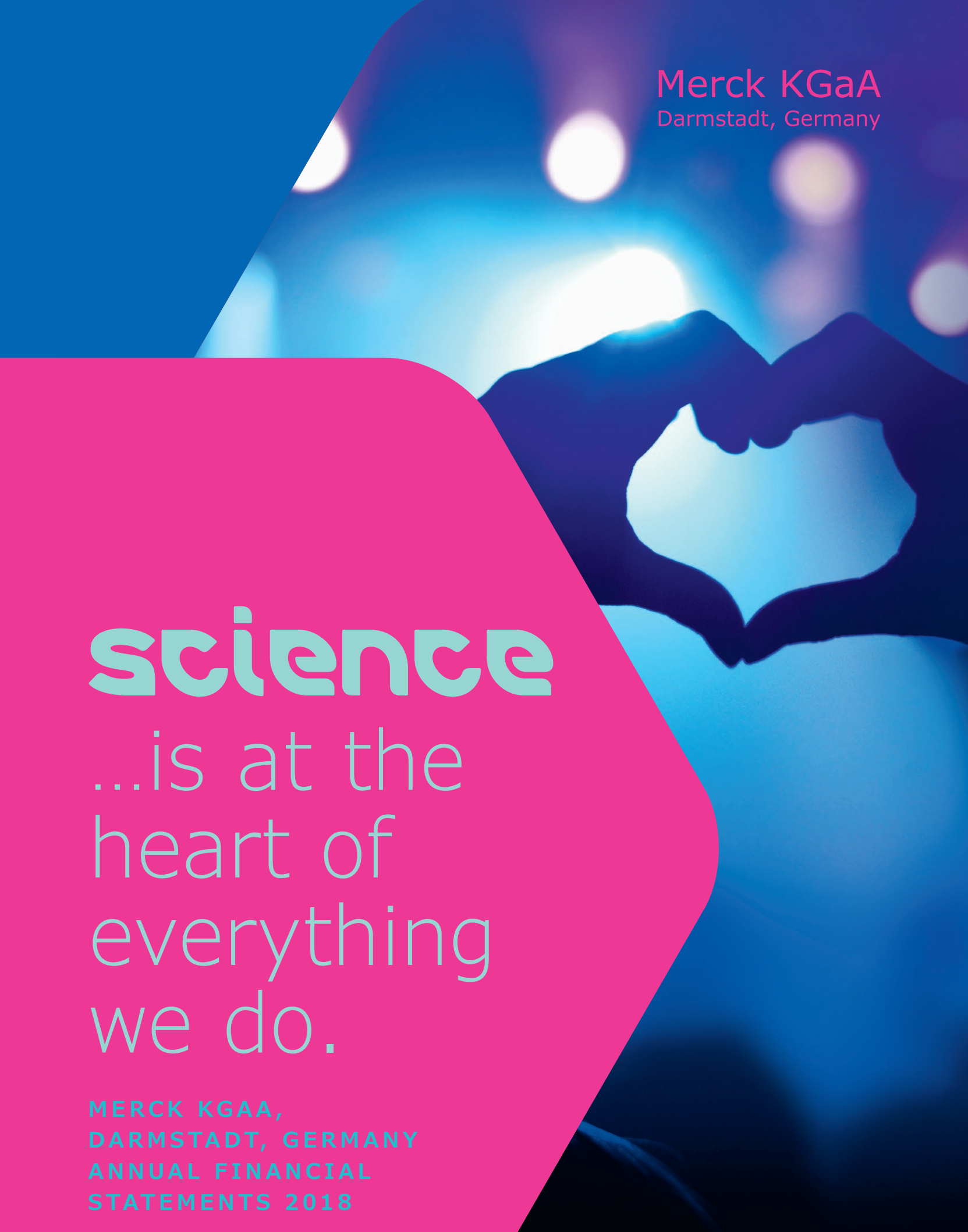
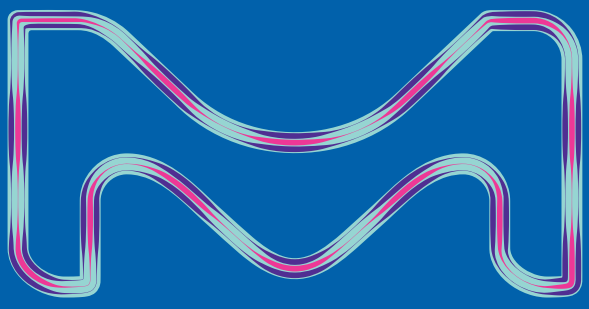
Merck KGaA
Darmstadt, Germany



science

...is at the heart of everything we do.

