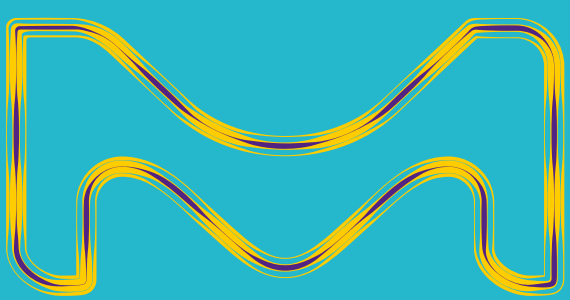
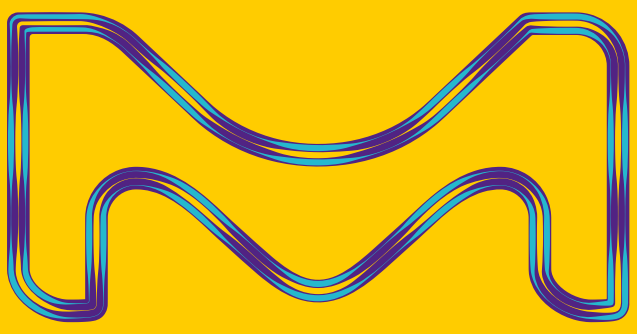
Merck KGaA
Darmstadt, Germany

Annual Report 2015

STRONGER





DISCLAIMER

GROUP

Key figures

€ million	2015	2014	Change in %
Net sales[1]	12,844.7	11,362.8	13.0
Operating result (EBIT)	1,843.2	1,762.0	4.6
Margin (% of net sales)[1]	14.3	15.5	
EBITDA	3,354.1	3,122.9	7.4
Margin (% of net sales)[1]	26.1	27.5	
EBITDA pre exceptionals	3,629.8	3,387.7	7.1
Margin (% of net sales)[1]	28.3	29.8	
Earnings per share (€)	2.56	2.66	–3.8
Earnings per share pre exceptionals (€)	4.87	4.60	5.9
Business free cash flow	2,766.2	2,605.1	6.2

[1]The composition of net sales has changed, see "Changes to accounting and measurement principles and disclosure changes" in the Notes to the Group accounts.

GROUP

Net sales

€ million

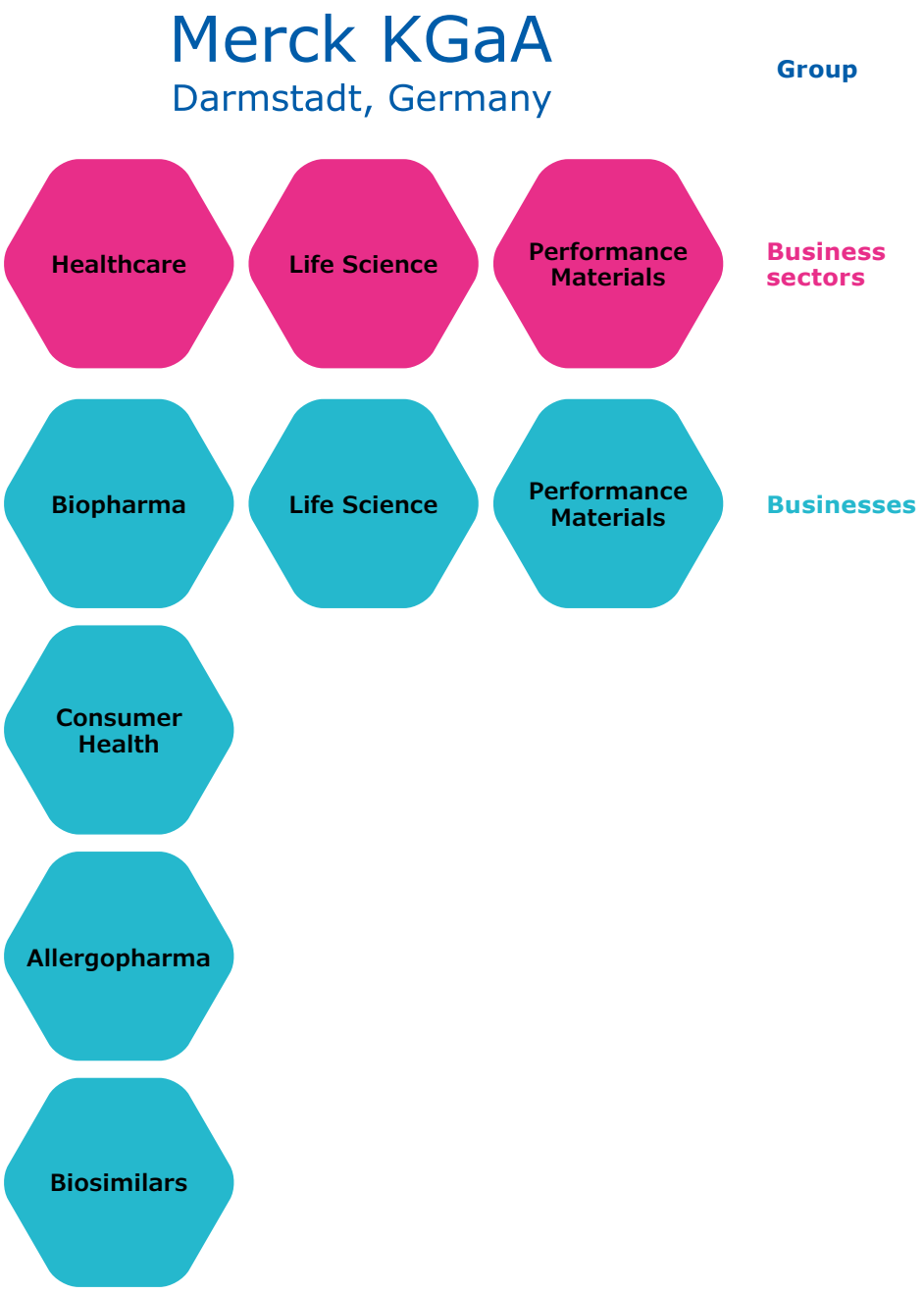
GROUP

EBITDA pre exceptionals

€ million

GROUP

Business sectors and businesses



our company has

fundamentally changed over the past ten years. We have developed from a classic supplier of pharmaceuticals and chemicals to a global science and technology company. With our unique combination of highly specialized biopharmaceutical, life science and materials businesses, we are in a position today to offer solutions to support global megatrends such as health and digitalization. Our new brand communicates this new direction to our customers, partners and applicants. We want to be recognizable and remain visible so as to strengthen our well-known brand name. To achieve this, we have adopted a bold and vibrant appearance.

“Today, our company is better positioned than ever before. We can be proud of what we are today: a leading science and technology company whose ideas and products can really make a difference in the world. With our three business sectors Healthcare, Life Science and Performance Materials, we are not only successful, but also improve the lives of patients, customers and partners all over the world.”

Karl-Ludwig Kley
Chairman of the Executive Board

Innovations are the essence of our activities. We work enthusiastically to develop future-oriented technologies and invest all our strength in promising areas of research such as cancer therapy, fertility treatment and new medicines, as well as in the development of cutting-edge materials for displays. The magazine in this annual report shows how we work on enriching human life through technological progress on a daily basis.

To Our Shareholders

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* The management report of Merck KGaA, Darmstadt, Germany, has been combined with the Group management report and published in both our 2015 Annual Report and our Annual Financial Statements. The annual financial statements and the combined management report of the Group and Merck KGaA, Darmstadt, Germany, for 2015 have been filed with the electronic German Federal Gazette and are available on the website of the German company register.

Highlights of 2015

March 4

Our company enables employees to share in the company's success
We paid out a total of around € 300 million to employees around the world in recognition of our business success in 2014, making this our highest profit-sharing payment ever. The good results of 2014 were mainly due to the successful implementation of the "Fit for 2018" transformation and growth program.

April 25

German Innovation Award
We received the German Innovation Award of the German Federal Ministry for Economic Affairs and Energy for our innovative liquid crystal technology. A few weeks earlier (March 22), we had also been awarded the Innovation Prize of German Industry in the "companies with innovative HR concepts" category for our Innovation Cup and Innospire initiatives.

May 28

Opening of the OLED Application Center in Korea
We opened our new OLED Application Center (OAC) in Pyeongtaek, Korea. With this € 7 million investment, we are strengthening our OLED research activities and Korea's leading role in the display industry.

June 3

Launch of our Curiosity Campaign in the United States
Launch of the cross-business "Smarter, Together" campaign. With the initiative, we underscored our rich history of innovation and relentless questioning in the United States, the world's largest pharmaceutical market. Our campaign aims to encourage scientists and engineers, among others, all over the world to share their passion and curiosity.

June 19

New OLED production unit in Darmstadt
We laid the cornerstone for a new OLED materials production unit in Darmstadt. Production of high-purity OLED materials for use in state-of-the-art displays and lighting systems is scheduled to start in the approximately 2,000 square meter building in summer 2016. Costing around € 30 million, the project is one of the largest single investments made at the site in recent years.

October 1

Innovation Center inaugurated
We opened our Innovation Center in Darmstadt, thereby creating a new platform for innovations. The aims are to promote the innovative potential of employees and give external innovators the opportunity to develop their ideas with our support.

October 13

Stefan Oschmann appointed new Chairman of the Executive Board
The Board of Partners of E. Merck KG, Darmstadt, Germany, appointed Stefan Oschmann as the new Chairman of the Executive Board and CEO of the Group. On conclusion of the Annual General Meeting on April 29, 2016, he will succeed Karl-Ludwig Kley, who will then retire after nine years at the helm.

October 14

Brand relaunched
We announced the relaunch of our brand identity. The revamped visual appearance and the introduction of a new logo reflect the transformation into a global science and technology company. Outside the United States and Canada, we operate uniformly under our corporate brand.

November 2

We are distinguished as a top employer by Science magazine
We were chosen as one of the world's best employers in the biopharmaceutical industry by Science magazine, an independent international publication.

November 18

Sigma-Aldrich acquisition closes
With the acquisition of Sigma-Aldrich for around US$ 17 billion, we completed the largest acquisition in our company's history, thus establishing one of the leading players in the over € 100 billion life science industry and a business with around 20,000 employees, 300,000 products and approximately one million customers.

November 20

Our company intends to double its presence in Africa by 2020
During its visit to Africa, our Executive Board announced plans to double the company's headcount and sales on the continent within the next five years. To achieve further growth, we are counting on the entrepreneurial spirit and innovative strength of this region.

A CLEAR VIEW

Unlocking a spirit of curiosity and inquiry: Innovative strength has always been a firm part of our DNA. The new Innovation Center in Darmstadt offers researchers an ideal environment to work on the products and solutions for tomorrow, for example, the ingenious LicriEye lens.

It's a melting pot of a broad assortment of ideas. At the Innovation Center in Darmstadt, interdisciplinary teams from all three business sectors of our company are passionately pursuing promising developments. In order to intensively work on their discoveries inside the modern, newly constructed light-gray building with its wide window façade, most of the teams were the winners of company-internal competitions. They have thus already cleared the first hurdle on the road to success.

The focal point: Our liquid crystal expertise

The LicriEye project team, which comprises experts from Performance Materials and Healthcare working hand in hand, is pursuing a clear view in two senses. The project, which is still in the early stages of development, is focusing on a novel way of treating cataracts, a widespread eye disorder. A cataract is a clouding of the lens in the eye, which commonly occurs in people over the age of 65. People with cataracts increasingly have problems with blurry and distorted vision and they have trouble seeing contrasts or bright colors. In most cases, this is a process that advances slowly and, if left untreated, could lead to blindness. Cataracts are treated by having them surgically removed in an outpatient procedure that usually takes around 15 minutes. Cataract surgery ranks among the most frequently performed operations worldwide. During surgery, an incision is made to remove the patient's clouded lens, which is then replaced by an intraocular artificial lens. The post-operative result depends on the precision of the implanted lens.

"An improperly measured artificial lens can only be subsequently corrected by surgically replacing the lens. Additional research is definitely required and development potential exists."

Prof. Dr. Lutz Hesse, Director of the Ophthalmology Clinic, SLK-Kliniken Heilbronn

"If the refractive index of the artificial lens has not been perfectly selected, the currently available intraocular lenses will not offer the patient precise vision after surgery," said Professor Lutz Hesse, Director of the Ophthalmology Clinic at SLK-Kliniken in Heilbronn, Germany. "An improperly measured artificial lens can only be subsequently corrected by surgically replacing the lens. Additional research is definitely required and development potential exists." The possible consequences are severe, for instance, poor eyesight with a refractive error of up to three diopters, which currently can only be corrected by eyeglasses.

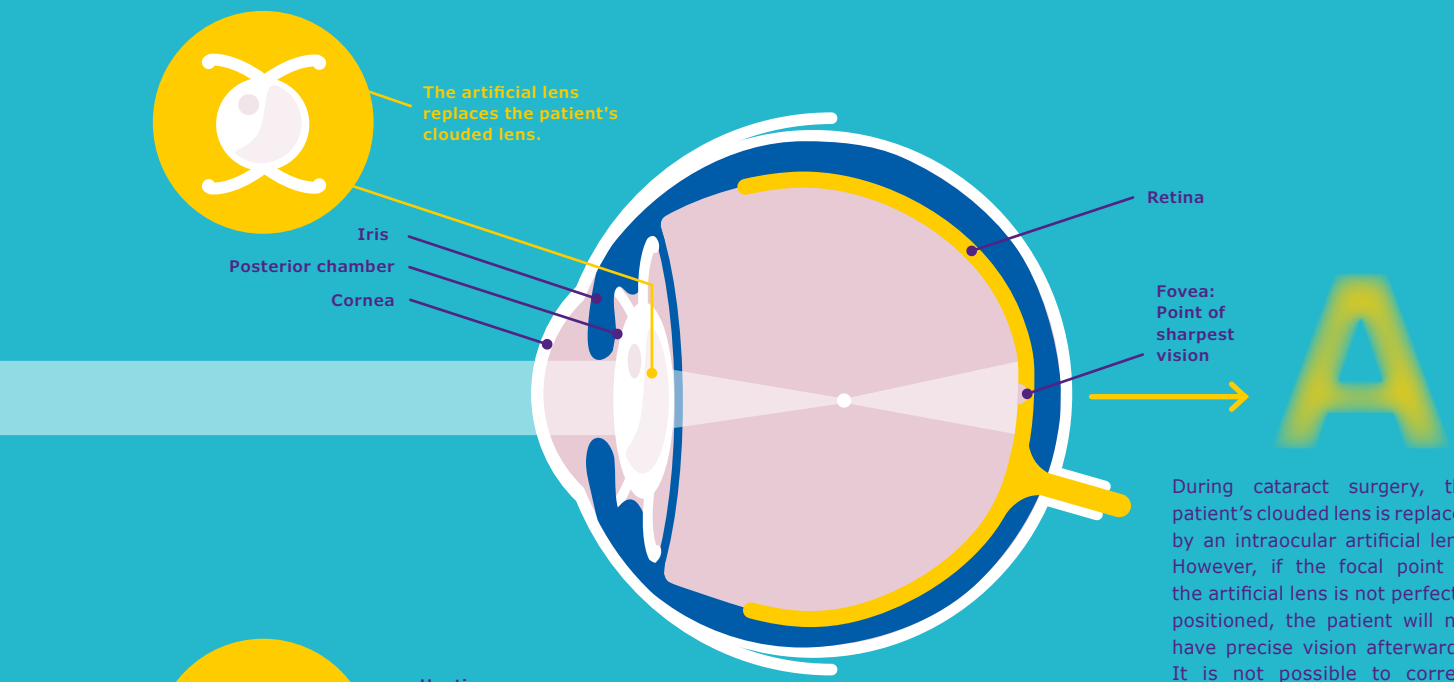
"LicriEye has the potential to restore the vision of patients after cataract surgery."

Martin Schraub, Head of the LicriEye project

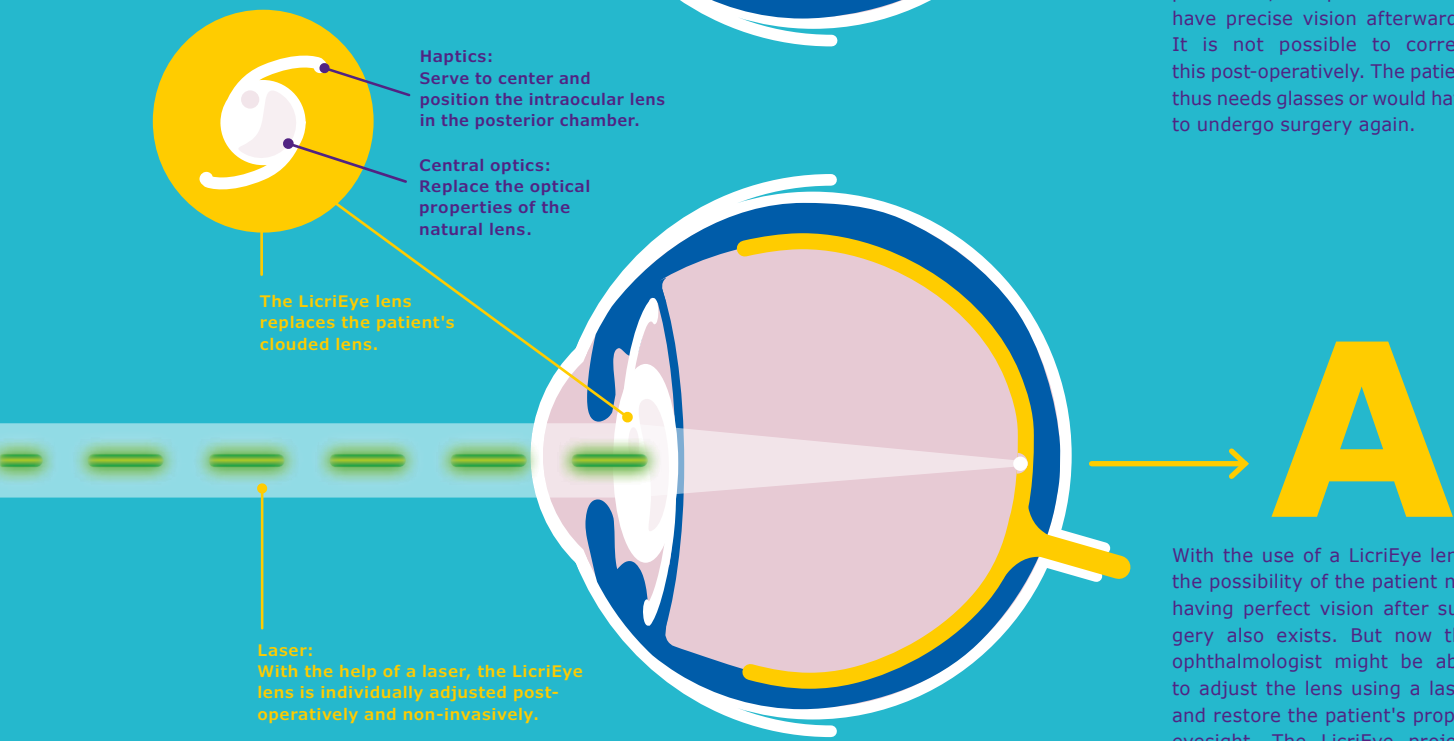
This is where the work of the LicriEye team comes in. The aim is to develop, in collaboration with a partner, an intelligent lens whose focal point(s) can be adjusted to the patient's needs after implantation. "Although lens implants have been standard medical practice for around 60 years now, there has not been very much development on the materials side," explains project head Martin Schraub. Whereas most manufacturers have been using plexiglass and its derivatives, we are conducting research on an innovative material that is photochemically targeted to the specific requirements and standards of this future medicinal product. It has to be transparent, flexible and biocompatible. Schraub and his colleagues are drawing on our wealth of liquid crystals experience normally used to produce 3D displays. After the lens has been implanted, the ophthalmologist could use a laser to non-invasively rework the material in order to individually adjust the optical properties of the lens, thus obviating the need for eyeglasses. Schraub, who is very optimistic about the market opportunities of the future medicinal product after potential regulatory approval, says, "LicriEye has the potential to restore the proper vision of patients after cataract surgery." Negotiations on manufacturing and marketing the product with a large partner company have already made very good progress.

What makes LicriEye unique

LicriEye would enable ophthalmologists to change the focus of the artificial lens after cataract surgery non-invasively using a laser, thus correcting potentially poor vision. Our liquid crystals expertise is playing a key role here.



During cataract surgery, the patient's clouded lens is replaced by an intraocular artificial lens. However, if the focal point of the artificial lens is not perfectly positioned, the patient will not have precise vision afterwards. It is not possible to correct this post-operatively. The patient thus needs glasses or would have to undergo surgery again.



With the use of a LicriEye lens, the possibility of the patient not having perfect vision after surgery also exists. But now the ophthalmologist might be able to adjust the lens using a laser and restore the patient's proper eyesight. The LicriEye project team is applying our expertise in reactive mesogens, a substance class produced by us and used along with other substances in 3D displays.

“As a company with a global footprint, international exchanges are especially important to us.”

Michael Gamber, Head of the Innovation Center

Project head Martin Schraub (left) talking to members of his team.

Scope for creativity

For a research-driven company such as ours, innovations are a key success factor. Yet progress is hardly ever the outcome of a process that can be precisely planned. By contrast, in order to allow visionary ideas to become reality, unconventional thinking, courage to take risks, and a pioneering spirit are required. Inaugurated in October 2015, the modular Innovation Center at our headquarters in Darmstadt offers the required scope for creativity. “On the one hand, the center is a springboard for young talent to develop and realize their concepts,” says Michael Gamber, Head of the Innovation Center. “On the other hand, it offers an attractive infrastructure for professional project work, which ideally will lead to future-oriented innovations.” These could be new products or services, as well as new business models or processes. The teams working in the Innovation Center took part in company selection processes, where they were able to convince a jury of experts from all the business sectors. External start-ups also have the opportunity to realize their ideas in the modular Innovation Center and are given a suitable budget to do so. The project teams receive additional support from our coaches and experienced managers, who serve as mentors and networkers. Not least, the aim is also to test the marketability and competitiveness of their ideas. “As a company with a global footprint, international exchanges are especially important to us,” Gamber emphasizes. Practical training, workshops, lectures, and online tutorials supplement the range of offers for the project teams in the modular Innovation Center.

Being open to new things is the guiding principle of the work in the two-story building, which has a surface area of nearly 4,000 square meters. The welcoming architecture also signals openness. There are no permanent offices, but rather flexible work spaces. The different wings of the building, which have been constructed as modules, are grouped around a spacious courtyard. The building is a trial run for the future Innovation Center, which is scheduled for completion by the end of 2017 and will form the heart of the new global headquarters. It is a key element of the “Fit for 2018” transformation program and is intended to further boost our innovative strength.

Further Innovation Center projects

Realizing ideas:
The Innovation
Center offers young talent
scope for creativity.

A simple rapid test for clinical diagnostics

The research work of a further interdisciplinary project team from the Healthcare, Life Science and Performance Materials business sectors of Merck KGaA, Darmstadt, Germany, in the modular Innovation Center is dedicated to a postage stamp-sized test strip for clinical diagnostics and quality assurance. Thanks to its special surface properties, the test strips can be used to investigate multiple parameters in just a few drops of liquid, all at the same time. A further major advantage of this test is its ease of use. It requires neither trained experts nor complex sample preparation or special laboratory equipment. Theoretically, non-experts could also conduct these rapid and uncomplicated diagnostics. The test can be used in a wide variety of healthcare and life science applications. From immunoassays to biochemical assays, several reactions can be adapted to the platform to generate a simple, fast and cost-effective diagnostic test. The project aims to make diagnostics available to everyone, anywhere they're needed.

A high success rate for in vitro fertilization

We are the leading supplier of hormones for fertility treatment. The Fertility Technology team led by Jan Kirsten is aiming to further strengthen our position in this therapeutic area and to improve treatment outcomes. For example, it has in-licensed and further developed new in vitro fertilization (IVF) technologies. The team is currently working on an innovative incubation system that is capable of simultaneously imaging embryonal development using a fully automated embryo and oocyte freezing system along with the Eeva® test. The aim of Eeva® (Early Embryo Viability Assessment) is to provide important information to assess in vitro fertilized embryos for transfer into the uterus. With these new technologies, fertility clinics can make more reliable decisions, for example when selecting the best embryo for transfer or freezing. Clinical trials show that the success rate of IVF treatments can be increased with the support of Eeva® in addition to traditional methods.

Efficient solutions for lab work

Analytical laboratories are confronted simultaneously by considerably growing numbers of samples and increasing pressure on costs. This situation requires new, rapid and economical forms of active ingredient analysis in many application fields. The Smart TLC project is conducting research in the modular Innovation Center on advanced solutions and methods designed to make laboratory work easier, application-friendlier and more efficient, as well as significantly increasing sample throughput. The objective is to considerably reduce analysis times while improving the quality of results and achieving greater reproducibility.

IMPLANTATION RATE*

% (2014)

- **The Eeva® test + traditional methods**
- **Traditional methods**

* The Eeva® test used together with traditional methods improves the success of implanting the blastocyst by 10 percentage points, compared to traditional methods alone.[1,2]

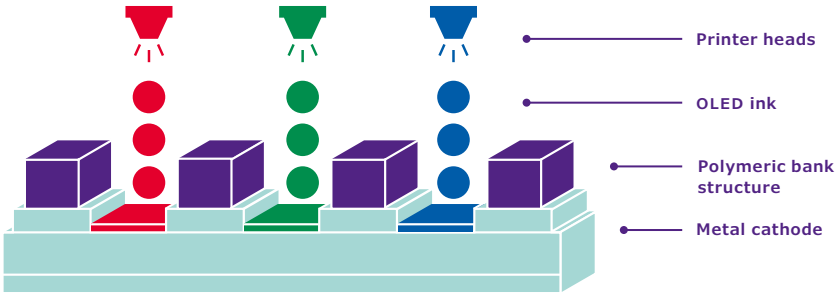
1. Adamson D, et al. Accepted for presentation at the American Society of Reproductive Medicine (ASRM) Annual Conference, (2014).

2. VerMilyea MD, et al. Computer-automated time-lapse analysis test results correlate to clinical pregnancy and embryo implantation:
A prospective, blinded, multi-center study. Reprod BioMed Online. 2014; 29(6):729–736.

READY FOR PRINTING

Brilliant colors, excellent image quality, high efficiency: OLED displays offer captivating advantages, whether for smartphones or large televisions. So far, producing OLED displays has been complex and costly. However, innovative printing processes, which we have been intensively developing for several years, are set to open up a “shining new era” soon.

Leticia Garcia Diez, responsible for technology development of OLED inks.



Printing OLEDs: The OLED substances (polymers, small molecules) are dissolved and the resulting inks are applied to a glass substrate by a printer head. Embedded between anode and cathode, the organic molecules are electrically excited, thus producing light.

What was still the future yesterday is now history today in the fast-paced and highly innovative electronics industry. But now comes the next "big thing" in display technology, which experts predict will have enormous potential. Organic light-emitting diodes, or OLEDs for short, are likely to capture the markets in a wide variety of applications soon. They are already lighting up the displays of many mobile phones. And they are also starting to be used in televisions to provide a colorful and contrast-rich viewing experience. There are hardly any limits to the imagination as far as the future use of OLED displays in multimedia is concerned. Transparent screens as well as houses, façades and windows with an enchanting shine, huge display panels and traffic control systems, as well as flexible displays that can be bent, folded and rolled up. Designers are already enthusiastic about the diverse possibilities of filigree illuminated tiles. And the automotive industry is also showing a keen interest in using OLEDs, for example as rear lights.

A shining example

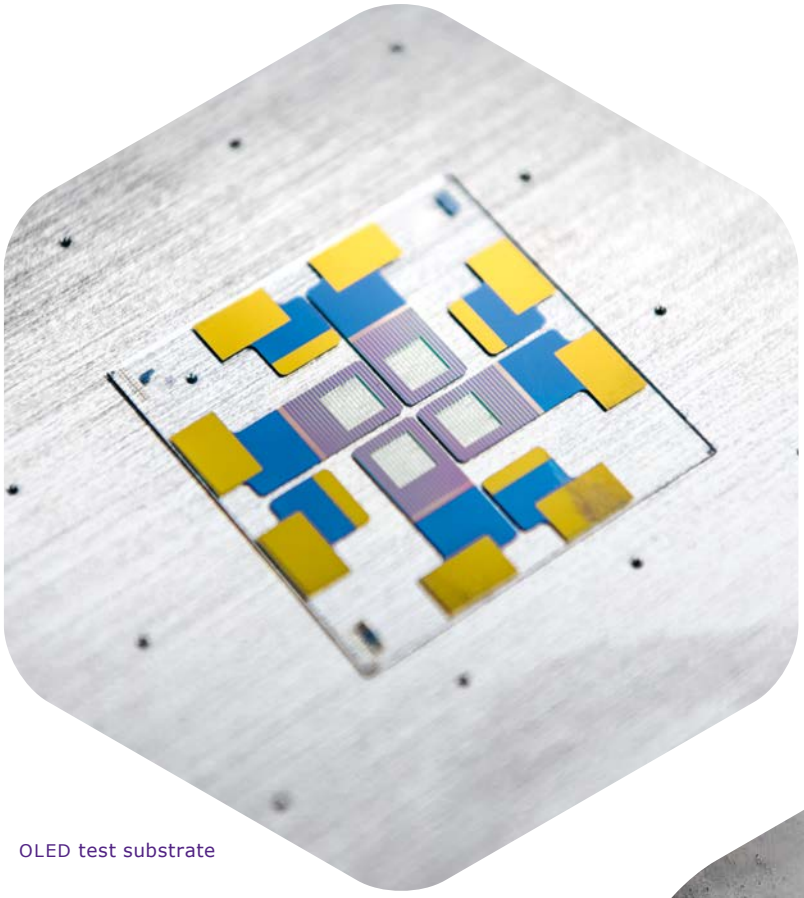
But what makes OLEDs so promising for the future? "A major advantage is the fact that semiconducting organic materials light up on their own when an electric voltage is applied," explains Herwig Buchholz, Global Head of R&D OLED Chemistry & Strategic Developments at Merck KGaA, Darmstadt, Germany. "In contrast to liquid crystal displays, OLEDs do not need any backlighting, so the displays can be extremely thin." Every single one of the millions of pixels in a high-resolution TV screen consists of one light-emitting diode each in red, green and blue. Whereas liquid crystals (LCs) act as a switchable filter and still transmit some light even if they are switched to dark, OLEDs only emit colored light when activated. From every viewing angle, this produces extremely high-contrast, sharp, colorful images with very fast response times. Other advantages of organic light-emitting diodes are their long lifetime and high energy efficiency.

Costly vapor

So why haven't OLEDs become the global standard yet? On the one hand, liquid crystals, a well-established field in which we are the market and technology leader, continue to meet increasing quality requirements. On the other hand, OLED production poses a challenge as it is still very complex and costly. For each diode, several ultrathin layers of material must be deposited with pinpoint precision in very small portions onto a glass plate. The closer the diodes are to one another, the higher the resolution of the display. In the currently prevailing coating process, a metal mask is used to evaporate and deposit the OLED materials. This process is repeated several times with different materials and masks. High costs and low material utilization are major disadvantages of this process. More than half of the OLED materials are lost during deposition. And last but not least, the energy and environmental footprint of this method is rather modest. "For technical and financial reasons, the evaporation method has limitations in the mass production of large-area OLED displays," says Anja Jatsch, Project Manager OLED Formulation. "For television screens, our customers are currently using a process that combines white OLEDs with color filters. This is yielding very good results for televisions with very large screens."

Both mass and class

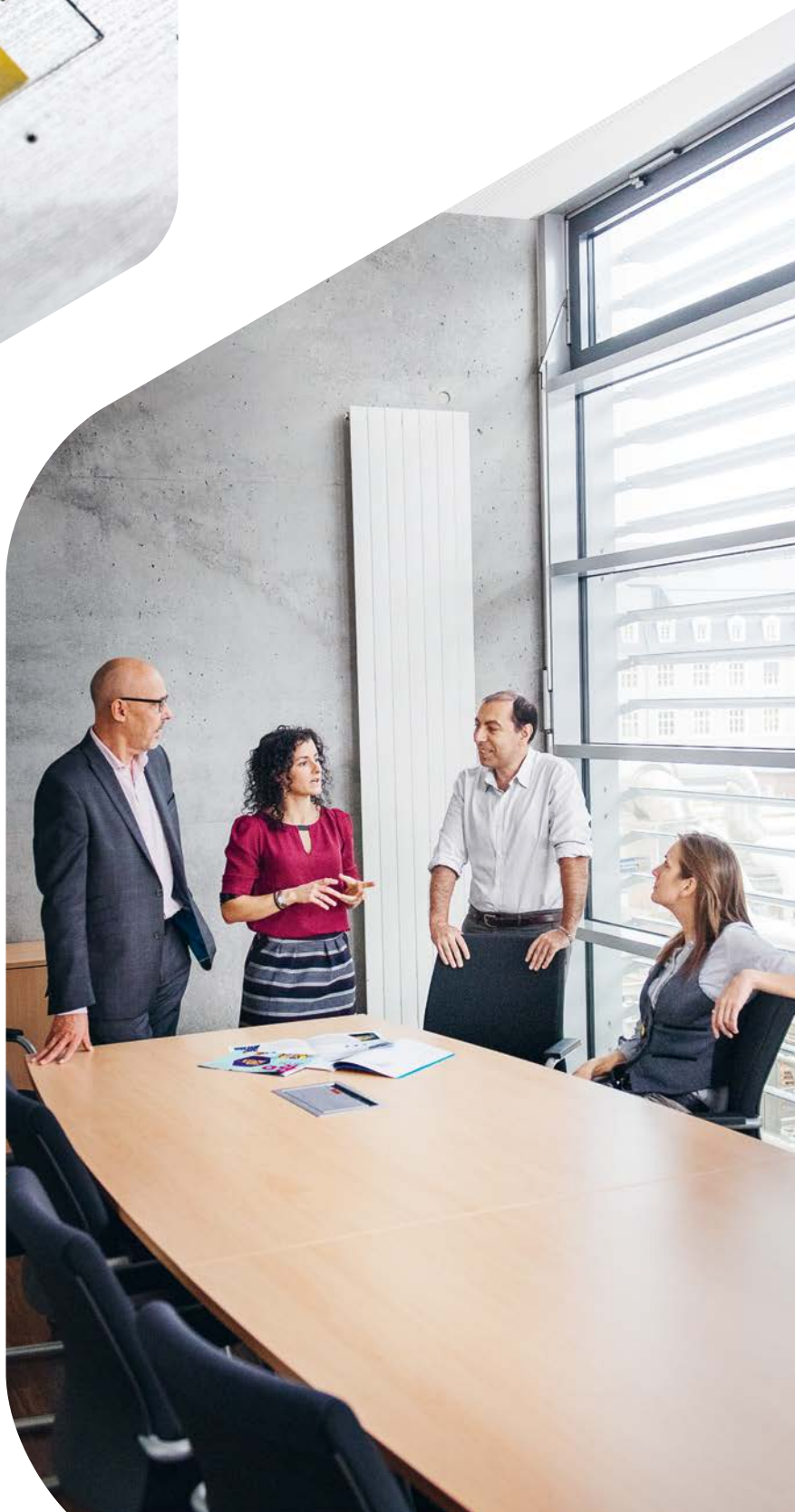
The key to future success is an innovative printing technology that we have been developing intensively for several years. The pioneering achievement combines the advantages of two different classes of materials – printing solutions of small molecules and semiconducting polymers. Small soluble molecules significantly increase the coating efficiency, while the printing process makes it possible to coat large surfaces with high homogeneity and low material consumption. "The use of inkjet technology brings the mass production of large OLED television screens within reach," says Jatsch.



OLED test substrate

"Different cultures and working methods come together in our international and interdisciplinary teams. This creates a highly innovative and stimulating environment. Coupled with our enthusiasm for developing new technologies, this contributes significantly to the success of our products."

Herwig Buchholz, Global Head of R&D OLED Chemistry and Strategic Developments



Our OLED researchers (from left) Herwig Buchholz, Leticia Garcia Diez, Remi Anemian and Anja Jatsch during a project meeting.

Anja Jatsch, Head of the formulation laboratory, preparing an OLED printing ink.

“The use of inkjet technology brings the mass production of large OLED televisions within reach.”

Anja Jatsch, Project Manager OLED Formulation

Remi Anemian in front of an interactive OLED mirror.

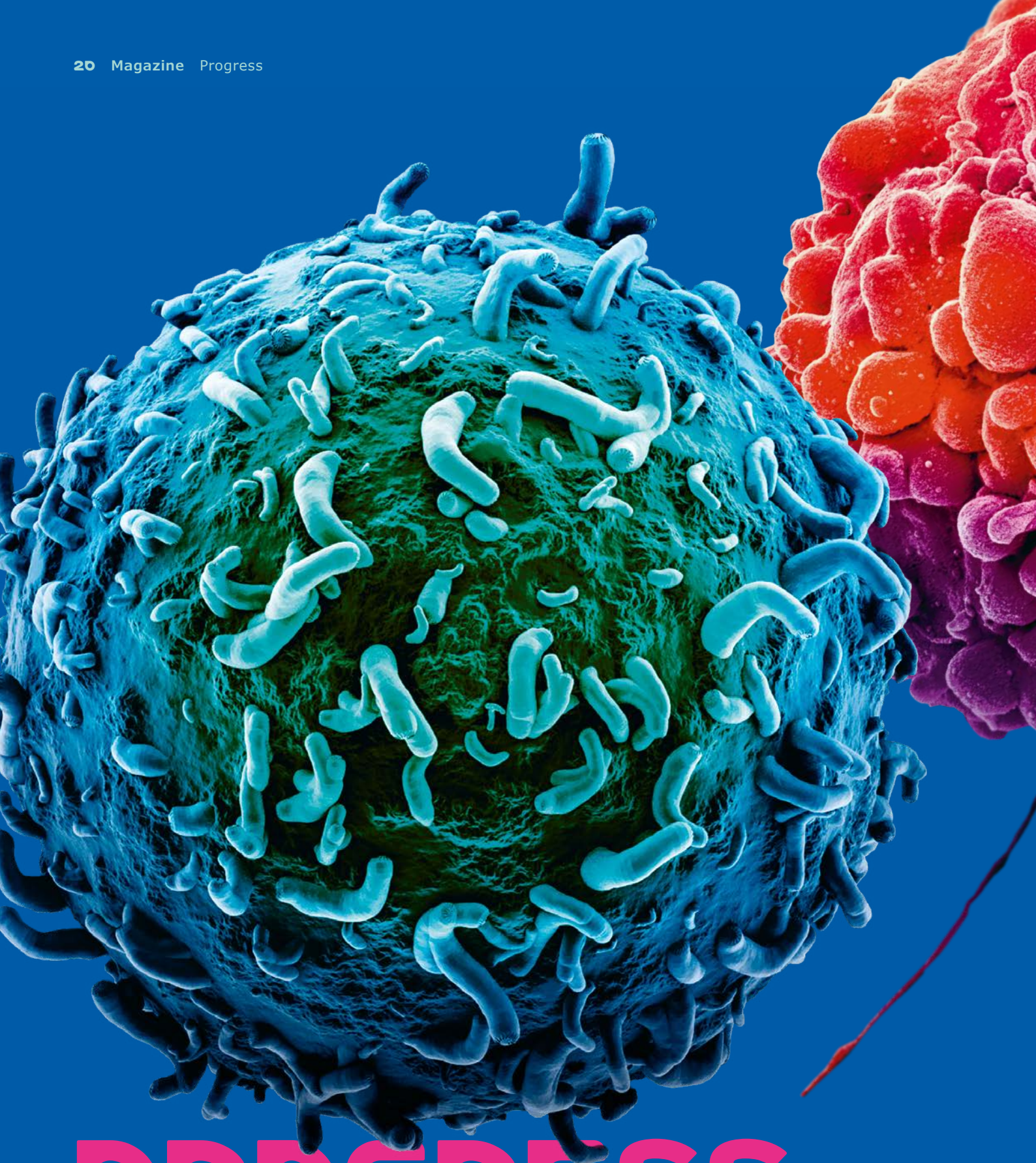
In order to advance the innovation process using inkjet printing inks, we have been collaborating closely with Seiko Epson since October 2012. The Japanese company is among the world’s leading printer manufacturers. “We are working together on transforming our high-quality OLED materials into printing inks that can be applied by inkjet printing systems,” says Leticia Garcia Diez, Project Manager OLED Ink Technology at Merck KGaA, Darmstadt, Germany. Very high requirements are placed on these inks. After formulating the OLED materials, they must be rapidly printable in error-free superior quality – in huge printers with a large number of print heads.

Endless team spirit

Step by step, scientists are optimizing OLED inks with regard to their electro-optical properties, drop and film formation, printing of stacks of different layers, and adaptation to the print heads. A global team of chemists, physicists, engineers and materials scientists are mastering these challenges. Last but not least, our marketing experts are also using the close contacts they have to their customers, namely display manufacturers from the liquid crystals business. After all, the OLED inks, delivered in special cartridges, are soon to be marketed worldwide. “Different cultures and working methods come together in our international and interdisciplinary teams,” says Herwig Buchholz. “This creates a highly innovative and stimulating environment. Coupled with our enthusiasm for developing new technologies, this contributes significantly to the success of our products.”

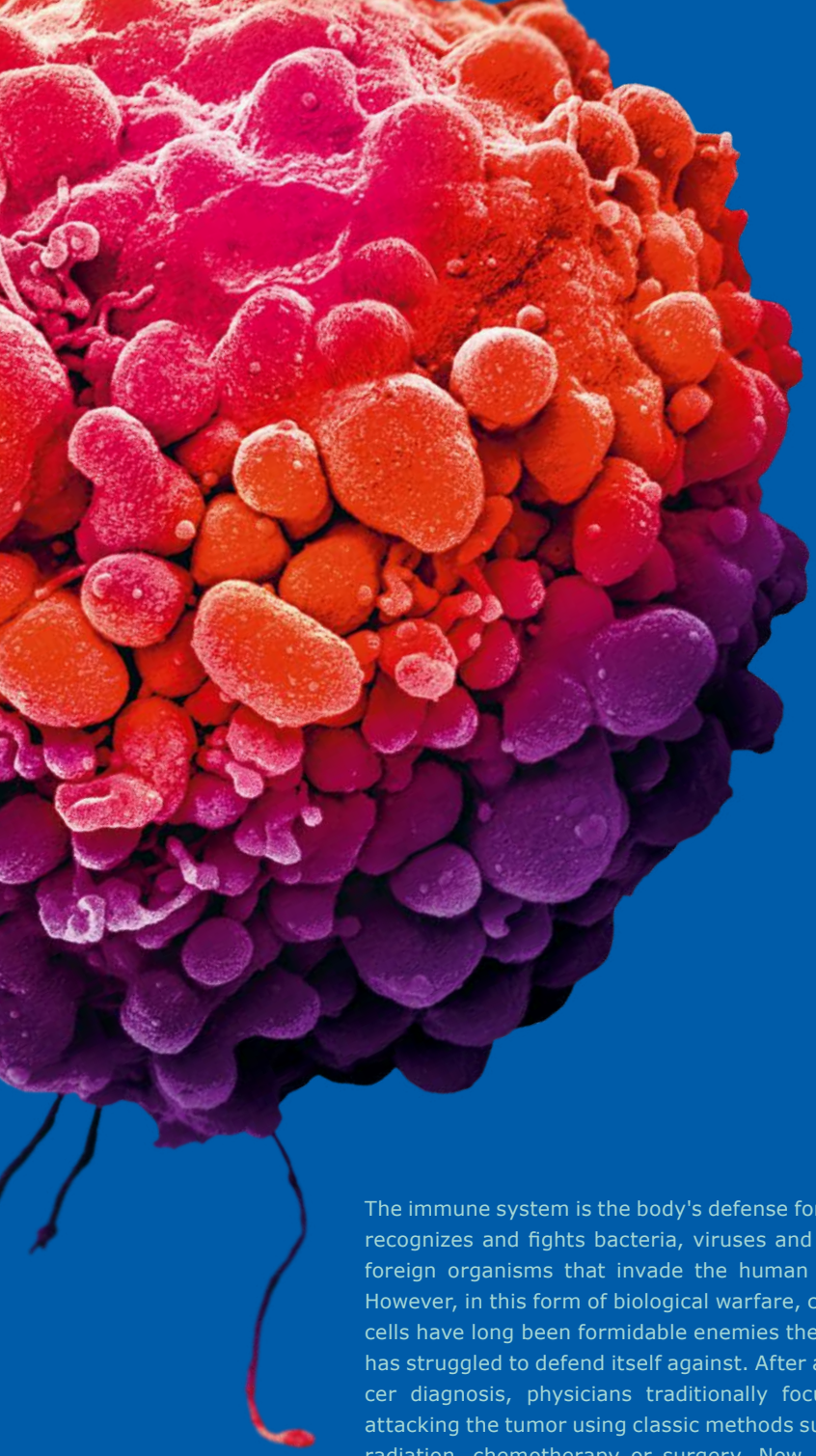
Organic growth

We are already very well-positioned in the OLED materials market. The high investments we are making at several locations underscore the company’s confidence in the future success of organic light-emitting diodes. “In our new R&D and application laboratory in Korea, for example, we are collaborating closely with key customers. In addition to the continuous development of materials for today’s coating processes, we are running exciting pilot projects to test the printing processes in large-scale production. The first market launches of printed OLED displays could be possible in 2017,” says Remi Anemian, Head of Global Technical Marketing OLED. And in Darmstadt, we laid the cornerstone for a new production plant in June 2015. Production of high-purity OLED materials for use in displays and lighting systems is scheduled to start in the approximately 2,000 square meter building in summer 2016. By investing around € 30 million, the company is further strengthening its position in this promising business. It’s an ambitious goal: By 2018, we also aim to be the world’s leading supplier of printable OLED materials.



PROGRESS

Immuno-oncology therapies activate the body's own immune system to fight tumors – and they represent a new era in cancer treatment. Through a strategic alliance, Merck KGaA, Darmstadt, Germany, and Pfizer are combining their strengths in order to quickly capture the potential of this promising research area.

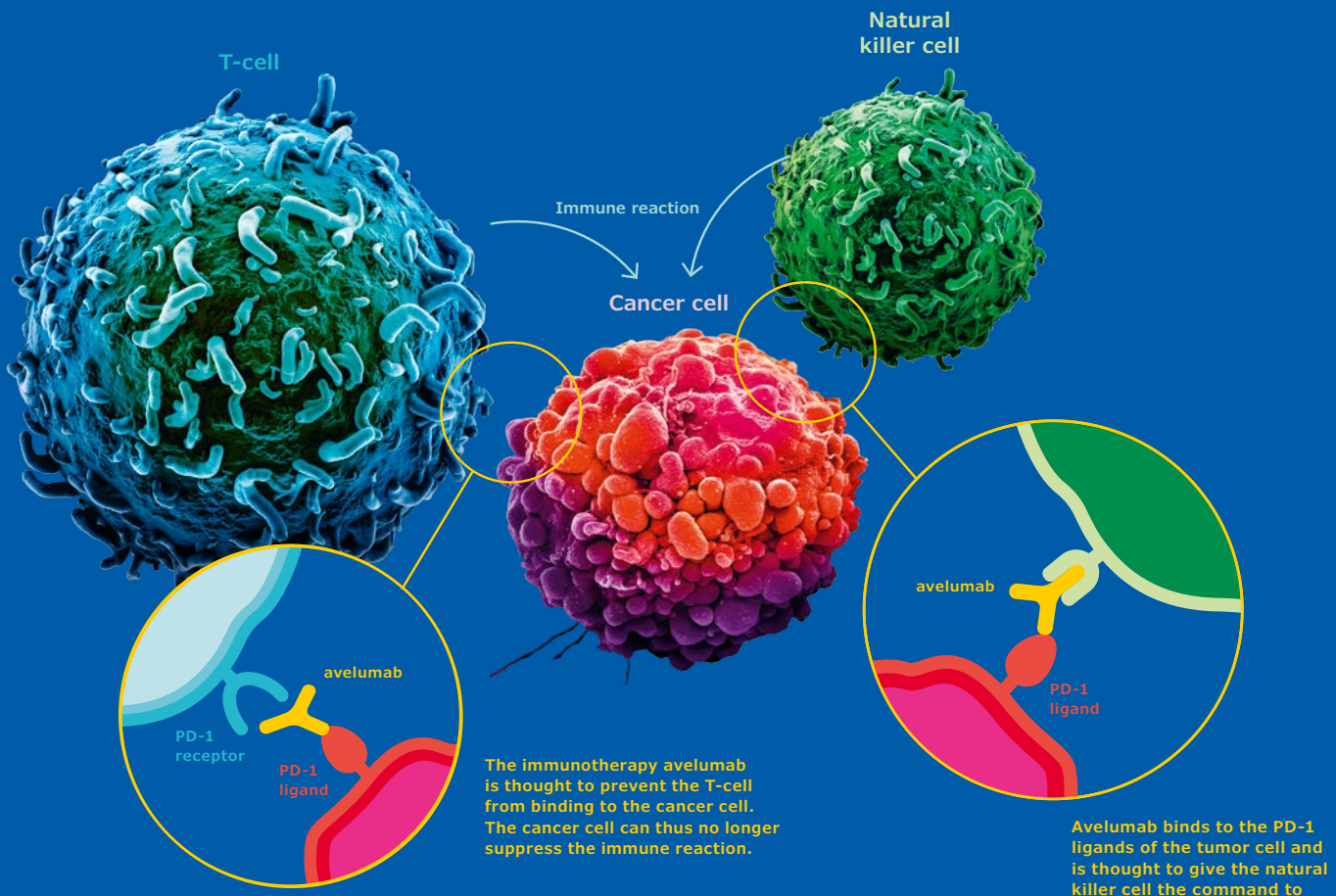


The immune system is the body's defense force. It recognizes and fights bacteria, viruses and other foreign organisms that invade the human body. However, in this form of biological warfare, cancer cells have long been formidable enemies the body has struggled to defend itself against. After a cancer diagnosis, physicians traditionally focus on attacking the tumor using classic methods such as radiation, chemotherapy or surgery. Now, along with other potentially promising treatments, immuno-oncology is opening up new prospects in cancer therapy because it harnesses the body's own immune system to fight tumor cells. Innovative immunotherapies could enhance the prospects for patients' survival in different forms of cancer, and therefore represent a promising opportunity for research-based pharmaceutical companies such as Merck KGaA, Darmstadt, Germany.

Joining forces to fight cancer

The ace that our company has in its hands is tiny, but a potential game-changer in the fight against cancer. Its anti-programmed death-ligand (anti-PD-L1) antibody (the proposed international non-proprietary name is 'avelumab') could be the basis for development of a new type of cancer drug. Our view is shared by the international pharmaceutical company Pfizer, so experts from both companies got together on this basis, with far-reaching consequences. In the spirit of the concept 'Together we are stronger', in November 2014 this culminated in the announcement that our company and Pfizer had formed an alliance to pursue what they see as a joint objective: developing anti-cancer strategies based on a shared understanding of the important biological role of checkpoint inhibitors, a move widely regarded as an exciting one within the industry. Avelumab was discovered and initially developed in our laboratories, and is one of the company's highest-priority programs.

"The alliance with Pfizer has enabled us to quickly accelerate the clinical development program for avelumab, and we're on track to meet several important milestones in the near term. Our efforts in immuno-oncology and R&D more broadly remain centered on making a meaningful difference in the lives of patients around the world," says Luciano Rossetti, Head of Global Research and Development within our Biopharma business. From our viewpoint, the alliance is also financially worthwhile: as part of the agreement, Pfizer has paid our company US$ 850 million in order to jointly develop and commercialize the anti-PD-L1 antibody. The two companies will share the costs and revenues, apart from a potential bonus for us. If certain milestones are achieved, we are eligible to receive an additional total amount of up to US$ 2 billion from Pfizer. Another outcome of the deal is the move by both companies to co-market Pfizer's cancer drug Xalkori® in the United States and in further key markets. As a result, our company has built up its own U.S. oncology sales force, which it previously did not have and which, ultimately, could be used to market avelumab and other cancer drugs. Through this alliance, we are thereby also gaining faster access to the U.S. oncology market – the world's largest. In addition, both companies will be further developing a potential therapy of Pfizer's with an almost identical designation: anti-PD-1.



The immunotherapy avelumab is thought to prevent the T-cell from binding to the cancer cell. The cancer cell can thus no longer suppress the immune reaction.

Avelumab binds to the PD-1 ligands of the tumor cell and is thought to give the natural killer cell the command to attack the cancer cell.

A camouflaged attack

So why are scientists excited about anti-PD-L1 antibodies? In order to explain the relatively complex functions of anti-PD-L1 and anti-PD-1, we need to consider the purpose of the immune system. Its capability as a successful defense against invaders that cause disease (pathogens) depends on a collective effort by organs, tissues and the immune cells, commonly known as white blood cells. Immune cells first scan the tissue for any sign of injury, infection and general malfunction, including signs of uncontrolled cell division that could potentially form a malignant tumor. T-cells (so-called because they mature in the thymus) comprise a key subtype of immune cells that are able to recognize and eliminate hostile attacks by pathogens, in concert with other immune cells. Microorganisms have specific structures on their cell surface, called antigens, which T-cells are able to recognize using very specific receptors, and stimulate the destruction of the pathogens. The memory of this specific antigen is then retained by the immune system to prevent a repeat infection.

This process is highly effective at eliminating pathogenic invaders, but it can also damage local tissues – the reason for the hot, red, painful area associated with inflammation. Once the infection has been resolved, local tissues release so-called "checkpoint-inhibitor" molecules, such as PD-L1, which act to switch off the T-cell response. Unfortunately, cancer cells exploit this mechanism – they cleverly camouflage themselves using the PD-L1 and other inhibitors. The consequences are disastrous: They are no longer recognized as enemies by the immune cells.

The power of antibodies

It is at this precise point where the antibodies anti-PD-L1 and anti-PD-1 come in. Their job is to turn off the mechanism that masks the spread of cancer cells. Avelumab is a molecule that binds to the PD-L1 used by cancer cells to camouflage themselves and is believed to serve as a giant red flag to the immune system, encouraging a multifaceted cell-mediated offensive against the cancer cells.

Avelumab has not yet been approved. Nevertheless, the extensive clinical development program is making tremendous progress (see interview). In the words of Kevin Chin, Executive Medical Director Immuno-Oncology at our company: "Our early clinical safety and efficacy data for avelumab point to encouraging therapeutic benefit for patients across multiple types of cancer. We look forward to seeing the full potential of this therapy unfold." Moreover, the professional medical community is also following the research activities of Merck KGaA, Darmstadt, Germany, and Pfizer with close interest, and with optimism. Dr. Mary "Nora" L. Disis, Professor, Department of Medicine, Division of Oncology, University of Washington, says, "The response to avelumab in patients with previously treated, recurrent or refractory ovarian cancer has been promising. The data presented at ASCO 2015 are the most exciting I've seen in ovarian cancer for this patient population in the last ten years." Avelumab could well emerge as a leading and significant addition to the pharmacological armory in the war against cancer.

"We're combining our resources and expertise"

Interview with Andrew Schiermeier, Head of our alliance with Pfizer

What are the key strategic drivers of the alliance with Pfizer?

Andrew Schiermeier: We are combining our resources and expertise because we share a vision of making a real difference to patients with cancer. Our focus is on jointly investigating avelumab* in different cancer indications: We will explore its potential as a single agent and in various combinations with our collective portfolio of approved and investigational oncology therapies. The alliance enables the companies to quickly move into the first wave of potential immuno-oncology-based monotherapy treatment regimens and to potentially take a leadership position in the next wave of immuno-oncology combination therapies.

Andrew Schiermeier, General Manager of our Immuno-Oncology Alliance with Pfizer and Head of Global Oncology at Merck KGaA, Darmstadt, Germany.

Where does the main potential of immuno-oncology and specifically of avelumab lie?

Andrew Schiermeier: Cancer immunotherapies work by harnessing the body's own immune system to attack a tumor, either by restoring or boosting an immune response to a malignant tumor. Avelumab is thought to enable the activation of T-cells and the adaptive immune system, while leaving other PD-1 interactions intact. Early data also suggest avelumab may possess unique features, including the possible engagement of the innate immune system. Through clinical trials, we want to identify whether this effect may benefit patients.

What are the biggest challenges in the clinical development program of avelumab?

Andrew Schiermeier: With the JAVELIN program, we aim to evaluate the potential for PD-L1 inhibition with avelumab to treat multiple types of cancer. With more than 1,500 patients treated to date, it is among the largest exploratory study programs in immuno-oncology. In 2015, more than 20 clinical programs were initiated, six of which are pivotal trials. Avelumab is currently being studied in over 15 tumor types.

What is the current status and when do you expect the market launch of avelumab?

Andrew Schiermeier: By the 2016 Annual Meeting of the American Society of Clinical Oncology (ASCO), the JAVELIN program is expected to include up to 25 trials studying avelumab as a single-agent and combination therapy. We expect the first potential market launch in 2017, with the alliance working toward at least one additional launch per year until 2022.

* Avelumab is the proposed International Nonproprietary Name (INN) for the anti-PD-L1 monoclonal antibody (previously known as MSB0010718C).

"The data presented at ASCO 2015 are the most exciting I've seen in ovarian cancer for this patient population in the last ten years."

Dr. Mary "Nora" L. Disis,
Professor, Department of Medicine, Division of Oncology, University of Washington

AWARE NESS

A young woman participating in a free diabetes screening offered through our CAP initiative.

With its multi-year Capacity Advancement Program, our company wants to strengthen its education and prevention efforts among people living in emerging economies and developing countries. The focus is on diseases such as diabetes and cancer, as well as on fertility treatment.

Kibera is a massive slum in southwest Nairobi, the capital of Kenya. Zena Ali is sitting on the side of a dusty street in front of a green corrugated-iron hut selling vegetables. She tells her story calmly, "It started around three years ago. I felt weak, needed to urinate frequently and had a fever. A doctor gave me some malaria drugs, but my condition did not improve." Not until she was examined in a hospital in Nairobi did she receive the correct diagnosis: diabetes. Zena Ali is confused. She was born and raised in a slum. And she still lives there today, together with her husband in very modest circumstances. "I asked myself how could I have a disease that otherwise only rich people get," Zena Ali recalls.
Diabetes is indeed still generally considered a disease of the wealthy, namely overweight, elderly people living in western industrialized countries. Africa, by contrast, is usually associated with the fight against infectious diseases such as AIDS.

New clinical pictures

But that's far off the mark, especially since the incidence of non-communicable diseases such as diabetes, cardiovascular disorders and cancer is rapidly growing. Around 12 million people in Africa suffer from diabetes today. According to the International Diabetes Federation (IDF), the number of people with diabetes in Africa is expected to double by 2035. The IDF has determined that in Africa, 76% of deaths due to diabetes are in people under the age of 60. Economic progress is the main reason for the spread of the disease. A significantly growing middle class is giving rise to new eating habits and an unhealthy lifestyle. Zena Ali also says, "I used to eat a lot of junk food and after my diagnosis I had to completely change my diet." Paradoxically, around 70% of people worldwide classified as poor live in emerging economies, mainly in Africa and Asia. The population has little knowledge of the causes of and therapies for diseases, especially in rural areas.

OUR PLANNED HEADCOUNT DEVELOPMENT

in Africa from now through 2020

Our company in Africa

We have been providing healthcare services in Africa since 1897. The company currently has around 400 employees across ten African countries and plans to increase this number to around 1,000 by 2020. We want to more than double our sales in Africa to € 500 million by 2020. In November 2015, our company signed an agreement on the local production of the diabetes treatment Glucophage® in Algeria, opened a new office in Nigeria and launched the cell counter Muse® for the detection of HIV. In addition, we support a wide range of initiatives within the health field, one of its Corporate Responsibility strategic spheres of activity. An important goal is to eliminate the worm disease schistosomiasis in cooperation with the World Health Organization (WHO).

Deepening training

Many physicians still do not have sufficient knowledge either. This is a challenge that we would like to actively tackle. The five-year Capacity Advancement Program (CAP) aims, among other things, to deepen the professional training of medical students as well as to develop awareness and educate the local population in emerging economies and developing countries. "In partnership with African universities – such as the University of Nairobi, Makerere University in Uganda, and the Universities of Namibia, Ghana, as well as Addis Abeba in Ethiopia – 7,000 medical students are already benefiting from a European-accredited clinical training program on the treatment of chronic diseases," explains Rasha Kelej, Head of Global Business Social Responsibility and Market Development, responsible for CAP at Merck KGaA, Darmstadt, Germany.

"In partnership with African universities 7,000 medical students are already benefiting from a European-accredited clinical training program on the treatment of chronic diseases."

Rasha Kelej, Head of Global Business Social Responsibility and Market Development

This training program is also underway under the auspices of CAP at Asian universities such as Maharashtra University in India and the University of Indonesia. By the end of 2018, we plan to reach more than 25,000 students and expand the program to further countries in Africa, Asia, Latin America and the Middle East. CAP also includes initiatives designed to boost research capacities and promote the work of young researchers in the healthcare field, for instance the UNESCO Merck KGaA, Darmstadt, Germany, Africa Research Summit (MARS). The annual summit aims to help build research capacity in Africa with a special focus on Ebola and emergent infectious diseases and pave the way for Africa's development as an international hub for research excellence and scientific innovation.

Free screening

With the launch of our Africa Diabetes Days, our company is taking action against the significant increase in the number of diabetes patients in Africa. The "Every Day is a Diabetes Day" initiative aims to educate people on the dangers of diabetes. Free diabetes screening and medical education on the disease is planned for more than 300,000 people throughout Africa by the end of 2016. "Merck KGaA, Darmstadt, Germany, is thus doing valuable prevention work. Patients with diabetes can receive proper treatment after being diagnosed and those at risk can protect themselves by changing their lifestyle," says Professor C.F. Fredrick Otieno from the University of Nairobi School of Medicine.

Fighting cancer

We are also focusing on the fight against cancer. Today, developing countries account for around one-half of all cases of cancer worldwide. And the trend is growing sharply. Here too, the disease distinguishes neither between rich and poor nor between old and young. The medical infrastructure of many African countries is hardly prepared for this tremendous challenge. The survival rate of cancer patients is much lower than in western industrialized countries. This is a situation that our Merck KGaA, Darmstadt, Germany, Cancer Control Program (MCCP), which was set up in 2015, wants to change, likewise under the umbrella of CAP. With the help of internationally renowned oncologists, the aim is to improve the training of medical students in the prevention and early detection of cancer. In addition, our E-Health initiative in cooperation with the Kenyan Ministry of Health is improving access to cancer therapies in rural regions by using the possibilities of telemedicine. "The majority of the poor population lives in rural areas with inadequate health facilities. Video conferencing can help to overcome this barrier," says James Macharia, Kenya's Cabinet Secretary for Health.

In addition, in order to increase the limited number of medical oncologists in Africa, we are supporting a medical oncology fellowship program. It will start in Kenya and be rolled out across Africa.

The Capacity Advancement Program of our company is supporting Zena Ali, a diabetes patient who lives in a slum outside Nairobi.

Students at Makerere University in Uganda discussing clinical diabetes management.

The stigma of infertility

A further CAP initiative is addressing the discrimination of childless or infertile women. In some cultures, the private problem of infertility can escalate into a public stigma with serious consequences. Childless women are often isolated and suffer from physical and mental abuse. The "More than a Mother" campaign launched by our company together with the Kenya Women Parliamentary Association (KEWOPA) and the University of Nairobi is tackling this problem.

The program will not only provide medical education and awareness for medical students and healthcare providers, but it will also help governments to define policies to improve access to safe and effective fertility care and address the need for interventions. Joyce Lay, Kenyan Member of Parliament and "More than a Mother" ambassador, says, "This initiative will define several interventions to reduce the social suffering and stigmatization of infertile women and raise awareness about infertility prevention, male infertility and the necessity for a team approach to family building among couples."

The "More than a Mother" initiative is being accompanied by a social media campaign in order to enable the affected women to share their stories of stigma.

GROWTH

One plus one equals three – that's the objective when two major players within an industry join forces. Having completed the acquisition of the laboratory supply company Sigma-Aldrich, we are now one of the leaders in the global life science industry. Customers will benefit from a superb e-commerce platform, among other things.

72 Million

visits to sigmaaldrich.com

18 Million

packages are shipped annually

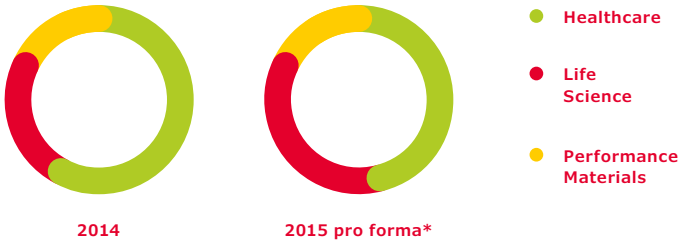
US$ 17,000,000,000: An impressive sum that we paid for the U.S. life science company Sigma-Aldrich. It was a mega deal that attracted attention beyond the industry. Our managers are firmly convinced that it was worth every cent. They see this as a significant milestone in a long-term strategy to invest in life science. The first major step was the acquisition of Millipore in 2010. The U.S. company was combined with our existing laboratory business, which was too small to command a leading position in the sector on its own. And with Sigma-Aldrich, the next step, which was actually a leap, followed. That's because as a result of the combination, we are now playing in the top league of the gigantic life science market worth more than € 100 billion.

More than 300,000 innovative products

With the integration having started, our Life Science business sector will operate worldwide under our corporate brand – except for the United States and Canada, where for legal reasons it will operate as MilliporeSigma. Around the globe, our science and technology company Merck KGaA, Darmstadt, Germany, now has around 50,000 employees working at 72 production locations in 66 countries. Around 9,000 of them joined from Sigma-Aldrich. The U.S. company manufactures and distributes chemicals, biochemicals and other products for research and applied labs. We now have an enormous product range of more than 300,000 life science products sold under established brands, for instance SAFC and BioReliance as well as Millipore and Milli-Q. Globally, there's probably hardly any drugs that do not come into contact with our substances or products in the course of their discovery, development or production. The company offers a comprehensive portfolio along with global reach and extraordinary delivery capabilities. "Our leading e-commerce and technology platforms assist our customers in finding the right products to conduct their science experiments through a simple search, and then buying them easily and reliably. This capability

Life Science at Merck KGaA, Darmstadt, Germany

SALES BREAKDOWN BY BUSINESS SECTOR



* This sales breakdown would have resulted had the first-time consolidation of Sigma-Aldrich already taken place on January 1, 2015. Therefore, they are not identical to the sales percentages actually reported for 2015.

over 1 Million

Life Science customers worldwide

More than 300,000

Life Science products

19,000

Life Science employees around the world

allows us to be a part of every future transformational innovation in the life science market," says Silji Abraham, Chief Information Officer for Life Science. "And I can easily imagine a future where our products and services are found in every lab around the world."

Close to customers

In order to solve the toughest problems in the industry, the new team is intensifying its collaboration with the global scientific community, in other words customers. In the dynamically growing international life science market, it's clear that customer needs are growing. They want top quality, global solutions, a broad range of possibilities and first-rate services. So the aim is to perfectly fulfill these needs in order to further raise competitiveness. After all, what's good for customers is also good for business and employees. In research, development and along the entire biotech production chain, our company wants to offer scientists the best possible support – through professional competence in applications technology and process planning. In order to be close to customers, independent commercial areas are organized into regions. The chief aims are to further and launch innovations that are aligned with industry needs.

Efficient e-commerce platform

When it comes to winning over customers from the scientific community, an efficient e-commerce platform is another important factor. And that's where we are well ahead of the game. By acquiring Sigma-Aldrich, the company has the leading e-commerce platform in the life science industry, which was also one of the key drivers of the acquisition. Of course we will utilize the platform in order to market not only the Sigma-Aldrich additions, but also its legacy life science products. With just a few clicks, millions of visitors to the portal can search the comprehensive electronic catalog, select and purchase products. Visitors find exactly what they are looking for as well as recommended related products based on real-time behavioral analytics. As a leader in online scientific content, we are also able to provide the relevant white papers, protocols and peer review articles. With an order number or credit card, customers can use the secure platform to quickly and easily order products, look up prices, select rush delivery, plan the delivery date, check invoices, and much more. "Our e-commerce platform integrates all our capabilities to provide customers with easy access to all that we can offer them," says Christos Ross, Head of Integrated Supply Chain Operations. Not only the e-commerce platform, but also the entire supply chain is highly efficient. The majority of the hundreds of thousands of products can be delivered within 24 hours around the world. "Our primary objective is to deliver quality products to our customers through our manufacturing operations and a combined network of 130 global distribution centers to get the right product to the right place at the right time," emphasizes Ross. To fuel its growth strategy in the digital age, our company is thus counting on e-commerce as a distribution channel so that its billion dollar investment in the life science sector will soon pay off.

"Our e-commerce platform integrates all our capabilities to provide customers with easy access to all that we can offer them."

Christos Ross, Head of Integrated Supply Chain Operations

130

Life Science distribution centers

€ 5.4 billion

in pro forma sales by our Life Science business sector including Sigma-Aldrich in 2015*

* This net sales calculation would have resulted had the first-time consolidation of Sigma-Aldrich already taken place on January 1, 2015. Therefore, it is not identical to the net sales actually reported for 2015.

01

TO OUR SHAREHOLDERS

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TO OUR SHAREHOLDERS

pages 31–42

Dear Shareholders and Friends,

2015 was a great year for our company. By acquiring Sigma-Aldrich, we successfully completed the portfolio realignment that started ten years ago. We made research advances and future-oriented investments that have opened the door to future success. And our new branding demonstrates self-confidence; it shows what makes us unique.

But even more importantly, we again achieved profitable growth. In 2015, our net sales rose by 13% to € 12.8 billion. EBITDA pre exceptionals, our key earnings indicator, grew by 7.1% to € 3.6 billion. Profit after tax declined by 3.5% to € 1.1 billion.

In addition to acquisition-related effects, organic sales growth of 2.6% contributed to our good performance in 2015. Contrary to 2014, we additionally benefited from currency tailwinds in 2015.

Business free cash flow was € 2.8 billion, which was markedly higher than in 2014. In the first ten months of the year, we completely eliminated our net financial debt. However, owing to the acquisition of Sigma-Aldrich, it increased as expected to € 12.7 billion as of year-end. As was the case following major acquisitions in the past, our aim is to quickly reduce our debt.

Once again, our focus on global growth markets paid off in 2015. At 33%, Asia-Pacific not only generated the largest proportion of Group sales, but also achieved the highest sales growth. More than half our overall sales growth was achieved in this region.

The soaring stock markets at the beginning of 2015 also fueled our shares. On April 10, our share price hit a new all-time high of € 111.25. At the same time, our shares proved to be more resilient than other equities in the second half of the year. For the year as a whole, the share price rose by 14%, outperforming the DAX® by nearly five percentage points.

We want the dividend to reflect the positive development of the company. Therefore, we will propose to the Annual General Meeting to increase the dividend by € 0.05 to € 1.05 per share.

Karl-Ludwig Kley
Chairman of the Executive Board

Five changes that took place in 2015 were particularly important to our company's strategic development:

- The acquisition of the life science company Sigma-Aldrich is the biggest takeover in our company's history of nearly 350 years. We have thus become one of the world's largest players in the life science industry. We can now offer our customers a broader product portfolio than any other company and we now have the leading e-commerce platform in the sector.

  With this move, we have not only considerably expanded our Life Science business, but also completed the realignment of our portfolio for now. Since 2007, we have been repositioning our company through acquisitions and divestments. This has fundamentally changed the company and secured its future viability. Today, we have three strong pillars: Healthcare, Life Science and Performance Materials. Each business sector can now further develop and grow its businesses, both with its own resources and in synergy with the other business sectors.

- In 2015, our immuno-oncology research made good progress. Its aim is to harness the human immune system to fight cancer cells. As of the end of 2015, we had commenced 20 clinical trials designed to test the efficacy of our active ingredient avelumab. Lung, ovarian, gastric, and bladder cancer are the most important indications.

  The results so far are promising and have been recognized by the regulatory authorities in Europe and the United States. We are convinced that our company can make an important contribution in immuno-oncology and sustainably improve the lives of patients. We want to become a leader in this highly promising market.

- Once again, Performance Materials proved to be a reliable source of strength and innovative ability in 2015. We clearly defended our global market leadership in liquid crystals, particularly thanks to continuous new developments. For example, UB-FFS technology represented a breakthrough in the energy efficiency of displays for mobile devices. We won the German Innovation Award for this in 2015.

  The OLED (organic light-emitting diodes) business has exceeded our own expectations. It has grown rapidly and we have gained numerous new customers. By investing in research and production in Korea and Darmstadt, we are paving the way for further success in this future market.

- We want to become even more innovative and pursue opportunities beyond our existing businesses. This is why we are building an Innovation Center at the heart of our global headquarters in Darmstadt. The construction work is making good progress.

  In 2015, a modular Innovation Center was inaugurated. Internal project teams and selected start-ups moved in to start work on interdisciplinary approaches and pursue new ideas. The businesses will still be responsible for product innovations and developing existing technologies further. But with the Innovation Center, we are creating scope to move beyond this. That's because we not only want to be part of technological trends, we want to shape them.

- The launch of our new branding attracted attention well beyond our company. It is vibrant and bold – and suits us splendidly. We have changed considerably in recent years. We are no longer a traditional supplier of chemicals and pharmaceuticals, but rather a leading science and technology company with global reach. With the new brand, we can present our company the way it is today. The fascinating world seen through a microscope gave us inspiration for the design of the visual elements.

  We're showing that we are a strong, unified company, which is why we stopped using the independent divisional brands. The Biopharmaceuticals and Life Science businesses are now simply operating under our corporate brand. Unfortunately, nothing has changed in terms of the fact that we need to operate under different names in the United States and Canada: Here – and only here – we operate as EMD Serono in the Biopharma business, as MilliporeSigma – following the completed acquisition of Sigma-Aldrich – in the Life Science business, and as EMD Performance Materials in the materials business. However, the new brand gives us creative possibilities to show on both sides of the Atlantic that we are one. And it strongly differentiates us from the competition. We are now universally unmistakable.

As you can see, a lot changed at our company in 2015. At the same time, we remained true to our entrepreneurial values. We are resolutely focused on what customers and patients want and need. Our commitment to quality and our passion for discoveries are unabated. We are aiming for long-term, sustainable growth in line with our six company values – courage, achievement, responsibility, respect, integrity, and transparency – as the yardstick for our work.

This combination of a strong identity and a willingness to embrace change is what makes us successful – and always will.

Our company is better positioned than ever before. We can be proud of what we are today: a leading science and technology company whose ideas and products can really make a difference in the world. With our three business sectors Healthcare, Life Science and Performance Materials, we are not only successful, but also improve the lives of patients, customers and partners around the world.

Our nearly 50,000 employees make all of this possible. Across the globe, they seek new solutions and the best answers for our customers. Through their passion for discovery, creativity and personal commitment, they build our success each and every day. I owe my thanks to every single one of them.

As already announced in October 2015, I will resign as Chairman of the Executive Board at the end of April 2016. Over the past several years, my successor Stefan Oschmann and I have cooperated superbly. He has significantly helped to make our company fit for the future. I know that the company is in good hands with him.

My years at our company were challenging, exciting and fulfilling. It was a privilege to lead this great company through major changes and to set the course for a successful future. I thank you for your trust and support during this time. Please remain loyal to us and look forward to the next chapter of this company's nearly 350-year success story.

Karl-Ludwig Kley
Chairman of the Executive Board

THE EXECUTIVE BOARD

Bernd Reckmann, Stefan Oschmann, Karl-Ludwig Kley, Marcus Kuhnert, Belén Garijo, Kai Beckmann

from left to right

Bernd Reckmann
Member of the Executive Board
CEO Life Science and
Performance Materials
Responsibility for Group functions: Environment, Health, Safety, Security, Quality

Stefan Oschmann
Vice Chairman of the Executive Board
Responsibility for Group functions: Group Strategy; Patents & Scientific Information; Public Affairs & Corporate Responsibility

Karl-Ludwig Kley
Chairman of the Executive Board
Responsibility for Group functions: Group Legal & Compliance; Group Internal Auditing; Group Communications

Marcus Kuhnert
Member of the Executive Board
Chief Financial Officer
Responsibility for Group functions:
Group Accounting; Group Treasury;
Group Tax; Group Controlling & Divisional
Controlling; Mergers & Acquisitions;
Investor Relations; Finance Operations

Belén Garijo
Member of the Executive Board
CEO Healthcare

Short biographies
More information can be found
at www.emdgroup.com
Our company > Management

Kai Beckmann
Member of the Executive Board
Chief Administration Officer
Responsibility for Group functions:
Group Human Resources; Group Information
Services; Group Procurement;
Inhouse Consulting; Site Operations

OUR SHARES

At a glance

For the stock markets, 2015 was a highly volatile year overall. This was also reflected by the development of our share price, which nevertheless rose by 14% during the course of 2015. Our shares thus again outperformed the relevant comparative indices. The performance of our shares was nearly five percentage points better than that of the DAX®. In comparison with the respective industry indices for the pharmaceutical and chemical sectors, the development of our share price exceeded both by around nine percentage points.

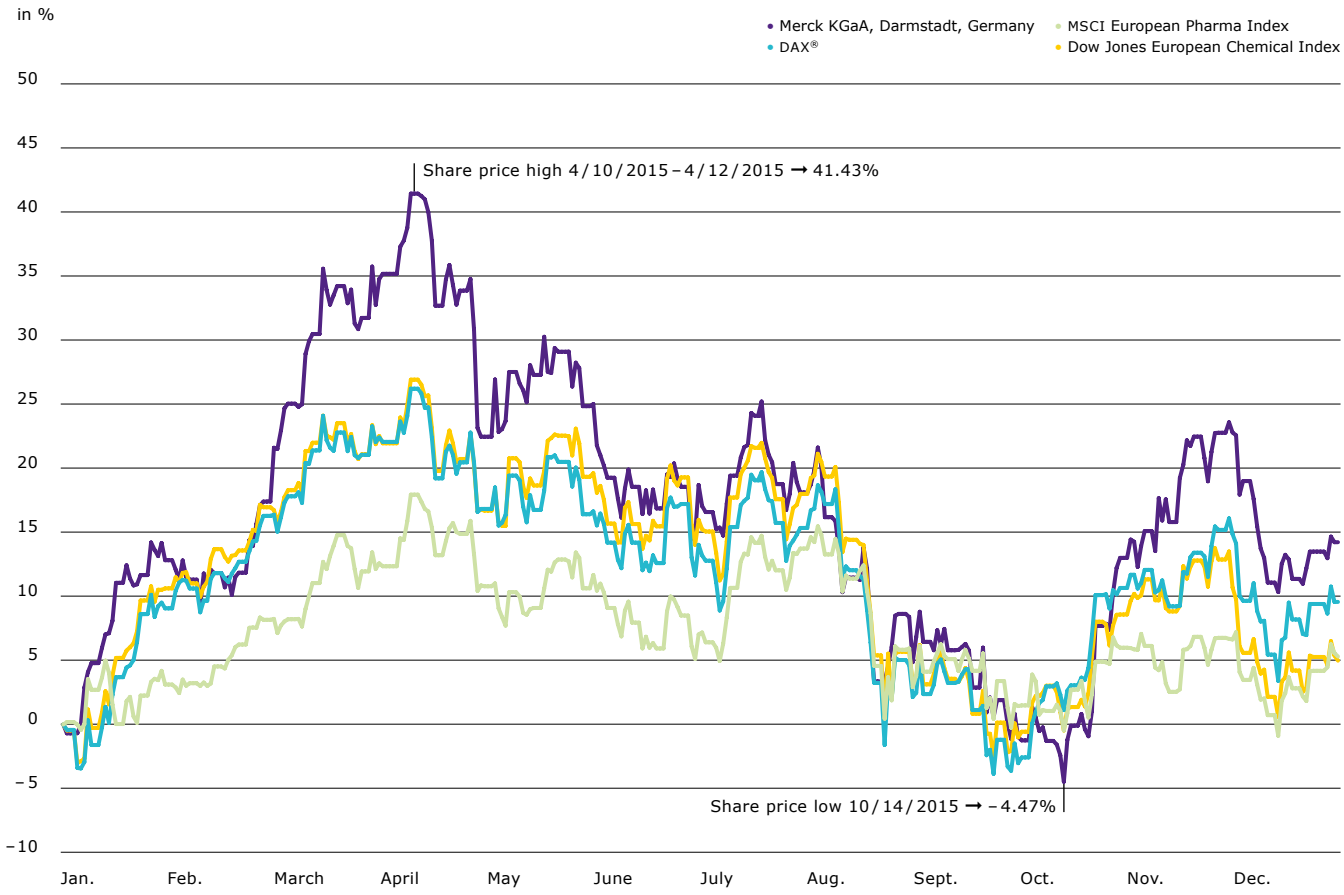
Continuing the strong development of 2014 almost seamlessly, our shares reached their annual high of € 111.25 on April 10, 2015, which also represented an all-time high. This was followed by a period of significant general market weakness caused by renewed uncertainty among market participants with respect to the European debt crisis, weak economic data from China, and the imminent change in interest rates in the United States. During this phase, which lasted until October 2015, both the relevant comparative indices as well as our shares incurred noticeable share price corrections. Our shares hit their annual low of € 74.90 on October 14, 2015, then continually recovered to close nearly 20% higher at € 89.57 on December 30, 2015.

From the capital market perspective, the company's news flow during the first half of the year reflected not only the continued strong business figures, but mainly also the latest developments leading to the completion of the Sigma-Aldrich acquisition, which closed on November 18, 2015. Important events in the second half of the year, which were received very positively by market participants, included the detailed and transparent report on the development of our pharmaceutical pipeline, which we gave during a conference call on October 1, 2015, as well as the successful Capital Market Day held on December 10, 2015. Thanks to its new format, the latter event gave investors and analysts the opportunity to get to know management representatives from all business sectors and to engage in close dialogue with them.

The average daily trading volume of our shares decreased by around 12% from approximately 639,000 in 2014 to 563,000 in 2015. In 2015, North America again accounted for the largest percentage of shares in free float. However, compared with the previous year, this figure decreased to around 37% (2014: 47%). By investor type, GARP (growth at reasonable price) and value investors continued to dominate. At the end of 2015, the top five investors held around 23% of the free float (end of 2014: 39%).

OUR SHARES

Share price development from January 1, 2015 to December 31, 2015



Source: Bloomberg (closing rates).

OUR SHARES

Share data[1]

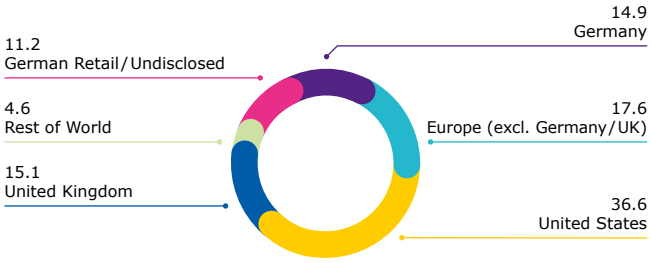
		2015	2014
Dividend	€	1.05[2]	1.00
Share price high	€	111.25	80.40
Share price low	€	74.90	56.55
Year-end share price	€	89.57	78.42
Daily average number of shares traded[3]	units	563,370	639,067
Market capitalization[4] (at year-end)	€ million	38,943	34,095
Market value of authorized shares[5] (at year-end)	€ million	11,576	10,135

[1] Share-price relevant figures relate to the closing price in XETRA® trading on the Frankfurt Stock Exchange.
[2] Subject to approval by the Annual General Meeting.
[3] Based on the floor trading systems of all German exchanges and the regulated market on XETRA®.
[4] Based on the theoretical number of shares (434.8 million).
[5] Based on the number of shares in free float (129.2 million).
Source: Bloomberg, Thomson Reuters

OUR SHARES

Identified investors by region as of December 2015

in %



Source: Orient Capital
Total number of shares outstanding: 129.2 million

OUR SHARES

Identified investors by type as of December 2015

in %

Source: Orient Capital

02

combined management report

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Combined Management Report Pages 43–144

FUNDAMENTAL INFORMATION ABOUT THE GROUP

The Group

We are a global science and technology company headquartered in Darmstadt, Germany.

In October 2015, we repositioned our corporate brand. The fundamental redesign of our visual appearance and the introduction of a new logo reflect our transformation into a global science and technology company. At the same time, we simplified the brand architecture. We will operate globally under our corporate brand in the future – the only exceptions are Canada and the United States. In these countries we operate as EMD Serono in the Biopharma business, as MilliporeSigma – following the completed acquisition of Sigma-Aldrich – in the Life Science business, and as EMD Performance Materials in the materials business.

With a history of nearly 350 years, we are the oldest chemical and pharmaceutical company in the world. Our product portfolio ranges from innovative pharmaceuticals and biopharmaceuticals, to life science tools, specialty chemicals, and high-tech materials.

Since January 1, 2015, in line with our strategic direction, our company has comprised three business sectors: Healthcare, Life Science and Performance Materials. These encompass the Group's six businesses. Our financial reporting has also followed this structure since January 1, 2015, with five regions: Europe, North America, Asia-Pacific (APAC), Latin America as well as Middle East and Africa (MEA).

We had 49,613 employees worldwide on December 31, 2015 compared with 39,639 on December 31, 2014, which was prior to the acquisition of Sigma-Aldrich.

Healthcare

Our Healthcare business sector comprises the four businesses Biopharma, Consumer Health, Biosimilars, and Allergopharma. In 2015, the Healthcare business sector generated 54% of Group sales and 50% of EBITDA pre exceptionals (excluding Corporate and Other), making it the largest of our three business sectors.

Since January 1, 2015, Belén Garijo has been the member of the Executive Board responsible for the Healthcare business sector. The regions of Europe and North America generated 60% of Healthcare's net sales in 2015. In recent years, we have steadily expanded the presence of this business sector in growth markets. In 2015, the Asia-Pacific and Latin America regions accounted for 34% of its sales.

Biopharma

Our Biopharma business discovers, develops, manufactures, and markets innovative pharmaceutical and biological prescription drugs to treat cancer, multiple sclerosis (MS), infertility and growth disorders, as well as certain cardiovascular and metabolic diseases. With headquarters in Darmstadt, Germany, we offer leading brands in specialty medicine indications. We are advancing our research and development (R&D) portfolio across the areas of oncology, immuno-oncology and immunology, and continue to invest in developing programs in multiple sclerosis. With our expertise in discovery and early development, as well as approximately 25 projects in clinical development, we are focused on delivering differentiated new therapies to patients with unmet medical needs.

Biopharma's top-selling medicine is Rebif® (interferon beta-1a), an important product for people living with MS. Multiple sclerosis is one of the most common neurological diseases among young adults. We signaled our continuing commitment to this disease area on September 11, 2015, when we announced that we had submitted a letter of intent to the European Medicines Agency (EMA) to file a Marketing Authorization Application (MAA) for our investigational treatment cladribine tablets. The letter initiates a process to address pre-submission requirements. Submission plans for other parts of the world are being further developed and executed.

Erbitux® is the second best-selling drug in the portfolio of the Biopharma business and its flagship product in oncology. The product is a standard of care in multiple lines of metastatic colorectal cancer (mCRC) therapy as well as of both recurrent/metastatic and locally advanced squamous cell carcinoma of the head & neck (SCCHN).

In November 2014, we entered into a global strategic alliance with Pfizer Inc. to develop and commercialize avelumab*, an investigational anti-PD-L1 antibody initially discovered and developed by us and currently in co-development as a potential treatment for multiple tumor types. The alliance is designed to boost the two companies' presence in immuno-oncology. Both companies have also agreed to combine resources and expertise to advance Pfizer's preclinical-stage anti-PD-1 antibody (PF-06801591) into Phase I trials. In 2015, together with Pfizer we initiated six pivotal trials for avelumab, including first- and second-line non-small cell lung cancer (NSLC), platinum-resistant ovarian cancer, first- and third-line gastric cancer, and first-line bladder cancer. Additionally, avelumab is currently being investigated in a Phase II study of patients with metastatic Merkel cell carcinoma.

* Avelumab is the proposed International Nonproprietary Name (INN) for the anti-PD-L1 monoclonal antibody, previously known as MSB0010718C.