MERCK KGAA, DARMSTADT, GERMANY ANNUAL FINANCIAL STATEMENTS 2018



DISCLAIMER

€ 2.2 BILLION
invested in research and development in 2018.

Around **52,000**
hearts beat for science.

Employees in **66** countries share a passion for pushing boundaries and making new discoveries.

Since **1668**, our name has stood for the positive power of science.

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MANAGEMENT REPORT

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Management Report

The management report for Merck KGaA, Darmstadt, Germany, has been combined with the Group management report and published in the 2018 Annual Report of the Group. The annual financial statements and the combined management report of the Group and Merck KGaA, Darmstadt, Germany, for 2018 are filed with the electronic German Federal Gazette (elektronischer Bundesanzeiger) and are available on the website of the German company register.

Fundamental Information about the Group

The Group

We are a vibrant science and technology company. Science is at the heart of everything we do. It drives the discoveries we make and the technologies we create. Our work makes a positive difference in millions of people's lives every day.

In Healthcare, we discover unique ways to treat the most challenging diseases such as multiple sclerosis and cancer. Our Life Science experts empower scientists by developing tools and solutions that help deliver breakthroughs more quickly. And in Performance Materials, we develop science that sits inside technologies and changes the way we access and display information.

Everything we do is fueled by a belief in science and technology as a force for good. A belief that has driven our work since 1668 and will continue to inspire us to find more joyful and sustainable ways to live. We are curious minds dedicated to human progress.

We operate globally under our corporate brand. The only exceptions are Canada and the United States. In these countries, we operate as EMD Serono in the biopharmaceutical business, as MilliporeSigma in the life science business and as EMD Performance Materials in the high-tech materials business.

In November, we announced the intent to form a joint venture under the brand name Syntropy, a joint venture with technology and software company Palantir Technologies. Syntropy is expected to empower scientists and research centers with a collaborative technology platform to advance cancer research, help drive scientific discovery and improve human lives.

Apart from our three business sectors, our financial reporting presents the five regions Europe, North America, Asia-Pacific (APAC), Latin America as well as Middle East and Africa (MEA). As of December 31, 2018, we had 51,749 employees worldwide[1], which compares with 52,941 on December 31, 2017.[2]

Healthcare

Our Healthcare business sector comprises the two businesses Biopharma and Allergopharma. On December 1, our Consumer Health business tranferred to Procter & Gamble (P&G). Since 2015, Belén Garijo has been CEO of the Healthcare business sector and member of the Executive Board. In 2018, Healthcare generated 42% of Group sales and 37% of EBITDA pre (excluding Corporate and Other), making it the largest of our three business sectors. The regions Europe and North America generated 58% of Healthcare's net sales in 2018. In recent years, we have steadily expanded our presence in growth markets. In 2018, Asia-Pacific and Latin America accounted for 35% of sales.

BIOPHARMA

Our Biopharma business discovers, develops, manufactures and markets innovative pharmaceutical and biological prescription drugs to treat cancer, multiple sclerosis (MS), infertility, growth disorders as well as certain cardiovascular and metabolic diseases. Biopharma is the larger of our Healthcare businesses and operates in four franchises: Oncology, Neurology & Immunology, Fertility and General Medicine & Endocrinology. Our R&D pipeline positions us with a clear focus on becoming a global specialty innovator in oncology, immuno-oncology and immunology including MS.

2018 marked the 20th anniversary of the European Commission's approval of our top-selling product Rebif® (interferon beta-1a), a disease-modifying drug used to treat relapsing forms of MS, acting in a way similar to that of interferon beta protein produced by the human body. Rebif®, which was approved in Europe in 1998 and in the United States in 2002, is registered in more than 90 countries worldwide. Rebif® has been proven to delay the progression of disability, reduce the frequency of relapses and reduce magnetic resonance imaging (MRI) lesion activity and area.

2018 also saw further launch progress of Mavenclad® (cladribine tablets), with approvals encompassing more than 40 countries. In addition, in July, the FDA accepted the resubmission of the New Drug Application (NDA) for cladribine tablets. The acceptance indicates that the FDA found the company's resubmission sufficiently complete to permit a substantive review. We view Mavenclad® as a complementary new oral treatment option in our MS product portfolio. Our MS treatment Rebif® is and remains a well-established therapy.

In March, we announced positive Phase IIb data for the first Bruton's tyrosine kinase (BTK) inhibitor to show clinical proof-of-concept in relapsing MS, namely evobrutinib, a highly specific, oral BTK inhibitor, and we further demonstrated our commitment to improving the lives of people with MS and other chronic progressive diseases via scientific advances and new data on our marketed and pipeline therapies (further details can be found under "Research & Development").

[1] The Consumer Health business was transferred to Procter & Gamble (P&G) on December 1, 2018, and was already classified as a discontinued operation according to IFRS 5 in April 2018. With the completion of the sale, around 3,300 employees joined P&G.

[2] The Group also has employees at sites which are not fully consolidated subsidiaries. These figures refer to all people directly employed by the Group and therefore may deviate from figures in the financial section of this report.

Erbitux® (cetuximab) remains the second-best-selling drug in terms of revenue in the portfolio of our Biopharma business and is our flagship product in oncology. Treating more than 900,000 patients since authorization, the product is a standard of care for patients with epidermal growth factor receptor (EGFR)-expressing, RAS wild-type metastatic colorectal cancer (mCRC), as well as both recurrent and/or metastatic and locally advanced squamous cell carcinoma of the head and neck (SCCHN). We continue to invest in Erbitux® and are committed to making it available to those patients it will benefit most.

Together with Pfizer Inc., we are developing much-needed new treatment options for patients with hard-to-treat cancers. We have made key progress in this area, with regulatory approvals in 46 countries for our anti-PD-L1 antibody avelumab under the brand name Bavencio®. In 2018, approvals were granted in several countries including Australia and Brazil for Merkel cell carcinoma (MCC), Israel for both MCC and urothelial carcinoma (UC) and Canada for UC. Bavencio® was initially granted two approvals in 2017 by the U.S. Food and Drug Administration (FDA) for the treatment of adults and pediatric patients 12 years and older with metastatic MCC and previously treated patients with locally advanced or metastatic UC. These indications were approved under accelerated approval based on tumor response rate and duration of response. Continued approval for these indications may be contingent upon verification and description of clinical benefit in confirmatory trials. The prognosis for both patient groups is very poor, so for patients around the world this may represent a welcome new treatment option.

The Bavencio® approvals were based on data from our comprehensive clinical development program JAVELIN, which currently comprises at least 30 clinical programs, including several Phase III trials and over 9,000 patients evaluated across more than 15 different tumor types. In addition to MCC and UC, these cancers include gastric/gastro-esophageal junction, head and neck, non-small cell lung, ovarian and renal cell carcinoma.

We are continuing to explore all potential options and have entered into a number of strategic collaborations to evaluate avelumab in combination with a range of complementary oncology medicines (further details can be found under “Research & Development”). Key data from the JAVELIN program were presented at major medical congresses in 2018, including the European Society for Medical Oncology Congress (ESMO), where we shared promising new results from the Phase III JAVELIN Renal 101 study evaluating avelumab in combination with axitinib compared with sunitinib as initial therapy for patients with advanced renal cell carcinoma.

Earlier pipeline highlights included the presentation of new data for M7824 (TGF-β-trap/anti-PD-L1) in a range of tumors, adding to existing evidence for the potential of this bifunctional immunotherapy and supporting our plans to continue its exploration in advanced solid tumors and ongoing cohort expansions. Additionally, in August we initiated a trial to investigate M7824 compared with pembrolizumab as a first-line treatment in patients with PD-L1-expressing advanced non-small cell lung cancer (NSCLC). In December, the FDA granted orphan drug designation to M7824, its first regulatory designation, for the treatment of biliary tract cancer (further details can be found under “Research & Development”). Data shared for oral MET inhibitor tepotinib included positive results in NSCLC and advanced hepatocellular carcinoma (HCC). We are currently assessing the potential of investigating tepotinib in combination with novel therapies for the treatment of advanced HCC after the two HCC Phase II trials met their primary endpoints, with clinical activity and safety demonstrated both as first-line and second-line treatment. Both M7824 and tepotinib were discovered in-house at our company.

Being the global market leader in fertility drugs and treatments, with a unique and broad portfolio from therapeutics to technologies, our Fertility franchise is an important growth driver for our Biopharma business. Infertility represents an increasing challenge globally due to demographic changes and growing lifestyle trends like delayed childbearing. In this highly specialized market, the focus lies on quality, standardization and outcomes. With our portfolio we are confident of being well-equipped to face the challenges in this field, aiming to be the preferred fertility treatment partner of our customers and offering innovative solutions across therapeutics, lab technologies, connectivity and services.

The Pergoveris® Pen is the first product with a combination of recombinant follicle-stimulating hormone (FSH) and recombinant luteinizing hormone (LH) in a ready-to-use liquid version, eliminating the need for mixing. It thus provides an improved and convenient treatment option for women with severe deficiency of both FSH and LH, a group of patients that is difficult to treat. Launches will continue. The number of countries in which Pergoveris® Pen has launched reached 13 in 2018 and we will continue to provide patients with access to this innovative therapeutic.