As part of the strategic alliance, we are co-promoting Pfizer's anaplastic lymphoma kinase (ALK) inhibitor Xalkori® (crizotinib), a medicine to treat ALK+ metastatic non-small cell lung cancer, in the United States and several other key markets. Under the agreement, Xalkori® is being co-promoted in two waves, the first of which started in the second and third quarters of 2015 in the United States, Canada, Japan and five European Union countries (France, Germany, Italy, Spain, and the United Kingdom). In the United States and Canada, Xalkori® is being co-promoted by EMD Serono, the brand under which our U.S. and Canadian Biopharma business operates. The second wave will begin in 2016 and includes China and Turkey.

The co-promotion term will last through December 31, 2020 for Canada, France, Germany, Italy, Japan, Spain, the United Kingdom, and the United States. It will run from January 1, 2016 through December 31, 2021 in China and Turkey. In the first year, we will receive compensation associated with our promotion of Xalkori®, followed by an 80% (Pfizer), 20% (Merck KGaA, Darmstadt, Germany) profit sharing on the product in subsequent years.

On December 7, 2015, we announced our decision not to pursue evofosfamide (hypoxia-activated prodrug) further in soft tissue sarcoma and pancreatic cancer since, despite signs of activity in locally advanced and metastatic pancreatic cancer, two Phase III studies did not meet pre-specified primary endpoints. We therefore decided not to pursue the evofosfamide development program further.

Our Biopharma business also offers products that help couples to conceive a child. The products in our Fertility franchise are an important growth driver for our Biopharma business with an increasing demand in growth markets and the trend of couples postponing childbearing until later in life when natural fertility is in decline. As market leader and innovator, we are the only company that has a complete and clinically proven portfolio of fertility drugs for every stage of the reproductive cycle, including recombinant versions of the three hormones needed to treat infertility. We combine an over 60-year heritage of fertility expertise and are committed to improving treatment outcomes, as well as developing and providing innovative products and devices. In 2015, we won the Red Dot Award: Product Design 2015 for our fertility pens, used to inject hormones for follicle stimulation.

To build on our strengths in fertility hormones, we are offering an additional comprehensive portfolio of highly innovative fertility technologies from incubation to freezing. This comprises the Gavi™, Geri™ and Gems™ product lines. Gavi™ is the world's first automated vitrification instrument, using an automated and standardized laboratory protocol. Geri™ is an innovative benchtop incubator with individually controlled incubation chambers per patient to minimize disruptive events to the early-stage embryo. Gems™ is the latest generation of Genea Biomedx culture media allowing for high quality embryo cultivation. Gavi™, and Geri™ received the CE mark clearance in Europe in 2015. The three product lines have not yet been cleared for use in the United States.

To further strengthen our offering, our Biopharma business established the joint development hub ARTinnovations together with Genea. Founded to develop an innovative pipeline of fertility technologies and services, ARTinnovations helps to support patients undergoing assisted reproductive technology (ART) and provides healthcare professionals with innovations to generate objective information to make important treatment decisions. Furthermore, we formed the Global Fertility Alliance, a collaboration with Illumina Inc. and Genea Limited to advance excellence and standardization in Fertility.

Also in 2015, we launched a new version of the Eeva® Test with the Xtend Algorithm, the advanced version of a non-invasive test to aid embryo assessment within assisted reproductive technology. The new version builds on the scientific and clinical record of our Eeva® System.

The General Medicine franchise mainly includes brands to treat cardiometabolic diseases. Although no longer patent-protected, the excellent brand equity built over decades makes our flagship products cornerstones for the treatment of chronic cardiovascular or metabolic diseases. This applies, for example, to Glucophage® containing the active ingredient metformin, the drug of choice for first-line treatment of type 2 diabetes; to Concor® containing bisoprolol, the leading beta-blocker for chronic cardiovascular diseases such as hypertension, coronary artery disease and chronic heart failure, for which around 12 million patients are treated every year; and to Euthyrox® (levothyroxine), the leading treatment for hypothyroidism.

Demand for cardiometabolic therapies is continuously rising, particularly in growth markets. This is due to both increasing life expectancy and in part also to growing prosperity in these regions, along with the resulting changes in lifestyle and dietary habits. Beyond developing life cycle management products to capitalize on our strong brand equity, we entered into a long-term strategic partnership with Lupin Ltd. of India to broaden the General Medicine portfolio in growth markets to include affordable, high-quality medicines. The main products of the Endocrinology franchise are Saizen® (somatropin) and Kuvan® (sapropterin dihydrochloride).

In October 2015, we announced that we would return the rights for Kuvan® to BioMarin in order to fully focus on our core businesses while giving patients continued support from a partner dedicated to orphan diseases. We remain highly committed to patients in the field of endocrinology, and in particular to advancing the treatment of growth hormone-deficient patients with Saizen®. Also in October 2015, Frost & Sullivan recognized our growth hormone franchise with the European Competitive Strategy Innovation and Leadership Award.

Furthermore, for several years we have been developing award-winning novel injection devices that make injections more user-friendly and at the same time more reliable for patients than conventional or prefilled syringes. In addition, these products make it easier for healthcare practitioners and patients to ensure adherence and thus to reach their treatment goals. Examples are the easypod™ electromechanical injection devices, the only growth hormone injection device of its kind, for the delivery of Saizen®, and RebiSmart™ for Rebif® (interferon beta-1a). Additionally, both easypod™ and RebiSmart™ are able to wirelessly transfer data such as injection times, dates and doses to the Web-based software systems easypod™ connect and MSdialog.

Consumer Health

In our Consumer Health business, we manufacture and market over-the-counter pharmaceuticals and food supplements, focusing on a number of well-known strategic brands. These include Neurobion®, Bion®, Seven Seas®, Nasivin®, Femibion®, and Dolo-Neurobion®, as well as Floratil®, Sangobion®, Vigantoletten®, Apaisyl®, and Kytta®. Ranking 11th in the global OTC market, we have a high market penetration in Europe, Latin America, Asia-Pacific, and Middle East and Africa. Our growth rates are particularly strong in Chile, Colombia, Ecuador, India, Indonesia, Mexico, the Philippines, and Saudi Arabia.

Global megatrends favor the future growth of our Consumer Health business. People are becoming more health-conscious and concerned with their own physical well-being. Preventive healthcare and as little invasive medication as possible are becoming increasingly important – in both established and growth markets, characterized by a growing middle class with specific needs.

We continue to pursue the "3 x 3 strategy". The aim is to deliberately invest in about 15 to 20 key countries in order to be present in each with at least three leading brands and to achieve a respective local market share of at least 3%. This should be accomplished by organic growth, geographic expansion and eventually smaller, tactical acquisitions of brands which fit into the strategy and ideally into the existing product categories.

For example, in 2015 we began the launch of our Bion® brand in Brazil to add another potentially leading brand to the local portfolio. In addition, the Vigantol®, Anemidox®/Confer® and Hepabionta® brands were transferred from Biopharma to Consumer Health to leverage them through consumerization.

Biosimilars

Our Biosimilars business is committed to providing access to high-quality biologics to more patients all over the globe. In addition, we are developing a biosimilars portfolio focused on oncology and inflammatory disorders through both in-house research and development expertise in biologics and partnerships with other biosimilar players. In 2015, we moved biosimilar candidates into clinical development. The first Phase III study for a biosimilar will be initiated in the first quarter of 2016.

Biosimilars is an attractive market in which we are well-positioned since we can build on existing strengths and capabilities across the biosimilars value chain. This includes the ability to leverage internal assets or source capabilities from suppliers to ensure compliance with regulatory requirements, secure market access across key growth markets, leverage commercial manufacturing capabilities and flexibility, as well as adopt a tailored go-to-market approach.

We have also established a strategic alliances with Dr. Reddy's in India to co-develop multiple cancer drugs and with Bionovis in Brazil to supply the Brazilian market with biological products under the Product Development Partnership (PDP) policy of the Brazilian Ministry of Health.

Allergopharma

Our allergy business Allergopharma is one of the leading companies in the field of allergen immunotherapy (AIT). The Allergopharma portfolio includes a diverse spectrum of approved allergen products that meet high quality standards. AIT (hyposensitization, desensitization, specific immunotherapy) is the only causal therapy for treating allergies to unavoidable allergens.

We manufacture products to diagnose and treat type 1 allergies such as hay fever or allergic asthma. Our allergy business offers high-dose, hypoallergenic, standardized products for allergen immunotherapy of pollen and mite allergies. These allergoids have a special focus in Allergopharma's product portfolio and constitute a cornerstone in its integrated health approach for patients suffering from these conditions. For effective treatment, reliable diagnosis is key. Allergopharma offers a broad range of diagnostics in the field of allergies with more than 100 single allergens, providing physicians with the specific tools needed to identify the substances causing an allergy. In addition, Allergopharma provides individual allergen extracts on a named patient basis, which are needed to treat less frequent allergies – personalized medicine has been a reality for Allergopharma for many years now. Products of Allergopharma are available in more than 20 markets worldwide.

The market for causal allergy therapies is a global growth market. On the one hand, the global growth expected by market researchers will be generated by an increasing number of people with allergies, and on the other hand it is based on the rising use of allergen immunotherapy in many growth markets.

By expanding production and thus our capacities in Reinbek as of 2017, we want to increase our global presence and help to meet increasingly high manufacturing standards.

Life Science

The purpose of our Life Science business sector is to solve the world's toughest life science problems by collaborating with the global scientific community. We have a broad product and technology portfolio and offer innovative solutions for scientists and engineers in the life science industry.

Life science comprises the research branches concerned with the structure and behavior of living organisms. Our products and services are used in the research, development and manufacture of biotechnological and pharmaceutical drug therapies, as well as in research and application laboratories. In addition, our products and services also reach adjacent markets such as the food and beverage industry.

For the Life Science business sector, the most important event of 2015 was the completion in autumn 2015 of the acquisition of the Sigma-Aldrich Corporation (Sigma-Aldrich). The takeover of this U.S. life science company was the largest in our corporate history.

In 2015, the Life Science business sector contributed 26% to Group sales and 22% to EBITDA pre exceptionals (excluding Corporate and Other). With the acquisition of Sigma-Aldrich and the first-time consolidation for a full year, these percentages are set to increase significantly in 2016, thus further raising the importance of the Life Science business sector.

On April 13, 2015, we had already announced Udit Batra's appointment to lead the combined Life Science business. This appointment took effect upon the successful completion of the acquisition of Sigma-Aldrich in November 2015.

In the course of 2015, the aim was to secure numerous antitrust approvals needed for the acquisition of Sigma-Aldrich. An important milestone here was European Commission approval, which was granted subject to certain conditions in June. This was followed by antitrust approvals in Japan and from the Chinese Ministry of Commerce. Prior to that we had secured antitrust clearance from the United States, Taiwan, South Africa, Russia, Serbia, Israel, and Ukraine. In order to fulfill the EU commitments, our company and Sigma-Aldrich had to agree to sell parts of Sigma-Aldrich's solvents and inorganics business in Europe. This included the sale of Sigma-Aldrich's manufacturing assets in Seelze, Germany, the divestment of solvents and inorganics sold by Sigma-Aldrich worldwide under the Fluka, Riedel-de-Haen and Hydranal brands, as well as a temporary license to the Sigma-Aldrich brand for the supply of solvents and inorganics in the European Economic Area. On October 20, 2015, we announced that an agreement had been reached to sell the relevant businesses in Europe to Honeywell in fulfilment of commitments made to the European Union in order to win antitrust approval of the acquisition of Sigma-Aldrich.

Approval from Brazil's Council for Economic Defense in August marked the final outstanding clearance after Israel and South Korea had also granted their approvals. Following the receipt of all the necessary antitrust approvals for the acquisition of Sigma-Aldrich, we announced the transaction closing on November 18, 2015.

By acquiring Sigma-Aldrich, we have become one of the leaders in the global life science industry worth more than € 100 billion. With this new combination we will be able to serve life science customers around the world with a highly attractive set of established brands such as Millipore, Sigma-Aldrich, Milli-Q, SAFC and BioReliance. Moreover, we have a highly efficient supply chain through which we can support the delivery of more than 300,000 products. In the laboratory and academia business, we offer our customers an extensive and customized range of products across laboratory chemicals, biologics and reagents. In pharma and biopharma production, Sigma-Aldrich complements our existing products and capabilities with additions along the entire value chain of drug production and validation.

While Sigma-Aldrich will largely be integrated into our Life Science business sector, we decided that the SAFC Hitech business will be integrated into our Performance Materials business sector and will operate as part of the Integrated Circuit Materials business unit. SAFC Hitech and Performance Materials offer complementary technologies, making these two businesses a natural fit.

In 2015, our Life Science business sector comprised three business areas: Lab Solutions, Process Solutions and Bioscience.

On this basis, our Life Science business generates recurring sales and stable, attractive cash flows in an industry that is characterized by stringent regulatory requirements. A highly diversified and loyal customer base additionally ensures a low risk profile. In the future, Life Science will benefit from an even broader portfolio, a highly efficient supply chain including a superb e-commerce platform, and a global reach.

Following the completion of the Sigma-Aldrich acquisition, we put in place Strategic Marketing & Innovation teams (SMIs) to promote and deliver innovation tailored to our life science customers' needs. These take the place of the previous business areas (Lab Solutions, Process Solutions and Bioscience). Going forward, our Life Science business sector will thus be organized around three customer segments: Research Solutions focuses on academia, Process Solutions supports biopharmaceutical production, and Applied Solutions serves clinical and diagnostic testing laboratories as well as the food and environmental industries. The SMI teams will be responsible for defining customer segment strategy, product portfolio and product value propositions. In the newly combined business, Life Science has commercial areas which are managed by region and customer segment to leverage regional and local expertise. There are two commercial areas – one dedicated to the lab customers between Research and Applied and one dedicated to the Process Solution customers (including the SAFC customer base). The commercial areas are responsible for marketing, sales as well as customer and dealer relationships.

In 2015, our Lab Solutions business covered demand for products for research as well as analytical and clinical laboratories in a wide variety of industries. The business area accounted for 36% of our Life Science sales in 2015. Laboratory water equipment, laboratory chemicals and consumables as well as test solutions make it possible to identify microbial contamination, for example in pharmaceutical products, food or drinking water. For inorganic chemistry, we supply ultrapure reagents, including salts, acids, caustic alkalis and buffering agents, and we also manufacture reference materials for instrumental analysis and products for inorganic trace analysis.

Adding to our industry-leading laboratory water equipment, in 2015 we started with the introduction of our AFS® water purification systems. They have been developed to provide clinical laboratories with an economical and reliable water purification solution for daily water volumes of up to 3,000 liters.

Later in the year we introduced a new class of spectrophotometers in Europe for analysis of waste water, drinking water, beverages and process water. Spectroquant® Prove is available in three models and offers the largest choice of water test kits and methods.

Bioscience accounted for 13% of sales in our Life Science business sector in 2015. The main product groups of this business area in 2015 included tools and consumables for filtration and sample preparation, reagents and kits for cell biology experiments, as well as small tools and consumables for cell analysis. With these products, we support our customers in understanding complex biological systems and identifying new target molecules. Our applications help to make research processes faster and more efficient.

Our new Magna ChIRP™ RNA Interactome Kits allow researchers to more easily identify, recover and analyze regions of chromatin that interact with chromatin-associated RNAs such as long non-coding RNA (lncRNA). The kits simplify the ChIRP method.

A study on our synthetic Strat-M® membrane was conducted by researchers at Josai University in Japan and published in the January 25, 2015 issue of the "European Journal of Pharmaceutical Sciences". This study showed that through the use of our Strat-M® membrane as a synthetic non-animal skin model, it is possible to predict the skin permeation of, for example, active pharmaceutical ingredients, cosmetic actives, personal care products and pesticides during studies as effectively as with real human or animal skin.

Our Process Solutions business area, which accounted for 43% of Life Science sales in 2015, offers a diverse range of products to pharmaceutical and biotechnology companies that enable customers to develop large- and small-molecule drugs safely, effectively and cost-efficiently. In addition, the business area's portfolio comprises more than 400 chemicals for the synthesis of active pharmaceutical ingredients as well as drug delivery compounds. The offering in biotech production comprises products supporting cell growth and gene expression, a wide range of filtration systems, as well as salts and sugars. The single-use solutions offered by the Process Solutions business provide increased flexibility to biopharma customers since they eliminate time- and cost-intensive cleaning procedures. Moreover, these single-use solutions are compatible with various products, thus reducing investment costs for our customers.

In 2015, we enhanced the application of our existing tangential flow filtration (TFF) technology that allows concentration of process streams without the recirculation required in traditional TFF.

A collaboration with the German company celares GmbH to provide PEGylation services to customers developing protein-based therapeutics and biosimilars was established. celares GmbH is a specialist for PEGylation, a special form of drug delivery for biopharmaceuticals. This collaboration enables us to expand our service offering to include conjugation, further helping our biopharmaceutical and biosimilar customers to optimize their protein therapeutics and to reduce their time to market.

In addition, we introduced enhancements to our industry-leading EMPROVE® portfolio of pharmaceutical raw materials in 2015. The expanded documentation and regulatory information facilitates drug product manufacturers' risk assessment workflows and supplier qualification. The enhancements also help drug product manufacturers meet their own internal quality guidelines as well as those recently published by the European Commission.

Building on our strong filtration portfolio, we introduced Millipore Express® PHF (process protection, high-flux) hydrophilic filters for fast, efficient and economical buffer filtration.

A highlight of 2015 for Process Solutions was a strategic alliance with Turgut Ilaç, a leading biosimilars company based in Turkey through which the business area will provide its Provantage® End-to-End services for the development and manufacturing of biologics. Phase one of the agreement will focus on monoclonal antibody biosimilars for non-small cell lung carcinoma and rheumatoid arthritis, the first molecules of Turgut's biosimilar pipeline that will be supported by us under this strategic relationship.

Performance Materials

Our entire specialty chemicals business is consolidated in our Performance Materials business sector. The portfolio includes high-tech performance chemicals for applications in fields such as consumer electronics, lighting, coatings, printing technology, paints, plastics, and cosmetics. Since January 1, 2015, Performance Materials has been organized into the following business units: Display Materials, Pigments & Functional Materials, Integrated Circuit Materials, and Advanced Technologies.

Performance Materials' share of Group sales was 20% and its share of EBITDA pre exceptionals (excluding Corporate and Other) amounted to 28%. The EBITDA margin pre exceptionals was 44.3% of sales.

Our Liquid Crystals (LC) business, which is part of the Display Materials business unit, generated more than half of Performance Materials' sales in 2015. We have long been the global market and technology leader in liquid crystal mixtures. This market is highly consolidated; it is characterized by barriers to market entry due to the technological complexity of liquid crystals and the high quality requirements of industrial customers and consumers. Large LC display manufacturers are among the customers of our Liquid Crystals business. It comprises the broadest product offering for our customers in industry, including, for example, liquid crystals optimized for PS-VA (televisions) and IPS (smartphones and tablets) technologies. In addition, we are continuously setting standards in new developments. An example of this is our UB-FFS technology, which is enabling a breakthrough in the energy efficiency of displays for smartphones and tablets, and for which we received the German Innovation Award in 2015.

The Display Materials business unit, which was newly formed on January 1, 2015, benefited in 2015 from the established Liquid Crystals business and the complementary former AZ Electronic Materials (AZ) business (Optronics) with display materials (for example photoresists), which was integrated into the business unit. The demand for established liquid crystal technologies remained robust, also benefiting from the demand for high-end televisions, for example ultra-HD TVs with ever larger display diagonals. In 2015, we focused on developing new application possibilities for liquid crystals, such as smart windows, so-called liquid crystal windows (LCWs). Liquid crystal windows allow continuously variable switching from light to dark in just seconds while permitting a broad color spectrum. In 2014, we acquired Peer+, a Dutch specialist for this technology; the company has meanwhile been fully integrated. In the first half of 2015, the first LCW panels were installed in our new modular Innovation Center in Darmstadt. Since then, the new technology has been presented at exhibitions and a broader market launch is planned for the coming years. The architectural opportunities offered by these smart materials were demonstrated in October 2015 at a congress in Chicago, which we organized together with Harvard University Graduate School of Design.

The Pigments & Functional Materials business unit develops and markets a comprehensive product portfolio of decorative effect pigments and functional materials. The effect pigments are primarily used in automotive and industrial coatings, plastics, printing applications, and cosmetics in order to give products a unique shine. Functional materials include laser marking, conductive additives, and applications for counterfeit protection, as well as high-quality cosmetic active ingredients, for example for use in skin care, sun protection and insect repellants.

The new Integrated Circuit Materials (ICM) business unit was established on January 1, 2015, from the former semiconductor business of AZ. ICM supplies products for integrated circuits. As an important partner to leading global electronics manufacturers, ICM achieves more than 60% of its sales in Asia, and generates more than three-quarters of its sales with products that are the leaders in their respective markets. The products offered by ICM are used, among other things, to manufacture integrated circuits and microelectronic systems, for antireflection coatings, and for the miniaturization of transistor structures. The portfolio of the former AZ thus optimally complements the range of materials offered by Performance Materials.

The Sigma-Aldrich SAFC Hitech business consisting of high-purity materials for silicon semiconductors, compound semiconductors and other high-tech applications is being fully integrated into the Integrated Circuit Materials business unit. It ideally complements our product offering as a leading global supplier to the electronics and semiconductor industries. In September we announced the acquisition of Ormet Circuits Inc. to further bolster the position of Integrated Circuit Materials as a manufacturer of semiconductor materials and to diversify the product portfolio.

The Advanced Technologies business unit invests particularly in future-oriented research and development in Performance Materials. A very good example of this is our materials for organic light-emitting diodes (OLEDs), which are used in new lighting techniques and display technologies. They enable, for example, foldable and rollable or transparent displays with excellent color brilliance and image sharpness. 2015 was the most successful year to date for our OLED materials business. The performance of the OLED materials business was very positive, not least thanks to the strong growth in demand from Asian countries. In 2015, it was one of our fastest growing businesses, with a constantly expanding customer base. Significant investments were made in order to set the course for further progress and success in this future-oriented business. In May 2015, we inaugurated the OLED Application Center in Pyeongtaek, Korea. Three weeks later, we laid the cornerstone for a new OLED materials production unit in Darmstadt. With a volume of more than € 30 million, the project is one of the largest single investments we have made at the Darmstadt site in recent years.

In June, we acquired the Israeli company Qlight Nanotech, a leading start-up for research in quantum materials which, among other things, can further improve the color properties of displays.

Objectives and Strategies

In 2015, the transformation process that we launched back in 2007 culminated in the successful acquisition of Sigma-Aldrich. We have transformed from a classic supplier of chemicals and pharmaceuticals into a leading science and technology company.

General principles and Group strategy

General principles

Our Group strategy is based on an almost 350-year history of success. General principles provide stability and guidance in all our business endeavors. They help those responsible within the company to shape strategic plans and make decisions.

The partner structure of Merck KGaA, Darmstadt, Germany, with members of the Merck family as personally liable partners requires the Executive Board, whose members are also personally liable partners, to pay special attention to the long-term development of value. Therefore, sustainability plays a special role for us. The objective is to align the long-term development of the company with the legitimate interests of shareholders, whose engagement in the company is normally of a shorter duration. That is why our business portfolio must always be balanced so that it reflects an optimum mix of entrepreneurial opportunities and risks. We achieve this through diversification in our Healthcare, Life Science and Performance Materials business sectors, as well as through our geographic breadth with respect to growth sources.

For us, however, the principle of sustainability applies not only to economic aspects. Instead, it also encompasses responsibility for society and environmental protection. With our existing and our future product portfolio, we want to help solve global challenges and shape a sustainable future. Around 50,000 employees work to further develop technologies that improve and enhance life, from biopharmaceutical therapies to treat cancer or multiple sclerosis, to cutting-edge systems for scientific research and production, to liquid crystals for smartphones and LCD televisions.

Group strategy

In 2007, we started a transformation process to secure our future through profitable growth in today's Healthcare, Life Science and Performance Materials business sectors of our company. With the completion of the acquisition of Sigma-Aldrich in November 2015, this transformation process achieved its aim. In recent years, we have thus transformed from a classic chemical and pharmaceutical group into a leading science and technology company. This change is also reflected by the repositioning of our corporate brand, which was launched with a revamped visual appearance and the introduction of a new logo in October 2015.

The process started with the change program "Sustain. Change. Grow." and the two major acquisitions of Serono SA in 2007 and the Millipore Corporation in 2010. In 2011, we embarked on the "Fit for 2018" transformation and growth program with a new executive management team. In the first phase, we created the foundation for profitable growth by introducing a new global leadership organization and a comprehensive, Group-wide efficiency program. The second phase, which started in 2014, was aimed at successively implementing the growth options identified by establishing three strong platforms for sustainable profitable growth. We are building on our core competencies:

- Science and technology
- Closeness to existing businesses
- Customer proximity (to offer tailored solutions)

Overall, acquisitions and divestments since 2004 with a total transaction volume of around € 38 billion have helped cement the strategic change to a science and technology company. These also included the acquisition of AZ Electronic Materials, a leading supplier of high-tech materials for the electronics industry. A milestone in our growth strategy was the successful completion of the acquisition of Sigma-Aldrich in 2015, which has enabled us to become a leading company in the attractive life science industry. The aim of our strengthened Life Science business sector is to solve the greatest challenges in the industry globally. To this end, we now have a considerably broader range comprising more than 300,000 products offered via one of the industry's leading e-commerce platforms.

The complete overhaul of our brand is to communicate this new direction to our customers, partners and employees. A more self-confident and at the same time clearer tone of voice and the new visual appearance reflect our character as a vibrant science and technology company. This investment in our company brand is also part of the strategic "Fit for 2018" transformation and growth program.

The strategic change is also indicated by the changing composition of sales, with a growing share of high-quality and innovative solutions in all three business sectors. Our Healthcare business sector today generates around 60% of its sales with biopharmaceuticals. In 2006, there was only one such product, Erbitux®, which accounted for less than 10% of sales. The classic Chemicals business has increasingly become a premium materials business that offers our customers a wide range of value-adding products. Today, high-tech materials and life science tools make up around 80% of sales in our Life Science and Performance Materials business sectors. In 2006, the share was around 30%.

In addition, the geographic split of sales has changed, reflecting our mid- to long-term goal to further expand our strong market position in growth markets. In 2015, the growth markets of the reported regions Asia-Pacific and Latin America contributed 43% to Group sales.

With our three business sectors Healthcare, Life Science and Performance Materials we now hold leading positions in the corresponding markets. Our goal is to continue to generate sustainable and profitable growth. We intend to achieve this by growing organically and further developing our competencies, as well as by making targeted acquisitions that complement and expand existing strengths in meaningful ways. Building on leading products in all our businesses, we aim to generate income that is largely independent of the prevailing economic cycles. With innovative products and services and our unique combination of businesses, we have built the platforms to offer solutions to support global megatrends triggered for example by demographic changes or digitalization. Our company aims to drive innovations within the businesses as well as between and beyond the existing businesses. In order to foster innovations across the three businesses and external partners, an Innovation Center at Group headquarters in Darmstadt was opened in October 2015 (see page 10 et seq. in the magazine section of this Annual Report). The company also started a digitalization initiative aimed at driving digitalization within the business sectors and set up corresponding projects. A Chief Digital Officer was appointed in December 2015.

Strategic initiatives

Capability initiatives

As we continue to grow in size and the business becomes increasingly global, we want us to be seen as ONE company. ONE Group stands not only for a strong brand, but also comprises three other capability initiatives that are of strategic importance for the Group.

The capability initiative ONE Brand aims to strengthen the value of our brand, to increase the company's global visibility and reputation, and to become more attractive to customers, partners and talent. Our new brand orientation is a significant factor in achieving this goal: A self-confident and expressive design with a new logo and the "Vibrant M" as a distinguishing feature create a visual link between all our global businesses and products. This focus on our core brand will be supported by eliminating the former, separate division names (with the exception of the United States and Canada).

The framework for talent development, compensation and performance management is also to be harmonized globally (ONE Talent Development, Rewards and Performance Management). As part of this initiative, we established a consistent and integrated talent and performance management process and are proactively identifying and sourcing talent, as well as ensuring workforce diversity.

The goal of the third capability initiative ONE Process Harmonization, Standardization and Excellence is to better coordinate processes and apply them consistently. This is particularly the case with software applications. Continuous improvement will take place through benchmarking. This will allow us to adapt rapidly to business changes as well as to integrate future acquisitions into the company seamlessly and efficiently.

The importance of our headquarters in Darmstadt is also to increase – along the lines of ONE Global Headquarters. Our headquarters is to become a central location for creativity, scientific exchange and innovation. With the new Innovation Center we have created a basis that will allow us to better use our employees' innovation potential, optimize cross-functional and Group-wide collaboration on projects, and also give external innovators the opportunity to develop their ideas with support from our company.

Business strategies

Healthcare business sector

Biopharma

We aim to be a preferred global biopharmaceutical partner through an enduring commitment to transforming patients' lives with innovative specialty medicines, leading brands and high-value solutions. Global megatrends such as world population growth and a general increase in life expectancy are bolstering the demand for our products. We are well-positioned for sustainable growth.

The first pillar of our strategy in Biopharma is to deliver innovation globally. We have redesigned our R&D operating model and improved the portfolio decision-making process. We have drastically improved the quality of our pipeline by aggressively pruning low probability assets and redirecting resources to priority programs. Efficiency in R&D has been strengthened with a focus on selected core therapeutic areas – oncology, immuno-oncology and immunology – and with the depth of talent in the respective Translational Innovation Platforms. We have also increased our focus on biomarker-driven programs to improve patient outcomes. Our development programs include avelumab, the anti-PD-L1 antibody that we are developing and will commercialize with Pfizer, and M7824, our first-in-class bi-functional fusion protein in immuno-oncology; tepotinib, a c-Met inhibitor in oncology; atacicept and BTKi447, a Bruton's tyrosine kinase inhibitor, in immunology; and cladribine in multiple sclerosis.

In this context, strategic collaborations are an integral part of delivering on our commitment to transforming the lives of patients living with serious unmet medical needs. We recognize the value of collaboration in the research and development of breakthrough therapies, as well as strengthening our current portfolio. We look for partners who share our passion for innovation and whose expertise complements our existing portfolio, and who share our mission to discover treatments that improve patient lives.

We focus on balancing the right blend of internal capabilities and external partnerships, building strong collaborations with other leaders in industry including Pfizer, Genea and Biocartis, among others. Our integrated research and development capacity is strongly supported by partnering activities to complement our pipeline, strengthen our technology base and enhance our scientific capabilities.

The second pillar of our strategy is to maximize our existing portfolio in developed markets. In the Multiple Sclerosis franchise, the vision is to remain a leader by providing innovative solutions that include drugs, devices and services to help people living with multiple sclerosis. We plan to realize the potential of Rebif®, our top-selling product, in an increasingly competitive multiple sclerosis market. We now have full control of its promotion since the end of our collaboration with Pfizer in the United States in this field. We will position Rebif® as the best interferon-based therapeutic option for patients who suffer from the relapsing form of the disease. We are driving differentiation via smart injection devices and the first comprehensive support program for patients with multiple sclerosis including an e-health platform. In Fertility, our focus is on expanding market leadership and on providing innovative services and technologies beyond drugs to address patient needs and to improve outcomes beyond stimulation. In Oncology, we promote the value of Erbitux®, especially in Europe and Japan, and emphasize the importance of offering patients complete testing for RAS status in order to ensure optimal outcomes. Through the co-promotion of Xalkori® with Pfizer, we have entered the United States oncology market and will prepare for the future launch of avelumab, our anti-PD-L1 antibody across the major markets.

The third pillar of our Biopharma strategy is to expand further in growth markets. With a growing middle class, extended health care coverage, a shift towards chronic diseases, and rising demand for biologics, growth markets are a key driver for us. We are implementing strategic growth initiatives in our General Medicine and specialty medicine franchises to address specific needs. We are leveraging capabilities and local channels, for example by extending the breadth and depth of promotion in China, expanding our portfolio via regional and local licensing, and supporting market developments in Fertility. We are also investing selectively and growing our flagship brands with new formulations (Euthyrox® and Glucophage®), fixed-dose combinations (Concor®) and devices (Saizen®). And we are repatriating business, for example in China and in Russia, taking back the promotion of our products from industry partners where attractive.

Biosimilars

Biosimilars is an attractive market in which we are well-positioned as we can build on existing strengths and capabilities across the biosimilars value chain. This comprises the ability to leverage internal assets or source capabilities from suppliers to ensure compliance with regulatory requirements, secure market access across key markets including growth markets, leverage commercial manufacturing capabilities and flexibility, as well as adopt a tailored go-to-market approach. In 2015, we made further progress with our biosimilars in clinical development. The first Phase III study for a biosimilar will start in the first quarter of 2016. We have established strategic alliances with Dr. Reddy's in India to co-develop multiple cancer drugs as well as Bionovis in Brazil to supply the Brazilian market with biological products under the Product Development Partnership (PDP) policy of the Brazilian Ministry of Health. Moreover, we are committed to further expand the Biosimilars business through additional collaboration agreements and partnerships in the future.

Allergopharma

Allergy remains a significant global problem as millions of people around the world suffer from allergies. Presently, the only way to prevent a potential worsening and chronic progression of the condition is Allergy Immunotherapy (AIT) comprising hyposensitization, desensitization and allergy immunization. Our Allergopharma business is a manufacturer of AIT diagnostics and prescription drugs. The market for causal allergy therapies is a global growth market. As expected by market researchers, the drivers are an increasing prevalence of allergies in a growing worldwide population as well as the growing use of Allergy Immunotherapy (AIT) in many emerging markets. A novel state-of-the-art production facility in Reinbek near Hamburg, will, from 2017 onwards advance global expansion and ensure that increasingly high manufacturing standards in the AIT industry are met. With its own research department and in cooperation with research institutes and other partners, Allergopharma is actively working on improving the efficacy, convenience and safety of current therapy options as well as on developing the next generation of drugs for allergen immunotherapy.

Consumer Health

After strategically realigning our Consumer Health business in 2012 and 2013, we began pursuing an aggressive growth strategy as of 2014. This growth strategy is captured by "3x3", indicating our aim to achieve a market share of at least 3% in each of our top markets (including Brazil, France, Germany, India, Indonesia, Mexico, Poland, and the United Kingdom), and at least three so-called "lovebrands" in leading positions within each respective market. An important milestone within the framework of this strategy was the transfer of the Neurobion® and Floratil® brands from Biopharma to Consumer Health in 2014. Following their transfer, both brands clearly demonstrated potential to focus more closely on consumer wishes and needs in core markets, an approach which we call "consumerization". For instance, the growth of Floratil® in the key market of Brazil increased more than tenfold. Following this initial move, in 2015 further brand transfers – such as Vigantol in Germany and Europe or smaller local vitamin brands in Latin America and Southeast Asia – were successfully implemented. In 2015, the Consumer Health business again achieved very high organic sales growth, thus contributing noticeably to the growth of the Healthcare business sector. Further important components of implementing the "3x3" strategy are geographic expansion of existing brands into new markets, such as the market launch of the Bion® brand in Brazil throughout 2015, as well as possible tactical acquisitions, as long as these are in line with the strategic direction.

Life Science business sector

By adding Sigma-Aldrich to our existing Life Science business, we are now one of the leading players in the attractive global life science industry with a broad product range in attractive segments.

For 2016, the two major areas of focus for our Life Science business sector will be to execute the integration and to leverage the synergy potential of the acquisition. A seamless integration is of utmost importance to both customers and the organization. At our Capital Market Day in December 2015, we reiterated that we want to realize the announced synergies of approximately € 260 million within the third year after closing and that it is our ambition to be the profitability champion of the sector.

We want to create sustainable value that is based on three strong strategic levers that form the foundation for future top-line growth in Life Science: a broad, innovative portfolio, a balanced geographic footprint and excellent capabilities. Firstly, as regards the portfolio, with a catalog of more than 300,000 products, we now deliver many of the most highly-respected brands in the industry, such as Millipore, Sigma-Aldrich, Milli-Q, SAFC and BioReliance. Our offering covers every step of the biotech production chain, creating a complete end-to-end workflow. Secondly, through the acquisition of Sigma-Aldrich, we have significantly increased our geographic footprint, especially our presence in North America. Our geographic reach now consists of a presence in more than 60 countries. Building on the strengths of each legacy organization, we aim to increase our access to the Asian and Latin American processing market and the North American research market. Thirdly, our capabilities include excellent supply chain management able to deal with complexity, an outstanding e-commerce platform to simplify and optimize the customer experience and the expertise to manage regulatory barriers.

To best meet the needs of our customers and accelerate innovation, as of 2016 the teams responsible for Life Science innovation and product development are strategically organized around our customers – Research Solutions, Process Solutions and Applied Solutions. Our Research Solutions team is focused on helping customers to better understand biological function and disease through a complete portfolio of solutions that enable scientific discovery. Our Process Solutions team provides products that meet the highest quality and purity standards with extensive documentation and services to ensure regulatory compliance. Our Applied Solutions team is focused on supplying products and workflow solutions that streamline processes, lower costs and deliver consistent, reliable results for customers.

Performance Materials business sector

The demand for high-tech products in general and innovative display solutions in particular has seen high global growth in recent years. This trend is not expected to weaken in the coming years. Instead, we assume that increasing demand for these types of consumer goods will come from an expanding middle class in growth markets. Therefore, we aim to defend our position as the market and technology leader for liquid crystals and further expand it as far as possible.

Since the typical life cycle of liquid crystal mixtures is less than three years, innovation will remain the key success factor. Our liquid crystals pipeline is well-stocked with new technologies such as SA-VA (self-aligned vertical alignment) for large-area displays as well as UB-FFS (ultra-brightness fringe field switching), which has already achieved commercial success in tablets and smartphones. Apart from established applications in displays of mobile devices and televisions, we are working to use our expertise as the global market and technology leader to capture new fields of use for liquid crystal technology, for example for liquid crystal windows (LCWs) or mobile antennas.

Our OLED business, which is part of the Advanced Technologies business unit, posted strong, above-average growth in 2015. We want to further position ourselves in the OLED market and play a leading role in this market segment in the medium to long term. Lower production costs for OLED displays are a precondition for this. External partnerships will also be used in the future to ensure the required exchange of technology and expertise. This includes for example the partnership with Seiko Epson, which was signed in 2012. We and Seiko Epson together developed a technology to print OLEDs. As we expect OLED technology to increase in importance in the future, we are investing in the development of a comprehensive OLED portfolio. Among other things, we are investing in a new OLED production plant at our Darmstadt site, where we are planning to produce materials for modern flat screens and lighting starting in summer 2016.

The acquisition of AZ Electronic Materials in 2014 sustainably strengthened and diversified the portfolio and the market position of our Performance Materials business sector, also beyond the liquid crystals market. All integration measures were successfully implemented in 2014, adding a further premium business to the existing profitable businesses. The new Integrated Circuit Materials business unit offers ultrapure, innovative specialty chemicals and materials for use in integrated circuits (semiconductors) and equipment, in flat-panel displays, and for photolithographic printing. Its business model is similar to that of the other Performance Materials business units as it is based on innovation, customer proximity, high market share, and profitability in the growth areas of displays, semiconductors, organic electronics, and lighting. Additionally, the integration of the SAFC Hitech business of Sigma-Aldrich has complemented the product offering of the Integrated Circuit Materials business unit as a leading global supplier to the electronics and semiconductor industries.

Within our Pigments & Functional Materials business unit, the focus of decorative effect pigments is on market and technological leadership in clearly defined markets for pearl luster pigments, for instance in applications for high-quality automotive and industrial coatings. The main focus of functional materials is on niche applications in cosmetics, for example UV filters, insect protection, anti-aging, as well as technical functional materials such as laser marking and antistatic applications.

Strategic financial and dividend policy

We are pursuing a conservative financial policy characterized by the following aspects:

Financial flexibility and a conservative funding strategy
We ensure that we meet our obligations at all times and adhere to a conservative and proactive funding strategy that involves the use of various financial instruments.

We have diversified and profitable businesses as the basis for our strong and sustainable cash flow generation capacity. Moreover, we have several funding resources in place. A € 2 billion syndicated loan facility maturing in 2020 exists to cover any unexpected cash needs. The facility is a pure back-up credit facility and has not been drawn on so far. In addition, we can use our € 2 billion commercial paper program to issue short-term commercial paper with a maturity of up to one year.

Furthermore, we are using bilateral bank loan agreements with first-class banks in order to optimize the funding structure and cost. Our € 15 billion Debt Issuance Program as one of the cornerstone financing vehicles enables us to issue bonds in Europe at short notice and at any time if markets allow. In addition, we issued hybrid bonds amounting to € 1.5 billion in 2014 and U.S. dollar bonds amounting to US$ 4 billion in 2015 outside the Debt Issuance Program in order to broaden the funding basis and to address different investor groups.

Maintaining sustainable and reliable business relations with a core banking group
We mainly work with a well-diversified, financially stable and reliable banking group. Due to our long-term oriented business approach, bank relationships typically last for many years and are characterized by professionalism and trust. The banking group consists of banks with strong capabilities and expertise in various products and geographic regions. We regard these banks as strategic partners. Accordingly, they are involved in important financing transactions, for instance the financing of the Sigma-Aldrich acquisition.

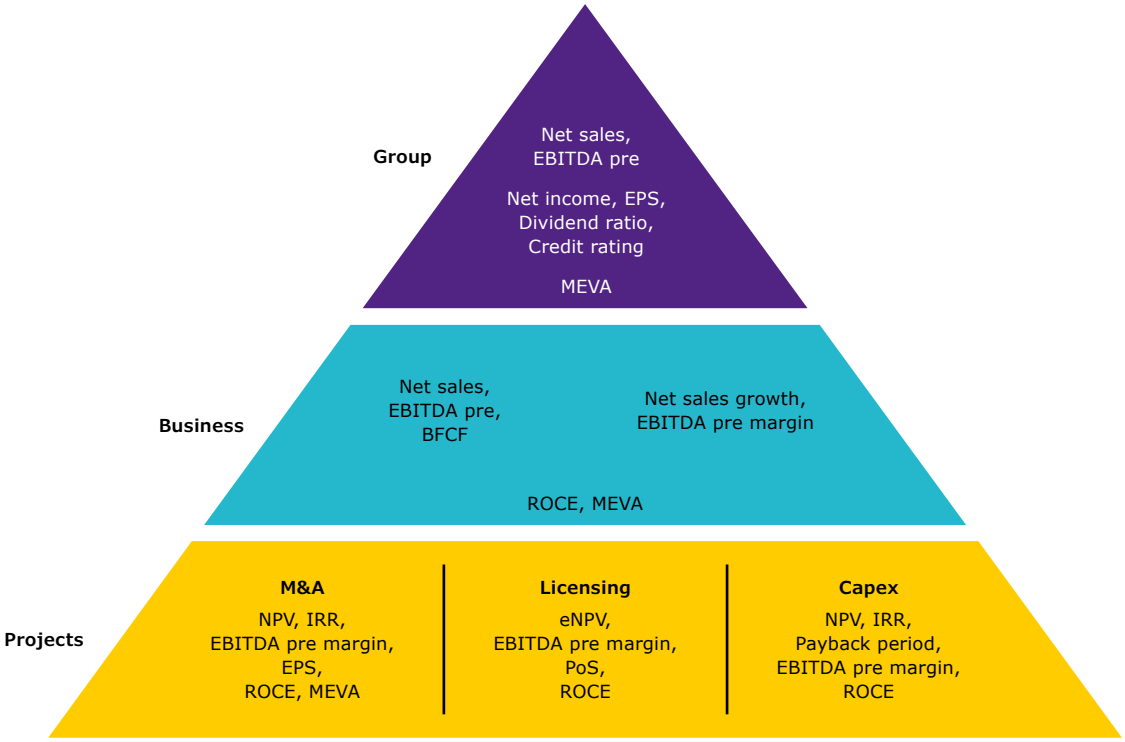
Strong investment grade rating
The rating of our creditworthiness by external rating agencies is an important indicator of the company's financial stability. A strong investment grade rating is an important cornerstone of our financial policy, as it safeguards access to capital markets at attractive financial conditions. Our company currently has a Baa1 rating from Moody's and an A rating from Standard & Poor's (S&P), both with a negative outlook following the acquisition of Sigma-Aldrich. Within the next two to three years, it is of utmost importance to us to sharply reduce our debt and to regain the ratings we had prior to the Sigma-Aldrich acquisition.

Dividend policy
We are pursuing a sustainable dividend policy. Provided that the economic environment develops in a stable manner, the current dividend represents the minimum level for future dividend proposals. The dividend policy follows the business development and earnings increase of the coming years. However, dividend growth could deviate, for example within the scope of restructuring or in the event of significant global economic developments. We also aim for a target corridor of 20% to 25% of EPS pre exceptionals.

Internal Management System

As a global company with a diverse portfolio of products and services, we use a comprehensive framework of indicators to manage performance. The most important KPI (key performance indicator) to measure performance is EBITDA pre exceptionals.

The Value Creation and Financial KPI Pyramid, which summarizes the important financial performance measures of the Group, reflects the comprehensive framework of financial KPIs to steer the businesses and prioritize the allocation of cash resources. It consists of three managerial dimensions, which require the use of different indicators: Group, Business and Projects.



Abbreviations

EBITDA pre = Earnings before interest, income tax, depreciation and amortization pre exceptionals
EPS = Earnings per share
MEVA = Value added of Merck KGaA, Darmstadt, Germany
BFCF = Business free cash flow
ROCE = Return on capital employed
NPV = Net present value
IRR = Internal rate of return
eNPV = expected Net present value
PoS = Probability of success
M&A = Mergers and acquisitions

Key performance indicators of the Group and its businesses

The three key performance indicators net sales, EBITDA pre exceptionals[1], and business free cash flow[1] are the most important factors for assessing operational performance. Therefore, we refer to these KPIs in the Report on Economic Position, the Report on Risks and Opportunities, and in the Report on Expected Developments. As the most important indicators of financial business performance, the KPIs are key elements of our performance management system.

Net sales

Net sales are defined as the revenues from the sale of goods and services rendered to external customers net of value added tax and after sales deductions such as rebates or discounts. Net sales are the main indicator of our business growth and therefore an important parameter of external as well as internal performance measurement. In addition, acquisition- and currency-adjusted sales are used for internal performance management. Since January 1, 2015, commission income has been included in net sales.

GROUP

Net sales

€ million/change in %	2015	2014	Change
Net sales	**12,844.7**	**11,362.8**	**13.0**

EBITDA pre exceptionals

EBITDA pre exceptionals is the main performance indicator measuring ongoing operational profitability and is used internally and externally. To allow for a better understanding of the underlying operational performance, it excludes from the operating result depreciation and amortization as well as exceptionals. Exceptionals are restricted to the following categories: impairments, integration costs/IT costs, restructuring costs, gains/losses on the divestment of businesses, acquisition costs, and other exceptionals. The classification of specific income and expenses as exceptionals follows clear definitions and underlies strict governance at Group level. Within the scope of internal performance management, EBITDA pre exceptionals allows for the necessary changes or restructuring without penalizing the performance of the operating business.

GROUP

Reconciliation EBIT to EBITDA pre exceptionals[1]

€ million/change in %	2015	2014	Change
Operating result (EBIT)	**1,843.2**	**1,762.0**	**4.6**
Depreciation and amortization	1,383.4	1,261.6	9.7
Impairment losses/Reversals of impairment losses	127.5	99.3	28.4
EBITDA[1]	**3,354.1**	**3,122.9**	**7.4**
Integration costs/IT costs	77.6	87.2	–11.0
Restructuring costs	47.5	83.9	–43.4
Gains/losses on the divestment of businesses	2.0	–1.9	–
Acquisition-related exceptionals	132.7	85.0	56.1
Other exceptionals	15.9	10.6	47.8
EBITDA pre exceptionals[1]	**3,629.8**	**3,387.7**	**7.1**

Business free cash flow (BFCF)

Business free cash flow comprises the major cash-relevant items that the individual businesses can influence and are under their full control. It comprises EBITDA pre exceptionals less the change in the opening and closing amounts reported in the balance sheet for investments in property, plant and equipment, software, advance payments for intangible assets, as well as the change in inventories and trade accounts receivable. To manage working capital on a regional and local level, the businesses use the two indicators days sales outstanding and days in inventory.

[1] Financial indicators not defined by International Financial Reporting Standards.

GROUP

Business free cash flow[1]

€ million/change in %	2015	2014	Change
EBITDA pre exceptionals [1]	**3,629.8**	**3,387.7**	**7.1**
Investments in property plant and equipment and software as well as advance payments for intangible assets	–609.0	–527.5	15.4
Changes in inventories as reported in the consolidated balance sheet	–960.1	–185.5	–
Changes in trade accounts receivable and receivables from royalties and licenses as reported in the consolidated balance sheet	–514.2	–214.2	140.0
Adjustment first-time consolidation of the Sigma-Aldrich Corporation	1,219.7	–	–
Adjustment first-time consolidation of AZ Electronic Materials S.A.	–	144.6	–
Business free cash flow[1]	**2,766.2**	**2,605.1**	**6.2**

Investments and value management

Sustainable value creation is essential to secure the long-term success of the company. To optimize the allocation of financial resources, we use a defined set of parameters as criteria for the prioritization of investment opportunities and portfolio decisions.

Net present value (NPV)

The main criterion for the prioritization of investment opportunities is net present value. It is based on the discounted cash flow method and is calculated as the sum of the discounted free cash flows over the projection period of a project. Consistent with the definition of free cash flow, the weighted average cost of capital (WACC), representing the weighted average of the cost of equity and cost of debt, is used as the discount rate. Depending on the type and location of a project different mark-ups are applied to the WACC.

Internal rate of return (IRR)

The internal rate of return is a further important criterion for the assessment of acquisition projects and investments in property, plant and equipment. It is the discount rate that makes the present value of all future free cash flows equal to the initial investment or the purchase price of an acquisition. A project adds value if the internal rate of return is higher than the weighted cost of capital including mark-ups.

Return on capital employed (ROCE)

In addition to NPV and IRR, when looking at individual accounting periods, ROCE is an important metric for the assessment of investment projects. It is calculated as the operating result (EBIT) pre exceptionals divided by the sum of property, plant and equipment, intangible assets, trade accounts receivable and trade accounts payable, as well as inventories.

Payback period

An additional parameter to prioritize investments into property, plant and equipment is the payback period, which indicates the time in years after which an investment will generate positive net cash flow.

Value added of Merck KGaA, Darmstadt, Germany (MEVA)

MEVA gives information about the financial value created in a period. Value is created when the return on capital employed (ROCE) of the company or the business is higher than the weighted average cost of capital (WACC). MEVA metrics provide us with a powerful tool to weigh investment and spending decisions against capital requirements and investors' expectations.

Capital-market-related parameters

Net income and earnings per share (EPS) and earnings per share pre exceptionals (EPS pre)

Earnings per share are calculated by dividing profit after tax attributable to the shareholders of Merck KGaA, Darmstadt, Germany, (net income) by the weighted average number of theoretical shares outstanding. The use of a theoretical number of shares takes into account the fact that the general partner's capital is not represented by shares. To provide a more comparable view, we also publish EPS pre**1**, which excludes exceptionals from impairment losses, integration costs, IT costs, restructuring costs, gains/losses on the divestment of businesses, and other exceptionals as well as amortization of intangible assets as of a threshold value of € 50 million and is based on the company's underlying tax ratio.

[1] Financial indicators not defined by International Financial Reporting Standards.

Credit rating

The rating of our creditworthiness by external agencies is an important indicator with respect to our ability to raise debt capital at attractive market conditions. The capital market makes use of the assessments published by independent rating agencies in order to assist debt providers in estimating the risks associated with a financial instrument. We are currently assessed by Moody's and Standard & Poor's (S&P). The most important factor for the credit rating is the ability to repay debt, which is determined in particular by the ratio of operating cash flow to (net) financial debt.

Dividend ratio

With the aim of ensuring an attractive return to our shareholders, we are pursuing a reliable dividend policy with a target payout ratio based on EPS pre exceptionals (see definition above).

Other relevant / non-financial performance measures

Apart from the indicators of the financial performance of the businesses, non-financial measures also play an important role in furthering the success of the company. From a Group perspective, specifically innovations in the businesses as well as the attraction and retention of highly qualified employees are of central importance.

Innovation

Innovations are the foundation of our business and will also be the prerequisite for future success in changing markets. We are continuously working to develop new products and service innovations for patients and customers. Indicators for the degree of innovation are defined individually depending on the specifics of the respective businesses.

Talent retention

Employing a highly qualified and motivated workforce is the basis for achieving our ambitious business goals. Therefore, we put a strong focus on establishing the processes and the environment needed to attract and retain the right talent with the right capabilities at the right time. To measure the success of the related measures, we have implemented talent retention as an important non-financial indicator.

Corporate Responsibility

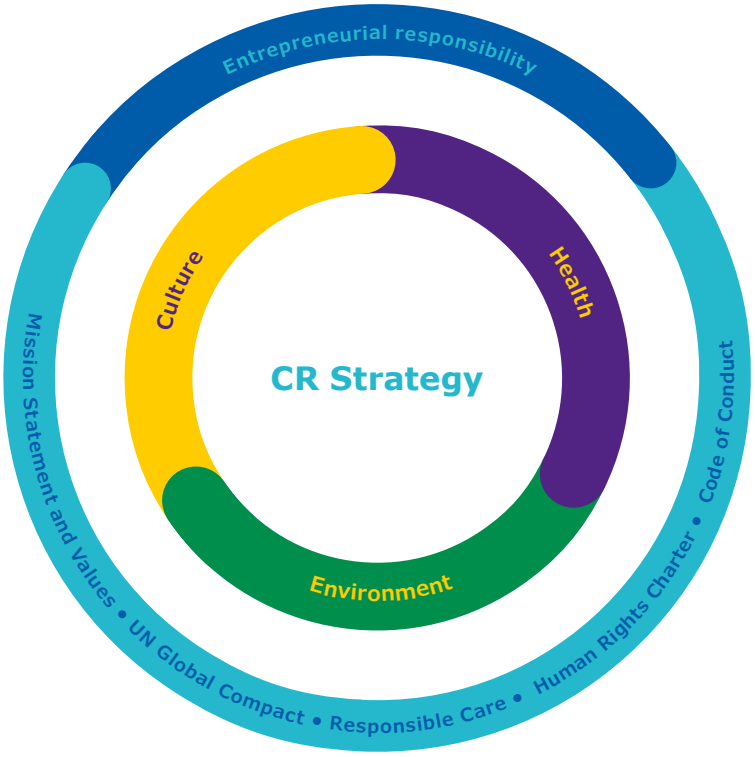
We take responsibility every day – and have been doing so for nearly 350 years. This is reflected in our corporate strategy and values. Responsible conduct with respect to employees, products, the environment and society is a fundamental prerequisite for our business success.

Strategy and management

Our corporate responsibility (CR) activities are directed by our CR Committee, which consists of representatives from the business sectors and relevant Group functions. Stefan Oschmann, Vice Chairman of the Executive Board, became chairman of this committee in January 2015.

Mankind is confronted with global societal challenges such as climate impact mitigation, resource scarcity and insufficient access to health in low- and middle-income countries. We believe that we can help resolve these global challenges through our innovative products in our Healthcare, Life Science and Performance Materials business sectors, as well as through responsible governance.

Responsible conduct means looking, listening and doing better. We respect the interests of our employees, customers, investors, and society, and minimize ethical, economic and social risks, thereby securing our success. It is firmly anchored in our corporate strategy and forms the basis of our CR strategy, enabling us to practice responsible governance every single day. At the same time, we consolidate our resources in the areas where we can make the biggest difference. We are engaged in three strategic spheres of activity: health, the environment and culture. In doing so, we always focus on securing the future of our company and our competitiveness.



Health: In low- and middle-income countries, many people do not have access to high-quality health solutions. We use our expertise and work together with strong partners to develop solutions for people locally.

Environment: We continuously work to further improve the sustainability footprint of our products. In addition, we want to help our customers to achieve their own sustainability goals.

Culture: Culture inspires people and broadens their horizons. Since our research and development activities benefit from people's creativity and enthusiasm, we promote cultural and educational projects worldwide.

We support relevant initiatives concerning responsible corporate governance. We are a member of the United Nations Global Compact and are committed to complying with the compact's principles regarding human rights, labor standards, environmental protection, and anti-corruption. Moreover, we also live our corporate responsibility through our commitment to follow the guidelines of the Responsible Care Global Charter, an initiative of the International Council of Chemical Associations (ICCA). This charter aims to continuously improve the products and services of the chemical industry in terms of environmental protection, health, plant safety, and security. We were among the first companies to sign the revised version of the Responsible Care Global Charter in 2014. In addition, we are a member of the "Chemie³" initiative, a collaboration between the German Chemical Industry Association (VCI), the German Employers' Federation of the Chemical Industry (BAVC), and the German Mining, Chemical and Energy Industrial Union (IG BCE). As part of this globally unique collaboration, the partners aim to make sustainability a core part of the chemical industry's guiding principles and to jointly drive the sector's position within the German economy as a key contributor to sustainable development.

To us, corporate responsibility does not merely mean taking action, but also listening. The dialogue with our various stakeholder groups is therefore highly important to us. These stakeholders include our employees, our business associates, the Merck family, investors, regulatory agencies, and associations. We also engage in a continuous exchange in order to create transparency and clearly demonstrate how we live our company values.

Thanks to good performance with respect to responsible, sustainable entrepreneurial conduct, we were again included in the FTSE4Good index in 2015. To be included in this leading international sustainability index, a company must demonstrate socially conscientious, ecological and ethical conduct. In 2015, we maintained our good position in other major sustainability indices as well. For instance, we were once more included in the STOXX Global ESG Leaders index and are also listed on the Euronext Vigeo Eurozone 120 index.

Strategic sphere of activity: Health

Access to Health (A2H) is one of our strategic priorities. Through our A2H approach, which spans all our businesses, we aim to help improve sustainable access to high-quality health solutions for underserved populations and communities in low- and middle-income countries. Since we realize that access is a complex and multifaceted challenge with no one-size-fits-all solution, our programs and initiatives are tailored to global, regional and local needs. We consider partnerships, collaboration and dialogue to be key instruments in delivering sustainable access results. Our efforts are supportive of the United Nations Sustainable Development Goals (SDGs).

During his presidency of the International Federation of Pharmaceutical Manufacturers & Associations (IFPMA), Stefan Oschmann, Vice Chairman of the Executive Board, is focusing on the core topic of accelerating access to high-quality health solutions for people in low- and middle-income countries.

Our Access to Health strategy focuses on four areas, the 4As of Availability, Affordability, Awareness, and Accessibility.

Availability

Availability entails the research, development and refinement of health solutions that address unmet needs and are tailored to local environments. Together with our partners, we are working to fight widespread diseases in developing countries. One example is the Pediatric Praziquantel Consortium. Through this public-private partnership, we are working on a pediatric formulation of praziquantel to treat the worm disease schistosomiasis in children under the age of six. In 2015, the consortium completed a Phase I trial with healthy subjects in South Africa as well as a taste study with children in Tanzania. In June 2015, the consortium was awarded a prestigious research grant from the Japanese Global Health Innovation Technology Fund for the second time. Another example is our partnership with the Medicines for Malaria Venue, a non-profit research foundation, to develop new antimalarials. In addition, our Healthcare and Life Science business sectors are currently developing a malaria diagnosis kit based on the Muse cell analysis system. The aims are to detect and determine the malaria pathogen as well as to determine relevant immune cells in the case of a possibly concurrent HIV infection.

Affordability

We seek to address affordability challenges through our efforts to provide assistance to those who are unable to pay for the health solutions they need. To tackle these challenges, we have taken a pro-access approach through our intellectual property initiatives and are engaging in equitable pricing strategies. We are a member of WIPO Re:Search, an open innovation platform, sponsored by the World Intellectual Property Organization, to accelerate early discovery of active ingredients to treat infectious diseases through intellectual property and knowledge sharing. In 2015, we started our first collaboration with the University of Buea in Cameroon, which aims to repurpose compounds from our library to develop a treatment for onchocerciasis, also known as river blindness. To this end we are strengthening the development of local skills and research expertise. Furthermore, we are working with the World Health Organization (WHO) to combat the worm disease schistosomiasis in Africa. We donate Cesol® 600 tablets containing the active ingredient praziquantel to WHO, and in 2015 we donated more than 100 million tablets. Since the start of the program, around 74 million patients, primarily school children, have been treated. As of 2016, we will supply WHO with up to 250 million praziquantel tablets annually. As a founding member of the Global Schistosomiasis Alliance, we are helping to eliminate schistosomiasis worldwide.

Awareness

We help to raise awareness by empowering health workers, communities and patients with appropriate tools, knowledge and skills to make informed decisions. With our Access Dialogues series, we aim to promote information exchange and discussion with numerous public and private stakeholders. In 2015, the focus was on the topics of intellectual property and supply chains. In India, we are supporting the Suswastha project together with various non-governmental organizations and the Indian Health and Family Ministry. The aim is to provide underserved rural populations with affordable health solutions and to engage patients through community-level meetings as well as educative health programs. In 2015, the project reached a total of more than 15,000 people through 717 community meetings and 43 health workshops. The non-profit organization Global Pharma Health Fund (GPHF), which is funded by our company, combats counterfeit medicines in developing and emerging countries. To date, the GPHF has supplied more than 700 Minilabs at cost to detect counterfeit medicines in more than 90 countries. In addition, through our Capacity Advancement Program (CAP), we want to raise awareness and further the prevention of non-communicable diseases such as diabetes and cancer, as well as address the issue of infertility. (Detailed information can be found in the story entitled “Awareness” in the magazine section of this Annual Report, starting on page 24).

Accessibility

We promote initiatives to strengthen supply chains and to develop localized health solutions in order to deliver and reach out efficiently at the point of care. Using heat sensors, for example, we monitor the transportation conditions of our primary shipments from Europe to the rest of the world. Patients can therefore be assured that our products are kept and released under the right conditions according to registration. Furthermore, we support the expertise and training of the managers of our partners in Africa, Asia and Latin America to strengthen local quality manufacturing standards. In India, we are cooperating with the non-governmental organization River Narmada Samagra. Our river ambulance transports health workers and provides healthcare solutions to local populations living in the remote region along the Narmada River. At the beginning of 2016, we donated a new boat to River Narmada Samagra so that even more people can be reached in the future. Additionally, in the Jharkhand region of northeastern India, we are financing a health center visited by approximately 150 patients per month.

Strategic sphere of activity: Environment

Through our products we are helping to overcome global challenges such as climate impact mitigation and resource scarcity. At the same time, we are also helping our customers achieve their own sustainability goals.

Developing sustainable products

We strive to continuously enhance the sustainability footprint of our products and are working to offer our customers products that enable them to reduce the negative impact of their own activities, as well as to achieve their own sustainability goals. For instance, we are developing innovative materials for energy-efficient liquid crystal and OLED displays and are thus helping our customers develop environmentally sustainable processes. Thanks to our liquid crystal technology PS-VA, displays consume approximately 20% less energy in comparison to the preceding VA technology. The new UB-FFS technology (ultra-brightness fringe field switching) provides displays with up to 15% more light transmittance, thus further reducing energy consumption. We are also developing liquid crystals for new applications. For instance, we are working with architects, glass makers and façade manufacturers to create the windows of tomorrow. Our ambitious goal is to use smart windows to make buildings more energy-efficient.

We have developed a series of environmentally friendly specialty chemicals and materials for the semiconductor industry – including PFOS-free antireflective and photoresist coatings that contain no trace of dangerous chemicals.

Within the scope of our cosmetic products business, we are working to sustainably procure and produce cosmetic ingredients as well as optimize the related production processes. In dialogue with our customers from the cosmetics industry, we are also developing cosmetic formulations that meet strict sustainability criteria and address the current trend towards more natural cosmetics. Several of our products have been certified by Ecocert, an independent organization that represents high international standards for environmentally sustainable products.

Within Life Science, the Design for Sustainability (DfS) program aims to reduce environmental impacts, also through customers' own use. Beginning with the concept stage, product teams identify potential environmental impacts in various product life cycle stages as well as opportunities to make improvements. A scorecard is used to assess product design in six focus categories: Materials, Energy and Emissions, Waste, Water, and Packaging, as well as Usability and Innovation. In 2014, we completed the integration of the DfS approach into the product development process. We set ourselves the goal of improving sustainability criteria in at least 10% of our Life Science product ranges, reaching this goal at the end of 2014 for our products in the former Life Science business.

In addition, Life Science works together with customers and recycling companies to design sustainable recycling programs.

Furthermore, we use our technical and scientific expertise in the field of water analysis to support clean water supply and adequate wastewater handling. A prime example of this is our participation since August 2015 in Semizentral, a Sino-German infrastructure project developed by the Technical University of Darmstadt and sponsored by the German Federal Ministry of Education and Research (BMBF). In May 2015, Semizentral won the GreenTec Award, Europe's biggest environmental and business prize, in the Urbanization category; in November 2015, the initiative ranked among the top three in the Research category of the 2015 German Sustainability Award.

Strategic sphere of activity: Culture

Cultural promotion is a core element of our engagement in society that reflects our centuries-old tradition of supporting art and culture. After all, culture nurtures characteristics that are indispensable to our business activities as a high-tech company: creativity, enthusiasm for new discoveries, and the courage to transcend boundaries. Our cultural engagement focuses on music, literature and education.

Deutsche Philharmonie of Merck KGaA, Darmstadt, Germany

The Deutsche Philharmonie of Merck KGaA, Darmstadt, Germany, is our musical ambassador. We consider classical music to be the universal language that brings people together; as such, it is an important part of our culture. The concerts of this professional ensemble are highly popular, with around 26,000 people attending them per year. They represent an integral part of the cultural life in the vicinity of our global headquarters in Darmstadt. Special events for children and adolescents as well as collaborations with schools, such as the orchestra workshop held once a year since 2010, aim to make classical music more accessible to young people.

In addition to this, the Deutsche Philharmonie of Merck KGaA, Darmstadt, Germany, regularly invites international ensembles to play in Darmstadt while itself also touring the globe. In 2015, the orchestra gave concerts in the United Kingdom and Israel. Furthermore, the Deutsche Philharmonie of Merck KGaA, Darmstadt, Germany, went on a tour of Latin America to mark the 85th anniversary of our presence in Mexico and the 40th anniversary of the opening of our production facility in Brazil, performing in Mexico City, Rio de Janeiro and São Paulo.

Fostering literature

Literature can stimulate the imagination; it can alleviate fears and give courage. Literature can also address scientific topics, thus furthering a deeper understanding of science and research. Through our engagement, we aim to help society better accept science and scientific progress. In addition, as an international company, we foster writers who further cultural exchange in our globalized world.

We grant and promote five literary prizes worldwide. Since 1964, we have been sponsoring the renowned Johann Heinrich Merck Award for Literary Critique and Essay, which is presented by the German Academy for Language and Poetry at its annual autumn conference. The award, which comes with a € 20,000 prize, went to publicist Gabriele Goettle in 2015.

For 13 years, we have been sponsoring the Premio Letterario of Merck KGaA, Darmstadt, Germany, in Italy. This award is worth € 10,000 and recognizes authors who build bridges between literature and science, thereby making them accessible to a wide audience. In 2015, the awards went to French author Maylis de Kerangal and American author and science writer David Quammen.

In India, we collaborate with the Goethe-Institut Calcutta to present the Merck Tagore Award of Merck KGaA, Darmstadt, Germany; worth 500,000 Indian rupees (around € 6,800), this literary prize is granted every two years to authors who have made a distinctive contribution to the cultural exchange between Germany and India. In Japan, we also present the Merck Kakehashi Literature Prize of Merck KGaA, Darmstadt, Germany, together with the Goethe-Institut Tokyo. Worth a total of € 20,000, this award is granted every two years to contemporary works by German authors that are made accessible to a wider readership in Japan. As of 2016, we will also grant a literature prize in Russia.

Education

We view education as a key component of culture – and vice versa. Education can help us understand culture. But culture can also build a bridge to education; it can stimulate curiosity and nurture creativity. We therefore support educational projects at many of our sites, by granting scholarships for instance, or sponsoring specific classes. In order to promote young scientists, every year since 1996 we have, for example, been organizing the renowned annual “Jugend forscht” competition for the German federal state of Hesse.

To mark our 125th anniversary in the United States, we launched the “Smarter, Together in the Classroom” initiative, committing US$ 125,000 to fund 132 scientific projects at 100 schools in low-income regions in Massachusetts. To date, nearly 18,000 pupils have benefited from the program. By 2016, we want to have reached more than 36,000 children in Massachusetts and Missouri with the campaign. In China, we won the 2015 Corporate Social Responsibility Award presented by the European Union Chamber of Commerce for our School Water project. To date, five primary schools in Shanghai and one primary school in Sichuan Province have received drinking water purification facilities free of charge. In addition, our employees educate the pupils on environmental protection on a regular basis.

Responsibility for our products

The safety of our products is at the core of our corporate responsibility. When used properly, they should pose no risk to customers, patients, consumers, or the environment. Our goal is to ensure a positive benefit/risk profile for our products. Therefore, we regularly examine safety across the entire life cycle of our products and continuously take steps to minimize risks. We provide our patients, consumers and customers with extensive information material so that they can use our products in a responsible, safe and proper manner.

Through our compliance policies for our Biopharma and Consumer Health businesses, we set standards for responsible marketing activities relating to our medicines. These aim to ensure that patients and healthcare professionals have access to the relevant information, and that patients receive effective treatment.

Safety of our chemical products

There are numerous regulations intended to ensure that chemicals pose no risk to humans or the environment. Compliance with these regulatory requirements is an important part of our work. With our Group-wide Product Safety Chemicals policy, we have established global processes for defining, steering and implementing product safety, as well as the corresponding management structures. We incorporate all relevant national and international chemical regulations into our policies and regulations and adhere to them. This includes for instance the EU chemicals regulation REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) and CLP (Classification, Labelling and Packaging of Substances and Mixtures, EU GHS). Furthermore, we are committed to transparency. For instance, in line with the Global Product Strategy, an international initiative of the chemical industry, we provide our customers with product safety summaries for hazardous materials.

We have successfully completed the second phase of REACH implementation. All substances we produce or import in quantities ranging from 100 to 1,000 metric tons per year – 70 different substances in total – were successfully registered with the European Chemicals Agency (ECHA) by June 1, 2013. We are currently in phase three, in which we are working to register all substances produced or imported in quantities between one and 100 metric tons per year by mid-2018. We are fully on schedule with our activities.

Safety of our healthcare products

Patient and consumer safety is our number-one priority in everything we do. During the entire life cycle of our medicines and consumer health products, we provide patients, consumers and physicians with up-to-date risk-benefit evaluations. To this end, our experts process safety-relevant information from various sources such as clinical trials, adverse reaction reports and scientific literature. Ultimate responsibility for the safety of our biopharmaceuticals is borne by our Global Chief Medical Officer, with support from our Medical Safety and Ethics Board (MSEB). Our Global Drug Safety unit continuously monitors and evaluates the safety and risk-benefit ratio of our medicines worldwide (pharmacovigilance). For our Consumer Health products, this function is performed by the Global Product Safety unit. Overall responsibility for the safety of our over-the-counter products falls under the Chief Medical Officer for the Consumer Health business, supported by the Safety & Labelling Committee (SLC).

For products in our Allergopharma business, we have developed comprehensive clinical efficacy and safety profiles that we continuously update. For the safety of our patients, we have established a global pharmacovigilance system that we continuously work to enhance.

Quality of our products

Our goal is to provide customers and patients with high-quality brand-name products at all times. Through our quality vision – “Quality is embedded in everything we do!” – we remind our employees of their responsibility – across all businesses, all Group functions and all levels of the company.

Supplier management

We source raw materials, packaging materials, technical products, components, and services from suppliers in more than 120 countries. Our basic expectations for suppliers and service providers include their compliance with fundamental environmental and social standards, which are primarily derived from the core labor standards of the ILO (International Labour Organisation), from the UN Global Compact, and from the Code of Conduct of the BME (German Federal Association for Materials Management, Purchasing and Logistics).

Our Group Procurement Policy and Responsible Sourcing Principles define our procurement practices and are integrated into our general terms and conditions. They therefore constitute the foundation of every sourcing transaction and procedure.

Due to the growing significance of emerging markets as sourcing markets for our company, we reinforced our efforts to ensure adherence to our supply chain standards.

We joined the Together for Sustainability (TfS) chemical industry initiative at the end of 2014 and since then have been able to jointly use the results of supplier assessments and audits with other member companies and in compliance with all competition law restrictions. Through TfS, we currently have access to assessments of more than 300 of our most important suppliers. Around 100 of these were generated for the first time in 2015 thanks to our initiative. For 2016, in addition to further assessments, we also plan to extend local TfS supplier audits.

Responsibility for our employees

Employees are crucial to the success of a company. They therefore play a central role in our business endeavors. In accordance with our company values, we live a culture of mutual esteem and respect. We want to contribute to entrepreneurial success by recruiting, developing and motivating the most suitable employees. We therefore place a strategic focus on the topics of talent development, compensation and performance management. Furthermore, we want to strengthen the diversity of our employees (Detailed information can be found in the section entitled “People”).

Responsibility for the environment

In the manufacture of our products, we seek to impact the environment as little as possible. This especially includes efficiently conserving resources such as energy, water and raw materials while also continuously reducing our emissions and waste.

Environmental management system

In our Corporate EHS Policy, we have defined our principles and strategies for the environment, health and safety. It is implemented through internal guidelines and instruction manuals on compliant behavior in day-to-day operations, such as the Group EHS Security and Quality Manual. At all sites, the local EHS managers are in charge of operational environmental protection measures. These employees continually receive training and obtain additional qualifications.

Since our businesses are constantly changing, our environmental management system must also remain flexible and adaptable. For this reason, we have internal and external audits conducted on a regular basis to determine whether the ISO 14001 requirements are still being met. In 2015, we received the ISO 14001 group certificate for our environmental management system for the seventh consecutive year. This certificate covers 57 sites. Seven sites belonging to the recently acquired company Sigma-Aldrich are already certified according to ISO 14001.

Our spending on environmental protection, health and safety totaled € 148 million in 2015, which also includes investments made during the year.

Focus topics: Energy efficiency, greenhouse gas emissions, water scarcity

Climate impact mitigation and resource scarcity are central challenges facing society in the 21st century. As a responsible company, it is especially important to contribute to this, which is why we have set ourselves the goal of reducing total direct and indirect greenhouse gas emissions by 20% by 2020, measured against the 2006 baseline.

To achieve this goal we have launched EDISON, a climate impact mitigation program that consolidates all our climate protection and energy efficiency activities. In 2016, as in the four preceding years, the Executive Board will earmark funds specifically for measures to conserve energy and reduce greenhouse gas emissions. Through the more than 400 EDISON projects that have been initiated since 2012, we aim to annually save around 90 metric kilotons of CO_2 in the medium term. In 2015, we lowered our greenhouse gas emissions by around 8% relative to the 2006 baseline, despite growth in our operating business.

Around 60% of the EDISON projects planned Group-wide have already been or are being rolled out. Our Life Science business sector is making a major contribution. In 2014, we reduced our process-related emissions per production unit through optimizing processes by around two-thirds at our site in Jaffrey, New Hampshire, USA, while in 2015, we launched a project to realize additional savings. In summer 2015, we commissioned a new photovoltaic plant with a power output of 400 kW in Shanghai, China, which will reduce the site's CO_2 emissions by around 280 metric tons per year.

ENERGY CONSUMPTION

(in GWh)	2011	2012	2013	2014	2015
Total energy consumption	1,474	1,528	1,549	1,602	1,720
Direct energy consumption	905	924	991	1,056	1,171
Natural gas	789	813	871	919	933
Liquid fossil fuels	103	98	105	110	103
Biomass and self-generated renewable energy	13	13	15	27	135
Indirect energy consumption	569	604	558	546	549
Electricity	511	491	493	460	466
Steam, heat, cold	58	113	65	86	83

Portfolio-adjusted in accordance with the Greenhouse Gas Protocol. The figures do not include the energy consumption data of Sigma-Aldrich since the Sigma-Aldrich integration process is still underway.

CO_2EQ EMISSIONS (EQ= EQUIVALENTS)

Emissions in kt, Scope 1 and 2	2011	2012	2013	2014	**2015**
Total CO_2eq emissions	529	543	559	517	518
Direct CO_2eq emissions	315	318	348	321	327
Indirect CO_2eq emissions	214	225	211	196	191

Portfolio-adjusted in accordance with the Greenhouse Gas Protocol.
The figures do not include data from Sigma-Aldrich since the Sigma-Aldrich integration process is still underway. The direct and indirect CO_2eq emissions (Scope 1 and 2) of the former Sigma-Aldrich sites add up to approximately 215 kt in 2015.
(Note: The calculation model has not yet been harmonized).

Energy management plays a key role in our efforts for sustainable energy efficiency and climate impact mitigation. Our production sites in Darmstadt and Gernsheim account for around 40% of our global energy consumption. In 2012, both of these sites qualified for ISO 50001 – Energy Management System certificates, which were reaffirmed in 2015. Currently, nine of our production sites have a certified energy management system. The results of the Carbon Disclosure Project likewise indicate that we are on the right path. In 2015, we achieved 98 out of 100 points in the Climate Disclosure Scoring, which assesses the level of reporting details as well as transparency, and were thus clearly in the upper range of all participating companies in the Germany, Austria and Switzerland category. In the Climate Performance Scoring, we ranked in performance band C, putting us above average. The Carbon Disclosure Project, an independent non-profit organization, assessed the emissions reduction progress and climate impact mitigation reporting of companies.

In addition to energy, in 2015 we also focused on the topic of water. We systematically examined our sites to determine which ones have a high annual water consumption and are also located in regions where water is scarce and thus an especially precious resource. Based on a detailed assessment, we plan to implement sustainable water management systems stepwise at these sites in the coming years.

Responsibility for society

We see ourselves as part of society, not only at our individual locations, but also at a global level. Taking responsibility towards society is an integral part of our entrepreneurial approach. We believe that we can make an important contribution to the community through our knowledge, our skills and our products.

Our social responsibility activities are primarily focused on those areas in which we have problem-solving expertise stemming from our core businesses. We are thus engaged in health and environmental projects and support education, specifically in the natural sciences. We provide disaster relief in emergency situations, especially in those regions in which we operate. In April 2015, we signed a three-year agreement with the German Red Cross (DRK). According to the terms of the agreement, in the event of a catastrophe we will primarily support the activities and projects of the German Red Cross by donating money and supplies. In December 2015, we donated € 50,000 to the German Red Cross to support health projects for refugees in Lebanon.

Our subsidiaries are engaged in a wide variety of local projects. We have defined overarching criteria for selecting projects, and the decisions concerning specific local projects are made by our subsidiaries. In 2015, we spent a total of around € 100 million on community engagement activities.

Research and Development

We discover and develop new products and solutions worldwide to improve the quality of life for patients and to meet customer needs. We consistently aim to further optimize the relevance and efficiency of our research and development activities, whether in-house or through external collaborations.

Around 5,000 employees work for our researching innovations to serve long-term health and technology trends in both established and growth markets.

We spent around € 1.7 billion on research and development in 2015. Here we focus on both in-house research and external collaborations, which enable us to increase the productivity of our research while simultaneously reducing financial outlay.

The organizational set-up of our research and development activities reflects the structure of our company with three business sectors.

Healthcare

Biopharma

The R&D organization of our Biopharma business advanced several key programs in 2015, both in the early and late stages of development – many of which are molecules discovered at our company. With a clear focus on oncology, immuno-oncology and immunology, there is significant potential in the near term to benefit patients and the business.

Under the direction of Luciano Rossetti, MD, Head of Global R&D, several new senior leaders joined the organization, including Alise Reicin, MD, Senior Vice President, Head of Global Clinical Development, and Laszlo Radvanyi, MD, Head of the Translational Innovation Platform Immuno-Oncology. In addition, Joern-Peter Halle, PhD was appointed Head of External Innovation for Biopharma R&D.

In September, our Biopharma business announced the expansion of its R&D facility in Darmstadt, Germany. We are investing € 65 million in a new laboratory building that will span more than 16,000 square meters and accommodate approximately 200 current employees whose focus will be on accelerating innovation in R&D. The new building will unite different functions within R&D Discovery Technologies, including Molecular Pharmacology, Medicinal Chemistry, Computational Chemistry, Molecular Interactions and Biophysics, Protein Engineering and Antibody Technologies, and Protein and Cell Sciences. The research building, when completed in autumn 2017, will be located within the new "Pharma Square" at our global headquarters in Darmstadt. We are thus uniting a significant part of our R&D activities in a single area, creating ideal conditions for the advancement of our biopharmaceutical pipeline.

Oncology

Regarding Erbitux®, in April 2015 the safety division of the Japanese Ministry of Health, Labour and Welfare issued an official notification to update the product information of Erbitux® for use in unresectable, advanced or recurrent colorectal cancer (CRC) patients with wildtype RAS tumors, in line with the current approval status in Europe.

At the European Society for Medical Oncology (ESMO) World GI (Gastrointestinal) Congress in Barcelona, Spain in July, results were presented from the Phase II CAPRI-GOIM trial. This was an independent study performed by an academic group which enrolled 340 KRAS exon 2 wild-type mCRC patients. Patients received first-line treatment of FOLFIRI plus Erbitux® and responders were then randomized to receive second-line treatment of FOLFOX plus Erbitux® or FOLFOX alone. A quadruple wild-type population from this study (no mutation in KRAS, NRAS, BRAF or PIK3CA; assessed by next-generation sequencing) showed significantly prolonged progression-free survival, improved overall survival, and response rates with second-line Erbitux®/FOLFOX after first-line Erbitux®/FOLFIRI. This suggests that continuing anti-EGFR treatment while switching the chemotherapy backbone in second line is feasible following progression, although confirmatory data from other studies will be needed.

Evofosfamide is an investigational hypoxia-activated prodrug thought to be activated under severe tumor hypoxic conditions, a feature of many cancers, which was investigated in Phase III trials in two indications (soft tissue sarcoma and pancreatic cancer). In May, we announced that the U.S. Food

and Drug Administration (FDA) had granted Fast Track designation for the development of evofosfamide for the treatment of previously untreated patients with metastatic or locally advanced unresectable pancreatic cancer. In December 2015 the outcome of both indications being investigated in Phase III was assessed. Unfortunately studies in neither indication achieved their primary endpoints. The decision was subsequently made to discontinue the development program for evofosfamide and we returned the rights to the program to Threshold Inc.

Tepotinib, an investigational small molecule inhibitor of the c-Met receptor tyrosine kinase, progressed into two Phase II parts of the ongoing Phase I/II trial. In early 2015, it was moved to the Phase II part of an ongoing Phase I/II trial in Asian patients with Met-positive (Met+) EGFR mutant non-small cell lung cancer (NSCLC). The study plans to randomize approximately 136 patients with Met+ tumors who have failed first-line gefitinib, to tepotinib 500 mg/d plus gefitinib or tepotinib plus cisplatin/pemetrexed. The primary endpoint is progression-free survival (PFS). In the second quarter tepotinib was moved to the Phase II part of an ongoing open-label Phase I/II trial in Asian patients to evaluate its efficacy, safety, and pharmacokinetics as first-line treatment versus sorafenib in subjects with treatment-naive advanced hepatocellular carcinoma. The study plans to randomize approximately 140 patients with Met+ tumors to tepotinib 500 mg per day or sorafenib 400 mg twice a day. The primary endpoint is time to progression.

In the field of oncology diagnostics, we signed an agreement with Illumina, Inc. in March 2015. We are working with Illumina to develop sequencing-based assays that detect and simultaneously measure multiple genetic variants in a single tumor sample in clinical trial settings. This will enable us to perform genome studies at a pace unheard of a few years ago, and could lead to the development of several diagnostics, thus strengthening our position as a global leader in precision medicine in oncology. In addition, we and our partner Sysmex Inostics GmbH announced that the first liquid biopsy RAS biomarker testing center opened in the Vall d'Hebron Institute of Oncology in Spain. The liquid biopsy method, also known as blood-based biomarker testing, is a simplified and rapid approach for determining the RAS (KRAS and NRAS) mutation status of tumors, as it requires a single blood draw, rather than a tissue biopsy or surgical procedure. The liquid biopsy RAS biomarker test is expected to receive its European Conformity approval (CE mark) in the coming months.

In November, our company announced that it had entered into a three-year collaboration to validate new therapeutic concepts in the field of oncology with Selvita, headquartered in Krakow, Poland. The aim of the collaboration is to deliver potential first-in-class small molecules as lead candidate drugs for multiple oncology indications. This collaboration will steer a joint portfolio of discovery projects in a risk/reward sharing model and builds on the framework that the two companies have developed during a two-year partnership in cancer metabolism, which began in 2013. Under the terms of the new agreement, we will have an exclusive license to the joint intellectual property and Selvita will receive milestone payments and royalties upon successful development and commercialization of products by our company.

Early in 2015 and following a review of all the data from our clinical studies, we decided to discontinue the development program for abituzumab (formerly known as DI17E6) in the area of oncology. A Phase Ib trial in solid tumors, in collaboration with Sanofi U.S., investigating pimasertib in combination with Sanofi U.S.'s hDM2 antagonist (SAR 405838) was concluded and the development will not be further pursued. Furthermore, after reviewing the competitive environment, we decided to return our rights outside China to the PARP inhibitor BeiGene-290 to BeiGene.

Our Biopharma business provides annual grants for outstanding extramural research in certain fields in oncology. This year's Grants for Oncology Innovation were awarded to three groups (two from Spain and one from Italy) at a ceremony coinciding with the 2015 European Cancer Congress (ECC) in Vienna, Austria.

Immuno-Oncology

At the 2015 American Society of Clinical Oncology (ASCO) Annual Meeting, multiple presentations were made on the preliminary safety and efficacy of avelumab (formerly known as MSB0010718C), an investigational fully human anti-PD-L1 IgG1 monoclonal antibody that potentially uses the body's own immune system to fight cancer. It included an oral presentation on ovarian cancer and posters on gastric cancer, non-small cell lung cancer (NSCLC) and several other studies in a range of patient populations. The NSCLC data were from the international open-label Phase I trial with multiple ascending doses that is investigating the safety, tolerability, pharmacokinetics, as well as biological and clinical activity in patients with metastatic or locally advanced solid tumors. In this analysis, the safety and clinical activity in 184 patients with stage IIIb/IV NSCLC who had progressed after receiving at least one platinum-containing doublet were assessed. Objective response was observed in 25 (13.6%) patients, including one complete response and 24 partial responses; 19 responses were ongoing at the time of the analysis, including in two patients who continued to respond off-treatment.

An oral presentation at ASCO 2015 showed data from the Phase I study for a cohort of patients with recurrent or refractory ovarian cancer, unselected for PD-L1 expression, with a median of four prior lines of treatment not including adjuvant treatment. Of the 75 enrolled patients, eight showed a partial response and 33 patients had stable disease, translating into

a disease control rate (DCR) of 54.7%. The objective response rate was 10.7%. Further patients with ovarian cancer have been enrolled in the ongoing Phase Ib study and Phase III studies in platinum-resistant or platinum-refractory and platinum-sensitive ovarian cancer are planned.

Clinical data of avelumab from a Phase I study in Japanese patients with advanced gastric cancer were also presented at ASCO. Of the 20 patients treated who had received multiple prior therapies, partial responses were observed in three patients. Enrollment of patients into the Japanese study has continued and further studies in patients with advanced gastric cancer are planned. Six abstracts were presented at the annual European Cancer Congress (ECC) held in Vienna in September. New data were presented in urothelial (e.g. bladder), mesothelial (e.g. pleura) and gastric/gastroesophageal cancers. Additional NSCLC and ovarian cancer data from Phase Ib trials were also presented.

Avelumab is currently being evaluated in a Phase II study in metastatic Merkel cell carcinoma (MCC) known as JAVELIN Merkel 200. MCC is a rare and aggressive form of skin cancer for which there is currently no specific therapy approved. The Phase II study is assessing the safety and efficacy of avelumab in patients with metastatic MCC who have progressed after at least one prior chemotherapy regimen. The primary endpoint is objective response rate, and secondary endpoints include duration of response, progression-free survival, overall survival and safety. A total of 88 patients were enrolled in this study by the third quarter of 2015 at sites across Asia-Pacific, Australia, Europe and North America. It is the largest clinical trial ever performed in this patient population. In the United States, the FDA granted avelumab Orphan Drug Designation in MCC in September, followed by Fast Track Designation and Breakthrough Therapy Designation in the fourth quarter of 2015. In December, the European Commission also granted avelumab Orphan Drug Status in metastatic MCC in the European Union following a positive opinion from the European Medicines Agency (EMA)'s Committee for Orphan Medicinal Products.