In addition, we launched two new technologies at the annual meeting of the European Society of Human Reproduction and Embryology (ESHRE) in Barcelona. Our connectivity platform QBOX IVF streamlines the data transfer between lab instruments and electronic medical records, improving data management across the clinic. Geri® Assess 2.0 extends our innovative software portfolio, enabling automatic detection of key events in embryo and blastocyst development.

During the ESHRE meeting we also introduced our new online platform, www.fertility.com. It is the gateway to two online portals: one for healthcare professionals, offering the latest scientific information in the advancing field of fertility, and one supporting women, men and couples who are looking for information about fertility and/or undergoing fertility treatment.

Every day, more than 66 million patients around the world use our trusted general medicine and endocrinology (GM&E) medications. Today, Concor®, Euthyrox®, Glucophage® and Saizen® are highly valued brands and market leaders in many key markets around the world. As a result, in terms of sales GM&E is the largest business franchise of the Healthcare business sector, with strong growth in all major therapeutic areas of focus, contributing significantly to the overall profitability of Biopharma and Merck KGaA, Darmstadt, Germany. Although no longer patent-protected, the brand equity built over decades makes our flagship products cornerstones for the treatment of chronic cardiovascular, metabolic and endocrine diseases.

Concor®, containing bisoprolol, is the leading beta-blocker for chronic cardiovascular diseases such as hypertension, coronary artery disease and chronic heart failure. Euthyrox®, with the active ingredient levothyroxine, is the worldwide market leader with a market share above 40% for the treatment of hypothyroidism, a disease with high prevalence but still low diagnosis rates in most emerging markets. Glucophage®, containing the active ingredient metformin, is the drug of choice for first-line treatment of type 2 diabetes. During 2018, several health authorities worldwide continued to authorize Glucophage® for prediabetes when intensive lifestyle changes have failed. This indication for Glucophage® is now approved in 40 countries. Due to an increasing prevalence of diabetes we see great potential for this product.

We also help to raise awareness and education in the areas we operate in, such as thyroid diseases and diabetes. This is well demonstrated by our active role in International Thyroid Awareness Week and partnership with the International Diabetes Federation (IDF), which serves as a basis for implementation of education and communication activities emphasizing the importance of type 2 diabetes prevention.

Earlier in the year we announced our collaboration with U.S.-based Medisafe to help our cardiometabolic patients better manage medication intake and adhere to prescribed treatment regimens. In the countries of scope, our patients will have access to a customized version of Medisafe's mobile platform that could combine reminders, motivation and support systems, targeted content, coupons and interventions in their local language.

Saizen® (somatropin) is our main endocrinology product and is indicated for the treatment of growth hormone deficiency in children and adults. Saizen® is delivered with the Easypod® electromechanical injection device, the only growth hormone injection device of its kind. Easypod® is able to wirelessly transfer data such as injection times, dates and doses to the web-based software system Easypod® connect, making it easier for healthcare practitioners and patients to ensure adherence and reach their treatment goals.

CONSUMER HEALTH

Our Consumer Health business tranferred to P&G on December 1. The cash purchase price was approximately € 3.4 billion. The transaction comprises the Consumer Health business in 44 countries with more than 900 products and two production facilities in Spittal (Austria) and Goa (India). Around 3,300 employees have transferred to P&G. The successful completion of the transaction marks a further step in our company's strategic focus on innovation-driven businesses.

ALLERGOPHARMA

Our allergy business Allergopharma is one of the leading companies in the field of allergy immunotherapy (AIT) in Europe. For high-precision, effective allergy therapy, we offer comprehensive diagnosis solutions as a basis for individual treatment concepts. Our AIT products concentrate on causal treatment of type 1 allergies such as allergic rhinitis (for example, hay fever) and allergic asthma to meet patients' needs. For AIT, strong evidence of efficacy and an acceptable safety profile have been well-documented in allergy-induced allergic rhino-conjunctivitis in numerous clinical trials. Furthermore, there is a potential positive effect on the long-term course of the allergic disease. AIT is designed to induce tolerance in the immune system of the allergy patient to the allergy-triggering allergen, thus potentially inducing an immune modification.

We offer high dosage, hypoallergenic, standardized preparations for allergen-specific immunotherapy for pollen and house dust mite allergies as well as a wide range of diagnostic allergy tests. Based on long-standing expertise, scientific excellence and entrepreneurial responsibility, we do our utmost to provide physicians with first-class therapy options and help people with allergies lead more fulfilled lives. Products of Allergopharma are available in 18 countries worldwide.