Our company and Pfizer initiated two international Phase III studies of avelumab in the treatment of NSCLC. The first study, JAVELIN Lung 200, was initiated in April, and aims to enroll approximately 650 patients. It will evaluate avelumab in patients whose disease has progressed after receiving a platinum-containing doublet chemotherapy compared with docetaxel. The primary endpoint of this study is overall survival (OS) in patients with programmed death-ligand 1 positive (PD-L1+) NSCLC. The second study, JAVELIN Lung 100, is designed to assess the safety and efficacy of avelumab, compared with platinum-based doublet chemotherapy in patients with late-stage NSCLC who have not previously received any treatment for their systemic lung cancer. This Phase III study is an open-label, multicenter, randomized clinical trial, in which patients with recurrent or stage IV PD-L1+ NSCLC will receive either avelumab or the investigator's choice of first-line platinum-based chemotherapy, depending on the patient's histology (either squamous or non-squamous). The study expects to enroll approximately 420 patients at more than 240 sites around the world. The primary endpoint of the study is progression-free survival in patients with PD-L1+ tumors. Secondary endpoints include progression-free survival in patients with strongly PD-L1 positive (PD-L1++) tumors, overall survival, objective response rate, quality of life, tolerability and safety in patients treated with avelumab versus investigator-choice chemotherapy.

In December, our company and Pfizer announced the initiation of four additional Phase III studies investigating avelumab in further indications. JAVELIN Gastric 100 is designed to evaluate superiority of avelumab as a maintenance treatment for advanced or metastatic gastric/gastro-esophageal junction cancers versus continuation of first-line platinum-based chemotherapy. This randomized, open-label study aims to enroll around 650 patients at more than 220 sites across the globe. The study JAVELIN Gastric 300 will evaluate avelumab as a third-line treatment in advanced or metastatic gastric/gastro-esophageal junction cancers, in approximately 330 patients at about 170 sites worldwide. JAVELIN Ovarian 200 will investigate avelumab as a treatment for platinum-resistant/refractory ovarian cancer. Study investigators intend to enroll approximately 550 patients across more than 190 sites. In addition, avelumab will be evaluated as a maintenance treatment, in the first-line setting, for patients with urothelial cancer in the JAVELIN Bladder 100 trial. This study is expected to enroll around 670 patients across more than 200 sites in 38 countries. The primary endpoint for all these studies is overall survival.

We started a Phase I trial with a novel investigational agent known as M7824. This is an open-label, multiple-ascending dose study, aiming to enroll 106 patients. This potential first-in-class bifunctional immunotherapy is designed to simultaneously block two immuno-inhibitory pathways that are commonly used by cancer cells to evade the immune system, thereby potentially controlling tumor growth by restoring and enhancing anti-tumor immune responses.

To enhance our R&D technology portfolio in immuno-oncology we entered into an exclusive strategic collaboration and license agreement with Intrexon Corporation to develop and commercialize Chimeric Antigen Receptor T-cell (CAR-T) cancer therapies. CAR-T cells are genetically engineered T-cells with synthetic receptors that recognize a specific antigen expressed on tumor cells. When CAR-T cells bind to a target, an immunological attack against the cancer cells is

triggered. Utilizing Intrexon's cell engineering techniques and RheoSwitch® platform, the collaboration aims to develop leading-edge products that empower the immune system to overcome the current challenges of CAR-T therapy. The collaboration will thus focus on developing a next-generation CAR-T platform to generate drug candidates.

Neurology/Immunology

In the field of multiple sclerosis we announced in September that we intend to submit data on our investigational treatment, cladribine tablets, for the treatment of relapsing-remitting multiple sclerosis (RRMS) to the European Medicines Agency (EMA). The decision follows our evaluation of new data and additional analyses which allow a better characterization of the compound's benefit-risk profile. Submission plans for other parts of the world are also being developed. We had wound down our clinical development program for cladribine tablets in 2011 after some regulatory authorities expressed concerns over the insufficient characterization of the drug's benefit-risk profile. Nevertheless, several large clinical trials were allowed to continue and additional safety information was also collected in a long-term registry.

At the European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS) meeting held in Barcelona in early October, eight abstracts were presented on Rebif®, our high-dose, high-frequency interferon beta-1a for relapsing forms of multiple sclerosis (MS). Data presented included post-hoc assessments of controlled studies in relapsing MS of predictive scores for disease activity and disability progression, as well as a cost-effectiveness analysis of Rebif® vs. Avonex® (interferon beta-1a) based on the "no evidence of disease activity" (NEDA) measure. These new data should help healthcare professionals and patients to make informed treatment decisions and to better understand the impact of Rebif® in patients with relapsing forms of MS.

The annual Grants for Multiple Sclerosis Innovation (GMSI) are awarded by our company for outstanding extramural research projects in certain fields of MS from all over the world. In 2015 the awards were made on the occasion of the 31st congress of the European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS) to four research groups from Finland, Italy, the Netherlands, and the United Kingdom.

In 2015, the "Journal of Neurology, Neurosurgery and Psychiatry" (JNNP) published 15-year follow-up data for Rebif® from the PRISMS (Prevention of Relapses and Disability by Interferon beta-1a Subcutaneously in Multiple Sclerosis) trial. The published data analyzed the relationship, over a 15-year period, between cumulative exposure to Rebif® treatment and other possible prognostic factors with long-term clinical outcomes in relapsing-remitting multiple sclerosis. In these post hoc exploratory analyses, higher-dose exposure to IFN β-1a and longer time on treatment were associated with better long-term outcomes over many years in patients with RRMS.

Patient enrollment was completed for the Phase IIa study of M2736 (also known as ATX-MS-1467), an investigational immune-tolerizing agent. This is an open-label, one-arm, proof-of-principle trial to evaluate the safety of M2736 and its effect on immune tolerance in subjects with relapsing multiple sclerosis which involves frequent neuroimaging using magnetic resonance imaging. The outcome of the study is expected in 2016.

In the field of immunology, our soluble fusion protein atacicept met an important milestone in fully completing patient enrollment into the ADDRESS II study, a Phase IIb clinical trial in patients with systemic lupus erythematosus (SLE). The target of 279 SLE patients was met ahead of schedule, and key results from the study are expected in 2016. Clinical Phase I testing of our BTK inhibitor (M2951) in patients with SLE began in the fourth quarter of 2015.

Fertility

Ovidrel® (recombinant-hCG), used to trigger follicle maturation and ovulation, was assessed in a Phase III trial in ovulation induction (OI) in Japan to bridge to the existing ovulation induction and advanced reproductive treatment (ART) data from global pivotal trials. We are currently preparing a regulatory submission in Japan based on the positive outcome of this trial.

The Biopharma business announced its support of the Grant for Fertility Innovation (GFI) fund with grants totaling up to € 1.2 million for the years 2015/2016. The announcement was made during the 31st annual meeting of the European Society of Human Reproductive and Embryology (ESHRE) which took place in Lisbon, Portugal. Launched in 2009, the GFI is dedicated to transforming innovative translational fertility research projects into concrete health solutions to improve the outcomes of assisted reproductive technologies (ART). In the last six years, approximately 750 applications to GFI were received from over 50 countries around the world.

Endocrinology

In July 2015, the European Commission (EC) authorized an update to the European marketing authorization for Kuvan® (sapropterin dihydrochloride), to allow its use in children with phenylketonuria (PKU) below four years of age who have been shown to be responsive to such treatment. This EC decision was based on a review of data from a Phase IIIb clinical study known as SPARK. On October 1, we announced that we had reached an agreement with BioMarin Pharmaceutical Inc., San Rafael, California, USA, to return the rights to Kuvan to allow us to focus on core areas within our Healthcare business sector. We also agreed to return our option to develop and commercialize Peg-Pal, an investigational drug that is also designed for the treatment of PKU.

The annual Grant for Growth Innovation (GGI) is awarded by Biopharma for outstanding extramural research projects in the field of growth disorders. In 2015 the GGI was awarded to two research groups from the United Kingdom and the United States at a ceremony which coincided with the 54th European Society for Paediatric Endocrinology (ESPE) conference in Barcelona, Spain.

General Medicine

We announced on November 3, 2015, that the United Kingdom regulatory authority had approved an updated labeling for Glucophage® XR (extended release metformin) for the treatment of patients with type 2 diabetes. The label change removes from the list of contraindications moderate renal impairment stage 3a in the absence of other conditions that may increase the risk of lactic acidosis and chronic heart failure. This means that in patients with stable chronic heart failure Glucophage® XR may now also be used with a regular monitoring of cardiac and renal function. Earlier in the year, the French regulatory authority had already approved an update of the labeling for Glucophage® IR (immediate release metformin), removing the same contraindications. The label changes apply to all countries in the European Union. The decisions were based on analyses of our extensive efficacy and safety data collected over many years as well as new clinical studies available for Glucophage®.

Recently we received approval of metformin for the treatment of prediabetes in Hungary. This approval follows that in a number of other countries including Mexico, Poland, the Philippines, and Turkey where Glucophage® can already be prescribed for patients with prediabetes.

Neglected diseases

Our company promotes a Group-wide Access to Health initiative to address key unmet medical needs of neglected tropical diseases especially in children from developing countries. This includes an R&D platform with a focus on tropical and priority communicable diseases. In this connection, we obtained the rights to the investigational antimalarial compound known as DDD107498, from Medicines for Malaria Venture (MMV). The objective of the future clinical program is to demonstrate whether this investigational compound exerts activity on a number of malaria parasite life-cycle stages, and remains active in the body long enough to offer potential as a single-dose treatment against the most severe strains of malaria.

BIOPHARMA PIPELINE

as of December 31, 2015

Therapeutic area Compound	Indication	Status
Neurodegenerative diseases		
Cladribine tablets (lymphocyte-targeting agent)	Relapsing-remitting multiple sclerosis	Registration[1]
M2736 (immune-tolerizing agent)	Relapsing-remitting multiple sclerosis	Phase II
Oncology		
Tepotinib (c-Met kinase inhibitor)	Non-small cell lung cancer	Phase II
Tepotinib (c-Met kinase inhibitor)	Hepatocellular cancer	Phase II
Tepotinib (c-Met kinase inhibitor)	Solid tumors	Phase I
BeiGene-283 (BRAF inhibitor)	Solid tumors	Phase I
M2698 (p70S6K and Akt inhibitor)	Solid tumors	Phase I
M3814 (DNA-PK inhibitor)	Solid tumors	Phase I
Immuno-Oncology		
Avelumab (anti-PD-L1 mAb)	Non-small cell lung cancer, 1st line	Phase III
Avelumab (anti-PD-L1 mAb)	Non-small cell lung cancer, 2nd line	Phase III
Avelumab (anti-PD-L1 mAb)	Gastric/gastro-esophageal junction cancer, 1st line	Phase III
Avelumab (anti-PD-L1 mAb)	Gastric/gastro-esophageal junction cancer, 3rd line	Phase III
Avelumab (anti-PD-L1 mAb)	Ovarian cancer platinum resistant/ refractory	Phase III
Avelumab (anti-PD-L1 mAb)	Bladder cancer, 1st line	Phase III
Avelumab (anti-PD-L1 mAb)	Merkel cell skin carcinoma	Phase II
Avelumab (anti-PD-L1 mAb)	Solid tumors	Phase I
M9241 (NHS-IL12, cancer immunotherapy)	Solid tumors	Phase I[2]
M7824 (bifunctional immunotherapy)	Solid tumors	Phase I
Immunology		
Atacicept (anti-BLys/anti-APRIL fusion protein)	Systemic lupus erythematosus	Phase II
Sprifermin (fibroblast growth factor 18)	Osteoarthritis	Phase II
M1095 (anti-IL-17A/F nanobody)	Psoriasis	Phase I
M2951 (BTK inhibitor)	Systemic lupus erythematosus	Phase I

[1] As announced on September 11, 2015 Merck KGaA, Darmstadt, Germany, is preparing a regulatory submission to the European Medicines Agency.
[2] Sponsored by the National Cancer Institute (USA).
More information on the ongoing clinical trials can be found at www.clinicaltrials.gov

Akt Protein kinase B
APRIL Proliferation-inducing ligand
BLyS B-lymphocyte stimulator
BTK Bruton's Tyrosine Kinase
IL Interleukin
mAb Monoclonal antibody
PD-L1 Programmed cell death ligand 1
PK Protein kinase

Consumer Health

The Consumer Health business develops and sells over-the-counter medicines and food supplements in Europe, in particular in France, Germany and the United Kingdom, and in growth markets in Latin America, the Middle East and Africa, and Southeast Asia. The focus of our research and development activities is on the continuous improvement of existing formulations as well as on the development of new products and line extensions. We are following a consumer-centric innovation approach based on intensive market research across all our key markets. Since 2014, we have been establishing cooperation agreements with independent third-party research facilities to leverage their specific capabilities and expertise for the development of new products that meet the specific needs of our consumers.

Biosimilars

In 2015, our company proceeded successfully with the clinical development of biosimilars. One Phase I study was finalized and the biosimilar was moved to Phase III in the first quarter of 2016. Further biologics were added to the pipeline to secure an attractive biosimilars portfolio and a sustainable biosimilars business for us.

Allergopharma

Allergopharma, our allergy business, is one of the leading manufacturers of diagnostics and prescription drugs for allergen immunotherapy. With its own research department and in cooperation with research institutes and other partners, we are helping develop a better understanding of the immunological mechanism that underlies the development of allergies and are actively working on the next generation of drugs for allergen immunotherapy.

Life Science

Innovation is core to value delivery to our customers. Our Life Science business sector has more than 650 employees working in various R&D functions around the world. These employees cooperate closely with our customers to address their needs and pain points. Our ultimate objective is to solve the toughest problems in life science by translating ideas into product innovations. Once again, we invested significantly in R&D in 2015.

The year 2015 was marked by successful innovations. Our innovation activities are diverse and can be assigned to four categories. We want to:

- Improve and expand our portfolio
- Invest in new and disruptive technologies for the long term
- Partner with our customers and
- Drive dialogues on unmet needs in the scientific community and solve the relevant problems

Portfolio expansion

We made important product launches to expand our portfolio across all segments in 2015. In Biomonitoring, we made three additions to our MAS-100® product family of air samplers, expanding our Biomonitoring portfolio to food and beverage customers. The family of products, developed for use in isolators, allows sampling at critical control points. The compact and easy-to-handle design makes these products well-suited for use in controlled environments.

In RNA detection, we introduced a number of important new products. For example, our Magna ChIRP™ RNA Interactome Kits allow researchers to more easily identify, recover and analyze regions of chromatin. The kits provide reliable detection and discovery of RNA-associated genomic DNA sequences, RNA sequences and proteins.

In Process Solutions, we expanded our Provantage® Biodevelopment Services to include a Clone Generation Service. With this addition, we provide a full range of services to optimize yield, productivity, consistency and efficiency of clinical-trial drug products. Our services help accelerate time-to-clinic by delivering high-quality, high-expressing cell lines. Our flexible production platform offers a choice of cell lines and the fully documented clones meet traceability requirements for clinical production, IND submission and commercial manufacturing.

With the launch of our new Mobius® 2000 liter single-use bioreactor, we influence key standards such as microbiological film selection and single-use technologies, in both upstream and downstream production and we can provide a scalable solution to customers looking to perform single-use in upstream processing. This new bioreactor enables us to help customers in the biosimilars market implement manufacturing strategies in a short time frame to increase speed to market.

New and disruptive technologies

Our innovation efforts also focus on new technologies that have long-term impact. We received a United States patent for developing a selective membrane layering method that significantly improves the consistency of virus filtration performance. The method is used to manufacture our Viresolve® Pro device, a virus filtration technology that offers highly productive parvovirus clearance for monoclonal antibodies and therapeutic proteins. As a result of selective layering, the Viresolve® Pro device provides an industry-leading performance consistency superior to other virus filtration devices on the market.

To solidify our leadership in tangential flow filtration (TFF), we introduced single-pass TFF with Pellicon® cassettes, an enhanced application of our existing technology that allows concentration of process streams without the recirculation required in traditional TFF. This alternative application eliminates typical process constraints caused by higher volumes or concentration factors, resulting in increased capacity. It also enables continuous processing by coupling the TFF step in line with other process steps.

To further accelerate growth in cell analysis, we introduced the new Cellvento™ CHO platform of cell culture media and companion feed formulations for batch, fed-batch and perfusion applications. The chemically defined, non-animal-origin media deliver superior cell growth and productivity for various CHO cell types used in biopharmaceutical development and manufacturing. The range of products gives customers the flexibility to choose the most suitable product to achieve the best possible performance results for their specific cell line.

We also introduced a new technology that compacts dry powder cell culture media into granules and therefore improves solubility, facilitating the handling of cell culture media used in biopharmaceutical production. The compacted media are more convenient to use, allowing biopharmaceutical manufacturers to further optimize their upstream processes.

Partnerships

In February, we entered into a partnership agreement to provide upstream process development services for Precision Biologics, Inc., a Texas-based clinical-stage biotechnology company, to advance a preclinical monoclonal antibody. The antibody, NEO-201, binds to a tumor-specific antigen found in several forms of cancer, offering therapeutic potential across multiple cancer types, including colorectal, lung, ovarian and pancreatic – an especially deadly cancer with limited treatment options.

In May, we entered into an agreement with Singulex, Inc., a developer and leading provider of Single Molecule Counting technology for clinical diagnostics and scientific discovery, to manage its life science research business. We now have exclusive rights to further develop and commercialize the technology for research applications worldwide.

Driving scientific dialogues

In the field of filtration, we established a new Scientific Advisory Board, which held its inaugural meeting in 2015. The goal is to solve the most challenging problems in filtration in collaboration with our customers by bringing together application and technology experts. Board members include some of the most knowledgeable external filtration experts and renowned scientists as well as colleagues of our Life Science business. As a leader in filtration, we are committed to continuously exploring new and disruptive innovations in the field. The Advisory Board is focused on identifying and addressing the most critical unmet needs in the area of filtration.

In the third quarter, the scientific journal "Methods of Molecular Biology" published two chapters on the use of our Immobilon PVDF (polyvinylidene fluoride) membranes for protein analysis, authored by our experts. We were featured due to our significant presence in and contribution to Western Blotting, which is the most commonly used analytical technique in cell and molecular biology.

We also published an original white paper recognizing the emerging biotech community's impact on the future of healthcare. This paper followed the Emerging Biotech Summit held in June in Philadelphia, Pennsylvania, hosted by our Life Science and Healthcare business sectors and attended by 40 biotech leaders from across the United States. There we established an open dialogue within the biotech community and gained insight from executives on the topics of advancing products faster through clinical development and bringing life-saving drugs to market.

We received several major industry awards for our product innovations in 2015:

We received a Stevie Award for our AFS® Lab Water systems at the 2015 American Business Awards ceremony in San Francisco, California in September. The new Large AFS-E system was a finalist in the "Best Product – Health & Pharmaceuticals" category. Today's diagnostic labs need multiple compact water systems to feed a single analyzer or a few smaller ones. Our AFS-E systems meet this need.

"R&D Magazine" presented us with two R&D 100 Awards in November. These awards are viewed as the "Oscars of Innovation" and recognize technologies in a wide variety of industries, including telecommunications, high-energy physics, software, manufacturing, and biotechnology. We won in the "Process/Prototyping" category for our AFS® water systems and in the "Analytical/Test" category for our Simplicon™ RNA Reprogramming Technology. This technology makes it possible to generate virus-free, human-induced stem cells safely and efficiently using a single transfection step, giving researchers an effective reprogramming method when studying diseases.

Performance Materials

We are the undisputed market and technology leader in liquid crystals (LC), which are primarily used in televisions and mobile communication applications. We are also one of the leading suppliers of decorative and functional effect pigments. Our high-tech materials and solutions are used by customers in the consumer electronics, lighting, coatings, printing technology, plastics applications, and cosmetics industries.

Display Materials

The latest generation of smartphones and tablets with their brilliant touchscreens would be unimaginable without the most recent advances in liquid crystal display technology. For these mobile devices we developed UB-FFS technology (ultra-brightness fringe field switching) with a new switching mode. This has the potential to increase display light transmittance by up to 15%. The new technology offers many advantages: Firstly, it consumes less energy and increases the battery life of mobile devices. Secondly, it improves mobile display quality and supports the trend towards higher resolutions. The market launch of UB-FFS is progressing very successfully; the new switching mode is already used in many smartphones and tablets. In April 2015, we received the German Innovation Award for this breakthrough technology. And in June, we received the 2015 Display Component of the Year Award in Gold for UB-FFS at the Society for Information Display conference in San José, California.

With our LC 2021 strategic initiative, we are combining our future activities in liquid crystals. Firstly, our focus is on the further development of conventional display technology. We want to contribute to the realization of more robust, more flexible displays and the utilization of holographic 3D technology. Secondly, we are focusing on applications beyond displays. These include new light management systems and smart antennas for better satellite communication. Liquid crystal windows (LCWs) are another field of our work. They can regulate both the light and heat transmittance of windows in building façades. We are further investing in the development of materials for such applications. Pilot production of the first smart windows is in full swing. The first LCW panels were already used in the construction of our new Innovation Center in Darmstadt. Collaborations with partners in the glass and façade technology sector are planned for broad-based marketing of the windows.

The future and potential of display technology have been the topic of our annual Displaying Futures symposium for several years now. This year's symposium took place in San Francisco, where renowned futurologists convened with more than 100 of our customers and business associates.

In China, Japan, Korea, and Taiwan – four core markets for Performance Materials – around 700 customers attended workshops we held in autumn 2015 under the motto "Creating the perfect pixel – through partnership". Most of the participants were researchers and engineers from various display panel manufacturers. The aim of these very successful events is to present our core competencies, discuss visions with our customers, demonstrate our technology leadership, and strengthen customer proximity.

High-quality pigments and functional materials

The Meoxal® brand is the latest development in effect pigments. These pigments captivate with their brilliant color saturation and exceptional performance. This is achieved by an innovative layer technology and the use of aluminum flakes as the substrate. The products are suitable for a multitude of high-performance applications, especially for automotive and plastic coatings.

With Xirallic® NXT, we are introducing a new patented product generation of the well-known high-tech effect pigments. These offer customers an exceptional "living-sparkle effect", high styling potential and consistent quality. The first product of the new generation – Xirallic® NXT Panthera Silver – is a dark-gray, metallic effect pigment.

Besides high-quality effect pigments, we also produce functional materials for technical applications as well as fillers and active ingredients for cosmetics. The new cosmetic active ingredient RonaCare® SereneShield was presented in time for the important in-cosmetics exhibition in Barcelona in 2015. The active ingredient is intended to help the skin at any age to reduce susceptibility to acne.

In technical applications, we developed additives for the laser marking of plastics and conductive coatings. These additives are also used in heat-reflective glazing for greenhouses. In high-voltage technology, we are also working on functional materials, with which we want to tap into new markets in the area of energy management. Within the scope of the research project iShield, which in view of its future potential is also government-funded, we have been collaborating since autumn 2015 with academic and industrial partners to develop novel materials to shield generators and engines.

Integrated Circuit Materials

In the Integrated Circuit Materials business unit, which supplies products for integrated circuit manufacture, we have developed a range of products for Extreme UV Lithography (EUV) applications that have already been qualified by several customers in the semiconductor industry for their processes. The shrink technology makes it possible to reduce lithographically generated structures after patterning, thus circumventing resolution limitations of existing exposure equipment in a cost-effective manner. New products are on the verge of production implementation. We are a leader in Directed Self Assembly (DSA), a revolutionary technology that is crucial to all advanced semiconductor manufacturers. In DSA, the information for the smallest structures is already contained in the chemical makeup of the coating material. We are collaborating with our customers to introduce DSA as a standard integrated circuit (IC) manufacturing method in the coming years. Additionally, we are intensively engaged in developing thick perhydropolysilazane products for 3D chip technology as well as novel insulator materials.

The further development of flat panel display technology towards larger formats and higher operating frequencies requires the use of transistors with feature sizes that are at the limit of the resolution capability of the exposure tools. We have successfully transferred from the IC sector so-called tandem resin technology with a specific molecular weight distribution, thus achieving a photoresist resolution near the theoretical resolution limit. In silicon technology, new siloxane materials are in an advanced stage of qualification as planarization materials for high-resolution displays and as a thin film barrier for organic light-emitting diode (OLED) lighting.

Ormet, a company that we acquired in September, has developed conductive pastes based on a unique environmental friendly technology which can solve technical challenges in semiconductor packaging. This is particularly interesting due to the growing demand for highly integrated devices such as mobile phones or wearables.

Advanced Technologies

An outstanding example of our activities in the Advanced Technologies business unit are OLEDs, which are used in new lighting techniques and display technologies. OLEDs provide brilliant colors and sharp images from any viewing angle; they have a long lifespan and are highly energy-efficient. In addition, OLEDs enable round or flexible displays, making them perfect for use in the latest technical applications. One such example is the smart watch, a wristwatch that provides Internet access along with additional computer functionality.

The name of our product line for these types of applications is livilux®. We have developed a strong portfolio of worldwide patents, based on more than ten years of experience. Development partnerships with customers are a way of testing new technologies and making them market-ready. For instance, together with printer manufacturer Seiko Epson, we have established a technology that can be used to print OLED displays. While we contributed our expertise in OLED material and ink development to the collaboration, Seiko Epson provided its know-how in print heads featuring Micro Piezo inkjet technology as well as process expertise. The jointly developed technology offers the advantage of lower costs and higher material efficiency. In contrast to evaporated OLED displays, the materials are applied at room temperature under normal pressure in the case of printed OLED displays. In addition, this technique only deposits material in the areas where diodes are actually located, thereby helping to conserve resources.

With the acquisition of Qlight Nanotech, we want to further expand our leading position and deepen our expertise in the research and development of display materials. Operating as a research hub in Jerusalem, Qlight develops materials and applications based on semiconducting nanocrystals. It has a leading technology team with significant experience and innovations in nanoscience and nanotechnology used in lighting applications and for displays and screens, among other things.

People

Our employees are crucial to our success. Therefore, it is particularly important to recruit the right talent with the right capabilities at the right time to our company, as well as to develop and retain them.

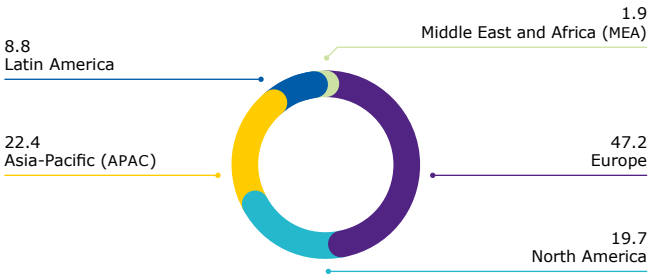
Overview of our headcount figures

As of December 31, 2015, we had 49,613 employees worldwide (2014: 39,639). The increase in the headcount is due primarily to the integration of Sigma-Aldrich. In 2015, we were represented by a total of 211 legal entities with employees in 66 countries.

BREAKDOWN OF EMPLOYEES

by region (Group incl. Sigma-Aldrich)

in %



Sigma-Aldrich became part of our company on November 18, 2015. As we are currently in the integration process, the remaining text in this section refers exclusively to our company, without Sigma-Aldrich. The Sigma-Aldrich figures that are already available can be found in the table at the end of this section.

As part of our Group strategy we place particular emphasis on talent development, performance management and compensation. In addition, we want to foster employee diversity in order to be optimally prepared for future global challenges. In order to support the Group strategy by providing suitable programs and initiatives, we have defined three focus areas:

- Enabling business growth and transformation
- Enhancing leadership, talent and performance management
- Building and fostering the corporate culture

The developments and the objectives achieved in these areas are presented in the following.

Enabling business growth and transformation

In a continuously changing world, qualified employees capable of innovative thinking are of tremendous importance to the success of any company. Therefore, the aim of our human resources strategy is to develop employees of all age groups and to prepare them for new challenges.

Innovation is shaping our future

Innovation plays a particularly important role at Merck KGaA, Darmstadt, Germany. In order to further enhance the preconditions for innovation, in 2015 we opened the modular Innovation Center in Darmstadt. This gives employees the possibility to focus on their ideas and work on projects in an environment that stimulates creativity. After all, innovation calls for innovative employees and scope for creativity. The Innovator Academy, which offers our employees various training courses, for instance on design thinking, creativity techniques and the business model canvass, is an important element of the Innovation Center. Internal project teams, start-ups and the Accelerator program as well as further interested colleagues from various areas throughout our company make extensive use of this offer.

Long-term success through employee development

The basic and advanced training of our employees remains a special area of focus. In 2015, we maintained a consistently high vocational training rate in Darmstadt, our largest site. More than 500 young people were enrolled in vocational training programs here in a total of 23 different occupations in 2015. Upon the successful completion of their training, we offer unlimited employment contracts to all apprentices working in occupations for which we have sustainable demand. On average, the post-apprenticeship hiring rate – taking voluntary terminations into account – was more than 90% over the past five years. We also continue to offer vocational training to a large number of young people at other sites.

"Start in die Ausbildung", a German program to prepare young people for an apprenticeship, was continued with 20 interns, the same number as in 2014. The program is for young people between the ages of 16 and 25 who have completed secondary school without having successfully found an apprenticeship for at least one year after completing school. We promote the professional expertise of our apprentices through numerous regional and global project activities. These include supporting a center for homeless children in Kenya. We were recognized for this and other activities to promote the social skills of apprentices. At the 2015 Hermann Schmidt Award ceremony, we received a special prize for innovative vocational training from the German Federal Institute for Vocational Training.

Our global advanced training program ensures that all of our employees and executives around the world develop the skills that they and we need to implement our company strategy and to remain successful in the future. For instance, we offer them a range of globally aligned classroom training courses on 17 selected subjects. In 2015, more than 4,000 employees participated in these programs. Moreover, we make various e-learning and language courses as well as book summaries and development tools available to our employees. In addition, local, business, and function-related offers exist to ensure the continuous further development of our employees. Our Team Performance workshop supports the participants in improving their effectiveness and cooperation.

We also offer our top talent and senior executives a range of advanced training programs. One of the aims of the seven-month International Management Program is to promote global thinking among young talent and to strengthen their leadership competencies. Additionally, in cooperation with top international universities, our Company University has been offering a multi-regional, modular one-year program since 1999. To date, 345 members of top management have taken part in this program. Furthermore, our company cooperates globally with universities in order to support employees who wish to study for an Executive MBA, for instance. In 2015, we launched the Growth Markets Management program in India and Latin America for local executives. This program, which encompasses business and company-specific topics, is also offered in China and Turkey. The programs had participants from a variety of countries and regions such as Africa, the Middle East, Japan, and Russia. Globally, a total of 98 managers took part in these programs in 2015. Moreover, in 2015 the Managerial Foundation Program was conducted in 15 countries with 507 participants and the Advanced Management Program was attended by 110 participants in four countries.

Through our investments in leadership quality, talent development and advanced training, we strengthened the loyalty of employees in countries with relatively high turnover rates such as China and India.

Enhancing leadership, talent and performance management

Furthering the performance culture at our company is another focal point of our human resources work. In this context, differentiated compensation and advanced training opportunities are important incentives. In order to establish this type of culture, we consider it particularly important for managers to set an example through their attitude and behavior. Selecting and positioning the right employees, both internally and externally, are crucial here.

Enhancing and developing a common understanding of leadership

Our managers are expected to drive our innovative business model. They achieve this by recognizing and making use of the opportunities offered by the diverse cultures and experiences of employees. At the same time, executives are to set an example, for instance by living the company values and nurturing a feedback culture. As part of an evaluation of our leadership and business model, not only were roles adapted, but leadership was also singled out as a central topic. Therefore, in October 2015, a new strategic competency model was introduced to further develop and support our business strategy and thus the related leadership culture. The strategic competencies according to which managers and employees are to behave are purposeful, future-oriented, innovative, results-driven, collaborative, and empowering. We will use the new model to build and expand these central competencies in line with our future strategic direction.

Promoting talent within the company, attracting talent from outside

Within the framework of the "Fit for 2018" program, we launched the capability initiative "ONE Talent Development, Rewards and Performance Management" as part of our Group strategy. The aim is to attract highly qualified graduates from around the world to our company and to retain them.

We consider it important to identify employee potential early on and foster it on an individual basis. We want to offer our employees interesting career opportunities, continuous personal and professional development as well as prospects within the company. We are therefore continuously working to strengthen the performance and development culture within the company. Our processes are intended to support this and to ensure that internal positions are filled in an even more efficient manner. In order to achieve this, talent and performance management processes are globally aligned for all employees in accordance with the same principle and are part of a shared IT system. We systematically combine talent recognition with performance management. Regular, individualized performance evaluations make it easier to identify employees with high potential and to develop them accordingly. Clear objectives, differentiated and open feedback and individual development plans are important prerequisites for personal development, as well as for the success of the company.

In 2015, we further expanded our workforce pool to internally fill management positions when they become vacant. The vast majority of management position vacancies were also filled by internal candidates in 2015. In addition, we recruited external executives in order to add new perspectives to our long-standing in-house expertise.

We are using the motto “Make great things happen” to position itself in the global job market, which conveys to potential applicants a sense of what makes our company unique: an inspiring, motivating work environment in which innovations thrive; an environment in which everyone has the opportunity to apply their ideas and engagement to benefit customers and the company, while at the same time developing themselves as employees. Further increasing our attractiveness as an employer was an important reason for the repositioning of the corporate brand in 2015. In late 2015, we started an analysis of the impact of the new corporate brand on employer branding. It is essential to harmonize employer branding and messages with the new brand in order to position ourselves as an attractive and authentic employer.

In recruitment, we focus our efforts on successfully attracting talent while paying attention to costs. For this, a globally uniform and binding process was introduced. This starts with a search in the internal talent pool and an internal job posting before external channels such as job portals and recruitment agencies are utilized. On the one hand, the process offers employees better development opportunities, and on the other hand it minimizes the costs incurred during external recruitment.

In order to support executives in making hiring decisions and to establish uniform quality standards, we offer interview training courses for employees with personnel responsibility. In the courses, the participants learn proper interview behaviors, professional question techniques and how to incorporate diversity aspects into the hiring decision.

Making performance worthwhile

Competitive and appropriate total compensation is a core element of our attractiveness as an employer as well as motivating and retaining our employees. For this reason, several years ago we implemented global and IT-based processes and programs that help us to implement our philosophy of transparent, consistent and competitive compensation sustainably. Moreover, it is our objective to offer compensation that is both performance- and position-based in both internal and external comparisons. As a family-owned company, total compensation offered by our company focuses not only on monetary salary components but also includes attractive non-monetary fringe benefits. Since 2015, it has been possible for individual performance to have a stronger impact on the variable bonus. In this way we create greater incentives for employees to achieve top performance, while at the same time allowing them to participate to a greater extent in the success of the company.

Build and foster the corporate culture

An open corporate culture and a diverse workforce contribute substantially to our business success. Therefore, promoting diversity and inclusion as well as making employees more willing to embrace cultural change are special areas of emphasis of our human resources work.

Competitiveness through diversity

To us, diversity means much more than having a certain gender ratio. Therefore, as part of our strategy, we focus on topics such as internationality and demography. Diversity is not only important to us on a managerial level, but also throughout the entire workforce. Together with a culture of inclusion, diversity promotes innovation and improves team performance. One of the strategic goals is to recognize the strengths of such a diverse workforce and to appreciate individual differences. It is important to us to create an integrative work environment in which all employees have the possibility to realize their full potential. With respect to three of our six company values, namely respect, transparency and integrity, multifaceted ideas are furthered and perspectives strengthened in order to drive innovation and to add more value. By signing the Equal Opportunity Charter of the German Mining, Chemical and Energy Industrial Union (IG BCE) in 2015, we underscored our commitment to fairness and tolerance in the workplace.

In addition to the Chief Diversity Officer, who is responsible for strategically managing diversity within the company, we also established the Diversity Council in 2013. Its aim is to build further buy-in for diversity and inclusion within the company. The council consists of high-ranking managers from all parts of the company. In 2015, the Diversity Council worked to introduce our Diversity Framework, which bundles the diversity and inclusion strategies. It focuses on the following four topics: recruiting the right people to work for us, developing and retaining them, promoting efficient collaboration, driving innovations and improvements, and serving customers with diverse needs. In addition, we support specific employee networks in order to foster exchange among like-minded individuals.

In September 2015, we celebrated Global Diversity Days with a campaign entitled "It starts with YOU – Diversity & Inclusion at our company". The objective of this year's initiative was to heighten awareness of diversity and inclusion among our workforce through global events. Globally, employees on five continents took part in one of 27 events.

Our goal is to anchor knowledge about our growth markets within the company. People from a total of 122 different nations work for our company. Only 26% of our employees are German citizens, and 72.2% work outside Germany.

Women currently make up 41.3% of the workforce. Since the ratio of women to men varies widely across the different regions, businesses and functions, we have set ourselves the goal of increasing the percentage of female employees wherever they are underrepresented. Here we take into account the situation that is typical for the industry as well as regional differences.

In Germany as well as several other EU countries, Japan and the United States, we are preparing ourselves for demographic change. Since the average age of our employees in these countries is slightly more than 40, the need for urgent action does not yet exist; however, we assume that this figure will continue to rise in the coming years. While increasing automation and digitalization will certainly help to lower the burden, we are already using various programs to meet the demographic challenges in Germany. For instance, in 2015 we not only developed new shift models, but also successfully introduced preventive health measures for shift workers. Moreover, we are systematically analyzing positions at the Darmstadt site in terms of demographic suitability, and deriving measures from this analysis. The participation in a research project in 2015 focusing on "mindfulness" was a further step to sensitize the workforce to the limits of their own physical and mental resources.

Diversity enriches our management team

We are convinced that balanced diversity among management enhances career advancement opportunities for talented employees while also helping to provide a broad experience base within the company. In addition, it allows for differentiated decision-making, thereby making a significant contribution to the success of the company.

As a global company, we consider it highly important to have an international management team. Currently, 61% of our managers – meaning positions rated Global Grade 14 and above in our Global Grading System – have a nationality other than German. Altogether, 64 different nationalities are represented in such positions.

The percentage of management positions held by women (Global Grade 14 and up) is currently 26.8% Group-wide. Certain Group functions such as IT have a lower percentage of women in management positions. However, the figures are steadily increasing across our company as a whole. We have achieved our strategic goal of raising the percentage of management positions held by women from 25% to 30% and intend to further increase this percentage by the end of 2016. The report on stipulations to promote the proportion of women in management positions at Merck KGaA, Darmstadt, Germany, pursuant to section 76 (4) and section 111 (5) of the German Stock Corporation Act can be found in the Corporate Governance section of this report.

Safety in day-to-day work

As a responsible employer, it is especially important to us to do everything in our power to prevent workplace-related illnesses and accidents. We apply the lost time injury rate (LTIR) as an indicator to determine the success of measures aimed at accident prevention as well as occupational health and safety. This key performance indicator describes the number of workplace accidents resulting in lost time of more than one day per one million working hours. In 2010, we had set ourselves the goal of reducing the lost time injury rate to 2.5 by 2015. Our future target is even more ambitious. By 2020, we intend to sustainably lower the LTIR to 1.5. The aim is to permanently stabilize or outperform this challenging figure, which we achieved for the first time in 2015.

The continuous rate of improvement in recent years can be particularly attributed to the BeSafe! program, which was launched in 2010. This is a global initiative with harmonized standards as well as local modules to meet the specific requirements at individual sites. This program focuses on engaging managers in the safety culture and making safety an intrinsic value, thus empowering our employees to take responsibility for their own safety. In 2015, we continued to sensitize our employees to workplace hazards through numerous activities and awareness campaigns.

Since 2010, we have been presenting the Safety Excellence Award annually in order to underscore the importance of safety. It is granted to all production sites with no workplace accidents on record for the year. In 2015, 41 out of 61 production sites were recognized.

Despite our efforts to prevent accidents, there were two workplace accidents resulting in fatalities in 2015. In the United States, an employee died in a car accident. In Germany, an employee was killed in an accident with a fork lift.

Reconciling the demands of a career and family

We want to help our employees achieve a good balance between their professional and personal objectives. This maintains and strengthens their motivation and performance potential, enabling them to better schedule their lives to suit their own needs.

We offer our employees in Germany and the United States various flexible working models. The Mywork at Merck KGaA, Darmstadt, Germany, working model initially implemented in 2013 at the Darmstadt, Gernsheim and Grafing sites in Germany for all exempt employees aims to strengthen a culture of performance and trust within the company. Employees can choose their working hours and work location freely. Since October 2014, non-exempt employees at these sites whose positions are suitable for this working model have also been able to make use of it. In addition, Mywork at Merck KGaA, Darmstadt, Germany, was also introduced for Merck Accounting Solutions & Services Europe GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, Merck Export GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, Merck Schuchardt OHG,

a subsidiary of Merck KGaA, Darmstadt, Germany, and Merck Selbstmedikation GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany. At the end of 2015, a total of 4,122 employees made use of Mywork at Merck KGaA, Darmstadt, Germany. Globally, 5.1% of our employees worked part-time in 2015. 10.9% of our part-time employees are men.

In addition, we offer our employees throughout Germany targeted and independent information, advice and assistance with regard to finding childcare and nursing care, as well as home and garden services. At various sites, employees benefit from childcare options that we subsidize. A daycare center with capacity for 150 children between the ages of one and twelve has been operating at the Darmstadt site for 48 years. Since 2013, the daycare center has had expanded, year-round opening hours from 6:30 a.m. to 7 p.m., needs-oriented daycare hour options of 25, 35, or 50 hours per week, as well as an adjacent new building, which is used exclusively as a nursery for up to 30 children ranging in age from one to three years. A good staff ratio, which offers parents and children reliability with respect to the number of hours of care, is particularly important to us. While their children adjust to the new environment, our employees can make use of additional offices for parents at the daycare center premises.

Dedicated employees contribute to success

A dedicated workforce is crucial in order to succeed as a global company. Honest and balanced feedback from our employees is thus important to us since it reveals, among other things, the factors that influence engagement and what the organization's strengths and weaknesses are.

In 2014 and 2015, around 20,000 of our employees from all business sectors and Group functions took part in the McKinsey Organizational Health Index (OHI) survey. Using nine health dimensions, the OHI shows in a holistic and business-oriented manner how efficient an organization is. In comparison with the more than 1,000 companies that conducted the survey, our OHI score for motivation is in the second quartile.

Although opportunities for improvement were identified, the overall results show that in comparison, our score is above-average. The consolidated OHI results were presented to our Executive Board in 2015. Work on central topics derived from the survey has already begun. The topics identified in the survey are being monitored and further pursued within the scope of employee surveys.

Additionally, we received an important distinction in 2015 for the innovation programs Innospire and the Innovation Cup. These were awarded the Innovation Prize of German Industry, the world's oldest innovation award, in the innovative personnel concepts category. Innospire fosters innovative employee ideas for new businesses; the Innovation Cup is aimed at top students from around the world. A further innovation program entitled Outcubation was realized in Heidelberg to promote young talent and was published in Nature Biotechnology, a renowned journal.

OVERVIEW OF EMPLOYEE FIGURES

			Group (Dec. 31, 2014)	Group **excl. Sigma-Aldrich (Dec. 31, 2015)**	**Sigma-Aldrich (Dec. 31, 2015)**	Group **incl. Sigma-Aldrich (Dec. 31, 2015)**
Number of employees	global, total		39,639	40,718	8,895	49,613
	by region	Asia-Pacific (APAC)	9,488	9,839	1,257	11,096
		Europe	20,537	20,950	2,479	23,429
		Latin America	3,883	4,032	320	4,352
		Middle East and Africa (MEA)	639	725	217	942
		North America	5,092	5,172	4,622	9,794
Number of employees (FTEs – full-time equivalents)	global, total		39,012.4	40,094.3	8,816.8	48,911.1
	by region	Asia-Pacific (APAC)	9,474.4	9,830.4	1,237.8	11,068.2
		Europe	19,946.2	20,359.2	2,426.5	22,785.7
		Latin America	3,877.6	4,024.2	320.0	4,344.2
		Middle East and Africa (MEA)	637.9	724.0	216.6	940.6
		North America	5,076.3	5,156.5	4,615.9	9,772.4
Number of countries in which the company has employees			66	66	34	66
Number of legal entities with employees			146	146	65	211
Number of employee nationalities	global, total		122	122	–[1]	–[1]
Number of employees working outside Germany			71.8%	72.2%	93.1%	75.9%
Percentage of women in the workforce	global, total		41.3%	41.3%	42.6%	41.6%
	in Germany		37.5%	37.6%	49.0%	38.2%
Percentage of women in management positions (Global Grade 14+)	global, total		26.3%	26.8%	–[1]	–[1]
	in Germany		26.1%	27.3%	–[1]	–[1]
Percentage of managers in the workforce (Global Grade 14+)	global, total		5.5%	5.9%	–[1]	–[1]
	number of nationalities		67	64	–[1]	–[1]
Percentage of employees working part-time	global, total		5.2%	5.1%	2.6%	4.7%
	of which men		10.5%	10.9%	15.2%	11.3%
Percentage of employees aged 0–29 years	global, total		14.9%	14.4%	19.3%	15.2%
Percentage of employees aged 30–49 years	global, total		64.2%	64.3%	54.7%	62.6%
Percentage of employees aged 50+ years	global, total		20.9%	21.3%	26.0%	22.2%
Average length of service in years	global, total		10.1	10.0	–[1]	–[1]

[1] No data available owing to the Sigma-Aldrich integration process, which is currently underway.

REPORT ON ECONOMIC POSITION

Macroeconomic and Sector-Specific Environment

The development of our net sales in 2015 was influenced by general global trends and by the growing importance of the Asia-Pacific region (APAC). In 2015, the APAC region accounted for approximately 56% of the organic growth in Group sales. All business sectors made positive contributions to the overall organic sales growth of the APAC region. In 2015, Healthcare and Performance Materials generated the APAC region's largest share of sales in absolute terms. At 10.4%, the highest organic sales growth in the region was achieved by Healthcare. Life Science and Performance Materials followed far behind, with organic growth rates of 5.5% and 0.8%, respectively.

According to the most recent report by the International Monetary Fund (IMF), the recovery in industrialized countries continued in 2015, whereas economic activity in emerging economies and developing countries weakened for the fifth year in a row. The IMF reported that global gross domestic product (GDP) rose by 3.1% in 2015, representing a decrease of 0.3 percentage points compared with 2014. While industrialized countries generated an increase of 1.9%, at 4.0% emerging economies again made the largest contribution to global growth.

According to the latest information, in 2015 the GDP of the United States, the world's largest economy, grew by 2.5% (2014: 2.4%), which was 0.6 percentage points short of the 2014 forecast. Growth in the United States slowed down in 2015 due to a decline in investment spending by the oil industry and a harsh winter. For the eurozone, the IMF noted a 1.5% increase in GDP in 2015 (2014: 0.9%). In Asia (excluding Japan), GDP grew in 2015 by 6.6% (2014: 6.8%). India (7.3%) and China (6.9%) made noteworthy contributions to this development. Japan, South Korea and Taiwan remained behind the previous year's growth expectations. However, with GDP growth of 0.6%, Japan returned to positive territory (2014: 0.0%). By contrast, economic activity slightly weakened in South Korea, with GDP growth of 2.7% (2014: 3.3%) and in Taiwan, with growth of 2.2% (2014: 3.8%).

	Development in 2015[1]	Development in 2014
Healthcare		
Global pharmaceutical market	8.9%	8.7%
Market for multiple sclerosis therapies[2]	8.0%	19.0%
Market for type 2 diabetes therapies[2]	2.0%	9.0%
Market for infertility treatment[2]	–7.0%	1.0%
Market for the treatment of colorectal cancer[2]	–1.7%	–5.8%
Market for OTC pharmaceuticals	4.9%	4.0%
Life Science		
Market for laboratory products	3.0%	2.8%
Share of biopharmaceuticals in the global pharmaceutical market	24.0%	23.0%
Performance Materials		
Growth of LC display surface area	declining growth dynamics	13.8%
Global automobile sales volumes	slightly weaker growth	4.0%
Materials for production of cosmetics	2.0%	1.8%
Semiconductor industry sales	sales at the previous year's level	8.0%

[1] Predicted development. Final development data for 2015 were not available for all industries when this report was prepared.
[2] Growth figures are based on market data stated in U.S. dollars. Market data from EvaluatePharma on the growth of indications are based on published company reports and are subject to exchange rate fluctuations.
Owing to the development of the €/US$ exchange rate in 2014–2015, market growth in U.S. dollars is weaker than when viewed in terms of euros.

Healthcare

The IMS Health Global Market Prognosis 2015 – 2019, a study published by IMS Health, expects an 8.9% increase in sales for the global pharmaceutical market in 2015 (2014: 8.7%). This sales increase is primarily attributable to Latin America and the United States. The U.S. pharmaceutical market saw growth of 11.4% (2014: 12.6%) and in Latin America, growth was as high as 15.8% (2014: 11.6%). At 7.0%, growth of the Chinese market was weaker compared with the previous year (2014: 11.2%). However, at 5.8%, European market growth continued (2014: 4.1%).

Not only the growth of the pharmaceutical sector as a whole, but also in particular the development of the biopharmaceutical market are relevant for our business. According to EvaluatePharma, the share of sales accounted for by biopharmaceuticals as a proportion of the overall pharmaceutical market has steadily increased since 2006, amounting to 24.0% in 2015. In absolute terms, global biopharmaceutical sales amounted to around US$ 183 billion in 2015. For the coming years, EvaluatePharma continues to expect increasing sales of biopharmaceuticals. It is also likely that the trend towards biopharmaceuticals making up an ever greater share of the overall pharmaceutical market will continue.

According to EvaluatePharma, among our therapeutic areas of focus, particularly the markets for multiple sclerosis therapies and type 2 diabetes treatments showed the highest growth, increasing by 8.0% (2014: 19.0%) and 2.0% (2014: 9.0%), respectively. Moreover, it should be emphasized that the market for infertility treatments recorded a sales decline of – 7.0% (2014: 1.0%). Despite this difficult environment, the Biopharma business generated an organic sales increase of around 3.7% with Gonal-f®, a hormone used in the treatment of infertility. In 2015, the market for oncology drugs to treat colorectal cancer declined by a further 1.7% in comparison with the previous year (2014: -5.8%).

In a market study, the company Nicholas Hall quantified growth of the global over-the-counter pharmaceutical market at 4.9% in 2015 (2014: 4.0%). The market growth drivers were India at 8.9% (2014: 9.0%) as well as Latin America at 7.0% (2014: 8.2%). The Japanese and western European markets showed the weakest growth dynamics of 0.2% and 3.3%, respectively.

Life Science

Our Life Science business sector is a leading supplier of products and services for general laboratory applications, as well as researching, developing and producing drug therapies of biological and chemical origin.

For the global laboratory product market relevant to Bioscience and Lab Solutions, the market research firm Frost & Sullivan calculated growth of 3.0% for 2015 (2014: 2.8%). Growth was primarily driven by biopharmaceutical industry customers, specifically emerging biotech start-ups. The stabilization of U.S. academic funding also helped to improve the performance and prospects of research tools markets. In comparison with 2014, the European market grew by 1.9% (2014: 1.6%), especially as a result of positive market developments from the EU Research and Innovation program Horizon 2020. Growth of the U.S. market improved to 3.2% (2014: + 3.0%) thanks to the robust performance of the biotech industry. Emerging economies delivered higher growth; however, a slowdown in China was visible.

The demand for Process Solutions products depends heavily on the volume of biological product sales as well as the research & development activities of biopharmaceutical companies. Global biopharmaceuticals are approaching US$ 200 billion in sales and are expected to double by 2020. According to EvaluatePharma, there are more than 7,500 active biologics projects in the pipeline, 25% of which are monoclonal antibodies. Biosimilars are a small, but fast-growing part of the pharmaceutical market. In 2015, IMS expects spending on biosimilars to reach US$ 2 billion annually, or approximately 1% of total global spending on biologics.

Performance Materials

With our Liquid Crystals business, we are the leading producer of liquid crystal mixtures for the display industry. Based on data collected by market researchers at DisplaySearch, in recent years the display industry has achieved growth rates in display surface areas averaging 10%. This dynamic growth was driven by higher sales volumes and increasing average display sizes. Owing to weak demand for televisions, 2015 saw waning growth dynamics. The display industry remains a growth sector in which the leading display technology is based on liquid crystals. OLED technology, for which we also rank among the leading material suppliers, is gaining importance in the high-quality display sector.

The markets for automotive coatings and cosmetics are crucial to our Pigments business. As reported by the German Automobile Industry Association (VDA), global automobile sales increased by 4% in 2014. The growth drivers were China (+ 13%), the United States (+ 6%) and western Europe (+ 5%), whereas automotive sales volumes declined in Latin America and eastern Europe. Owing to the weakening of economic activity in China, global growth of the automotive industry is expected to come in slightly weaker in 2015. According to Euromonitor International, global consumption of materials used to produce cosmetics grew by 2%, with Asia reporting the highest growth rate of 5%.

The semiconductor industry is the most important sales market for the business with integrated circuit materials (IC Materials). The long-term growth of the semiconductor industry has a cyclical demand pattern. According to Gartner, a market research institute specializing in the technology and electronics markets, in 2015 the industry's sales were at the previous year's level as a result of declining demand in the PC business. In 2014, dynamic growth of 8% was recorded.

REVIEW OF FORECAST AGAINST ACTUAL BUSINESS DEVELOPMENTS

In the Annual Report for 2014, we gave forecasts of the key financial performance indicators for the Group and our business sectors for 2015. At the time of the forecast, the acquisition of Sigma-Aldrich was still pending due to outstanding antitrust clearances. We therefore provided a separate forecast in the event of the successful acquisition of Sigma-Aldrich, in which we expected the first-time consolidation of Sigma-Aldrich in mid-2015. The following report reviews the forecast against the actual business developments, including the first-time consolidation of Sigma-Aldrich on November 18, 2015.

Net sales

We predicted slight organic sales growth for the Group in 2015, supplemented by a slight portfolio effect and a moderately positive exchange rate effect. All business sectors contributed significantly to the moderate 2.6% organic increase in the net sales of the Group, thus exceeding the forecast. In addition, despite the delay in the acquisition of Sigma-Aldrich owing to antitrust reviews, we recorded a solid portfolio effect of 4.3%, in part due to the good performance of AZ Electronic Materials, a company we acquired in 2014. The strengthening of the U.S. dollar and major Asian currencies against the euro in 2015 contributed significantly to the strong positive currency effect of 6.2% on net sales.

Our Healthcare business sector generated slight organic sales growth of 1.6% in 2015, thus slightly exceeding the guidance provided in the Annual Report for 2014. In addition to the performance of Rebif® in North America, which exceeded our expectations, this was due to the organic increase in sales of our products to treat diabetes (Glucophage®), cardiovascular diseases (Concor®), infertility (Gonal-f®), and thyroid disorders (Euthyrox®), as well as Neurobion®, a brand marketed by the Consumer Health business.

For our Life Science business sector, we forecast a moderate organic increase in sales in the Annual Report for 2014. Posting strong organic sales growth of 6.5% in 2015, the Life Science business sector of our company exceeded this forecast. Process Solutions made a significant contribution to this development with organic sales growth of 11.6%. In addition, our Life Science business sector saw a portfolio effect of 10.2% due to the acquisition of Sigma-Aldrich.

For our Performance Materials business sector, we predicted slight organic sales growth, supplemented by a strong portfolio effect. At 0.6%, the actual organic growth was only slightly below this forecast. Special mention should be made of the dynamic development of the OLED materials business, as well as the energy-saving UB-FFS technology from the Display Materials business unit. However, the mature LC technology TN-TFT suffered from an accelerated decline in volumes. The portfolio effect of the revenues from acquired businesses was 10.4%.

EBITDA pre exceptionals

In 2015, excluding the acquisition of Sigma-Aldrich, EBITDA pre exceptionals of the Group saw a solid increase over the previous year, thus exceeding the forecast we gave in the Annual Report for 2014. In addition, apart from operating performance, positive foreign exchange effects of the U.S. dollar and major Asian currencies contributed to this development. Including Sigma-Aldrich, we generated a strong EBITDA pre exceptionals increase of 7.1% to € 3,630 million for the Group in 2015.

For our Healthcare business sector, we predicted a slight decline in EBITDA pre exceptionals in the Annual Report for 2014. The good development of organic sales helped us to exceed this forecast, achieving the year-earlier level with EBITDA pre exceptionals of € 2,002 million.

In the Annual Report for 2014, we predicted a moderate increase for our Life Science business sector. Excluding Sigma-Aldrich, EBITDA pre exceptionals of our Life Science business sector saw a low double-digit increase, thus exceeding our guidance provided in the Annual Report for 2014. In addition to positive exchange rate effects, this development was also attributable to a favorable product mix.

We forecast a low double-digit increase in EBITDA pre exceptionals for our Performance Materials business sector in 2015. With medium double-digit growth (excluding Sigma-Aldrich), we significantly exceeded this forecast. Both good operating business performance and positive exchange rate effects were responsible for this development.

For EBITDA pre exceptionals of Corporate and Other, we expected a low double-digit percentage decline. Owing to expenses for currency hedging transactions as a result of the global exchange rate movements against the euro and the intensification of future-oriented Group initiatives (e.g. new branding), the Corporate and Other expense of EBITDA pre exceptionals more than doubled overall. Consequently, we did not meet our forecast.

Business free cash flow

For 2015, we had forecast a slight improvement in business free cash flow of the Group. Excluding the contribution from Sigma-Aldrich, we can confirm this forecast. While business free cash flows of the Life Science and Performance Materials business sectors of our company showed a sharp increase over 2014, both our Healthcare business sector and Corporate and Other saw a decline. The decrease in Healthcare is attributable to higher investments and the high amount of capital tied up in receivables. In Corporate and Other, expenses for the ONE Global Headquarters and strategic Group initiatives in particular led to a decrease in business free cash flow. Including Sigma-Aldrich, our Group business free cash flow increased sharply by 6.2%.

Review of forecast against actual business developments in 2015

	Actual results 2014 in € million	Forecast for 2015 in the Annual Report for 2014
Group		
Net sales[1]	11,363	Slight organic growth, slight portfolio effect, moderately positive foreign exchange effect Forecast incl. Sigma-Aldrich: Double-digit growth rates
EBITDA pre exceptionals	3,388	Slight increase due to operating business developments and positive foreign exchange effects; at least at the 2014 level Forecast incl. Sigma-Aldrich: Very strong growth
Business free cash flow	2,605	Slight increase Forecast incl. Sigma-Aldrich: Very strong growth
Healthcare		
Net sales[1]	6,621	Organic at the previous year's level
EBITDA pre exceptionals	2,000	Slight decline
Business free cash flow	1,701	Slight decline
Life Science		
Net sales[1]	2,682	Moderate organic growth Forecast incl. Sigma-Aldrich: Double-digit growth rates
EBITDA pre exceptionals	659	Moderate increase Forecast incl. Sigma-Aldrich: Double-digit growth rates
Business free cash flow	419	Strong increase Forecast incl. Sigma-Aldrich: Double-digit growth rates
Performance Materials		
Net sales[1]	2,060	Slight organic increase, strong portfolio effect
EBITDA pre exceptionals	895	Low double-digit percentage increase
Business free cash flow	700	Low double-digit percentage increase
Corporate and Other		
EBITDA pre exceptionals	–166	Double-digit percentage decline
Business free cash flow	–215	–

[1] The composition of net sales has changed, see "Changes to accounting and measurement principles and disclosure changes" in the Notes to the Group accounts.

Forecast for 2015 in:			
Q1/2015 Interim Report	Q2/2015 Interim Report	Q3/2015 Interim Report	**Results 2015 in € million (% YoY)**
€ 12.3–12.5 billion Forecast incl. Sigma-Aldrich: Double-digit growth rates	€ 12.3–12.5 billion Forecast incl. Sigma-Aldrich: Low double-digit percentage growth	€ 12.6–12.8 billion, of which Sigma-Aldrich: € 300 million	12,845 (+13.0% +2.6% org. +4.3% portfolio, +6.2% currency)
€ 3.45–3.55 billion Forecast incl. Sigma-Aldrich: Double-digit growth rates	€ 3.45–3.55 billion Forecast incl. Sigma-Aldrich: Low double-digit percentage growth	€ 3.58–3.65 billion, of which Sigma-Aldrich: € 80–95 million	3,630 (+7.1%)
€ 2.4–2.5 billion Forecast incl. Sigma-Aldrich: Strong growth	€ 2.4–2.5 billion Forecast incl. Sigma-Aldrich: Stable development	€ 2.6–2.7 billion, of which Sigma-Aldrich: € 50–70 million	2,766 (+6.2%)
Organic at the previous year's level	Organic at the previous year's level	Organic at the previous year's level	6,934 (+4.7% +1.6% org. +3.1% currency)
€ 1.9–2.0 billion	€ 1.9–2.0 billion	€ 1.93–2.0 billion	2,002 (+0.1%)
€ 1.5–1.55 billion	€ 1.5–1.55 billion	€ 1.5–1.55 billion	1,581 (–7.1%)
Moderate organic growth Forecast incl. Sigma-Aldrich: Double-digit growth rates	Moderate organic growth Forecast incl. Sigma-Aldrich: Double-digit growth rates	Solid organic growth, portfolio effect in the low double-digit percentage range	3,355 (+25.1% +6.5% org. +10.2% portfolio, +8.4% currency)
€ 730–760 million Forecast incl. Sigma-Aldrich: Double-digit growth rates	€ 740–760 million Forecast incl. Sigma-Aldrich: Double-digit growth rates	€ 760–780 billion, in addition from Sigma-Aldrich: € 80–95 million	856 (+30.0%)
€ 450–480 million	€ 450–480 million	€ 530–560 million, in addition from Sigma-Aldrich: € 50–70 million	676 (+61.2%)
Slight organic increase, strong portfolio effect	Slight organic increase, strong portfolio effect	Slight organic increase, strong portfolio effect	2,556 (+24.1% +0.6% org. +10.4% portfolio, +13.1% currency)
€ 1.05–1.1 billion	€ 1.06–1.1 billion	€ 1.1–1.14 billion	1,132 (+26.5%)
€ 850–900 million	€ 850–900 million	€ 890–940 million	931 (+33.0%)
€ –330– –280 million	€ –350– –300 million	€ –360– –340 million	–360 (+116.9%)
€ –420– –390 million	€ –420– –390 million	€ –440– –410 million	–421 (+96.2%)

COURSE OF BUSINESS AND ECONOMIC POSITION

Group

Overview of 2015

- Sales increase by 13.0% to € 12.8 billion
- All business sectors report organic sales growth
- EBITDA pre exceptionals up 7.1% to around € 3.6 billion
- Earnings per share pre exceptionals rise 5.9% to € 4.87
- Business free cash flow increases by 6.2% to € 2.8 billion
- Healthcare: Robust base business; cooperation with Pfizer developing according to plan
- Life Science: Strong and profitable organic sales growth amid successful completion of the Sigma-Aldrich acquisition
- Performance Materials: Market positions in all businesses successfully defended with organic sales at 2014 level
- Corporate objectives for 2015 met in full

GROUP

Key figures

€ million	**2015**	2014	Change in %
Net sales[1]	12,844.7	11,362.8	13.0
Operating result (EBIT)	1,843.2	1,762.0	4.6
Margin (% of net sales)[1]	14.3	15.5	
EBITDA	3,354.1	3,122.9	7.4
Margin (% of net sales)[1]	26.1	27.5	
EBITDA pre exceptionals	3,629.8	3,387.7	7.1
Margin (% of net sales)[1]	28.3	29.8	
Earnings per share (€)	2.56	2.66	–3.8
Earnings per share pre exceptionals (€)	4.87	4.60	5.9
Business free cash flow	2,766.2	2,605.1	6.2

[1]The composition of net sales has changed, see “Changes to accounting and measurement principles and disclosure changes” in the Notes to the Group accounts.

Development of net sales and results of operations

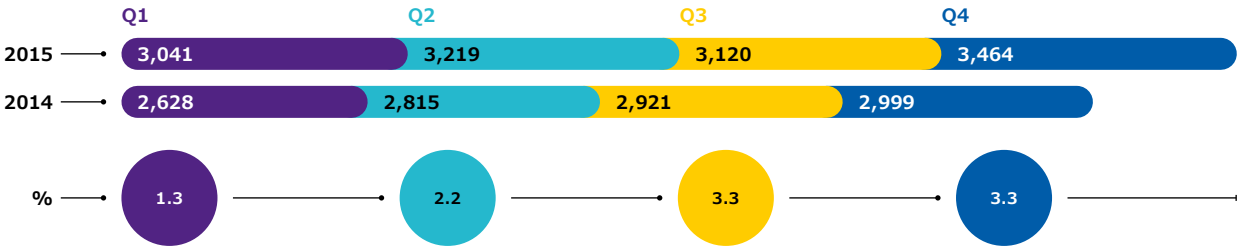
In 2015, we generated net sales of € 12,845 million (2014: € 11,363 million), representing an increase of 13.0% or € 1,482 million over 2014. This positive sales development was due to organic growth, positive exchange rate effects and acquisition-related increases. In 2015, the organic increase in sales amounted to 2.6% or € 293 million. As a consequence of the weaker value of the euro against the most important currencies, this led to net positive exchange rate effects of 6.2% or € 702 million. This was primarily due to the U.S. dollar and Asian currencies, especially the Chinese renminbi and the Taiwan dollar. Negative exchange rate effects resulted mainly from Latin American currencies, for instance the Venezuelan bolivar and the Brazilian real. Acquisitions/divestments increased net sales overall by 4.3% or € 487 million. The acquisition-related effect from the first-time consolidation of AZ Electronic Materials (AZ) on May 2, 2014 amounted to € 203 million. The increase in sales due to the consolidation of Sigma-Aldrich since November 18, 2015 totaled € 289 million. Of this amount, € 279 million was generated by our Life Science business sector and € 10 million by our Performance Materials business sector. Subsequent to the divestment of the Discovery and Development Solutions business field in our Life Science business sector as of March 31, 2014, net sales declined by € 5 million compared with the previous year.

The development of net sales in the individual quarters in comparison with 2014 as well as respective organic growth rates are presented in the following overview:

GROUP

Net sales and organic growth by quarter[1]

€ million/organic growth in %



[1] Quarterly breakdown unaudited.

In 2015, Healthcare accounted for 54% (2014: 58%) of our total Group sales and thus remained our largest business sector in terms of sales. Life Science and Performance Materials followed behind, contributing 26% (2014: 24%) and 20% (2014: 18%) to Group sales, respectively. The respective two percentage-point increases in the share of sales accounted for by both Life Science and Performance Materials were mainly related to the acquisitions of Sigma-Aldrich and AZ.

GROUP

Net sales by business sector – 2015

€ million/% of net sales

GROUP

Net sales components by business sector – 2015

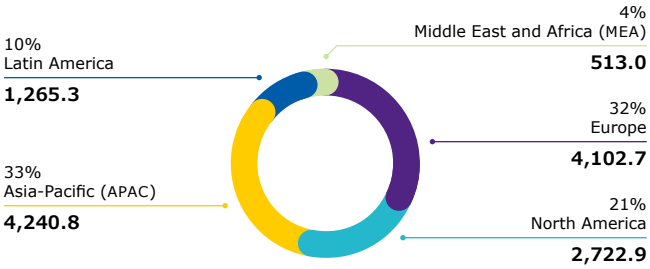
€ million/change in %	Net sales	Organic growth	Exchange rate effects	Acquisitions/ divestments	Total change
Healthcare	6,933.8	1.6	3.1	–	4.7
Life Science	3,355.3	6.5	8.4	10.2	25.1
Performance Materials	2,555.6	0.6	13.1	10.4	24.1
Group	**12,844.7**	**2.6**	**6.2**	**4.3**	**13.0**

All our business sectors recorded organic sales increases and positive exchange rate effects in 2015. Achieving an organic growth rate of 6.5%, which corresponded to an absolute increase of € 173 million, Life Science made the strongest absolute contribution to organic sales growth, followed by Healthcare with organic sales growth of € 106 million, equivalent to a growth rate of 1.6%, and Performance Materials with € 13 million, or 0.6%. The overall change in net sales reflects the benefits of positive exchange rate effects and sales contributions from the acquired businesses. Driven mainly by the first-time consolidation of Sigma-Aldrich, Life Science delivered a growth rate of 25.1% or € 673 million, the strongest sales increase among our business sectors.

GROUP

Net sales by region – 2015

€ million / % of net sales



Driven by positive exchange rate movements and acquisition-related growth, sales in the Asia-Pacific region rose by 23.2% or € 798 million to € 4,241 million (2014: € 3,443 million). Asia-Pacific thus became our top-selling region and the growth engine of the Group; more than half of total sales growth in 2015 was generated in this region. In particular, Performance Materials benefited in this region from positive currency effects and the consolidation of AZ Electronic Materials. All business sectors contributed to organic growth of 4.7%, although this development was mainly attributable to Healthcare, which reported organic growth of 10.4%. The contribution to Group sales by the Asia-Pacific region rose by three percentage points to 33% (2014: 30%).

Sales generated in Europe grew by 2.1% to € 4,103 million (2014: € 4,017 million). While the Life Science (+12.7%) and Performance Materials (+6.5%) business sectors achieved sales growth, Healthcare posted a sales decline (–2.1%). Overall, this region's contribution to Group sales in 2015 declined to 32% (2014: 36%).

Sales in North America amounted to € 2,723 million (2014: € 2,152 million), which represents a year-on-year increase of 26.5%. This was due in particular to favorable currency effects from the strong U.S. dollar and acquisition-related sales increases that were primarily attributable to the acquisition of Sigma-Aldrich. The organic growth generated by our Life Science business sector (+8.5%) was canceled out by the organic sales declines in the other two business sectors. The contribution to Group sales by this region in 2015 was 21%, representing an increase of two percentage points (2014: 19%).

In Latin America, Group sales decreased slightly owing to currency effects to € 1,265 million (2014: € 1,285 million). Negative exchange rate effects stemmed mainly from the change in the translation of the Venezuelan bolivar into the reporting currency, euros. In this connection, reference is made to the explanations in Note [7] "Management judgments and sources of estimation uncertainty" in the Notes to the Group accounts. All business sectors contributed to organic sales growth of 8.6%. In 2015, Latin America generated 10% (2014: 11%) of Group sales.

Net sales in the Middle East and Africa region rose in 2015 by 10.1%, amounting to € 513 million (2014: € 466 million). Organic sales growth of 6.8% was mainly attributable to our Healthcare business sector. This region accounted for an unchanged 4% of Group sales.

GROUP

Net sales components by region – 2015

€ million / change in %	Net sales	Organic growth	Exchange rate effects	Acquisitions / divestments	Total change
Europe	4,102.7	0.2	0.2	1.8	2.1
North America	2,722.9	–0.9	17.9	9.6	26.5
Asia-Pacific (APAC)	4,240.8	4.7	12.6	5.9	23.2
Latin America	1,265.3	8.6	–10.5	0.4	–1.5
Middle East and Africa (MEA)	513.0	6.8	2.5	0.8	10.1
Group	**12,844.7**	**2.6**	**6.2**	**4.3**	**13.0**

The consolidated income statement of the Group is as follows:

GROUP

Consolidated Income Statement[1]

€ million	2015	in %	2014	in %	Change in € million	Change in %
Net sales	**12,844.7**	**100.0**	**11,362.8**	**100.0**	**1,481.9**	**13.0**
Cost of sales	–4,076.3	–31.7	–3,526.4	–31.0	–549.9	15.6
(of which: amortization of intangible assets)[2]	*(–166.6)*		*(–94.0)*		*(–72.6)*	*(77.3)*
Gross profit	**8,768.4**	**68.3**	**7,836.4**	**69.0**	**932.0**	**11.9**
Marketing and selling expenses	–4,049.5	–31.5	–3,589.1	–31.6	–460.4	12.8
(of which: amortization of intangible assets)[2]	*(–778.9)*		*(–719.0)*		*(–59.9)*	*(8.4)*
Administration expenses	–719.9	–5.6	–608.6	–5.4	–111.3	18.3
Research and development costs	–1,709.2	–13.3	–1,703.7	–15.0	–5.5	0.3
(of which: amortization of intangible assets)[2]	*(–2.7)*		*(–3.8)*		*(1.1)*	*(–30.5)*
Other operating expenses and income	–446.6	–3.5	–173.0	–1.5	–273.6	158.2
Operating result (EBIT)	**1,843.2**	**14.3**	**1,762.0**	**15.5**	**81.2**	**4.6**
Financial result	–356.7	–2.8	–205.0	–1.8	–151.7	74.0
Profit before income tax	**1,486.5**	**11.6**	**1,557.0**	**13.7**	**–70.5**	**–4.5**
Income tax	–368.0	–2.9	–392.2	–3.5	24.2	–6.2
Profit after tax from continuing operations	**1,118.5**	**8.7**	**1,164.8**	**10.3**	**–46.3**	**–4.0**
Profit after tax from discontinued operations	**5.6**	**–**	**–**	**–**	**5.6**	**–**
Profit after tax	**1,124.1**	**8.8**	**1,164.8**	**10.3**	**–40.7**	**–3.5**
Non-controlling interests	–9.3	–0.1	–7.5	–0.1	–1.8	25.1
Net income	**1,114.8**	**8.7**	**1,157.3**	**10.2**	**–42.5**	**–3.7**

[1] The reporting structure has changed, see "Changes to accounting and measurement principles and disclosure changes" in the Notes to the Group accounts.
[2] Excluding amortization of internally generated or separately acquired software.

The increase in cost of sales as well as other functional costs, for example marketing and selling expenses and administration expenses, was significantly influenced by exchange rate effects and the first-time consolidation of Sigma-Aldrich. Despite the rise in cost of sales to € 4,076 million (2014: € 3,526 million), gross profit saw a double-digit increase (+ 11.9%) to € 8,768 million. Gross margin, i.e. gross profit as a percentage of sales, declined slightly to 68.3% (2014: 69.0%).

In 2015, research and development costs were at the previous year's level. Healthcare, which is the Group's most research-intense business sector, accounted for 77% (2014: 80%) of Group-wide R&D spending. The Group research spending ratio (research and development costs as a percentage of sales) declined to 13.3% (2014: 15.0%). Our research spending ratio in our Healthcare business sector was 18.9% (2014: 20.6%).

GROUP

Research and development costs by business sector – 2015

€ million / in %

In 2015, other operating expenses and income (net) amounted to € –447 million (2014: € –173 million) and comprised expenses of € 917 million (2014: € 737 million) as well as income of € 471 million (2014: € 564 million). The increase in other operating expenses was primarily due to exchange rate losses in operating business and higher allowances for receivables. The decrease in other operating income was mainly due to one-time income in 2014 from the adjustment of provisions for litigation with Israel Bio-Engineering Project Limited Partnership ("IBEP"). This effect could not be offset by higher income from milestone payments largely attributable to the alliance entered into with Pfizer in November 2014 to co-develop and co-commercialize active ingredients in immuno-oncology. Further information about the development and composition of other operating expenses and income can be found in Note [12] "Other operating income" and Note [13] "Other operating expenses" in the Notes to the Group accounts.

Overall, our operating result (EBIT) increased by 4.6% to € 1,843 million.

In 2015, the negative financial result grew by € 152 million to € –357 million (2014: € –205 million), particularly owing to higher interest expenses in connection with the financing measures for the Sigma-Aldrich acquisition. Furthermore, we incurred higher exchange rate losses from financial transactions that burdened the financial result more strongly than in 2014 (see Note [14] "Financial result" in the Notes to the Group accounts).

Income tax expenses of € 368 million (2014: € 392 million) led to a tax ratio of 24.8% (2014: 25.2%). Further information about income taxes can be found in Note [15] "Income taxes" in the Notes to the Group accounts.

Profit after tax of discontinued operations comprises the business activities of Sigma-Aldrich acquired with a view to resale. As a consequence of the antitrust commitments imposed by the European Commission, our company and Sigma-Aldrich had agreed to sell parts of Sigma-Aldrich's solvents and inorganics business in Europe (see also Note [4] "Acquisitions, assets held for sale and disposal groups" in the Notes to the Group accounts).

Net income, i.e. profit after tax attributable to our shareholders, for 2015 was € 1,115 million (2014: € 1,157 million), resulting in earnings per share of € 2.56 (2014: € 2.66).

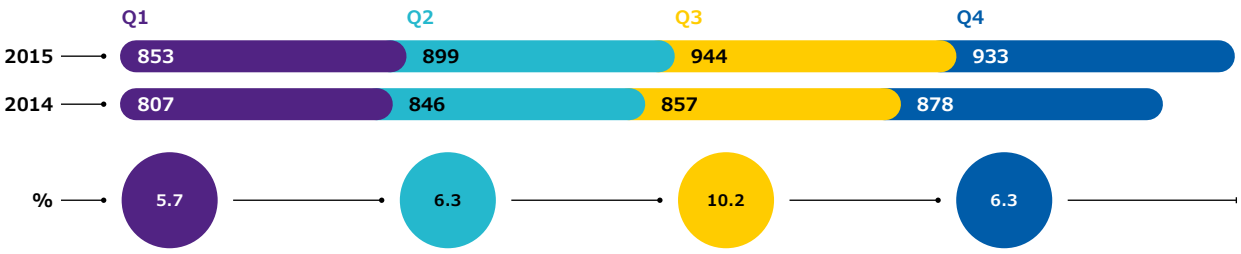
The key financial indicator used to steer operating business, EBITDA pre exceptionals, climbed 7.1% to € 3,630 million (2014: € 3,388 million). The resulting EBITDA margin pre exceptionals of 28.3% nearly reached the year-earlier level (29.8%). The reconciliation of the operating result (EBIT) to EBITDA pre exceptionals is presented under "Internal Management System".

The development of EBITDA pre exceptionals in the individual quarters in comparison with 2014 is presented in the following overview:

GROUP

EBITDA pre exceptionals and change by quarter[1]

€ million / change in %



[1] Quarterly breakdown unaudited.

The increase in Group EBITDA pre exceptionals was driven by our Life Science and Performance Materials business sectors. Life Science improved this key performance indicator by € 198 million or 30.0%, and Performance Materials delivered an increase of € 237 million or 26.5%. At € 2,002 million, EBITDA pre exceptionals of our Healthcare business sector remained at the level of 2014, accounting for a 50% share (2014: 56%) of Group EBITDA pre exceptionals (excluding the € –360 million decline due to Corporate and Other). The percentage shares of EBITDA pre exceptionals attributable to Life Science and Performance Materials rose to 22% (2014: 19%) and 28% (2014: 25%), respectively.

GROUP

EBITDA pre exceptionals by business sector – 2015

€ million / in %

Not presented: Decline in Group EBITDA pre exceptionals by € –360 million due to Corporate and Other.

Net assets and financial position

GROUP

Balance sheet structure[1]

	Dec. 31, 2015		Dec. 31, 2014		Change	
	€ million	**in %**	€ million	in %	€ million	in %
Non-current assets	**30,657.0**	**80.7**	**15,529.7**	**59.7**	**15,127.3**	**97.4**
of which:						
Intangible assets	25,339.0		11,395.5		13,943.5	
Property, plant and equipment	4,009.1		2,990.4		1,018.7	
Other non-current assets	1,308.9		1,143.8		165.1	
Current assets	**7,350.2**	**19.3**	**10,480.4**	**40.3**	**–3,130.2**	**–29.9**
of which:						
Inventories	2,619.8		1,659.7		960.1	
Trade accounts receivable[2]	2,738.3		2,219.5		518.8	
Current financial assets	227.0		2,199.4		–1,972.4	
Other current assets[2]	932.9		1,523.3		–590.4	
Cash and cash equivalents	832.2		2,878.5		–2,046.3	
Total assets	**38,007.2**	**100.0**	**26,010.1**	**100.0**	**11,997.1**	**46.1**
Equity	**12,855.3**	**33.8**	**11,801.0**	**45.4**	**1,054.3**	**8.9**
Non-current liabilities	**15,768.9**	**41.5**	**7,607.7**	**29.2**	**8,161.2**	**107.3**
of which:						
Provisions for pensions and other post-employment benefits	1,836.1		1,820.1		16.0	
Other non-current provisions	855.3		626.1		229.2	
Non-current financial liabilities	9,616.3		3,561.1		6,055.2	
Other non-current liabilities	3,461.2		1,600.4		1,860.8	
Current liabilities	**9,383.0**	**24.7**	**6,601.4**	**25.4**	**2,781.6**	**42.1**
of which:						
Current provisions	535.4		561.7		–26.3	
Current financial liabilities	4,096.6		2,075.9		2,020.7	
Trade accounts payable	1,921.2		1,539.4		381.8	
Other current liabilities	2,829.8		2,424.4		405.4	
Total liabilities and equity	**38,007.2**	**100.0**	**26,010.1**	**100.0**	**11,997.1**	**46.1**

[1] Since January 1, 2015, the consolidated balance sheet has been structured in descending order of maturity.
[2] Previous year's figures have been adjusted, see "Changes to accounting and measurement principles and disclosure changes" in the Notes to the Group accounts.

As of December 31, 2015, total assets amounted to € 38,007 million. This represents an increase of € 11,997 million or 46.1% over December 31, 2014 (€ 26,010 million). Both this very strong increase and the change in the balance sheet structure were mainly due to the acquisition of Sigma-Aldrich, which closed in November 2015. As part of the preliminary purchase price allocation for this transaction, the acquired assets and liabilities were measured at fair values in the balance sheet. On the date of first-time consolidation, this increased intangible assets (excluding goodwill) by € 5,873 million. The goodwill from the acquisition amounted to € 8,613 million. Further information on the purchase price allocation for the Sigma-Aldrich acquisition can be found in Note [4] "Acquisitions, assets held for sale and disposal groups" in the Notes to the Group accounts. The purchase price of € 15,974 million was financed through cash on our balance sheet, bank loans and bonds. Following the issuance of a hybrid bond (€ 1.5 billion) in December 2014, we issued a further bond with a volume of US$ 4 billion in March 2015. Lastly, in August 2015, we issued a euro bond amounting to € 2.1 billion. Moreover, credit lines totaling € 2.95 billion were utilized for the purchase price payment. An overview of the outstanding bonds can be found in Note [28] "Financial liabilities / Capital management" in the Notes to the Group accounts.

The composition and the development of net financial debt were as follows:

GROUP

Net financial debt

	Dec. 31, 2015	Dec. 31, 2014	Change	
	€ million	€ million	€ million	in %
Bonds and commercial paper	9,851.4	4,624.2	5,227.2	113.0
Loans to banks	3,006.0	267.4	2,738.6	–
Liabilities to related parties	577.8	501.4	76.4	15.2
Loans from third parties and other financial liabilities	89.2	84.5	4.7	5.6
Liabilities from derivatives (financial transactions)	183.7	153.0	30.7	20.1
Finance lease liabilities	4.8	6.5	–1.7	–26.2
Total financial liabilities	**13,712.9**	**5,637.0**	**8,075.9**	**143.3**
less				
Cash and cash equivalents	832.2	2,878.5	–2,046.3	–71.1
Current financial assets	227.0	2,199.4	–1,972.4	–89.7
Net financial debt	**12,653.7**	**559.1**	**12,094.6**	**–**

GROUP

Reconciliation of net financial debt

€ million	**2015**
January 1	**559.1**
Currency translation	–737.2
Dividend payments to shareholders and to E. Merck KG, Darmstadt, Germany	567.8
Acquisitions[1]	13,482.3
Assumption of financial liabilities from Sigma-Aldrich	425.3
Payment from the disposal of assets held for sale[1]	–86.0
Free cash flow	–1,538.5
Other	–19.1
December 31	**12,653.7**

[1] According to the consolidated cash flow statement.

Thanks to the strong internal financing power of the Group, the increase in net financial debt in 2015 was significantly lower than the cash outflow in connection with the acquisition of Sigma-Aldrich.

GROUP

Working capital

€ million	Dec. 31, 2015	Dec. 31, 2014	Change in € million	Change in %
Trade accounts receivable	2,738.3	2,219.5	518.8	23.4
Receivables from royalties and licenses	11.5	16.1	–4.6	–28.6
Inventories	2,619.8	1,659.7	960.1	57.8
Trade accounts payables	–1,921.2	–1,539.4	–381.8	24.8
Working capital	**3,448.4**	**2,355.9**	**1,092.5**	**46.4**

The increase in working capital was likewise due to the first-time consolidation of Sigma-Aldrich and to exchange rate effects. Excluding these effects, working capital would have been at the level of 2014.

Our equity increased by € 1,054 million, amounting to € 12,855 million on December 31, 2015 (December 31, 2014: € 11,801 million). This strong increase of 8.9% was mainly driven by profit after tax generated in 2015 amounting to € 1,124 million and the development of currency translation differences from the translation of assets held in foreign currencies into euros, the reporting currency. This was countered by the reclassification of the Sigma-Aldrich purchase price hedging gains, dividend payments, and the profit transfer to E. Merck KG, Darmstadt, Germany, (see "Consolidated Statement of Comprehensive Income" and "Consolidated Statement of Changes in Net Equity" in the Consolidated Financial Statements). Owing to the sharp increase in total assets, the equity ratio decreased by 11.6 percentage points, amounting to 33.8% as of December 31, 2015 (December 31, 2014: 45.4%).

Free cash flow was € 1,539 million in 2015, which did not meet the high level achieved in 2014. The composition and the development of the relevant items are presented in the following table:

GROUP

Free cash flow

€ million	2015	2014	Change in %
Cash flow from operating activities according to the cash flow statement	2,195.2	2,705.5	–18.9
Payments for investments in intangible assets	–179.1	–143.3	25.0
Payments from the disposal of intangible assets	27.4	2.1	–
Payments for investments in property, plant and equipment	–513.9	–480.9	6.9
Payments from the disposal of property, plant and equipment	8.9	14.0	–36.3
Free cash flow	**1,538.5**	**2,097.4**	**–26.6**

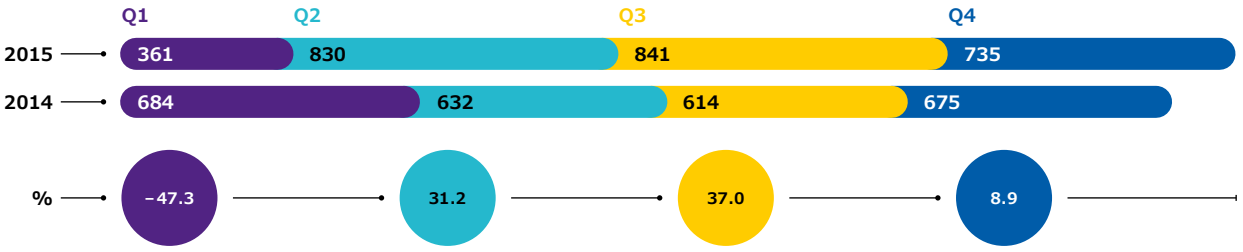
Driven by the development of EBITDA pre exceptionals, business free cash flow of the Group rose in 2015 by 6.2% to € 2,766 million (2014: € 2,605 million). The composition of this financial indicator is presented under "Internal Management System".

The distribution of business free cash flow across the individual quarters and the percentage changes in comparison with 2014 were as follows:

GROUP

Business free cash flow and change by quarter[1]

€ million/change in %



[1] Quarterly breakdown unaudited.

GROUP

Business free cash flow by business sector – 2015

€ million/in %

Not presented: Decline in Group business free cash flow by € –421 million due to Corporate and other.

The increase in Group business free cash flow in 2015 was attributable to the two operating business sectors Life Science and Performance Materials. Healthcare generated business free cash flow amounting to € 1,581 million (2014: € 1,701 million). Consequently, with a 50% share (2014: 60%) of Group business free cash flow (excluding the decline of € –421 million due to Corporate and Other), Healthcare was once again the business sector with the highest cash flows. In 2015, our Life Science business sector achieved a 61.2% increase in business free cash flow to € 676 million (2014: € 419 million), thus also increasing its share of Group business cash flow to 21% (2014: 15%). Performance Materials contributed € 931 million (2014: € 700 million) to this Group financial indicator, equivalent to 29% (2014: 25%).

The investments in property, plant, equipment and software included in the calculation of business free cash flow as well as advance payments for intangible assets increased in 2015 by 15.4% to a total of € 609 million (2014: € 528 million). The investments in property, plant and equipment included therein amounted to € 564 million in 2015 (2014: € 485 million), of which € 262 million was attributable to strategic investment projects each with a project volume of more than € 2 million; the remainder was attributable to smaller capital spending projects.

In 2015, strategic investments of € 83 million were made to expand the Darmstadt site. Of this amount, € 29 million was used to upgrade global headquarters; the projects include an Innovation Center, a Visitor Center and an employee cafeteria, among other things. Moreover, in our Performance Materials business sector, OLED production capacity was expanded with an investment of € 13 million in order to better meet growing demand. In our Healthcare business sector, € 8 million was invested in a new laboratory research building.