Life Science

In Life Science, we are a leading, global supplier of tools, high-grade chemicals, and equipment for academic labs, biotech and biopharmaceutical manufacturers, as well as the industrial sector. We make scientific discovery easier and faster with technologies like CRISPR for gene-editing; and we provide drug manufacturers with process development expertise that make medicines safer and more effective for patients. We offer both testing kits and services to ensure that our food is safe to eat and water is clean to drink.

In Life Science, our purpose is to solve the toughest problems in life science by collaborating with the global scientific community. Since acquiring the chemical and technology company Sigma-Aldrich in 2015, we have put a strategy in place that we continue to execute today: complete the integration of Sigma-Aldrich; strengthen our core businesses by delivering a broad and relevant portfolio to our customers and establishing new pillars of growth in scientific areas like cell and gene therapy and continuous bioprocessing. As ranked by sales, our Life Science business sector has achieved a top-three ranking in the global life science industry.

Udit Batra was named CEO of the Life Science business sector in 2014 and was appointed to the Executive Board in 2016. In 2018, Life Science generated 42% of Group sales as well as 44% of EBITDA pre (excluding Corporate and Other).

Our portfolio comprises more than 300,000 products ranging from lab water systems to genome-editing tools, antibodies and cell lines, as well as end-to-end bioprocessing systems to support the manufacturing needs of both emerging biotech and large pharma companies. For example, our Life Science business sector has built the expertise to further develop our BioReliance® End-to-End Solutions, a service offering for process development and manufacturing for emerging biotechs. Another example is BrightLab™, our digital ecosystem for complete lab management.

Our e-commerce platform, sigmaaldrich.com, continues to grow and connect customers in nearly every country with the products needed to advance their research, development and production efforts. In 2018, we implemented initiatives to optimize how our customers search and find our products, engage with our content and make purchasing decisions. With our teams' technical expertise and dedication to customer service, we continued to experience growth in both user sessions and revenue. This was recognized with three external awards.

In the first quarter of 2018, we made the first of several investment announcements. In February, we invested €40 million in Asia, which included an integrated cell culture facility in Songdo, Incheon, Korea; a new manufacturing and distribution center near Mumbai, India; and a single-use manufacturing facility in Wuxi, China. The Songdo center includes cell culture media facilities (imMEDIAte Advantage® Custom Media) and a logistics infrastructure to help meet the rapid growth in the biopharmaceutical industry in Songdo (Incheon, Korea). The new center in Mumbai, which is expected to be completed in 2019, is being built to ensure that our customers have ready access to the products needed to develop new therapies and biosimilars to accelerate access to health.

In June, we announced expansion plans to our operations in Gillingham, United Kingdom. The distribution center, which will grow by 5,250 square meters, will supply the pharmaceutical industry, biotechnology companies, research institutes and academic centers with biochemical and chemical reagents, laboratory supplies and testing services. The € 9 million investment will boost distribution capabilities for the business. Anticipated to open in early 2019, the updated facility will serve as the primary distribution center for the United Kingdom.

In September, we established our first Mobius® single-use manufacturing facility in China to support the development of the biopharma industry in the region. This facility, which is expected to be operational by the first quarter of 2019, will provide flexible and customized single-use solutions to support local customers in accelerating drug development and manufacturing.

In the second half of 2018, we opened a € 13 million (SG $ 20 million), 3,800-square-meter laboratory in Singapore, the only lab of its kind in Singapore and outside of the United States and the United Kingdom. The lab will focus on biologics testing, which is a major step in the drug development process.

In October, we also opened a new, 1,000-square-meter M Lab™ Collaboration Center in São Paulo, Brazil, to serve the Latin America region. The lab, which is one of nine such centers around the world, includes a non-good manufacturing practice (non-GMP) pilot and bench scale labs for customers. This allows customers to engage in process development support, troubleshooting, demonstrations and hands-on training to explore new ways to increase productivity, improve processes and mitigate risks.

In addition to new facilities, in 2018 we also announced a new platform for our biopharmaceutical customers who manufacture monoclonal antibodies. In the third quarter, we launched our BioContinuum™ Platform, which addresses intensified bioprocessing and continuous manufacturing. Continuous bioprocessing integrates the typical batch-based, separate manufacturing steps into a connected process, enabling a continuous flow from the addition of raw materials through product harvest, purification and testing. Pilot studies suggest that conversion to such a manufacturing method may reduce manufacturing costs by up to 50%.

A key goal for our Life Science business units is to help our customers that manufacture drugs, from small to large innovator companies, bring life-enhancing medicines and therapies to market – and

to patients – faster. To facilitate reaching this target, we opened our first BioReliance® End-to-End Biodevelopment Center in North America in June 2018. This center supplies drug manufacturers with complete solutions for the development of cell lines, upstream processes and downstream processes as well as production not subject to good manufacturing practices, or non-GMP production. The facility is designed to help customers with their biopharmaceutical manufacturing processes and accelerate clinical development from DNA to market.