Globally, strategic investments were made in the Healthcare business sector of our company. Special mention should be made of the production facility in Nantong, China (€ 50 million), a new production plant for the Allergy business in Reinbek, Germany (€ 17 million), an expansion of the existing filling plant at the Bari site in Italy (€ 18 million), and the construction of a new packaging unit at the Aubonne site in Switzerland (€ 8 million). Within our Life Science business sector, € 7 million was invested in a new production unit in Spain.

In 2015, there were no changes to our long-term credit ratings by the two rating agencies Moody's and Standard & Poor's. The latter continues to issue a rating of "A" with a negative outlook and Moody's a "Baa1" rating with a negative outlook. An overview of the development of our rating in recent years is presented in the Report on Risks and Opportunities.

The development of key balance sheet figures was as follows:

GROUP

Key balance sheet figures

in %		Dec. 31, 2015	Dec. 31, 2014	Dec. 31, 2013	Dec. 31, 2012	Dec. 31, 2011
Equity ratio	Equity / Total assets	33.8	45.4	53.2	48.1	47.4
Asset ratio	Non-current assets / Total assets	80.7	59.7	64.5	69.4	71.1
Asset coverage	Equity / Non-current assets	41.9	76.0	82.4	69.4	66.7
Finance structure	Current liabilities / Liabilities (total)	37.3	46.5	40.0	40.6	37.5

Overall assessment of business performance and economic situation

We again achieved very good operational success with our strong businesses in 2015. At the same time, we also realized important strategic objectives concerning the long-term direction of the Group. Net sales grew by 13% to € 12,845 million and EBITDA pre exceptionals, our key financial indicator to assess operational performance, rose by 7.1% to € 3,630 million. All our business sectors contributed to this success.

The successful acquisition of Sigma-Aldrich in November 2015, through which our Life Science business sector has become a leading supplier in the lucrative Life Science market, was of major significance to us. We thus achieved an important step in the implementation of our long-term strategy, through which we want to secure future growth and profitability. Additionally, we made progress with the further development of our pharmaceutical pipeline in 2015. The operating business of our Performance Materials business sector benefited from the successful integration of AZ Electronic Materials.

The solid accounting and finance policy of the Group is again reflected by the very good key balance sheet figures. The equity ratio as of December 31, 2015 was 33.8%, thus remaining at a good level. As expected, net financial debt rose massively owing to the acquisition of Sigma-Aldrich. We assume that our strong internal financing power will enable us to quickly reduce our financial liabilities. This is underscored by the unchanged long-term ratings from Moody's and Standard & Poor's. Against the backdrop of our solid net assets and financial position as well as the earning strength of our businesses, we assess the economic position of the Group positively overall. It represents a superb starting basis for future organic growth of the Group.

Healthcare

HEALTHCARE

Key figures

€ million	2015	2014	Change in %
Net sales[1]	6,933.8	6,620.5	4.7
Operating Result (EBIT)	1,096.7	1,106.4	–0.9
Margin (% of net sales)[1]	15.8	16.7	
EBITDA	1,970.4	1,946.4	1.2
Margin (% of net sales)[1]	28.4	29.4	
EBITDA pre exceptionals	2,001.7	2,000.3	0.1
Margin (% of net sales)[1]	28.9	30.2	
Business free cash flow	1,581.0	1,701.2	–7.1

[1] The composition of net sales has changed, see "Information on segment reporting" in the Notes to the Group accounts.

Development of net sales and results of operations

In 2015, our Healthcare business sector generated slight organic sales growth of 1.6%. Including positive exchange rate effects of 3.1%, net sales rose overall by 4.7% to € 6,934 million (2014: € 6,621 million). Nearly all the franchises contributed to the business sector's organic growth. In 2015, the organic increase in sales was driven in particular by products to treat diabetes (Glucophage®), cardiovascular diseases (Concor®), infertility (Gonal-f®), thyroid disorders (Euthyrox®), as well as Neurobion®, a brand marketed by the Consumer Health business. However, our two top-selling drugs Rebif® and Erbitux® posted organic sales declines.

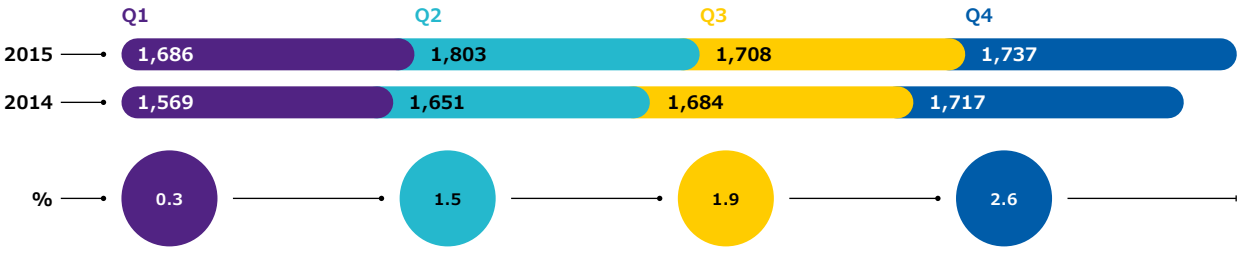
Commission income, which is also included in net sales, rose to € 103 million in 2015 (2014: € 71 million). The agreement reached with Bristol-Myers Squibb in 2013 on the co-promotion of Glucophage® in China had a positive effect on commission income in 2015.

The development of sales in the individual quarters in comparison with 2014 as well as the respective organic growth rates are presented in the following overview:

HEALTHCARE

Net sales and organic growth by quarter[1]

€ million / organic growth in %

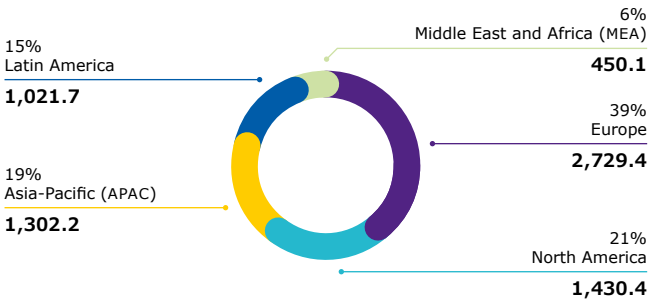


[1] Quarterly breakdown unaudited.

HEALTHCARE

Net sales by region – 2015

€ million/% of net sales of the business sector



Europe, our Healthcare business sector's largest region, accounting for 39% of net sales (2014: 42%), recorded a slight organic sales decline of –1.7%. Consequently, net sales totaled € 2,729 million (2014: € 2,787 million). The good sales performance by other franchises could not fully offset the organic decline in sales of Rebif®, which was particularly due to the difficult competitive environment.

In North America, the second-largest region in terms of sales, net sales amounted to € 1,430 million in 2015 (2014: € 1,292 million). This was due to an organic decline of –6.1%, offset by positive currency effects of 16.8%. Sales of Rebif®, which increased to € 1,042 million (2014: € 971 million) owing to currency effects, contributed significantly to the business sector's sales performance in North America. The share of Healthcare sales attributable to this region thus rose by one percentage point to 21% in 2015.

In the Asia-Pacific region, organic sales growth of 10.4% was recorded in 2015. Including positive exchange rate effects of 10.7%, sales thus rose to € 1,302 million (2014: € 1,075 million). Organic growth was driven in particular by the Fertility and CardioMetabolic Care franchises. This region's share of the business sector's net sales increased from 16% in 2014 to 19% in 2015.

Sales in Latin America amounted to € 1,022 million in 2015 (2014: € 1,059 million). This reflects an organic sales increase of 8.4% and negative exchange rate effects of –11.8%. Organic sales growth was mainly attributable to the development of sales in the CardioMetabolic Care franchise and of the Neurobion® brand. The negative currency effects mainly stemmed from the translation of the Venezuelan bolivar into the reporting currency, euros. In this connection, reference is made to the explanations in Note [7] "Management judgments and sources of estimation uncertainty" in the Notes to the Group accounts. The contribution by the Latin America region to net sales of our Healthcare business sector fell by one percentage point to 15%.

With net sales of € 450 million (2014: € 408 million), the Middle East and Africa region recorded an organic sales increase of 7.6%, mainly in the CardioMetabolic Care franchise. Positive currency effects increased sales by 2.8%.

HEALTHCARE

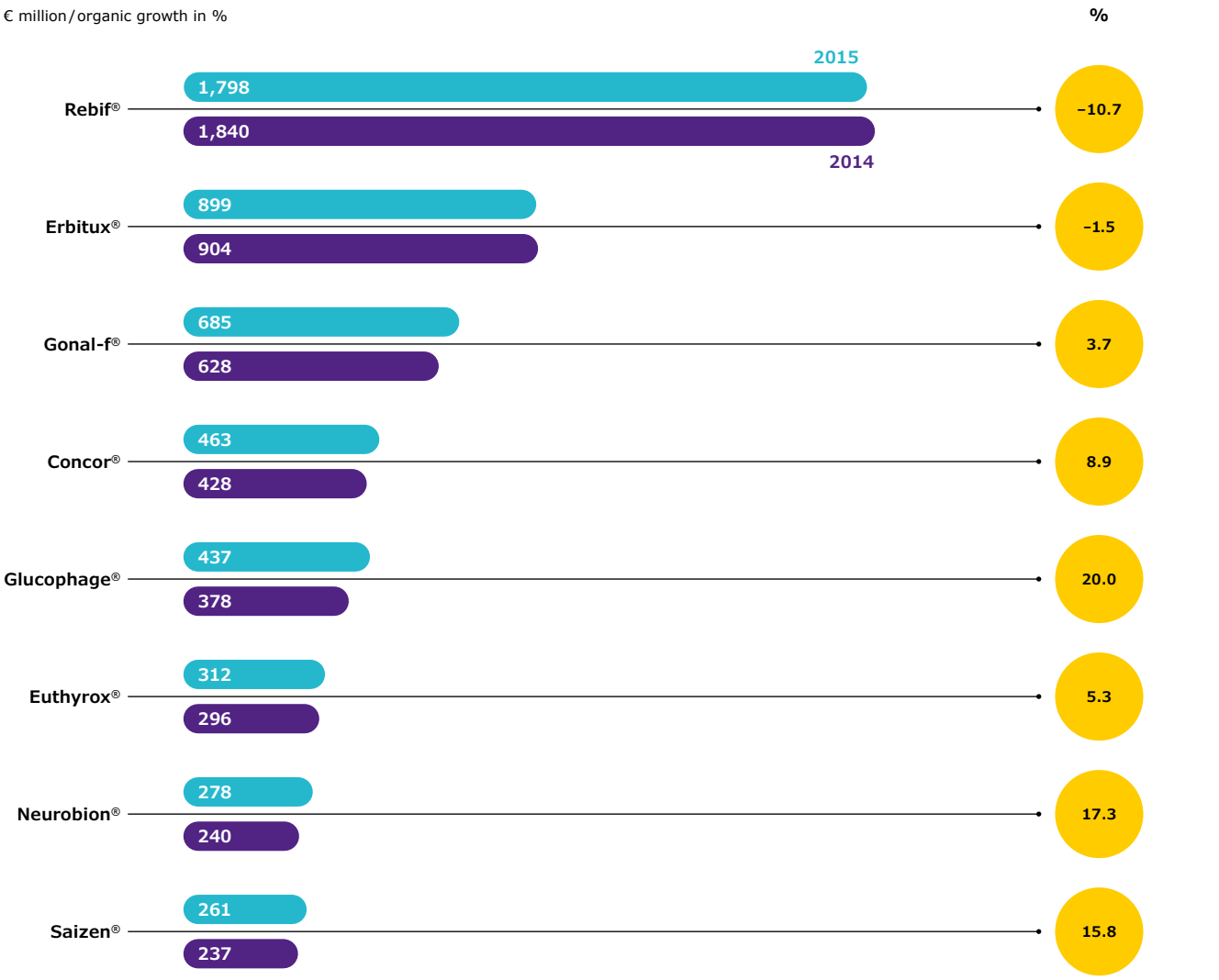
Net sales components by region – 2015

€ million/change in %	Net sales	Organic growth	Exchange rate effects	Acquisitions/ divestments	Total change
Europe	2,729.4	–1.7	–0.4	–	–2.1
North America	1,430.4	–6.1	16.8	–	10.7
Asia-Pacific (APAC)	1,302.2	10.4	10.7	–	21.2
Latin America	1,021.7	8.4	–11.8	–	–3.5
Middle East and Africa (MEA)	450.1	7.6	2.8	–	10.5
Healthcare	**6,933.8**	**1.6**	**3.1**	**–**	**4.7**

Net sales and organic growth rates of the key products developed in 2015 as follows:

HEALTHCARE

Product sales and organic growth



Sales of Rebif®, which is used to treat relapsing forms of multiple sclerosis, declined organically by –10.7% in 2015 due to continued competitive pressure from oral formulations. Amid currency tailwinds of 8.5%, Rebif® sales amounted to € 1,798 million (2014: € 1,840 million).

North America generated 58% of Rebif® sales (2014: 53%) and is the largest market for this product. Owing to the strength of the U.S. dollar (currency effect: +16.7%), this region reported a strong increase in Rebif® sales to € 1,042 million (2014: € 971 million). Despite price increases in 2015, sales declined organically by –9.4% compared with 2014 due to the difficult market environment.

In Europe, which accounts for 34% of sales (2014: 38%) and is the second-largest region for the product, sales of Rebif® declined organically by –13.0% to € 605 million due to competition (2014: € 698 million).

Together, the remaining regions Latin America, Middle East and Africa, and Asia-Pacific accounted for an 8% share of sales (2014: 9%).

At € 899 million, Group sales of the oncology drug Erbitux® in 2015 were at the previous year's level (2014: € 904 million). The slight organic sales decline of –1.5% was partly offset by positive exchange rate effects of 0.9%.

In Europe, which accounted for 55% (2014: 56%) of Erbitux® sales and is thus the top-selling region for this product, sales declined organically by –1.4%, mainly owing to the competitive situation and customary price decreases. Including negative currency effects (–0.1%), sales amounted to € 496 million (2014: € 504 million).

The Asia-Pacific region, which contributed a 29% (2014: 27%) share of Erbitux® sales, generated an increase in sales to € 265 million (2014: € 240 million). Both organic growth of 1.6% and currency tailwinds of 9.0% had a positive impact on the development of sales.

In Latin America, the business sector generated net sales of € 87 million with Erbitux® (2014: € 112 million). The overall −22.2% decline in sales was mainly attributable to the negative currency effects in Venezuela and an organic sales decline in Brazil. This region's contribution to total Erbitux® sales thus decreased to 10% (2014: 12%).

In the Middle East and Africa region, sales amounted to € 50 million and were thus slightly higher than in 2014.

HEALTHCARE

Product sales and organic growth of Rebif® and Erbitux® by region – 2015

		Total	Europe	North America	Asia-Pacific (APAC)	Latin America	Middle East and Africa (MEA)
Rebif®	€ million	1,798.1	605.3	1,041.5	16.3	76.5	58.5
	Organic growth in %	−10.7	−13.0	−9.4	−9.0	−7.4	−11.4
	% of sales	100	34	58	1	4	3
Erbitux®	€ million	898.7	496.4	–	265.2	87.3	49.8
	Organic growth in %	−1.5	−1.4	–	1.6	−10.0	1.1
	% of sales	100	55	–	29	10	6

In 2015, the Healthcare business sector of our company generated organic sales growth of 3.7% with Gonal-f®, the leading recombinant hormone used in the treatment of infertility. Including positive currency effects, sales rose to € 685 million (2014: € 628 million). Sales of this medicine showed the strongest growth in the Asia-Pacific region. The other products in the Fertility franchise also developed positively.

Sales by the Endocrinology franchise, which mainly consists of products to treat metabolic and growth disorders, amounted to € 461 million, thus considerably exceeding the year-earlier figure of € 394 million. The reported sales increase reflected good organic growth of 9.9% and a positive foreign exchange impact of 7.2%. Sales of the growth hormone Saizen®, the top-selling product of this franchise, saw an organic increase of 6.7% and positive foreign exchange effects of 3.4%. Consequently, sales amounted to € 261 million (2014: € 237 million).

General Medicine (including CardioMetabolic Care), which commercializes products to treat cardiovascular diseases and diabetes, among other things, generated organic sales growth of 7.4%. Including negative foreign exchange effects of −1.2%, mainly in Venezuela, sales amounted to € 1,849 million (2014: € 1,742 million).

Glucophage®, which is used for the treatment of diabetes, also delivered a strong organic sales increase of 20.0%. Including negative foreign exchange effects, sales climbed to € 437 million (2014: € 378 million). Organic sales growth was mainly achieved in Europe and the Middle East and Africa region.

In 2015, the Consumer Health business delivered a very strong organic increase of 10.2% with sales of over-the-counter pharmaceuticals. Including negative exchange rate effects of −1.4%, sales amounted to € 833 million (2014: € 766 million). Organic sales growth was mainly generated in Latin America. Here, the growth rate was 11.6% and was especially bolstered by demand for the strategic brands Neurobion® and Dolo-Neurobion®, as well as local brands.

The results of operations developed as follows:

HEALTHCARE

Result of operations[1]

€ million	2015	in %	2014	in %	Change € million	Change in %
Net sales	**6,933.8**	**100.0**	**6,620.5**	**100.0**	**313.3**	**4.7**
Cost of sales	–1,442.4	–20.8	–1,370.5	–20.7	–71.9	5.3
(of which: amortization of intangible assets)[2]	*(–0.9)*		*(–)*		*(–0.9)*	*(–)*
Gross profit	**5,491.4**	**79.2**	**5,250.0**	**79.3**	**241.4**	**4.6**
Marketing and selling expenses	–2,801.3	–40.4	–2,550.8	–38.5	–250.5	9.8
(of which: amortization of intangible assets)[2]	*(–565.8)*		*(–555.4)*		*(–10.4)*	*(1.9)*
Administration expenses	–259.4	–3.7	–246.9	–3.7	–12.5	5.1
Research and development costs	–1,310.1	–18.9	–1,366.0	–20.6	55.9	–4.1
(of which: amortization of intangible assets)[2]	*(–1.5)*		*(–1.0)*		*(–0.5)*	*(50.0)*
Other operating expenses and income	–23.9	–0.3	20.1	0.3	–44.0	–
Operating result (EBIT)	**1,096.7**	**15.8**	**1,106.4**	**16.7**	**–9.7**	**–0.9**
Depreciation/amortization/impairment losses/ reversals of impairment losses	873.7	12.6	840.0	12.7	33.7	4.0
(of which: exceptionals)	*(90.3)*		*(4.7)*		*(85.6)*	–
EBITDA	**1,970.4**	**28.4**	**1,946.4**	**29.4**	**24.0**	**1.2**
Restructuring costs	30.4		51.5		–21.1	–40.8
Integration costs/IT costs	0.9		2.4		–1.5	–61.6
Gains/losses on the divestment of businesses	–		–		–	–
Acquisition-related exceptionals	–		–		–	–
Other exceptionals	–		–		–	–
EBITDA pre exceptionals	**2,001.7**	**28.9**	**2,000.3**	**30.2**	**1.4**	**0.1**

[1] The reporting structure has changed, see "Information on segment reporting" in the Notes to the Group accounts.
[2] Excluding amortization of internally generated or separately acquired software.

Gross profit of our Healthcare business sector rose by € 241 million to € 5,491 million (2014: € 5,250 million), resulting in a gross margin of 79.2% (2014: 79.3%). Due to ongoing investments in growth markets as well as currency effects, marketing and selling expenses were higher in 2015 than in 2014.

The business sector's research spending ratio decreased to 18.9% (2014: 20.6%). The decline in research and development costs was mainly due to one-time effects in connection with the discontinuation of clinical development projects that had increased research and development costs in 2014.

The development of other operating expenses and income (net) in 2015 was mainly due to one-time effects in 2014. On the one hand, the adjustment of provisions for litigation following the settlement with Israel Bio-Engineering Project Limited Partnership (IBEP) led to higher income in 2014 whereas, on the other hand, the discontinuation of the aforementioned clinical development projects led to impairments of intangible assets. In 2015, income generated in connection with the alliance entered into with Pfizer in 2014 to co-develop and co-commercialize active ingredients in immuno-oncology had a positive impact.

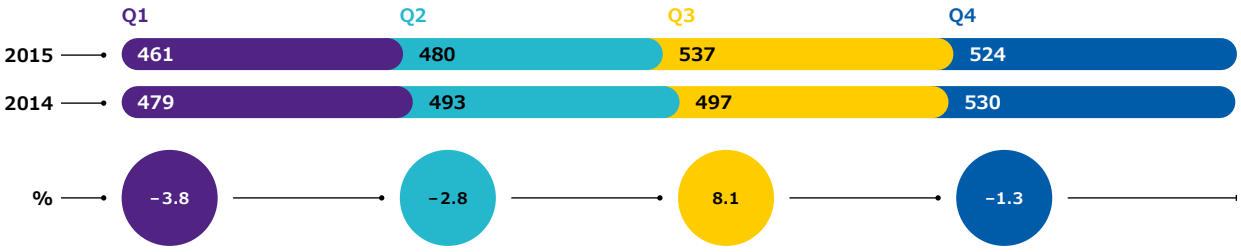
After adjusting for depreciation, amortization and exceptionals, EBITDA pre exceptionals, the key financial indicator used to steer operating business, amounted to € 2,002 million (2014: € 2,000 million), which was thus at the previous year's level. The EBITDA margin pre exceptionals declined to 28.9% (2014: 30.2%).

The development of EBITDA pre exceptionals in the individual quarters in comparison with 2014 is presented in the following overview:

HEALTHCARE

EBITDA pre exceptionals and change by quarter[1]

€ million/change in %



[1] Quarterly breakdown unaudited.

Development of business free cash flow

In 2015, business free cash flow of our Healthcare business sector amounted to € 1,581 million, falling short of the previous year's level of € 1,701 million. The decline of € 120 million was mainly due to higher investments and the high amount of capital tied up in receivables.

HEALTHCARE

Business free cash flow

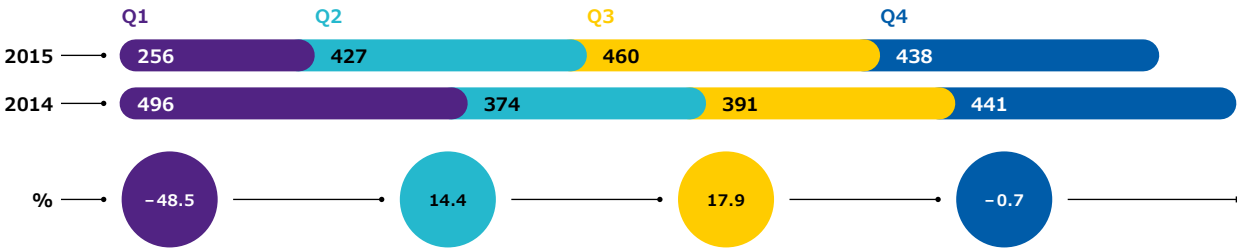
€ million	2015	2014	Change in %
EBITDA pre exceptionals	2,001.7	2,000.3	0.1
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–289.1	–240.0	20.4
Changes in inventories	–26.7	–42.4	–37.0
Changes in trade accounts receivables as well as receivables from royalties and licenses	–104.9	–16.7	–
Business free cash flow	**1,581.0**	**1,701.2**	**–7.1**

The development of business free cash flow in the individual quarters in comparison with 2014 is presented in the following overview:

HEALTHCARE

Business free cash flow and change by quarter[1]

€ million/change in %



[1] Quarterly breakdown unaudited.

Life Science

LIFE SCIENCE

Key figures

€ million	2015	2014	Change in %
Net sales[1]	3,355.3	2,682.5	25.1
Operating Result (EBIT)	300.8	289.2	4.0
Margin (% of net sales)[1]	9.0	10.8	
EBITDA	674.3	598.9	12.6
Margin (% of net sales)[1]	20.1	22.3	
EBITDA pre exceptionals	856.1	658.6	30.0
Margin (% of net sales)[1]	25.5	24.6	
Business free cash flow	675.6	419.0	61.2

[1] The composition of net sales has changed, see "Information on segment reporting" in the Notes to the Group accounts.

Development of sales and results of operations

2015 was another successful year for our Life Science business sector. Net sales grew by 25.1% to € 3,355 million (2014: € 2,682 million), stemming from strong organic growth of 6.5%; positive exchange rate effects of 8.4% primarily related to the development of the U.S. dollar; and 10.2% from acquisitions and divestments.

All three business areas contributed to the organic growth of our Life Science business sector in 2015. In particular, Process Solutions generated double-digit organic sales growth of 11.6% owing to price increases and higher sales volumes. Lab Solutions continued to perform well, posting organic growth of 3.1%. The Bioscience business area, which provides products and services to support life science research for pharmaceutical, biotechnological and academic research laboratories, reported an organic increase of 0.7%.

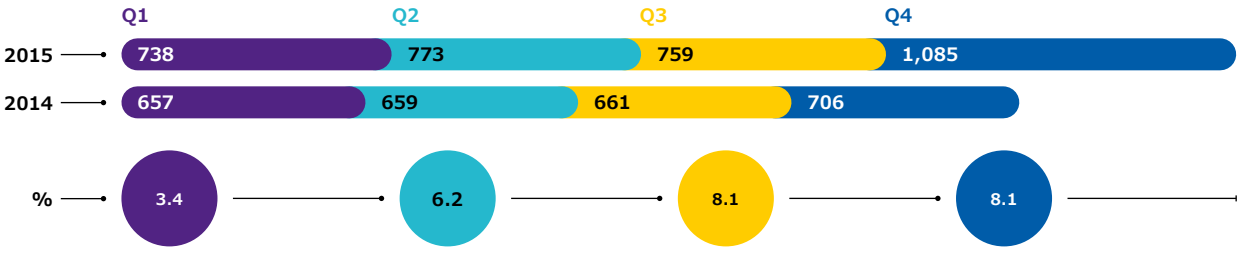
During the period from November 18, 2015 to December 31, 2015, Sigma-Aldrich contributed sales of € 279 million. This was slightly lowered by the divestment of the Discovery and Development Solutions business field in the first quarter of 2014.

The development of net sales in the individual quarters in comparison with 2014 as well as the respective organic growth rates are presented in the following overview:

LIFE SCIENCE

Net sales and organic growth by quarter[1]

€ million / organic growth in %

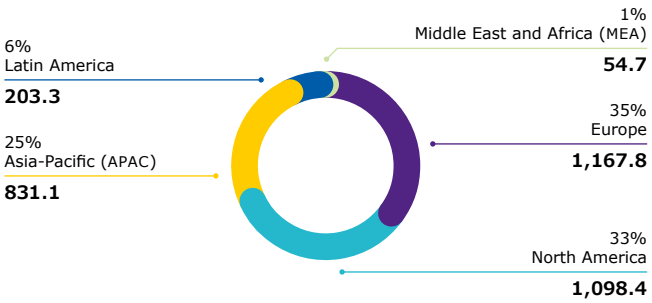


[1] Quarterly breakdown unaudited.

LIFE SCIENCE

Net sales by region – 2015

€ million/% of net sales of the business sector



Compared with 2014, the geographic breakdown of Life Science sales changed as a result of different regional growth trends and the Sigma-Aldrich acquisition.

Europe remained the business sector's largest geographic market, generating sales of € 1,168 million (2014: € 1,036 million), or 35% of Life Science sales (2014: 39%). The organic sales increase of 5.6% in this region was mainly attributable to the Process Solutions business area.

In North America, Life Science achieved organic growth of 8.5%, which was driven by the Process Solutions business area and its products for biopharmaceutical manufacturing processes, with contributions from Lab Solutions and Bioscience as well. Sales in North America rose to € 1,098 million (2014: € 725 million). This region's share of Life Science sales thus increased from 27% in 2014 to 33% in 2015.

The Asia-Pacific region continued to perform well, delivering organic growth of 5.5%. Sales rose sharply particularly in major Asian countries such as China, India, Singapore, and South Korea. Sales increased to € 831 million (2014: € 681 million), which represents 25% (2014: 25%) of Life Science net sales.

Sales developed very well in the Latin America region, which grew organically by 7.8%. The organic sales development was fueled by good demand for Process Solutions and Lab Solutions products. Latin America's share of Life Science sales slightly decreased to 6% (2014: 7%).

In the Middle East and Africa region, sales showed moderate organic growth of 3.1%, representing 1% (2014: 2%) of Life Science net sales.

Sales attributable to the Sigma-Aldrich acquisition had a positive impact across all regions, particularly in North America.

Lastly, exchange rate effects boosted sales in all regions with the exception of Latin America, where currency headwinds of –3.4% partly offset the increases stemming from organic growth and acquisitions.

LIFE SCIENCE

Net sales components by region – 2015

€ million/change in %	Net sales	Organic growth	Exchange rate effects	Acquisitions/ divestments	Total change
Europe	1,167.8	5.6	1.7	5.4	12.7
North America	1,098.4	8.5	19.8	23.2	51.5
Asia-Pacific (APAC)	831.1	5.5	10.4	6.1	22.1
Latin America	203.3	7.8	–3.4	2.5	6.9
Middle East and Africa (MEA)	54.7	3.1	0.3	5.3	8.7
Life Science	**3,355.3**	**6.5**	**8.4**	**10.2**	**25.1**

The Process Solutions business area, which markets products and services for the entire pharmaceutical production value chain, generated organic sales growth of 11.6%, which was the highest rate within our Life Science business sector. Including a positive foreign exchange effect of 9.8% and the 0.5% decrease in sales due to the divestment of the Drug Discovery Solutions business field in the first quarter of 2014, sales amounted to € 1,430 million in 2015 (2014[1]: € 1,183 million). Process Solutions thus accounted for 43% of Life Science net sales (2014: 44%). The increase was driven by higher demand for products used in biopharmaceutical production, especially in the United States, western Europe, and a few Asian countries, as well as by the very positive development of sales to the pharmaceutical industry in 2015.

Lab Solutions, which accounted for a 36% (2014: 41%) share of Life Science net sales, delivered healthy organic sales growth of 3.1% with its broad range of products for researchers and scientific laboratories. Organic growth was mainly driven by higher demand for biomonitoring solutions, particularly from customers in the pharmaceutical industry, as well as for Lab Water products and by price increases across the portfolio. Including positive exchange rate effects of 6.2%, sales amounted to € 1,196 million (2014[1]: € 1,094 million).

[1] Previous year's figures have been adjusted owing to an internal reorganization.

The Bioscience business area recorded a slight organic increase of 0.7%. Including a positive foreign exchange effect of 10.4%, sales amounted to € 450 million (2014[1]: € 405 million). This growth was primarily driven by a recovery in demand in the United States and good sales performance of Separation & Preparation products, as well as hardware demand in Molecular Cell Biology. The share of sales accounted for by Bioscience in 2015 was 13% (2014: 15%).

The first-time consolidation of Sigma-Aldrich on November 18 boosted Life Science sales by € 279 million, accounting for 8% of the business sector's net sales.

LIFE SCIENCE

Net sales components by business area – 2015

€ million/change in %	Net sales	Organic growth	Exchange rate effects	Acquisitions/ divestments	Total change
Bioscience	450.3	0.7	10.4	–	11.1
Lab Solutions	1,196.3	3.1	6.2	–	9.3
Process Solutions	1,429.7	11.6	9.8	–0.5	20.9
Sigma-Aldrich	279.0	–	–	–	–

The results of operations developed as follows:

LIFE SCIENCE

Result of operations[2]

					Change	
€ million	**2015**	**in %**	2014	in %	€ million	in %
Net sales	**3,355.3**	**100.0**	**2,682.5**	**100.0**	**672.8**	**25.1**
Cost of sales	–1,482.8	–44.2	–1,168.7	–43.6	–314.1	26.9
(of which: amortization of intangible assets)[3]	*(–50.7)*		*(–47.6)*		*(–3.1)*	*(6.6)*
Gross profit	**1,872.5**	**55.8**	**1,513.8**	**56.4**	**358.7**	**23.7**
Marketing and selling expenses	–1,038.5	–31.0	–859.8	–32.1	–178.7	20.8
(of which: amortization of intangible assets)[3]	*(–197.2)*		*(–151.8)*		*(–45.4)*	*(29.9)*
Administration expenses	–151.1	–4.5	–110.4	–4.1	–40.7	36.9
Research and development costs	–197.5	–5.9	–162.6	–6.1	–34.9	21.4
(of which: amortization of intangible assets)[3]	*(–0.5)*		*(–)*		*(–0.5)*	*(–)*
Other operating expenses and income	–184.6	–5.5	–91.8	–3.4	–92.8	101.1
Operating result (EBIT)	**300.8**	**9.0**	**289.2**	**10.8**	**11.6**	**4.0**
Depreciation/amortization/impairment losses/ reversals of impairment losses	373.5	11.1	309.7	11.5	63.8	20.6
(of which: exceptionals)	*(0.6)*		*(–)*		*(0.6)*	*(–)*
EBITDA	**674.3**	**20.1**	**598.9**	**22.3**	**75.4**	**12.6**
Restructuring costs	6.8		11.9		–5.1	–43.0
Integration costs/IT costs	43.0		31.6		11.4	35.9
Gains/losses on the divestment of businesses	–		–0.4		0.4	–
Acquisition-related exceptionals	132.0		16.6		115.4	–
Other exceptionals	–		–		–	–
EBITDA pre exceptionals	**856.1**	**25.5**	**658.6**	**24.6**	**197.5**	**30.0**

[1] Previous year's figures have been adjusted owing to an internal reorganization.
[2] The reporting structure has changed, see "Information on segment reporting" in the Notes to the Group accounts.
[3] Excluding amortization of software either produced in-house or purchased individually.

Gross profit amounted to € 1,872 million (2014: € 1,514 million), equivalent to an increase of 23.7%. This very strong increase was driven by a manufacturing site optimization program, a price increase initiative and a favorable product mix. This development was also positively impacted by exchange rate effects and the Sigma-Aldrich acquisition.

In addition to the Sigma-Aldrich acquisition, Life Science continued to execute its growth strategy by investing in commercial operations and developing new products. Marketing and selling expenses increased by 20.8% to € 1,038 million (2014: € 860 million) while R&D expenses grew by 21.4%. Part of this increase was also driven by the stronger U.S. dollar since a significant portion of our Life Science operations is located in the United States. Other operating expenses and income increased significantly to € 185 million (2014: € 92 million) due to the Sigma-Aldrich acquisition, integration costs and restructuring activities.

After eliminating depreciation and amortization, EBITDA rose by 12.6% to € 674 million (2014: € 599 million).

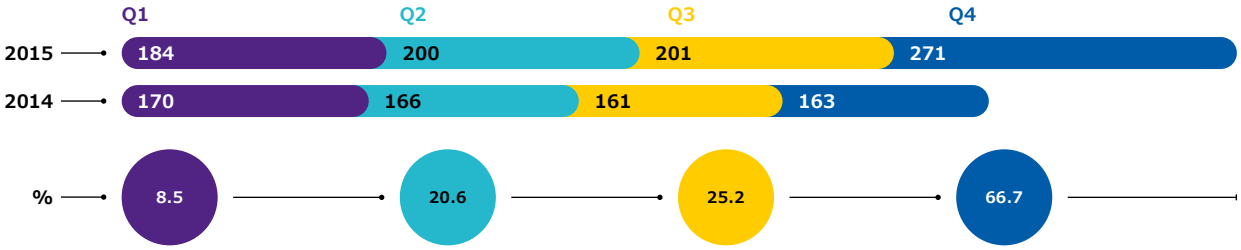
Adjusted for exceptionals, EBITDA pre exceptionals rose by 30.0% to € 856 million, or 25.5% of net sales (2014: € 659 million, 24.6% of net sales). Consequently, the key financial indicator rose more sharply than sales (+25.1%) thanks to the execution of efficiency initiatives, leveraging of Life Science capabilities and competencies, and the Sigma-Aldrich acquisition. The improvement in the EBITDA margin pre exceptionals reflects strong organic sales growth, a favorable product mix, exchange rate effects, and strict cost control.

The development of EBITDA pre exceptionals in the individual quarters in comparison with 2014 is presented in the following overview:

LIFE SCIENCE

EBITDA pre exceptionals and change by quarter[1]

€ million / change in %



[1] Quarterly breakdown unaudited.

Development of business free cash flow

In 2015, business free cash flow of the Life Science business sector of our company rose by 61% or € 257 million to € 676 million. This very strong increase was primarily due to the positive development of EBITDA pre exceptionals.

LIFE SCIENCE

Business free cash flow

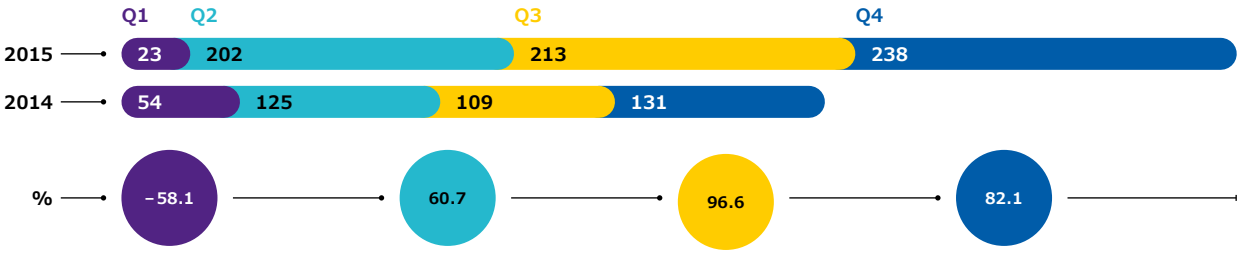
€ million	2015	2014	Change in %
EBITDA pre exceptionals	856.1	658.6	30.0
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–149.9	–141.0	6.3
Changes in inventories	–850.1	–44.2	–
Changes in trade accounts receivables as well as receivables from royalties and licenses	–375.4	–54.4	–
Adjustments first-time consolidation of Sigma-Aldrich	1,194.8	–	–
Business free cash flow	**675.6**	**419.0**	**61.2**

The development of business free cash flow items in the individual quarters in comparison with 2014 is presented in the following overview:

LIFE SCIENCE

Business free cash flow and change by quarter[1]

€ million / change in %



[1] Quarterly breakdown unaudited.

Performance Materials

PERFORMANCE MATERIALS

Key figures

€ million	2015	2014	Change in %
Net sales[1]	2,555.6	2,059.8	24.1
Operating Result (EBIT)	878.0	611.5	43.6
Margin (% of net sales)[1]	34.4	29.7	
EBITDA	1,120.4	803.6	39.4
Margin (% of net sales)[1]	43.8	39.0	
EBITDA pre exceptionals	1,132.1	894.8	26.5
Margin (% of net sales)[1]	44.3	43.4	
Business free cash flow	930.8	699.6	33.0

[1] The composition of net sales has changed, see "Information on segment reporting" in the Notes to the Group accounts.

Development of net sales and results of operations

In 2015, net sales of the Performance Materials business sector of our company grew by 24.1% to € 2,556 million (2014: € 2,060 million). This double-digit sales increase was mainly due to the significantly positive currency effect of 13.1%, stemming primarily from the strong U.S. dollar, the leading transaction currency in the Performance Materials business. Revenues from acquired businesses also contributed considerably to the strong sales growth (+ 10.4%). These acquisition-related sales effects were largely attributable to AZ Electronic Materials (AZ), acquired in May 2014. In addition, the first-time consolidation of the SAFC Hitech business of Sigma-Aldrich acquired in November 2015 contributed around € 10 million to the sales increase in our Performance Materials business sector. Organically, sales were at the previous year's level (+ 0.6%), based on stable business performance, to which all business units contributed.

The Display Materials business unit, which was established at the beginning of 2015 and consists of our liquid crystals business and the business with the complementary display materials from the acquisition of AZ, represents more than 60% of the net sales of Performance Materials. In 2015, this business unit recorded a slight organic sales decline, however it solidified its global market leadership position. The doubling of the business with the energy-saving UB-FFS technology could not fully compensate for the accelerated decline in volumes of the mature LC technology TN-TFT. The leading active-matrix technologies PS-VA and IPS generated stable sales.

For the Pigments & Functional Materials business unit, 2015 was a stable year with sales at the previous year's level. In contrast to the continuing success story of the high-quality Xirallic® pigments for automotive coatings, a comparatively sharp decline in sales was recorded for Iriodin® pigments used in plastics and printing applications.

The Integrated Circuit Materials (ICM) business unit includes the former AZ business with materials used to manufacture integrated circuits and the SAFC Hitech business of Sigma-Aldrich acquired in November 2015. The business unit recorded a slight organic sales increase – mainly fueled by strong growth of the business with dielectric materials for chip manufacture.

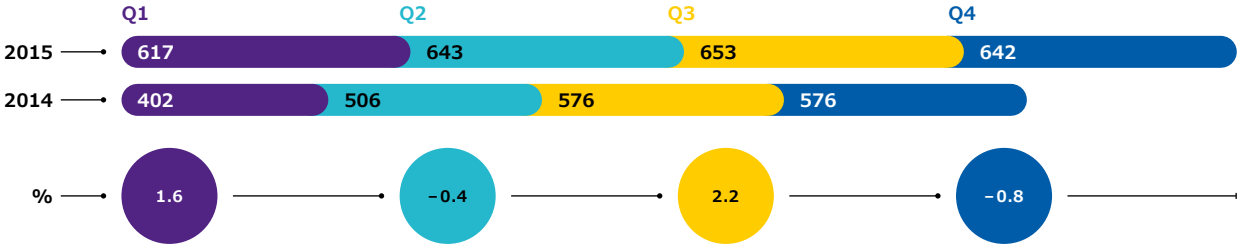
The Advanced Technologies business unit achieved the highest growth rates within our Performance Materials business sector. Special mention should be made of the dynamic development of the OLED materials business.

The development of net sales in the individual quarters in comparison with 2014 as well as the respective organic growth rates are presented in the following overview:

PERFORMANCE MATERIALS

Net sales and organic growth by quarter[1]

€ million / organic growth in %

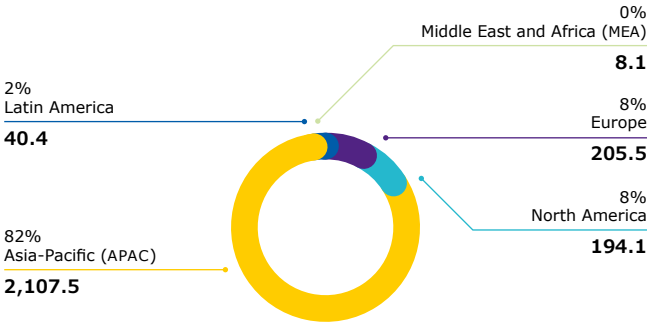


[1] Quarterly breakdown unaudited.

PERFORMANCE MATERIALS

Net sales by region – 2015

€ million / % of net sales of the business sector



Accounting for a stable 82% share, the Asia-Pacific region again generated the vast majority of the business sector's net sales. This is attributable to the concentration of customers for display and integrated circuit materials in Asia. In this region, the business sector achieved significant sales growth of 24.9%, mainly due to acquisition and currency effects. Organically, sales were stable (+0.8%); however, increases in OLED and dielectric IC materials were almost canceled out by declines in the Display Materials business unit. This led to net sales of € 2,107 million (2014: € 1,688 million), underscoring the sustainable strength of our Performance Materials business sector in the strategically important Asia-Pacific region.

In Europe, Performance Materials generated net sales of € 206 million (2014: € 193 million). The rise in sales was mainly attributable to acquisition-related effects due to the first-time consolidation of AZ on May 2, 2014. Organically, sales declined slightly in 2015, mainly as a result of weaker demand for cosmetic actives as well as pigments for plastics and printing applications.

In North America, due to acquisition and exchange rate effects, net sales climbed to € 194 million (2014: € 135 million). Organically, regional sales decreased by –2.2%. This was mainly attributable to the weaker demand in Pigments & Functional Materials, particularly pigments for plastics and printing applications.

Since they account for a low proportion of sales, the two regions Latin America and Middle East and Africa (MEA) only played a subordinate role. Latin America recorded double-digit organic growth, albeit a low level of net sales. Organic growth was generated by strong increases in the Pigments & Functional Materials business unit.

PERFORMANCE MATERIALS

Net sales components by region – 2015

€ million/change in %	Net sales	Organic growth	Exchange rate effects	Acquisitions/ divestments	Total change
Europe	205.5	–1.6	0.5	7.6	6.5
North America	194.1	–2.2	18.1	28.0	43.9
Asia-Pacific (APAC)	2,107.5	0.8	14.6	9.5	24.9
Latin America	40.4	20.7	–10.1	0.6	11.1
Middle East and Africa (MEA)	8.1	–10.0	2.2	10.4	2.6
Performance Materials	**2,555.6**	**0.6**	**13.1**	**10.4**	**24.1**

The results of operations developed as follows:

PERFORMANCE MATERIALS

Result of operations[1]

					Change	
€ million	**2015**	**in %**	2014	in %	€ million	in %
Net sales	**2,555.6**	**100.0**	**2,059.8**	**100.0**	**495.8**	**24.1**
Cost of sales	–1,151.4	–45.1	–983.2	–47.7	–168.2	17.1
(of which: amortization of intangible assets)[2]	*(–114.9)*		*(–46.4)*		*(–68.5)*	*(147.8)*
Gross profit	**1,404.2**	**54.9**	**1,076.6**	**52.3**	**327.6**	**30.4**
Marketing and selling expenses	–207.8	–8.1	–178.8	–8.7	–29.0	16.2
(of which: amortization of intangible assets)[2]	*(–16.0)*		*(–11.7)*		*(–4.3)*	*(36.4)*
Administration expenses	–63.1	–2.5	–56.1	–2.7	–7.0	12.6
Research and development costs	–197.0	–7.7	–170.6	–8.3	–26.4	15.4
(of which: amortization of intangible assets)[2]	*(–0.7)*		*(–2.8)*		*(2.1)*	*(–76.4)*
Other operating expenses and income	–58.3	–2.3	–59.6	–2.9	1.3	–2.3
Operating result (EBIT)	**878.0**	**34.4**	**611.5**	**29.7**	**266.5**	**43.6**
Depreciation/amortization/impairment losses/ reversals of impairment losses	242.4	9.5	192.1	9.3	50.3	26.2
(of which: exceptionals)	*(–)*		*(–)*		*(–)*	*(–)*
EBITDA	**1,120.4**	**43.8**	**803.6**	**39.0**	**316.8**	**39.4**
Restructuring costs	1.8		6.0		–4.2	–70.3
Integration costs/IT costs	15.0		12.2		2.8	24.4
Gains/losses on the divestment of businesses	–5.8		4.6		–10.4	–
Acquisition-related exceptionals	0.7		68.4		–67.7	–99.0
Other exceptionals	–		–		–	–
EBITDA pre exceptionals	**1,132.1**	**44.3**	**894.8**	**43.4**	**237.3**	**26.5**

[1] The reporting structure has changed, see "Information on segment reporting" in the Notes to the Group accounts.
[2] Excluding amortization of internally generated or separately acquired software.

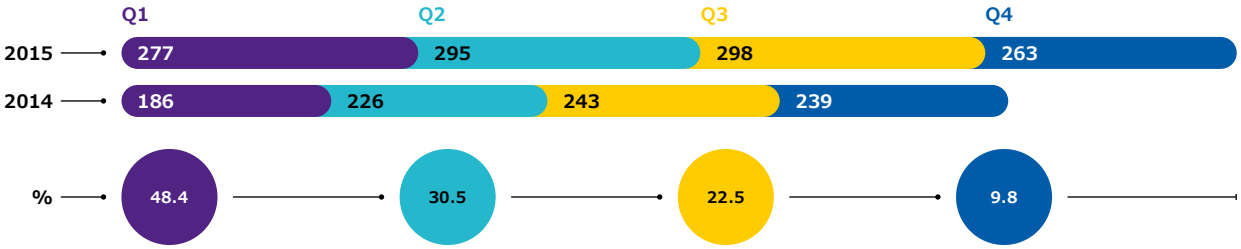
The increase in gross profit was attributable to favorable exchange rate effects and good business performance. In addition, the AZ Electronic Materials business acquired in May 2014 and the SAFC Hitech business from the Sigma-Aldrich acquisition in November 2015 contributed to the improvement in gross profit. Within the scope of the first-time consolidation, in 2014 the acquired AZ inventories were stepped up to fair values and recognized as an expense in cost of sales. Overall, this resulted in an increase in the gross margin in 2015 to 54.9% (2014: 52.3%). The operating result (EBIT) rose by € 267 million to € 878 million in 2015 (2014: € 611 million). Consequently, both good operating business performance and positive exchange rate effects increased EBITDA pre exceptionals by 26.5% to € 1,132 million (2014: € 895 million). The EBITDA margin pre exceptionals improved to 44.3% in 2015 (2014: 43.4%).

The development of EBITDA pre exceptionals in the individual quarters in comparison with 2014 is presented in the following overview:

PERFORMANCE MATERIALS

EBITDA pre exceptionals and change by quarter[1]

€ million / change in %



[1] Quarterly breakdown unaudited.

Development of business free cash flow

In 2015, the Performance Materials business sector of our company generated business free cash flow of € 931 million, which represents a significant year-on-year increase of € 231 million (2014: € 700 million). This was mainly attributable to the strong improvement in EBITDA pre exceptionals.

PERFORMANCE MATERIALS

Business free cash flow

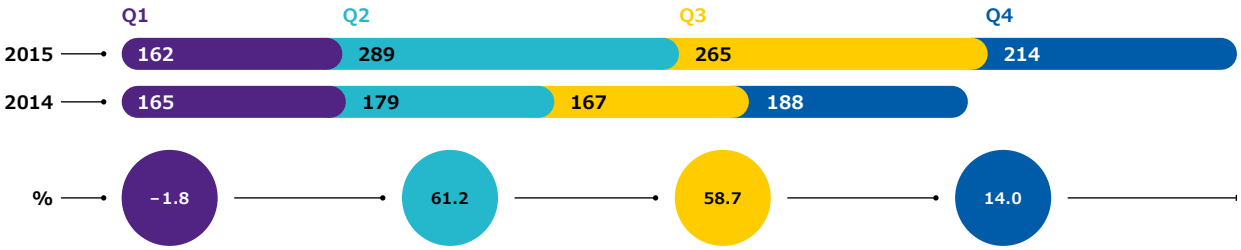
€ million	2015	2014	Change in %
EBITDA pre exceptionals	1,132.1	894.8	26.5
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–109.4	–97.6	12.1
Changes in inventories	–83.2	–98.8	–15.8
Changes in trade accounts receivable and receivables from royalties and licenses	–33.6	–143.4	–76.5
Adjustments first-time consolidation of AZ Electronic Materials	–	144.6	–
Adjustments first-time consolidation of Sigma-Aldrich	24.9	–	–
Business free cash flow	**930.8**	**699.6**	**33.0**

The development of business free cash flow items in the individual quarters in comparison with 2014 is presented in the following overview:

PERFORMANCE MATERIALS

Business free cash flow and change by quarter[1]

€ million / change in %



[1] Quarterly breakdown unaudited.

Corporate and Other

Corporate and Other comprises Group administration expenses for Group functions that cannot be directly allocated to the business sectors, such as Finance, Procurement, Legal, Communications, and Human Resources. Corporate costs additionally encompass expenses for central, non-allocated IT functions, including expenses related to the expansion and harmonization of IT systems within the Group.

CORPORATE AND OTHER

Key figures

€ million	**2015**	2014	Change in %
Operating result (EBIT)	–432.3	–245.1	76.3
EBITDA	–411.0	–226.0	81.8
EBITDA pre exceptionals	–360.1	–166.0	116.9
Business free cash flow	–421.2	–214.7	96.2

In 2015, administration expenses reported under Corporate and Other amounted to € 246 million (2014: € 195 million). Other operating expenses (net) rose to € –180 million (2014: € –42 million). This was due primarily to the development of the foreign currency result from operating activities. Whereas foreign currency gains of € 53 million were reported in 2014, a loss of € –72 million was incurred in 2015. Taking these effects into account, in 2015 EBIT amounted to € –432 million (2014: € –245 million) and EBITDA was € –411 million (2014: € –226 million). Adjusted for one-time effects, EBITDA pre exceptionals totaled € –360 million (2014: € –166 million). This had a significant impact on the development of business free cash flow, which dropped to € –421 million in 2015 (2014: € –215 million).

REPORT ON RISKS AND OPPORTUNITIES

Risks and opportunities are inherent to entrepreneurial activity. We have put systems and processes in place to identify risks at an early stage and to counteract them by taking appropriate action. Within the company, opportunity management is an integral component of internal decision-making processes such as short- and medium-term operational planning and intra-year business plans.

Risk and opportunity management

We are part of a complex, global business world and is therefore exposed to a multitude of external and internal influences. Every business decision is therefore based on the associated risks and opportunities.

In our internal risk reporting, risks are defined as possible future events or developments that could lead to a negative deviation from our (financial) targets. In parallel, opportunities are defined as possible events or developments that imply a positive deviation from our planned (financial) targets. Identified future events and expected developments are taken into account in internal planning provided that it can be assumed that their occurrence is likely in the planning period. The risks and opportunities presented in the following risk and opportunities report are those possible future events that could respectively lead to a negative or positive deviation from the topics covered by planning.

Risk management process

The objective of our risk management activities is to recognize, assess and manage risks early on and to implement appropriate measures to minimize them. The responsibilities, objectives and processes of risk management are described in our internal risk management guidelines. The business heads, managing directors of our subsidiaries, and the heads of Group functions are specified as employees with responsibility for risks. The group of consolidated companies for risk reporting purposes is the same as the group of consolidated companies for the consolidated financial statements. Every six months, the risk owners assess their risk status and report their risk portfolio to Risk Management. We use special risk management software in the context of these activities.

If risk-mitigating measures can be taken, their impact on risk is also assessed. The residual risk after the implementation of mitigation measures is presented in the internal risk report as net risk. The planned timeframe for implementation and the assumed mitigation effect are tracked by Group Risk Management.

Group Controlling & Risk Management forms the organizational framework for risk management and reports directly to the Group Chief Financial Officer. Group Risk Management uses the information reported to determine the current risk portfolio for the Group, presenting this in a report to the Executive Board, the Supervisory Board and the Finance Committee with detailed explanations twice per year. Furthermore, significant changes in the assessment of the risks already known and new significant risks can be reported at any time and are communicated to the corporate bodies on an ad hoc basis.

In the standard process a lower limit for reporting risks is set at a value of € 5 million and for the ad hoc process at a value of € 25 million. Risks below these limits are steered independently within the business sectors. The relevant timeframe for internal risk reporting is five years. The effects of risks described in this report on risks and opportunities are presented as annual values. The assessment of the risks presented relates to December 31, 2015. There were no relevant changes after the end of the reporting period that would have necessitated an amended presentation of the risk situation of the Group.

Within the scope of audits, Group Internal Auditing regularly reviews the performance of risk management processes within the units and, at the same time, the communication of relevant risks from the operating businesses to Group Risk Management.

Opportunity management process

The risk management system described concentrates on business risks, and not on opportunities at the same time. The opportunity management process is integrated into our internal controlling processes and carried out in the operating units on the basis of the Group strategy. The businesses analyze and assess potential market opportunities as part of strategy and planning processes. In this connection, investment opportunities are examined and prioritized primarily in terms of their potential value proposition in order to ensure an effective allocation of resources. We selectively invest in growth markets to leverage the opportunities of dynamic development and customer proximity at a local level.

If the occurrence of the identified opportunities is rated as likely, they are incorporated into the business plans and the short-term forecasts. Trends going beyond this or events that could lead to a positive development in the net assets, financial position and results of operations are presented in the following report as opportunities. These could have a positive effect on our medium-term prospects and lead to a positive deviation from forecasts.

Risk and opportunity assessment

Risks

The significance of risks is calculated on the basis of their possible negative impact on the forecast financial targets in conjunction with the probability of occurrence of the respective risk. In line with these two factors, risks are classified as "high", "medium" or "low".

The underlying scales for measuring these factors are shown below:

PROBABILITY OF OCCURRENCE

Probability of occurrence	Explanation
< 20%	Unlikely
20 – 50%	Possible
51 – 80%	Likely
> 80%	Very likely

DEGREE OF IMPACT

Degree of impact	Explanation
> € 50 million	Critical negative impact on the net assets, financial position and results of operations
€ 20–50 million	Substantial negative impact on the net assets, financial position and results of operations
€ 5 – < 20 million	Moderate negative impact on the net assets, financial position and results of operations
< € 5 million	Immaterial negative impact on the net assets, financial position and results of operations

The combination of the two factors results in the risk matrix below, which shows the individual risks and their significance to the Group.

RISK MATRIX

> € 50 million	Medium	Medium	High	High
€ 20 – 50 million	Medium	Medium	Medium	High
€ 5 – < 20 million	Low	Medium	Medium	Medium
< € 5 million	Low	Low	Low	Low
Impact / Probability of occurrence	< 20%	20 – 50%	51 – 80%	> 80%

Opportunities

Opportunities are assessed in their respective specific business environment. Marketing measures for operational planning are usually quantified in relation to sales, EBITDA pre exceptionals and business free cash flow. Net present value, internal rate of return, the return on capital employed (ROCE), and the amortization period of the investment are primarily used to assess and prioritize investment opportunities. Similarly, scenarios are frequently set up to simulate the influence of possible fluctuations and changes in the respective factors on results. There is no overarching, systematic classification of the probability of occurrence and impact of opportunities.

Internal control system for the Group accounting process

The objective of the internal control system for the accounting process is to implement controls that provide assurance that the financial statements are prepared in compliance with the relevant accounting laws and standards. It covers measures designed to ensure the complete, correct and timely conveyance and presentation of information that is relevant for the preparation of the consolidated financial statements and the management report.

Key tools

The internal control system is geared to ensuring the accuracy of the consolidated accounting process and the implementation of internal controls for the preparation of compliant financial statements with reasonable assurance. The Group Accounting function centrally steers the preparation of the consolidated financial statements of Merck KGaA, Darmstadt, Germany, as the parent company of the Group. This Group function defines the reporting requirements that our subsidiaries must meet as a minimum requirement. At the same time, this function steers and monitors the scheduling and process-related requirements of the consolidated financial statements. Group-wide accounting guidelines form the basis for the preparation of the statutory financial statements of the parent company and of the subsidiaries, which are reported to Group Accounting; the guidelines are adapted in a timely manner to reflect changes in the financial regulatory environment and are updated in accordance with internal reporting requirements. Intra-group transactions are eliminated during the consolidation process. This gives rise to the need for a mirrored entry at the corresponding subsidiaries that is monitored during the consolidation process.

Group Accounting also ensures the timely central management of changes to the equity holding structure and correspondingly adapts the Group's scope of consolidation. The individual companies have a local internal control system. Where financial processes are handled by a Shared Service Center, the internal control system of the Shared Service Center is additionally applied. Both ensure that accounting complies with IFRS (International Financial Reporting Standards) and with the Group accounting guidelines.

Group Accounting provides support to the local contacts and ensures a consistently high quality of reporting throughout the entire reporting process.

The accounting process is designed at all levels to ensure a clearly defined segregation of duties and assignment of responsibilities to the units involved in the accounting process at all times within the scope of dual control.

For the assessment of balance sheet items, Group Accounting closely cooperates with Group Risk Management in order to correctly present potential balance sheet risks. For special issues, such as the measurement of intangible assets within the scope of company acquisitions or pension obligations, external experts are additionally involved where necessary. For the Group accounting process, we use a standard SAP software tool in most countries. Via a detailed authorization concept to limit user rights on a need-to-have basis, and in line with the principles of the separation of duties, the system contains both single-entity reporting and the consolidated financial statements.

The effectiveness of our internal control system with regard to accounting and the compliance of financial reporting by the individual companies is confirmed by both the local managing director and the local chief financial officer when they sign the single-entity reporting. All the structures and processes described are subject to regular review by Group Internal Auditing based on an annual audit plan set out by the Executive Board. The results of these audits are dealt with by the Executive Board, the Supervisory Board and the Finance Committee.

The internal control system at our company makes it possible to lower the risk of material misstatements in accounting to a minimum. However, no internal control system – regardless of its design – can entirely rule out a residual risk.

Business-related risks and opportunities

Political and regulatory risks and opportunities

As a global company, we face political and regulatory changes in a large number of countries and markets.

Risk of more restrictive regulatory requirements regarding drug pricing, reimbursement and approval

In our Healthcare business sector, the known trend towards increasingly restrictive requirements in terms of drug pricing, reimbursement and approval is continuing. These requirements can negatively influence the profitability of our products, also through market referencing between countries, and jeopardize the success of market launches and new approvals. Close communication with health and regulatory authorities serves as a preventive measure to avert risks. The effects of corresponding risks are taken into account as best possible in the business sector's plans.

Risk of stricter regulations for the manufacture, testing and marketing of products

Likewise, in our Life Science and Performance Materials business sectors, we must adhere to a multitude of regulatory specifications regarding the manufacture, testing and marketing of many of our products. Specifically in the European Union, we are subject to the European chemicals regulation REACH. It demands comprehensive tests for chemical products. Moreover, the use of chemicals in production could be restricted, which would make it impossible to continue manufacturing certain products. We are constantly pursuing research and

development in substance characterization and the possible substitution of critical substances so as to reduce the occurrence of this risk, and therefore view it as unlikely. Nevertheless, it is classified as a medium risk given its critical negative impact on the net assets, financial position and results of operations.

Risk of destabilization of political systems and the establishment of trade barriers

The destabilization of political systems as for example in Ukraine and the Middle East and the possible establishment of trade barriers as well as foreign exchange policy changes can lead to declines in sales in certain countries and regions. Diversification in terms of products, industries and regions enables the mitigation of potential negative effects. The effects of corresponding risks are taken into account to the best of ability in the business plans for the countries and regions concerned. In particular, our business can furthermore be affected by macroeconomic developments in, for example, Venezuela, Argentina, Brazil, Russia, and Greece. Corresponding sales strategy measures have been introduced in these countries to minimize the impact on business. Nevertheless, the remaining possible net risk could have critical negative effects on the net assets, financial position and results of operations and therefore we rate this as a medium risk.

Market risks and opportunities

We compete with numerous companies in the pharmaceutical, chemical and life science sectors. Rising competitive pressure can have a significant impact on the quantities sold and prices attainable for our products.

Opportunities due to the further development of the Biosimilars business

Over the past three and a half years, we have moved forward with the development of our own Biosimilars business with a focus on the therapeutic areas of oncology and autoimmune diseases. Apart from the development of our own active ingredients, we entered into a partnership with Dr. Reddy's Laboratories Ltd., Hyderabad, India, among others, to co-develop a portfolio of biosimilars in oncology. Moreover, in 2014 we established a partnership in the Brazilian market with Bionovis SA, Barueri, Brazil to develop a portfolio of biosimilars. Significant contributions to sales by the Biosimilars business unit are not to be expected before the medium to long term. However, the expenditure required for the development of this business unit has already been taken into account in today's planning.

Opportunities due to new technologies in the manufacture of displays

We see opportunities in the medium- to long-term possibilities of significant market growth of OLED applications in high-quality display applications. We are building on more than ten years of experience in manufacturing organic light-emitting diode (OLED) materials as well as a strong portfolio of worldwide patents in order to develop ultrapure and extremely stable materials that are precisely tailored to customer requirements. The development in the OLED market is being driven by the diversification of applications for OLED displays. OLED technology is an established alternative to LCDs in small-area displays, for instance smartphones. However, owing to technological advances, OLED technology is increasingly being used in more and more large-area displays, such as televisions. High-quality lighting applications, for example for automobiles, offer further growth potential for OLEDs. In order to make the mass production of large-area OLED displays more efficient, we have been cooperating since the end of 2012 with Seiko Epson Corporation to enable printing processes for OLED displays. To support the expected market growth, we are investing around € 30 million in a new OLED production unit at the Darmstadt site, where we will start manufacturing ultra-high-purity OLED materials for applications in modern displays and lighting systems as of summer 2016. We made a further investment of around € 7 million to construct a new OLED Application Center (OAC) in Korea, which was inaugurated in May 2015. With the OAC, we are securing competitive advantages since it enables us to better meet the needs of Korean customers and to correspondingly shorten the time to market launch.

Moreover, within the framework of partnerships with display manufacturers, start-ups and universities, progress has been made in the realization of shapeable displays. Through the application of flexible organic electronics, an entirely glass-free plastic LC display that is both bendable and extremely robust has been developed.

Lastly, we fully acquired the Israeli company Qlight Nanotech Ltd., Tel Aviv, Israel in order to actively support technological advances in the display industry. This move is expected to strengthen the further development of quantum materials for display applications.

Opportunities due to new application possibilities for liquid crystals

We are pursuing a strategy of leveraging our expertise as the global market leader in liquid crystals in order to develop new fields of application for innovative liquid crystal technologies, e.g. liquid crystal windows (LCWs), mobile antennas or liquid crystal displays (LCDs). With the acquisition of our long-standing cooperation partner Peer+ B.V., we are further advancing the development of the future-oriented market for LCWs. Thanks to licrivision™ technology, LCWs create new architectural possibilities. Through progressive brightness control, they can for example increase a building's energy efficiency.

Antennas that can receive signals transmitted in the high frequency range (e.g. Ka and Ku band) can also be realized with the aid of corresponding liquid crystal mixtures. As a result, mobile data exchange could improve significantly in a wide variety of fields of application. Since novel liquid crystal materials for antennas are currently being developed, the

market launch of liquid crystal antennas could still take a few years. New application opportunities for liquid crystals could have medium- to long-term positive effects on the financial indicators of our Performance Materials business sector.

Opportunities from the launch of our new branding
In October 2015, we announced that we had relaunched our branding and in this context presented our new visual appearance and new logo to the public. Our new branding reflects our transformation into a science and technology company while at the same time ensuring that we operate uniformly under our corporate brand worldwide, with the exception of the United States and Canada.

Through this step, we will be uniformly and widely visible. Due to the higher recognition and the brand strengthening we are aiming for, potential new business opportunities could arise. Moreover, stronger customer ties could have positive effects on our business and financial results. However, since the new brand must first be established, the effects on our business will only be possible in the medium to long term.

Opportunities from leveraging the e-commerce and distribution platform
With the acquisition of Sigma-Aldrich we have gained access to the leading life science e-commerce platform. Our customers are already benefiting from an offering of more than 300,000 products including highly respected brands distributed via this e-commerce platform. Our goal is to expand this platform and to continuously increase the number of products available on it. Making ordering processes faster and more convenient for our customers could lead to higher sales volumes and enable us to reach new customers. If this opportunity materializes, our net sales could increase faster than expected.

Risk due to increased competition and customer technology changes
In our Healthcare business sector, both our biopharmaceutical products and classic pharmaceutical business are exposed to increased competition from rival products (in the form of biosimilars and generics). In our Life Science and Performance Materials business sectors, risks are posed not only by cyclical business fluctuations but also, particularly with respect to liquid crystals, by changes in the technologies used or customer sourcing strategies. We use close customer relationships and in-house further developments as well as precise market analyses as mitigating measures. Overall, owing to its possible occurrence with a critical negative impact, the market risk is classified as a medium risk.

Risks and opportunities of research and development
For us, innovation is a major element of the Group strategy. Research and development projects can experience delays, expected budgets can be exceeded, or targets can remain unmet. Research and development activities are of special importance to our Healthcare business sector. In the course of portfolio management, we regularly evaluate and, if necessary, refocus research areas and all R&D pipeline projects.

Special mention should be made of the strategic alliance formed in 2014 between our company and Pfizer Inc. as a research and development opportunity in our Healthcare business sector. By making the required investments jointly and combining their strengths and expertise, Pfizer and we will maximize the potential value of the research compound MSB0010718C, an anti-PD-L1 antibody that we developed. Owing to the relatively long cycles in active ingredient development, we expect that positive effects of this alliance will be reflected in the sales and profitability of our Healthcare business sector in the medium to long term. By contrast, expenses currently being incurred particularly in the research and development units of our Healthcare business sector are already reflected in the latest plans. The same applies to the pro rata recognition of deferred income from Pfizer's upfront payment.

Risks of discontinuing development projects and regulatory approval of developed medicines
Sometimes development projects are discontinued after high levels of investment at a late phase of clinical development. Decisions – such as those relating to the transition to the next clinical phase – are taken with a view to minimizing risk. Furthermore, there is the risk that the regulatory authorities either do not grant or delay approval, which can have an impact on earnings. Additionally, there is the danger that undesirable side effects of a pharmaceutical product could remain undetected until after approval or registration, which could result in a restriction of approval or withdrawal from the market. We are currently not aware of any risks beyond general development risks that could significantly affect the net assets, financial position and results of operations.

Risks and opportunities of product quality and availability

Risk of a temporary ban on products/production facilities or of non-registration of products due to non-compliance with quality standards
We are required to comply with the highest standards of quality in the manufacture of pharmaceutical products (Good Manufacturing Practice). In this regard we are subject to the supervision of the regulatory authorities. Conditions imposed by national regulatory authorities could result in a temporary ban on products/production facilities, and possibly affect new registrations with the respective authority. We take the utmost effort to ensure compliance with regulations, regularly perform our own internal inspections and also carry out external audits. Thanks to these quality assurance processes, the occurrence of a risk is unlikely, however cannot be entirely ruled out. Depending on the product concerned and the severity of the objection, such a risk can have a critical negative impact on the net assets, financial position and results of operations. Therefore, we rate this as a medium risk.

Risks of dependency on suppliers
Quality controls along the entire value chain reduce the risks related to product quality and availability. This starts with the qualification of our suppliers. Quality controls also include comprehensive quality requirements for raw materials, purchased semi-finished products and plants. We are dependent on individual suppliers of precursor products for some of our main products. In the event that one of these suppliers curtails or discontinues production, or supply is disrupted, this could potentially have a critical impact on the business concerned. With long-term strategic alliances for precursor products critical to supply and price as well as alternative sourcing strategies, we reduce the probability of occurrence of these risks and rate them as unlikely. Overall, these are classified as medium risks.

Damage and product liability risks
Further risks include the risk of operational failures due to force majeure, for example natural disasters such as floods or earthquakes, which could lead to a substantial interruption or restriction of business activities. Insofar as it is possible and economical to do so, the Group limits its damage risks with insurance coverage, the nature and extent of which is constantly adapted to current requirements. Although the occurrence of these risks is considered unlikely, an individual event could have a critical negative effect on the net assets, financial position and results of operations and is therefore classified as a medium risk.

Companies in the chemical and pharmaceutical industries are exposed to product liability risks in particular. Product liability risks can lead to considerable claims for damages and costs to avert damages. We have taken out the liability insurance that is standard in the industry for such risks. However, it could be that the insurance coverage available is insufficient for individual cases. Although the occurrence of product liability claims in excess of the existing insurance coverage is considered unlikely, individual cases could still have a critical negative effect on the net assets, financial position and results of operations. We therefore rate a potential product liability risk as a medium risk.

Risks due to product-related crime and espionage
Owing to our portfolio, we are exposed to a number of sector-specific crime risks. This relates primarily to products, including among other things, counterfeiting, illegal channeling, misuse as well as all types of property crime, including attempts at these crimes. Crime phenomena such as cybercrime and espionage could equally affect our innovations or innovation abilities as such.

To combat product-related crime, an internal coordination network covering all functions and businesses (“Merck KGaA, Darmstadt, Germany, Anti-Counterfeiting Operational Network”) was set up several years ago. In addition, security measures are in use to protect products against counterfeiting. Innovative technical security solutions and defined preventive approaches are used to ward off dangers relating to cybercrime and espionage. Measures to prevent risks and to prosecute identified offenses are conducted in all the relevant crime areas in close and trustworthy cooperation with the responsible authorities.

The impact of these risks on business operations depends on the respective individual case, product-specific factors, the value chain, as well as on regional aspects in particular. Group Security is responsible for the overall coordination of all measures in this area. Overall, the threat resulting from crime in general is seen as being possible and is classified as a medium risk.

Opportunities due to an expanding local presence in high-growth markets
We continue to assume that in the coming years, the markets of Asia, the Middle East, Latin America, and Africa will be of above-average importance to the growth of all the business sectors. In order to further use this potential for our businesses, we have moved forward with several investment projects in recent years. These include for example the construction of our new OLED Application Center in Korea and a new production facility for liquid crystals as well as the establishment of a new Biopharma site in China. Moreover, we are strengthening our activities in Africa through strategic investments as well as geographic expansion in selected regions. The greater local presence and customer proximity could give us a key competitive edge and, in the medium to long term, offers the opportunity for significant growth in sales and EBITDA pre exceptionals.

Financial risks and opportunities

As a corporate group that operates internationally and due to our presence in the capital market, we are exposed to various financial risks and opportunities. Above all, these are liquidity and counterparty risks, financial market risks and opportunities, risks of fluctuations in the market values of operational tangible and intangible assets, as well as risks and opportunities from pension obligations.

Risk and opportunity management in relation to the use of financial instruments

In the area of financial risks and opportunities, we use an active management strategy to reduce the effects of fluctuations in exchange and interest rates. The management of financial risks and opportunities by using derivatives in particular is regulated by extensive guidelines. Speculation is prohibited. Derivative transactions are subject to constant risk controls. A strict separation of functions between trading, settlement and control functions is ensured.

Liquidity risks

In order to ensure its continued existence, a company must be able to fulfill its commitments from operating and financial activities at all times. We therefore have a central Group-wide liquidity management process to reduce potential liquidity risks. Furthermore, we have a multi-currency revolving credit facility of € 2 billion with a term of five years, which ensures continuing solvency if any liquidity bottlenecks occur. As our loan agreements do not contain any financial covenants, these agreed lines of credit can be accessed even if our credit rating should deteriorate. Additionally, we have a commercial paper program with a maximum volume of € 2 billion as well as a debt issuance program that forms the contractual basis for the issue of bonds with a maximum volume of € 15 billion.

The acquisition of Sigma-Aldrich (US$ 17 billion) was financed by cash on hand, diverse euro and U.S. dollar bonds, as well as various bilateral loans and a syndicated credit line with a bank consortium. The financing instruments are to be successively repaid in the coming years. Overall, the liquidity risk is rated as low.

Counterparty risks

Counterparty risks arise from the potential default by a partner in connection with financial investments, loans and financing commitments on the one hand and receivables in operating business on the other.

As for counterparty risks from financial transactions, we review all positions relating to trading partners and their credit ratings on a daily basis. We manage financial risks of default by diversifying our financial positions and through the related active management of our trading partners. Significant financial transactions involving credit risk are entered into with banks and industrial companies that have a good credit rating. Moreover, our large banking syndicate – the multi-currency revolving credit facility of € 2 billion was syndicated by 19 banks – reduces possible losses in the event of default.

The solvency and operational development of trading partners is regularly reviewed as part of the management of operational counterparty risks. Sovereign risks are also analyzed. The volume of receivables of each customer is capped in line with their credit ratings. Risk-mitigating measures, such as credit insurance, are utilized as appropriate. Nevertheless, defaults by isolated trading partners, even those with outstanding credit ratings, cannot be entirely ruled out, although rated as unlikely (further information can be found in “Credit risks” under “Management of financial risks” in the Notes to the Group accounts).

Counterparty risk is classified as a medium risk overall owing to the unlikely probability of occurrence with a potential critical negative effect.

Financial market opportunities and risks

As a result of our international business activities and global corporate structure, we are exposed to risks and opportunities from fluctuations in exchange rates. These result from financial transactions, operating receivables and liabilities, as well as forecast future cash flows from sales and costs in foreign currency. We use derivatives to manage and reduce the aforementioned risks and opportunities (further information can be found in “Derivative financial instruments” in the Notes to the Group accounts). Due to their possible occurrence with a potentially critical negative effect on the net assets, financial position and results of operations, foreign exchange rate risks are rated as medium risk.

Future refinancing and cash investments are exposed to the risks and opportunities of interest rate fluctuations. These are also managed and reduced using derivatives. Following the issue of multiple fixed-interest financing instruments within the context of the Sigma-Aldrich acquisition, interest rate risks have declined. They have a potentially moderate negative impact, are considered unlikely and pose low risks overall.

Risks of impairment of balance sheet items

The carrying amounts of individual balance sheet items are subject to the risk of changing market and business conditions and thus to changes in fair values as well. Necessary impairments could have a significant negative non-cash impact on earnings and affect the accounting ratios. This applies in particular to the high level of intangible assets including goodwill, which mainly derive from the purchase price allocations made in connection with past acquisitions (further information can be found under “Intangible assets” in the Notes to the Group accounts). All relevant risks were assessed during the preparation of the consolidated financial statements and taken into account accordingly. We rate risks beyond this as low.

Risks and opportunities from pension obligations

We have commitments in connection with pension obligations. The present value of defined benefit obligations can be significantly increased or reduced by changes in the relevant valuation parameters, for example the interest rate or future salary increases. Pension obligations are regularly assessed as part of annual actuarial reports. Some of these obligations are

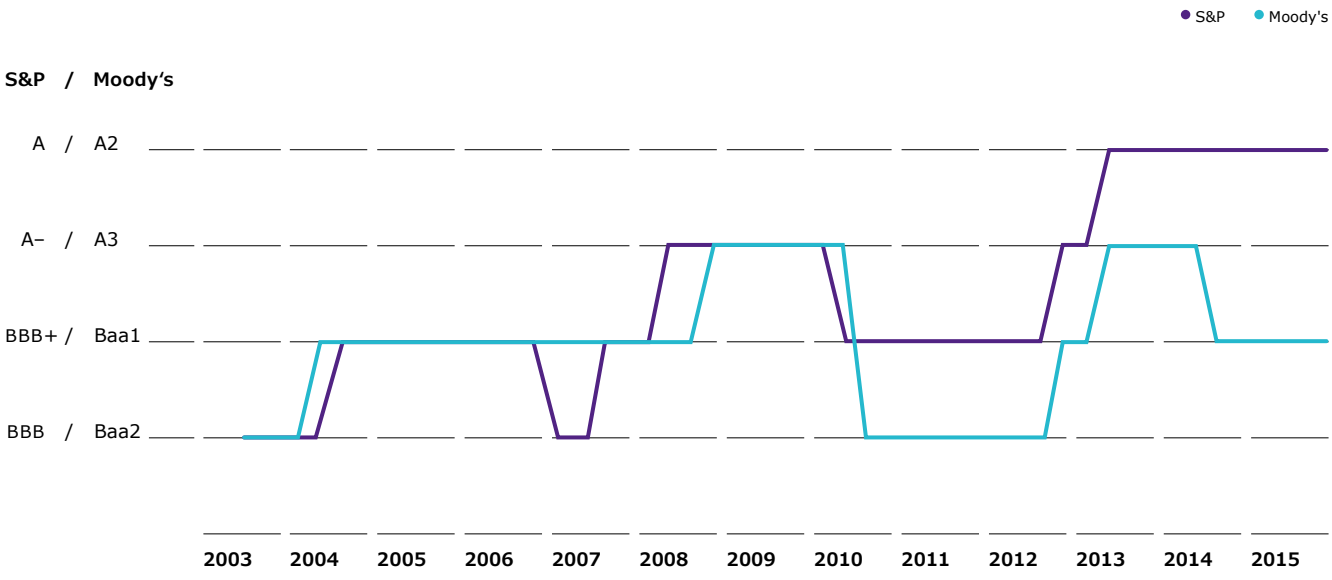
covered by the pension provisions reported in the balance sheet, while other obligations are funded by plan assets (further information can be found under "Provisions for pensions and other post-employment benefits" in the Notes to the Group accounts). To the extent that pension obligations are covered by plan assets consisting of interest-bearing securities, shares, real estate, and other financial assets, decreasing or negative returns on these assets can adversely affect the fair value of plan assets and thus result in further additions to pension provisions. By contrast, rising returns increase the value of plan assets, thereby resulting in excess cover of plan liabilities. We increase the opportunities of fluctuations in the market value of plan assets on the one hand and reduce the risks on the other by using a diversified investment strategy. The possible risk due to pension obligations could have a moderate negative impact on the net assets, financial position and results of operations, and is classified as a medium risk.

Assessments by independent rating agencies

The capital market uses the assessments published by rating agencies to help lenders assess the risks of a financial instrument. We are currently rated by the agencies Standard & Poor's and Moody's. While Standard & Poor's issued a long-term rating of A with a negative outlook, Moody's issued a Baa1 rating with a negative outlook. The latest drop in the Moody's rating by one grade in 2014 as well as the negative outlook of both rating agencies is due to the higher debt level following the Sigma-Aldrich transaction. In line with market procedures, our financing conditions are closely tied to our rating. The better a rating, the more favorably we can generally raise funds on the capital market or from banks.

REPORT ON RISKS AND OPPORTUNITIES

Overview of rating development



Legal risks

Generally, we strive to minimize and control our legal risks. To this end, we have taken the necessary precautions to identify threats and defend our rights where necessary.

Nevertheless, we are still exposed to litigation risks or legal proceedings. In particular, these include risks in the areas of product liability, competition and antitrust law, pharmaceutical law, patent law, tax law, and environmental protection. As a research-based company, we have a valuable portfolio of industrial property rights, patents and brands that could become the target of attacks and infringements. The outcome of future proceedings or those currently pending is difficult to foresee. Generally, due to long statutes of limitations or in some cases the absence thereof, it is not possible to rule out that we will face third-party claims arising from the same issue despite the conclusion of legal proceedings. Court or official rulings or settlements can lead to expenses with a significant impact on our business and earnings.

Tax risks are reviewed regularly and systematically by Group Tax. Corresponding standards and guidelines are used in order to identify tax risks at an early stage as well as to review, evaluate and correspondingly minimize them. Risk reduction measures are coordinated by Group Tax together with the subsidiaries abroad.

In our opinion, the lawsuits described below constitute the most significant legal risks. This should not be seen as an exhaustive list of all legal disputes currently ongoing.

Risks from product-related and patent law disputes

We are involved in a patent dispute in the United States with Biogen IDEC Inc. (Massachusetts, USA) (“Biogen”). Biogen claims that the sale of Rebif® in the United States infringes on a Biogen patent. The disputed patent was granted to Biogen in 2009 in the United States. Subsequently, Biogen sued us and other pharmaceutical companies for infringement of this patent. Our company defended itself against all allegations and brought a countersuit claiming that the patent was invalid and not infringed on by our actions. A Markman hearing took place in January 2012, however a decision has not yet been announced. The parties are currently engaged in court-ordered mediation proceedings that have not yet officially ended. It is currently not clear when a first-instance decision will be made. We have taken appropriate accounting measures. Given the potential critical negative effects of the legal dispute on the financial position in the event of a negative decision, we nevertheless classify this as a high risk.

In our Performance Materials business sector we have negotiated with a competitor regarding potential patent infringements. We maintain that the competitor’s patent infringement assertion is invalid owing to relevant prior art and have filed the corresponding nullity actions. The competitor has meanwhile filed two patent infringement lawsuits. We are prepared for a confrontation in this issue and have taken appropriate measures. Nevertheless, a potentially critical negative impact on the financial position cannot be ruled out.

Risks due to antitrust and other government proceedings

Raptiva®: In December 2011, the federal state of São Paulo sued us for damages because of alleged collusion between various pharmaceutical companies and an association of patients suffering from psoriasis and vitiligo. This collusion is alleged to have been intended to increase sales of the medicines from the companies involved to the detriment of patients and state coffers. Moreover, patients are also suing for damages in connection with the product Raptiva®. We have taken appropriate accounting measures for these issues. Risks in excess of this with a substantial negative effect on the net assets, financial position and results of operations cannot be ruled out, but are considered unlikely. This is rated as a medium risk.

In one jurisdiction, we are subject to a government investigation regarding compliance with foreign exchange transfer restrictions. In this connection, the responsible authorities are investigating whether import prices led to impermissibly high foreign exchange transfers. Appropriate accounting measures have been taken for repayments and fines that are estimated to be probable due to the uncertain legal situation in the affected country. We classify this as a medium risk since a substantial negative impact on the financial position cannot be ruled out.

Risks from drug pricing by the divested Generics Group

Paroxetine: In connection with the divested generics business, we are subject to antitrust investigations by the British Competition and Market Authority (CMA) in the United Kingdom. In March 2013, the authorities informed us of the assumption that a settlement agreement entered into in 2002 between Generics (UK) Ltd. and several GlaxoSmithKline companies in connection with the antidepressant drug paroxetine violates British and European competition law. Our company, the then owner of Generics (UK) Ltd., was allegedly involved in the negotiations for the settlement agreement and is therefore liable. The investigations into Generics (UK) Ltd. started in 2011, without this being known to us. On February 11, 2016, the CMA imposed a fine in this matter. We intend to take legal action against this decision and have taken appropriate accounting measures. Given the latest decision, we classify this as a medium risk with a moderate negative impact on the financial position.

Human resources risks

Our future growth is highly dependent on our innovative strength. Therefore, the expertise and engagement of employees in all sectors in which we operate are crucial to the success of the company.

The markets relevant to the company are characterized by intensive competition for qualified specialists and by demographic challenges. Fluctuation risks specific to countries and industries have to be identified ahead of time and specifically addressed in order to keep the skills and expertise critical to success and business within the company.

Recruiting and retaining specialists and talent is therefore one of the key priorities for the company and is managed through the targeted use of, for instance, employer branding initiatives, global talent and succession management processes as well as competitive compensation packages. Nevertheless, employee-related risks that affect business activities are possible, even though their impact is difficult to assess. We rate this as a medium risk.

Information technology risks

We use a variety of IT systems and processes in order to optimally focus and adequately support our globalization. Trends in information technology offer various opportunities but also harbor risks.

Risks due to cybercrime and the failure of business-critical IT applications

Increasing international networking and the related possibility of IT system abuse are resulting in cybercrime risks for us, such as the failure of central IT systems, the disclosure of confidential research and business development data, the manipulation of IT systems in chemical process control, or an increased burden or adverse impact on IT systems as a result of virus attacks. The entire Group has global security guidelines and information protection management for IT and non-IT areas, each with organizational and technical standards for access rights as well as information and data protection, based on ISO 27001.

Additionally, IT applications used globally form the basis for the contractual delivery of products and solutions. The failure of business-critical IT applications could therefore have a direct influence on our ability to deliver; likewise this applies to the failure of a data center. To achieve the required service quality, we use a quality management system certified to ISO 20000:2011. In addition, to reduce the risk of failure, we operate several redundantly designed data centers.

Despite the mitigating measures taken and functional continuity plans, the effects of cybercrime or the failure of business-critical IT applications and their influence on the net assets, financial position and results of operations are considered medium risks owing to possibly substantial impacts.

Environmental and safety risks

As a company with global production operations, we are exposed to risks of possible damage to people, goods and our reputation. Audits, consulting and training on environmental protection and occupational health and safety minimize these risks to people and the environment. In order to ensure the continuity of plant and equipment, we monitor these risks both at our own sites as well as at suppliers and contract manufacturers. By adhering to high technical standards, our rules of conduct and all legal requirements in environmental protection and occupational health and safety, we ensure the preservation of goods and assets. We have taken sufficient appropriate accounting measures for the environmental risks known to us. Nevertheless, we classify these as a high risk since a critical negative impact on the financial position cannot be ruled out.

Risks of the divestment, acquisition and integration of companies and businesses

Irrespective of the fact that acquisitions made in the past have been successfully completed, the risk of conducting the acquisition and integration exists for future transactions, for instance for the current integration of Sigma-Aldrich. This includes, among other things, the inability to meet sales volume targets and higher integration costs than expected, as well as the failure to meet synergy goals. The divestment of companies and businesses can lead to liability vis-à-vis the buyer, for instance through indemnity clauses and guarantee commitments. Through strong due diligence processes and closely managed integration processes, we seek to reduce the probability of occurrence of this risk. Nevertheless, owing to a possible occurrence of this risk with potentially critical negative effects on the net assets, financial position and results of operations, we classify this as a medium risk.

Overall view of the risk and opportunity situation and management assessment

Although the number of risks reported is higher than the specific opportunities identified, we consider the distribution of risks and opportunities to be balanced. A balanced overall view is also supported by the fact that net sales and business success are built on a diverse range of pharmaceutical and chemical products for a variety of industries. As the markets differ in their structure and economic cycles, this diversification helps to lower risk. This diversification is being strengthened by the current acquisition of Sigma-Aldrich and the strategic alliance entered into with Pfizer in 2014.

The most significant individual risks in the businesses have been named in the report above, with business-related risks being the most significant alongside legal risks.

With respect to high and medium risks, certain changes have resulted as the assessment of the individual risks has of course altered over the fiscal year due to changing external and internal conditions, while the overall risk assessment remained stable. Thanks to the risk reduction measures taken – such as the consistent implementation of management action (organizational responsibility and process improvements), existing insurance coverage and accounting precautions – our significant risks in particular have been further minimized in net terms.