Today, 60% of drugs in the pipeline are being developed by biotech start-ups focused on innovative therapies, including those intended to treat niche diseases with small patient populations. These companies are the focus of our global health commitment to support them in bringing their drugs to market through our grant programs. Grants provide these companies with free products and services of our company to help accelerate market entry of new therapies. Through our Advance Biotech Grant Program, every six months, three recipients around the globe are awarded a total of € 200,000 in services and products to address their process development challenges.

In February, we announced a two-year research collaborative with Washington University in St. Louis, Missouri, United States, that includes the use of our CRISPR genome-editing technology. The goal of the research is to determine the differences between gut bacterial communities in healthy and malnourished children, and to identify what features of healthy intestinal bacteria are critical for supporting healthy growth.

Further to these grants, in the second quarter of 2018, we announced three new partnerships with leading academic institutions. The first is a partnership with Oxford University's Jenner Institute, in the United Kingdom, which seeks to develop more robust and scalable vaccine manufacturing processes. A second collaboration, in addition to the aforementioned grant, is with Washington University in St. Louis, Missouri, United States, to optimize nutritional supplements to restore a healthy gut microbial community (microbiome). The third is a partnership with Tongji University in Shanghai, China, for our CRISPR Core Partnership Program to provide the university with exclusive access to our genome-editing technology and comprehensive technical support.

Related to our advancements in CRISPR, in December we announced a strategic alliance in the CRISPR/Cas9 rodent model market with France-based biotechnology company genOway. Through an exclusive worldwide license of our foundational CRISPR integration patents , genOway will develop new models and solutions allowing non-profit and for-profit scientists to use CRISPR/Cas9 technology. Under the agreement, genOway will also develop a network of sublicensees in both the model creation and distribution businesses and preclinical services for all potential applications worldwide, with a strong focus on the United States, Asia and Europe.

In addition to awarding grants to academic institutions, our businesses also extend to the wider community through SPARK, our global volunteer program. In 2018, through this initiative, nearly 1,700 employees volunteered nearly 9,000 hours to engage 66,500 students around the world in science learning. For the second year, our Curiosity Cube™, mobile science lab toured North America, traveling 30,000 kilometers and engaging approximately 36,000 students at schools and city centers in 24 communities.

In 2018, we served as the exclusive sponsor of TeleScience, a new online platform for Seeding Labs, an organization that provides scientists in developing countries with lab equipment, training and opportunities to collaborate with experts in their field. To date, our partnership with Seeding Labs has enabled the organization to equip 65 universities in 34 developing countries with 77 shipments (containing nearly 200 tons) of equipment, providing access to the global scientific community and helping to accelerate scientific research.

In October, we announced an agreement to sell our Amnis® Flow Cytometry and Guava® Technologies businesses to Luminex Corporation for € 63 million. The transaction transferred our flow cytometry platforms Amnis and Guava as well as the associated reagents under those brands. This included a portfolio of leading technologies serving the research space.

We will continue to actively manage our comprehensive portfolio by tapping into innovation and placing it in the best hands to continuously drive value for customers.

Performance Materials

Our Performance Materials business sector comprises our specialty chemicals business and supplies solutions for displays, computer chips and surfaces of all kinds. Effective April 1, 2018, Performance Materials comprises three business units: Display Solutions, Semiconductor Solutions and Surface Solutions. If we compare Performance Materials with a smartphone, Display Solutions represents the user interface, Semiconductor Solutions the intelligence and Surface Solutions the aesthetics.

On July 3, the Performance Materials business sector presented a strategy update explaining how, after 2019, it aims to achieve average annual sales growth of around 2% to 3% with an expected sustainable EBITDA pre margin of around 30%. We expect to be able to more than offset the decline in our liquid crystals business for displays with growth in the other businesses after 2019.

One pillar of the "Bright Future" transformation program is the realignment of Research and Development (R&D) as presented at the Capital Markets Day on October 16. In the wake of this realignment, the business sector is seeking to align its resources more

purposefully to the requirements of end customers. On top of this, decisions on the evaluation of projects and the allocation of resources are to be made centrally, and the business sector aims to push ahead with integrated and interdisciplinary R&D.