The overall view of the risk situation of the Group, which is derived from the summary of the risks described on the basis of their impact and probability of occurrence, leads to the assessment that the risks are not of a nature to threaten the existence of the Group as a going concern. We are confident that we will continue to successfully master the challenges arising from the above risks in the future as well.

In our view, business-related opportunities offer the greatest potential. An important element here is the continuous expansion in Asia, Latin America, Africa, and the Middle East. With the continuing intensification and focusing of our research and development activities, we want to be able to continue to offer our customers innovative products and help shape markets. Moreover, we also consolidate our expertise in numerous alliances, for instance with Pfizer Inc., Seiko Epson, as well as with various universities and start-ups. The topic of innovation is at the forefront of all our activities. Externally, this is becoming particularly apparent through our new Innovation Center at Group headquarters in Darmstadt, which is to develop into a nucleus of creativity at our company. The activities listed hold significant opportunities for us in the medium to long term, beyond the underlying forecast period.

We pursue the opportunities that arise and show their expected effects in the forecast development of our key performance indicators – net sales, EBITDA pre exceptionals and business free cash flow. Furthermore, we will actively seek new opportunities, examine their implementation and drive them forward where appropriate. If opportunities arise in addition to the forecast developments, or these occur more quickly than anticipated, this could have correspondingly positive effects on our net assets, financial position and results of operations.

REPORT ON EXPECTED DEVELOPMENTS

The following report provides a forecast for fiscal 2016 of the development of the Group and its three business sectors: Healthcare, Life Science and Performance Materials. The forecast again covers our key performance indicators as in 2014, namely net sales, EBITDA pre exceptionals and business free cash flow. Subsequent to the successful completion of the Sigma-Aldrich acquisition in November 2015, all forecasts take into account the effects of this acquisition on our businesses.

Forecast for the Group

€ million	Actual results 2015	Forecast for 2016	Key assumptions
Net sales	12,844.7	– Slight organic growth – Portfolio effect amounting to a low double-digit percentage increase	– Slight organic growth in Healthcare despite continued challenging environment for Rebif® – Moderate organic growth in Life Science, with Process Solutions as the main growth driver – Slight organic growth in Performance Materials despite continued price pressure on liquid crystals; strong growth dynamics for OLED and UB-FFS – Positive low double-digit portfolio effect due to the acquisition of Sigma-Aldrich
EBITDA pre exceptionals	3,629.8	– Low double-digit percentage increase taking into account the Sigma-Aldrich portfolio effect	– Additional investments in Healthcare research and development, particularly in immuno-oncology – Scheduled realization of synergies from the Sigma-Aldrich integration – Maintaining the profitability of Performance Materials despite sustained price pressure on liquid crystals
Business free cash flow	2,766.2	– High single-digit percentage increase	– Expected increase in EBITDA pre exceptionals – Further investments in property, plant and equipment within the scope of strategic growth initiatives

Net sales

For the Group, we expect slight organic sales growth in 2016 compared with the previous year. Owing to the acquisition of Sigma-Aldrich, we additionally expect a positive portfolio effect in the low double-digit percentage range. As a global corporate group, we are exposed to currency effects due to the fluctuation of foreign exchange rates. In 2016, we forecast a €/US$ rate of 1.07 – 1.12, which we expect will lead to a positive currency effect compared with 2015. In growth markets, however, especially Latin America, the Group is likely to see a negative development as a result of exchange rate effects. Overall, we expect a slightly negative exchange rate effect for the Group in 2016.

For our Healthcare business sector, we forecast slight organic sales growth in 2016. For Rebif®, Healthcare's top-selling product, we continue to expect a challenging market environment that will lead to a sharp organic decline in net sales. However, we plan to offset this decline through a strong organic increase in growth markets and sales from our co-promotion of Xalkori®. In addition, we expect a slightly negative portfolio effect due to the divestment of Kuvan®.

In our Life Science business sector, we forecast a moderate organic increase in net sales as well as a high double-digit portfolio effect due to the acquisition of Sigma-Aldrich. It is assumed that the strongest driver of growth will be Process Solutions.

We expect that our Performance Materials business sector will achieve slight organic sales growth despite sustained price pressure on liquid crystals, while the UB-FFS and OLED technologies are increasingly becoming the business sector's growth drivers.

EBITDA pre exceptionals

EBITDA pre exceptionals is our key financial indicator to steer operating business. In 2016, owing to the expected operating development and the acquisition of Sigma-Aldrich, we forecast a low double-digit percentage increase of EBITDA pre exceptionals of the Group over the previous year.

For our Healthcare business sector, we expect a low double-digit percentage decline in EBITDA pre exceptionals, primarily as a result of additional investments in research and development (particularly in immuno-oncology). We expect EBITDA pre exceptionals of our Life Science business sector to increase moderately as a result of organic sales growth. Additionally, a high double-digit percentage portfolio effect due to the acquisition of Sigma-Aldrich can be expected. This forecast has already taken into account the scheduled realization of synergies as part of the integration of Sigma-Aldrich. In 2016, EBITDA pre exceptionals of our Performance Materials business sector is forecast to increase slightly, but at least reaching the level of 2015.

Expenses reported under Corporate and Other are expected to increase significantly in 2016 since we plan to further expand future-oriented Group initiatives such as branding and ONE Global Headquarters and also drive forward the digitalization of the company.

Business free cash flow

Business free cash flow of the Group is forecast to show a high single-digit percentage increase in 2016. Apart from an increase in the operating result, we also expect further investments in property, plant and equipment within the scope of strategic growth initiatives.

Forecast for our Healthcare business sector

€ million	Actual results 2015	Forecast for 2016	Key assumptions
Net sales	6,933.8	– Slight organic growth – Slight negative portfolio effect due to the divestment of Kuvan®	– Increase in growth markets and co-promotion of Xalkori® offset Rebif® decline – Negative currency effect, due in particular to Latin American currencies
EBITDA pre exceptionals	2,001.7	– Low double-digit percentage decline taking into consideration commercialization costs, especially for avelumab (excluding market launch costs: high single-digit to mid-teens percentage decline – Negative portfolio effect in the medium double-digit million range due to the divestment of Kuvan®	– Rising research and development costs owing to pipeline development, particularly in immuno-oncology – Absence of commission expenses resulting from the termination of the agreement between Merck KGaA, Darmstadt, Germany, and Pfizer to co-promote Rebif® in the United States – Significant market launch costs, especially for avelumab and cladribine – Negative product mix due to Rebif® decline – Negative currency effect, particularly due to Latin American currencies – Divestment of Kuvan®
Business free cash flow	1,581.0	Low double-digit percentage decline	– Decline in EBITDA pre exceptionals – Stable level of inventories and trade accounts receivable – Further investments in property, plant and equipment within the scope of strategic growth projects

Net sales

We expect slight organic growth of net sales in our Healthcare business sector in 2016 compared with the previous year. We forecast a sharp organic increase in growth markets and higher sales from our co-promotion of Xalkori®. This growth is to offset the expected decline in sales of Rebif®, Healthcare's top-selling product. Since the rights to Kuvan® were returned to BioMarin Pharmaceutical Inc. in January 2016, we additionally forecast a slightly negative portfolio effect in 2016.

EBITDA pre exceptionals

EBITDA pre exceptionals for our Healthcare business sector is likely to see a low double-digit percentage decline. We predict that the focused further development of our pipeline, especially in immuno-oncology, will result in significant research and development costs. By contrast, due to the termination of the agreement between Merck KGaA, Darmstadt, Germany, and Pfizer to co-promote Rebif® in the United States, commission expenses will no longer be incurred. A lower-margin product mix, significant commercialization costs for avelumab and cladribine, and an expected negative currency effect particularly attributable to Latin American currencies will burden the margin of our Healthcare business sector in 2016. Furthermore, since the divestment of Kuvan® will also have a noticeable impact on EBITDA pre exceptionals, we expect a negative portfolio effect in the mid double-digit million range.

Business free cash flow

In 2016, we expect business free cash flow of our Healthcare business sector to show a low double-digit percentage decline over the previous year. The key driver will be the development of EBITDA pre exceptionals. We expect the development of inventories and trade accounts receivable to be at the previous year's level. Likewise, we expect further investments in property, plant and equipment within the scope of strategic growth projects.

Forecast for our Life Science business sector

€ million	Actual results 2015	Forecast for 2016	Key assumptions
Net sales	3,355.3	– Moderate organic growth – High double-digit percentage portfolio effect due to the acquisition of Sigma-Aldrich	– Process Solutions expected to be key growth driver – Research Solutions and Applied Solutions also to contribute to growth to a smaller extent
EBITDA pre exceptionals	856.1	– Moderate increase due to organic sales growth – High double-digit percentage portfolio effect due to the acquisition of Sigma-Aldrich	– In line with the development of sales – Scheduled realization of synergies of € 90 million from the Sigma-Aldrich integration
Business free cash flow	675.6	– High double-digit percentage increase	– Improvement in EBITDA pre exceptionals – Development of inventories and trade accounts receivable in line with net sales growth

Net sales

Overall, we expect moderate organic growth of net sales in the Life Science business sector of our company in 2016 compared with the previous year. Process Solutions is expected to continue to contribute substantially to this growth, benefiting from the sustained growth dynamics of the market for biopharmaceuticals. Research Solutions and Applied Solutions are also expected to contribute to organic sales growth, but to a smaller extent. Owing to the acquisition of Sigma-Aldrich, we expect a portfolio effect in the high double-digit percentage range.

EBITDA pre exceptionals

In 2016, we expect EBITDA pre exceptionals of our Life Science business sector to increase moderately over the previous year as a result of organic growth of net sales. In addition, as a consequence of the acquisition of Sigma-Aldrich, we expect EBITDA pre exceptionals to see portfolio-related growth in the high double-digit percentage range. This forecast already takes into account the scheduled realization of synergies amounting to around € 90 million in 2016.

Business free cash flow

We expect business free cash flow of our Life Science business sector in 2016 to show a high double-digit percentage increase over the previous year. The predicted rise in EBITDA pre exceptionals should be the main driver of this increase. We forecast the development of inventories and trade accounts receivable in line with that of net sales.

Forecast for our Performance Materials business sector

€ million	Actual results 2015	Forecast for 2016	Key assumptions
Net sales	2,555.6	Slight organic growth	– Sustained volume increases in all businesses – Typical price decline in the liquid crystals business – Strong growth dynamics in OLED and UB-FFS
EBITDA pre exceptionals	1,132.1	Slight increase, yet at least at the 2015 level	– Maintaining the profitability of the Liquid Crystals business despite noticeable price decline
Business free cash flow	930.8	Moderate increase	– At least stable EBITDA pre exceptionals – Optimization of inventories

Net sales

We forecast slight organic sales growth in our Performance Materials business sector in 2016 compared with the previous year. All Performance Materials businesses are likely to increase their sales volumes. We assume that the growth dynamics, especially in the businesses with OLED and UB-FFS technologies, will be particularly strong. By contrast, we expect a liquid crystals price decline typical for the market.

EBITDA pre exceptionals

In our estimation, EBITDA pre exceptionals of our Performance Materials business sector in 2016 will see a slight increase, but at least remain at the level of 2015. One of our key objectives is to maintain the profitability of the Liquid Crystals business at a high level despite the price decline.

Business free cash flow

In 2016, business free cash flow of our Performance Materials business sector is forecast to increase moderately. This forecast is in line with the expected development of EBITDA pre exceptionals. As regards inventories, we expect an optimization of these in 2016.

Summary

For 2016, we expect a slight organic increase in Group net sales, to which all business sectors are forecast to contribute. Owing to the acquisition of Sigma-Aldrich, we additionally expect a positive portfolio effect in the low double-digit percentage range compared with the previous year.

EBITDA pre exceptionals of the Group is expected to increase by a low double-digit percentage in 2016, taking into consideration the portfolio effect resulting from the Sigma-Aldrich acquisition. This includes expected cost synergies from the integration of Sigma-Aldrich. In our Healthcare business sector, we will invest further in the research and development of innovative medicines and therefore expect additional expenses for the pharmaceutical pipeline. For our Performance Materials business sector, we continue to expect high earning power and assume that EBITDA pre exceptionals will increase slightly, but at least remain at the level of 2015. We expect business free cash flow of the Group to show a high single-digit percentage increase over 2015.

REPORT IN ACCORDANCE WITH SECTION 315 (4) OF THE GERMAN COMMERCIAL CODE (HGB)

The following information is provided in accordance with section 315 (4) of the German Commercial Code and the explanatory report pursuant to section 176 (1) sentence 1 of the German Stock Corporation Act (AktG).

As of the balance sheet date, the company's subscribed capital is divided into 129,242,251 no-par value bearer shares plus one registered share. Each share therefore corresponds to € 1.30 of the share capital. The holder of the registered share is E. Merck Beteiligungen KG, Darmstadt, Germany. It is entitled and obliged to appoint one-third of the members of the Supervisory Board representing the limited liability shareholders. If the holder of the registered share is a general partner, he or she has no such right of appointment. The transfer of the registered share requires the company's approval. The approval is granted at the sole discretion of the personally liable general partner with an equity interest, namely E. Merck KG, Darmstadt, Germany.

Pursuant to the information on voting rights submitted to us in accordance with the German Securities Trading Act (WpHG), on December 31, 2015 no shareholders owned direct or indirect investments exceeding more than 10% of the voting rights.

According to the Articles of Association of Merck KGaA, Darmstadt, Germany, the general partners not holding an equity interest who form the Executive Board are admitted by E. Merck KG, Darmstadt, Germany, with the consent of a simple majority of the other general partners. A person may only be a general partner not holding an equity interest if he or she is also a general partner of E. Merck KG, Darmstadt, Germany. In addition, at the proposal of E. Merck KG, Darmstadt, Germany, and with the approval of all general partners not holding an equity interest, further persons who are not general partners not holding an equity interest may be appointed to the Executive Board.

The Articles of Association can be amended by a resolution by the Annual Meeting that requires the approval of the general partners. The resolutions of the General Meeting are, notwithstanding any statutory provisions to the contrary, adopted by a simple majority of the votes cast. Where the law requires a capital majority in addition to the voting majority, resolutions are adopted by a simple majority of the share capital represented in the vote. The Articles of Association of the company specify the authorized share capital.

The Executive Board is authorized, with the approval of the Supervisory Board and of E. Merck KG, Darmstadt, Germany, to increase the share capital on one or several occasions until April 26, 2018 by up to a total of € 56,521,124.19 by issuing new shares against cash and/or contributions in kind (Authorized Capital). The Executive Board is authorized to exclude, with the approval of the Supervisory Board, the statutory subscription right of the limited liability shareholders in the case of capital increases against cash contributions if the issue price of the new shares is not significantly lower than the stock exchange price of already listed shares carrying the same rights, as defined in section 203 (1) and (2) and section 186 (3) sentence 4 of the German Stock Corporation Act (AktG), at the time when the Executive Board finally fixes the issue price, and if the proportion of the share capital represented by the new shares for which the subscription right is excluded does not exceed 10% of the share capital available at the time of the resolution of the Annual General Meeting or – if this amount is lower – of the share capital available at the time of exercising this authorization. This upper limit shall be reduced by the prorated amount of shares that are sold during the term of the authorized capital under exclusion of shareholders' subscription rights pursuant to section 71 (1) no. 8 sentence 5 and section 186 (3) sentence 4 of the German Stock Corporation Act, as well as shares that must be issued to redeem option or convertible bonds, as long as the bonds have been issued during the term of this authorization under exclusion of subscription rights. In addition, with the approval of the Supervisory Board, the subscription right of the shareholders can be excluded in order to enable E. Merck KG, Darmstadt, Germany, to exercise its right pursuant to Article 32 (3) of the Articles of Association to participate in a capital increase by issuing shares or freely transferable share subscription rights and to enable E. Merck KG, Darmstadt, Germany, to exercise its right pursuant to Article 33 of the Articles of Association to convert its equity interest into share capital. Moreover, with the approval of the Supervisory Board, the subscription right of the shareholders can be excluded as far as this is necessary, in order to grant subscription rights for new shares to holders of warrants and convertible bonds issued by the company or its subsidiaries, to the extent to which they would be entitled after exercising their option and conversion rights or fulfilling their option and conversion obligations. Lastly, with the

approval of the Supervisory Board, the subscription right of the shareholders can be excluded in order to exclude fractional amounts from the subscription right.

The Articles of Association also encompass contingent capital. The share capital is contingently increased by up to € 66,406,298.40 divided into 51,081,768 shares (Contingent Capital I). The contingent capital increase serves to grant exchange rights to E. Merck KG, Darmstadt, Germany, in accordance with Article 33 of the Articles of Association to enable the conversion of its equity interest. The shares carry dividend rights from the beginning of the fiscal year following the year in which the conversion option is exercised. Moreover, the share capital is contingently increased by up to € 16,801,491.20 composed of up to 12,924,224 no-par value bearer shares (Contingent Capital II). This increase in contingent capital is only to be implemented insofar as the bearers or creditors of option or conversion rights or the conversion obligations on warrant bonds, option participation certificates, option participation bonds, convertible bonds, convertible participation certificates or convertible participation bonds issued against contributions that are issued or guaranteed by the company or a subordinate Group company on the basis of the authorization resolution of the Annual General Meeting of May 9, 2014 to May 8, 2019, utilize their option or conversion rights or, to fulfill their conversion obligation insofar as they are obliged to fulfill their conversion obligation, or insofar as the company exercises an option, wholly or in part, of granting shares in the company instead of paying the sum of money due and to the extent that in each case a cash settlement is not granted, or own shares or other forms of fulfillment are used. Each issue of new shares shall take place at the determined option or conversion price, pursuant to the aforementioned authorization resolution. The new shares participate in the profit from the beginning of the fiscal year in which they are created; insofar as this is legally permissible, the Executive Board may, with the approval of the Supervisory Board, and in deviation from section 60 (2) AktG, stipulate that the new shares also participate in the profit for a past fiscal year. The Executive Board is authorized, with the approval of the Supervisory Board and of E. Merck KG, Darmstadt, Germany, to stipulate the further details of the implementation of the increase in contingent capital.

The company is not authorized to acquire its own shares.

The company has not entered into any material agreements subject to a change of control pursuant to a takeover offer nor has it entered into any compensation agreements with the members of the Executive Board or employees in the event of a takeover offer.

ADDITIONAL INFORMATION IN ACCORDANCE WITH THE GERMAN COMMERCIAL CODE (HGB)

The management report of Merck KGaA, Darmstadt, Germany, has been combined with the Group management report. The annual financial statements and the combined management reports of the Group and Merck KGaA, Darmstadt, Germany, for 2015 have been filed with the electronic German Federal Gazette (elektronischer Bundesanzeiger) and are available on the website of the German company register.

Statement on Corporate Governance

The Statement on Corporate Governance according to section 289a HGB can be found on pages 148 to 163.

Business Development

The sales of Merck KGaA, Darmstadt, Germany, rose further in 2015. All business sectors contributed to the increase of € 478 million:

€ million / Change in %	**2015**	2014	Change
Healthcare	1,617	1,525	6.0
Life Science	674	622	8.4
Performance Materials	1,597	1,263	26.4
Total	**3,888**	**3,410**	**14.0**

Sales increases, particularly in our Healthcare and Performance Materials business sectors, were achieved in all four quarters of 2015 compared with the previous year.

The share of Group sales also rose in 2015 (92.7%; 2014: 90.9%). This development underscores the importance of Merck KGaA, Darmstadt, Germany, to the Group as a production company:

€ million / Change in %	**2015**	2014	Change
Group sales	3,605	3,100	16.3
Sales to third parties	283	310	–8.7
Total	**3,888**	**3,410**	**14.0**

At 88.1%, the share of exports increased again in 2015 compared with the previous year (2014: 85.7%).

€ million / Change in %	**2015**	2014	Change
Outside Germany	3,427	2,922	17.3
Germany	461	488	–5.5
Total	**3,888**	**3,410**	**14.0**

In our Healthcare business sector, particularly sales of products in the Cardiovascular (+20.0%) and Thyroid (+12.9%) franchises increased in almost all regions, with notable sales increases in the Asia-Pacific and Europe regions. In comparison, the declines in reported sales of General Medicine (–22.3%), Neurodegenerative Diseases (–7.7%) and Oncology (–1.5%) products were not as high. These declines relate primarily to the European market.

In all major markets, particularly in the Asia-Pacific region (+29.9%), our Performance Materials business sector recorded sales growth (+26.4%). The Display Materials (+27.9%) and Advanced Technologies (+84.1%) business units contributed significantly to this growth. The Pigments & Functional Materials business unit (+7.9%) also maintained its level of sales in Europe and increased sales in North America and Latin America.

In our Life Science business sector the strongest growth was achieved by the Process Solutions business area (+10.7%). The business sector performed particularly well in North America (+47.0%) and Latin America (+15.9%). However, slight declines in sales were recorded in Europe (–1.0%).

Results of operations

			Change	
€ million	**2015**	2014	€ million	%
Sales	3,888	3,410	478	14.0
Other income	966	952	14	1.5
Cost of materials	–956	–879	–77	8.8
Personnel expenses	–1,123	–1,019	–104	10.2
Depreciation, amortization, write-downs and impairment losses	–280	–348	68	–19.5
Other operating expenses	–2,050	–1,877	–173	9.2
Investment result/Write-downs of financial assets	339	445	–106	–23.8
Financial result	–175	–32	–143	–446.9
Profit from ordinary activities	**609**	**652**	**–43**	**–6.6**
Profit transfers	–373	–426	53	–12.4
Taxes	–116	–77	–39	–50.6
Profit after tax and profit transfers	**120**	**149**	**–29**	**–19.5**

The increase in other income was mainly attributable to both higher license income and releases of provisions. This was offset by inventory reduction costs.

The cost of materials decreased slightly in relation to sales (24.6%; 2014: 25.8%).

The rise in personnel expenses was attributable to the higher number of employees and higher pension expenses.

The decrease in depreciation, amortization, write-downs and impairment losses was mainly due to lower impairment losses (€ –73 million). In fiscal 2015, impairment losses of € 105 million on intangible assets related particularly to the discontinuation of development projects (2014: € 176 million).

Other operating expenses increased as a result of the intensified marketing and selling activities as well as due to legal and advisory expenses in connection with the Sigma-Aldrich acquisition.

The investment result declined mainly due to lower dividend payments from Merck Capital Holding Ltd., Malta, a subsidiary of Merck KGaA, Darmstadt, Germany, and Merck Holding GmbH, Darmstadt, a subsidiary of Merck KGaA, Darmstadt, Germany.

The borrowing of funds for the acquisition of Sigma-Aldrich resulted in higher interest expenses, which increased the negative financial result.

Net assets and financial position

ASSETS

			Change	
€ million	**Dec. 31, 2015**	Dec. 31, 2014	€ million	%
Fixed assets	**17,770**	**7,089**	**10,682**	**150.7**
Intangible assets	227	325	–98	–30.2
Tangible assets	921	879	43	4.9
Financial assets	16,622	5,885	10,737	182.5
Current assets	**1,280**	**1,485**	**–205**	**–13.8**
Inventories	617	588	29	4.9
Trade accounts receivable	213	220	–7	–3.2
Receivables and other assets	450	677	–228	–33.7
Cash and cash equivalents	0	0	0	0.0
Prepaid expenses	**27**	**40**	**–13**	**–32.5**
Excess of plan assets over relevant obligations	**–**	**195**	**–195**	**–100.0**
	19,077	**8,808**	**10,269**	**116.6**

EQUITY AND LIABILITIES

			Change	
€ million	**Dec. 31, 2015**	Dec. 31, 2014	€ million	%
Net equity	**5,268**	**5,312**	**–44**	**–0.8**
Provisions	**930**	**750**	**180**	**24.0**
Provisions for pensions and other post-employment benefits	5	–	5	–
Other provisions	925	750	175	23.4
Liabilities	**12,878**	**2,746**	**10,132**	**369.0**
Financial obligations	1,500	1,500	0	0.0
Trade accounts payable	289	192	97	50.4
Other liabilities	11,089	1,054	10,035	952.3
Deferred income	**1**	**–**	**1**	**–**
	19,077	**8,808**	**10,269**	**116.6**

The development of the net assets and financial position of Merck KGaA, Darmstadt, Germany, in fiscal 2015 was characterized by the acquisition of the Sigma-Aldrich Corporation, USA. The increase in total assets by € 10,269 million to € 19,077 million was largely attributable to the completion of this important transaction, increasing financial assets by € 10,737 million. The intragroup sale of Merck Ltd., Japan, a subsidiary of Merck KGaA, Darmstadt, Germany, within the scope of the reorganization subsequent to acquisition of AZ in 2014 caused financial assets to decline in 2015.

Intangible assets declined primarily due to the discontinuation of the development project for evofosfamide and the associated impairment losses of capitalized rights amounting to € 82 million.

In addition, the progress of the construction project ONE Global Headquarters at the Darmstadt site contributed significantly to an increase in fixed assets.

The decline in current assets (€ –205 million) was mainly due to lower receivables from affiliates, primarily because of the increased funding requirement for the acquisition of Sigma-Aldrich.

The increase in other provisions (€ 175 million) was partly due to the repayment of a cash deposit in a trust agreement to cover provisions for a partial retirement program amounting to € 48 million. These provisions under the partial retirement program will now be secured by a bank guarantee. In addition, the provisions for outstanding invoices increased by € 32 million.

In 2015, no excess of plan assets over relevant obligations was disclosed for pension provisions, as pension obligations exceeded plan assets by € 5 million. This is largely attributable to the decrease in the applicable discount rate pursuant to the specifications of the German Central Bank (Deutsche Bundesbank).

The increase in liabilities to affiliates resulted primarily from the granting of intragroup loans (€ 8.5 billion) and from the clearing account (€ 1.5 billion) with Merck Financial Services GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany.

Research and Development

Research and development spending amounted to € 782 million in 2015 (2014: € 774 million), a large portion of which was incurred also by companies outside the Group. Our Performance Materials business sector accounted for € 4 million of the total increase of € 8 million (1.0%). At 77.8% (2014: 78.6%) our Healthcare business sector accounted for the largest share of research and development spending. In Darmstadt, Healthcare mainly focuses on oncology as well as autoimmune and inflammatory diseases. Our Performance Materials business sector focuses its research primarily on developing new and improved basic materials and mixtures for LC displays as well as for innovative OLED applications. To strengthen the Pigments business, new effect pigments for the automotive, cosmetics and printing ink sectors were developed. In our Life Science business sector, research activities focused on technologies in the laboratory and life science segment, and new developments progressed. These include improved test kits, chromatography methods, substrates for separating active substances, and innovations in the fields of microbiology and hygiene monitoring.

€ million / Change in %	**2015**	2014	Change
Healthcare	609	608	0.2
Life Science	38	35	8.6
Performance Materials	130	126	3.2
Other R&D spending that cannot be allocated to the individual business sectors	5	5	0.0
Total	**782**	**774**	**1.0**

The research spending ratio (research and development costs as a percentage of sales) was 20.1% (2014: 22.7%). In total, an average of 2,186 employees were engaged in R&D activities. Merck KGaA, Darmstadt, Germany, was one of the main research sites of the Group, accounting for 45.7% (2014: 45.5%) of total Group research and development spending.

Dividend

For 2015, we will propose to the General Meeting a dividend of € 1.05 per share. Based on our earnings expectations, the family of owners and shareholders of our company can continue to expect to receive an earnings-oriented dividend.

Personnel

As of December 31, 2015, Merck KGaA, Darmstadt, Germany, had 9,537 employees, a slight increase over the previous year (2014: 9,407).

Average number of employees by functional area:

Average number of employees during the year	**2015**	2014
Production	3,114	3,024
Administration	2,254	2,174
Research	2,186	2,160
Logistics	583	542
Engineering	555	538
Sales and marketing	409	389
Other	348	551
Total	**9,449**	**9,378**

Risks and opportunities

Merck KGaA, Darmstadt, Germany, is largely subject to the same opportunities and risks as the Group. More detailed information on risks and opportunities is provided in the consolidated financial statements of Merck KGaA, Darmstadt, Germany.

Forecast for Merck KGaA, Darmstadt, Germany

Deviations of actual business developments in 2015 from previously reported guidance:

In the 2014 Annual Financial Statements of Merck KGaA, Darmstadt, Germany, we expected sales to increase slightly in 2015.

In our sales forecast, we anticipated a slight sales decrease for our Healthcare business sector as a result of lower sales of Erbitux®. The expected decline in sales of the Oncology franchise, however, was more than compensated for by the sales increases in the Cardiovascular and Thyroid franchises, leading to overall sales growth of 6.0%.

In our Performance Materials business sector, sales were expected to decrease due to the persisting high competitive pressure in the context of liquid crystals. This development did not materialize. The business units Display Materials (+27.9%), Advanced Technologies (+84.1%) and Pigments & Functional Materials (+7.9%) achieved sales growth, resulting in an overall sales increase in our Performance Materials business sector of 26.4%.

As expected, our Life Science business sector increased its sales (+8.4%) in 2015.

As stated in the Annual Financial Statements for 2014, we expected a decrease in profit from ordinary activities and thus also of financial resources.

Profit from ordinary activities in 2015 mainly declined compared with 2014 due to a lower investment result and the associated increase in financing costs in connection with the Sigma-Aldrich acquisition. The financial resources for this acquisition were provided through borrowings from Merck Financial Services GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany.

Forecast for 2016

A slight decline in sales is assumed for 2016 for our Healthcare and Performance Materials business sectors. This decline is expected to be nearly fully offset by sales growth in our Life Science business sector.

The financing costs of the Sigma-Aldrich acquisition will have a negative impact on earnings. Accordingly, we expect net income to decline. Net income will also be influenced significantly by investment results and dividend payments of subsidiaries. The provision of a sufficient amount of financial resources is ensured by Merck Financial Services GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany.

Currently no risks can be identified that could jeopardize the continued existence of Merck KGaA, Darmstadt, Germany.

The internal control system for the accounting process according to section 289 (5) HGB

The annual financial statements of Merck KGaA, Darmstadt, Germany, are prepared by Merck Accounting Solutions & Services Europe GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany, and an independent legal entity within the Group. The financial statement process of Merck KGaA, Darmstadt, Germany, is based on the accounting provisions of the German Commercial Code with due consideration of key processes and uniform deadlines. The objective of the internal control system for accounting is to implement controls that will provide the security needed to ensure that financial statements are prepared in compliance with the relevant accounting laws and standards. It covers measures designed to ensure the complete, correct and timely conveyance and presentation of information that is relevant for the preparation of the financial statements. The financial reporting processes are monitored via a stringent internal control system that ensures the accuracy of financial reporting as well as compliance with the relevant legal regulations.

The main rules and tools used are as follows:

- Accounting guidelines based on Group-wide guidelines. These Group-wide accounting guidelines are the responsibility of Group Accounting and are available to all employees of the relevant units via the company's intranet. Detailed account allocation instructions are provided here for all major transactions. These guidelines include, for example, clear requirements for the inventory valuation process and transfer pricing within intragroup supply relationships.
- Clearly defined segregation of tasks and assignment of responsibilities to the units involved in the financial reporting process. Through corresponding organizational measures, the company ensures that in the accounting system duties are segregated between the booking of transactions and the review and approval of transactions. These measures include the power of disposition approved by the Executive Board in relation to authorizing contracts and credit notes, as well as consistently implementing a dual-control principle.
- Involvement of external experts as needed, for example for the valuation of pension obligations
- Use of suitable, largely uniform IT finance systems and the application of detailed authorization concepts to limit user rights on a need-to-have basis, taking into account principles concerning the segregation of duties.
- System-based IT controls as well as manual, process-integrated controls, particularly within the scope of the financial reporting process
- Consideration of risks recorded and assessed by the risk management system in the annual financial statements insofar as this is required by existing accounting rules.

The management of the respective department is responsible for the implementation of these rules and utilization of the tools.

The annual financial statements of the company are the responsibility of the Chief Financial Officer, who is a member of the Executive Board of Merck KGaA, Darmstadt, Germany. This responsibility is laid down in the rules of procedure of the Executive Board.

All the structures and processes described are subject to constant review by Group Internal Auditing. The Executive Board determines the structures and processes that are to be audited in an annual audit plan.

The results of these audits are dealt with regularly in meetings of the Executive Board, the Supervisory Board and the Finance Committee of E. Merck KG, Darmstadt, Germany.

SUBSEQUENT EVENTS

At the beginning of January 2016, two contracts entered into with BioMarin Pharmaceutical Inc., USA (BioMarin), became effective. Firstly, the sale of the rights to Kuvan®, a drug used to treat the metabolic disorder known as phenylketonuria (PKU), was agreed. And secondly, our company returned its option to develop and commercialize Peg-Pal to BioMarin. Based on these two agreements, in January 2016 our company received an upfront payment of € 340 million for the sale of the rights to Kuvan® as well as an entitlement to milestone payments of up to € 185 million. The financial statements of Merck KGaA, Darmstadt, Germany, prepared in accordance with the German Commercial Code are only affected by this via future dividend payments from subsidiaries. More information can be found in Note [4] “Acquisitions, assets held for sale and disposal groups” in the Notes to the Group accounts.

Subsequent to the balance sheet date, no further events of special importance occurred that could have a material impact on the net assets, financial position or results of operations.

03

corporate governance

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Corporate Governance
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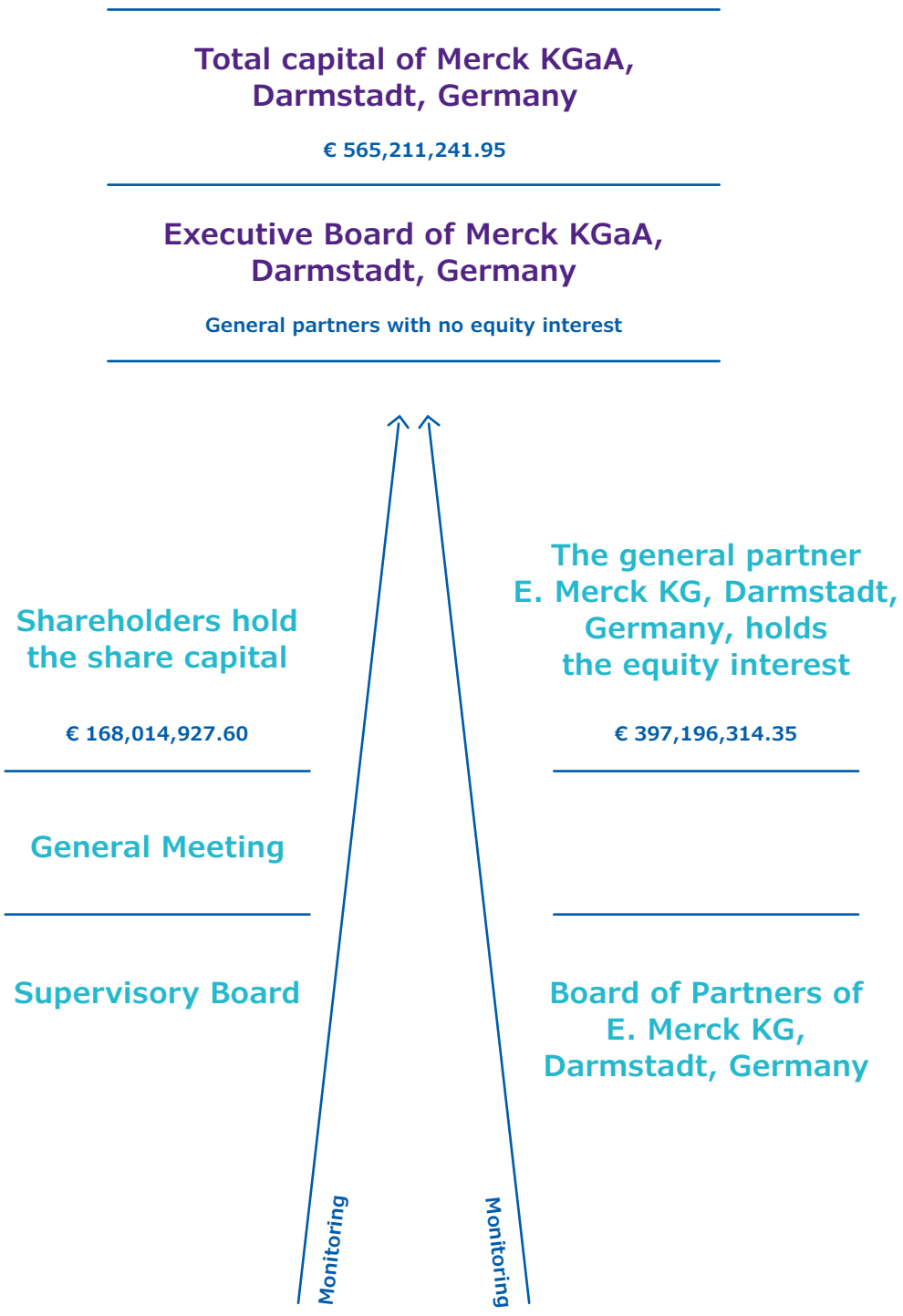
CAPITAL STRUCTURE AND GOVERNANCE BODIES OF MERCK KGAA, DARMSTADT, GERMANY



STATEMENT ON CORPORATE GOVERNANCE

The Statement on Corporate Governance contains the Statement of Compliance, relevant information on practices within the company as well as a description of the procedures of the corporate bodies.

Joint report of the Executive Board and the Supervisory Board according to section 3.10 of the German Corporate Governance Code including Statement of Compliance

The German Corporate Governance Code is geared toward the conditions found in a German stock corporation ("Aktiengesellschaft" or "AG") and does not take into consideration the special characteristics of a corporation with general partners ("Kommanditgesellschaft auf Aktien" or "KGaA") such as Merck KGaA, Darmstadt, Germany. Given the structural differences between an AG and a KGaA, several recommendations of the German Corporate Governance Code are to be applied to a KGaA only in a modified form. Major differences between the two legal forms exist in terms of liability and management. While, in the case of an AG, only the AG is liable as a legal entity, the general partners of a KGaA also have unlimited personal liability for the company's obligations (section 278 (1) of the German Stock Corporation Act – "AktG"). At Merck KGaA, Darmstadt, Germany, this pertains to both E. Merck KG, Darmstadt, Germany – which pursuant to Art. 8 (5) of the Articles of Association is excluded from management and representation – as well as to the managing general partners, who together make up the Executive Board of Merck KGaA, Darmstadt, Germany. The members of the Executive Board of Merck KGaA, Darmstadt, Germany, are therefore subject to unlimited personal liability. Unlike an AG, their executive authority is not conferred by the Supervisory Board, but rather by their status as general partners.

Consequently, in addition to other responsibilities typical of the supervisory board of an AG (see description of the procedures of the Supervisory Board on page 159 et seq.), the supervisory board of a KGaA does not have the authority to appoint the management board, draw up management board contracts or specify compensation of the management board. This legal form also involves special features with regard to the General Meeting. For example, in a KGaA, many of the resolutions made require the consent of the general partners (section 285 (2) AktG), including in particular the adoption of the annual financial statements (section 286 (1) AktG).

Merck KGaA, Darmstadt, Germany, applies the Code analogously where these regulations are compatible with the legal form of a KGaA. In order to enable shareholders to compare the situation at other companies more easily, to a broad extent we base corporate governance on the conduct recommendations made by the Government Commission of the German Corporate Governance Code and forego having our own, equally permissible, code. The recommendations of the Code in both of the last two versions dated June 24, 2014 and May 5, 2015, the intent and meaning of which are applied, were complied with in the period between the last Statement of Compliance issued on February 27, 2015 with four exceptions. In the future, the recommendations of the Code will again be adhered to with four exceptions. Further details can be found on page 149.

For a clearer understanding, the following gives a general explanation of the application of German company law at our company with additional references to the General Meeting and shareholder rights.

Merck KGaA, Darmstadt, Germany

The general partner E. Merck KG, Darmstadt, Germany, holds around 70% of the total capital of Merck KGaA, Darmstadt, Germany, (equity interest); the shareholders hold the remainder, which is divided into shares (share capital). E. Merck KG, Darmstadt, Germany, is excluded from the management of business activities. The general partners with no equity interest (Executive Board) manage the business activities. Nevertheless, due to its substantial capital investment and unlimited personal liability, E. Merck KG, Darmstadt, Germany, has a strong interest in the businesses of Merck KGaA, Darmstadt, Germany, operating efficiently in compliance with procedures, and exercises its influence accordingly. The participation of Merck KGaA, Darmstadt, Germany, in the profit/loss of E. Merck KG, Darmstadt, Germany, in accordance with Articles 26 et seq. of the Articles of Association further harmonizes the interests of the shareholders and of E. Merck KG, Darmstadt, Germany. E. Merck KG, Darmstadt, Germany, appoints and dismisses the Executive Board. In addition, E. Merck KG, Darmstadt, Germany, has created bodies – complementing the expertise and activities of the Supervisory Board – to monitor and advise the Executive Board. This task applies primarily to the Board of Partners of E. Merck KG, Darmstadt, Germany. Based on the provisions of the German Stock Corporation Act, the Articles of Association of Merck KGaA, Darmstadt, Germany, and the rules of procedure of the various committees, Merck KGaA, Darmstadt, Germany, has a set of rules for the Executive Board and its supervision that meet

the requirements of the Code. The investors, who bear the entrepreneurial risk, are protected as provided for by the Code.

The General Meeting of Merck KGaA, Darmstadt, Germany

The twentieth General Meeting of Merck KGaA, Darmstadt, Germany, was held on April 17, 2015 in Frankfurt am Main, Germany. At 64.32%, the proportion of share capital represented at the meeting was slightly higher than in the previous year. In 2014, the proportion of share capital represented was 63.85%.

In particular, the Annual General Meeting passes resolutions concerning the approval of the annual financial statements, the appropriation of net retained profit, the approval of the actions of the Executive Board members and the Supervisory Board members, as well as the choice of the auditor. Changes to the Articles of Association likewise require the adoption of a resolution by the General Meeting.

The shareholders of Merck KGaA, Darmstadt, Germany, exercise their rights at the General Meeting. They may exercise their voting rights personally, through an authorized representative or through a proxy appointed by the company. The proxy is in attendance throughout the duration of the General Meeting. All the documents and information concerning upcoming General Meetings (including a summary explanation of shareholder rights) are also posted on our website. Moreover, the General Meeting is webcast live on the Internet from its commencement until the end of the speech by the Chairman of the Executive Board. The introductory speeches by the Chairman of the Executive Board and the Chairman of the Supervisory Board are recorded in order to make them available to interested members of the public at any time after the meeting. In this way, we are satisfying the high transparency requirements of the Group.

Statement of Compliance

In accordance with section 161 AktG, applying the provisions of the German Corporate Governance Code correspondingly, the Executive Board and the Supervisory Board issued the following statement of compliance with the recommendations of the Government Commission of the German Corporate Governance Code:

"Declaration of the Executive Board and the Supervisory Board of Merck KGaA, Darmstadt, Germany, on the recommendations of the Government Commission of the German Corporate Governance Code pursuant to section 161 AktG.

Since the last statement of compliance on February 27, 2015, the Group has complied with the recommendations of the Government Commission of the German Corporate Governance Code in the versions dated June 24, 2014 and May 5, 2015 published in the official section of the German Federal Gazette during its period of validity with the following exceptions:

Contrary to section 4.2.5 para 3 sentences 1 and 2 of the German Corporate Governance Code, certain information on the compensation of Executive Board members has not been included, nor have the model tables provided for this purpose been utilized. It seems doubtful as to whether the largely repetitive provision of identical information in two additional tables contributes to the transparency or the understandability of the Compensation Report (see section 4.2.5 para 1 sentence 3 of the German Corporate Governance Code).

Contrary to section 5.3.2 of the German Corporate Governance Code, the Supervisory Board has not established an audit committee. However, an audit committee does exist in the form of the Finance Committee of the Board of Partners of E. Merck KG, Darmstadt, Germany, which to a large extent exercises the duties described in section 5.3.2 of the Code. Due to the relatively limited authority of the supervisory board of a KGaA in comparison with that of an AG, this therefore satisfies the requirements of the German Corporate Governance Code.

Contrary to section 5.4.1 para 2 sentence 1 of the German Corporate Governance Code, no age limit or regular limit on the length of Supervisory Board membership is taken into account when proposing candidates for election to the Supervisory Board pursuant to the published objectives of the Supervisory Board. The age and length of membership of Supervisory Board members are not criteria for their qualifications and competence. Moreover, we do not wish to forego the many years of experience of Supervisory Board members. Crucial to the successful work of the Supervisory Board is a good balance among Supervisory Board members in terms of age and length of membership.

Contrary to section 7.1.2 sentence 4 of the German Corporate Governance Code, owing to the way in which the German legal holidays fall, the interim report for the first quarter was only made publicly accessible slightly after the allotted 45-day time limit from the end of the reporting period. In fiscal 2016, the allotted 45-day time limit for publication of the interim report for the first quarter will also be slightly exceeded again for the same reason.

In view of future compliance with the current recommendations of the Government Commission of the German Corporate Governance Code, the Executive Board and the Supervisory Board declare the following: With the exception of the aforementioned deviations from section 4.2.5 para 3 sentences 1 and 2 (disclosure of compensation), section 5.3.2 (audit committee), section 5.4.1 para 2 sentence 1 (age limit, regular limit on length of membership), and section 7.1.2 sentence 4 (publication deadline), the company will comply with the recommendations of the Code in the version dated May 5, 2015."

Darmstadt, March 4, 2016

For the Executive Board	For the Supervisory Board
s. Karl-Ludwig Kley	**s. Wolfgang Büchele**

Compensation report

(The Compensation Report is part of the audited Notes to the Group accounts).

Compensation of members of the Executive Board of Merck KGaA, Darmstadt, Germany

Unlike management board members of German stock corporations, the members of the Executive Board of Merck KGaA, Darmstadt, Germany, are not employed officers of the company. Rather, they are personally liable general partners of both Merck KGaA, Darmstadt, Germany, and the general partner E. Merck KG, Darmstadt, Germany, and in this capacity they receive profit-based compensation from E. Merck KG, Darmstadt, Germany. Given this context, the stipulations of the German Corporate Governance Code concerning the compensation of management board members of publicly listed German stock corporations as well as the individual disclosure thereof do not apply to the Executive Board members of Merck KGaA, Darmstadt, Germany. Nevertheless, Merck KGaA, Darmstadt, Germany, has decided to disclose the individual compensation of each Executive Board member in the following report.

Unlike publicly listed German stock corporations, at Merck KGaA, Darmstadt, Germany, it is not the Supervisory Board, but the Board of Partners of E. Merck KG, Darmstadt, Germany, that decides on the amount and composition of compensation. E. Merck KG, Darmstadt, Germany, has transferred the execution of this right to its Personnel Committee. Among other things, the Personnel Committee is responsible for the following decisions: contents of contracts with Executive Board members, granting of loans and advance salary payments, approval for taking on honorary offices, board positions and other sideline activities, as well as the division of responsibilities within the Executive Board of Merck KGaA, Darmstadt, Germany. The compensation system defined by the Personnel Committee for Executive Board members takes into account various aspects relevant to compensation, including the responsibilities and duties of the individual Executive Board members and their status as personally liable partners, their individual performance, the economic situation, performance and prospects of the company as well as normal compensation levels (by way of peer comparison) and the rewards structure otherwise in place in the company. The relationship between Executive Board compensation and the compensation of top management and the workforce as a whole is also taken into account, also in a multiyear assessment. The Personnel Committee regularly commissions an independent compensation consultant to review the appropriateness of the compensation.

Features of the compensation system

The compensation paid to the Executive Board members of Merck KGaA, Darmstadt, Germany, in fiscal 2015 comprises fixed components, variable compensation components and additions to pension provisions. Benefits in kind and other benefits are additionally granted.

Fixed compensation

Fixed compensation is paid in the form of 12 equivalent monthly installments. The table on page 152 provides an overview of the amount of the fixed compensation paid in 2014 and 2015.

Variable compensation

Variable compensation is based on the three-year rolling average of profit after tax of the Group of E. Merck, Darmstadt, Germany. The Personnel Committee of E. Merck KG, Darmstadt, Germany, decides at its own and equitable discretion whether to consider exceptional factors of particular importance. From the net income determined in this manner, the members of the Executive Board receive individually fixed per mille rates based on the net income of the Group of E. Merck, Darmstadt, Germany.

Additionally, in exceptional cases the Personnel Committee of E. Merck KG, Darmstadt, Germany, which is responsible for the compensation of the Executive Board, may grant one-time payments voluntarily and at its own discretion.

Additional variable compensation (Long-Term Incentive Plan of Merck KGaA, Darmstadt, Germany)

In 2012, a long-term variable compensation component known as our company's Long-Term Incentive Plan was added to the variable compensation of the members of the Executive Board. It aims to enhance the sustainability of the compensation system and to align it not only with target achievement based on key performance indicators, but above all with a sustainable performance of company shares.

Subject to the resolution of the Personnel Committee each year, under the our company's Long-Term Incentive Plan the members of the Executive Board could be eligible to receive a certain number of virtual shares – Share Units of Merck KGaA, Darmstadt, Germany, (MSUs) – at the end of a three-year performance cycle. The number of MSUs that could be received depends on the total value defined for the respective person and the average closing price of company shares in Xetra® trading during the last 60 trading days prior to January 1 of the respective fiscal year (reference price). In order to participate in the Plan, members of the Executive Board must personally own an investment in our shares equivalent to 10% of their respective fixed annual compensation, taking into account the equity interest held in E. Merck KG, Darmstadt, Germany, as a personally liable general partner. It is not permitted to sell these shares during the performance cycle. After termination of the three-year performance cycle, the number of MSUs to be granted then is determined based on the development of two key performance indicators (KPIs). These are:

a) the performance of the company share price compared to the DAX® with a weighting of 70%, and
b) the development of the EBITDA pre margin during the performance cycle as a proportion of a defined target value with a weighting of 30%.

Depending on the development of the KPIs, at the end of the respective performance cycle the members of the Executive Board are granted between 0% and 150% of the MSUs they could be eligible to receive.

Based on the number of MSUs granted, the members of the Executive Board receive a cash payment at a defined point in time in the year following the expiration of the three-year performance cycle. The value of an MSU corresponds to the average closing price of our shares in Xetra® trading during the last 60 trading days prior to January 1 after the performance cycle. The payment amount is limited to three times the reference price. The members of the Executive Board invest 50% of the payment amount in our shares. One-third of these shares may be sold at the earliest one year after termination of the performance cycle, another third after two years, and another third after three years.

In fiscal 2015, the following total values were specified for members of the Executive Board, which resulted in the respective number of MSUs they were eligible to receive based upon the definitive reference price of our shares (60 trading days preceding January 1, 2015) of € 74.53: Karl-Ludwig Kley € 1.5 million (20,127 MSUs), Stefan Oschmann € 1.0 million (13,418 MSUs), Kai Beckmann € 1.0 million (13,418 MSUs), Belén Garijo Lopez € 1.0 million (13,418 MSUs), Marcus Kuhnert € 1.0 million (13,418 MSUs), and Bernd Reckmann € 1.0 million (13,418 MSUs).

The following maximum compensation amounts for variable compensation components, which were applicable for the first time in 2014, have been agreed.

	One-time payment (€ thousand)	Variable compensation (€ thousand)	Long-Term Incentive Plan of Merck KGaA, Darmstadt, Germany (times the respective total amount)	Total variable compensation components (€ thousand)
Karl-Ludwig Kley	2,000	8,000	4.5	9,800
Stefan Oschmann	1,500	6,000	4.5	8,000
Kai Beckmann	1,500	6,000	4.5	8,000
Belén Garijo Lopez	1,500	6,000	4.5	8,000
Marcus Kuhnert	1,500	6,000	4.5	8,000
Bernd Reckmann	1,500	6,000	4.5	8,000

Additional benefits

The members of the Executive Board also receive certain additional benefits, mainly contributions to insurance policies, personal security expenses, as well as a company car, which they are entitled to use privately. Overall, the value of other additional benefits totaled € 252 thousand in 2015 (2014: € 156 thousand). Of this amount, in 2015 € 148 thousand was attributable to Karl-Ludwig Kley (2014: € 53 thousand); € 25 thousand to Stefan Oschmann (2014: € 21 thousand); € 25 thousand to Kai Beckmann (2014: € 41 thousand); € 6 thousand to Belén Garijo Lopez; € 20 thousand to Marcus Kuhnert (2014: € 7 thousand); € 28 thousand to Bernd Reckmann (2014: € 28 thousand); and € 0 thousand to Matthias Zachert (2014: € 6 thousand).

Total compensation

Accordingly, the following total compensation results for the members of the Executive Board of Merck KGaA, Darmstadt, Germany, broken down by performance-independent and performance-related components:

		Performance-independent components		Performance-related components			Total	Expense recorded in the period for share-based compensation[4]
				Without a long-term incentive effect	With a long-term incentive effect			
		Fixed compensation	Additional benefits	Variable compensation[1]	Long-Term Incentive Plan of Merck KGaA, Darmstadt, Germany			
		(€ thousand)	(€ thousand)	(€ thousand)	Number of MSUs[2] (units)	Time value[3] (€ thousand)	(€ thousand)	(€ thousand)
Current members								
Karl-Ludwig Kley	2015	1,300	148	4,464	20,127	1,974	7,886	2,959
	2014	1,300	53	5,265	12,211	1,147	7,765	4,196
Stefan Oschmann	2015	1,200	25	4,161	13,418	1,316	6,702	1,973
	2014	1,200	21	4,799	8,141	765	6,785	2,797
Kai Beckmann	2015	1,000	25	3,411	13,418	1,316	5,752	1,973
	2014	1,000	41	3,049	8,141	765	4,855	2,797
Belén Garijo Lopez	2015	1,000	6	3,411	13,418	1,316	5,733	383
	2014	–	–	–	–	–	–	–
Marcus Kuhnert	2015	800	20	2,411	13,418	1,316	4,547	687
	2014	333	7	882	3,392	462	1,684	107
Bernd Reckmann	2015	1,200	28	4,411	13,418	1,316	6,955	1,973
	2014	1,200	28	3,549	8,141	765	5,542	2,797
Matthias Zachert (until March 31, 2014)	2015	–	–	–	–	–	–	–
	2014	250	6	762	–	–	1,018	0
Total	**2015**	**6,500**	**252**	**22,269**	**87,217**	**8,554**	**37,575**	**9,948**
	2014	**5,283**	**156**	**18,306**	**40,026**	**3,904**	**27,649**	**12,694**

[1] The one-time payment for 2015 granted to Bernd Reckmann as well as the one-time payments for 2014 granted to Karl-Ludwig Kley and Stefan Oschmann are included in the variable compensation components for 2015 and 2014, respectively.

[2] Number of the potential MSUs subject to target achievement. For details see page 150/151. The actual number of MSUs to be granted after the expiration of the three-year performance cycle may deviate from this.
The share split that took effect on June 30, 2014 does not affect the number of MSUs granted. The 1:2 share split was compensated for by a doubling in the accounting value of an MSU.

[3] Time value on the date of the grant (date of the legally binding entitlement). The amount of a potential payment is thus not predefined. Payment is subject to target achievement and is only made on a specified date after the expiration of a three-year performance cycle. The time value was calculated using a Monte Carlo simulation based on the previously described KPIs. The expected volatilities are based on the implicit volatility of company shares and the DAX® index in accordance with the remaining term of the Long-Term Incentive Plan tranche. The dividend payments incorporated into the valuation model orient towards medium-term dividend expectations.

[4] In accordance with IFRS, the expense recorded for 2015 includes the values for the 2013, 2014, and 2015 Long-Term Incentive Plan tranches. In accordance with IFRS, the expense recorded in 2014 includes the values for the Long-Term Incentive Plan tranches 2012, 2013 and 2014.

Pension provisions

The individual contractual pension obligations grant the members of the Executive Board entitlement to a life-long old-age pension or surviving dependents' pension in the event of reaching the individual contractually agreed age limit, permanent disability or death. As an alternative to an old-age pension, upon reaching the age limit specified in their individual contracts, the members of the Executive Board have been offered the possibility to receive their pension entitlement in the form of a one-time lump-sum payment calculated in accordance with actuarial principles.

The amount of the old-age pension is determined by a percentage share of pensionable compensation defined by the Personnel Committee.

The individual values are presented in the following table:

	Pensionable compensation (€ thousand)	Percentage entitlement
Karl-Ludwig Kley	900	70
Stefan Oschmann	650	55
Kai Beckmann	400	49
Belén Garijo Lopez	400	50
Marcus Kuhnert	300	40
Bernd Reckmann	650	64

The percentage entitlement increases up until retirement by two percentage points per year of service up to 70% for Kai Beckmann and Bernd Reckmann. Their pension entitlement was thus accordingly increased in 2015.

For Belén Garijo Lopez and Marcus Kuhnert, as of 2016 the percentage entitlement will increase up until retirement by two percentage points per year of service up to 70%.

The pension provisions and the service cost are presented in the following table.

	Service cost		
€ thousand	**2015**	2014	Amount of pension provisions as of Dec. 31, 2015
Karl-Ludwig Kley	1,607	1,127	13,957
Stefan Oschmann	953	549	3,502
Kai Beckmann	230	108	5,053
Belén Garijo Lopez	672	–	672
Marcus Kuhnert	353	144	435
Bernd Reckmann	375	215	10,131
Total	**4,190**	**2,143**	**33,750**

The surviving dependents' pension grants the spouse a life-long surviving dependents' pension amounting to 60% of the pension entitlement, and dependent children either a half-orphan's or an orphan's pension maximally until the age of 25.

Benefits in the event of termination of duties as an Executive Board member

The employment contracts of Karl-Ludwig Kley, Stefan Oschmann, Kai Beckmann and Bernd Reckmann each contain a post-contractual non-competition clause. An amount equal to 50% of the average contractual benefits paid to the respective Executive Board member within the past 12 months prior to leaving the company shall be provided as compensation for each year of the two-year non-competition period. During the period of the non-competition clause, other employment income and pension payments will be credited toward this compensation. Within certain time limits, E. Merck KG, Darmstadt, Germany, has the possibility to dispense with adherence to the non-competition clause with the consequence that the obligation to make the compensation payments shall cease to apply.

The contracts of the Executive Board members further provide for the continued payment of fixed compensation to surviving dependents for a limited period of time in the event of death. Above and beyond this and existing pension obligations, no further obligations exist in the event of the termination of the contractual relationships of the Executive Board members.

Miscellaneous

The members of the Executive Board do not receive additional compensation for serving on the boards of Group companies.

Should members of the Executive Board be held liable for financial losses while executing their duties, under certain circumstances this liability risk is covered by a D&O insurance policy from Merck KGaA, Darmstadt, Germany. The D&O insurance policy has a deductible in accordance with the legal requirements and recommendations of the German Corporate Governance Code.

Payments to former Executive Board members and their surviving dependents

Pension payments to former members of the Executive Board or their surviving dependents amounted to € 11,908 thousand in 2015 (2014: € 11,220 thousand). Pension provisions totaling € 111,812 thousand exist for the pension entitlements of this group of persons (2014: € 120,674 thousand).

Compensation of the Supervisory Board members of Merck KGaA, Darmstadt, Germany

The compensation of the Supervisory Board members is defined by Article 20 of the Articles of Association of Merck KGaA, Darmstadt, Germany. The members of the Supervisory Board receive fixed compensation of € 47,000 per year. The Chairman receives double this amount and the Vice Chairman receives one and a half times this amount. In addition, the members receive additional compensation of € 750 per meeting.

The individual values are presented in the following table:

	Fixed compensation		Compensation for meeting attendance		Total compensation	
in €	**2015**	2014	**2015**	2014	**2015**	2014
Wolfgang Büchele (Chairman since May 9, 2014)	94,000.00	77,517.81	3,750.00	3,750.00	97,750.00	81,267.81
Michael Fletterich (Vice Chairman since May 9, 2014)	70,500.00	62,258.90	3,750.00	3,750.00	74,250.00	66,008.90
Crocifissa Attardo	47,000.00	47,000.00	3,750.00	3,000.00	50,750.00	50,000.00
Mechthild Auge	47,000.00	47,000.00	3,750.00	3,750.00	50,750.00	50,750.00
Johannes Baillou[1]	0.00	16,610.96	0.00	750.00	0.00	17,360.96
Frank Binder[1]	0.00	16,610.96	0.00	750.00	0.00	17,360.96
Gabriele Eismann[2]	47,000.00	30,517.81	3,750.00	3,000.00	50,750.00	33,517.81
Jens Frank[1]	0.00	16,610.96	0.00	750.00	0.00	17,360.96
Edeltraud Glänzer	47,000.00	47,000.00	2,250.00	3,000.00	49,250.00	50,000.00
Jürgen Glaser[1]	0.00	16,610.96	0.00	750.00	0.00	17,360.96
Michaela Freifrau von Glenck	47,000.00	47,000.00	3,750.00	3,750.00	50,750.00	50,750.00
Siegfried Karjetta[2]	47,000.00	30,517.81	3,750.00	3,000.00	50,750.00	33,517.81
Rolf Krebs[1] (Chairman until May 9, 2014)	0.00	33,221.92	0.00	750.00	0.00	33,971.92
Hans-Jürgen Leuchs[1]	0.00	16,610.96	0.00	750.00	0.00	17,360.96
Albrecht Merck	47,000.00	47,000.00	3,750.00	3,750.00	50,750.00	50,750.00
Dietmar Oeter[2]	47,000.00	30,517.81	3,750.00	3,000.00	50,750.00	33,517.81
Alexander Putz[2]	47,000.00	30,517.81	3,750.00	3,000.00	50,750.00	33,517.81
Helga Rübsamen-Schaeff[2]	47,000.00	30,517.81	3,750.00	3,000.00	50,750.00	33,517.81
Karl-Heinz Scheider	47,000.00	47,000.00	3,750.00	3,750.00	50,750.00	50,750.00
Gregor Schulz[2]	47,000.00	30,517.81	3,750.00	3,000.00	50,750.00	33,517.81
Theo Siegert	47,000.00	47,000.00	3,750.00	3,750.00	50,750.00	50,750.00
Tobias Thelen[2]	47,000.00	30,517.81	3,750.00	3,000.00	50,750.00	33,517.81
Heiner Wilhelm[1] (Vice Chairman until May 9, 2014)	0.00	24,916.44	0.00	750.00	0.00	25,666.44
Total	**822,500.00**	**823,594.54**	**58,500.00**	**58,500.00**	**881,000.00**	**882,094.54**

[1] Until May 9, 2014.
[2] Since May 9, 2014.

As a member of corporate bodies of E. Merck KG, Darmstadt, Germany, Wolfgang Büchele received an additional payment of € 140,000 for performing this function in 2015 (2014: € 140,000).
As a member of corporate bodies of E. Merck KG, Darmstadt, Germany, Michaela Freifrau von Glenck received an additional payment of € 80,000 for performing this function in 2015 (2014: € 80,000).
As a member of corporate bodies of E. Merck KG, Darmstadt, Germany, Siegfried Karjetta received an additional payment of € 140,000 for performing this function in 2015 (2014: € 137,260).
As a member of corporate bodies of E. Merck KG, Darmstadt, Germany, Albrecht Merck received an additional payment of € 120,000 for performing this function in 2015 (2014: € 120,000).
As a member of corporate bodies of E. Merck KG, Darmstadt, Germany, Helga Rübsamen-Schaeff received an additional payment of € 140,000 for performing this function in 2015 (2014: € 139,727).
As a member of corporate bodies of E. Merck KG, Darmstadt, Germany, Gregor Schulz received an additional payment of € 140,0000 for performing this function in 2015 (2014: € 130,411).
As a member of corporate bodies of E. Merck KG, Darmstadt, Germany, Theo Siegert received an additional payment of € 150,000 for performing this function in 2015 (2014: € 150,000).
As a member of corporate bodies of E. Merck KG, Darmstadt, Germany, Tobias Thelen received an additional payment of € 140,000 for performing this function in 2015 (2014: € 135,890).
As a member of corporate bodies of E. Merck KG, Darmstadt, Germany, Johannes Baillou, who left the Supervisory Board in 2014, received an additional payment of € 9,590 for performing this function in 2014.
As a member of corporate bodies of E. Merck KG, Darmstadt, Germany, Frank Binder, who left the Supervisory Board in 2014, received an additional payment of € 8,220 for performing this function in 2014.
As a member of corporate bodies of E. Merck KG, Darmstadt, Germany, Rolf Krebs, who left the Supervisory Board in 2014, received an additional payment of € 10,274 for performing this function in 2014.
As a member of corporate bodies of E. Merck KG, Darmstadt, Germany, Hans-Jürgen Leuchs, who left the Supervisory Board in 2014, received an additional payment of € 9,590 for performing this function in 2014.

Ownership, purchase or sale of shares in the company by members of the Executive Board and of the Supervisory Board

As of December 31, 2015, the members of the Executive Board and of the Supervisory Board either directly or indirectly held 81,992 shares of Merck KGaA, Darmstadt, Germany. Their total ownership represents less than 1% of the issued shares of Merck KGaA, Darmstadt, Germany. Transactions executed by members of the Executive Board and of the Supervisory Board are disclosed on the company website at www.emdgroup.com -> Investors -> Corporate Governance -> Directors' Dealings.

Information on corporate governance practices

Reporting

It is the objective of Merck KGaA, Darmstadt, Germany, to provide the latest information to all shareholders, media, financial analysts and interested members of the public, while creating the greatest possible transparency. For this reason, we use a wide range of communication platforms to engage in a timely dialogue with all interested parties about the situation of the company and business changes. Our principles include providing factually correct, comprehensive and fair information.

Information subject to disclosure requirements, as well as information that is not, can be accessed worldwide on the company website (www.emdgroup.com), which is the company's most important publication platform. Apart from a detailed financial calendar, quarterly and half-year financial reports covering the past three years are available here in German and English. In addition, in line with the legal requirements, ad hoc announcements are published on the website. These contain information on circumstances and facts that could impact the company share price.

Regular press conferences, investor meetings on the occasion of investor conferences as well as road shows offer another platform for dialogue. The company presentations prepared for this purpose are also available on the company website. In addition, the Investor Relations team is always available to private and institutional investors who wish to receive further information.

To ensure the greatest possible transparency, all documents concerning the General Meeting are available on the company website. Additionally, some parts of the General Meeting are webcast live on the Internet.

Dealing with insider information

Dealing properly with insider information is very important to us. Our insider committee examines the existence of insider information, ensures compliance with legal obligations and prepares any necessary measures. The members of the insider committee are appointed by the Executive Board; at least two members work in Group Legal & Compliance. The insider committee meets at regular intervals, yet also meets when circumstances require. The Chief Financial Officer is vested with the authority to make the final decision on handling potential insider information.

In order to ensure a high level of protection for insider information, in 2011 the Executive Board issued internal insider guidelines applicable throughout the Group worldwide. The guidelines inform employees about their responsibilities under insider trading laws and gives clear instructions for compliant behavior. In addition, it describes the function of the insider committee in detail. Moreover, our Code of Conduct, which is binding on all employees, also contains an explicit, detailed reference to the ban on using insider information. Within the scope of obligatory training courses on the Code of Conduct as well as specific training courses on insider law, all employees are instructed on the stipulations of insider trading.

Accounting and audits of financial statements

Merck KGaA, Darmstadt, Germany, prepares its consolidated financial statements and combined management report in accordance with International Financial Reporting Standards (IFRS), as applicable in the EU, as well as the supplementary rules applicable under section 315a (1) of the German Commercial Code (HGB) and as stipulated by our Articles of Association. The consolidated financial statements and the combined management report are prepared by the Executive Board and examined by an auditor, taking into account the generally accepted standards for the audit of financial statements promulgated by the Institute of Public Auditors in Germany (Institut der Wirtschaftsprüfer – IDW).

The Supervisory Board commissioned KPMG AG Wirtschaftsprüfungsgesellschaft, Berlin, to audit the consolidated financial statements and the combined management report for 2015. Moreover, the Supervisory Board agreed with KPMG AG Wirtschaftsprüfungsgesellschaft, Berlin, that the auditor shall inform the Supervisory Board without delay of any grounds for bias or disqualification occurring during the audit if these cannot be immediately rectified. Additionally, the auditor shall immediately report to the Supervisory Board any findings and issues which emerge during the audit that have a direct bearing upon the tasks of the Supervisory Board. The auditor shall inform the Supervisory Board or note in the audit report any circumstances determined during the audit that would render inaccurate the Statement of Compliance made by the Executive Board and the Supervisory Board. It has also been agreed with the auditor that in order to assess whether the Executive Board has fulfilled its obligations in accordance with section 91 (2) AktG, the audit will also cover the company's early warning risk identification system. Moreover, the auditor is required to examine and evaluate the accounting-relevant internal control system insofar as this is necessary and appropriate for assessing the accuracy of financial reporting.

The auditor responsible for auditing the consolidated financial statements changes regularly in accordance with the statutory requirements. Bodo Rackwitz is currently leading the audit engagement and has been the auditor in charge of the engagement since fiscal 2015. The Supervisory Board had KPMG AG Wirtschaftsprüfungsgesellschaft, Berlin, provide a

statement regarding the scope of the business, financial, personal, and other relationships between KPMG AG, its bodies and head auditors, and Merck KGaA, Darmstadt, Germany, its Group companies and the members of their bodies. The statement also covers the scope of the services provided by KPMG AG in the previous fiscal year as well as the services (other than auditing services) that are contracted for the upcoming year (especially consultancy services) for our company and its subsidiaries (independence declaration). Having examined the declaration, the Supervisory Board has found no grounds to doubt the independence of KPMG AG Wirtschaftsprüfungsgesellschaft, Berlin. Neither party identified any conflicts of interest.

Values and compliance

Based on a corporate culture that places the fundamental company values – courage, achievement, responsibility, respect, integrity and transparency – at the center of our entrepreneurial actions, the Code of Conduct helps those involved in the business process to implement the values when dealing with one another on a daily basis.

We have created the Code of Conduct as a set of rules and regulations intended to help our employees to act responsibly and to make the right decisions in their daily work.

The Code of Conduct explains the principles for dealings with business associates, general partners, colleagues and employees, as well as the communities in which we operate. Thus, it supports all employees in acting ethically – not only in their dealings with one another, but also outside the company. The Code of Conduct is thus the main set of rules of our compliance program.

To Merck KGaA, Darmstadt, Germany, compliance means observing legal and company internal regulations and the basic ethical principles anchored in the company values. With the Code of Conduct and the various unit-specific ethical compliance rules, the values are integrated into daily work and business practice. The Code of Conduct is binding on all employees, both at headquarters and in the subsidiaries. The Compliance Office monitors observance of the Code of Conduct with support from corresponding monitoring and training programs throughout the Group. All employees are called upon to report compliance violations to their supervisor, Legal, HR or other relevant departments. We created the position of Group Compliance Officer in 2002. This employee is responsible for setting up, maintaining and further developing our global compliance program. By taking appropriate measures, the Group Compliance Officer and his team, including regional compliance officers, help to lower the risk of serious legal violations of, for instance, antitrust law or anticorruption rules. Since 2014 and 2015, compliance officers of the business sectors have been providing specific compliance input. A further focal area of the Compliance program is ensuring legally and ethically correct dealings with medical professionals and adhering to the transparency requirements. Since October 2013, the Group Compliance Officer has agreed extensive measures with the affected areas of the company in order to establish an internal framework of rules as well as the corresponding approval and documentation processes that ensure truthful publication. The role of the Group Compliance Officer is reflected in the subsidiaries, which ensure that compliance measures are implemented in the countries. Since 2013, Compliance tasks in the countries and on a regional basis have largely been performed by full-time compliance officers. As a result, a higher level of compliance expertise is based locally and the increasing tasks in all business sectors are taken into account. At the same time, the management structure was streamlined and the reporting lines for the countries were consolidated regionally. Regular regional compliance meetings are held to promote the exchange of information within the Compliance organization. Newcomer training seminars were introduced in 2010 for newly appointed compliance officers. These seminars serve to build up compliance expertise and strengthen cooperation within the Compliance organization. This Group-wide network is used to steer the global compliance program.

Within the scope of this program, a high degree of importance is attached to regular compliance seminars of the Compliance Training Plan of Merck KGaA, Darmstadt, Germany, which are conducted as Web-based training courses and onsite events. By presenting various training topics, particularly on the Code of Conduct, corruption, antitrust and competition law as well as healthcare compliance, they serve to sensitize employees and management to the consequences of compliance violations and to show ways of avoiding them. Since we set up a central SpeakUp line, employees have been able to report compliance violations by telephone or via a Web-based application in their respective national language. The SpeakUp line is available 24 hours a day, free of charge. Case numbers enable anonymous, two-way communication. The reports received are individually reviewed. If a compliance violation exists, corresponding corrective action is taken based on concrete action plans. If necessary, disciplinary measures are taken. These can range from a simple warning up to the dismissal of the employee who violated a compliance rule. In 2010, we set up a Compliance Committee to guide these processes. The Compliance Committee consists of members from various Group functions; they are involved in reviewing compliance violations and introducing countermeasures. The joint work in the Compliance Committee enables processes between the various Group functions to be optimally coordinated and designed efficiently. Further significant elements of the Compliance program include requirements on locally identifying and assessing risks and reporting these, both within the subsidiary abroad and to the Group functions. Group Compliance regularly reviews and assesses the implementation status of the Compliance program at the subsidiaries abroad. In cooperation with Group Internal Auditing, the Compliance Office regularly reviews the implementation of Group-wide compliance measures at the subsidiaries abroad. The audits regularly focus on the local compliance structure, the compliance measures taken, as well as the existence of corresponding compliance guidelines and processes.

The Compliance Office reports regularly to the Executive Board and the Supervisory Board, informing them of the status of compliance activities (including training status), compliance risks and serious compliance violations.

The Executive Board informs the supervisory bodies at least once a year about the key compliance issues.

Risk and opportunity management

The Executive Board, the Supervisory Board and the Finance Committee are regularly informed about the current risk portfolio of the Group and the individual companies. More detailed information can be found in the Report on Risks and Opportunities on page 120.

Avoidance of conflicts of interest

Within the framework of their work, all Executive Board and Supervisory Board members of Merck KGaA, Darmstadt, Germany, are exclusively committed to the interests of the company and neither pursue personal interests nor grant unjustified advantages to third parties.

Before an Executive Board member takes on honorary offices, board positions or other sideline activities, this must be approved by the Personnel Committee of the Board of Partners of E. Merck KG, Darmstadt, Germany. The Chairman of the Executive Board, Karl-Ludwig Kley, and the Chief Financial Officer, Marcus Kuhnert, are both members of the Executive Board of E. Merck KG, Darmstadt, Germany. This does not, however, lead to conflicts of interest.

In its report to the General Meeting, the Supervisory Board discloses any conflicts of interest involving its members and how they were dealt with. Consultancy agreements as well as other service and work contracts of a Supervisory Board member with our company require the approval of the Supervisory Board. In fiscal 2015, there were neither conflicts of interest nor consultancy agreements or other service or work contracts with Merck KGaA, Darmstadt, Germany, involving Supervisory Board members.

Adherence to environmental and safety standards

At our company, closed-loop thinking guides the way in which we address environmental concerns and environmental protection issues. To this end, we integrate precautionary measures into our planning processes. Our Environment, Health and Safety Policy with its principles and strategies implements the guidelines formulated by the national and international associations of the chemical industry in the Responsible Care guidelines. The Responsible Care Global Charter developed by the International Council of Chemical Associations (ICCA) in 2006 puts even more emphasis than before on overall responsibility for products, supply chains and the community. We signed this expanded version of Responsible Care for the entire Group in February 2007. In addition, we were one of the first companies in 2014 to sign the new version of the Responsible Care Global Charter, which is currently being rolled out by us internationally. We report our ecological, economic and social performance transparently in accordance with the internationally recognized principles of the Global Reporting Initiative (GRI), taking into account the requirements of the German Sustainability Code and the principles of the UN Global Compact.

One of our major climate protection objectives is to achieve a 20% reduction in our greenhouse gas emissions by 2020 measured against the 2006 baseline.

Many guidelines specify how the sites and employees of the Group are to observe the principles in their daily work. The Group function Environment, Health, Safety, Security & Quality steers these global activities and ensures compliance with regulatory requirements, standards and business needs throughout the entire Group. In this way, Group-wide risks are minimized and continuous improvement is promoted in the areas of Environment, Health, Safety, Security and Quality. Corporate Responsibility reports are also published at regular intervals.

Procedures of the Executive Board, Supervisory Board, Board of Partners and its Committees

Members of the Executive Board of Merck KGaA, Darmstadt, Germany

Notes on memberships of statutory supervisory boards and comparable German and foreign supervisory bodies (section 285 No. 10 HGB in conjunction with section 125 (1) sentence 5 AktG).

Member	Memberships of (a) statutory supervisory boards and (b) comparable German and foreign supervisory bodies of corporations
Karl-Ludwig Kley Darmstadt, Chairman	(a) – Bertelsmann SE & Co. KGaA, Gütersloh (until May 2016) – Bertelsmann Management SE, Gütersloh (until May 2016) – BMW AG, Munich (Vice Chairman) – Deutsche Lufthansa AG, Cologne (b) – Verizon Communications Inc., Wilmington (Delaware), USA (since November 5, 2015)
Stefan Oschmann Munich, Vice Chairman	no board positions
Kai Beckmann Darmstadt, Chief Administration Officer	no board positions
Belén Garijo Lopez Frankfurt am Main, CEO Healthcare	(b) – Banco Bilbao Vizcaya Argentaria S. A., Bilbao, Spain – L'Oréal S.A., Clichy, France
Marcus Kuhnert Königstein, Chief Financial Officer	no board positions
Bernd Reckmann Seeheim-Jugenheim, CEO Life Science and Performance Materials	(a) – Zschimmer & Schwarz GmbH & Co KG Chemische Fabriken, Lahnstein (since June 26, 2015)

The general partners with no equity interest (Executive Board) manage the business activities in accordance with the laws, the Articles of Association and the rules of procedure. They are appointed by E. Merck KG, Darmstadt, Germany, in accordance with the consent of a simple majority of the other general partners. The members of the Executive Board are jointly responsible for the entire management of the company. Certain tasks are assigned to individual Executive Board members based on a responsibility distribution plan. Each Executive Board member promptly informs the other members of any important actions or operations in his respective business area. The Executive Board is responsible for preparing the annual financial statements of Merck KGaA, Darmstadt, Germany, and of the Group as well as for approving the quarterly and half-year financial statements of the Group. In addition, the Executive Board ensures that all legal provisions, official regulations and the company's internal policies are abided by, and works to achieve compliance with them by all the companies of the Group. A Group-wide guideline defines in detail which transactions require prior Executive Board approval.

The Executive Board provides the Supervisory Board with regular, up-to-date and comprehensive reports about all company-relevant issues concerning strategy, planning, business developments, the risk situation, risk management and compliance. The rules of procedure of the Executive Board and of the Supervisory Board as well as a Supervisory Board resolution regulate further details on the information and reporting duties of the Executive Board vis-à-vis the Supervisory Board.

The Executive Board informs the Board of Partners and the Supervisory Board at least quarterly of the progress of business and the situation of the company. In addition, the Executive Board informs the aforementioned boards at least annually of the company's annual plans and strategic considerations.

The Executive Board passes its resolutions in meetings that are normally held twice a month.

Supervisory Board

Member	Memberships of (a) other statutory supervisory boards and (b) comparable German and foreign supervisory bodies of corporations
Wolfgang Büchele Munich, Chairman of the Executive Board of Linde AG, Munich, Chairman	b) – E. Merck KG, Darmstadt, Germany, Darmstadt[1] – Kemira Oyj, Helsinki, Finland
Michael Fletterich Gernsheim, Chairman of the Works Council of Merck KGaA, Darmstadt, Germany, Darmstadt/Gernsheim, Vice Chairman	no board positions
Crocifissa Attardo Darmstadt, Full-time member of the Works Council of Merck KGaA, Darmstadt, Germany, Darmstadt/Gernsheim	b) – BKK of Merck KGaA, Darmstadt, Germany
Mechthild Auge Wehrheim, Full-time member of the Works Council of Merck KGaA, Darmstadt, Germany, Darmstadt	no board positions
Gabriele Eismann Seeheim-Jugenheim, Senior Product Manager	no board positions
Edeltraud Glänzer Hannover, Vice Chairperson of the IG BCE	(a) – B. Braun Melsungen AG, Melsungen – Solvay Deutschland GmbH, Hannover (Vice Chairperson)
Michaela Freifrau von Glenck Zurich, Retired teacher	no board positions
Siegfried Karjetta[2] Darmstadt, Physician	(b) – E. Merck KG, Darmstadt, Germany, Darmstadt[1]
Albrecht Merck Schriesheim, Commercial Director of the Castel Peter Winery, Bad Dürkheim	(b) – E. Merck KG, Darmstadt, Germany, Darmstadt[1]
Dietmar Oeter Seeheim-Jugenheim, Vice President Corporate Quality Assurance	no board positions
Alexander Putz Michelstadt, Full-time member of the Works Council of Merck KGaA, Darmstadt, Germany, Darmstadt	no board positions
Helga Rübsamen-Schaeff Langenburg, Chairperson of the Advisory Board of AiCuris Anti-infective Cures GmbH, Wuppertal	(a) – 4SC AG, Martinsried (since January 2, 2015) – Supervisory Board of Bonn University Hospital (since March 1, 2015) (b) – E. Merck KG, Darmstadt, Germany, Darmstadt[1]
Karl-Heinz Scheider Gross-Zimmern, Specialist, Life Science Operations Strategy of Merck KGaA, Darmstadt, Germany	no board positions
Gregor Schulz Umkirch, Pediatrician	(b) – E. Merck KG, Darmstadt, Germany, Darmstadt[1]
Theo Siegert Düsseldorf, Managing Partner of de Haen-Carstanjen & Söhne, Düsseldorf	(a) – E.ON SE, Düsseldorf – Henkel AG & Co KGaA, Düsseldorf (b) – E. Merck KG, Darmstadt, Germany, Darmstadt[1] – DKSH Holding Ltd., Zurich, Switzerland
Tobias Thelen[2] Munich, Managing Partner of Altmann Analytik GmbH & Co. KG, Munich	(b) – E. Merck KG, Darmstadt, Germany, Darmstadt[1]

[1] Internal board position.
[2] Members appointed according to Article 6 (5) of the Articles of Association.

The Supervisory Board performs a monitoring function. It supervises the management of the company by the Executive Board. In comparison with the supervisory board of a German stock corporation, the role of the supervisory board of a corporation with general partners (KGaA) is limited. This is due to the fact that the members of the Executive Board are personally liable partners and therefore are themselves responsible for the management of the company. In particular, the Supervisory Board is not responsible for appointing and dismissing general partners or for regulating the terms and conditions of their contracts. This is the responsibility of E. Merck KG, Darmstadt, Germany. Nor does the Supervisory Board have the authority to issue rules of procedure for the Executive Board or a catalogue of business transactions requiring approval. This authority likewise belongs to E. Merck KG, Darmstadt, Germany (Article 13 (3) sentence 1 and (4) sentence 1 of the Articles of Association). However, the fact that the Supervisory Board has no possibilities to directly influence the Executive Board restricts neither its information rights nor audit duties. The Supervisory Board must monitor the Executive Board in terms of legality, regularity, usefulness, and economic efficiency. In particular, the Supervisory Board has the duty to examine the reports provided by the Executive Board. This includes regular reports on the intended business policy, as well as other fundamental issues pertaining to corporate planning, especially financial, investment and HR planning; the profitability of the Group; the progress of business; the risk situation; risk management (including compliance); and the internal auditing system. In addition, by means of consultation with the Executive Board, it creates the basis for supervision of the management of the company by the Supervisory Board according to section 111 (1) of the German Stock Corporation Act (AktG).

The Supervisory Board examines the annual financial statements as well as the consolidated financial statements and the combined management report, taking into account in each case the reports of the auditor. Moreover, the Supervisory Board discusses the quarterly reports and the half-year financial report, taking into account in the latter case the report of the auditor on the audit review of the abridged financial statements and the interim management report of the Group. The adoption of the annual financial statements is not the responsibility of the Supervisory Board, but of the General Meeting. The Supervisory Board normally meets four times a year. Further meetings may be convened if requested by a member of either the Supervisory Board or the Executive Board. As a rule, resolutions of the Supervisory Board are passed at meetings. At the instruction of the chairman, in exceptional cases a resolution may be passed by other means, details of which are given in the rules of procedure.

The members of the Board of Partners of E. Merck KG, Darmstadt, Germany, and of the Supervisory Board may be convened to a joint meeting if so agreed by the chairmen of the two boards.

The rules of procedure prescribe that the Supervisory Board may form committees as and when necessary. The Supervisory Board has formed a Nomination Committee comprising three shareholder representatives. Its members are Albrecht Merck, Wolfgang Büchele and Theo Siegert. The Nomination Committee is responsible for proposing to the Supervisory Board suitable candidates for its proposal to the Annual General Meeting. Apart from legal requirements and the recommendations of the German Corporate Governance Code, the "Objectives of the Supervisory Board with respect to its composition" are to be taken into consideration as well. Owing to the aforementioned limited authority, and since a corresponding need has not yet arisen, the Supervisory Board currently has no further committees.

The German Stock Corporation Act prescribes that the Supervisory Board of a publicly listed company must have at least one independent member who has professional expertise in accounting or auditing. Theo Siegert satisfies these requirements and is furthermore the Chairman of the Finance Committee of the Board of Partners of E. Merck KG, Darmstadt, Germany.

Board of Partners of E. Merck KG, Darmstadt, Germany

Some of the responsibilities that lie with the supervisory board of a German stock corporation are fulfilled at our company by E. Merck KG, Darmstadt, Germany. This applies primarily to the Board of Partners of E. Merck KG, Darmstadt, Germany. Therefore, the Board of Partners and the composition and procedures of its committees are described in the following.

The Board of Partners has nine members.

Member	Memberships of (a) other statutory supervisory boards and (b) comparable German and foreign supervisory bodies of corporations
Johannes Baillou Vienna, Austria, Vice Chairman of the Executive Board and General Partner of E. Merck KG, Darmstadt, Germany, Chairman	no board positions
Frank Stangenberg-Haverkamp Darmstadt, Chairman of the Executive Board and General Partner of E. Merck KG, Darmstadt, Germany	(a) – Fortas AG, Rösrath (Chairman) (b) – Oras Invest Ltd, Helsinki, Finland – Travel Asset Group Ltd., London, United Kingdom (Chairman)
Wolfgang Büchele Munich, Chairman of the Executive Board of Linde AG, Munich	(a) – Merck KGaA, Darmstadt, Germany (b) – Kemira Oyj, Helsinki, Finland
Siegfried Karjetta Darmstadt, Physician	(a) – Merck KGaA, Darmstadt, Germany
Albrecht Merck Schriesheim, Commercial Director of the Castel Peter Winery, Bad Dürkheim	(a) – Merck KGaA, Darmstadt, Germany
Helga Rübsamen-Schaeff Langenburg, Chairperson of the Advisory Board of AiCuris Anti-infective Cures GmbH, Wuppertal	(a) – Merck KGaA, Darmstadt, Germany – 4SC AG, Martinsried (since January 2, 2015) – Supervisory Board of Bonn University Hospital (since March 1, 2015)
Gregor Schulz Umkirch, Pediatrician	(a) – Merck KGaA, Darmstadt, Germany
Theo Siegert Düsseldorf, Managing Partner of de Haen-Carstanjen & Söhne, Düsseldorf	(a) – Merck KGaA, Darmstadt, Germany – E.ON SE, Düsseldorf – Henkel AG & Co KGaA, Düsseldorf (b) – DKSH Holding Ltd., Zurich, Switzerland
Tobias Thelen Munich, Managing Partner of Altmann Analytik GmbH & Co. KG, Munich	(a) – Merck KGaA, Darmstadt, Germany

The Board of Partners supervises the Executive Board in its management of the company. It informs itself about the business matters of Merck KGaA, Darmstadt, Germany, and may inspect and examine the company's accounts and other business documents, and the assets for this purpose. According to Article 13 (4) of the Articles of Association of Merck KGaA, Darmstadt, Germany, the Executive Board requires the approval of E. Merck KG, Darmstadt, Germany, for transactions that are beyond the scope of the Group's ordinary business activities. For such transactions to be approved, approval must first be obtained from the Board of Partners of E. Merck KG, Darmstadt, Germany. The Board of Partners convenes as and when necessary; however, it meets at least four times a year. The members of the Executive Board of Merck KGaA, Darmstadt, Germany, are invited to all meetings of the Board of Partners, unless the Board of Partners resolves otherwise in individual cases. The members of the Board of Partners may convene a joint meeting with the Supervisory Board of Merck KGaA, Darmstadt, Germany, if so agreed by the chairmen of the two boards.

The Board of Partners may confer the responsibility for individual duties to committees. Currently the Board of Partners has three committees in place: the Personnel Committee, the Finance Committee, and the Research and Development Committee.

Personnel Committee

The Personnel Committee has four members. These are Johannes Baillou (Chairman since February 9, 2015), Frank Stangenberg-Haverkamp (Chairman until February 9, 2015), Wolfgang Büchele, and Theo Siegert.

The Personnel Committee meets at least twice a year. Further meetings are convened as and when necessary. Meetings of the Personnel Committee are attended by the Chairman of the Executive Board of Merck KGaA, Darmstadt, Germany, unless the Committee decides otherwise.

The Personnel Committee is responsible for, among other things, the following decisions concerning members and former members of the Executive Board: contents of and entry into employment contracts and pension contracts, granting of loans and advance payments, changes to the compensation structure and adaptation of compensation, approval for taking on honorary offices, board positions and other sideline activities, as well as division of responsibilities within the Executive Board of Merck KGaA, Darmstadt, Germany,. The Personnel Committee passes its resolutions by a simple majority – in matters concerning the Chairman of the Executive Board unanimity is required. The Chairman of the Committee regularly informs the Board of Partners of its activities.

Finance Committee

The Finance Committee has four members. These are Theo Siegert (Chairman), Johannes Baillou, Wolfgang Büchele, and Tobias Thelen.

The Finance Committee holds at least four meetings a year, at least one of which is a joint meeting with the auditor of Merck KGaA, Darmstadt, Germany. Further meetings are convened as and when necessary. Meetings of the Finance Committee are attended by the Chief Financial Officer of Merck KGaA, Darmstadt, Germany. Other members of the Executive Board of Merck KGaA, Darmstadt, Germany, may attend the meetings upon request by the Finance Committee. These meetings regularly include the Chairman of the Executive Board. The Finance Committee is responsible for, among other things, analyzing and discussing the annual financial statements, the consolidated financial statements and the respective reports of the auditor, as well as the half-year financial report (including the report of the auditors for the audit review of the abridged financial statements and interim management report contained in the half-year report) and the quarterly reports. Moreover, the Finance Committee recommends to the Chairman of the Supervisory Board annual audit focuses for the auditors of the annual financial statements. It also recommends to the Supervisory Board an auditor for the annual financial statements as well as auditors for the audit review of the abridged financial statements and interim management report contained in the half-year financial report for the Supervisory Board's corresponding suggestion to the General Meeting. In addition, the Finance Committee is concerned with the net assets, financial position, results of operations and liquidity of our company, as well as accounting, internal auditing, risk management and compliance issues. Upon request of the Board of Partners, the Finance Committee examines investment projects that must be approved by the Board of Partners and provides recommendations pertaining thereto.

Research and Development Committee

The Research and Development Committee has four members. These are Helga Rübsamen-Schaeff (Chairperson), Johannes Baillou, Siegfried Karjetta, and Gregor Schulz.

The Research and Development Committee is convened as and when necessary, but holds at least two meetings a year. Meetings of the Research and Development Committee are attended by members of the Executive Board of Merck KGaA, Darmstadt, Germany, upon request of the Committee. These meetings regularly include the Chairman of the Executive Board as well as the CEO Healthcare and the CEO Life Science/Performance Materials. The Research and Development Committee is responsible, among other things, for reviewing and discussing the research activities of our Healthcare and/or Life Science/Performance Materials business sectors. The Chairperson of the Committee reports to the Board of Partners on the insights gained from the meetings held.

Stipulations to promote the percentage of management positions held by women pursuant to section 76 (4) and section 111 (5) AktG (German Stock Corporation Act)

Stipulations pursuant to section 76 (4) AktG (target for the percentage of positions held by women on the two upper management levels below the Executive Board)

We foster diversity within the company, which also includes ensuring a balance of genders in management. To this end, we pursue both voluntary and statutory objectives, and we work continuously and sustainably on achieving them.

Pursuant to section 76 (4) AktG, the management body of companies that are listed or subject to co-determination are required to set binding targets for the percentage of positions held by women on the two management levels below the management body.

In September 2015, the Executive Board of Merck KGaA, Darmstadt, Germany, set the following targets for the percentage of positions held by women on the two management levels below the Executive Board:

- First management level below the Executive Board: 21% of positions held by women
- Second management level below the Executive Board: 21% of positions held by women

The targets relate to the percentage of positions held by women on the respective management level as of September 30, 2015 and correspond to the current status. This naturally does not exclude an increase in the percentage of positions held by women on these management levels. The deadline set by the Executive Board of Merck KGaA, Darmstadt, Germany, for reaching this target ends on December 31, 2016.

In addition, as a global company with correspondingly aligned global (management) structures, our company is continuing to pursue the (voluntary) target of 25% to 30% of management positions held by women (Global Grade 14 and up; see page 83 “Diversity enriches our management team”.

Stipulations pursuant to section 111 (5) AktG (target for the percentage of positions on the Supervisory Board held by women)

Pursuant to section 111 (5) AktG, the Supervisory Board of companies that are listed or subject to co-determination stipulates binding targets for the percentage of positions on the Supervisory Board and on the Management Board held by women. However, for Merck KGaA, Darmstadt, Germany, stipulations pursuant to section 111 (5) AktG need not be set for the following reasons:

The statutory target of 30% pursuant to section 96 (2) AktG is already applied on the Supervisory Board of Merck KGaA, Darmstadt, Germany. This eliminates the obligation to stipulate a further target for the percentage of positions held by women on the Supervisory Board (see section 111 (5) sentence 5 AktG).

The obligation to stipulate a target for the percentage of positions held by women on the Management Board pursuant to section 111 (5) AktG is not applicable to the legal form of a corporation with general partners (Kommanditgesellschaft auf Aktien) as a corporation with general partners does not have a management board comparable to that of a stock corporation with personnel authority of the supervisory board, but has an executive board consisting of personally liable partners (see also pages 159/160 for the description of Supervisory Board procedures).

REPORT OF THE SUPERVISORY BOARD

The Supervisory Board again properly executed its duties in 2015 in accordance with the law as well as the company's Articles of Association and rules of procedure. In particular, the Supervisory Board monitored the work of the Executive Board diligently and regularly.

Cooperation with the Executive Board

The cooperation with the Executive Board was characterized by intensive, trustworthy exchange. During fiscal 2015, the Executive Board provided the Supervisory Board with regular written and verbal reports on the business development of Merck KGaA, Darmstadt, Germany and the Group. In particular, the Supervisory Board was informed about the market and sales situation of the company against the background of macroeconomic development, the financial position of the company and its subsidiaries, along with their earnings development, as well as corporate planning. Within the scope of quarterly reporting, the sales and operating results were presented for the Group as a whole, and broken down by business sector. Aside from the Supervisory Board meetings, the Chairman of the Supervisory Board also maintained and continues to maintain a regular exchange of information with the Chairman of the Executive Board.

Key topics of the Supervisory Board meetings

Four Supervisory Board meetings were held in fiscal 2015. At these meetings, the Supervisory Board discussed the reports of the Executive Board in detail and discussed company developments and strategic issues together with the Executive Board.

At the meeting held on February 27, 2015, the Executive Board first reported on business performance during 2014. In addition, the Supervisory Board intensively addressed the annual financial statements and consolidated financial statements for 2014 and the corresponding management reports. The auditor explained the audit report. The Executive Board reported on the financial statements. Furthermore, the Supervisory Board resolved upon the Statement of Compliance with the German Corporate Governance Code as well as the Statement on Corporate Governance, which simultaneously includes the joint report on Corporate Governance of the Executive Board and Supervisory Board. The Supervisory Board also approved the proposals to be made to the General Meeting. The Executive Board presented the plans for fiscal 2015. Further topics were the report of Group Internal Auditing and the status of the Sigma-Aldrich acquisition.

The meeting held on May 13, 2015 focused on current business developments in the first quarter of 2015. The report of the Research and Development Committee Life Science/Performance Materials of the Board of Partners of E. Merck KG, Darmstadt, Germany, was a further focus of the meeting. The Supervisory Board also dealt with the report of the Group Compliance Officer, the report of the Group Data Privacy Officer and a report on ERP strategy.

At its meeting on July 29, 2015, the Supervisory Board focused intensively on the report of the Executive Board on business performance in the second quarter of 2015. In addition, KPMG explained the half-year financial report. Risk management within the company was a further topic. The Head of Risk Management presented the status report for the first half of 2015. No risks that threaten the continued existence of the company were identified.

At its fourth meeting on November 10, 2015, the Supervisory Board discussed the results of the efficiency examination that took place in 2015. Furthermore, the Supervisory Board dealt with the report of the Executive Board on the third quarter of 2015. Additional topics of focus were the 2015 status reports of Group Internal Auditing and on compliance and data protection as well as the report of the Research and Development Committee Healthcare. Furthermore, the Group Executive Conference and our current strategic direction were reported on and discussed.

In addition, on October 13, 2015, the Supervisory Board members were informed by telephone of Mr. Oschmann's appointment as successor to Mr. Kley as Chairman of the Executive Board on April 30, 2016 as well as the launch of the new branding.

Annual financial statements

The annual financial statements of Merck KGaA, Darmstadt, Germany, the consolidated financial statements of the Group, and the combined management report for Merck KGaA, Darmstadt, Germany, and the Group, including the accounts, were audited by KPMG AG Wirtschaftsprüfungsgesellschaft, Berlin. The auditors issued an unqualified audit opinion on the annual financial statements of Merck KGaA, Darmstadt, Germany, in accordance with German Auditing Standards. For the consolidated financial statements prepared in accordance with International Financial Reporting Standards, as well as the combined management report, the auditors issued the unqualified auditor's report reproduced in the Annual Report

of the Group. In addition, the auditor audited the calculation of the participation of Merck KGaA, Darmstadt, Germany, in the profits of E. Merck KG, Darmstadt, Germany, in accordance with Art. 27 (2) of the Articles of Association. The annual financial statements of Merck KGaA, Darmstadt, Germany, the consolidated financial statements of the Group, the combined management report for Merck KGaA, Darmstadt, Germany, and the Group, and the proposal by the Executive Board for the appropriation of the net retained profit were presented and distributed to the Supervisory Board, together with the auditor's reports.

In accordance with Art. 14 (2) of the Articles of Association, the Supervisory Board also examined the annual financial statements of Merck KGaA, Darmstadt, Germany, the proposal for the appropriation of net retained profit and the auditor's report presented in accordance with Article 27 (2) of the Articles of Association. It also examined the consolidated financial statements of the Group as well as the combined management report for Merck KGaA, Darmstadt, Germany, and the Group, and took note of the auditor's report of KPMG AG Wirtschaftsprüfungsgesellschaft, Berlin.

The discussion of the relevant agenda item at the Supervisory Board's meeting on March 4, 2016 to approve the financial statements was also attended by the auditors who sign the audit opinion on the annual financial statements of Merck KGaA, Darmstadt, Germany, and the consolidated financial statements of the Group. These auditors furthermore reported on their audit at this meeting.

The Supervisory Board took note of and approved the results of the audit. On completion of its examination, the Supervisory Board raised no objections and thus approved the annual financial statements for Merck KGaA, Darmstadt, Germany, the consolidated financial statements of the Group and the combined management report of Merck KGaA, Darmstadt, Germany, and the Group prepared by the Executive Board, as well as the report presented by the auditor in accordance with Article 27 (2) of the Articles of Association. Following its own examination of the situation, the Supervisory Board gave its consent to the proposal of the Executive Board for the appropriation of net retained profit.

Corporate governance and Statement of Compliance

Corporate governance is a topic of high priority for the Supervisory Board. In its own estimation, the Supervisory Board has an adequate number of independent members. There were no conflicts of interest, as defined by the German Corporate Governance Code, involving Supervisory Board members during 2015. After addressing corporate governance topics in detail, the Executive Board and Supervisory Board resolved to adopt and issue the updated Statement of Compliance on February 18, 2016 (Executive Board) and on March 4, 2016 (Supervisory Board) and jointly issued it on March 4, 2016 in accordance with section 161 of the German Stock Corporation Act. The statement is permanently available on the company website (www.emdgroup.com -> Investors -> Corporate Governance). More information about corporate governance at Merck KGaA, Darmstadt, Germany, including the compensation of the Executive Board and Supervisory Board, is given in the Statement of Compliance on pages 148 et seq. of the Annual Report.

Committees

Apart from the Nomination Committee, the Supervisory Board of Merck KGaA, Darmstadt, Germany, currently has no further committees on account of the special features that apply to the Supervisory Board of a corporation with general partners (KGaA) under German company law and because a corresponding need for this has not emerged to date. The members of the Nomination Committee newly elected on November 11, 2014 did not convene in fiscal 2015. No report is given on the work of further committees.

Personnel matters

With the exception of Edeltraud Glänzer, who was absent from the meeting on November 10, 2015, all the Supervisory Board members attended all the Supervisory Board meetings. There were no changes in the composition of the Supervisory Board in 2015.

Darmstadt, March 4, 2016

The Supervisory Board of Merck KGaA, Darmstadt, Germany

Wolfgang Büchele
Chairman

OBJECTIVES OF THE SUPERVISORY BOARD WITH RESPECT TO ITS COMPOSITION

Initial situation

According to section 5.4.1 (2) and (3) of the German Corporate Governance Code, the Supervisory Board shall specify concrete objectives regarding its composition which, while considering the specifics of the enterprise, take into account the international activities of the enterprise, potential conflicts of interest, the number of independent Supervisory Board members, an age limit to be specified for Supervisory Board members and a regular limit on the length of Supervisory Board membership to be specified, as well as diversity.

General notes on the composition of the Supervisory Board

The Supervisory Board of Merck KGaA, Darmstadt, Germany, currently consists of 16 members, eight of whom represent the shareholders and a further eight who represent the employees. The eight employee representative members are elected by employee delegates pursuant to the provisions of the German Codetermination Act (Mitbestimmungsgesetz "MitbestG"). These consist of six company employees, including a senior executive, as well as two union representatives. The Supervisory Board has no statutory proposal right with respect to electing the delegates or employee representatives. Owing to a delegation right of E. Merck Beteiligungen KG, Darmstadt, Germany, two of the eight shareholder representatives are specified. The Supervisory Board likewise has no statutory proposal right with respect to exercising this delegation right. The remaining six shareholder representatives are elected by the General Meeting. In accordance with section 124 (3) sentence 1 AktG, the Supervisory Board shall propose to the General Meeting Supervisory Board members for election. These proposals require a majority of the votes of the shareholder representative members of the Supervisory Board. The next scheduled election to the Supervisory Board shall take place at the 2019 General Meeting. The General Meeting is not required to follow the election proposals. The appointment objectives that the Supervisory Board sets forth below therefore do not represent requirements to be met by those eligible to elect or to delegate members. Instead, they are intended to express the objectives pursued by the Supervisory Board in office with regard to its advisory and monitoring functions.

Objectives of the Supervisory Board with respect to its composition

In accordance with section 5.4.1 (2) of the German Corporate Governance Code, the Supervisory Board has specified the following objectives with respect to its composition and reports on the status of their implementation below.

Expertise and diversity

Professional qualifications and personal expertise are the two most important prerequisites for appointments to seats on the Supervisory Board. When proposing Supervisory Board candidates for election or delegation, the Supervisory Board will always give top priority to these prerequisites, which are essential for fulfilling its legal duties.

Overall, the Supervisory Board's policy is to optimally meet its monitoring and advisory duties by having diversity among its members. Diversity includes, in particular, internationality as well as different experience backgrounds and career paths. The proportion of women on the Supervisory Board is also considered to be an aspect of diversity. When preparing proposals for election or delegation, due consideration shall be given in individual cases to the extent to which different, yet complementary professional profiles, career and life experiences, as well as appropriate representation of both genders can benefit the work of the Supervisory Board. Additionally, the Supervisory Board shall support the Executive Board in its efforts to increase diversity within the company.

In-depth knowledge of the fields relevant to the company

The Supervisory Board shall have at least four members with in-depth knowledge and experience of fields that are important to the company, including at least one expert for the Healthcare and Life Science/Performance Materials sectors, respectively.

Our company is currently meeting this objective for the composition of the Supervisory Board. At present, the Supervisory Board has more than four members who have in-depth knowledge and experience of the Healthcare and Life Science/Performance Materials sectors. More than four Supervisory Board members also have executive experience in companies that also or specifically operate in the Healthcare and Life Science/Performance Materials sectors.

Management experience

The Supervisory Board shall have at least three members who have experience in managing or supervising a medium- or large-sized company.

The Supervisory Board has more than three members who have the corresponding experience. This includes both Supervisory Board members who were or still are management board members or directors in such companies, as well as Supervisory Board members who have gained experience in supervisory bodies of German and/or foreign companies of this size.

Family-owned company

The Supervisory Board shall have at least one member who has experience in managing medium- or large-sized family-owned companies.

The Supervisory Board currently has multiple members who have the appropriate management experience in family-owned companies of this size.

Internationality

The Supervisory Board shall have at least three members with business experience in the main sales markets of Merck KGaA, Darmstadt, Germany. Currently, the main sales markets of Merck KGaA, Darmstadt, Germany, are Europe, North and Latin America, and Asia-Pacific.

The present composition of the Supervisory Board satisfies this objective. More than three Supervisory Board members have entrepreneurial experience in Europe, covering a wide range of countries. More than three Supervisory Board members have experience in management positions in companies that operate globally.

Women on the Supervisory Board

Six women are currently members of the Supervisory Board of Merck KGaA, Darmstadt, Germany. This corresponds to 37.5% of the Supervisory Board. When nominating candidates for election to the Supervisory Board or making proposals for delegation, the Supervisory Board shall examine whether the percentage of women can be increased by suitable candidates.

The Supervisory Board currently consists of 37.5% women, which it considers a satisfactory percentage. This is based on both the percentage of women in management positions at our company, as well as the fact that the supervisory boards of other companies have a comparable percentage of women.

Number of independent members/no material conflicts of interest

The Supervisory Board shall have an adequate number of independent members. Assuming that the status of being an employee representative per se does not justify doubts with respect to the independence criteria within the meaning of section 5.4.2 of the German Corporate Governance Code, normally all employee representatives should be independent within the meaning of the Code. In any case, at least four of the shareholder representatives on the Supervisory Board should be independent. According to the Articles of Association of Merck KGaA, Darmstadt, Germany, six members representing the shareholders are to be elected by the General Meeting and two members are to be delegated. Taking this into account, the Supervisory Board considers four shareholder representatives to be an appropriate number of independent members. In the Supervisory Board's estimation, the objectives concerning independent members are currently met. In particular, the Supervisory Board does not believe that membership of the Board of Partners of E. Merck KG, Darmstadt, Germany, conflicts with independence. The Board of Partners exists complementary to the competencies and the activities of the Supervisory Board. It is not to be expected that this will lead to material and not merely temporary conflicts of interest. It should also be taken into account that due to its substantial capital investment and unlimited personal liability, E. Merck KG, Darmstadt, Germany, has a strong interest in the businesses of Merck KGaA, Darmstadt, Germany, operating efficiently and in compliance with procedures, counteracting from the outset conflicts of interest between E. Merck KG, Darmstadt, Germany, and Merck KGaA, Darmstadt, Germany, and thus also corresponding conflicts of interest between the members of the respective corporate bodies.

Moreover, no one shall be proposed for election to the Supervisory Board who simultaneously serves on a body of or advises a major competitor of the company, or owing to another function, e.g. advisor to major contract partners of the company, could potentially become involved in a conflict of interest. No Supervisory Board member serves on a body of or advises a major competitor. No Supervisory Board member performs a function that could lead to a lasting conflict of interest.

No age limit or maximum length of membership

An age limit or a regular limit on the length of membership for Supervisory Board members is not specified since age and length of membership are not criteria for qualifications and expertise. Moreover, we do not wish to forego the many years of experience of Supervisory Board members. Crucial to the successful work of the Supervisory Board is a good balance among Supervisory Board members in terms of age and length of membership.

The achievement of the aforementioned objectives shall be pursued initially until 2017, taking into account applicable law within the scope of elections and re-elections, delegations as well as court appointments of replacement members if these become necessary. All Supervisory Board members will correspondingly influence those eligible to elect or delegate. Taking into consideration the aforementioned criteria and in accordance with its duties under German stock corporation law, the Supervisory Board proposes to the General Meeting the candidates it believes to be best suited in each case and will continue to do so in the future.

Every year, the Supervisory Board will provide information in the Annual Report on the status of implementing its objectives.

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To download the tables in the consolidated financial statements as Excel files, please use the following link:
ar2015.emdgroup.com/downloads

Consolidated Income Statement[1]

€ million	Note	2015	2014
Net sales	→ 8	**12,844.7**	**11,362.8**
Cost of sales	→ 9	–4,076.3	–3,526.4
(of which: amortization of intangible assets)[2]		*(–166.6)*	*(–94.0)*
Gross profit		**8,768.4**	**7,836.4**
Marketing and selling expenses	→ 10	–4,049.5	–3,589.1
(of which: amortization of intangible assets)[2]		*(–778.9)*	*(–719.0)*
Administration expenses		–719.9	–608.6
Research and development costs	→ 11	–1,709.2	–1,703.7
(of which: amortization of intangible assets)[2]		*(–2.7)*	*(–3.8)*
Other operating income	→ 12	470.7	564.4
Other operating expenses	→ 13	–917.3	–737.4
Operating result (EBIT)		**1,843.2**	**1,762.0**
Financial result	→ 14	–356.7	–205.0
Profit before income tax		**1,486.5**	**1,557.0**
Income tax	→ 15	–368.0	–392.2
Profit after tax from continuing operations		**1,118.5**	**1,164.8**
Profit after tax from discontinued operations		**5.6**	**–**
Profit after tax		**1,124.1**	**1,164.8**
of which: attributable to shareholders of Merck KGaA, Darmstadt, Germany (net income)		1,114.8	1,157.3
of which: attributable to non-controlling interests	→ 25	9.3	7.5
Earnings per share (in €)	→ 16		
basic		2.56	2.66
- thereof from continuing operations		2.55	2.66
- thereof from discontinued operations		0.01	–
diluted		2.56	2.66
- thereof from continuing operations		2.55	2.66
- thereof from discontinued operations		0.01	–

[1] The reporting structure has changed, see "Changes to accounting and measurement principles and disclosure changes".
[2] Excluding amortization of internally generated or separately acquired software.

Consolidated Statement of Comprehensive Income

€ million	Note	2015	2014
Profit after tax		**1,124.1**	**1,164.8**
Items of other comprehensive income that will not be reclassified to profit or loss in subsequent periods:			
Remeasurement of the net defined benefit liability			
Changes in remeasurement	→ 26	160.5	–861.5
Tax effect		–45.3	149.2
Changes recognized in equity		115.2	–712.3
		115.2	–712.3
Items of other comprehensive income that may be reclassified to profit or loss in subsequent periods:			
Available-for-sale financial assets			
Fair value adjustments		18.5	–1.4
Reclassification to profit or loss		–10.9	–0.1
Tax effect		–2.5	0.4
Changes recognized in equity		5.1	–1.1
Derivative financial instruments			
Fair value adjustments		725.5	411.7
Reclassification to profit or loss		71.0	–43.0
Reclassification to assets		–1,380.3	–
Tax effect		15.6	–20.2
Changes recognized in equity		–568.2	348.5
Exchange differences on translating foreign operations			
Changes taken directly to equity		971.8	682.4
Reclassification to profit or loss		–	0.1
Changes recognized in equity		971.8	682.5
		408.7	1,029.9
Other comprehensive income		**523.9**	**317.6**
Comprehensive income		**1,648.0**	**1,482.4**
of which attributable to to shareholders of Merck KGaA, Darmstadt, Germany		1,635.9	1,469.1
of which attributable to non-controlling interests	→ 25	12.1	13.3

Consolidated Balance Sheet[1]

€ million	Note	Dec. 31, 2015	Dec. 31, 2014
Non-current assets			
Intangible assets	→ 17	25,339.0	11,395.5
Property, plant and equipment	→ 18	4,009.1	2,990.4
Non-current financial assets	→ 19	131.5	94.4
Other non-current assets	→ 20	127.8	56.5
Deferred tax assets	→ 15	1,049.6	992.9
		30,657.0	**15,529.7**
Current assets			
Inventories	→ 21	2,619.8	1,659.7
Trade accounts receivable[2]	→ 22	2,738.3	2,219.5
Current financial assets	→ 19	227.0	2,199.4
Other current assets[2]	→ 20	496.2	1,226.3
Income tax receivables	→ 23	391.0	297.0
Cash and cash equivalents	→ 24	832.2	2,878.5
Assets held for sale	→ 4	45.7	–
		7,350.2	**10,480.4**
Total assets		**38,007.2**	**26,010.1**
Total equity	→ 25		
Equity capital		565.2	565.2
Reserves		9,678.9	9,038.9
Gains/losses recognized in equity		2,543.4	2,137.5
Equity attributable to shareholders of Merck KGaA, Darmstadt, Germany		**12,787.5**	**11,741.6**
Non-controlling interests		67.8	59.4
		12,855.3	**11,801.0**
Non-current liabilities			
Provisions for pensions and other post-employment benefits	→ 26	1,836.1	1,820.1
Other non-current provisions	→ 27	855.3	626.1
Non-current financial liabilities	→ 28	9,616.3	3,561.1
Other non-current liabilities	→ 29	608.5	782.0
Deferred tax liabilities	→ 15	2,852.7	818.4
		15,768.9	**7,607.7**
Current liabilities			
Current provisions	→ 27	535.4	561.7
Current financial liabilities	→ 28	4,096.6	2,075.9
Trade accounts payable	→ 30	1,921.2	1,539.4
Income tax liabilities	→ 31	1,011.3	849.8
Other current liabilities	→ 29	1,818.5	1,574.6
Liabilities directly related to assets held for sale	→ 4	–	–
		9,383.0	**6,601.4**
Total equity and liabilities		**38,007.2**	**26,010.1**

[1] Since January 1, 2015, the consolidated balance sheet of the Group has been structured in descending order of maturity.
[2] Previous year's figures have been adjusted, see "Changes to accounting and measurement principles and disclosure changes".

Consolidated Cash Flow Statement

€ million	Note	2015	2014
Profit after tax		**1,124.1**	**1,164.8**
Depreciation/amortization/impairment losses/reversals of impairments		1,510.9	1,360.9
Changes in inventories		–90.0	20.9
Changes in trade accounts receivable[1]		–84.5	–94.8
Changes in trade accounts payable		166.5	52.8
Changes in provisions		214.7	–341.6
Changes in other assets and liabilities[1]		–636.3	533.1
Neutralization of gains/losses on disposal of assets		–42.0	–9.3
Other non-cash income and expenses		31.8	18.7
Net cash flows from operating activities	→ 34	**2,195.2**	**2,705.5**
thereof: from discontinued operations		**5.6**	**–**
Payments for investments in intangible assets		–179.1	–143.3
Payments from the disposal of intangible assets		27.4	2.1
Payments for investments in property, plant and equipment		–513.9	–480.9
Payments from the disposal of property, plant and equipment		8.9	14.0
Payments for investments in financial assets		–1,740.8	–3,143.3
Payments for acquisitions less acquired cash and cash equivalents		–13,482.3	–1,419.3
Payments from the disposal of other financial assets		3,858.0	3,508.6
Payments from the divestment of assets held for sale		86.0	20.9
Net cash flows from investing activities	→ 35	**–11,935.8**	**–1,641.2**
thereof: from discontinued operations		**84.4**	**–**
Dividend payments to shareholders of Merck KGaA, Darmstadt, Germany		–129.2	–122.8
Dividend payments to non-controlling interests		–3.6	–3.1
Dividend payments to E. Merck KG, Darmstadt, Germany		–435.0	–382.7
Payments from new borrowings of financial liabilities from E. Merck KG, Darmstadt, Germany		560.0	610.0
Repayments of financial liabilities to E. Merck KG, Darmstadt, Germany		–483.6	–470.6
Payments for the acquisition of non-controlling interests		–	–351.3
Repayments of bonds		–1,737.7	–
Payments from issuance of bonds		5,756.3	1,482.9
Payments from new borrowings of other current and non-current financial liabilities		4,106.5	322.6
Repayments of other current and non-current financial debt liabilities		–469.9	–324.5
Net cash flows from financing activities	→ 35	**7,163.8**	**760.5**
thereof: from discontinued operations		**–**	**–**
Changes in cash and cash equivalents		**–2,576.8**	**1,824.8**
Changes in cash and cash equivalents due to currency translation		530.5	72.9
Cash and cash equivalents as of January 1		2,878.5	980.8
Cash and cash equivalents as of December 31		832.2	2,878.5
Plus cash and cash equivalents included in assets held for sale		–	–
Cash and cash equivalents as of December 31 (consolidated balance sheet)	→ 24	**832.2**	**2,878.5**

[1] Previous year's figures have been adjusted, see "Notes to the consolidated cash flow statement".

Consolidated Statement of Changes in Net Equity

For details see Note [25] “Equity”.

	Equity capital			Retained earnings	
€ million	General partner’s equity Merck KGaA, Darmstadt, Germany	Subscribed capital Merck KGaA, Darmstadt, Germany	Capital reserves (share premium) Merck KGaA, Darmstadt, Germany	Retained earnings/ Net retained profit	Remeasurement of defined benefit plans
Balance as of January 1, 2014	**397.2**	**168.0**	**3,813.7**	**6,090.1**	**–562.7**
Profit after tax	–	–	–	1,157.3	–
Other comprehensive income	–	–	–	–	–712.0
Comprehensive income	**–**	**–**	**–**	**1,157.3**	**–712.0**
Dividend payments	–	–	–	–122.8	–
Profit transfer to/from E. Merck KG, Darmstadt, Germany including changes in reserves	–	–	–	–435.0	–
Transactions with no change of control	–	–	–	–189.4	–
Changes in scope of consolidation/Other	–	–	–	–0.3	–
Balance as of December 31, 2014	**397.2**	**168.0**	**3,813.7**	**6,499.9**	**–1,274.7**
Balance as of January 1, 2015	**397.2**	**168.0**	**3,813.7**	**6,499.9**	**–1,274.7**
Profit after tax	–	–		1,114.8	–
Other comprehensive income	–	–	–	–	115.2
Comprehensive income	**–**	**–**	**–**	**1,114.8**	**115.2**
Dividend payments	–	–	–	–129.2	–
Profit transfer to/from E. Merck KG, Darmstadt, Germany including changes in reserves	–	–	–	–461.0	–
Transactions with no change of control	–	–	–	–	–
Changes in scope of consolidation/Other	–	–	–	0.2	–
Balance as of December 31, 2015	**397.2**	**168.0**	**3,813.7**	**7,024.7**	**–1,159.5**

Gains/losses recognized in equity					
Available-for-sale financial assets	Derivative financial instruments	Currency translation difference	Equity attributable to Merck KGaA, Darmstadt, Germany, shareholders	Non-controlling interests	Total equity
1.0	**44.2**	**1,068.5**	**11,020.0**	**49.2**	**11,069.2**
–	–	–	1,157.3	7.5	1,164.8
–1.1	348.5	676.4	311.8	5.8	317.6
–1.1	**348.5**	**676.4**	**1,469.1**	**13.3**	**1,482.4**
–	–	–	–122.8	–3.1	–125.9
–	–	–	–435.0	–	–435.0
–	–	–	–189.4	–161.9	–351.3
–	–	–	–0.3	161.9	161.6
–0.1	**392.7**	**1,744.9**	**11,741.6**	**59.4**	**11,801.0**
–0.1	**392.7**	**1,744.9**	**11,741.6**	**59.4**	**11,801.0**
–	–	–	1,114.8	9.3	1,124.1
5.1	–568.2	969.0	521.1	2.8	523.9
5.1	**–568.2**	**969.0**	**1,635.9**	**12.1**	**1,648.0**
–	–	–	–129.2	–3.6	–132.8
–	–	–	–461.0	–	–461.0
–	–	–	–	–	–
–	–	–	0.2	–0.1	0.1
5.0	**–175.5**	**2,713.9**	**12,787.5**	**67.8**	**12,855.3**

NOTES TO THE GROUP ACCOUNTS

General

(1) Company information

The accompanying consolidated financial statements as of December 31, 2015 have been prepared with MERCK Kommanditgesellschaft auf Aktien (Merck KGaA), Frankfurter Strasse 250, 64293 Darmstadt, Germany, which manages the operations of the Group, as parent company. In accordance with the provisions of the German financial reporting disclosure law (Publizitätsgesetz), consolidated financial statements are also prepared for E. Merck Kommanditgesellschaft (E. Merck KG), Darmstadt, Germany, the ultimate parent company and general partner of Merck KGaA, Darmstadt, Germany, with an equity interest of 70.274% as of December 31, 2015. These consolidated financial statements include Merck KGaA, Darmstadt, Germany, and its subsidiaries. The authoritative German versions of these financial statements are filed with the German Federal Gazette (Bundesanzeiger) and can be accessed at www.bundesanzeiger.de.

(2) Reporting principles

These consolidated financial statements have been prepared in accordance with the International Financial Reporting Standards in force on the balance sheet date and adopted by the European Union as issued by the International Accounting Standards Board and the IFRS Interpretations Committee (IFRS and IAS, as well as IFRIC and SIC) as well as the additionally applicable provisions of section 315a of the German Commercial Code (HGB). The fiscal year corresponds to the calendar year. These financial statements have been prepared in euros, the reporting currency. The figures reported in the consolidated financial statements have been rounded, which may lead to individual values not adding up to the totals presented.

The following rules took effect as of fiscal 2015:
- Annual Improvements to IFRSs 2011– 2013 Cycle
- IFRIC 21 “Levies”

These new rules did not have any material effects on the consolidated financial statements.

The following rules take effect as of fiscal 2016:
- Amendment to IAS 1 “Presentation of Financial Statements”
- Amendments to IAS 16 “Property, Plant and Equipment”
- Amendment to IAS 19 “Employee Benefits”
- Amendment to IAS 27 “Separate Financial Statements”
- Amendment to IAS 38 “Intangible Assets”
- Amendment to IAS 41 “Agriculture”
- Amendment to IFRS 11 “Joint Arrangements”
- Annual Improvements to IFRSs 2010 – 2012 Cycle
- Annual Improvements to IFRSs 2012 – 2014 Cycle

The Group currently does not expect the new rules to have any material effects on the consolidated financial statements.

As of the balance sheet date, the following standards were published by the International Accounting Standards Board, but not yet adopted by the European Union:
- IFRS 9 “Financial Instruments”
- IFRS 14 “Regulatory Deferral Accounts”
- IFRS 15 “Revenue from Contracts with Customers”
- Amendments to IAS 28 “Investments in Associates and Joint Ventures”
- Amendments to IFRS 10 “Consolidated Financial Statements”
- Amendment to IFRS 12 “Disclosure of Interests in Other Entities”
- Amendment to IFRS 15 “Revenue from Contracts with Customers”

The impact of IFRS 9 and IFRS 15, which will become effective as of 2018 (subject to a corresponding endorsement by the European Union), on the consolidated financial statements is currently being examined. Based on the results of a preliminary study, the Group currently does not expect that the first-time application of IFRS 15 will have any significant effects on the amount and timing of revenue recognition. According to the present state of knowledge, certain changes will result with respect to outlicensing as well as to a smaller extent with respect to the multiple-element arrangements within the Life Science business sector. From today’s perspective, the other new rules are not expected to have any material effects on the consolidated financial statements.

(3) Changes in the scope of consolidation

The scope of consolidation changed as follows in the reporting period:

Fully consolidated companies as of December 31, 2014		**218**
Additions	Establishment	2
	Acquisitions	102
	Materiality	4
Retirements	Liquidations/Mergers	–7
	Divestments	0
	Immateriality	–3
Fully consolidated companies as of December 31, 2015		**316**
Non-consolidated subsidiaries as of December 31, 2014		28
Non-consolidated subsidiaries as of December 31, 2015		63

Due to the acquisition of the Sigma-Aldrich Corporation, USA, and its subsidiaries, the number of fully consolidated companies of the Group increased by 100; the number of companies not consolidated due to immateriality increased by 40.

Overall, the impact of subsidiaries not consolidated due to immateriality on sales, profit after tax, assets and equity was less than 1% relative to the entire Group. The interests in subsidiaries not consolidated due to immateriality were classified as available-for-sale financial assets and presented under non-current financial assets. The list of shareholdings presents all of the companies included in the consolidated financial statements as well as all of the shareholdings of Merck KGaA, Darmstadt, Germany, (see Note [67] "List of shareholdings").

(4) Acquisitions, assets held for sale and disposal groups

Acquisition of Sigma-Aldrich Corporation, USA

On November 18, 2015, the Group obtained control of the Sigma-Aldrich Corporation, a life science enterprise headquartered in St. Louis, USA (Sigma-Aldrich). Prior to that, on September 22, 2014, the Group and Sigma-Aldrich entered into an agreement under which the Group would acquire Sigma-Aldrich for US$ 140 per share in cash. Afterwards, the Group received the approval of Sigma-Aldrich shareholders as well as clearance from various antitrust authorities regarding the acquisition. Due to the commitments imposed by the European antitrust authorities, the Group and Sigma-Aldrich had agreed to sell parts of Sigma-Aldrich's solvents and inorganics business in Europe. This business was reported under "assets held for sale" in the overview of fair values as of the acquisition date. Further information can be found in the section entitled "Business activities of Sigma-Aldrich acquired with a view to resale".

The purchase price as well as the payments for the acquisitions of 100% of the shares in Sigma-Aldrich were as follows:

€ million	
Purchase price for 100% of shares (US$ 17,015 million) at the closing rate on November 18, 2015	15,973.8
Reclassification of hedging gains from other comprehensive income to assets	–1,380.3
Purchase price according to IFRS 3	**14,593.5**
Acquired cash and cash equivalents	1,235.1
Payments for 100% of the interests less acquired cash and cash equivalents	**13,358.4**

The vast majority of the currency risk stemming from the purchase price payment for Sigma-Aldrich in U.S. dollars was hedged within the scope of a rolling hedging strategy using derivatives (forward exchange transactions and currency options) in line with the requirements for cash flow hedge accounting. The resulting income amounting to € 1,380.3 million was taken into consideration during the determination of the purchase price in accordance with IFRS 3.

Acquisition financing

The purchase price was financed through cash on the Group's balance sheet, bank loans and bonds. Following the issuance of a hybrid bond (€ 1.5 billion) in December 2014, the Group issued a further bond with a volume of US$ 4 billion in the United States on March 17, 2015. On August 27, 2015, the Group issued a euro bond amounting to € 2.1 billion. The bond issues comprised various tranches along with various maturities and interest rates. An overview of the outstanding bonds can be found in Note [28] "Financial liabilities/Capital management".

Business activities as well as sales and earnings contribution of Sigma-Aldrich

Sigma-Aldrich manufactures and distributes more than 250,000 chemicals, biochemicals and other essential products to customers in research and applied labs as well as in industrial and commercial markets. Sigma-Aldrich operates in 37 countries, has approximately 9,300 employees and, under U.S. Generally Accepted Accounting Principles (U.S. GAAP), generated sales of US$ 2,785 million (€ 2,102 million) and net income of US$ 500 million (€ 377 million) in 2014. In 2013, the corresponding values under U.S. GAAP were US$ 2,704 million (€ 2,033 million) for sales and US$ 491 million (€ 369 million) for net income.

Following the transaction closing, the Group started to integrate the life science business of Sigma-Aldrich into the Life Science business sector and the SAFC Hitech business into the Performance Materials business sector. The aim of the acquisition is to offer customers a wider range of products, greater geographic reach and a broad combination of industry-leading capabilities.

The impact of the consolidation of Sigma-Aldrich on sales between November 18, 2015 and December 31, 2015 as well as net income after taxes amounted to € 289.5 million and € –5.8 million, respectively. This result also includes higher cost of sales due to the step-up of the acquired inventories to preliminary fair values as well as the amortization of assets identified and remeasured during the purchase price allocation.

Assuming the first-time consolidation of Sigma-Aldrich had already taken place as of January 1, 2015, sales of the Group for the period from January 1 to December 31, 2015 would have amounted to € 14,926.8 million (compared with reported sales of € 12,844.7 million) and net income after taxes would have been € 1,150.3 million (compared with reported net income of € 1,124.1 million). The determination of these figures assumed that the adjustments of the book values as a result of the purchase price allocation would have been identical.

Purchase price allocation

Since the obtainment of control over Sigma-Aldrich did not take place until November 18, 2015, and material information for the purchase price allocation was only obtained after that date for legal reasons, the purchase price allocation for all assets and liabilities as of December 31, 2015 has not yet been completed. The preliminary fair values as of the acquisition date were as follows:

€ million	Fair values on the acquisition date
Non-current assets	
Intangible assets (excluding goodwill)	5,872.6
Property, plant and equipment	840.3
Other non-current assets	124.7
	6,837.6
Current assets	
Cash and cash equivalents	1,235.1
Inventories	851.9
Receivables	451.5
Other current assets	36.0
Assets held for sale	123.8
	2,698.3
Assets	**9,535.9**
Non-current liabilities	
Non-current financial liabilities	0.2
Other non-current liabilities and provisions	150.1
Deferred tax liabilities	2,441.8
	2,592.1
Current liabilities	
Current financial liabilities	425.1
Other current liabilities and provisions	538.6
Liabilities directly related to assets held for sale	–
	963.7
Liabilities	**3,555.8**
Acquired net assets	**5,980.1**
Purchase price for the acquisition of shares	**14,593.5**
Positive difference (goodwill)	**8,613.4**

The most significant impact of the purchase price allocation resulted from the remeasurement of intangible assets, property, plant and equipment as well as finished and unfinished goods within inventories at fair value, and from the recognition of deferred taxes. The intangible assets identified during the preliminary purchase price allocation and recognized on the date of first-time consolidation as well as the measurement methods applied are presented in the following overview:

	Fair values on the acquisition date (preliminary) € million	Useful lives in years (preliminary)	Valuation method for determining the fair values
Customer relationships	4,675.5	22 – 24	multi-period excess earnings method
Trademarks and brands	963.6	12	relief from royalty method
Technologies (patented and non-patented)	129.5	10 – 15	relief from royalty method, reproduction cost method
Other	104.0		–
Total	**5,872.6**		
Goodwill	8,613.4	indefinite	
Total	**14,486.0**		

A major factor for the measurement of customer relationships was the assumption regarding long-term customer retention. If the annual loss of customers was one percentage point higher, the fair value of customer relationships would be € 529.2 million lower and the amortization period would have to be reduced by two years. The most significant assumption for the measurement of trademarks and brands concerned the underlying royalty rates. These were derived from available market information. In case of a reduction of the royalty rates by 0.5 percentage points, the fair value would have been € 113.6 million lower.

The preliminary positive difference of € 8,613.4 million was recognized as goodwill. This comprised anticipated synergies from the integration of Sigma-Aldrich into the Group as well as intangible assets that are not recognizable, such as the expertise of the workforce. Synergies are primarily expected in the areas of administration, production and purchasing. Apart from these cost synergies, earnings synergies are expected particularly through the use of the e-commerce platform of Sigma-Aldrich for products from the legacy life science business. The goodwill was allocated on a preliminary basis to the two business sectors Life Science (€ 8,260.2 million) and Performance Materials (€ 353.2 million). Goodwill is not expected to be deductible for tax purposes.

Within the scope of the acquisition, no contingent consideration was agreed upon which the Group would possibly have to pay in the future. The selling shareholders did not contractually indemnify the Group for the outcome of a contingency or uncertainty related to the acquired assets or liabilities. Costs of € 76.6 million related to the acquisition of the company were recorded under other operating expenses in 2015 (€ 60.0 million) and in 2014 (€ 16.6 million).

The development of goodwill, which is carried in U.S. dollars, during the period from first-time recognition and December 31, 2015 was as follows:

€ million	Development of goodwill
Goodwill on November 18, 2015	8,613.4
Exchange rate effects	– 219.9
Goodwill on December 31, 2015	**8,393.5**

No material contingent liabilities were identified in the course of the preliminary purchase price allocation. The gross amounts of the acquired receivables on the acquisition date were € 456.5 million. The best possible estimate of the irrecoverable receivables amounted to € 5.0 million.

Further acquisitions in 2015

At the end of July 2015, the Group acquired the remaining 52.3% interest in the start-up Qlight Nanotech Ltd., Israel (Qlight). Since then, the Group has held 100% of the company. Qlight conducts research in the field of quantum materials and was integrated into the Performance Materials business sector. The purchase price comprised fixed consideration amounting to US$ 3 million (€ 2.7 million), conditional purchase

price components of up to US$ 4 million (€ 3.6 million) as well as further license remuneration provided that certain preconditions are met. Expenses of € 0.5 million were recorded from the remeasurement of the interests in Qlight prior to the obtainment of control. The intangible assets identified were attributable to technology-related assets amounting to € 6.1 million. Deferred tax liabilities amounting to € 1.6 million and goodwill of € 1.1 million were recognized. The purchase price allocation had not yet been completed on December 31, 2015.

In December 2015, the Group acquired the outstanding shares (89.7%) in Ormet Circuits, Inc., USA (Ormet) to enhance its position as a semiconductor materials supplier. Ormet will be integrated into the Performance Materials business sector. The purchase price for 100% of the shares amounts to US$ 32.0 million (€ 29.2 million). Income of € 0.6 million was recorded from the remeasurement of the interests in Ormet prior to the obtainment of control. The purchase price allocation had not been completed by December 31, 2015; therefore, the preliminary difference was fully reported as goodwill.

Acquisition of AZ Electronic Materials S.A. in 2014

Within the scope of a public takeover offer, on May 2, 2014 the Group had received valid acceptances of the offer in respect of 81.3% of the share capital and thus obtained control of the publicly listed company AZ Electronic Materials S.A., Luxembourg (AZ). By June 27, 2014, the Group had increased its shareholding in AZ to 99.8% and was then able to initiate a squeeze-out, which was completed on July 2, 2014 with the acquisition of the remaining shareholding of 0.2%.

AZ is a manufacturer of ultrapure specialty chemicals and materials for use in integrated circuits (semiconductors) and equipment, in flat-panel displays, and for photolithographic printing.

Within the scope of the acquisition, no conditional consideration was agreed upon which the Group would possibly have to pay in the future. The purchase price allocation was completed on December 31, 2014.

The development of goodwill recognized within the framework of the acquisition and carried in U.S. dollars was as follows:

€ million	Development of goodwill
Goodwill on December 31, 2014	930.0
Exchange rate effects	104.1
Goodwill on December 31, 2015	**1,034.1**

Divestment of the rights to Kuvan® and Peg-Pal

On October 1, 2015, the Group entered into an agreement with BioMarin Pharmaceutical Inc., USA (BioMarin), to return the rights to Kuvan® (sapropterin dihydrochloride), a drug used to treat phenylketonuria (PKU), a rare metabolic disorder, and the related business activities. These business activities, which were allocated to the Healthcare business sector, were reported as a disposal group and include an intangible asset of € 23.9 million, allocable goodwill of € 21.6 million, as well as an immaterial amount of inventories.

In addition, an agreement was also reached on October 1, 2015 under which the Group will return its option to develop and commercialize Peg-Pal to BioMarin. Peg-Pal is an investigational drug that is also designed for the treatment of PKU.

Both agreements became effective at the beginning of January 2016. Based on the agreements, in January 2016 the Group received an upfront payment of € 340 million for the sale of the rights to Kuvan®. Moreover, the Group is entitled to up to € 185 million for the achievement of certain milestones.

Business activities of Sigma-Aldrich acquired with a view to resale

On June 15, 2015, before control of the Sigma-Aldrich Corporation, USA, was obtained, the Group received conditional antitrust approval from the European Commission for the acquisition of Sigma-Aldrich. As a consequence of the EU commitments, the Group and Sigma-Aldrich had agreed to sell parts of Sigma-Aldrich's solvents and inorganics business in Europe.

This includes Sigma-Aldrich Laborchemikalien GmbH, Seelze, where most of the solvents and inorganics sold by Sigma-Aldrich in Europe were manufactured. The agreement further concerns those solvents and inorganics sold by Sigma-Aldrich in Europe under the Sigma-Aldrich brand and globally under the Fluka® brand, as well as the global rights to the Hydranal® and Chromasolv® trademarks. A corresponding agreement on the sale of these businesses was entered into with Honeywell Specialty Chemicals Seelze GmbH, Seelze, on October 19/20, 2015. Since the obtainment of control, the provisions of IFRS 5 in relation to discontinued operations have applied to the corresponding assets and liabilities, which are thus disclosed as "assets held for sale" in the overview of fair values as of the Sigma-Aldrich acquisition date. The transaction with Honeywell closed on December 15, 2015. Consequently, as of year-end, the corresponding assets and liabilities were no longer reported in the consolidated balance sheet of the Group. Profit after tax of € 5.6 million was recorded in the income statement, based on net sales of € 13.1 million and expenses of € –7.5 million.

(5) Joint arrangements of material significance

Strategic alliance with Pfizer Inc., USA, to co-develop and co-commercialize active ingredients in immuno-oncology

On November 17, 2014 the Group formed a global strategic alliance with Pfizer Inc., USA, (Pfizer) to co-develop and co-commercialize the anti-PD-L1 antibody avelumab (also known as MSB0010718C). This antibody is currently being studied in multiple clinical trials as a potential treatment for further tumor types. The active ingredient is to be developed as a single agent as well as in various combinations with Pfizer's and the Group's broad portfolio of approved and investigational pipeline candidates. As part of the strategic alliance, the two companies will combine resources and expertise to also co-develop and co-market Pfizer's anti-PD-1 antibody. The overriding objective of the strategic alliance is share the risks of development and to accelerate the two companies' presence in immuno-oncology.

According to the collaboration agreement, during the development period each partner will bear one-half of the development expenses. In a potentially later commercialization phase, the Group will realize the vast majority of sales from the commercialization of avelumab while the Group and Pfizer will split defined income and expense components.

The execution of the collaboration agreement is not being structured through a separate vehicle. This means that the assets and liabilities attributable to the contractual arrangement are owned by the two contract partners. Decisions about the relevant activities require unanimous consent in accordance with the collaboration agreement. Therefore, the accounting rules governing joint operations pursuant to IFRS 11 are applied and the Group records the assets, liabilities, revenues and expenses attributable to the collaboration in accordance with the respectively valid IFRS.

Under the terms of the agreement, in 2014 Pfizer made an upfront cash payment of US$ 850 million (€ 678.3 million) to the Group after the closing. Pfizer also committed to make further payments of up to US$ 2 billion to the Group subject to the achievement of defined regulatory and commercial milestones. Based on the collaboration agreement, the Group additionally received the right to co-market for multiple years Xalkori® (crizotinib), a drug for the treatment of non-small-cell lung cancer, in the United States and certain other major markets. During co-commercialization of the product, the Group will receive from Pfizer compensation for marketing activities and a share of the profits. The fair value of the right was determined by an independent external expert using the multi-period excess earnings method. The entitlement to the right was capitalized when it was granted and will be amortized over the term of the agreement. The residual book value of these assets as of December 31, 2015 was € 261.7 million (2014: € 294.4 million).

On the date of the closing of the collaboration agreement, both the upfront payment received and the value of the right to co-market Xalkori® were recognized in the balance sheet as deferred revenues under other liabilities. Both amounts are being recognized over the expected period during which the Group is to meet certain obligations and will be disclosed under other operating income. More information on the exercise of management judgments and estimation uncertainties in this regard can be found in Note [7] "Management judgments and sources of estimation uncertainty."

Agreement with Threshold Pharmaceuticals, Inc., USA, to co-develop and co-market evofosfamide

In February 2012, the Healthcare business sector entered into a global agreement with Threshold Pharmaceuticals, Inc., USA (Threshold), to co-develop and co-commercialize evofosfamide (also known as TH-302), a chemical molecule for use in cancer treatment. Under the terms of the agreement, the Group received co-development rights as well as exclusive global commercialization rights. Threshold had the option to co-commercialize the therapeutic in the United States.

On December 7, 2015, the Group announced that it will not submit evofosfamide for approval in locally advanced inoperable or metastatic soft-tissue sarcoma as well as advanced pancreatic cancer after two Phase III studies had failed to meet their primary endpoints in these indications. Consequently, the upfront and milestone payments that had been capitalized as intangible assets with indefinite useful lives as well as capitalized borrowing costs amounting to € 84.4 million were impaired in full in December 2015.

Agreement with Eli Lilly and Company, USA and Bristol-Myers Squibb Company, USA for the co-commercialization of Erbitux® in Japan

Until its termination, which took effect on May 1, 2015, an agreement was in place between the Healthcare business sector, ImClone Systems Inc., USA (which has now merged into Eli Lilly and Company, USA) and Bristol-Myers Squibb Company, USA, for the co-development and co-commercialization of Erbitux® (cetuximab), a drug indicated for the treatment of metastatic colorectal cancer, as well as for other cancers, in Japan. Since the collaboration ended, the Group has been marketing the aforementioned activities itself in Japan, bearing exclusive overall responsibility.

Up until the end of the agreement, the Group recorded sales of € 36.7 million from the commercialization of Erbitux® in Japan (2014 in full: € 113.2 million).

Agreement with Bristol-Myers Squibb Company, USA, for the co-commercialization of Glucophage® in China

In March 2013, the Healthcare business sector established an agreement with Bristol-Myers Squibb Company, USA, for the co-commercialization of the antidiabetic agent Glucophage® (active ingredient: metformin hydrochloride) for the treatment of type 2 diabetes in China. In 2015, the Group recorded sales of € 84.3 million from co-commercialization (2014: € 59.3 million).

(6) Changes to accounting and measurement principles and disclosure changes

In comparison with the previous year, there were no material changes to accounting and measurement principles. Only the disclosure changes described in the following were made in order to ensure improved comparability of the income statement and the balance sheet of the Group with other companies.

Consolidated Income Statement

New composition of net sales

Since January 1, 2015, royalty, license and commission income has no longer been disclosed in a separate line in the consolidated income statement. While commission income is now recorded as part of net sales, royalty and license income is included under other operating income.

Functional allocation of royalty, license and commission expenses

Effective January 1, 2015, royalty, license and commission expenses, which were previously disclosed in a separate line, were allocated to the corresponding functional costs.

The previous year's figures in the consolidated income statement have been adjusted accordingly and are presented in the following table:

GROUP

Adjustment

€ million	2014 old structure	2014 adjustment	2014 adjusted
Net sales	**11,291.5**	**71.3**	**11,362.8**
Royalty, license and commission income	209.3	–209.3	–
Total revenues	**11,500.8**	**–**	**–**
Cost of sales	–3,526.4	–	–3,526.4
(of which: amortization of intangible assets)[1]	*(–94.0)*	*(–)*	*(–94.0)*
Gross profit	**7,974.4**	**–138.0**	**7,836.4**
Marketing and selling expenses	–3,104.9	–484.2	–3,589.1
(of which: amortization of intangible assets)[1]	*(–719.0)*	*(–)*	*(–719.0)*
Royalty, license and commission expenses	–537.5	537.5	–
Administration expenses	–608.6	–	–608.6
Research and development costs	–1,703.7	–	–1,703.7
(of which: amortization of intangible assets)[1]	*(–3.8)*	*(–)*	*(–3.8)*
Other operating income	426.4	138.0	564.4
Other operating expenses	–684.1	–53.3	–737.4
Operating result (EBIT)	**1,762.0**	**–**	**1,762.0**
Margin (% of net sales)	15.6	–0.1	15.5
EBITDA	**3,122.9**	**–**	**3,122.9**
Margin (% of net sales)	27.7	–0.2	27.5
EBITDA pre exceptionals	**3,387.7**	**–**	**3,387.7**
Margin (% of net sales)	30.0	–0.2	29.8

[1] Excluding amortization of internally generated or separately acquired software.

Consolidated Balance Sheet

Balance sheet structure
Since January 1, 2015, the consolidated balance sheet of the Group has been structured in descending order of maturity. The previous year's figures have been adjusted accordingly.

Disclosure of receivables from royalties and licenses
As a result of the disclosure of royalty and license income under other operating income, in the consolidated balance sheet dated December 31, 2014, receivables from royalties and licenses, which amounted to € 16.1 million and were previously included under trade accounts receivable, were reclassified to other current assets.

Segment Reporting

On January 1, 2015, the Group changed its segment reporting structure to report on the three segments Healthcare, Life Science and Performance Materials. The Healthcare business sector comprises the businesses that were reported separately as the Biopharma business and Consumer Health segments in the previous year. The Life Science business sector comprises the Life Science business as well as the acquired life science business of the Sigma-Aldrich Corporation, USA. The Performance Materials business sector corresponds to the segment of the same name in the previous year as well as the acquired SAFC Hitech business of Sigma-Aldrich. More information on the new segmentation as well as reconciliation of the previous year's figures by business sector can be found in Note [33] "Information on segment reporting".

As regards segment reporting by country and region, the composition of regions was adjusted and the corresponding comparative year-earlier figures are presented. The regional reporting structure now comprises five regions: Europe, North America, Asia-Pacific, Latin America as well as Middle East and Africa.

(7) Management judgments and sources of estimation uncertainty

The preparation of the consolidated financial statements requires management to make discretionary decisions and assumptions as well as estimates to a certain extent. The discretionary decisions, assumptions relating to the future and sources of estimation uncertainty described below are associated with the greatest potential effects on these consolidated financial statements.

Recognition and measurement of assets, liabilities and contingent liabilities acquired in the context of business combinations
The recognition and measurement of assets, liabilities and contingent liabilities at fair value during purchase price allocations involve the use of estimates. The expertise of external valuation experts is obtained here. The fair values of the assets and liabilities recognized as part of the purchase price allocation of the Sigma-Aldrich Corporation and further information on this acquisition, which closed in the reporting period, can be found in Note [4] "Acquisitions, assets held for sale and disposal groups".

Sales deductions
The Group grants its customers various kinds of rebates and discounts. In addition, expected returns, state compulsory charges and rebates from health plans and programs are also deducted from sales.

The most significant portion of these deductions from sales is attributable to the Healthcare business sector. The most substantial sales deductions in this business sector relate to government rebate programs in North America such as the "U.S. Federal Medicare Program" and the "U.S. Medicaid Drug Rebate Program". Other significant sales deductions in the business sector result from compulsory government rebate programs in individual European countries.

Insofar as sales deductions were not already made on payments received, the Group determines the level of sales deductions on the basis of current experience and recognizes them as a liability. The sales deductions reduce gross sales revenues. Adjustments of liabilities can lead to increases or reductions of income in later periods.

Impairment tests of goodwill and other intangible assets with indefinite useful lives
The goodwill (carrying amount as of December 31, 2015: € 14,370.1 million/2014: € 5,693.9 million) and other intangible assets with indefinite useful lives (carrying amount as of December 31, 2015: € 183.6 million/2014: € 168.7 million) reported in the consolidated financial statements are tested for impairment at least once a year or when a triggering event arises. The carrying amounts of goodwill are allocated to the following cash-generating units or groups of cash-generating units on which level the impairment tests were performed:

€ million	Goodwill as of Dec. 31, 2015	Goodwill as of Dec. 31, 2014
Biopharma	1,579.8	1,601.5
Consumer Health	243.1	243.1
Life Science	11,130.4	2,911.1
Performance Materials	1,416.8	938.2
Total	**14,370.1**	**5,693.9**

The internal reorganization and changes to the reporting structure of the Group on January 1, 2015 did not result in any changes to the level at which the impairment tests are conducted. Subsequent to the reorganization, the cash-generating units or groups of cash-generating units continue to represent the lowest level at which goodwill is monitored for internal purposes by management.

As in 2014, no impairment losses for goodwill were recorded in the year under review. Owing to the termination of development projects in the Healthcare business sector, in 2015 impairment losses of other intangible assets with indefinite useful lives were recorded in the amount of € 108.5 million (2014: € 84.8 million).

Owing to a change in the planning process, the detailed planning period was shortened by one year to four years, and the date of the goodwill impairment test was changed, complying with the one-year time period stipulated by IAS 36.

When conducting the impairment tests the following parameters were used:

Measurement basis	Value in use
Impairment test level	Biopharma (including Allergopharma and Biosimilars) Consumer Health Life Science Performance Materials
Planning basis	Most recent financial medium-term planning approved by the Executive Board and used for internal purposes
Detailed planning period	4 years (2014: 5 years)
Key assumptions	Net cash flows Long-term growth rate after the detailed planning period Discount rate after tax (Weighted average cost of capital after tax – WACC)
Determination of the value of the key assumptions	Net cash flows • Sales growth Based on internal planning, taking into consideration internal and external market information and market estimations, i.e. regarding market shares, excluding approvals of new compounds from the development pipeline and other expansion investments • Profit margins Based on past experiences, adjusted for expected changes
	Long-term growth rate after the detailed planning period Based on long-term inflation expectations and expected long-term sector growth
	Discount rate after tax (Weighted average cost of capital after tax – WACC) • Cost of equity Risk-free interest rate: Derived from the returns of long-term German government bonds Beta factor: Derived from respective peer group Market risk premium: Range as recommended by the Technical Committee for Business Valuation and Commerce of the Institute of Public Auditors in Germany (Institut der Wirtschaftsprüfer e.V. – IDW) • Cost of debt and capital structure Derived from respective peer group

The long-term growth rates and weighted average cost of capital (WACC) used to conduct the goodwill impairment tests were as follows:

	Long-term growth rate		Cost of capital after tax		Cost of capital before tax	
in %	**2015**	2014	**2015**	2014	**2015**	2014
Biopharma	0.00	0.00	6.2	7.2	8.0	9.3
Consumer Health	2.00	2.00	6.2	6.9	7.6	8.4
Life Science[1]	1.75	2.00	6.1	6.8	7.5	7.8
Performance Materials[1]	0.50	1.00	6.6	6.3	8.6	7.8

[1] The disclosures for 2015 relate to the impairment test performed before the acquisition of the Sigma-Aldrich Corporation, USA.

The cost of capital before tax is iteratively calculated based on the discounted cash flows determined using cost of capital after tax.

All of the aforementioned assumptions are considered a source of estimation uncertainty due to their inherent uncertainty.

In all the impairment tests performed, the recoverable amount was more than 10% higher than the carrying amount of the respective cash-generating unit or group of cash-generating units. Irrespective of this, sensitivity analyses of the key assumptions were performed as part of the impairment tests. Overall, no change of a significant assumption deemed possible by the management would have resulted in an impairment. The following table presents the amount by which the key assumptions would have to change before an impairment would need to be recognized within the scope of an impairment test:

	Decrease in long-term growth rate		Increase in cost of capital after tax		Decrease in net cash flow	
	2015	2014	**2015**	2014	**2015**	2014
	percentage points		percentage points		%	
Biopharma	> 2	> 2	> 2	> 2	> 5	> 5
Consumer Health	> 2	> 2	> 2	> 2	> 5	> 5
Life Science[1]	> 2	> 2	> 2	> 2	> 5	> 5
Performance Materials[1]	> 2	> 2	> 2	> 2	> 5	> 5

[1] The disclosures for 2015 relate to the impairment test performed before the acquisition of the Sigma-Aldrich Corporation, USA.

Based on the preliminary purchase price allocation for the acquisition of the Sigma-Aldrich Corporation, USA, which was completed in November 2015, goodwill amounting to € 8,613.4 million was attributable to this acquisition. Based on a preliminary determination, € 8,260.2 million of this goodwill would have been allocated to Life Science and € 353.2 million to Performance Materials. Since the purchase price allocation had not yet been completed on the balance sheet date, a final allocation was not yet possible. An indicative test of the related goodwill as of November 30, 2015, on the basis of the preliminary planning used in the context of the purchase price allocation did not lead to an impairment requirement, neither with respect to the value in use nor the fair value less costs of disposal (based on non-observable input factors). The difference between the recoverable amount and the carrying amount for Life Science decreased due to the allocation of significant intangible assets and goodwill, however the difference was still more than 10%. Within the scope of these indicative impairment tests, costs of capital after tax of 6.1% (Life Science) and 6.5% (Performance Materials) were used. The assumption regarding long-term growth rates is identical to the assumption shown above. Based on the indicative test, a reduction of the long-term growth rate by around one percentage point in the Life Science business sector would have resulted in a situation where the recoverable amount would have been identical with the carrying amount. The recoverable amount would have also been identical with the carrying amount in the Life Science business sector if the cost of capital after tax (WACC) had been increased by around one percentage point. In the Performance Materials business sector, no change of a significant assumption deemed possible by the management would have resulted in an impairment.

Determination of the amortization of intangible assets with finite useful lives

In addition to goodwill and other intangible assets with indefinite useful lives, the Group has a significant amount of intangible assets with finite useful lives (carrying amount as of December 31, 2015: € 10,674.9 million / December 31, 2014: € 5,496.1 million). Substantial assumptions and estimates are required to determine the appropriate level of amortization of these intangible assets. This relates in particular to the determination of the underlying remaining useful life. The parameter is reviewed regularly by the Group and adjusted if necessary. The Group considers factors including the typical product life cycles for each asset and publicly available information about the estimated useful lives of similar assets.

If the amortization of intangible assets from customer relationships, market authorizations, patents, licenses and similar rights, capitalized brand names and trademarks had been 10% higher, for example due to shortened remaining useful lives, earnings before taxes would have been € 94.8 million lower in fiscal 2015 (2014: reduction of € 84.2 million). In fiscal 2015, a reduction of the useful lives of the intangible asset reported in connection with the drug Rebif® by one year would have lowered earnings before taxes by € 92.0 million (2014: € 73.6 million).

Research and development collaborations as well as in- and out-licensing of intangible assets

The Group is regularly a partner of research and development collaborations with research institutions, biotechnology companies and other contract parties. These collaborations are aimed at developing marketable products. The Group also enters into in-licensing agreements regarding intellectual property of contract partners. Such agreements typically involve making upfront payments and payments for the achievement of certain milestones related to development and marketing progress. In this context, the Group has to judge to what extent upfront or milestone payments represent remuneration for services received (research and development expense) or whether such payments result in an in-licensing of an intangible asset that has to be capitalized. This assessment is normally subject to judgment.

The Group regularly receives upfront and milestone payments as part of research and development collaborations or out-licensing agreements. In this context, income may only be recognized if the Group has transferred all material risks and rewards of an intangible asset to the acquirer, has no interest in the remaining business activities and has no material continuing commitment. If these criteria are not deemed to be met, the received payments are deferred and recognized over the period in which the Group is expected to fulfill its performance obligations. Both the assessment of the revenue recognition criteria and the determination of the appropriate period during which revenue is recognized are subject to judgment.

If the consideration, that was received as part of the strategic alliance with Pfizer Inc., USA, in November 2014 and deferred as a liability had been recognized in the income statement over a shorter period reduced by one year, in 2015 this would have increased other operating income and thus profit before income tax would have increased by € 47.8 million (2014: € 3.9 million). Recognition over a period extended by one year would have lowered other operating income and profit before tax by € 31.9 million (2014: € 2.6 million).

Identification of impairment of non-financial assets

Discretionary decisions are required in the identification of existing indications of impairment of intangible assets and property, plant and equipment. As of December 31, 2015, the carrying amounts of these assets totaled € 29,348.1 million (December 31, 2014: € 14,385.9 million). External and internal information is used to identify indications of impairment. For example, the approval of a competing product in the Healthcare business sector or the closure of a site can be an indicator of impairment. Nevertheless, the Group's analysis of indications of impairment can prove too optimistic or too pessimistic in hindsight due to the high degree of uncertainty.

In October 2015, the Group relaunched its branding and fundamentally revamped its visual appearance. In the future, the Group will operate uniformly under its corporate brand worldwide, expect for the US and Canada, where it operates as EMD Serono in the Biopharma business, as MilliporeSigma in the Life Science business and as EMD Performance Materials in the materials business. Owing to this, the "Millipore" brand, which is recognized as an intangible asset in the balance sheet, was subjected to an impairment test. As a result of this impairment test, a need to record an impairment loss was not identified since the value added from the continued use of the brand for the Group's filtration products and as part of the name the Life Science business operates under in the U.S. and Canadian markets exceeded the residual book value of the brand. The intangible assets for the "Serono" brand recognized within the scope of the purchase price allocation for Serono SA had already been fully amortized when the new branding was launched.

Impairment of financial assets

On every balance sheet date, the Group reviews whether there is any objective evidence that a financial asset is impaired and, if this is the case, carries out the impairment to the extent estimated as necessary. Particularly important in this context are impairment losses on trade accounts receivable whose carrying amount was € 2,738.3 million as of December 31, 2015 (2014: € 2,219.5 million).

Significant indicators for the identification of impaired receivables and the subsequent impairment tests are, in particular, payment default or delay in the payment of interest or principal, negative changes in economic or regional economic framework conditions as well as considerable financial difficulties of a debtor. These estimates are discretionary.

Other provisions and contingent liabilities

As a global company for high-tech products, the Group is exposed to a multitude of litigation risks. In particular, these include risks from product liability, competition and antitrust law, pharmaceutical law, patent law, tax law and environmental protection. The Group is engaged in legal proceedings and official investigations, the outcomes of which are uncertain. A detailed description of the most important legal matters as of the balance sheet date can be found in Notes [27] "Provisions" and [39] "Contingent liabilities". The provisions recognized for legal disputes mainly relate to the Healthcare business sector and amounted to € 490.6 million as of the balance sheet date (2014: € 393.1 million).

To assess the existence of a reporting obligation in relation to provisions and to quantify pending outflows of resources, the Group draws on the knowledge of the legal department as well as any other outside counsel. In spite of this, both the assessment of the existence of a present obligation and the estimate of the probability of a future outflow of resources are highly subject to uncertainty. Equally, the evaluation of a possible payment obligation is to be considered a major source of estimation uncertainty. Accordingly, the date of utilization may be determined reliably not earlier than after an out-of-court settlement is reached or upon the termination of judicial proceedings.

To a certain extent, the Group is obliged to take measures to protect the environment and reported provisions for environmental protection of € 126.9 million as of December 31, 2015 (2014: € 123.7 million). The underlying obligations were located mainly in Germany, Latin America and the United States. Provisions were recognized primarily for obligations from soil remediation and groundwater protection in connection with the discontinued crop protection business.

The calculation of the present value of the future settlement amount requires, among other things, estimates of the future settlement date, the actual severity of the identified contamination, the applicable remediation methods, the associated future costs, and the discount rate. The measurement is carried out regularly in consultation with independent experts. In spite of this, the determination of the future settlement amount of the provisions for environmental protection measures is subject to a considerable degree of uncertainty.

In the event of the discontinuation of clinical development projects, the Group is regularly required to bear unavoidable subsequent costs for a certain future period of time. The measurement of these provisions requires estimates regarding the length of time and the amount of the subsequent costs.

Apart from provisions, contingent liabilities are also subject to estimation uncertainties and discretionary judgment. Accordingly, contingent liabilities from legal and tax disputes are subject to the same estimation uncertainties and discretionary judgment as provisions for litigation. Therefore, the existence and the amount of the outflow of resources, which is not unlikely, is subject to estimation uncertainties similarly to the date on which a potential obligation arises.

Provisions for pensions and other post-employment benefits

The Group maintains several defined benefit pension plans, particularly in Germany, Switzerland and the United Kingdom. The determination of the present value of the obligation from these defined benefit pension plans primarily requires estimates of the discount rate, future salary increases, future pension increases and future cost increases for medical care.

Detailed information on the existing pension obligations and a sensitivity analysis of the parameters named above are provided in Note [26] "Provisions for pensions and other post-employment benefits" and under "Accounting and measurement principles" in Note [64] "Provisions for pensions and other post-employment benefits". As of the balance sheet date, the amount recorded in the consolidated balance sheet for provisions for pensions and other post-employment benefits was € 1,836.1 million (2014: € 1,820.1 million). The present value of the defined benefit pension obligation was € 4,152.7 million as of December 31, 2015 (2014: € 3,812.7 million).

Income taxes

The calculation of the reported assets and liabilities from current and deferred income taxes requires extensive discretionary judgments, assumptions and estimates. Income tax liabilities were € 1,011.3 million as of December 31, 2015 (2014: € 849.8 million). The carrying amounts of deferred tax assets and liabilities amounted to € 1,049.6 million and € 2,852.7 million, respectively, as of the balance sheet date (2014: € 992.9 million and € 818.4 million, respectively).

The recognized income tax liabilities and provisions are partially based on estimates and interpretations of tax laws and ordinances in different jurisdictions.

With regard to deferred tax items, there are degrees of uncertainty concerning the date on which an asset is realized or a liability settled and concerning the tax rate applicable on this date. This particularly relates to deferred tax liabilities recognized in the context of the acquisitions of the Sigma-Aldrich Corporation, the Millipore Corporation, Serono SA, and AZ Electronic Materials S.A. The recognition of deferred tax assets from loss carryforwards requires an estimate of the probability of the future realizability of loss carryforwards. Factors considered in this estimate are results history, results planning and any tax planning strategy of the respective Group company.

Assets held for sale, disposal groups and discontinued operations

The assessment as to when a non-current asset, disposal group or discontinued operation meets the prerequisites for a classification as "held for sale" is subject to significant discretionary judgment. Even in the case of an existing management decision to review a disposal, an assessment subject to uncertainties has to be made as to the probability that a corresponding disposal will occur during the year or not.

Applicable foreign exchange mechanism in Venezuela

Through subsidiaries, the Group imports and distributes products in Venezuela. The translation of the local financial statements from Venezuelan bolivars as the functional currency to euros as the reporting currency must proceed in analogous application of IAS 21.26 using the exchange rate at which the future cash flows represented by the transaction or balance could have been settled if those cash flows had occurred at the measurement date.

The Venezuelan bolivar is not a freely convertible currency, meaning that its exchange into other currencies requires authorization and must take place at official exchange rates set by the government. As of December 31, 2015, the three following exchange rate mechanisms were in place:

- "CENCOEX" (6.3 bolivars per U.S. dollar): Official privileged exchange rate mechanism allowed only for imports of high-priority essential goods such as food and medicines;
- "SICAD" (13.5 bolivars per U.S. dollar): Official exchange rate mechanism whereby exchange rates are set based on the conducted auctions.
- "SIMADI" (Marginal Currency System) (198.7 bolivars per U.S. dollar): Official exchange rate mechanism that permits individuals and entities to buy and sell foreign currency with fewer restrictions than other exchange rate mechanisms in Venezuela.

In the past, the Group applied the privileged exchange rate mechanism CENCOEX for the translation of local financial statements prepared in Venezuelan bolivars, the functional currency, into euros, the reporting currency. In 2015, the Venezuelan authorities have been increasingly limiting authorizations to pay for imports using the privileged exchange rate. Against this background and owing to the development of payments received as well as the growing uncertainty since the last balance sheet date regarding the extent to which the privileged CENCOEX exchange rate mechanism will be available in the future, the Executive Board of Merck KGaA, Darmstadt, Germany, came to the conclusion that for the translation as of July 1, 2015 of local financial statements reported in Venezuelan bolivars, the functional currency, into euros as the reporting currency, it will be necessary to apply the SIMADI exchange rate mechanism.

This estimate is discretionary. The Group continues to closely monitor the development of payments received and the exchange rate mechanism. Should the payment rates improve or if it can no longer be assumed that the SIMADI exchange rate is the relevant exchange rate for the translation from local currency into the reporting currency, euros, this could lead to an amended estimate, which in turn could trigger an amended currency translation.

On this basis, in fiscal 2015 the Group generated sales of € 175.1 million, € 168.3 million of which was attributable to the first half of 2015. Net sales using the CENCOEX exchange rate amounted to € 221.1 million in 2014. Cash and cash equivalents in Venezuela, translated using the SIMADI exchange rate as of December 31, 2015, amounted to € 8.2 million. They were classified as restricted.

Other judgments, assumptions and sources of estimation uncertainty

The Group makes other judgments, assumptions and estimates in the following areas:

- Classification of financial assets and financial liabilities
- Cash flow hedging for highly probable forecast transactions
- Determination of the fair value of financial instruments classified as available-for-sale and of derivative financial instruments
- Determination of the fair value of the liability for share-based compensation
- Determination of the fair value of plan assets

Notes to the Consolidated Income Statement

(8) Net sales

Net sales were generated primarily from the sale of goods and to a limited degree also included revenues from services rendered and commission income. Since January 1, 2015, commission income has been disclosed as part of sales. In 2014, royalty, license and commission income was disclosed in a separate line in the consolidated income statement. More information in Note [6] "Changes to accounting and measurement principles and disclosure changes".

Group net sales totaled € 12,844.7 million in 2015 (2014: € 11,362.8 million), which represented an increase of 13.0% compared with 2014 (increase of 5.5% in 2014). The breakdown of net sales is presented in the Segment Reporting in Note [32] "Information by business sector/countries and regions".

(9) Cost of sales

Cost of sales primarily included the cost of manufactured products sold as well as merchandise sold. Cost comprises overheads and, if necessary, inventory write-downs, in addition to directly attributable costs, such as the cost of materials, personnel and energy, as well as depreciation/amortization.

(10) Marketing and selling expenses

Marketing and selling expenses comprised the following:

€ million	**2015**	2014
Sales force	–913.1	–809.3
Internal sales services	–740.0	–613.6
Sales promotion	–521.9	–469.4
Logistics	–471.2	–412.6
Amortization of intangible assets[1]	–778.9	–719.0
Royalty and license expenses	–512.8	–484.2
Other marketing and selling expenses	–111.6	–81.0
Marketing and selling expenses[2]	**–4,049.5**	**–3,589.1**

[1] Excluding amortization of internally generated or separately acquired software.
[2] The composition of Marketing and selling expenses has been changed, see "Changes to accounting and measurement principles and disclosure changes".

Amortization of intangible assets was mainly attributable to marketing approvals, customer relationships, brands, trademarks and other, which could be functionally allocated to Marketing and Selling.

Royalty and license expenses arose mainly in connection with the commercialization of Erbitux® outside the United States and Canada amounting to € 93.5 million (2014: € 84.7 million) as well as for the commercialization of Rebif® in the United States amounting to € 333.6 million (2014: € 314.6 million).

(11) Research and development costs

Research and development costs totaled € 1,709.2 million in 2015 (2014: € 1,703.7 million).

Reimbursements for research and development amounting to € 88.0 million (2014: € 18.4 million) were offset against research and development costs. This figure also included government subsidies of € 3.4 million (2014: € 5.9 million). The increase was mainly due to reimbursements from the strategic alliance with Pfizer Inc., USA.

The breakdown of research and development costs by region is presented in the Segment Reporting (see Note [32] "Information by business sector/country and region").

(12) Other operating income

Other operating income was as follows:

OTHER OPERATING INCOME

€ million	2015	2014
Income from milestone payments, rights and royalties	261.7	138.0
Gains on disposal of non-current assets	52.4	3.7
Release of allowances for receivables	40.2	41.8
Gains from the release of provisions for litigation	35.3	260.3
Exchange rate differences from operating activities (net)	–	53.3
Income from miscellaneous services	21.7	26.4
Other operating income[1]	59.4	40.9
Total other operating income[2]	**470.7**	**564.4**

[1] Previous year's figure has been adjusted. It comprises Income from investments.
[2] The composition of Other operating income has been changed, see "Changes to accounting and measurement principles and disclosure changes".

In 2015, € 191.4 million (2014: € 15.9 million) of the income from milestone payments, rights and royalties amounting to € 261.7 million (2014: € 138.0 million) was attributable to the collaboration agreement entered into with Pfizer Inc., USA, in 2014 in the field of immuno-oncology. This related to the pro rata recognition of deferred income from the upfront payment as well as the value of the right to co-promote Xalkori® (see Note [5] "Joint arrangements of material significance"). Royalty and license income was mainly due to the products Viibryd® (Allergan, Inc., Ireland) and Puregon® (Merck & Co. Inc., USA).

Gains on disposal of non-current assets in the amount of € 52.4 million (2014: € 3.7 million) were primarily attributable to the disposal of marketing authorizations and distribution rights as well as other investments carried at amortized cost.

Income from the release of provisions for litigation amounting to € 35.3 million (2014: € 260.3 million) resulted primarily from the adjustment of the provision in connection with the paroxetine legal dispute (see Note [27] "Provisions"). In 2014, income related mainly to the resolution of the legal dispute with Israel Bio-Engineering Project Limited Partnership ("IBEP").

There was no income from investments in fiscal 2015; in the prior year, income from investments amounted to € 1.5 million and was reported as other operating income.

(13) Other operating expenses

The breakdown of other operating expenses was as follows:

OTHER OPERATING EXPENSES

€ million	2015	2014
Impairment losses	–128.4	–100.2
Acquisition costs	–101.6	–24.5
Litigation	–85.1	–95.5
Allowances for receivables	–84.1	–41.9
Integration costs/IT costs	–77.6	–87.2
Premiums, fees and contributions	–56.8	–55.2
Exchange rate differences from operating activities (net)	–48.8	–
Restructuring costs	–47.5	–83.9
Non-income related taxes	–44.5	–35.5
Profit share expenses	–26.3	–53.3
Expenses for miscellaneous services	–20.3	–21.8
Project costs	–16.2	–4.4
Other operating expenses[1]	–180.1	–134.0
Total other operating expenses[2]	**–917.3**	**–737.4**

[1] The figure for 2014 was adjusted and now includes losses on the divestment of businesses.
[2] The composition of Other operating expenses has been changed, see "Changes to accounting and measurement principles and disclosure changes".

Impairment losses totaled € 128.4 million (2014: € 100.2 million) and related in the amount of € 120.9 million (2014: € 84.9 million) to assets which were assigned to research and development, in the amount of € 6.9 million (2014: € 5.7 million) to administration, and in the amount of € 0.3 million (2014: € 0.1 million) to sales-related assets. Impairment losses on production plants amounted to € 0.3 million (2014: € 5.1 million). No impairments were recognized for non-consolidated investments and other financial instruments which were classified to the category "available-for-sale" (2014: € 4.4 million). Further information on impairments can be found in Note [17] "Intangible assets".

Acquisition costs amounting to € 101.6 million (2014: € 24.5 million) were incurred in 2015 in connection with the acquisition and the integration of the Sigma-Aldrich Corporation, USA. In 2014, the expenses were largely attributable to the acquisition of AZ Electronic Materials S.A., Luxembourg.

Integration and IT costs of € 77.6 million (2014: € 87.2 million) were incurred primarily for the global harmonization of the IT landscape and in connection with the integration of acquired and existing businesses.

The restructuring charges incurred in fiscal 2015 amounting to € 47.5 million (2014: € 83.9 million) arose completely in connection with the "Fit for 2018" transformation and growth program (2014: € 79.5 million). As in the previous year, these charges largely related to personnel measures, for instance the elimination of positions in order to create a leaner and more efficient organization. Of the recognized impairment losses, an amount of € 6.9 million (2014: € 4.5 million) was attributable to the program, which resulted in total expenses of € 54.4 million (2014: € 84.0 million) for the "Fit for 2018" program.

Other operating expenses also included special environmental protection costs as well as personnel expenses not allocable to the functional areas.

(14) Financial result

€ million	2015	2014
Interest income and similar income	32.0	30.6
Interest expenses and similar expenses	–291.6	–159.8
Interest expenses from interest rate derivatives	–11.4	–2.6
Interest component from currency hedging transactions	–	–5.1
Interest result	**–271.0**	**–136.9**
Interest component of the additions to pension provisions and other non-current provisions	–45.8	–55.2
Currency differences from financing activities	–39.9	–13.0
Result from financial investments	–	0.1
	–356.7	**–205.0**

Higher interest expenses year-on-year were mainly the result of expenses for the hybrid bond issued in December 2014, the U.S. bond issued in March 2015, as well as the euro bond placed in August 2015. All the bonds are part of the financing of the acquisition of the Sigma-Aldrich Corporation, USA. More information on bonds issued by the Group can be found in Note [28] "Financial liabilities/Capital management".

Currency differences from financing activities were mainly the result of expenses for hedging intragroup transactions in foreign currency. These expenses result from hedging at forward rates while intragroup transactions are measured at spot rates. The increase over 2014 is mainly attributable to lower interest rates in Europe as well as a higher hedging volume.

The decline in the interest component of the additions to pension provisions and other non-current provisions resulted largely from lower interest expenses in connection with non-current provisions.

(15) Income tax

€ million	2015	2014
Current taxes in the period	–704.6	–592.4
Taxes for previous periods	–95.1	–21.9
Deferred taxes in the period	431.7	222.1
	–368.0	**–392.2**

The following table presents the tax reconciliation from theoretical tax expense to tax expense according to the consolidated income statement. The theoretical tax expense is determined by applying the statutory tax rate of 30.7% of a corporation headquartered in Darmstadt.

€ million	**2015**	2014
Profit before income tax	1,486.5	1,557.0
Tax rate	30.7%	30.7%
Theoretical tax expense	–456.4	–478.0
Tax rate differences	151.1	100.8
Tax effect of companies with a negative contribution to consolidated profit	–22.0	–15.8
Tax for other periods	–95.1	–21.9
Tax credits	520.7	23.2
Tax effect on tax loss carryforwards	16.1	18.5
Tax effect of non-deductible expenses/Tax-free income/Other tax effects	–482.4	–19.0
Tax expense according to consolidated income statement	**–368.0**	**–392.2**
Tax ratio according to consolidated income statement	24.8%	25.2%

The tax expense consisted of corporation and trade taxes for the companies domiciled in Germany as well as comparable income taxes for foreign companies.

The higher tax credits arose primarily in the United States due to the consideration of dividend income from high-tax countries. However, this dividend income is also taxable in the United States; the related tax expense is included in the item "Tax effect of non-deductible expenses/Tax-free income/Other tax effects." The change in the item "Tax for other periods" results, among other things, from the addition to provisions for tax audits.

The reconciliation between deferred taxes in the consolidated balance sheet and deferred taxes in the consolidated income statement is presented in the following table:

€ million	**2015**	2014
Change in deferred tax assets (balance sheet)	56.7	256.5
Change in deferred tax liabilities (balance sheet)	–2,034.3	–152.9
Deferred taxes credited/debited to equity	41.4	–177.4
Changes in scope of consolidation/currency translation/other changes	2,367.9	295.9
Deferred taxes (consolidated income statement)	**431.7**	**222.1**

Tax loss carryforwards were structured as follows:

	Dec. 31, 2015			Dec. 31, 2014		
€ million	**Germany**	**Abroad**	**Total**	Germany	Abroad	Total
Tax loss carryforwards	22.3	1,183.7	**1,206.0**	8.0	948.4	**956.4**
thereof: Including deferred tax asset	5.4	447.5	**452.9**	3.1	292.5	**295.6**
Deferred tax asset	0.4	113.9	**114.3**	0.5	71.5	**72.0**
thereof: Excluding deferred tax asset	16.9	736.2	**753.1**	4.9	655.9	**660.8**
Theoretical deferred tax asset	2.5	186.0	**188.5**	0.8	106.5	**107.3**

The increase in non-German tax loss carryforwards was mainly due to the recognition of loss carryforwards in Luxembourg as well as the acquisition vehicle Mario Finance Corp., USA. The interest expenses incurred in connection with the financing of the acquisition of the Sigma-Aldrich Corporation, USA, led to a negative tax result and to a higher deferred tax asset.

Deferred tax assets are recognized for tax loss and interest carryforwards only if for tax loss carryforwards of less than € 5.0 million realization of the related tax benefits is probable within one year, and for tax loss carryforwards of more than € 5.0 million realization of the related tax benefits is probable within the next three years.

The vast majority of the tax loss carryforwards either has no expiry date or can be carried forward for up to 20 years.

The tax loss carryforwards accumulated in Germany for corporation and trade tax amounted to € 22.3 million (2014: € 8.0 million).

The additional theoretically possible deferred tax assets amounted to € 188.5 million (2014: € 107.3 million).

In 2015, the income tax expense was reduced by € 16.1 million (2014: € 18.5 million) due to the utilization of tax loss carryforwards from prior years for which no deferred tax asset had been recognized in prior periods.

Deferred tax assets and liabilities correspond to the following balance sheet items:

	Dec. 31, 2015		Dec. 31, 2014	
€ million	**Assets**	**Liabilities**	Assets	Liabilities
Intangible assets	80.1	2,859.9	72.2	1,047.5
Property, plant and equipment	23.4	169.3	16.1	69.8
Current and non-current financial assets	10.4	11.8	0.1	3.6
Inventories	627.0	28.7	507.6	10.2
Current and non-current receivables/Other assets	25.9	10.8	57.5	7.4
Provisions for pensions and other post-employment benefits	351.3	69.6	338.0	47.2
Current and non-current other provisions	308.2	35.8	308.1	72.5
Current and non-current liabilities	124.9	19.7	120.0	36.0
Tax loss carryforwards	114.3	–	72.0	–
Tax refund claims/Other	163.5	426.5	18.7	41.6
Offset deferred tax assets and liabilities	–779.4	–779.4	–517.4	–517.4
Deferred taxes (consolidated balance sheet)	**1,049.6**	**2,852.7**	**992.9**	**818.4**

The increase in deferred tax liabilities on assets is largely due to their recognition at fair value within the scope of the purchase price allocation of the Sigma-Aldrich Corporation, USA.