We are currently undergoing a transformation in the Performance Materials business sector with a view to adjusting to new market realities and customer requirements. We are building the foundations for the future. It is our strategic goal to return to sustainable profitable growth, to ensure an attractive margin and to remain competitive as Performance Materials. In order to achieve this, we have to optimize our cost base and to adopt our R&D ratio, which is far beyond industry benchmark. Our goal is a ratio of R&D investments compared to Sales of around 8%. This is at the upper end of what comparable companies invest in Research and Development. We are adjusting our cost structure in the Display Solutions and Integrated Supply Chain business units as well as in Research & Development, in particular.

Performance Materials accounted for 16% of Group sales in 2018 and its share of EBITDA pre (excluding Corporate and Other) was 19%. The EBITDA pre margin amounted to 32.7% of net sales.

Our Display Solutions business unit comprises the liquid crystals, OLED (organic light-emitting diodes), photoresists and liquid crystal windows businesses. Even though competition has intensified, we defended our position as the global market and technology leader in the display materials business in 2018. Modern, energy-efficient technologies such as UB-FFS (ultra-brightness fringe-field-switching) have further established themselves on the market. We have secured projects in the area of large-surface displays and for high-resolution mobile devices for our product offerings of the newly launched XtraBright™ brand.

The first commercial lighthouse projects in the architecture segment are running with our liquid crystal window modules. In October, we launched our new product brand, eyrise™. Its launch follows the opening of our production plant for liquid crystal window modules in Veldhoven, the Netherlands, at the end of 2017. Our business with photoresists for displays continues to consolidate thanks to proven technical success in high-performance product lines, in particular. This growth is supported by a strong position in new display production lines on the growing Chinese market. As a result of continuous improvements as well as substantial increases in the current lifetime and efficiency of the OLED materials in our portfolios, these materials have been selected for a large number of new devices being launched on the market.

Semiconductor Solutions, the second-largest business unit in Performance Materials, supplies products for integrated circuits, microelectronic systems, for antireflection coatings and for the miniaturization of transistor structures. Deposition materials and conductive pastes for semiconductor packaging round off the portfolio. We are continuously looking for new materials for metallization processes with low resistance and various dielectric characteristics for faster or better processors, servers and data storage density. Our business with dielectric materials for spin-on procedures is growing steadily. Furthermore, we are reporting rising demand for krypton fluoride (KrF) thick film resists, an important material in the production of 3D NAND staircase structures.

Materials for Directed Self Assembly (DSA) provide cost-effective patterning solutions which enable further chip scaling. DSA combines bottom-up with conventional top-down patterning. DSA uses a variety of different materials, in particular so-called block copolymers (BCP) that consist of two continuous, linked strands of different polymers. These BCPs have the ability to arrange themselves in even shapes along the conductive structure under certain conditions. They form the basis for the extremely fine transistors and printed circuit paths for the computer chips of the future. Our technological competence in combination with a strengthened supply chain have contributed to this growth.

In the Surface Solutions business unit our goal is to help customers with our materials and solutions to make innovative surfaces of all kinds more beautiful, more resistant or even more intelligent. Our pearlescent pigments enable striking automotive coatings, fascinating cosmetics, extraordinary packaging, innovative product design and even unique food creations. With our functional solutions we serve a large number of innovative applications, from dirt-repellent and easy-care surfaces to laser markings of plastic parts and cables.

On October 26, the Surface Solutions business unit announced that it would align itself even more closely with the needs of its markets. The future business areas of Surface Solutions will be automotive coatings, cosmetic solutions and industrial solutions.

Strategy

General principles

At our company, we believe in the opportunities of science, the transformational power of technology and the endless possibilities to change the lives of patients, researchers and customers. Our purpose is "We are curious minds dedicated to human progress". Science is at the heart of everything we do. It drives the discoveries we make and the technologies we create, it inspires our ideas and drives our entrepreneurial spirit.

We believe that scientific exploration and responsible entrepreneurship are key to technological advances that benefit us all. Our everyday decisions are guided by our company values. We want to live courage, achievement, responsibility, respect, integrity and transparency in every step we take, in every decision we make.

Together, we have defined the road ahead until 2022. This strategy is based on our Group Foundation, external trends that will impact our industry and a concrete map on how to reach our future ambition.