In addition to deferred tax assets on tax loss carryforwards amounting to € 114.3 million (2014: € 72.0 million), deferred tax assets of € 935.3 million were recognized for temporary differences (2014: € 920.9 million).

As of the balance sheet date, deferred taxes for temporary differences for interests in subsidiaries were recognized to the extent that these related to planned dividend payments and, in this context, the reversal of these differences was foreseeable. Deferred tax liabilities in a total amount of € 391.2 million (2014: € 31.0 million) were recognized for the higher or lower tax expense attributable to dividend payments. The increase resulted from the planned dividend payments of companies acquired in connection with the Sigma-Aldrich acquisition. Temporary differences relating to the retained earnings of subsidiaries amounted to € 5,247.7 million (2014: € 5,194.3 million).

(16) Earnings per share

Basic earnings per share are calculated by dividing the profit after tax attributable to the shareholders of Merck KGaA, Darmstadt, Germany, by the weighted average number of theoretical shares outstanding. The use of a theoretical number of shares takes into account the fact that the general partner's capital is not represented by shares.

The share capital of € 168.0 million was divided into 129,242,252 shares. Accordingly, the general partner's capital of € 397.2 million was divided into 305,535,626 theoretical shares. Overall, the total capital thus amounted to € 565.2 million or 434,777,878 theoretical shares outstanding. The weighted average number of shares in 2015 was likewise 434,777,878.

Earnings per share from discontinued operations resulted from the business operations acquired with a view to resale in connection with the acquisition of the Sigma-Aldrich Corporation, USA (see Note [4] "Acquisitions, assets held for sale and disposal groups").

As of December 31, 2015 there were no potentially dilutive shares. Diluted earnings per share were equivalent to basic earnings per share.

Notes to the Consolidated Balance Sheet

(17) Intangible assets

	Customer relationships, marketing authorizations, patents, licenses and similar rights, brands, trademarks and other		Goodwill	Software	Advance payments and software in development	Total
€ million	Finite useful life	Indefinite useful life				
Cost at January 1, 2014	**10,932.7**	**656.0**	**4,583.2**	**304.3**	**42.3**	**16,518.5**
Changes in scope of consolidation	1,049.5	–	818.4	1.6	–	1,869.5
Additions	62.1	38.6	–	2.2	40.4	143.3
Disposals	–4.8	–61.5	–	–11.9	–0.2	–78.4
Transfers	0.2	–	–	47.0	–45.5	1.7
Classification as held for sale or transfer to a disposal group	–	–	–	–	–	–
Currency translation	285.3	0.6	292.3	10.8	–	589.0
December 31, 2014	**12,325.0**	**633.7**	**5,693.9**	**354.0**	**37.0**	**19,043.6**
Accumulated amortization and impairment losses January 1, 2014	**–5,992.6**	**–441.1**	**–**	**–217.6**	**–**	**–6,651.3**
Changes in scope of consolidation	–	–	–	–	–	–
Amortization	–841.6	–	–	–35.6	–	–877.2
Impairment losses	–	–84.8	–	–5.1	–0.2	–90.1
Disposals	4.7	61.5	–	10.1	–	76.3
Transfers	–	–	–	–	–	–
Reversals of impairment losses	–	–	–	–	–	–
Classification as held for sale or transfer to a disposal group	–	–	–	–	–	–
Currency translation	–96.6	–0.6	–	–8.6	–	–105.8
December 31, 2014	**–6,926.1**	**–465.0**	**–**	**–256.8**	**–0.2**	**–7,648.1**
	5,398.9	**168.7**	**5,693.9**	**97.2**	**36.8**	**11,395.5**
Net carrying amount as of December 31, 2014						
Cost at January 1, 2014	**12,325.0**	**633.7**	**5,693.9**	**354.0**	**37.0**	**19,043.6**
Changes in scope of consolidation	5,774.8	–	8,643.6	36.0	68.0	14,522.4
Additions	302.7	125.8	–	1.7	43.3	473.5
Disposals	–3.3	–0.4	–	–9.2	–	–12.9
Transfers	8.2	–2.0	–	36.5	–37.8	4.9
Classification as held for sale or transfer to a disposal group	–61.4	–	–21.6	–	–	–83.0
Currency translation	140.8	0.4	54.2	5.9	0.1	201.4
December 31, 2015	**18,486.8**	**757.5**	**14,370.1**	**424.9**	**110.6**	**34,149.9**
Accumulated amortization and impairment losses January 1, 2015	**–6,926.1**	**–465.0**	**–**	**–256.8**	**–0.2**	**–7,648.1**
Changes in scope of consolidation	–	–	–	–	–	–
Amortization	–948.2	–	–	–36.0	–	–984.2
Impairment losses	–5.9	–108.5	–	–0.4	–	–114.8
Disposals	3.3	0.1	–	8.7	–	12.1
Transfers	–4.1	–	–	0.2	–	–3.9
Reversals of impairment losses	–	–	–	–	–	–
Classification as held for sale or transfer to a disposal group	37.5	–	–	–	–	37.5
Currency translation	–104.2	–0.5	–	–4.8	–	–109.5
December 31, 2015	**–7,947.7**	**–573.9**	**–**	**–289.1**	**–0.2**	**–8,810.9**
Net carrying amount as of December 31, 2015	**10,539.1**	**183.6**	**14,370.1**	**135.8**	**110.4**	**25,339.0**

Customer relationships, marketing authorizations, patents, licenses and similar rights, brands, trademarks and other
The changes in the scope of consolidation mainly include additions to intangible assets resulting from the acquisition of the Sigma-Aldrich Corporation, USA. A detailed presentation of this acquisition can be found in Note [4] "Acquisitions, assets held for sale and disposal groups".

The net carrying amount of "Customer relationships, marketing authorizations, patents, licenses and similar rights, brands, trademarks and other" with finite useful lives amounting to € 10,539.1 million (2014: € 5,398.9 million) mainly included the identified and capitalized assets from the purchase price allocations for the acquisition of the Sigma-Aldrich Corporation, AZ Electronic Materials S.A., the Millipore Corporation, and Serono SA. The vast majority was attributable to customer relationships. The remaining useful lives of these assets ranged between 0.3 and 23.9 years.

The additions to intangible assets with finite useful lives amounted to € 302.7 million in 2015 (2014: € 62.1 million). The Healthcare business sector accounted for € 295.6 million of this figure. Most of this amount, or € 294.4 million, was attributable to the co-marketing right for the product Xalkori® with Pfizer Inc., USA (see Note [5] "Joint arrangements of material significance").

The item "Customer relationships, marketing authorizations, patents, licenses and similar rights, brand names, trademarks and other" with indefinite useful lives primarily related to rights that the Group had acquired for active ingredients, products or technologies that were still in the research and development stage. Owing to the uncertainty as to the extent to which these projects will ultimately lead to the marketing of marketable products, the period for which the resulting capitalized assets would generate an economic benefit for the company could not yet be determined. Amortization will only begin once the products receive marketing approval and is carried out on a straight-line basis over the shorter period of the patent or contract term or the expected useful life.

In 2015, additions to intangible assets with indefinite useful lives amounted to € 125.8 million (2014: € 38.6 million) and were almost exclusively attributable to the Healthcare business sector with € 125.4 million. The vast majority was attributable to a capitalized upfront payment of € 103.8 million (US$ 115 million) made to the Intrexon Corporation, USA, in connection with the strategic collaboration and license agreement to develop and commercialize Chimeric Antigen Receptor T-cell (CAR-T) cancer therapies. For the first two targets of interest selected by the Healthcare business sector, Intrexon will receive research funding and is eligible to receive up to US$ 826 million (€ 755.6 million, translated at the closing rate) for development, regulatory and commercial milestones, as well as tiered royalties on product sales.

Intangible assets with definite useful lives amounting to € 23.9 million (historical acquisition and manufacturing costs of € 61.4 million and accumulated amortization of € 37.5 million) as well as allocable goodwill of € 21.6 million were reclassified to "assets held for sale". Details of this transaction are presented in Note [4] "Acquisitions, assets held for sale and disposal groups".

In 2015, borrowing costs of € 3.4 million directly allocable to intangible assets were capitalized.

Goodwill
Goodwill was incurred mainly in connection with the acquisition of the Sigma-Aldrich Corporation, AZ Electronic Materials S.A., the Millipore Corporation, and Serono SA. The changes in goodwill caused by foreign exchange rates resulted almost exclusively from translating the goodwill from the acquisitions of the Sigma-Aldrich Corporation, AZ Electronic Materials S.A. and the Millipore Corporation, part of which is carried in U.S. dollars, into the reporting currency. More information on the acquisition of the Sigma-Aldrich Corporation can be found in Note [4] "Acquisitions, assets held for sale and disposal groups".

The carrying amounts of "Customer relationships, marketing authorizations, patents, licenses and similar rights, brands, trademarks and other" as well as goodwill were attributable to the business sectors as follows:

€ million	Remaining useful life in years	Healthcare	Life Science[1]	Performance Materials[1]	**Total Dec. 31, 2015**	Total Dec. 31, 2014
Customer relationships, marketing authorizations, patents, licenses and similar rights, brands, trademarks and other						
Finite useful life	**–**	**2,276.3**	**6,907.1**	**1,355.7**	**10,539.1**	**5,398.9**
Rebif®	4.0	1,472.9	–	–	1,472.9	1,841.0
Gonal-f®	3.0	284.9	–	–	284.9	379.8
Xalkori®	6.0	261.7	–	–	261.7	–
Saizen®	4.0	122.9	–	–	122.9	153.7
Other marketing authorizations	4.0 – 6.3	85.8	–	–	85.8	103.7
Technologies	0.3 – 12.0	–	512.2	1,003.5	1,515.7	1,462.7
Brands	0.5 – 11.9	6.6	1,154.2	31.5	1,192.3	269.7
Customer relationships	0.5 – 23.9	1.9	5,240.7	316.7	5,559.3	1,097.0
Others	2.3 – 18.5	39.6	–	4.0	43.6	91.3
Indefinite useful life	**–**	**183.2**	**0.4**	**–**	**183.6**	**168.7**
Goodwill	**–**	**1,822.9**	**11,130.4**	**1,416.8**	**14,370.1**	**5,693.9**

[1] Carrying amounts of the intangible assets acquired within the scope of the acquisition of the Sigma-Aldrich Corporation, USA, are preliminary.

Information on impairment tests of intangible assets with indefinite useful lives

In 2015, goodwill was not impaired. The assumptions used in the goodwill impairment test are presented in Note [7] "Management judgments and sources of estimation uncertainty".

In 2015, impairment losses on intangible assets with indefinite useful lives totaled € 108.5 million (2014: € 84.8 million). Of this amount, an impairment loss of € 84.4 million was attributable to the capitalized upfront and milestone payments for evofosfamide. The reason for this impairment loss was that in the indications locally advanced inoperable or metastatic soft-tissue sarcoma as well as advanced pancreatic cancer, evofosfamide failed to meet the primary endpoints in two corresponding Phase III clinical trials. The Group therefore decided not to pursue evofosfamide further and not to submit it for approval. Moreover, four development projects were discontinued and their carrying amounts of € 22.3 million was recognized in full as an impairment loss.

All of these items were allocated in the consolidated income statement to the Biopharma business and recorded in impairment losses under operating expenses. In 2015, no intangible assets were pledged as security for liabilities.

(18) Property, plant and equipment

€ million	Land, land rights and buildings, including buildings on third-party land	Plant and machinery	Other facilities, operating and office equipment	Construction in progress and advance payments to vendors and contractors	Total
Cost at January 1, 2014	**2,412.5**	**3,200.8**	**925.0**	**263.5**	**6,801.8**
Changes in the scope of consolidation	89.8	58.9	33.5	3.6	185.8
Additions	20.5	23.9	30.9	410.9	486.2
Disposals	–14.3	–49.2	–46.8	–2.9	–113.2
Transfers	69.6	132.9	58.4	–253.2	7.7
Classification as held for sale or transfer to a disposal group	–	–	–	–	–
Currency translation	57.3	42.4	16.5	8.6	124.8
December 31, 2014	**2,635.4**	**3,409.7**	**1,017.5**	**430.5**	**7,493.1**
Accumulated depreciation and impairment losses January 1, 2014	**–1,069.8**	**–2,374.5**	**–709.4**	**–0.9**	**–4,154.6**
Changes in the scope of consolidation	–	–	–	–	–
Depreciation	–104.3	–189.8	–90.4	–	–384.5
Impairment losses	–0.4	–4.7	–0.6	–	–5.7
Disposals	10.7	46.1	44.9	0.1	101.8
Transfers	–4.1	–0.1	0.1	–	–4.1
Reversals of impairment losses	0.1	0.4	0.2	–	0.7
Classification as held for sale or transfer to a disposal group	–	–	–	–	–
Currency translation	–19.0	–25.6	–11.6	–0.1	–56.3
December 31, 2014	**–1,186.8**	**–2,548.2**	**–766.8**	**–0.9**	**–4,502.7**
Net carrying amount as of December 31, 2014	**1,448.6**	**861.5**	**250.7**	**429.6**	**2,990.4**
Cost at January 1, 2015	**2,635.4**	**3,409.7**	**1,017.5**	**430.5**	**7,493.1**
Changes in the scope of consolidation	517.1	233.7	10.3	80.0	841.1
Additions	5.9	27.5	28.2	502.4	564.0
Disposals	–44.8	–52.0	–54.1	–4.3	–155.2
Transfers	129.5	223.1	68.7	–417.4	3.9
Classification as held for sale or transfer to a disposal group	–	–	–	–	–
Currency translation	48.4	37.5	13.4	1.0	100.3
December 31, 2015	**3,291.5**	**3,879.5**	**1,084.0**	**592.2**	**8,847.2**
Accumulated depreciation and impairment losses January 1, 2015	**–1,186.8**	**–2,548.2**	**–766.8**	**–0.9**	**–4,502.7**
Changes in the scope of consolidation	–	–	–	–	–
Depreciation	–109.8	–196.6	–92.8	–	–399.2
Impairment losses	–7.7	–2.2	–3.6	–0.1	–13.6
Disposals	41.0	49.5	51.9	0.9	143.3
Transfers	–3.5	–5.0	3.9	–	–4.6
Reversals of impairment losses	–	0.9	–	–	0.9
Classification as held for sale or transfer to a disposal group	–	–	–	–	–
Currency translation	–22.2	–30.0	–9.9	–0.1	–62.2
December 31, 2015	**–1,289.0**	**–2,731.6**	**–817.3**	**–0.2**	**–4,838.1**
Net carrying amount as of December 31, 2015	**2,002.5**	**1,147.9**	**266.7**	**592.0**	**4,009.1**

Changes in the scope of consolidation mainly included the additions to property, plant and equipment from the acquisition of the Sigma-Aldrich Corporation, USA. A detailed presentation of this acquisition can be found in Note [4] "Acquisitions, assets held for sale and disposal groups".

Material additions to construction in progress are attributable to the expansion of global headquarters as well as the construction of a new modular Innovation Center and a second energy station at the Darmstadt site. Further investments at the Darmstadt site were made in a new OLED production plant and a new laboratory building. In addition, investments were made in a new pharmaceutical production plant in Nantong, China, as well as at the production sites in Bari, Italy, and Reinbek, Germany. Furthermore, construction work on a new packaging site in Aubonne, Switzerland, started, and investments were made to expand the production site. Transfers relating to construction in progress mainly include completed subprojects at Group headquarters in Darmstadt as well as investments in the United States, Ireland and Switzerland.

In 2015, impairment losses in the amount of € 13.6 million (2014: € 5.7 million) were recognized. These related mainly to assets allocated to the Healthcare business sector as well as central Group functions.

The total amount of property, plant and equipment used to secure financial liabilities as well as government grants and subsidies was immaterial.

Directly allocable borrowing costs on qualified assets in the amount of € 6.1 million (2014: € 3.2 million) were capitalized.

Property, plant and equipment also included assets that were leased. The total value of capitalized leased assets amounted to € 8.9 million (2014: € 9.4 million) and the corresponding obligations amounted to € 4.8 million (2014: € 6.5 million) (see Note [40] "Other financial obligations").

The carrying amounts of assets classified as finance leases were as follows:

€ million	**Dec. 31, 2015**	Dec. 31, 2014
Land and buildings	6.4	6.8
Vehicles	1.2	1.1
Other property, plant and equipment	1.3	1.5
	8.9	**9.4**

(19) Financial assets

€ million	**current**	**non-current**	**Dec. 31, 2015**	current	non-current	Dec. 31, 2014
Held to maturity investments	29.8	–	29.8	21.7	–	21.7
Available-for-sale financial assets	161.6	110.4	272.0	2,135.0	80.7	2,215.7
Loans and receivables	2.9	16.5	19.4	2.9	13.7	16.6
Derivative assets (financial transactions)	32.7	4.6	37.3	39.8	–	39.8
Total	**227.0**	**131.5**	**358.5**	**2,199.4**	**94.4**	**2,293.8**

Current financial assets primarily include available-for-sale financial assets amounting to € 161.6 million (2014: € 2,135.0 million). As of December 31, 2015 this item mainly included bonds amounting to € 143.0 million (2014: € 1,178.6 million). There were no investments in commercial paper in 2015 (2014: € 956.4 million).The decrease results from the liquidation of available-for-sale financial assets to make the purchase price payment for the acquisition of the Sigma-Aldrich Corporation, USA (see Note [4] "Acquisitions, assets held for sale and disposal groups").

The loans and receivables contained in current financial assets are neither past due nor impaired.

Non-current available-for-sale financial assets mainly include unconsolidated investments amounting to € 22.0 million (2014: € 21.5 million) and investments in associates and other companies amounting to € 87.5 million (2014: € 57.9 million). In 2015, no impairment losses were recognized for unconsolidated investments or for other available-for-sale non-current financial assets. The prior year's impairment losses amounting to € 4.4 million were recorded in the consolidated income statement under other operating expenses.

(20) Other assets

Other assets comprised:

€ million	current	non-current	Dec. 31, 2015	current	non-current	Dec. 31,2014
Other receivables[1]	152.0	3.1	155.1	163.1	5.4	168.5
Derivative assets (operational)	7.6	6.2	13.8	468.5	2.9	471.4
Financial items	**159.6**	**9.3**	**168.9**	**631.6**	**8.3**	**639.9**
Receivables from non-income related taxes	176.3	29.1	205.4	199.8	24.5	224.3
Prepaid expenses	61.1	19.9	81.0	53.8	17.1	70.9
Assets from defined benefit plans	6.3	–	6.3	1.8	–	1.8
Other assets	92.9	69.5	162.4	339.3	6.6	345.9
Non-financial items	**336.6**	**118.5**	**455.1**	**594.7**	**48.2**	**642.9**
	496.2	**127.8**	**624.0**	**1,226.3**	**56.5**	**1,282.8**

[1] Previous year's figures have been adjusted, see "Changes to accounting and measurement principles and disclosure changes".

Other receivables included current receivables from related parties amounting to € 35.4 million (2014: € 76.5 million) as well as current receivables from affiliates amounting to € 6.3 million (2014: € 0.9 million). Moreover, this includes license receivables amounting to € 11.5 million (2014: € 16.1 million). Interest receivables amounted to € 1.4 million (2014: € 12.5 million). In addition, other prepayments were reported under this item. Owing to the completion of the acquisition of the Sigma-Aldrich Corporation, USA, and the realization of hedging transactions in this connection, derivative assets declined. The increase in other non-current assets is largely the result of the inclusion of Sigma-Aldrich. In 2014, other current assets included the entitlement to the joint marketing right for Xalkori® (crizotinib) with Pfizer Inc., USA, in the amount of € 294.4 million, which was reclassified to intangible assets in 2015.

Other receivables from third parties were as follows:

€ million	Dec. 31, 2015	Dec. 31, 2014
Neither past due nor impaired	152.5	164.6
Past due, but not impaired		
up to 3 months	0.7	2.2
up to 6 months	0.7	–
up to 12 months	0.2	–
up to 24 months	0.9	0.9
over 2 years	0.1	0.2
Impaired	–	0.6
Carrying amount[1]	**155.1**	**168.5**

[1] Previous year's figures have been adjusted, see "Changes to accounting and measurement principles and disclosure changes".

In 2015, no allowances for other receivables from third parties were necessary (2014: € 0.4 million). There were no reversals of allowances in this connection in 2015 or in 2014.

(21) Inventories

This item comprised:

€ million	Dec. 31, 2015	Dec. 31, 2014
Raw materials and supplies	493.3	377.3
Work in progress	679.1	496.6
Finished goods	1,405.9	726.9
Goods for resale	41.5	58.9
	2,619.8	**1,659.7**

Write-downs of inventories in 2015 amounted to € 133.3 million (2014: € 99.5 million). In 2015, reversals of inventory write-downs of € 47.3 million were recorded (2014: € 45.3 million). As of the balance sheet date, no inventories were pledged as security for liabilities. The increase in finished goods is largely due to inventories acquired from the Sigma-Aldrich Corporation, USA, which were recognized at their fair values.

(22) Trade accounts receivable

Trade accounts receivable amounting to € 2,738.3 million (2014: 2,219.5 million) exclusively existed vis-à-vis third parties.

The maturity structure of trade accounts receivable was as follows:

€ million	Dec. 31, 2015	Dec. 31, 2014
Neither past due nor impaired	2,320.6	1,793.4
Past due, but not impaired		
up to 3 months	234.1	143.3
up to 6 months	14.2	13.5
up to 12 months	4.7	5.8
up to 24 months	2.0	5.1
over 2 years	0.4	0.5
Impaired	162.3	257.9
Carrying amount[1]	**2,738.3**	**2,219.5**

[1] Previous year's figures have been adjusted, see "Changes to accounting and measurement principles and disclosure changes".

The corresponding allowances developed as follows:

€ million	2015	2014
January 1	**–126.2**	**–136.8**
Additions	–84.1	–41.5
Reversals	40.2	41.8
Utilizations	8.8	9.7
Currency translation and other changes	–4.2	0.6
December 31	**–165.5**	**–126.2**

In the period from January 1 to December 31, 2015 trade accounts receivable in Italy with a nominal value of € 130.8 million were sold for € 128.5 million. Previous impairments in this context amounting to € 3.9 million were reversed and disclosed under other operating income. The sold receivables do not involve any further rights of recovery against the Group.

(23) Income tax receivables

Income tax receivables amounted to € 391.0 million (2014: € 297.0 million). The increase largely resulted from higher tax credits in the United States due to the inclusion of dividend income from high-tax countries. In addition, tax receivables above all resulted from tax prepayments that exceeded the actual amount of tax payable for 2015 and prior fiscal years, and from refund claims for prior years.

(24) Cash and cash equivalents

This item comprised:

€ million	Dec. 31, 2015	Dec. 31, 2014
Cash, bank balances and cheques	577.5	546.7
Short-term cash investments (up to 3 months)	254.7	2,331.8
	832.2	**2,878.5**

Changes in cash and cash equivalents as defined by IAS 7 are presented in the consolidated cash flow statement.

Cash and cash equivalents include restricted cash amounting to € 326.6 million (2014: € 254.4 million). Restricted cash relates mainly to cash and cash equivalents with subsidiaries which the Group only has restricted access to owing to foreign exchange controls.

The maximum default risk is equivalent to the carrying value of the cash and cash equivalents.

(25) Equity

Equity capital

The total capital of the company consists of the share capital composed of shares and the equity interest held by the general partner E. Merck KG, Darmstadt, Germany. As of the balance sheet date, the company's share capital amounting to € 168.0 million was divided into 129,242,251 no-par value bearer shares plus one registered share and is disclosed as subscribed capital. The amount resulting from the issue of shares by Merck KGaA, Darmstadt, Germany, exceeding the nominal amount was recognized in the capital reserves. The equity interest held by the general partner amounted to € 397.2 million.

Share of net profit of E. Merck KG, Darmstadt, Germany

E. Merck KG, Darmstadt, Germany, and Merck KGaA, Darmstadt, Germany, engage in reciprocal net profit transfers. This makes it possible for E. Merck KG, Darmstadt, Germany, the general partner of Merck KGaA, Darmstadt, Germany, and the shareholders to participate in the net profit/loss of Merck KGaA, Darmstadt, Germany, in accordance with the ratio of the general partner's equity interest and the share capital (70.274% or 29.726% of the total capital).

The allocation of net profit/loss is based on the net income of E. Merck KG, Darmstadt, Germany, determined in accordance with the provisions of the German Commercial Code as well as the income/loss from ordinary activities and the extraordinary result of Merck KGaA, Darmstadt, Germany,. These results are adjusted for trade tax and create the basis for the allocation of net profit/loss.

The reciprocal net profit/loss transfer between E. Merck KG, Darmstadt, Germany,and Merck KGaA, Darmstadt, Germany, as stipulated by the Articles of Association was as follows:

		2015		2014	
€ million		**E. Merck KG, Darmstadt, Germany**	**Merck KGaA, Darmstadt, Germany**	E. Merck KG, Darmstadt, Germany	Merck KGaA, Darmstadt, Germany
Result of E. Merck KG, Darmstadt, Germany		–19.6	–	–17.9	–
Result of ordinary activities of Merck KGaA, Darmstadt, Germany		–	609.2	–	651.2
Extraordinary result		–	–	–	–
Adjustment for trade tax in accordance with Art. 27 (1) Articles of Association of Merck KGaA, Darmstadt, Germany		–	–	–3.1	–
Trade tax in accordance with Art. 30 (1) Articles of Association of Merck KGaA, Darmstadt, Germany		–	–87.2	–	–54.2
Basis for appropriation of profits	**(100%)**	**–19.6**	**522.0**	**–21.0**	**597.0**
Profit transfer to E. Merck KG, Darmstadt, Germany Ratio of general partner's capital to total capital	(70.274%)	366.8	–366.8	419.5	–419.5
Profit transfer from E. Merck KG, Darmstadt, Germany Ratio of share capital to total capital	(29.726%)	5.8	–5.8	6.3	–6.3
Trade tax		–	–	3.1	
Corporation tax		–	–28.7		–22.8
Net income		**353.0**	**120.7**	**407.9**	**148.4**

The result of E. Merck KG, Darmstadt, Germany, on which the appropriation of profits adjusted for trade tax is based amounted to € –19.6 million (2014: € –21.0 million). This resulted in a result transfer to Merck KGaA, Darmstadt, Germany, of € –5.8 million (2014: € –6.3 million). The result of Merck KGaA, Darmstadt, Germany, from ordinary activities adjusted for trade tax and extraordinary result, on which the appropriation of its profit is based, amounted to € 522.0 million (2014: € 597.0 million). Merck KGaA, Darmstadt, Germany, transferred € 366.8 million of its profit to E. Merck KG, Darmstadt, Germany, (2014: € 419.5 million). In addition, an expense from corporation tax charges amounting to € 28.7 million resulted (2014: expense of € 22.8 million). Corporation tax is only calculated on the income received by shareholders. Its equivalent is the income tax applicable to E. Merck KG, Darmstadt, Germany. However, this must be paid by the partners of E. Merck KG, Darmstadt, Germany, directly and is not disclosed in the annual financial statements.

Appropriation of profits

The profit distribution to be resolved upon by shareholders also defines the amount of that portion of net profit/loss freely available to E. Merck KG, Darmstadt, Germany. If the shareholders resolve to carry forward or to allocate to retained earnings a portion of the net retained profit of Merck KGaA, Darmstadt, Germany, to which they are entitled, then E. Merck KG, Darmstadt, Germany, is obligated to allocate to the profit brought forward/retained earnings of Merck KGaA, Darmstadt, Germany, a comparable sum determined in accordance with the ratio of share capital to general partner's capital. This ensures that the retained earnings and the profit carried forward of Merck KGaA, Darmstadt, Germany, correspond to the ownership ratios of the shareholders on the one hand and E. Merck KG, Darmstadt, Germany, on the other hand. Consequently, for distributions to E. Merck KG, Darmstadt, Germany, only the amount is available that results after netting the profit transfer of Merck KGaA, Darmstadt, Germany, with the amount either allocated or withdrawn by E. Merck KG, Darmstadt, Germany, from retained earnings/profit carried forward. This amount corresponds to the amount that is paid as a dividend to the shareholders, and reflects their pro rata shareholding in the company.

€ million	2015 E. Merck KG, Darmstadt, Germany	2015 Merck KGaA, Darmstadt, Germany	2014 E. Merck KG, Darmstadt, Germany	2014 Merck KGaA, Darmstadt, Germany
Net income/loss	353.0	120.7	407.9	148.4
Profit carried forward from previous year	71.9	30.4	26.3	11.2
Withdrawal from revenue reserves	–	–	–	–
Transfer to revenue reserves	–	–	–	–
Retained earnings Merck KGaA, Darmstadt, Germany		**151.1**		**159.6**
Withdrawal by E. Merck KG, Darmstadt, Germany	–388.4		–362.3	
Dividend proposal		–135.7		–129.2
Profit carried forward	**36.5**	**15.4**	**71.9**	**30.4**

For 2014, a dividend of € 1.00 per share was distributed. The dividend proposal for fiscal 2015 will be € 1.05 per share, corresponding to a total dividend payment of € 135.7 million (2014: € 129.2 million) to shareholders. The amount withdrawn by E. Merck KG, Darmstadt, Germany, would amount to € 388.4 million (2014: € 362.3 million).

Changes in reserves

For 2015 the profit transfer to E. Merck KG, Darmstadt, Germany, including changes in reserves amounted to € 461.0 million. This consists of the profit transfer to E. Merck KG, Darmstadt, Germany, (€ –366.8 million), the result transfer from E. Merck KG, Darmstadt, Germany, to Merck KGaA, Darmstadt, Germany, (€ –5.8 million), the change in profit carried forward of E. Merck KG, Darmstadt, Germany, (€ –35.4 million) as well as the profit transfer from Merck & Cie, a subsidiary of Merck KGaA, Darmstadt, Germany, to E. Merck KG, Darmstadt, Germany (€ –53.0 million). Merck & Cie, a subsidiary of Merck KGaA, Darmstadt, Germany, is a partnership under Swiss law that is controlled by Merck KGaA, Darmstadt, Germany, but distributes its operating result directly to E. Merck KG, Darmstadt, Germany. This distribution is a payment to shareholders and is therefore also presented under changes in equity.

Non-controlling interests

The disclosure of non-controlling interests was based on the stated equity of the subsidiaries concerned after any adjustment required to ensure compliance with the accounting policies of the Group, as well as pro rata consolidation entries.

The net equity and profit attributable to non-controlling interests mainly related to the minority interests in the publicly traded companies Merck Ltd., India, a subsidiary of Merck KGaA, Darmstadt, Germany, and P.T. Merck Tbk, Indonesia, a subsidiary of Merck KGaA, Darmstadt, Germany, as well as Merck Ltd., Thailand, a subsidiary of Merck KGaA, Darmstadt, Germany, and Merck (Pvt.) Ltd., Pakistan, a subsidiary of Merck KGaA, Darmstadt, Germany,.

In 2014, for an interim period, non-controlling interests of € 161.9 million also existed in the course of the acquisition of AZ Electronic Materials S.A., Luxembourg. The acquisition of these interests after May 2, 2014 was recognized in equity as a transaction without a change of control. This lowered retained earnings by € 189.4 million. This amount represents the difference between the purchase price of € 351.3 million paid for the remaining shares and the disposal of non-controlling interests in the amount of € 161.9 million.

(26) Provisions for pensions and other post-employment benefits

Depending on the legal, economic and fiscal circumstances prevailing in each country, different retirement benefit systems are provided for the employees of the Group. Generally these systems are based on the years of service and salaries of the employees. Pension obligations of the Group include both defined benefit and defined contribution plans and comprise both obligations from current pensions and accrued benefits for pensions payable in the future. In the Group, defined benefit plans are funded and unfunded. Provisions also contain other post-employment benefits, such as accrued future health care costs for retirees in the United States.

In order to limit the risks of changing capital market conditions and demographic developments, for many years now the Group has been offering newly hired employees plans that are largely structured as defined contribution systems.

The value recognized in the consolidated balance sheet for pensions and other post-employment benefits was derived as follows:

€ million	Dec. 31, 2015	Dec. 31, 2014
Present value of all defined benefit obligations	**4,152.7**	**3,812.7**
Fair value of the plan assets	–2,322.9	–1,994.4
Funded status	**1,829.8**	**1,818.3**
Effects of asset ceilings	–	–
Net defined benefit liability recognized in the balance sheet	**1,829.8**	**1,818.3**
Assets from defined benefit plans	6.3	1.8
Provisions for pensions and other post-employment benefits	**1,836.1**	**1,820.1**

The calculation of the defined benefit obligations as well as the relevant plan assets was based on the following actuarial parameters:

	Germany		Switzerland		United Kingdom		Other countries	
in %	**2015**	2014	**2015**	2014	**2015**	2014	**2015**	2014
Discount rate	2.40	2.00	0.70	1.00	3.86	3.66	3.72	4.16
Future salary increases	2.50	2.52	1.80	1.96	2.42	2.10	3.80	4.53
Future pension increases	1.75	1.75	–	–	3.07	3.06	1.91	1.58
Future cost increases for health care benefits	–	–	–	–	–	–	5.06	5.10

These are average values weighted by the present value of the respective benefit obligation.

The defined benefit obligations of the Group were based on the following types of benefits provided by the respective plan:

	Germany	Other countries	Group
Present value of defined benefit obligations in € million	**Dec. 31, 2015**	**Dec. 31, 2015**	**Dec. 31, 2015**
Benefit based on final salary			
Annuity	2,346.3	577.1	2,923.4
Lump sum	–	103.3	103.3
Installments	1.3	–	1.3
Benefit not based on final salary			
Annuity	205.8	834.9	1,040.7
Lump sum	–	42.1	42.1
Installments	6.8	–	6.8
Medical plan	–	35.1	35.1
	2,560.2	**1,592.5**	**4,152.7**

The main benefit rules are as follows:

Group companies in Germany accounted for € 2,560.2 million of the defined benefit obligations (2014: € 2,692.5 million; due to the acquisition of the Sigma-Aldrich Corporation, USA, the obligations increased by € 21.4 million in 2015) as well as for € 1,103.9 million of the plan assets (2014: € 1,100.4 million). Of these amounts the vast majority in each case were attributable to plans that encompass old-age, disability and surviving dependent pensions. On the one hand, these obligations are based on benefit rules comprising benefit commitments dependent upon years of service and final salary from which newly hired employees have been excluded. On the other hand, the benefit rules applicable to employees newly hired since January 1, 2005 comprise a direct commitment basically in the form of a defined contribution pension plan. The benefit entitlement results from the cumulative total of annually determined pension components that are calculated on the basis of a defined benefit expense and an age-dependent annuity table. Statutory minimum funding obligations do not exist.

Pension plans in Switzerland accounted for € 767.9 million of the defined benefit obligations (2014: € 439.8 million; due to the acquisition of the Sigma-Aldrich Corporation the obligations increased by € 188.3 million in 2015) as well as for € 599.8 million of the plan assets (2014: € 391.7 million; due to the acquisition of the Sigma-Aldrich Corporation, the plan assets increased by € 146.5 million in 2015). These obligations are largely based on the granting of old-age, disability and surviving dependent benefits, which include the legally required benefits. Both employer and employee contributions are paid into the pension funds. Statutory minimum funding obligations exist.

Pension plans in the United Kingdom accounted for € 500.0 million of the defined benefit obligations (2014: € 390.0 million; due to the acquisition of Sigma-Aldrich, the obligations increased by € 103.9 million in 2015) as well as for € 465.8 million of the plan assets (2014: € 357.5 million; due to the acquisition of Sigma-Aldrich, the plan assets increased by € 93.6 million in 2015). These obligations result primarily from benefit plans which are based on years of service and final salary and were closed to newly hired employees in 2006. The agreed benefits comprise old-age, disability and surviving dependent benefits. The employer and the employees make contributions to the plans. Statutory minimum funding obligations exist.

In the reporting period, the following items were recognized in income:

€ million	**2015**	2014
Current service cost	134.4	83.5
Past service cost	0.1	–2.5
Gains (–) or losses (+) on settlement	–1.1	–4.3
Other effects recognized in income	5.5	1.8
Interest expense	82.8	101.9
Interest income	–44.8	–67.2
Total amount recognized in income	**176.9**	**113.2**

With the exception of the net balance of interest expense on the defined benefit obligations and interest income from the plan assets, which is recorded under the financial result, the relevant expenses for defined benefit and defined contribution pension systems are allocated to the individual functional areas.

During the reporting period, the present value of the defined benefit obligations changed as follows:

€ million	**Funded benefit obligations**	**Benefit obligations funded by provisions**	**2015**	Funded benefit obligations	Benefit obligations funded by provisions	2014
Present value of the defined benefit obligations on January 1	3,503.6	309.1	3,812.7	2,533.0	203.8	2,736.8
Currency translation differences recognized in equity	39.0	–3.2	35.8	33.7	3.1	36.8
Currency translation differences recognized in income	37.7	–	37.7	5.5	–	5.5
Current service cost	119.0	15.4	134.4	73.0	10.5	83.5
Past service cost	0.2	–0.1	0.1	–2.0	–0.5	–2.5
Gains (–) or losses (+) on settlement	–1.1	–	–1.1	–3.2	–1.1	–4.3
Interest expense	75.5	7.3	82.8	92.6	9.0	101.6
Actuarial gains (–)/losses (+)	–166.4	–22.9	–189.3	849.2	73.8	923.0
Contributions by plan participants	10.6	–	10.6	7.2	–	7.2
Pension payments	–146.4	–6.5	–152.9	–94.0	–5.9	–99.9
Changes in the scope of consolidation	342.5	43.2	385.7	8.3	17.4	25.7
Other effects recognized in income	0.1	–0.2	–0.1	–	0.1	0.1
Other changes	–4.8	1.1	–3.7	0.3	–1.1	–0.8
Present value of the defined benefit obligations on December 31	**3,809.5**	**343.2**	**4,152.7**	**3,503.6**	**309.1**	**3,812.7**

The following overview shows how the present value of all defined benefit obligations would have been influenced by changes to definitive actuarial assumptions. To determine the sensitivities, in principle each of the observed parameters was varied while keeping the measurement assumptions otherwise constant. Insofar as its development of social security is comparable to salary trends, the amounts for social security vary together with the salary trend.

€ million	**Dec. 31, 2015**
Present value of all defined benefit obligations if	
the discount rate is 50 basis points higher	3,779.9
the discount rate is 50 basis points lower	4,597.0
the expected rate of future salary increases is 50 basis points higher	4,278.3
the expected rate of future salary increases is 50 basis points lower	4,040.9
the expected rate of future pension increases is 50 basis points higher	4,386.6
the expected rate of future pension increases is 50 basis points lower	3,976.9
the medical cost trend rate is 50 basis points higher	4,154.1
the medical cost trend rate is 50 basis points lower	4,151.5

The fair value of the plan assets changed in the reporting period as follows:

€ million	**2015**	2014
Fair value of the plan assets on January 1	1,994.4	1,840.2
Currency translation differences recognized in equity	34.4	28.2
Currency translation differences recognized in income	34.4	5.5
Interest income from plan assets	44.8	67.2
Actuarial gains (+)/losses (–) arising from experience adjustments	–28.8	50.7
Employer contributions	30.0	27.2
Employee contributions	10.6	7.2
Pension payments from plan assets	–84.5	–32.8
Changes in the scope of consolidation	293.3	3.0
Plan administration costs paid from the plan assets recognized in income	–2.4	–1.9
Other effects recognized in income	0.1	0.2
Other changes	–3.4	–0.3
Fair value of the plan assets on December 31	**2,322.9**	**1,994.4**

The actual return on plan assets amounted to € 16.0 million in 2015 (2014: € 117.9 million).

In 2015, there were no changes in the effects of the asset ceilings in accordance with IAS 19.64. In the previous year, € 10.8 million was recognized as actuarial gains and € 0.3 million as interest expenses. In both years, there were no effects from the asset ceiling.

The development of cumulative actuarial gains (+) and losses (-) was as follows:

€ million	**2015**	2014
Cumulative actuarial gains (+)/losses (–) recognized in equity on January 1	–1,568.4	–694.8
Currency translation differences	–12.5	–12.1
Remeasurements of defined benefit obligations		
Actuarial gains (+)/losses (–) arising from changes in demographic assumptions	–37.8	19.1
Actuarial gains (+)/losses (–) arising from changes in financial assumptions	217.3	–915.2
Actuarial gains (+)/losses (–) arising from experience adjustments	9.8	–26.9
Remeasurements of plan assets		
Actuarial gains (+)/losses (–) arising from experience adjustments	–28.8	50.7
Effects of the asset ceilings		
Actuarial gains (+)/losses (–)	–	10.8
Reclassification within retained earnings	–	–
Cumulative actuarial gains (+)/losses (–) recognized in equity on December 31	**–1,420.4**	**–1,568.4**

Plan assets for funded defined benefit obligations primarily comprised fixed-income securities, stocks, and investment funds. They did not directly include financial instruments issued by Group companies or real estate used by Group companies.

The plan assets serve exclusively to meet the defined benefit obligations. Covering the benefit obligations with financial assets represents a means of providing for future cash outflows, which occur in some countries (e.g. Switzerland and the United Kingdom) on the basis of legal requirements and in other countries (e.g. Germany) on a voluntary basis.

The ratio of the fair value of the plan assets to the present value of the defined benefit obligations is referred to as the degree of pension plan funding. If the benefit obligations exceed the plan assets, this represents underfunding of the pension fund.

It should be noted, however, that both the benefit obligations as well as the plan assets fluctuate over time. This could lead to an increase in underfunding. Depending on the statutory regulations, it could become necessary in some countries for the Group to reduce underfunding through additions of liquid assets. The reasons for such fluctuations could include changes in market interest rates and thus the discount rate as well as adjustments to other actuarial assumptions (e.g. life expectancy, inflation rates).

In order to minimize such fluctuations, in managing its plan assets, the Group also pays attention to potential fluctuations in liabilities. In the ideal case, assets and liabilities develop in opposite directions when exposed to exogenous factors, creating a natural defense against these factors. In order to achieve this effect, the corresponding use of financial instruments is considered in respect of individual pension plans.

The fair value of the plan assets can be allocated to the following categories:

	Dec. 31, 2015			Dec. 31, 2014		
€ million	**Quoted market price in an active market**	**No quoted market price in an active market**	**Total**	Quoted market price in an active market	No quoted market price in an active market	Total
Cash and cash equivalents	27.3	–	27.3	167.0	–	167.0
Equity instruments	740.3	–	740.3	544.9	–	544.9
Debt instruments	957.5	–	957.5	662.5	–	662.5
Direct investments in real estate	–	98.2	98.2	–	84.7	84.7
Investment funds	369.9	–	369.9	371.3	–	371.3
Insurance contracts	–	79.2	79.2	–	74.9	74.9
Other	50.5	–	50.5	88.2	0.9	89.1
Fair value of the plan assets	**2,145.5**	**177.4**	**2,322.9**	**1,833.9**	**160.5**	**1,994.4**

Employer contributions to plan assets and direct payments to beneficiaries will probably amount to around € 99.2 million in 2016. The weighted duration amounted to 20 years.

The cost of ongoing contributions for defined contribution plans that are financed exclusively by external funds and for which the companies of the Group are only obliged to pay the contributions amounted to € 46.8 million (2014: € 38.7 million). In addition, employer contributions amounting to € 62.9 million (2014: € 57.2 million) were transferred to the German statutory pension insurance system and € 34.9 million (2014: € 28.5 million) to statutory pension insurance systems abroad.

(27) Provisions

Provisions developed as follows:

€ million	Litigation	Restructuring	Personnel	Environmental protection	Other	**Total**
January 1, 2015	**393.1**	**136.5**	**266.8**	**123.7**	**267.7**	**1,187.8**
Additions	114.7	33.0	180.0	9.9	184.1	521.7
Utilizations	–6.4	–72.8	–116.1	–9.7	–72.0	–277.0
Release	–35.3	–6.6	–36.2	–2.0	–59.2	–139.3
Interest portion	7.4	–	1.0	2.5	0.1	11.0
Currency translation	–1.3	1.9	2.7	0.5	2.7	6.5
Changes in scope of consolidation/Other	18.4	–	41.0	2.0	18.6	80.0
December 31, 2015	**490.6**	**92.0**	**339.2**	**126.9**	**342.0**	**1,390.7**
thereof current	77.9	37.7	97.0	24.1	298.7	535.4
thereof non-current	412.7	54.3	242.2	102.8	43.3	855.3

Litigation

As of December 31, 2015, the provisions for legal disputes amounted to € 490.6 million (2014: € 393.1 million). The legal matters described below represent the most significant legal risks.

Product-related and patent disputes

Rebif®: The Group is involved in a patent dispute with Biogen Inc., USA, (Biogen) in the United States. Biogen claims that the sale of Rebif® in the United States infringes on a Biogen patent. The disputed patent was granted to Biogen in 2009 in the United States. Subsequently, Biogen sued the Group and other pharmaceutical companies for infringement of this patent. The Group defended itself against all allegations and brought a countersuit claiming that the patent was invalid and not infringed on by the Group's actions. A Markman hearing was held in January 2012; a decision has not yet been announced. The parties are currently engaged in court-ordered mediation proceedings that have not yet officially ended. It is currently not clear when a first-instance decision will be made. The Group has taken appropriate accounting measures. Cash outflow is not expected to occur within the next twelve months.

In the Performance Materials business sector, the Group is in negotiations with a competitor regarding potential patent infringements. The Group maintains that the competitor's patent infringement assertion is invalid owing to relevant prior art and has filed the corresponding nullity actions. In the meantime, the competitor has filed two patent infringement lawsuits. The Group is prepared for this issue and has taken appropriate accounting measures. The Group anticipates that a final decision will be made only within the next two to five years, leading to a potential outflow of resources.

Antitrust proceedings

Raptiva®: In December 2011, the Brazilian federal state of São Paulo sued the Group for damages because of alleged collusion between various pharmaceutical companies and an association of patients suffering from psoriasis and vitiligo. The collusion is alleged to have aimed at an increase in the sales of the involved companies' drugs to the detriment of patients and state coffers. Moreover, in connection with the product Raptiva®, patients have filed suit to receive compensatory damages. The Group has taken appropriate accounting measures for these legal disputes. These are different legal disputes, and an outflow of cash in fiscal year 2016 cannot be ruled out.

Paroxetine: In connection with the divested generics business, the Group is subject to antitrust investigations by the British Competition and Market Authority ("CMA") in the United Kingdom. In March 2013, the CMA informed the Group of the assumption that a settlement agreement entered into in 2002 between Generics (UK) Ltd. and several GlaxoSmithKline companies in connection with the antidepressant drug paroxetine violates British and European competition law. As the owner of Generics (UK) Ltd. at the time, the Group was allegedly involved in the settlement negotiations and is therefore liable. The investigations into Generics (UK) Ltd. started in 2011, without the Group being aware of this. On February 11, 2016, the CMA imposed a fine in this matter. The Group intends to take legal action against this decision. The Group has recognized appropriate provisions in this connection; in 2015, the provision was released in part based on a re-assessment of the risk. A decision and an outflow of resources, if any, is expected for 2016.

Foreign exchange transfer restrictions

In one jurisdiction, the Group and other companies are subject to a government investigation regarding compliance with foreign exchange transfer restrictions. In this connection, the responsible authorities are investigating whether import prices led to impermissibly high foreign exchange transfers. Appropriate accounting measures have been taken for repayments and fines that are estimated to be probable due to the uncertain legal situation in the affected country. A cash outflow is not expected for 2016.

In addition to provisions for the mentioned litigation, provisions existed as of the balance sheet date for various smaller pending legal disputes.

Restructuring

Provisions for restructuring mainly include commitments to employees in connection with restructuring projects and provisions for onerous contracts. These were recognized once detailed restructuring plans had been prepared and communicated.

In 2012, the "Fit for 2018" transformation and growth program was established. The aim of this program is to secure the competitiveness and the growth of the Group over the long term. The provisions of € 92.0 million as of December 31, 2015 (2014: € 136.5 million) in this connection mainly consist of commitments to employees from partial and early retirement arrangements. The payments made in 2015 in the amount of € 72.8 million are primarily due to severance or early retirement payments to employees. Cash flows owing to provisions for restructuring are for the most part expected within a period of up to 2019.

Provisions for employee benefits / Share-based payment

Provisions for employee benefits include obligations from long-term variable compensation programs. More information on these compensation programs can be found in Note [66] "Share-based compensation programs". The following table presents the key parameters as well as the development of the potential number of Share Units of Merck KGaA, Darmstadt, Germany, ("MSUs") for the individual tranches:

	2013 tranche	2014 tranche	**2015 tranche**
Performance cycle	Jan. 1, 2013 – Dec. 31, 2015	Jan. 1, 2014 – Dec. 31, 2016	Jan. 1, 2015 – Dec. 31, 2017
Term	3 years	3 years	3 years
Reference price of shares of Merck KGaA, Darmstadt, Germany, in € (60-day average share price of Merck KGaA, Darmstadt, Germany, prior to the start of the performance cycle)	100.11[1]	122.84[1]	74.53
DAX® value (60-day average of the DAX® prior to the start of the performance cycle)	7,350.64	9,065.08	9,403.99
Potential number of MSUs			
Potential number offered for the first time in 2013	389,658	–	–
Expired	11,938	–	–
Status as on Dec. 31, 2013	377,720	–	–
Potential number offered for the first time in 2014	–	355,164	–
Expired	38,179	21,247	–
MSUs granted to employees of the AZ Electronic Materials Group on May 2, 2014	–	22,865	–
Status as on Dec. 31, 2014	339,541	356,782	–
Potential number offered for the first time in 2015	–	–	609,799
Expired	20,885	23,541	21,447
Further additional granted MSUs	–	2,167	–
Status as on Dec. 31, 2015	**318,656**	**335,408**	**588,352**

[1] Price of shares before share split in 2014.

The value of the provision for the vesting period already completed was € 123.9 million as of December 31, 2015 (2014: € 144.8 million). The net expense for fiscal 2015 was € 64.3 million (2014: € 81.3 million). The three-year tranche issued in 2012 ended at the end of 2014 and was paid out in 2015 in the amount of € 85.9 million.

Provisions for employee benefits also include obligations for the partial retirement program and other severance pay that were not set up in connection with the "Fit for 2018" transformation and growth program as well as obligations in connection with long-term working hour accounts and anniversary bonuses.

With respect to provisions for defined-benefit pensions and other post-employment benefits, see Note [26] "Provisions for pensions and other post-employment benefits".

Environmental protection

Provisions for environmental protection mainly existed in Germany, Latin America and the United States and were set up particularly for obligations from soil remediation and groundwater protection in connection with the crop protection business that was discontinued in 1987.

Other provisions

Other provisions mainly include provisions for purchase commitments, subsequent contract costs stemming from discontinued research projects, other guarantees, and provisions for uncertain commitments from contributions, duties and fees.

Provisions were recognized in 2015 for expected subsequent costs due to the discontinuation of the evofosfamide development program. In addition, provisions were recognized for interest and penalties resulting from tax audits. Releases and utilizations mainly related to provisions recognized in previous years for subsequent costs in relation to discontinued development programs in the Healthcare business sector.

(28) Financial liabilities / Capital management

The composition of financial liabilities as well as a reconciliation to net financial debt are presented in the following table:

	Book value Dec. 31, 2015 € million	Book value Dec. 31, 2014 € million	Maturity	Interest rate %	Nominal volume million	Currency
Eurobond 2010/2015	–	1,349.7	March 2015	3.375	1,350.0	€
Eurobond 2009/2015	–	100.0	Dec. 2015	3.615	100.0	€
Eurobond 2006/2016	214.4	–	June 2016	5.875	250.0	€
Eurobond 2009/2016	60.0	–	Nov. 2016	4.000	60.0	€
Total bonds (current)	**274.4**	**1,449.7**				
Commercial paper	999.2	–				
Loans to banks	2,136.8	67.4				
Liabilities to related parties	577.8	501.4				
Loans from third parties and other financial liabilities	26.6	18.6				
Liabilities from derivatives (financial transactions)	79.8	36.0				
Finance lease liabilities	2.0	2.8				
Total current financial liabilities	**4,096.6**	**2,075.9**				
Eurobond 2006/2016	–	218.4	June 2016	5.875	250.0	€
Eurobond 2009/2016	–	60.0	Nov. 2016	4.000	60.0	€
U.S. bond 2015/2017	228.5	–	March 2017	variable[1]	250.0	USD
Eurobond 2015/2017	699.0	–	Sept. 2017	variable[2]	700.0	€
U.S. bond 2015/2018	365.5	–	March 2018	1.700	400.0	USD
Eurobond 2009/2019	69.3	69.1	Dec. 2019	4.250	70.0	€
Eurobond 2015/2019	797.3	–	Sept. 2019	0.750	800.0	€
U.S. bond 2015/2020	683.8	–	March 2020	2.400	750.0	USD
Eurobond 2010/2020	1,345.1	1,344.1	March 2020	4.500	1,350.0	€
U.S. bond 2015/2022	909.6	–	March 2022	2.950	1,000.0	USD
Eurobond 2015/2022	546.8	–	Sept. 2022	1.375	550.0	€
U.S. bond 2015/2025	1,448.4	–	March 2025	3.250	1,600.0	USD
Hybrid bond 2014/2074	987.7	986.2	Dec. 2074[3]	2.625	1,000.0	€
Hybrid bond 2014/2074	496.8	496.7	Dec. 2074[4]	3.375	500.0	€
Total bonds (non-current)	**8,577.8**	**3,174.5**				
Loans to banks	869.2	200.0				
Liabilities to related parties	–	–				
Loans from third parties and other financial liabilities	62.6	65.9				
Liabilities from derivatives (financial transactions)	103.9	117.0				
Finance lease liabilities	2.8	3.7				
Total non-current financial liabilities	**9,616.3**	**3,561.1**				
Total financial liabilities	**13,712.9**	**5,637.0**				
less:						
Cash and cash equivalents	832.2	2,878.5				
Current financial assets	227.0	2,199.4				
Net financial debt	**12,653.7**	**559.1**				

[1] Interest rate: 0.35% spread over 3-month U.S. dollar LIBOR.
[2] Interest rate: 0.23% spread over 3-month EURIBOR.
[3] Merck KGaA, Darmstadt, Germany, has the right to prematurely repay this tranche of the hybrid bond issued in December 2014 for the first time in June 2021.
[4] Merck KGaA, Darmstadt, Germany, has the right to prematurely repay this tranche of the hybrid bond issued in December 2014 for the first time in December 2024.

The Group issued a U.S. bond with a five-tranche structure in March 2015, and a further euro bond with a three-tranche structure in August 2015. Both issuances are part of the financing of the acquisition of the Sigma-Aldrich Corporation, USA. The Group issued a bond with a volume of € 1.35 billion in March 2015, and repaid a further bond with a volume of € 100 million in December 2015. On December 18, 2015, the Group also repaid early a bond acquired within the scope of the acquisition of Sigma-Aldrich with a nominal volume of US$ 300 million.

For the hybrid bond 2014/2074 issued by the Group in two tranches, the two rating agencies Standard & Poor's and Moody's have given equity credit treatment to half of the issuance, thus making the issuance more favorable to the Group's credit rating than a classic bond issue. The bond is recognized in full as financial liabilities in the balance sheet. In addition to the issued bonds, to finance the purchase price payment for the acquisition of Sigma-Aldrich, the Group utilized a credit line of € 1.6 billion from a banking syndicate, as well as bilateral credit agreements amounting to € 1.35 billion.

The financial liabilities of the Group are not secured by liens or similar forms of collateral. The loan agreements do not contain any financial covenants. The Group's average borrowing cost as of the balance sheet date was 2.0% (2014: 3.3%).

Information on liabilities to related parties can be found in Note [46] "Related-party disclosures".

Capital management

The objective of capital management is to secure financial flexibility in order to maintain long-term business operations and to realize strategic options. Maintaining a stable investment grade rating, ensuring liquidity, limiting financial risks as well as optimizing the cost of capital are the objectives of our financial policy and set important framework conditions for capital management. The responsible committees decide on the capital structure of the balance sheet, the appropriation of net retained profit and the dividend level. In this context, net financial debt is one of the leading capital management indicators.

Traditionally, the capital market represents a major source of financing for the Group, for instance via bond issues. In addition, the Group has a € 2 billion multi-currency revolving credit facility, which was renewed in fiscal 2013 ("Syndicated Loan 2013"). The credit line was underwritten by an international group of banks and has a remaining term until March 2020. This credit line had not been utilized as of December 31, 2015. The Group still had access to a commercial paper program to meet short-term capital requirements with a volume of € 2 billion, of which € 1 billion had been utilized as of December 31, 2015 (2014: no utilization). Moreover, the Group utilized an amount of € 3.53 billion (2014: € 2.93 billion) of the debt issuance program with a volume of € 15.0 billion (2014: € 15.0 billion) as of December 31, 2015. As of December 31, 2015, further bank lines of € 206.5 million were available (2014: € 11,544.8 million). In 2014, these credit lines were available especially for the acquisition of Sigma-Aldrich. There are no indications that the availability of credit lines already extended was restricted.

On the balance sheet date, the bank financing commitments vis-à-vis the Group were as follows:

€ million	Financing commitments from banks	**Utilization as of Dec. 31, 2015**	Interest	Maturity of financing commitments
Syndicated loan 2013	2,000.0	0.0	variable	2020
Loan agreement with banking syndicate for acquisition financing	1,600.0	1,600.0	variable	2018
Bilateral credit agreement with banks	700.0	700.0	variable	2019
Bilateral credit agreement with banks	400.0	400.0	variable	2020
Bilateral credit agreement with banks	250.0	250.0	variable	2022
Various bank credit lines	206.5	56.0	variable	< 1 year
	5,156.5	**3,006.0**		

(29) Other liabilities

This item comprised:

€ million	current	non-current	Dec. 31, 2015	current	non-current	Dec. 31, 2014
Other financial liabilities	889.9	14.4	904.3	692.9	3.2	696.1
Liabilities from derivatives (operational)	46.4	14.4	60.8	29.0	6.4	35.4
Financial items	**936.3**	**28.8**	**965.1**	**721.9**	**9.6**	**731.5**
Accruals for personnel expenses	535.5	–	535.5	474.3	–	474.3
Deferred income	226.1	576.0	802.1	220.9	768.6	989.5
Advance payments received from customers	15.1	–	15.1	15.0	–	15.0
Liabilities from non-income related taxes	105.5	3.7	109.2	142.5	3.8	146.3
Non-financial items	**882.2**	**579.7**	**1,461.9**	**852.7**	**772.4**	**1,625.1**
	1,818.5	**608.5**	**2,427.0**	**1,574.6**	**782.0**	**2,356.6**

As of December 31, 2015, other financial liabilities included liabilities to related companies amounting to € 453.6 million (2014: € 425.6 million). These are mainly profit entitlements of E. Merck KG, Darmstadt, Germany. Moreover, this item contained liabilities to investments amounting to € 8.5 million (2014: € 3.1 million), interest accruals of € 97.4 million (2014: € 85.9 million) as well as payroll liabilities of € 179.5 million (2014: € 65.9 million). The remaining amount of € 165.3 million (2014: € 115.6 million) recorded under other financial liabilities included among other things liabilities to insurers as well as contractually agreed payment obligations vis-à-vis other companies. The deferred income results mainly from the collaboration agreement with Pfizer Inc., USA, in immuno-oncology and was released as planned on a pro rata basis in 2015 (see Note [5] "Joint arrangements of material significance").

(30) Trade accounts payable

Trade accounts payable consisted of the following:

€ million	Dec. 31, 2015	Dec. 31, 2014
Liabilities to third parties	1,920.9	1,539.3
Liabilities to investments	0.3	0.1
	1,921.2	**1,539.4**

Trade accounts payable included an accrued amount of € 906.4 million (2014: € 831.0 million) for outstanding invoices and sales deductions.

(31) Tax liabilities

Tax liabilities and provisions for tax liabilities resulted in total income tax liabilities of € 1,011.3 million as of December 31, 2015 (2014: € 849.8 million). The increase in tax liabilities was primarily due to the acquisition of the Sigma-Aldrich Corporation, USA, higher income tax expenses in fiscal 2015 (see Note [15] "Income taxes") as well as provisions for potential tax obligations.

Segment Reporting

(32) Information by business sector / country and region

INFORMATION BY BUSINESS SECTOR

	Healthcare		Life Science	
€ million	**2015**	2014	**2015**	2014
Net sales[1]	**6,933.8**	**6,620.5**	**3,355.3**	**2,682.5**
Operating result (EBIT)	**1,096.7**	**1,106.4**	**300.8**	**289.2**
Depreciation and amortization	752.2	749.2	371.6	308.1
Impairment losses	121.5	90.8	2.0	1.6
Reversals of impairment losses	–	–	–0.1	–
EBITDA	**1,970.4**	**1,946.4**	**674.3**	**598.9**
Exceptionals	31.3	53.9	181.8	59.7
EBITDA pre exceptionals (Segment result)	**2,001.7**	**2,000.3**	**856.1**	**658.6**
EBITDA margin pre exceptionals (in % of net sales)	28.9	30.2	25.5	24.6
Net operating assets	5,813.1	6,041.0	21,441.3	6,196.3
Segment liabilities	–2,479.0	–2,507.9	–909.6	–434.6
Investments in property, plant and equipment[2]	232.3	225.1	133.4	130.6
Investments in intangible assets[2]	145.9	114.1	8.2	6.5
Net cash flows from operating activities	1,682.8	2,287.3	706.2	580.0
Business free cash flow	1,581.0	1,701.2	675.6	419.0

[1] The composition of net sales has been changed, see "Changes to accounting and measurement principles and disclosure changes".
[2] According to the consolidated cash flow statement.

INFORMATION BY COUNTRY AND REGION

	Europe		thereof Germany		thereof Switzerland		North America	
€ million	**2015**	2014	**2015**	2014	**2015**	2014	**2015**	2014
Net sales by customer location[1]	4,102.7	4,016.7	850.8	845.5	159.6	149.3	2,722.9	2,152.3
Net sales by company location[1]	4,735.2	4,580.7	1,563.5	1,592.3	176.7	182.5	2,718.7	2,142.4
Intangible assets	8,427.6	7,966.3	595.2	448.9	4,235.6	4,151.4	15,959.7	2,522.5
Property, plant and equipment	2,401.2	2,163.1	1,104.2	1,032.8	527.5	498.2	1,027.0	416.2
Research and development costs	–1,509.7	–1,550.7	–835.0	–816.0	–529.6	–604.8	–123.5	–90.4
Number of employees	23,429	20,537	11,938	11,191	1,946	1,347	9,794	5,092

[1] The composition of net sales has been changed, see "Changes to accounting and measurement principles and disclosure changes".

Performance Materials		Corporate and Other		Group	
2015	2014	**2015**	2014	**2015**	2014
2,555.6	**2,059.8**	**–**	**–**	**12,844.7**	**11,362.8**
878.0	**611.5**	**–432.3**	**–245.1**	**1,843.2**	**1,762.0**
241.7	190.0	17.9	14.3	1,383.4	1,261.6
1.5	2.7	3.4	5.1	128.4	100.2
–0.8	–0.6	–	–0.3	–0.9	–0.9
1,120.4	**803.6**	**–411.0**	**–226.0**	**3,354.1**	**3,122.9**
11.7	91.2	50.9	60.0	275.7	264.8
1,132.1	**894.8**	**–360.1**	**–166.0**	**3,629.8**	**3,387.7**
44.3	43.4	–	–	28.3	29.8
4,278.6	3,348.6	112.4	126.1	31,645.4	15,712.0
–289.5	–355.4	–61.2	–56.5	–3,739.3	–3,354.4
102.9	91.5	45.3	33.6	513.9	480.9
9.7	7.5	15.3	15.2	179.1	143.3
1,138.9	900.4	–1,332.7	–1,062.2	2,195.2	2,705.5
930.8	699.6	–421.2	–214.7	2,766.2	2,605.1

thereof USA		Asia-Pacific		thereof China		Latin America		Middle East and Africa		Group	
2015	2014	**2015**	2014	**2015**	2014	**2015**	2014	**2015**	2014	**2015**	2014
2,566.5	2,009.9	4,240.8	3,442.9	1,104.7	805.7	1,265.3	1,285.1	513.0	465.8	12,844.7	11,362.8
2,586.7	2,022.3	4,014.4	3,266.3	668.7	472.3	1,238.1	1,256.5	138.3	116.9	12,844.7	11,362.8
15,959.6	2,522.3	940.7	904.0	52.2	54.3	5.0	2.4	6.0	0.3	25,339.0	11,395.5
1,025.0	415.1	443.4	314.8	123.7	58.1	93.0	88.4	44.5	7.9	4,009.1	2,990.4
–120.8	–88.7	–45.1	–37.8	–12.4	–7.0	–24.0	–20.7	–6.9	–4.1	–1,709.2	–1,703.7
9,629	4,939	11,096	9,488	2,619	2,172	4,352	3,883	942	639	49,613	39,639

(33) Information on segment reporting

Segmentation was performed in accordance with the organizational and reporting structure of the Group that applied during 2015.

The Healthcare business sector comprises the businesses with prescription and over-the-counter pharmaceuticals and biopharmaceuticals as well as allergy products. The Life Science business sector offers solutions to research and analytical laboratories in the pharmaceutical/biotechnology industry or in academic institutions, and customers manufacturing large- and small-molecule drugs. The Performance Materials business sector consists of the entire specialty chemicals business. The fields of activity of the individual segments are described in detail in the sections about the business sectors in the combined management report.

Corporate and Other includes income and expenses, assets and liabilities as well as cash flows that cannot be directly allocated to the reportable segments presented. This relates mainly to central Group functions. Moreover, the column serves the reconciliation to the Group numbers. The expenses and income as well as cash flows attributable to the financial result and income taxes are also presented under Corporate and Other.

Apart from sales, the success of a segment is mainly determined by EBITDA pre exceptionals (segment result) and business free cash flow. EBITDA pre exceptionals and business free cash flow are performance indicators not defined by International Financial Reporting Standards. However, they represent important variables used to steer the Group. To permit a better understanding of operational performance, EBITDA pre exceptionals excludes depreciation and amortization, impairment losses, and reversals of impairment losses as well as specific income and expenses of a one-time nature presented in the following. Among other things, business free cash flow is also used for internal target agreements.

Transfer prices for intragroup sales are determined on an arm's-length basis.

Neither in 2015 nor in 2014 did any single customer account for more than 10% of Group sales.

The following table presents the reconciliation of EBITDA pre exceptionals of all operating businesses to the profit before income tax of the Group:

€ million	2015	2014
Total EBITDA pre exceptionals of the operating businesses	**3,989.9**	**3,553.7**
Corporate and Other	–360.1	–166.0
EBITDA pre exceptionals of the Group	**3,629.8**	**3,387.7**
Depreciation and amortization/impairment losses/reversals of impairments	–1,510.9	–1,360.9
Exceptionals	–275.7	–264.8
Operating result (EBIT)	**1,843.2**	**1,762.0**
Financial result	–356.7	–205.0
Profit before income tax	**1,486.5**	**1,557.0**

Exceptionals comprised the following:

€ million	2015	2014
Acquisition-related exceptionals	–132.7	–85.0
Integration costs/IT costs	–77.6	–87.2
Restructuring costs	–47.5	–83.9
Gains/losses on the divestment of businesses	–2.0	1.9
Other exceptionals	–15.9	–10.6
Exceptionals before impairment losses/reversals of impairments	**–275.7**	**–264.8**
Impairment losses	–91.5	–9.8
Reversals of impairments	–	–
Exceptionals (total)	**–367.2**	**–274.6**

Exceptionals are included in the consolidated income statement under cost of sales as well as under other operating expenses. The costs of € 132.7 million reported under acquisition-related exceptionals (2014: € 85.0 million) were largely incurred in connection with the acquisition of the Sigma-Aldrich Corporation, USA. Of this amount, € 41.6 million was attributable to integration planning activities; further expenses of € 60.0 million were incurred directly for the acquisition of the company. Both amounts were recorded under other operating expenses. A further amount of € 31.1 million was related to cost of sales and disclosed accordingly.

Business free cash flow was determined as follows:

€ million	**2015**	2014
EBITDA pre exceptionals	**3,629.8**	**3,387.7**
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–609.0	–527.5
Changes in inventories as reported in the consolidated balance sheet	–960.1	–185.5
Changes in trade accounts receivable and receivables from royalties and licenses as reported in the consolidated balance sheet	–514.2	–214.2
Adjustment first-time consolidation of the Sigma-Aldrich Corporation	1,219.7	–
Adjustment first-time consolidation of AZ Electronic Materials S.A.	–	144.6
Business free cash flow	**2,766.2**	**2,605.1**

The reconciliation of operating assets presented in the Segment Reporting to the total assets of the Group was as follows:

€ million	**Dec. 31, 2015**	Dec. 31, 2014
Assets	38,007.2	26,010.1
Monetary assets (cash and cash equivalents, current financial assets, loans and securities)	–1,093.0	–5,563.1
Non-operating receivables, income tax receivables, deferred taxes and net defined benefit assets	–1,483.8	–1,380.6
Assets held for sale	–45.7	–
Operating assets (gross)	**35,384.7**	**19,066.4**
Trade accounts payable	–1,921.2	–1,539.4
Other operating liabilities	–1,818.1	–1,815.0
Segment liabilities	**–3,739.3**	**–3,354.4**
Operating assets (net)	**31,645.4**	**15,712.0**

The following tables present the adjustments to the previous year's figures of the three business sectors owing to disclosure changes to royalty, license and commission expenses as well as royalty, license and commission income (see Note [6] "Changes to accounting and measurement principles and disclosure changes").

HEALTHCARE

2014 Adjustment

€ million	2014 old structure	2014 adjustment	2014 adjusted
Net sales	**6,549.4**	**71.2**	**6,620.5**
Royalty, license and commission income	194.4	–194.4	–
Total revenues	**6,743.8**	**–**	**–**
Cost of sales	–1,370.4	–0.1	–1,370.5
(of which: amortization of intangible assets)[1]	*(–)*	*(–)*	*(–)*
Gross profit	**5,373.4**	**–123.3**	**5,250.0**
Marketing and selling expenses	–2,083.3	–467.5	–2,550.8
(of which: amortization of intangible assets)[1]	*(–555.4)*	*(–)*	*(–555.4)*
Royalty, license and commission expenses	–520.9	520.9	–
Administration expenses	–246.9	–	–246.9
Research and development costs	–1,366.0	–	–1,366.0
(of which: amortization of intangible assets)[1]	*(–1.0)*	*(–)*	*(–1.0)*
Other operating income	324.6	123.2	447.8
Other operating expenses	–374.4	–53.3	–427.7
Operating result (EBIT)	**1,106.4**	**–**	**1,106.4**
Margin (% of net sales)	16.9	–0.2	16.7
EBITDA	**1,946.4**	**–**	**1,946.4**
Margin (% of net sales)	29.7	–0.3	29.4
EBITDA pre exceptionals	**2,000.3**	**–**	**2,000.3**
Margin (% of net sales)	30.5	–0.3	30.2

[1] Excluding amortization of internally generated or separately acquired software.

LIFE SCIENCE

2014 Adjustment

€ million	2014 old structure	2014 adjustment	2014 adjusted
Net sales	**2,682.5**	**–**	**2,682.5**
Royalty, license and commission income	14.0	–14.0	–
Total revenues	**2,696.5**	**–**	**–**
Cost of sales	–1,168.7	–	–1,168.7
(of which: amortization of intangible assets)[1]	*(–47.6)*	*(–)*	*(–47.6)*
Gross profit	**1,527.8**	**–14.1**	**1,513.8**
Marketing and selling expenses	–844.1	–15.6	–859.8
(of which: amortization of intangible assets)[1]	*(–151.8)*	*(–)*	*(–151.8)*
Royalty, license and commission expenses	–15.6	15.6	–
Administration expenses	–110.4	–	–110.4
Research and development costs	–162.6	–	–162.6
(of which: amortization of intangible assets)[1]	*(–)*	*(–)*	*(–)*
Other operating income	11.5	14.1	25.6
Other operating expenses	–117.4	–	–117.4
Operating result (EBIT)	**289.2**	**–**	**289.2**
Margin (% of net sales)	10.8	–	10.8
EBITDA	**598.9**	**–**	**598.9**
Margin (% of net sales)	22.3	–	22.3
EBITDA pre exceptionals	**658.6**	**–**	**658.6**
Margin (% of net sales)	24.6	–	24.6

[1] Excluding amortization of internally generated or separately acquired software.

PERFORMANCE MATERIALS

2014 Adjustment

€ million	2014 old structure	2014 adjustment	2014 adjusted
Net sales	**2,059.6**	**0.2**	**2,059.8**
Royalty, license and commission income	0.9	–0.9	–
Total revenues	**2,060.5**	**–**	**–**
Cost of sales	–983.2	–	–983.2
(of which: amortization of intangible assets)[1]	*(–46.4)*	*(–)*	*(–46.4)*
Gross profit	**1,077.3**	**–0.6**	**1,076.6**
Marketing and selling expenses	–177.8	–1.1	–178.8
(of which: amortization of intangible assets)[1]	*(–11.7)*	*(–)*	*(–11.7)*
Royalty, license and commission expenses	–1.1	1.1	–
Administration expenses	–56.1	–	–56.1
Research and development costs	–170.6	–	–170.6
(of which: amortization of intangible assets)[1]	*(–2.8)*	*(–)*	*(–2.8)*
Other operating income	6.4	0.6	7.0
Other operating expenses	–66.6	–	–66.6
Operating result (EBIT)	**611.5**	**–**	**611.5**
Margin (% of net sales)	29.7	–	29.7
EBITDA	**803.6**	**–**	**803.6**
Margin (% of net sales)	39.0	–	39.0
EBITDA pre exceptionals	**894.8**	**–**	**894.8**
Margin (% of net sales)	43.4	–	43.4

[1] Excluding amortization of internally generated or separately acquired software.

Notes to the Consolidated Cash Flow Statement

The consolidated cash flow statement presents the changes in cash and cash equivalents as a result of cash inflows and outflows from operating, investing and financing activities. Further information on cash flows can be found in the explanation of cash and cash equivalents (see Note [24] "Cash and cash equivalents"). The amount of undrawn borrowing facilities that could be tapped for future operating activities and to meet obligations is disclosed in Note [28] "Financial liabilities/Capital management".

The cash flows reported by Group companies in non-functional currencies are in principle translated at average exchange rates. Cash and cash equivalents are translated at the closing rates. The impact of foreign exchange rate changes is disclosed separately under changes in cash and cash equivalents.

Within net cash flows from operating activities, the figures for 2014 were adjusted in connection with the disclosure changes to license receivables (see Note [6] "Changes to accounting and measurement principles and disclosure changes").

(34) Net cash flows from operating activities

In 2015, tax payments totaled € 865.5 million (2014: € 667.8 million). Tax refunds totaled € 161.0 million (2014: € 54.9 million). Interest paid totaled € 297.4 million (2014: € 191.1 million). Interest received amounted to € 54.5 million (2014: € 89.4 million).

In 2014, the changes in provisions were affected by the payment following the written settlement reached with Israel Bio-Engineering Project Limited Partnership (IBEP). In 2014, the changes in other assets and liabilities included the upfront payment in the amount of US$ 850 million (€ 678.3 million) paid in cash by Pfizer Inc., USA, after the agreement had been entered into. The non-cash income from the pro rata reversal of the deferred item from the collaboration agreement with Pfizer was corrected in the reporting period.

Net cash flows from operating activities include € 5.6 million from discontinued operations. This amount relates to the operating result of those business activities of the Sigma-Aldrich Corporation, USA, that were acquired with a view to resale (see Note [4] "Acquisitions, assets held for sale and disposal groups".

(35) Net cash flows from investing activities and financing activities

The payments for the major acquisitions in fiscal 2015 were as follows:

€ million	Sigma-Aldrich	Other Acquisitions	Total
Purchase price payment	–15,973.8	–	–15,973.8
Cash income from hedges in fiscal 2014 and 2015	1,380.3	–	1,380.3
Purchase price in accordance with IFRS 3	–14,593.5	–29.3	–14,622.8
Acquired cash and cash equivalents	1,235.1	0.8	1,235.9
Purchase price in accordance with IFRS 3 less acquired cash and cash equivalents	**–13,358.4**	**–28.5**	**–13,386.9**
Thereof: cash income from hedges already received in fiscal 2014	*–95.4*	–	*–95.4*
Payments for acquisitions less acquired cash and cash equivalents as reported in the consolidated cash flow statement in 2015	**–13,453.8**	**–28.5**	**–13,482.3**

In 2014, a hedging gain of € 95.4 million in connection with the acquisition of the Sigma-Aldrich Corporation, USA, had already been reclassified from other comprehensive income to financial assets. Consequently, the payment for 100% of the shares less acquired cash and cash equivalents totaled € 13,453.8 million for 2014 and 2015. The figures for 2014 reflected the acquisition of AZ Electronic Materials S.A., Luxembourg, in the amount of € 1,419.3 million.

Net cash outflows from investments in current and non-current assets amounting to € 1,740.8 million (2014: € 3,143.3 million) mainly resulted from the purchase of short-term investments in securities not classified as cash and cash equivalents.

Cash inflows from investing activities include € 84.4 million from discontinued operations in relation to those business activities of Sigma-Aldrich that were acquired with a view to resale (see Note [4] “Acquisitions, assets held for sale and disposal groups”).

The cash flows from financing activities included the payments from new borrowings and the repayment of bonds as well as the repayment of the bond acquired in the context of the Sigma-Aldrich acquisition with a nominal volume of US$ 300 million. Further information on the bonds can be found in Note [28] “Financial liabilities/Capital management”.

Other Disclosures

(36) Derivative financial instruments

The Group uses derivative financial instruments (hereinafter "derivatives") to hedge and reduce risks from currency and interest rate positions. The Group uses marketable forward exchange contracts, options and interest rate swaps as hedging instruments. Depending on the nature of the hedged item, changes in the fair values of derivatives are recorded in the consolidated income statement either in the operating result or in the financial result. The strategy to hedge interest rate and foreign exchange rate fluctuations arising from forecast transactions and transactions already recognized in the balance sheet is set by a Group risk committee, which meets on a regular basis. Extensive guidelines regulate the use of derivatives. There is a ban on speculation. Derivative transactions are subject to continuous risk management procedures. Trading, settlement and control functions are strictly separated. Derivatives are only entered into with banks that have a good credit rating. Related default risks are continuously monitored.

The following derivatives were held as of the balance sheet date:

	Nominal volume		Fair value	
€ million	**Dec. 31, 2015**	Dec. 31, 2014	**Dec. 31, 2015**	Dec. 31, 2014
Cash flow hedge	2,161.0	10,041.8	–90.3	313.4
Interest	–	650.0	–	–99.9
Currency	2,161.0	9,391.8	–90.3	413.3
Fair value hedge	–	–	–	–
Interest	–	–	–	–
Currency	–	–	–	–
No hedge accounting	5,468.1	3,682.6	–103.1	9.4
Interest	1,100.0	–	–99.3	–
Currency	4,368.1	3,682.6	–3.8	9.4
	7,629.1	**13,724.4**	**–193.4**	**322.8**

Cash flow hedges include currency hedges in a nominal volume of € 1,386.6 million (2014: € 8,913.1 million) with a remaining term of up to one year and hedges in a nominal volume of € 774.4 million (2014: € 478.7 million) with a remaining term of more than one year. Of the interest rate hedges held in the prior year in the context of cash flow hedges in a total amount of € 650.0 million, € 100.0 million had a remaining term of up to one year and € 550.0 million had a remaining term of more than one year.

The nominal volume corresponds to the total of all nominal values of currency hedges (translated at the closing rate into euros) as well as all the nominal values of interest rate hedges.

The fair value results from the actuarial valuation of the derivatives on the basis of quoted prices or current market data as of the balance sheet date provided by a recognized information service and the application of a discount for own credit risk or counterparty credit risk. Any offsetting effects from hedged items are not taken into account in the derivatives' fair value.

The maturities of the derivatives (nominal volume) were as follows as of the balance sheet date:

€ million	**Remaining maturity less than 1 year**	**Remaining maturity more than 1 year**	**Total Dec. 31, 2015**	Remaining maturity less than 1 year	Remaining maturity more than 1 year	Total Dec. 31, 2014
Forward exchange contracts	5,714.5	765.2	6,479.7	11,942.6	433.9	12,376.5
Currency options	40.2	9.2	49.4	653.1	44.8	697.9
Interest rate swaps	–	1,100.0	1,100.0	100.0	550.0	650.0
	5,754.7	**1,874.4**	**7,629.1**	**12,695.7**	**1,028.7**	**13,724.4**

Currency hedging serves to economically protect the company from the foreign exchange risks of the following types of transaction:

- Forecast transactions in non-functional currency, the expected probability of which is very high for the next 36 months,
- Off-balance sheet firm purchase commitments of the next 36 months in non-functional currency,
- Intragroup financing in non-functional currency as well as
- Receivables and liabilities in non-functional currency

Exchange rate fluctuations of mainly the following currencies against the euro were hedged:

Nominal volume € million	**Dec. 31, 2015**	Dec. 31, 2014
USD	3,673.8	10,233.5
CNY	480.2	–
JPY	458.3	920.8
CHF	401.9	431.2
TWD	343.2	255.5
GBP	311.6	383.6

Forecast transactions and firm purchase commitments in non-functional currency are hedged using forward exchange contracts and currency options which are due within the next 36 months. Overall, forecast transactions and firm purchase commitments in non-functional currency were hedged in the amount of € 1,920.8 million (2014: € 9,044.6 million). In 2014, a major portion related to the hedging of the U.S. dollar-denominated purchase price payment made for the acquisition of the Sigma-Aldrich Corporation, USA in 2015. The nominal amount of the forward exchange and currency option contracts for this purpose was US$ 9,900 million (€ 7,689 million). Based on the translation of the purchase price into euros at the exchange rate on the acquisition date, the hedge lowered the purchase price by € 1,380.3 billion.

All hedging transactions for forecast transactions and firm purchase commitments in non-functional currency represent cash flow hedges.

Intragroup financing as well as receivables and payables in non-functional currency are hedged exclusively using forward exchange contracts. Overall, balance sheet items amounting to € 4,608.3 million (2014: € 4,029.8 million) were hedged. In this context, the hedging transactions are largely purely economic hedges for which hedge accounting is not applied.

To fix the interest rate level of a bond issued in August 2015 for refinancing purposes with a volume of € 550 million, in 2012 and 2013 forward starting payer interest rate swaps were entered into with a nominal volume of € 550.0 million and interest payments from 2015 to 2022. Up until May 2015, these interest hedging relationships represented cash flow hedges. With entry into offsetting transactions in May 2015, the hedging relationship was terminated voluntarily. The original transactions as well as the offsetting transactions are now classified as “held for trading”. The changes in fair value are reflected in the income statement.

In 2015, the ineffective portion from hedge accounting amounted to € –2.6 million. In the previous year, there was no ineffectiveness.

(37) Management of financial risks

Market fluctuations with respect to foreign exchange and interest rates represent significant profit and cash flow risks for the Group. The Group aggregates these Group-wide risks and steers them centrally also by using derivatives. The Group uses scenario analyses to estimate existing risks of foreign exchange and interest rate fluctuations. The Group is not subject to any material risk concentration from financial transactions. The Report on Risks and Opportunities included in the combined management report provides further information on the management of financial risks.

Foreign exchange risks

Owing to its international business focus, the Group is exposed to foreign exchange-related transaction risks within the scope of both ordinary business and financing activities. Different strategies are used to limit or eliminate these risks. Foreign exchange risks from transactions already recognized on the balance sheet are eliminated as far as possible through the use of forward exchange contracts. Foreign exchange risks arising from forecast transactions are analyzed regularly and reduced if necessary through forward exchange contracts or currency options by applying the hedge accounting rules.

The Group is exposed to currency translation risks since many companies of the Group are located outside the eurozone. The financial statements of these companies are translated into euros. Exchange differences resulting from currency translation of the assets and liabilities of these companies are recognized in equity. These effects are not taken into consideration in the following tables.

The following table presents the net exposure of the Group in relation to exchange rate fluctuations of the major currencies against the euro:

€ million	CHF	CNY	JPY	TWD	USD
Net exposure Dec. 31, 2015	–265.3	202.9	135.0	214.7	1,406.9
Net exposure Dec. 31, 2014	–246.6	355.8	121.6	260.0	753.0

The net exposure by currency consists of the following components:

- Balance sheet items in the respective currency to the extent that these do not correspond to the functional currency of a company, as well as the derivative items used for hedging. Normally, balance sheet items not in functional currency are economically hedged in full.
- Planned cash flows in the next 12 months in the respective currency as well as
- Derivatives to hedge these planned cash flows. Usually, the hedging ratio is 30% – 70%.

The following table shows the effects of exchange rate movements of the key currencies against the euro in relation to the net income and equity of the Group on the balance sheet date. The effects of planned cash flows of the next 12 months are not taken into consideration here. By contrast, the effects of cash flow hedges are taken into consideration in the equity of the Group and are included in the following table.

€ million Dec. 31, 2015		CHF	CNY	JPY	TWD	USD
Exchange rate +10% (Appreciation vs. €)	Consolidated income statement	0.0	0.0	0.0	0.0	0.0
	Equity	12.0	–15.4	–15.3	–20.5	–108.7
Exchange rate –10% (Depreciation vs. €)	Consolidated income statement	0.0	0.0	0.0	0.0	0.0
	Equity	–14.7	18.9	16.9	25.1	132.9

€ million Dec. 31, 2014		CHF	CNY	JPY	TWD	USD
Exchange rate +10% (Appreciation vs. €)	Consolidated income statement	0.0	0.0	0.1	0.0	0.0
	Equity	0.0	0.0	–14.2	–10.8	844.1
Exchange rate –10% (Depreciation vs. €)	Consolidated income statement	0.0	0.0	32.1	0.0	0.0
	Equity	0.0	0.0	9.2	9.1	–681.7

Interest rate risks

The Group's exposure to interest rate changes comprises the following:

€ million	Dec. 31, 2015	Dec. 31, 2014
Short-term or variable interest rate monetary deposits	1,059.2	5,131.9
Short-term or variable interest rate monetary borrowings	–5,799.7	–2,169.0
Net interest rate exposure	**–4,740.5**	**2,962.9**

The effects of a parallel shift in the yield curve by +100 or –100 basis points on the consolidated income statement as well as on equity relative to all current or variable interest rate balance sheet items, all securities classified as "available for sale" as well as all derivatives are presented in the following table.

€ million	2015		2014	
Change in market interest rate	+100 basis points	–100 basis points	+100 basis points	–100 basis points
Effects on consolidated income statement	–47.4	23.4	21.3	–1.3
Effects on equity	0.0	0.0	40.5	–22.9

The scenario calculations here assumed that for material variable interest-bearing loan agreements, the risk-free interest rate component (EURIBOR) cannot fall below 0%.

Changes in market interest rates did not have effects on equity since an interest rate hedge for a bond issued in August 2015 for refinancing purposes was voluntarily terminated in the reporting period with the entry into an offsetting transaction. Additionally, the level of interest-bearing securities declined significantly in comparison with 2014 and was immaterial as of the balance sheet date.

Share price risks

The shares in publicly listed companies amounting to € 15.6 million (2014: € 1.3 million) are generally exposed to a risk of fluctuations in fair value. A 10% change in the value of the stock market would impact equity by € 1.6 million (2014: € 0.1 million). This change in value would initially be recognized in equity and then in profit or loss at the time of disposal.

Liquidity risks

The liquidity risk, meaning the risk that the Group cannot meet its payment obligations resulting from financial liabilities, is limited by establishing the required financial flexibility and by effective cash management. Information on bonds issued by the Group and other sources of financing can be found in Note [28] "Financial liabilities / Capital management". Liquidity risks are monitored and reported to management on a regular basis.

Trade payables amounting to € 1,921.2 million (2014: € 1,539.4 million) had a remaining term of less than one year.

The following tables present the contractual cash flows such as repayments and interest on financial liabilities and derivative financial instruments with a negative fair value:

		Cash flows < 1 year		Cash flows 1–5 years		Cash flows > 5 years	
€ million Dec. 31, 2015	**Carrying amount**	**Interest**	**Repayment**	**Interest**	**Repayment**	**Interest**	**Repayment**
Bonds and commercial paper	9,851.4	236.8	1,272.1	852.0	4,200.8	400.7	4,428.6
Liabilities to banks	3,006.0	18.8	2,135.4	13.0	619.2	1.7	250.0
Liabilities to related parties	577.8	0.2	577.8	–	–	–	–
Loans from third parties and other financial liabilities	89.2	5.7	26.6	10.6	59.5	–	3.1
Liabilities from derivatives (financial transactions)	183.7	17.3	79.9	65.2	–	26.0	–
Financing leasing liabilities	4.8	0.2	2.0	0.1	2.8	–	–
	13,712.9	**279.0**	**4,093.8**	**940.9**	**4,882.3**	**428.4**	**4,681.7**

		Cash flows < 1 year		Cash flows 1–5 years		Cash flows > 5 years	
€ million Dec. 31, 2014	**Carrying amount**	**Interest**	**Repayment**	**Interest**	**Repayment**	**Interest**	**Repayment**
Bonds and commercial paper	4,624.2	170.9	1,450.0	442.3	342.1	197.6	2,850.0
Liabilities to banks	267.4	5.1	67.4	2.8	200.0	–	–
Liabilities to related parties	501.4	1.6	501.4	–	–	–	–
Loans from third parties and other financial liabilities	84.5	5.8	18.6	11.8	61.6	–	4.3
Liabilities from derivatives (financial transactions)	153.0	2.5	36.0	63.7	17.3	40.7	–
Financing leasing liabilities	6.5	0.2	2.8	0.2	3.7	–	–
	5,637.0	**186.1**	**2,076.2**	**520.8**	**624.7**	**238.3**	**2,854.3**

Credit risks

The Group is only subject to a relatively low credit risk. On the one hand, financial contracts are only entered into with banks and industrial companies with good credit ratings, and on the other hand, the broad-based business structure with a large number of different customers results in a diversification of credit risks within the Group. The credit risk from financial contracts is monitored daily on the basis of rating information as well as market information on credit default swap rates.

The credit risk with customers is monitored using established credit management processes that take the individual customer risks into account. This is done in particular by continuously analyzing the age structure of trade accounts receivable. The Group continuously reviews and monitors open positions of all trading partners in the affected countries and takes risk- mitigating measures if necessary. If there is objective evidence that particular accounts receivable are fully or partially impaired, respective impairment losses are recognized to provide for credit defaults. On the balance sheet date, the theoretically maximum default risk corresponded to the net carrying amounts less any compensation from credit insurance.

There were no indications of impairment for financial assets neither past due nor impaired on the balance sheet date.

(38) Other disclosures on financial instruments

The following table presents the reconciliation of the balance sheet items to categories of financial instruments pursuant to the disclosures required by IFRS 7 and provides information on the measurement of fair value:

		Subsequent measurement according to IAS 39				
€ million	**Carrying amount Dec. 31, 2015**	Amortized cost	At cost	Fair value	Carrying amount according to IAS 17	Non-financial items
Assets						
Cash and cash equivalents	832.2	832.2	–	–	–	–
Current financial assets	227.0	32.7	–	194.3	–	–
Held for trading (non-derivatives)	–	–	–	–	–	–
Derivatives without a hedging relationship	32.7	–	–	32.7	–	–
Held to maturity	29.8	29.8	–	–	–	–
Loans and receivables	2.9	2.9	–	–	–	–
Available for sale	161.6	–	–	161.6	–	–
Derivatives with a hedging relationship	–	–	–	–	–	–
Trade accounts receivable[1]	2,738.3	2,738.3	–	–	–	–
Loans and receivables[1]	2,738.3	2,738.3	–	–	–	–
Other current and non-current other assets[1]	624.0	155.1	–	13.8	–	455.1
Derivatives without a hedging relationship	1.6	–	–	1.6	–	–
Loans and receivables[1]	155.1	155.1	–	–	–	–
Derivatives with a hedging relationship	12.2	–	–	12.2	–	–
Non-financial items	455.1	–	–	–	–	455.1
Non-current financial assets	131.5	16.5	82.0	33.0	–	–
Derivatives without a hedging relationship	4.6	–	–	4.6	–	–
Held to maturity	–	–	–	–	–	–
Loans and receivables	16.5	16.5	–	–	–	–
Available for sale[1]	110.4	–	82.0	28.4	–	–
Derivatives with a hedging relationship	–	–	–	–	–	–
Liabilities						
Current and non-current financial liabilities	13,712.9	13,524.4	–	183.7	4.8	–
Derivatives without a hedging relationship	138.5	–	–	138.5	–	–
Other liabilities	13,524.4	13,524.4	–	–	–	–
Derivatives with a hedging relationship	45.2	–	–	45.2	–	–
Finance lease liabilities	4.8	–	–	–	4.8	–
Trade accounts payable	1,921.2	1,921.2	–	–	–	–
Other liabilities	1,921.2	1,921.2	–	–	–	–
Current and non-current other liabilities	2,427.0	904.3	–	60.8	–	1,461.9
Derivatives without a hedging relationship	3.5	–	–	3.5	–	–
Other liabilities	904.3	904.3	–	–	–	–
Derivatives with a hedging relationship	57.3	–	–	57.3	–	–
Non-financial items	1,461.9	–	–	–	–	1,461.9

[1] Some of the figures as of Dec. 31, 2014 have been adjusted.

		Subsequent measurement according to IAS 39					
Fair value, Dec. 31, 2015	Carrying amount Dec. 31, 2014	Amortized cost	At cost	Fair value	Carrying amount according to IAS 17	Non-financial items	Fair value Dec. 31, 2014
832.2	2,878.5	2,878.5	–	–	–	–	2,878.5
	2,199.4	24.6	–	2,174.8	–	–	
–	–	–	–	–	–	–	–
32.7	39.8	–	–	39.8	–	–	39.8
29.8	21.7	21.7	–	–	–	–	21.7
2.9	2.9	2.9	–	–	–	–	2.9
161.6	2,135.0	–	–	2,135.0	–	–	2,135.0
–	–	–	–	–	–	–	–
	2,219.5	2,219.5	–	–	–	–	
2,738.3	2,219.5	2,219.5	–	–	–	–	2,219.5
	1,282.8	168.5	–	471.4	–	642.9	
1.6	0.7	–	–	0.7	–	–	0.7
155.1	168.5	168.5	–	–	–	–	168.5
12.2	470.7	–	–	470.7	–	–	470.7
	642.9	–	–	–	–	642.9	
	94.4	13.7	66.9	13.8	–	–	
4.6	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
16.5	13.7	13.7	–	–	–	–	13.7
28.4	80.7	–	66.9	13.8	–	–	13.8
–	–	–	–	–	–	–	–
	5,637.0	5,477.5	–	153.0	6.5	–	
138.5	25.4	–	–	25.4	–	–	25.4
13,705.5	5,477.5	5,477.5	–	–	–	–	5,835.6
45.2	127.6	–	–	127.6	–	–	127.6
4.8	6.5	–	–	–	6.5	–	6.5
	1,539.4	1,539.4	–	–	–	–	
1,921.2	1,539.4	1,539.4	–	–	–	–	1,539.4
	2,356.6	696.1	–	35.4	–	1,625.1	
3.5	5.7	–	–	5.7	–	–	5.7
904.3	696.1	696.1	–	–	–	–	696.1
57.3	29.7	–	–	29.7	–	–	29.7
	1,625.1	–	–	–	–	1,625.1	

Net gains and losses on financial instruments mainly include measurement results from currency translation, fair value adjustments, impairments and reversals of impairments, disposal gains/losses as well as the recognition of premiums and discounts. Dividends and interest are not recognized in the net gains and losses on financial instruments, except for dividends and interest in the category "held for trading". In the Group, the category "held for trading" only includes derivatives not in a hedging relationship.

The net gains or losses on financial instruments by category were as follows:

		Net gains or losses			
€ million 2015	**Interest**	**Impairments**	**Reversals of impairment**	**Fair value adjustments**	**Disposal gains/losses**
Financial instrument of the category					
Held for trading	–	–	–	–14.9	–
Held to maturity	2.7	–	–	–	–
Loans and receivables	18.4	–84.1	40.2	–	–
Available-for-sale	10.9	–	7.2	–	17.5
Other liabilities	–314.1	–	–	–	–

		Net gains or losses			
€ million 2014	Interest	Impairments	Reversals of impairment	Fair value adjustments	Disposal gains/losses
Financial instrument of the category					
Held for trading	–	–	–	–90.8	–
Held to maturity	1.4	–	–	–	–
Loans and receivables	18.2	–41.9	41.8	–	–
Available-for-sale	10.0	–4.4	–	–	0.2
Other liabilities	–141.4	–	–	–	–

In 2015, foreign exchange losses of € –48.8 million resulting from receivables and payables in operating business, their economic hedging, as well as hedging of forecast transactions in operating business were recorded (2014: gains of € 53.3 million). Foreign exchange losses of € –39.9 million resulting from financial balance sheet items, their economic hedging as well as fair value fluctuations of option contracts to hedge forecast transactions were recorded (2014: losses of € –13.0 million).

The fair value of financial assets and liabilities is based on the official market prices and market values quoted on the balance sheet date (Level 1 assets and liabilities) as well as mathematical calculation models with inputs observable in the market on the balance sheet date (Level 2 assets and liabilities). Level 1 assets comprise stocks and bonds and are classified as "available-for-sale", Level 1 liabilities comprise issued bonds and are classified as "other liabilities". Level 2 assets and liabilities are primarily liabilities to banks classified as "other liabilities", interest-bearing securities classified as "available-for-sale" as well as derivatives with and without hedging relationships. The fair value of interest-bearing securities as well as of the liabilities classified as "other liabilities" is determined by discounting future cash flows using market interest rates. The calculation of the fair value of forward exchange contracts and currency options uses market spot and forward rates as well as foreign exchange volatilities applying recognized mathematical principles. The fair value of interest rate swaps is determined with standard market valuation models using interest rate curves available in the market.

Level 3 assets comprise investments in equity instruments classified as "available-for-sale". These relate to non-controlling interests in a partnership. The fair value of these interests was determined through an internally performed valuation using the discounted cash flow method. Expected future cash flows based on the company's latest medium-term planning were taken into account. The planning relates to a period of five years. Cash flows for periods beyond this are included by calculating the terminal value using a long-term growth rate of 0.5%. The discount rate used (after tax) was 7.0%.

Level 3 liabilities consist of contingent purchase price components from the acquisition of Qlight Nanotech Ltd., Israel. These are reported as "other liabilities" and amounted to € 0.9 million as of the balance sheet date.

Counterparty credit risk is taken into consideration for all valuations. In the case of non-derivative financial instruments, such as other liabilities or interest-bearing securities, this is reflected using risk-adequate premiums on the discount rate, while discounts on market value (so-called credit valuation adjustments and debit valuation adjustments) are used for derivatives.

The fair value of available-for-sale investments in equity instruments with a carrying amount of € 82.0 million (2014: € 66.9 million) could not be reliably determined since there is no quoted price for an identical instrument in an active market and it is not possible to make a reliable estimate of fair value. They were measured at cost. Financial investments primarily include equity investments in various companies. There is currently no intention to sell these financial instruments. The Group has no information on a market for these financial instruments.

The financial instruments recognized for at fair value in the balance sheet and the additionally disclosed fair values for financial instruments were determined as follows:

€ million

Dec. 31, 2015	Assets	Liabilities
Fair value determined by official prices and quoted market values (Level 1)	**178.1**	**9,021.8**
thereof available-for-sale	178.1	–
thereof other liabilities	–	9,021.8
Fair value determined using inputs observable in the market (Level 2)	**51.1**	**4,928.2**
thereof available-for-sale	–	–
thereof derivatives with a hedging relationship	12.2	102.5
thereof derivatives without a hedging relationship	38.9	142.0
thereof other liabilities	–	4,683.7
Fair value determined using inputs unobservable in the market (Level 3)	**11.9**	**0.9**
thereof available-for-sale	11.9	–
thereof other liabilities	–	0.9

€ million

Dec. 31, 2014	Assets	Liabilities
Fair value determined by official prices and quoted market values (Level 1)	**1,178.6**	**4,970.2**
thereof available-for-sale	1,178.6	–
thereof other liabilities	–	4,970.2
Fair value determined using inputs observable in the market (Level 2)	**1,470.1**	**1,053.8**
thereof available-for-sale	958.9	–
thereof derivatives with a hedging relationship	470.7	157.3
thereof derivatives without a hedging relationship	40.5	31.1
thereof other liabilities	–	865.4
Fair value determined using inputs unobservable in the market (Level 3)	**11.3**	**–**
thereof available-for-sale	11.3	–

The changes in financial assets allocated to Level 3 and measured at fair value were as follows:

€ million	**2015**	2014
Net book values as of January 1	**11.3**	**–**
Additions due to acquisitions	–0.9	10.8
Transfers into Level 3 out of Level 1/Level 2	–	–
Fair value changes		
Gains (+)/losses (–) recognized in consolidated income statement	–	–
Gains (+)/losses (–) recognized in consolidated statement of comprehensive income	0.6	0.5
Sales	–	–
Transfers out of Level 3 into Level 1/Level 2	–	–
Net book values as of December 31	**11.0**	**11.3**

Gains and losses from Level 3 assets are reported in other comprehensive income in the consolidated statement of comprehensive income under the item "fair value adjustments" related to "available-for-sale financial assets". If the discount rate used for the determination of the fair value of the non-controlling interests in a partnership had been one percentage point higher, other comprehensive income would have decreased by € 2.3 million. By contrast, a decline in the discount rate by one percentage point would have increased other comprehensive income by € 3.1 million.

Balance sheet netting is not possible. From an economic perspective, netting is only possible for derivatives. This possibility results from the framework agreements on derivatives trading which the Group enters into with commercial banks. The Group does not offset financial assets and financial liabilities in its balance sheet.

The following table presents the potential netting volume of the reported derivative financial assets and liabilities:

				Potential netting volume		
€ million Dec. 31, 2015	**Gross presentation**	**Netting**	**Net presentation**	**due to master netting agreements**	**due to financial collateral**	**Potential net amount**
Derivative financial assets	51.1	–	51.1	45.7	–	5.4
Derivative financial liabilities	–244.5	–	–244.5	–45.7	–	–198.8

				Potential netting volume		
€ million Dec. 31, 2014	Gross presentation	Netting	Net presentation	due to master netting agreements	due to financial collateral	Potential net amount
Derivative financial assets	511.2	–	511.2	70.5	–	440.7
Derivative financial liabilities	–188.4	–	–188.4	–70.5	–	–117.9

(39) Contingent liabilities

€ million	Dec. 31, 2015	thereof affiliates	Dec. 31, 2014	thereof affiliates
Contingent liabilities from legal disputes and tax matters	64.0	–	54.3	–
Guarantees	0.8	–	17.1	–
Warranties	0.2	–	0.5	–

Contingent liabilities from legal disputes included potential obligations, for which the probability of an outflow of resources did not suffice to recognize a provision as of the balance sheet date. These mainly related to obligations under civil law as well as under antitrust and environmental law. The potential civil law obligations primarily related to potential liabilities to pay damages due to a legal dispute under antitrust law. It was possible that the Group would be subject to claims for compensation for damages asserted by health insurance companies due to excessively high drug prices in case of a valid judgment under antitrust law.

Contingent liabilities pertaining to tax matters included various non-German income and non-income related tax matters that mainly related to intragroup business transfers as well as legal disputes attributable to the determination of earnings under tax law, customs regulations and transfer pricing adjustments.

(40) Other financial obligations

Other financial obligations comprised the following:

€ million	Dec. 31, 2015	thereof affiliates	Dec. 31, 2014	thereof affiliates
Obligation to purchase the entire share capital of Sigma-Aldrich Corporation	–	–	13,975.0	–
Obligations to acquire intangible assets and to pay due to collaboration agreements	3,021.2	–	2,897.6	–
Obligations to acquire property, plant and equipment	108.8	–	55.3	–
Future operating lease payments	343.7	–	199.7	–
Long-term purchase commitments	383.6	–	138.4	–
Other financial obligations	34.7	–	30.8	–
	3,892.0	**–**	**17,296.8**	**–**

In connection with the offer to acquire the Sigma-Aldrich Corporation, USA, which was announced by the Group on September 22, 2014, a contingent financial obligation amounting to € 13,975.0 million (US$ 16,985.2 million; based on the exchange rate on December 31, 2014) existed in 2014 to acquire the entire share capital of Sigma-Aldrich for a cash consideration.

Since the acquisition of Sigma-Aldrich was successfully completed on November 18, 2015, the obligation no longer existed on December 31, 2015.

Obligations to acquire intangible assets existed in particular owing to conditional purchase price components and within the scope of research and development collaborations. Here the Group has obligations to make milestone payments when certain objectives are reached. In the unlikely event that all contract partners achieve all milestones, the Group would be obligated to pay up to € 1,543.8 million (2014: € 1,494.8 million) for the acquisition of intangible assets.

Moreover, within the scope of collaboration agreements, individual research and development or commercialization budgets were contractually set upon the basis of which collaboration partners can commit the Group to make payments in the amount of up to € 1,447.4 million (2014: € 1,402.8 million).

The expected maturities of these obligations were as follows:

€ million	Dec. 31, 2015	Dec. 31, 2014
Obligations to acquire intangible assets and to pay due to collaboration agreements		
within one year	258.3	135.2
in 1–5 years	1,218.7	1,081.3
more than 5 years	1,544.2	1,681.1
	3,021.2	**2,897.6**

Other financial obligations were recognized at nominal value.

The maturities of liabilities from lease agreements were as follows:

€ million Dec. 31, 2015	within 1 year	1–5 years	more than 5 years	Total
Present value of future payments from finance leases	2.0	2.8	–	4.8
Interest component of finance leases	0.2	0.1	–	0.3
Future finance lease payments	**2.2**	**2.9**	**–**	**5.1**
Future operating lease payments	**98.5**	**207.2**	**38.0**	**343.7**

€ million Dec. 31, 2014	within 1 year	1–5 years	more than 5 years	Total
Present value of future payments from finance leases	2.8	3.7	–	6.5
Interest component of finance leases	0.2	0.2	–	0.4
Future finance lease payments	**3.0**	**3.9**	**–**	**6.9**
Future operating lease payments	**83.7**	**108.7**	**7.3**	**199.7**

Operating leasing agreements related mainly to leasing arrangements to lease real estate, company fleet vehicles as well as operating and office equipment. The payments resulting from operating leasing agreements amounted to € 112.5 million (2014: € 91.8 million) and were recorded as an expense in the reporting period.

(41) Personnel expenses / Headcount

Personnel expenses comprised the following:

€ million	2015	2014
Wages and salaries	2,992.8	2,630.9
Compulsory social security contributions and special financial assistance	431.6	376.6
Pension expenses	209.8	157.4
	3,634.2	**3,164.9**

As of December 31, 2015, the Group had 49,613 employees (2014: 39,639). The average number of employees during the year was 41,511 (2014: 38,930). The increase was mainly due to the acquisition of the Sigma-Aldrich Corporation, USA, which was completed on November 18, 2015.

The breakdown of personnel by function was as follows:

Average number of employees	2015	2014
Production	11,563	10,176
Logistics	2,581	2,207
Marketing and Sales	12,871	12,113
Administration	6,763	6,342
Research and Development	5,097	4,738
Infrastructure and Other	2,636	3,354
	41,511	**38,930**

(42) Material costs

Material costs in 2015 amounted to € 1,736.8 million (2014: € 1,516.8 million) and were reported under cost of sales.

(43) Auditors' fees

The costs of the auditors (KPMG) of the financial statements of the Group consisted of the following:

	2015		2014	
€ million	**Group**	**thereof KPMG Germany**	**Group**	thereof KPMG Germany
Audits of financial statements	7.9	2.2	5.4	1.6
Other audit-related services	1.0	0.8	0.6	0.5
Tax consultancy services	0.9	0.5	0.6	0.3
Other services	1.2	0.9	0.3	0.2
	11.0	**4.4**	**6.9**	**2.6**

(44) Corporate governance

The Statement of Compliance in accordance with section 161 of the German Stock Corporation Act (Aktiengesetz) was published in the corporate governance section of the website www.emdgroup.com/investors → corporate governance in March 2015 and thus made permanently available.

(45) Companies opting for exemption under section 264 (3) HGB or section 264 b HGB

The following companies, which have been consolidated in these financial statements, have opted for exemption:
Allergopharma GmbH & Co. KG, Reinbek
Allergopharma Verwaltungs GmbH, Darmstadt
Biochrom GmbH, Berlin
Chemitra GmbH, Darmstadt
Litec-LLL GmbH, Greifswald
Merck Accounting Solutions & Services Europe GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany
Merck Chemicals GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany
Merck Consumer Health Holding GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany
Merck Export GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany
Merck Life Science GmbH, Eppelheim, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany
Merck Selbstmedikation GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany
Merck Serono GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany
Merck Versicherungsvermittlung GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany

(46) Related-party disclosures

Related parties in respect of the Group are E. Merck KG, Darmstadt, Germany, Emanuel-Merck-Vermögens-KG, Darmstadt, Germany, and E. Merck Beteiligungen KG, Darmstadt, Germany. In principle, direct or indirect subsidiaries of Merck KGaA, Darmstadt, Germany, associates of the Group, jointly controlled companies where the Group is involved, as well as pension funds that are classified as funded defined benefit plans in accordance with IAS 19 are also related parties within the meaning of IAS 24. Members of the Executive Board and the Supervisory Board of Merck KGaA, Darmstadt, Germany, the Executive Board and the Board of Partners of E. Merck KG, Darmstadt, Germany, as well as close members of their families are also related parties.

As of December 31, 2015, there were liabilities by Merck Financial Services GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, Merck KGaA, Darmstadt, Germany, and Merck & Cie, Switzerland, a subsidiary of Merck KGaA, Darmstadt, Germany, to E. Merck KG, Darmstadt, Germany, in the amount of € 1,031.2 million (2014: € 926.9 million). Merck Financial Services GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, had liabilities vis-à-vis Merck Capital Asset Management, Malta, amounting to € 0.1 million (2014: € 0.1 million). Moreover, as of December 31, 2015, Merck KGaA, Darmstadt, Germany, had receivables from E. Merck Beteiligungen KG, Darmstadt, Germany, in the amount of € 35.4 million (2014: € 76.5 million). The balances result mainly from the profit transfers by Merck & Cie, Switzerland, a subsidiary of Merck KGaA, Darmstadt, Germany, to E. Merck KG, Darmstadt, Germany, as well as the reciprocal profit transfers between Merck KGaA, Darmstadt, Germany, and E. Merck KG, Darmstadt, Germany. They included financial payables of € 577.8 million (2014: € 501.4 million) which were subject to standard market interest rates. Neither collateral nor guarantees existed for any of the balances either in favor or to the disadvantage of the Group.

Moreover, as of December 31, 2015 Merck Serono SA, Switzerland, a subsidiary of Merck KGaA, Darmstadt, Germany, had a receivable from Calypso Biotech SA, Switzerland, amounting to € 1.2 million (2014: € 0.0 million) stemming from a convertible bond with a volume of CHF 1,350,000 and an annual coupon of 8% maturing on December 31, 2016.

From January to December 2015, Merck KGaA, Darmstadt, Germany, performed services for E. Merck KG, Darmstadt, Germany, with a value of € 0.9 million (2014: € 1.2 million), for E. Merck Beteiligungen KG, Darmstadt, Germany, with a value of € 0.3 million (2014: € 0.3 million), and for Emanuel-Merck-Vermögens-KG, Darmstadt, Germany, with a value of € 0.2 million (2014: € 0.3 million). During the same period, E. Merck KG, Darmstadt, Germany, performed services for Merck KGaA, Darmstadt, Germany, with a value of € 0.5 million (2014: € 0.5 million).

Business transactions with major subsidiaries were eliminated during consolidation. Information on pension funds that are classified as funded defined benefit plans in accordance with IAS 19 can be found in Note [26] "Provisions for pensions and other post-employment benefits". There were no further material transactions with these pension funds.

As was the case in 2014, there were no transactions between companies of the Group and associates from January to December 2015. As in the previous year, companies of the Group had no receivables or liabilities vis-à-vis associates as of December 31, 2015.

There were no material transactions such as, for example, the provision of services or the granting of loans, between companies of the Group and members of the Executive Board or the Supervisory Board of Merck KGaA, Darmstadt, Germany, the Executive Board or the Board of Partners of E. Merck KG, Darmstadt, Germany or members of their immediate families.

(47) Executive Board and Supervisory Board compensation

The compensation of the Executive Board of Merck KGaA, Darmstadt, Germany, is paid by the general partner, E. Merck KG, Darmstadt, Germany, and recorded as an expense in its income statement. For the period from January to December 2015, fixed salaries of € 6.5 million (2014: € 5.3 million), variable compensation of € 22.3 million (2014: € 18.3 million), and additional benefits of € 0.3 million (2014: € 0.2 million) were recorded for members of the Executive Board. Furthermore, additions to the provisions of E. Merck KG, Darmstadt, Germany, for the Long-Term Incentive Plan totaled € 9.9 million (2014: € 12.7 million), and additions to the pension provisions of E. Merck KG, Darmstadt, Germany, include current service costs of € 4.2 million (2014: € 2.1 million) for members of the Executive Board of Merck KGaA, Darmstadt, Germany.

The compensation of the Supervisory Board amounting to € 881.0 thousand (2014: € 882.1 thousand) consisted of a fixed portion of € 822.5 thousand (2014: € 823.6 thousand) and meeting attendance compensation of € 58.5 thousand (2014: € 58.5 thousand).

Further individualized information and details can be found in the Compensation Report on pages 150 et seq.

(48) Information on preparation and approval

The Executive Board of Merck KGaA, Darmstadt, Germany, prepared the consolidated financial statements on February 18, 2016 and approved them for forwarding to the Supervisory Board. The Supervisory Board has the responsibility to examine the consolidated financial statements and to declare whether it approves them.

(49) Subsequent events

At the beginning of January 2016, two contracts entered into with BioMarin Pharmaceutical Inc., USA (BioMarin), became effective. Firstly, the sale of the rights to Kuvan®, a drug used to treat the metabolic disorder known as phenylketonuria (PKU) was agreed. And secondly, the Group returned its option to develop and commercialize Peg-Pal to BioMarin. Based on these two agreements, in January 2016 the Group received an upfront payment of € 340 million for the sale of the rights to Kuvan® as well as an entitlement to milestone payments of up to € 185 million. More information can be found in Note [4] "Acquisitions, assets held for sale and disposal groups".

Subsequent to the balance sheet date, no further events of special importance occurred that could have a material impact on the net assets, financial position and results of operations of the Group.

Accounting and Measurement Policies

(50) Measurement policies

The main assets and liabilities disclosed in the consolidated balance sheet are measured as follows:

Balance sheet item	Measurement principle
Assets	
Intangible assets	
With finite useful life	Amortized cost
With indefinite useful life	Amortized cost (subsequent measurement impairment-only approach)
Property, plant and equipment	Amortized cost
Financial assets (current/non-current)	
Held to maturity investments	Amortized cost
Available-for-sale financial assets	Fair value
Loans and receivables	Amortized cost
Derivative assets (financial transactions)	Fair value
Other assets	
Derivative assets (operational)	Fair value
Receivables from non-income related taxes	Amortized cost
Other receivables	Amortized cost
Deferred tax assets	Undiscounted measurement based on tax rates that are expected to apply to the period when the asset is realized or the liability is settled
Inventories	Lower of cost and net realizable value
Trade accounts receivable	Amortized cost
Income tax receivables	Expected tax refunds based on tax rates that have been enacted or substantively enacted by the end of the reporting period
Cash and cash equivalents	Nominal value
Assets held for sale	Lower of carrying amount and fair value less costs to sell

Balance sheet item	Measurement principle
Equity and liabilities	
Provisions for pensions and other post-employment benefits	Projected unit credit method
Provisions (current/non-current)	Present value of the expenditures expected to be required to settle the obligation
Financial liabilities (current/non-current)	
Bonds	Amortized cost
Liabilities to related parties	Amortized cost
Loans to banks	Amortized cost
Liabilities from derivatives (financial transactions)	Fair value
Finance lease liabilities	Amortized cost
Other liabilities (current/non-current)	
Liabilities from derivatives (operational)	Fair value
Liabilities from non-income related taxes	Settlement amount
Other liabilities	Settlement amount
Deferred tax liabilities	Undiscounted measurement based on tax rates that are expected to apply to the period when the asset is realized or the liability is settled
Trade accounts payable	Amortized cost
Income tax liabilities	Expected tax payments based on tax rates that have been enacted or substantively enacted by the end of the reporting period
Liabilities directly related to assets held for sale	Fair value

(51) Consolidation methods

The consolidated financial statements are based on the single-entity financial statements of the consolidated companies as of the balance sheet date, which were prepared applying consistent accounting policies in accordance with IFRS.

Acquisitions are accounted for using the purchase method in accordance with IFRS 3. Subsidiaries acquired and consolidated for the first time were measured at the carrying values at the time of acquisition. Differences resulting in this connection are recognized as assets and liabilities to the extent that their fair values differ from the values carried in the financial statements. Any remaining – and usually – positive difference is recognized as goodwill within intangible assets.

In cases where a company was not acquired in full, non-controlling interests are measured using the fair value of the proportionate share of net assets. The option to measure non-controlling interests at fair value on the date of their acquisition (full goodwill method) was not utilized.

When additional shares in non-controlling interests are acquired, the purchase price amount that exceeds the carrying amount of this interest is recognized immediately in equity.

IFRS 11 is applied for joint arrangements. A joint arrangement exists when, on the basis of a contractual arrangement, the Group and third parties jointly control business activities. Joint control means that decisions about the relevant activities require unanimous consent. Joint arrangements are either joint operations or joint ventures. Revenues and expenses as well as assets and liabilities from joint operations are included in the consolidated financial statements on a pro rata basis in accordance with the Group's rights and obligations. By contrast, interests in joint ventures as well as in material associates over which the Group has significant influence are included in accordance with IAS 28 using the equity method of accounting.

Intragroup sales, expenses and income, as well as all receivables and payables between the consolidated companies, were eliminated. The effects of intragroup deliveries reported under non-current assets and inventories were adjusted by eliminating any intragroup profits. In accordance with IAS 12, deferred taxes are applied to these consolidation measures.

(52) Currency translation

The functional currency concept applies to the translation of financial statements of consolidated companies prepared in foreign currencies. The subsidiaries of the Group generally conduct their operations independently. The functional currency of these companies is normally the respective local currency. Assets and liabilities are measured at the closing rate, and income and expenses are measured at weighted average annual rates in euros, the reporting currency. Any currency translation differences arising during consolidation of Group

companies are taken directly to equity. If Group companies are deconsolidated, existing currency differences are reversed and reclassified to profit or loss. The local currency is not the functional currency at only a few subsidiaries. When the financial statements of consolidated companies are prepared, business transactions that are conducted in currencies other than the functional currency are recorded using the current exchange rate on the date of the transaction. Foreign currency monetary items (cash and cash equivalents, receivables and payables) in the year-end financial statements of the consolidated companies prepared in the functional currency are translated at the respective closing rates. Exchange differences from the translation of monetary items are recognized in the income statement with the exception of net investments in a foreign operation. Hedged items are likewise carried at the closing rate. The resulting gains or losses are eliminated in the consolidated income statement against offsetting amounts from the fair value measurement of derivatives.

Currency translation was based on the following key exchange rates:

	Average annual rate		Closing rate	
€ 1 =	**2015**	2014	**Dec. 31, 2015**	Dec. 31, 2014
British pound (GBP)	0.728	0.805	0.737	0.781
Chinese renminbi (CNY)	7.003	8.167	7.183	7.534
Japanese yen (JPY)	134.431	140.594	131.576	145.392
Swiss franc (CHF)	1.075	1.214	1.081	1.203
Taiwan dollar (TWD)	35.337	40.172	35.831	38.448
U.S. dollar (USD)	1.112	1.325	1.093	1.215

(53) Recognition of net sales and other revenue items

Net sales and revenues are recognized when the amount of revenue can be measured reliably, it is probable that the economic benefits will flow to the entity as well as when the following preconditions have been met.

Net sales are deemed realized once the goods are delivered or the services have been rendered and the significant risks and rewards of ownership have been transferred to the purchaser. In the case of sales of equipment in the Life Science business sector, these preconditions are only met after installation has been successfully completed to the extent that the installation requires specialized knowledge, does not represent a clear ancillary service and the relevant equipment can only be used by the customer once successfully set up.

Net sales are recognized net of sales-related taxes and sales deductions. When sales are recognized, estimated amounts are taken into account for expected sales deductions, for example rebates, discounts and returns.

The vast majority of Group sales are generated by the sale of goods.

In the Healthcare business sector, products are often sold to pharmaceutical wholesalers and to a lesser extent directly to pharmacies or hospitals. In the Life Science and Performance Materials business sectors, products are largely sold to business customers, and to a lesser extent to distributors.

In addition to revenue from the sale of goods, sales also include commission income, and in the Life Science business sector revenue from services, but the volume involved is insignificant. In the case of long-term service agreements, the Group records the sales revenues on a pro rata basis over the term of the agreement or in accordance with the degree to which the services have been rendered.

Royalty and license income is recognized when the contractual obligation has been met.

Dividend income is recognized when the shareholders' right to receive the dividend is established. This is normally the date of the dividend resolution.

Interest income is recognized in the period in which it is earned.

(54) Research and development costs

Research and development costs comprise the costs of research departments and process development, the expenses incurred as a result of research and development collaborations as well as the costs of clinical trials (both before and after approval is granted).

The costs of research cannot be capitalized and are expensed in full in the period in which they are incurred. As internally generated intangible assets, it is necessary to capitalize development expenses if the cost of the internally

generated intangible asset can be reliably determined and the asset can be expected to lead to future economic benefits. The condition for this is that the necessary resources are available for the development of the asset, technical feasibility of the asset is given, its completion and use are intended, and marketability is given. Owing to the high risks up to the time that pharmaceutical products are approved, these criteria are not met in the Healthcare business sector. Costs incurred after regulatory approval are usually insignificant and are therefore not recognized as intangible assets. Owing to the risks existing up until market launch, development expenses in the Life Science and Performance Materials business sectors can likewise not be capitalized.

Reimbursements for R&D are offset against research and development costs.

(55) Financial instruments: Principles

A financial instrument is a contractual arrangement that gives rise to a financial asset of one entity and a financial liability or an equity instrument of another entity. A distinction is made between non-derivative and derivative financial instruments. The Group accounts for regular way purchases or sales of non-derivative financial instruments at the settlement date and of derivatives at the trade date.

Upon initial recognition, financial assets and financial liabilities are measured at fair value, taking into account any transaction costs, if necessary.

Financial assets are derecognized in part or in full if the contractual rights to the cash flows from the financial asset have expired or have been fulfilled or if control and substantially all the risks and rewards of ownership of the financial asset have been transferred to a third party. Financial liabilities are derecognized if the contractual obligations have been discharged, cancelled, or expired. Cash and cash equivalents are carried at nominal value.

(56) Financial instruments: Categories and classes of financial instruments

Financial assets and liabilities are classified into the following IAS 39 measurement categories and IFRS 7 classes. The classes required to be disclosed in accordance with IFRS 7 consist of the measurement categories set out here. Additionally, cash and cash equivalents with an original maturity of up to 90 days, finance lease liabilities, and derivatives designated as hedging instruments are also classes in accordance with IFRS 7.

Financial assets and financial liabilities at fair value through profit or loss

"Financial assets and financial liabilities at fair value through profit or loss" can be both non-derivative and derivative financial instruments. Financial instruments in this category are subsequently measured at fair value. Gains and losses on financial instruments in this measurement category are recognized directly in the consolidated income statement. This measurement category includes an option to designate non-derivative financial instruments as "at fair value through profit or loss" on initial recognition (fair value option) or as "financial instruments held for trading". The fair value option was applied neither during the fiscal year nor the previous year. The Group only assigns derivatives to the "held for trading" measurement category. Special accounting rules apply to derivatives that are designated as hedging instruments in a hedging relationship.

Held to maturity investments

"Held to maturity investments" are non-derivative financial assets with fixed or determinable payments and a fixed maturity that are quoted in an active market. To be able to assign a financial asset to this measurement category, the entity must have the positive intention and ability to hold it to maturity. These investments are subsequently measured at amortized cost using the effective rate method. If there is objective evidence that such an asset is impaired, an impairment loss is recognized in profit or loss. Subsequent reversals of impairment losses are also recognized in profit or loss up to the amount of the amortized cost. In the Group, this measurement category is used for current financial assets.

Loans and receivables

"Loans and receivables" are non-derivative financial assets with fixed or determinable payments that are not quoted in an active market. They are subsequently measured at amortized cost using the effective rate method. If there is objective evidence that such assets are impaired, an impairment loss is recognized in profit or loss. Subsequent reversals of impairment losses are also recognized in profit or loss up to the amount of amortized cost. Long-term non-interest-bearing and low-interest receivables are measured at their present value. The Group primarily assigns trade receivables, loans, and miscellaneous other current and non-current receivables to this measurement category. The Group always uses a separate allowance account for impairment losses on trade and other receivables. Amounts from the allowance account are recognized in the carrying amount of the corresponding receivable as soon as this is derecognized due to irrecoverability.

Available-for-sale financial assets

"Available-for-sale financial assets" are those non-derivative financial assets that are not assigned to the measurement categories "financial assets and financial liabilities at fair value through profit or loss", "held-to-maturity investments" or "loans and receivables". Financial assets in this category are subsequently measured at fair value. Changes in fair value are recognized immediately in equity and are only transferred to the consolidated income statement when the financial asset is derecognized.

If there is substantial evidence of an asset impairment, the accumulated loss recognized immediately in equity is to be reclassified to the consolidated income statement, even if the financial asset has not been derecognized. Reversals of impairment losses on previously impaired equity instruments are recognized immediately in equity. Reversals of impairment losses on previously impaired debt instruments are recognized in profit or loss up to the amount of the impairment loss. Any amount in excess of this is recognized directly in equity. Financial assets in this category for which no fair value is available or fair value cannot be reliably determined are measured at cost less any accumulated impairment losses. Impairment losses on financial assets carried at cost may not be reversed. In the Group, this measurement category is used in particular for interest-bearing securities, financial assets, and financial investments in equity instruments as well as interests in subsidiaries that are not consolidated due to secondary importance (affiliates). Both interests in non-consolidated subsidiaries as well as to some extent financial investments in equity instruments are measured at cost.

Other liabilities

Other liabilities are non-derivative financial liabilities that are subsequently measured at amortized cost. Differences between the amount received and the amount to be repaid are amortized to profit or loss over the maturity of the instrument. The Group primarily assigns financial liabilities such as issued bonds and liabilities due to banks, trade payables, and miscellaneous other non-derivative current and non-current liabilities to this category.

(57) Financial instruments: Derivatives and hedge accounting

The Group uses derivatives solely to economically hedge recognized assets or liabilities and forecast transactions. The hedge accounting rules in accordance with IFRS are applied to some of these hedges. A distinction is made between fair value hedge accounting and cash flow hedge accounting. Designation of a hedging relationship requires a hedged item and a hedging instrument. The Group currently only uses derivatives as hedging instruments.

The hedging relationship must be effective at all times, i.e. the change in fair value of the hedging instrument almost fully offsets changes in the fair value of the hedged item. The Group uses the dollar offset method as well as regression analyses to measure hedge effectiveness. Derivatives that do not or no longer meet the documentation or effectiveness requirements for hedge accounting, whose hedged item no longer exists, or for which hedge accounting rules are not applied are classified as "financial assets and liabilities at fair value through profit or loss". Changes in fair value are then recognized in profit or loss.

In the Group, cash flow hedges normally relate to highly probable forecast transactions in foreign currency and to future interest payments. In cash flow hedges, the effective portion of the gains and losses on the hedging instrument taking deferred taxes into consideration is recognized in equity until the hedged expected cash flows affect profit or loss. This is also the case if the hedging instrument expires, is sold, or is terminated before the hedged transaction occurs and the occurrence of the hedged item remains likely. The ineffective portion of a cash flow hedge is recognized directly in profit or loss.

(58) Intangible assets

Acquired intangible assets are recognized at cost and are classified as assets with finite and indefinite useful lives. Self-developed intangible assets are only capitalized if the requirements specified by IAS 38 have been met. Intangible assets acquired in the course of business combinations are recognized at fair value on the acquisition date. If the development of intangible assets takes a substantial period of time, the directly attributable borrowing costs incurred up until completion are capitalized as part of the costs.

Intangible assets with indefinite useful lives

Intangible assets with indefinite useful lives are not amortized; however they are tested for impairment when a triggering event arises or at least once a year. Here, the respective carrying amounts are compared with the recoverable amount and impairments are recognized as required. Impairment losses recognized on indefinite-life intangible assets other than goodwill are reversed if the original reasons for impairment no longer apply.

Goodwill is allocated to cash-generating units or groups of cash-generating units and tested for impairment either annually or if there are indications of impairment. The carrying amounts of the cash-generating units or groups of cash-generating units are compared with their recoverable amounts and impairment losses are recognized where the recoverable amount is lower than the carrying amount. The recoverable amount of a cash-generating unit is determined as the higher of fair value less costs of disposal and value in use estimated using the discounted cash flow method.

Intangible assets with finite useful lives

Intangible assets with a finite useful life are amortized using the straight-line method. The useful lives of customer relationships, marketing authorizations, acquired patents, licenses and similar rights, brand names, trademarks and software are between three and 24 years. Amortization of intangible assets and software is allocated to the functional costs in the consolidated income statement. An impairment test is performed if there are indications of impairment. Impairment losses are determined using the same methodology as for indefinite-life intangible assets. Impairment losses are reversed if the original reasons for impairment no longer apply.

(59) Property, plant and equipment

Property, plant and equipment is measured at cost less depreciation and impairments plus reversals of impairments. The component approach is applied here in accordance with IAS 16. Subsequent costs are only capitalized if it is probable that future economic benefits will arise for the Group and the cost of the asset can be measured reliably. The cost of self-constructed property, plant and equipment is calculated on the basis of the directly attributable unit costs and an appropriate share of overheads. If the construction of property, plant and equipment takes a substantial period of time, the directly attributable borrowing costs incurred up until completion are capitalized as part of the costs. In accordance with IAS 20, costs are reduced by the amount of government grants in those cases where government grants or subsidies have been paid for the acquisition or manufacture of assets (grants related to assets). Grants related to expenses which no longer offset future expenses are recognized in profit or loss. Property, plant and equipment is depreciated by the straight-line method over the useful life of the asset concerned. Depreciation of property, plant and equipment is based on the following useful lives:

USEFUL LIFE OF PROPERTY, PLANT AND EQUIPMENT

	Useful life
Production buildings	maximum of 33 years
Administration buildings	maximum of 40 years
Plant and machinery	6 to 25 years
Operating and office equipment; other facilities	3 to 10 years

The useful lives of the assets are reviewed regularly and adjusted if necessary. If indications of a decline in value exist, an impairment test is performed. The determination of the possible need to recognize impairments proceeds in the same way as for intangible assets. If the reasons for an impairment loss no longer exist, a reversal of the impairment loss recognized in prior periods is recorded.

(60) Leasing

Where non-current assets are leased and economic ownership lies with the Group (finance lease), the asset is recognized at the present value of the minimum lease payments or the lower fair value in accordance with IAS 17 and depreciated over its useful life. The corresponding payment obligations from future lease payments are recorded as liabilities. If an operating lease is concerned, the associated expenses are recognized in the period in which they are incurred.

(61) Other non-financial assets and liabilities

Other non-financial assets are carried at amortized cost. Allowances are recognized for any credit risks. Long-term non-interest-bearing and low-interest receivables and liabilities are carried at their present value. Other non-financial liabilities are carried at the amount to be repaid.

(62) Deferred taxes

Deferred tax assets and liabilities result from temporary differences between the carrying amount of an asset or liability in the IFRS and tax balance sheets of consolidated companies as well as from consolidation activities, insofar as the reversal of these differences will occur in the future. In addition, deferred tax assets are recorded in particular for tax loss carryforwards if and insofar as their utilization is probable in the foreseeable future. In accordance with the liability method, the tax rates enacted and published as of the balance sheet date are used.

Deferred tax assets and liabilities are only offset on the balance sheet date if they meet the requirements of IAS 12.

(63) Inventories

Inventories are carried at the lower of cost or net realizable value. When determining cost, the "first-in, first-out" (FIFO) and weighted average cost formulas are used.

In addition to directly attributable unit costs, manufacturing costs also include overheads attributable to the production process, which are determined on the basis of normal capacity utilization of the production facilities.

Inventories are written down if the net realizable value is lower than the acquisition or manufacturing cost carried in the balance sheet.

Since the inventories are not manufactured within the scope of long-term production processes, the manufacturing cost does not include any borrowing cost.

(64) Provisions for pensions and other post-employment benefits

Provisions for pensions and other post-employment benefits are recorded in the balance sheet in accordance with IAS 19. The obligations under defined benefit plans are measured using the projected unit credit method. Under the projected unit credit method, dynamic parameters are taken into account in calculating the expected benefit payments after an insured event occurs; these payments are spread over the entire period of service of the participating employees. Annual actuarial opinions are prepared for this purpose. The actuarial assumptions, e.g. for discount rates, salary and pension trends, as well as health care cost increases, which were used to calculate the benefit obligation, were determined on a country-by-country basis in line with the economic conditions prevailing in each country; the latest country-specific actuarial mortality table was used in each case. The respective discount rates are generally determined on the basis of the returns on high-quality corporate bonds issued with adequate maturities and currencies. For euro-denominated obligations, bonds with ratings of at least "AA" from one of the three major rating agencies (Standard & Poor's, Moody's or Fitch), and a euro swap rate of adequate duration served as the basis for the data. Actuarial gains and losses resulting from changes in actuarial assumptions and/or experience adjustments (the effects of differences between the previous actuarial assumptions and what has actually occurred) are recognized immediately in equity as soon as they are incurred, taking deferred taxes into account. Consequently, the consolidated balance sheet discloses – after deduction of the plan assets – the full scope of the obligations while avoiding the fluctuations in expenses that can result especially when the calculation parameters change. The actuarial gains and losses recorded in the respective reporting period are presented separately in the Statement of Comprehensive Income.

(65) Provisions and contingent liabilities

Provisions are recognized in the balance sheet if it is more likely than not that a cash outflow will be required to settle the obligation and the amount of the obligation can be measured reliably. The carrying amount of provisions takes into account the amounts required to cover future payment obligations, recognizable risks and uncertain obligations of the Group to third parties.

Measurement is based on the settlement amount with the highest probability or, if the probabilities are equivalent and a high number of similar cases exist, it is based on the expected value of the settlement amounts. Long-term provisions are discounted and carried at their present value as of the balance sheet date. To the extent that reimbursement claims exist as defined in IAS 37, they are recognized separately as an asset if their realization is virtually certain and the asset recognition criteria have been met.

Contingent liabilities comprise not only possible obligations arising from past events and whose existence is subject to the occurrence of uncertain future events, but also present obligations arising from past events where an outflow of resources embodying economic benefits is not probable or where the amount of the obligation cannot be measured with reliability. Contingent liabilities that were not assumed within the context of a business combination are not recognized in the consolidated balance sheet. Unless the possibility of an outflow of resources embodying economic benefits is remote, information on the relevant contingent liabilities is disclosed in the notes.

In this context, the present value of the future settlement amount is used as the basis for measurement. The settlement amount is determined in accordance with the rules set out in IAS 37 and is based on the best estimate.

(66) Share-based compensation programs

Provisions have been set up for obligations from share-based compensation programs. These share-based compensation programs with cash settlement are aligned not only with target achievement based on key performance indicators, but above all also with the long-term performance of the shares of Merck KGaA, Darmstadt, Germany. Certain executives and employees could be eligible to receive a certain number of virtual shares – Share Units of Merck KGaA, Darmstadt, Germany, (MSUs) – at the end of a three-year performance cycle. The number of MSUs that could be received depends on the total value defined for the respective person and the average closing price of the shares of Merck KGaA, Darmstadt, Germany, in Xetra® trading during the last 60 trading days prior to January 1 of the respective fiscal year (reference price). In order for members of top management to receive payment, they must personally own an investment in the shares of Merck KGaA, Darmstadt, Germany, dependent on their respective fixed annual compensation. When the three-year performance cycle ends, the number of MSUs to then be granted is determined based on the development of two key performance indicators (KPIs). These are on the one hand the performance of the company's share price compared to the performance of the DAX® with a weighting of 70%, and on the other hand the development of the EBITDA pre margin during the performance cycle as a proportion of a defined target value with a weighting of 30%. Depending on the development of the KPIs, at the end of the respective performance cycle the eligible participants are granted between 0% and 150% of the MSUs they could be eligible to receive.

Based on the MSUs granted, the eligible participants receive a cash payment at a specified point in time in the year after the three-year performance cycle has ended. The value of a granted MSU, which is relevant for payment, corresponds to the average closing price of the shares of Merck KGaA, Darmstadt, Germany, in Xetra® trading during the last 60 trading days prior to January 1 after the performance cycle. The payment amount is limited to three times the reference price. The fair value of the obligations is recalculated on each balance sheet date using a Monte Carlo simulation based on the previously described KPIs. The expected volatilities are based on the implicit volatility of the shares of Merck KGaA, Darmstadt, Germany, and the DAX® in accordance with the remaining term of the respective tranche. The dividend payments incorporated into the valuation model orient towards medium-term dividend expectations.

The Executive Board members have their own Long-Term Incentive Plan, the conditions of which largely correspond to the Long-Term Incentive Plan described here. A description of the plan for the Executive Board can be found in the compensation report, which is part of the Statement on Corporate Governance.

List of Shareholdings

(67) List of shareholdings

The shareholdings of Merck KGaA, Darmstadt, Germany, as of December 31, 2015 are presented in the following table:

Country	Company	Registered Office	Equity interest (%)	Thereof: Merck KGaA, Darmstadt, Germany (%)
I. Fully consolidated companies				
Germany				
Germany	Merck KGaA, Darmstadt, Germany	Darmstadt	Parent Company	
Germany	AB Allgemeine Pensions GmbH & Co. KG	Zossen	100.00	100.00
Germany	Allergopharma GmbH & Co. KG	Reinbek	100.00	
Germany	Allergopharma Verwaltungs GmbH	Darmstadt	100.00	100.00
Germany	Biochrom GmbH	Berlin	100.00	
Germany	Chemitra GmbH	Darmstadt	100.00	100.00
Germany	Emedia Export Company mbH	Gernsheim	100.00	
Germany	IHS – Intelligent Healthcare Solutions GmbH	Frankfurt-Main	100.00	
Germany	Litec-LLL GmbH	Greifswald	100.00	100.00
Germany	Merck 12. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck 13. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	
Germany	Merck 15. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	
Germany	Merck Accounting Solutions & Services Europe GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck Chemicals GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	
Germany	Merck China Chemicals Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	
Germany	Merck Consumer Health Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck Export GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck Financial Services GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck Financial Trading GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Gernsheim	100.00	100.00
Germany	Merck Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Gernsheim	100.00	100.00
Germany	Merck International GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck Internationale Beteiligungen GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	
Germany	Merck Life Science GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Eppelheim	100.00	100.00

Country	Company	Registered Office	Equity interest (%)	Thereof: Merck KGaA, Darmstadt, Germany (%)
Germany	Merck Performance Materials GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Wiesbaden	100.00	
Germany	Merck Schuchardt OHG, a subsidiary of Merck KGaA, Darmstadt, Germany	Hohenbrunn	100.00	100.00
Germany	Merck Selbstmedikation GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	
Germany	Merck Serono GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck Versicherungsvermittlung GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck Vierte Allgemeine Beteiligungsgesellschaft mbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Gernsheim	100.00	
Germany	Sigma-Aldrich Biochemie GmbH	Steinheim	100.00	
Germany	Sigma-Aldrich Chemie GmbH	Steinheim	100.00	
Germany	Sigma-Aldrich Chemie Holding GmbH	Taufkirchen	100.00	
Germany	Sigma-Aldrich Grundstücks GmbH & Co. KG	Steinheim	100.00	
Germany	Sigma-Aldrich Logistik GmbH	Steinheim	100.00	
Germany	Sigma-Aldrich Produktions GmbH	Steinheim	100.00	
Germany	Sigma-Aldrich Verwaltungs GmbH	Steinheim	100.00	100.00
Other European countries				
Austria	Allergopharma Vertriebsgesellschaft m.b.H.	Vienna	100.00	
Austria	Merck Chemicals and Life Science GesmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Vienna	100.00	
Austria	Merck Gesellschaft mbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Vienna	100.00	
Austria	Merck KGaA & Co. Werk Spittal, a subsidiary of Merck KGaA, Darmstadt, Germany	Spittal	100.00	99.00
Austria	Sigma-Aldrich Handels GmbH	Vienna	100.00	
Belgium	Merck Chemicals N.V./S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Overijse	100.00	
Belgium	Merck Consumer Healthcare N.V.-S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Overijse	100.00	
Belgium	Merck N.V.-S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Overijse	100.00	
Belgium	Sigma-Aldrich BVBA/SPRL	Diegem	100.00	
Bulgaria	Merck Bulgaria EAD, a subsidiary of Merck KGaA, Darmstadt, Germany	Sofia	100.00	
Croatia	Merck d.o.o., a subsidiary of Merck KGaA, Darmstadt, Germany	Zagreb	100.00	
Czech Republic	Merck spol.s.r.o., a subsidiary of Merck KGaA, Darmstadt, Germany	Prague	100.00	
Czech Republic	Sigma-Aldrich spol.s.r.o.	Prague	100.00	
Denmark	Merck A/S, a subsidiary of Merck KGaA, Darmstadt, Germany	Hellerup	100.00	
Denmark	Merck Life Science A/S, a subsidiary of Merck KGaA, Darmstadt, Germany	Hellerup	100.00	
Denmark	Sigma-Aldrich Denmark ApS	Broendby	100.00	
Denmark	Survac ApS	Frederiksberg	100.00	100.00
Estonia	Merck Serono OÜ, a subsidiary of Merck KGaA, Darmstadt, Germany	Tallinn	100.00	
Finland	Merck Life Science OY, a subsidiary of Merck KGaA, Darmstadt, Germany	Espoo	100.00	

Country	Company	Registered Office	Equity interest (%)	Thereof: Merck KGaA, Darmstadt, Germany (%)
Finland	Merck OY, a subsidiary of Merck KGaA, Darmstadt, Germany	Espoo	100.00	
Finland	Sigma-Aldrich Finland OY	Helsinki	100.00	
France	Gonnon S.A.S.	Lyon	100.00	
France	Laboratoire Médiflor S.A.S.	Lyon	100.00	
France	Merck Biodevelopment S.A.S., a subsidiary of Merck KGaA, Darmstadt, Germany	Lyon	100.00	
France	Merck Chimie S.A.S., a subsidiary of Merck KGaA, Darmstadt, Germany	Fontenay s/Bois	100.00	
France	Merck Médication Familiale S.A.S., a subsidiary of Merck KGaA, Darmstadt, Germany	Lyon	100.00	
France	Merck Performance Materials S.A.S., a subsidiary of Merck KGaA, Darmstadt, Germany	Trosly Breuil	100.00	
France	Merck S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Lyon	99.84	
France	Merck Santé S.A.S., a subsidiary of Merck KGaA, Darmstadt, Germany	Lyon	100.00	
France	Merck Serono S.A.S., a subsidiary of Merck KGaA, Darmstadt, Germany	Lyon	100.00	
France	Millipore S.A.S.	Molsheim	100.00	
France	Sigma-Aldrich Chimie S.a.r.l.	St. Quentin Fallavier	100.00	
France	Sigma-Aldrich Chimie SNC Partnership	St. Quentin Fallavier	100.00	
France	Sigma-Aldrich Holding S.a.r.l.	St. Quentin Fallavier	100.00	
Greece	Merck A.E., a subsidiary of Merck KGaA, Darmstadt, Germany	Maroussi, Athens	100.00	
Hungary	Merck Kft., a subsidiary of Merck KGaA, Darmstadt, Germany	Budapest	100.00	
Hungary	Sigma-Aldrich Kft.	Budapest	100.00	
Ireland	Merck Millipore Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Carrigtwohill	100.00	
Ireland	Merck Serono (Ireland) Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Dublin	100.00	
Ireland	Millipore Cork	Carrigtwohill	100.00	
Ireland	Shrawdine Limited	Arklow	100.00	
Ireland	Sigma-Aldrich Financial Services Limited	Dublin	100.00	
Ireland	Sigma-Aldrich Ireland Ltd.	Arklow	100.00	
Ireland	Silverberry Limited	Arklow	100.00	
Italy	Allergopharma S.p.A.	Rome	100.00	
Italy	Istituto di Ricerche Biomediche Antoine Marxer RBM S.p.A.	Colleretto Giacosa	100.00	
Italy	Merck S.p.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Vimodrone	100.00	
Italy	Merck Serono S.p.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Rome	99.74	
Italy	Sigma-Aldrich Italia S.r.l.	Milan	100.00	
Italy	Sigma-Aldrich S.r.l.	Milan	100.00	
Latvia	Merck Serono SIA, a subsidiary of Merck KGaA, Darmstadt, Germany	Riga	100.00	
Lithuania	Merck Serono, UAB, a subsidiary of Merck KGaA, Darmstadt, Germany	Vilnius	100.00	
Luxembourg	AZ Electronic Materials (Luxembourg) S.a.r.l.	Luxembourg	100.00	
Luxembourg	AZ Electronic Materials Group S.a.r.l.	Luxembourg	100.00	
Luxembourg	AZ Electronic Materials S.a.r.l.	Luxembourg	100.00	
Luxembourg	AZ Electronic Materials TopCo S.a.r.l.	Luxembourg	100.00	
Luxembourg	Mats Finance S.a.r.l.	Luxembourg	100.00	

Country	Company	Registered Office	Equity interest (%)	Thereof: Merck KGaA, Darmstadt, Germany (%)
Luxembourg	Merck Chemicals Holding S.a.r.l., a subsidiary of Merck KGaA, Darmstadt, Germany	Luxembourg	100.00	
Luxembourg	Merck Finance S.a.r.l., a subsidiary of Merck KGaA, Darmstadt, Germany	Luxembourg	100.00	
Luxembourg	Merck Finanz S.a.r.l., a subsidiary of Merck KGaA, Darmstadt, Germany	Luxembourg	100.00	100.00
Luxembourg	Merck Holding S.a.r.l., a subsidiary of Merck KGaA, Darmstadt, Germany	Luxembourg	100.00	
Luxembourg	Merck Invest SCS, a subsidiary of Merck KGaA, Darmstadt, Germany	Luxembourg	100.00	
Luxembourg	Merck Re S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Luxembourg	100.00	
Luxembourg	Millilux S.a.r.l.	Luxembourg	100.00	
Luxembourg	Millipart S.a.r.l.	Luxembourg	100.00	
Luxembourg	Millipore International Holdings, S.a.r.l.	Luxembourg	100.00	
Luxembourg	Ridgefield Acquisition S.a.r.l.	Luxembourg	100.00	
Luxembourg	Ridgefield Holdco S.a.r.l.	Luxembourg	100.00	
Luxembourg	Sigma-Aldrich S.a.r.l.	Luxembourg	100.00	
Malta	Merck Capital Holding Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Pietà	100.00	
Malta	Merck Capital Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Pietà	100.00	
Netherlands	Merck B.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Schiphol-Rijk	100.00	
Netherlands	Merck Chemicals B.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Amsterdam Zuidoost	100.00	
Netherlands	Merck Holding Netherlands B.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Schiphol-Rijk	100.00	100.00
Netherlands	Serono Tri Holdings B.V.	Schiphol-Rijk	100.00	
Netherlands	Sigma-Aldrich B.V.	Zwijndrecht	100.00	
Netherlands	Sigma-Aldrich Chemie B.V.	Zwijndrecht	100.00	
Norway	Merck Life Science AS, a subsidiary of Merck KGaA, Darmstadt, Germany	Oslo	100.00	
Norway	Sigma-Aldrich Norway AS	Oslo	100.00	
Poland	Merck Sp.z o.o., a subsidiary of Merck KGaA, Darmstadt, Germany	Warsaw	100.00	
Poland	Sigma-Aldrich Sp.z.o.o.	Posen	100.00	
Portugal	Merck, S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Algés	100.00	
Romania	Merck Romania S.R.L., a subsidiary of Merck KGaA, Darmstadt, Germany	Bucharest	100.00	
Russia	Merck LLC, a subsidiary of Merck KGaA, Darmstadt, Germany	Moscow	100.00	
Russia	Sigma-Aldrich Rus	Moscow	100.00	
Serbia	Merck d.o.o. Beograd, a subsidiary of Merck KGaA, Darmstadt, Germany	Belgrade	100.00	
Slovakia	Merck spol.s.r.o., a subsidiary of Merck KGaA, Darmstadt, Germany	Bratislava	100.00	
Slovenia	Merck d.o.o., a subsidiary of Merck KGaA, Darmstadt, Germany	Ljubljana	100.00	
Spain	Merck Chemicals and Life Science S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Madrid	100.00	
Spain	Merck, S.L.U., a subsidiary of Merck KGaA, Darmstadt, Germany	Madrid	100.00	

Country	Company	Registered Office	Equity interest (%)	Thereof: Merck KGaA, Darmstadt, Germany (%)
Spain	Sigma-Aldrich Quimica S.L.	Tres Cantos	100.00	
Sweden	Merck AB, a subsidiary of Merck KGaA, Darmstadt, Germany	Solna	100.00	
Sweden	Merck Chemicals and Life Science AB, a subsidiary of Merck KGaA, Darmstadt, Germany	Solna	100.00	
Sweden	Sigma-Aldrich Sweden AB	Stockholm	100.00	
Switzerland	Allergopharma AG	Therwil	100.00	
Switzerland	Ares Trading SA	Aubonne	100.00	
Switzerland	Merck & Cie, a subsidiary of Merck KGaA, Darmstadt, Germany	Altdorf	51.63	51.63
Switzerland	Merck (Schweiz) AG, a subsidiary of Merck KGaA, Darmstadt, Germany	Zug	100.00	
Switzerland	Merck Biosciences AG, a subsidiary of Merck KGaA, Darmstadt, Germany	Läufelfingen	100.00	
Switzerland	Merck Performance Materials (Suisse) SA, a subsidiary of Merck KGaA, Darmstadt, Germany	Coinsins	100.00	
Switzerland	Merck Serono SA, a subsidiary of Merck KGaA, Darmstadt, Germany	Coinsins	100.00	
Switzerland	SeroMer Holding SA	Chéserex	100.00	
Switzerland	Sigma-Aldrich (Switzerland) Holding AG	Buchs	100.00	
Switzerland	Sigma-Aldrich Chemie GmbH	Buchs	100.00	
Switzerland	Sigma-Aldrich International GmbH	St. Gallen	100.00	
Switzerland	Sigma-Aldrich Production GmbH	Buchs	100.00	
Turkey	Merck Ilac Ecza ve Kimya Ticaret AS, a subsidiary of Merck KGaA, Darmstadt, Germany	Istanbul	100.00	
United Kingdom	Aldrich Chemical Co. Ltd.	Gillingham	100.00	
United Kingdom	AZ Electronic Materials (UK) Ltd.	Stockley Park	100.00	
United Kingdom	BioReliance Limited	Aberdeen	100.00	
United Kingdom	BioReliance U.K. Acquisition Limited	London	100.00	
United Kingdom	Epichem Group Limited	Bromborough	100.00	
United Kingdom	Lamberts Healthcare Ltd.	Tunbridge Wells	100.00	
United Kingdom	Merck Chemicals Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Nottingham	100.00	
United Kingdom	Merck Consumer Health Care Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hull	100.00	
United Kingdom	Merck Holding Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Feltham	100.00	
United Kingdom	Merck Investments Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hull	100.00	
United Kingdom	Merck Performance Materials Services UK Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Stockley Park	100.00	
United Kingdom	Merck Serono Europe Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	London	100.00	
United Kingdom	Merck Serono Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Feltham	100.00	
United Kingdom	Millipore (U.K.) Ltd.	Feltham	100.00	
United Kingdom	Millipore UK Holdings LLP	London	100.00	
United Kingdom	SAFC Biosciences Limited	Gillingham	100.00	
United Kingdom	SAFC Hitech Limited	Bromborough	100.00	
United Kingdom	Seven Seas Limited	Hull	100.00	
United Kingdom	Sigma-Aldrich Company Limited	Gillingham	100.00	
United Kingdom	Sigma-Aldrich Holdings Ltd.	Gillingham	100.00	
United Kingdom	Sigma-Genosys Limited	Gillingham	100.00	

Country	Company	Registered Office	Equity interest (%)	Thereof: Merck KGaA, Darmstadt, Germany (%)
North America				
Canada	EMD Chemicals Canada Inc.	Toronto	100.00	
Canada	EMD Crop BioScience Canada Inc.	Toronto	100.00	
Canada	EMD Inc.	Mississauga	100.00	
Canada	Millipore (Canada) Ltd.	Toronto	100.00	
Canada	Sigma-Aldrich Canada Co.	Oakville	100.00	
United States	3506 South Broadway Redevelopment Corp.	St. Louis	100.00	
United States	Aldrich Chemical Co. LLC	Milwaukee	100.00	
United States	Aldrich Chemical Foreign Holding LLC	St. Louis	100.00	
United States	Aldrich-APL, LLC	Urbana	100.00	
United States	Amnis Corp.	Seattle	100.00	
United States	BioReliance Corporation	Rockville	100.00	
United States	BioReliance Holdings, Inc.	Rockville	100.00	
United States	BioReliance Intermediate, Inc.	Rockville	100.00	
United States	Cell Marque Corporation	Rocklin	100.00	
United States	Cerilliant Corporation	Round Rock	100.00	
United States	EMD Accounting Solutions & Services America, Inc.	Quincy	100.00	
United States	EMD Finance LLC	Wilmington	100.00	
United States	EMD Holding Corp.	Rockland	100.00	
United States	EMD Millipore Corporation	Billerica	100.00	
United States	EMD Performance Materials Corp.	Philadelphia	100.00	
United States	EMD Serono Holding Inc.	Rockland	100.00	
United States	EMD Serono Research & Development Institute, Inc.	Billerica	100.00	
United States	EMD Serono, Inc.	Rockland	100.00	
United States	KL Acquisition Corp.	St. Louis	100.00	
United States	Mario Finance Corp.	Wilmington	100.00	
United States	Millipore Asia Ltd.	Wilmington	100.00	
United States	Millipore Pacific Ltd.	Wilmington	100.00	
United States	Millipore UK Holdings I, LLC	Wilmington	100.00	
United States	Millipore UK Holdings II, LLC	Wilmington	100.00	
United States	Olive/Ewing/Laclede Redevelopment Corporation	St. Louis	100.00	
United States	Ormet Circuits, Inc.	San Diego	100.00	
United States	Research Organics, LLC	Cleveland	100.00	
United States	SAFC Biosciences, Inc.	Lenexa	100.00	
United States	SAFC Carlsbad, Inc.	Carlsbad	100.00	
United States	SAFC Hitech, Inc.	Haverhill	100.00	
United States	SAFC, Inc.	Madison	100.00	
United States	SAFC-JRH Holding Company, Inc.	Lenexa	100.00	
United States	Serono Laboratories Inc.	Rockland	100.00	
United States	Sigma Chemical Foreign Holding LLC	St. Louis	100.00	
United States	Sigma Redevelopment Corporation	St. Louis	100.00	
United States	Sigma Second Street Redevelopment Corporation	St. Louis	100.00	
United States	Sigma-Aldrich Business Holdings, Inc.	St. Louis	100.00	
United States	Sigma-Aldrich Co. LLC	St. Louis	100.00	
United States	Sigma-Aldrich Corporation	St. Louis	100.00	
United States	Sigma-Aldrich Finance Co.	St. Louis	100.00	
United States	Sigma-Aldrich Foreign Holding Co.	St. Louis	100.00	
United States	Sigma-Aldrich Holding LLC	St. Louis	100.00	
United States	Sigma-Aldrich Lancaster, Inc.	St. Louis	100.00	
United States	Sigma-Aldrich Manufacturing LLC	St. Louis	100.00	
United States	Sigma-Aldrich Missouri Insurance Company	St. Louis	100.00	
United States	Sigma-Aldrich Research Biochemicals, Inc.	Natick	100.00	
United States	Sigma-Aldrich RTC, Inc.	Laramie	100.00	
United States	Sigma-Aldrich, Inc.	St. Louis	100.00	

Country	Company	Registered Office	Equity interest (%)	Thereof: Merck KGaA, Darmstadt, Germany (%)
United States	Sigma-Genosys of Texas LLC	The Woodlands	100.00	
United States	Supelco, Inc.	Bellefonte	100.00	
APAC				
Australia	Merck Pty. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Bayswater	100.00	
Australia	Merck Serono Australia Pty. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Sydney	100.00	
Australia	SAFC Biosciences Pty. Ltd.	Castle Hill	100.00	
Australia	Sigma-Aldrich Oceania Pty. Ltd.	Castle Hill	100.00	
Australia	Sigma-Aldrich Pty. Ltd.	Castle Hill	100.00	
China	AZ Electronic Materials (Hong Kong) Finance Ltd.	Hong Kong	100.00	
China	Beijing Skywing Technology Co., Ltd.	Beijing	100.00	
China	Merck Chemicals (Shanghai) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Shanghai	100.00	
China	Merck Display Materials (Shanghai) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Shanghai	100.00	
China	Merck Electronic Materials (Suzhou) Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Suzhou	100.00	
China	Merck Holding (China) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Shanghai	100.00	
China	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hong Kong	100.00	
China	Merck Millipore Lab Equipment (Shanghai) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Shanghai	100.00	
China	Merck Performance Materials Hong Kong Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hong Kong	100.00	
China	Merck Performance Materials Hong Kong Services Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hong Kong	100.00	
China	Merck Pharmaceutical (HK) Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hong Kong	100.00	
China	Merck Pharmaceutical Manufacturing (Jiangsu) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Nantong	100.00	
China	Merck Serono (Beijing) Pharmaceutical Distribution Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Beijing	100.00	
China	Merck Serono (Beijing) Pharmaceutical R&D Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Beijing	100.00	
China	Merck Serono Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Beijing	100.00	
China	SAFC Hitech (Shanghai) Co., Ltd.	Shanghai	100.00	
China	Sigma-Aldrich (Shanghai) Trading Co., Ltd.	Shanghai	100.00	
China	Sigma-Aldrich (Wuxi) Life Science & Technology Co., Ltd.	Wuxi	100.00	
China	Sigma-Aldrich Hong Kong Holding Ltd.	Hong Kong	100.00	
China	Suzhou Taizhu Technology Development Co., Ltd.	Taicang	100.00	
India	Merck Life Science Pvt. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Mumbai	100.00	
India	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Mumbai	51.80	
India	Merck Performance Materials Pvt. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Sanpada New Mumbai	100.00	
India	Merck Specialities Pvt. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Mumbai	100.00	
India	Sigma-Aldrich Chemicals Private Limited	Bangalore	100.00	

Country	Company	Registered Office	Equity interest (%)	Thereof: Merck KGaA, Darmstadt, Germany (%)
Indonesia	P.T. Merck Chemicals and Life Sciences, a subsidiary of Merck KGaA, Darmstadt, Germany	Jakarta	100.00	
Indonesia	P.T. Merck Tbk., a subsidiary of Merck KGaA, Darmstadt, Germany	Jakarta	86.65	
Japan	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Tokyo	100.00	
Japan	Merck Performance Materials G.K., a subsidiary of Merck KGaA, Darmstadt, Germany	Tokyo	100.00	
Japan	Merck Performance Materials IP G.K., a subsidiary of Merck KGaA, Darmstadt, Germany	Tokyo	100.00	
Japan	Merck Performance Materials Manufacturing G.K., a subsidiary of Merck KGaA, Darmstadt, Germany	Tokyo	100.00	
Japan	Merck Serono Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Tokyo	100.00	
Japan	Sigma-Aldrich Japan G.K.	Tokyo	100.00	
Malaysia	Merck Sdn Bhd, a subsidiary of Merck KGaA, Darmstadt, Germany	Petaling Jaya	100.00	
Malaysia	Sigma-Aldrich (M) Sdn Bhd	Subang Jaya	100.00	
New Zealand	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Palmerston North	100.00	
Pakistan	Merck (Pvt.) Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Karachi	75.00	26.00
Pakistan	Merck Pharmaceuticals (Pvt.) Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Karachi	75.00	
Pakistan	Merck Specialities (Pvt.) Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Karachi	100.00	
Philippines	Merck Inc., a subsidiary of Merck KGaA, Darmstadt, Germany	Makati City	100.00	
Singapore	Merck Performance Materials Pte. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Singapore	100.00	
Singapore	Merck Pte. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Singapore	100.00	
Singapore	Sigma-Aldrich Pte. Ltd.	Singapore	100.00	
South Korea	AZ Chem Korea Ltd.	Seoul	100.00	
South Korea	Merck Electronic Materials Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Seoul	100.00	
South Korea	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Seoul	100.00	
South Korea	Merck Performance Materials Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Pyungtaek-si	100.00	
South Korea	Sigma-Aldrich Holding Ltd.	Yongin City	100.00	
South Korea	Sigma-Aldrich Korea Ltd.	Yongin City	100.00	
Taiwan	AZ EM Taiwan Holding Co. Ltd.	Taipei	100.00	
Taiwan	Merck Display Technologies Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Taipei	100.00	
Taiwan	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Taipei	100.00	
Taiwan	Merck Performance Materials Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Taipei	100.00	100.00
Taiwan	SAFC Hitech Taiwan Co. Ltd.	Kaohsuing	100.00	
Thailand	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Bangkok	45.11	
Vietnam	Merck Vietnam Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Ho Chi Minh City	100.00	

Country	Company	Registered Office	Equity interest (%)	Thereof: Merck KGaA, Darmstadt, Germany (%)
Latin America				
Argentina	Merck S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Buenos Aires	100.00	
Argentina	Sigma-Aldrich de Argentina S.r.l.	Buenos Aires	100.00	
Brazil	Merck S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Rio de Janeiro	100.00	
Brazil	Sigma-Aldrich Brasil Ltda.	São Paulo	100.00	
Chile	Merck S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Santiago de Chile	100.00	
Chile	Sigma-Aldrich Quimica Ltda.	Providencia	100.00	
Colombia	Merck S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Bogota	100.00	
Ecuador	Merck C.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Quito	100.00	
Guatemala	Merck, S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Guatemala City	100.00	
Mexico	Merck, S.A. de C.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Mexico City	100.00	
Mexico	Sigma-Aldrich Quimica, S. de R.L. de C.V.	Toluca	100.00	
Panama	Mesofarma Corporation	Panama City	100.00	
Peru	Merck Peruana S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Lima	100.00	
Uruguay	ARES Trading Uruguay S.A.	Montevideo	100.00	
Venezuela	Merck S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Caracas	100.00	
Venezuela	Representaciones MEPRO S.A.	Caracas	100.00	
MEA				
Egypt	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Cairo	100.00	
Israel	Inter-Lab Ltd.	Yavne	100.00	
Israel	InterPharm Industries Ltd.	Yavne	100.00	
Israel	InterPharm Laboratories Ltd.	Yavne	100.00	
Israel	Merck Serono Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Herzliya Pituach	100.00	
Israel	Qlight Nanotech Ltd.	Jerusalem	100.00	
Israel	Sigma-Aldrich Israel Ltd.	Rehovot	100.00	
Mauritius	Millipore Mauritius Ltd.	Cyber City	100.00	
South Africa	Merck (Pty) Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Halfway House	100.00	
South Africa	Merck Pharmaceutical Manufacturing (Pty) Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Wadeville	100.00	
South Africa	Sigma-Aldrich (Pty) Ltd.	Kempton Park	100.00	
Tunisia	Merck Promotion SARL, a subsidiary of Merck KGaA, Darmstadt, Germany	Tunis	100.00	
Tunisia	Merck SARL, a subsidiary of Merck KGaA, Darmstadt, Germany	Tunis	100.00	
United Arab Emirates	Merck Serono Middle East FZ-LLC, a subsidiary of Merck KGaA, Darmstadt, Germany	Dubai	100.00	
II. Companies not consolidated due to secondary importance				

Country	Company	Registered Office	Equity interest (%)	Thereof: Merck KGaA, Darmstadt, Germany (%)
Germany				
Germany	AB Pensionsverwaltung GmbH	Zossen	100.00	100.00
Germany	Merck 16. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck 17. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck 18. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck 19. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck 20. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck 21. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Germany	Merck Patent GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	
Germany	Merck Wohnungs- und Grundstücksverwaltungsgesellschaft mbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt	100.00	100.00
Other European countries				
Greece	Sigma-Aldrich (OM) Ltd.	Athens	100.00	
Ireland	SAFC Arklow Ltd.	Arklow	100.00	
Luxembourg	Sigma-Aldrich Global S.a.r.l.	Luxembourg	100.00	
Netherlands	Merck Window Technologies B.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Eindhoven	100.00	100.00
Netherlands	MS Ventures B.V.	Amsterdam	100.00	
Portugal	Laquifa Laboratorios S.A.	Algés	100.00	
Russia	Chemical Trade Limited	Moscow	100.00	
Russia	MedChem Limited	Moscow	100.00	
Russia	SAF-LAB	Moscow	100.00	
Switzerland	Asceneuron SA	Lausanne	80.00	
Switzerland	Calypso Biotech SA	Plan-les-Ouates	75.00	
United Kingdom	B-Line Systems Limited	Gillingham	100.00	
United Kingdom	Bristol Organics Ltd.	Gillingham	100.00	
United Kingdom	Fluka Chemical Company, Ltd.	Gillingham	100.00	
United Kingdom	Merck Cross Border Trustees Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hull	100.00	
United Kingdom	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hull	100.00	
United Kingdom	Merck Pension Trustees Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hull	100.00	
United Kingdom	Nature's Best Health Products Ltd.	Tunbridge Wells	100.00	
United Kingdom	Sigma Chemical Co. Ltd.	Poole	100.00	
United Kingdom	Sigma Entity One Limited	Gillingham	100.00	
United Kingdom	UFC Ltd.	Gillingham	100.00	
United Kingdom	Ultrafine Limited	Gillingham	100.00	
United Kingdom	Webnest Ltd.	Gillingham	100.00	
United Kingdom	Wessex Biochemicals Ltd.	Poole	100.00	

Country	Company	Registered Office	Equity interest (%)	Thereof: Merck KGaA, Darmstadt, Germany (%)
North America				
United States	Aldrich-Boranes, Inc.	Milwaukee	100.00	
United States	Barton Real Estate Holdings, Inc.	St. Louis	100.00	
United States	Barton/Second Streets Redevelopment Corp.	St. Louis	100.00	
United States	Fluka Chemical Corp.	St. Louis	100.00	
United States	FMI Holdings, Inc.	St. Louis	100.00	
United States	GLM Holdings, Inc.	St. Louis	100.00	
United States	Midwest Consultants Co.	St. Louis	100.00	
United States	Research Organics Foreign Trade Corporation	Cleveland	100.00	
United States	S and F Properties, Inc.	Cleveland	100.00	
United States	Second President Properties Company	St. Louis	100.00	
United States	Sigma Chemical Corp.	St. Louis	100.00	
United States	Sigma-Aldrich China, Inc.	St. Louis	100.00	
United States	Sigma-Aldrich Subsidiary I Corp.	St. Louis	100.00	
United States	Techcare Systems, Inc.	St. Louis	100.00	
United States	TocopheRx, Inc.	Groton	65.78	
APAC				
Australia	Biochrom Australia Pty. Ltd.	Bayswater	100.00	
Australia	Proligo Australia Pty. Ltd.	Castle Hill	100.00	
Japan	BioReliance KK	Tokyo	100.00	
New Zealand	Sigma-Aldrich New Zealand Co.	Christchurch	100.00	
South Korea	SAFC Hitech Korea Ltd.	Yongin City	100.00	
Thailand	Sigma-Aldrich (Thailand) Co., Ltd.	Bangkok	100.00	

Country	Company	Registered Office	Equity interest (%)	Thereof: Merck KGaA, Darmstadt, Germany (%)
Latin America				
Dominican Republic	Merck Dominicana, S.R.L., a subsidiary of Merck KGaA, Darmstadt, Germany	Santo Domingo	100.00	
MEA				
Morocco	Merck Maroc S.A.R.L., a subsidiary of Merck KGaA, Darmstadt, Germany	Casablanca	100.00	
Nigeria	Merck Pharmaceutical and Life Sciences Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Lagos	100.00	
South Africa	Serono South Africa Ltd.	Johannesburg	100.00	
III. Associates not included at equity due to secondary importance				
Other European countries				
Switzerland	Prexton Therapeutics SA	Plan-les-Ouates	31.51	
Switzerland	Vaximm AG	Basel	24.66	
APAC				
South Korea	Soulbrain Sigma-Aldrich Ltd.	Gongju-Si	50.00	
MEA				
Israel	Neviah Genomics Ltd.	Yavne	69.00	7.75

Darmstadt, February 18, 2016

Karl-Ludwig Kley

Stefan Oschmann

Kai Beckmann

Belén Garijo Lopez

Marcus Kuhnert

Bernd Reckmann

RESPONSIBILITY STATEMENT

To the best of our knowledge, and in accordance with the applicable reporting principles, the consolidated financial statements of the Group give a true and fair view of the assets, liabilities, financial position and profit or loss of the Group, and the combined management report includes a fair review of the development and performance of the business and the position of the Group, together with a description of the material opportunities and risks associated with the expected development of the Group.

Darmstadt, February 18, 2016

Karl-Ludwig Kley

Stefan Oschmann

Kai Beckmann

Belén Garijo Lopez

Marcus Kuhnert

Bernd Reckmann

AUDITOR'S REPORT

We have audited the consolidated financial statements prepared by MERCK Kommanditgesellschaft auf Aktien, Darmstadt, Germany, comprising the Consolidated Income Statement, the Consolidated Statement of Comprehensive Income, the Consolidated Balance Sheet, the Consolidated Cash Flow Statement, the Consolidated Statement of Changes in Net Equity, and the Notes to the Group accounts, together with the Combined Management Report for the business year from January 1 to December 31, 2015. The preparation of the consolidated financial statements and the Combined Management Report in accordance with IFRSs, as adopted by the EU, and the additional requirements of German commercial law pursuant to § 315a (1) HGB [Handelsgesetzbuch "German Commercial Code"] and supplementary provisions of the articles of association are the responsibility of the parent company`s management. Our responsibility is to express an opinion on the consolidated financial statements and on the Combined Management Report based on our audit.

We conducted our audit of the consolidated financial statements in accordance with § 317 HGB [Handelsgesetzbuch "German Commercial Code"] and German generally accepted standards for the audit of financial statements promulgated by the Institut der Wirtschaftsprüfer [Institute of Public Auditors in Germany] (IDW). Those standards require that we plan and perform the audit such that misstatements materially affecting the presentation of the net assets, financial position and results of operations in the consolidated financial statements in accordance with the applicable financial reporting framework and in the Combined Management Report are detected with reasonable assurance. Knowledge of the business activities and the economic and legal environment of the Group and expectations as to possible misstatements are taken into account in the determination of audit procedures. The effectiveness of the accounting related internal control system and the evidence supporting the disclosures in the consolidated financial statements and the Combined Management Report are examined primarily on a test basis within the framework of the audit. The audit includes assessing the annual financial statements of those entities included in consolidation, the determination of entities to be included in consolidation, the accounting and consolidation principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements and Combined Management Report. We believe that our audit provides a reasonable basis for our opinion.

Our audit has not led to any reservations.

In our opinion, based on the findings of our audit, the consolidated financial statements comply with IFRSs, as adopted by the EU, the additional requirements of German commercial law pursuant to § 315a (1) HGB and supplementary provisions of the articles of association and give a true and fair view of the net assets, financial position and results of operations of the Group in accordance with these requirements. The Combined Management Report is consistent with the consolidated financial statements and as a whole provides a suitable view of the Group's position and suitably presents the opportunities and risks of future development.

Frankfurt/Main, February 19, 2016

KPMG AG
Wirtschaftsprüfungsgesellschaft

Original German version signed by

Braun
Wirtschaftsprüfer

Rackwitz
Wirtschaftsprüfer

BUSINESS DEVELOPMENT 2011 – 2015

This overview may include historically adjusted values in order to ensure comparability with 2015.

€ million
Earnings performance
Net sales[1]
Operating result (EBIT)
Margin (% of net sales)[1]
EBITDA
Margin (% of net sales)[1]
Exceptionals
EBITDA pre exceptionals
Margin (% of net sales)[1]
Profit before income tax
Profit after tax
Earnings per share (in €)[2]
Assets and liabilities
Total assets
Non-current assets
of which:
Intangible assets (incl. goodwill)
Property, plant and equipment
Current assets
of which:
Cash and cash equivalents
Trade accounts receivable[3]
Inventories
Financial liabilities
Current
Non-current
Net equity
Liquidity
Investments in intangible assets[4]
Investments in property, plant and equipment[4]
Business free cash flow
Net financial debt
Other key data
Equity ratio (in %)
Research and development costs
Dividend per share before share split (in €)[5]
Dividend per share after share split (in €)[5]
Employees (number as of December 31)

[1] The composition of net sales has changed, see "Changes accounting and measurement principles and disclosure changes" in the Notes to the Group accounts; fiscal 2011 to 2014 have been adjusted accordingly.
[2] Taking into account the share split in 2014; fiscal 2011 to 2013 have been adjusted accordingly.
[3] The composition of trade accounts receivable has changed, see "Changes to accounting and measurement principles and disclosure changes" in the Notes to the Group accounts; fiscal 2014 has been adjusted accordingly.
[4] According to the consolidated cash flow statement.
[5] In fiscal 2014, a 2:1 share split took place.
[6] Proposal on the appropriation of profits for 2015.

2011	2012	2013	2014	**2015**	Change in %
9,922	10,756	10,735	11,363	12,845	13.0
1,132	964	1,611	1,762	1,843	4.6
11.4	9.0	15.0	15.5	14.3	
2,731	2,360	3,069	3,123	3,354	7.4
27.5	21.9	28.6	27.5	26.1	
7	– 605	– 184	– 265	– 276	4.1
2,724	2,965	3,253	3,388	3,630	7.1
27.5	27.6	30.3	29.8	28.3	
839	709	1,389	1,557	1,487	– 4.5
618	579	1,209	1,165	1,124	– 3.5
1.39	1.30	2.77	2.66	2.56	– 3.8
22,122	21,643	20,819	26,010	38,007	46.1
15,723	15,017	13,434	15,530	30,657	97.4
11,764	10,945	9,867	11,396	25,339	122.4
3,113	2,954	2,647	2,990	4,009	34.1
6,399	6,626	7,385	10,480	7,350	– 29.9
938	730	981	2,879	832	– 71.1
2,328	2,115	2,021	2,220	2,738	23.4
1,691	1,534	1,474	1,660	2,620	57.8
5,539	4,454	3,698	5,637	13,713	143.3
1,394	1,091	440	2,076	4,097	97.3
4,145	3,362	3,257	3,561	9,616	170.0
10,494	10,415	11,069	11,801	12,855	8.9
80	144	110	143	179	25.0
366	329	407	481	514	6.9
2,262	2,969	2,960	2,605	2,766	6.2
3,484	1,926	307	559	12,654	–
47.4	48.1	53.2	45.4	33.8	
1,514	1,511	1,507	1,704	1,709	0.3
1.50	1.70	1.90	–	–	
–	–	–	1.00	1.05[6]	5.0
40,676	38,847	38,154	39,639	49,613	25.2

Information and Service

The Annual Report for 2015 was published in German and English. A fully navigable online version of the report along with the consolidated financial statements is available on the Web at ar2015.emdgroup.com. It has been optimized for mobile devices.

More information about our company can be found on the Web at www.emdgroup.com and in the brochure “Who we are”, which you may read at www.emdgroup.com/emd/company/publications/publications.html.

You can order all publications from Group Communications, Merck KGaA, 64271 Darmstadt, Germany, comms@emdgroup.com.

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Merck KGaA, Group Communications
Frankfurter Strasse 250,
64293 Darmstadt, Germany
Telephone: +49 6151 72–0
Fax: +49 6151 72–5577
E-Mail: comms@emdgroup.com
Website: www.emdgroup.com

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Financial Calendar for 2016

March

Tuesday, March 8, 2016
Annual Press Conference

April

Friday, April 29, 2016
Annual General Meeting

May

Thursday, May 19, 2016
Report on the first quarter

August

Thursday, August 4, 2016
Report on the second quarter

November

Tuesday, November 15, 2016
Report on the third quarter

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