Group Strategy

THE TRANSFORMATIONAL JOURNEY SINCE 2007

Throughout the past years, our company has grown significantly through a series of strategic moves that have enabled us to develop into the vibrant science and technology company we are today. We have systematically and continuously strengthened and focused our portfolio of innovative science and technology throughout our business sectors. In Healthcare we divested our Generics business (2007) to focus on highly specialized products and acquired Serono (2007) to expand our pipeline and strengthen our business. This focused approach has continued until today with the divestments of the Biosimilars business (2017) and Consumer Health business (2018), so that we can increase our efforts on our Oncology, Immuno-oncology and Immunology franchises. Within Life Science, we have significantly transformed to become a diversified industry leader through the acquisition of Millipore (2010) and Sigma-Aldrich (2015). We continue to leverage the Sigma-Aldrich e-commerce platform to expand our reach and leadership in the industry as well as investing in strategic initiatives such as Gene Editing & Novel Modalities and End-to-End Bioprocessing. During this time, Performance Materials has continued to deliver profitable growth and a significant cash contribution, and we evolved this business further into attractive science and technology areas such as semiconductor materials through the acquisition of AZ Electronic Materials (2014), which also helped us further diversify our product portfolio that was strongly driven by liquid crystals.

Strategically, what we have achieved is the transformation of a classic chemicals and pharmaceuticals supplier into the vibrant science and technology company with leading positions in Healthcare, Life Science and Performance Materials. To further achieve our strategic goals from 2011 – 2017, we completed a transformation and growth program known as "Fit for 2018", primarily targeting organizational effectiveness and process optimization, and in the later years new initiatives such as the commencement of our Innovation Center in Darmstadt, new product innovations and our new brand.

THE ROADMAP

Our Group Strategy considers certain foundational elements such as, first and foremost, a risk diversification strategy that ensures that we are not over-exposed to any single customer, industry or region. We want to be a forward-thinking company generating long- term sustainable value. We focus our efforts and activities on innovative areas to add maximum value to the future of science and technology. We continue to operate under our current ownership structure with the Merck family, as a majority owner, and external shareholders. We aim to maintain an attractive financial profile. M&A (mergers & acquisitions) is an important part of our long-term value creation strategy with a focus on innovation-driven technology. In 2018, we further prioritized our activities in line with our strategic ambition to become the vibrant science and technology company. This includes the initiation of a new strategic approach in Performance Materials focused on the expanding electronics market, optimizing R&D through the efficient reallocation and adjustment of resources, and increasing our customer focus. In Healthcare, in addition to the aforementioned divestment of Consumer Health, we have continued our strategy of becoming a Global Specialty Innovator through continued development and externalization of selected pipeline projects. This way, we aim to ensure that promising products can be brought to the market quickly for the benefit of patients everywhere. Life Science is on track with the integration of Sigma-Aldrich and has continued along the path of science and technology leadership through its sustained investment and focus on its strategic initiatives of Gene Editing & Novel Modalities, which includes gene editing tools, viral and gene therapies, cellular therapies and RNA therapies, End-to-End Solutions for Bioprocessing and Connected Labs.

From now until 2022, we categorize our strategy as a period of growth and expansion, with all business sectors contributing to our growth ambition. In order to achieve our strategic ambition by 2022, we want to work on ensuring strong and innovative, specialty-focused pillars with strong positions in our priority growth areas, such as Oncology, Immuno-oncology and Immunology, Bioprocessing, and Semiconductor Solutions.

In more detail, it is our goal to continue to accelerate organic growth, expand our market footprint and sustain our leadership positions within our science and technology specialty areas. We have clearly defined goals, such as generating annual sales of at least € 2 billion by 2022 with products from our Healthcare R&D pipeline – products that we launched recently or expect to bring to market soon. In addition, we aim to double our Group sales in China. Healthcare shall contribute significantly to our growth ambition with the main drivers being new product launches and stable base business delivery. We expect Life Science to continuously target above-market growth with Process Solutions contributing significantly to this.

We expect the Performance Materials business sector to generate an EBITDA pre margin of around 30% after 2019. The business sector initiated the "Bright Future" transformation program. Besides the ambition to get back to organic top-line growth, the program focuses on resource allocation, process excellence and active portfolio management.

We aim to keep an attractive financial profile, regain our financial flexibility through stringent deleveraging and sustain our strong investment-grade rating. It is of utmost importance to us that we meet our obligations at all times through our diversified and profitable businesses as the basis for sustained cash flow generation. We are aiming to achieve sustained organic profitable growth, while targeted acquisition remains a growth option. We pursue 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. In addition, our Group Strategy is always aimed at delivering our ambition of becoming the vibrant science and technology company, and be an innovation leader within our fields of activity. We will therefore strive to achieve our strategy by continuing to focus on our three core priorities: "Performance", "People" and "Technology".

Performance

Our priority area "Performance" includes all activities that create sustainable, profitable growth. We have defined a strategic roadmap until 2022 to meet our ambition. Our primary aim is to deliver accelerated profitable growth through sustained core business delivery and selective portfolio strengthening.

In Healthcare, a successful 2018 included our innovative product launches of Bavencio® and Mavenclad®, which together reached around € 160 million in sales in 2018. Our Healthcare core business has grown consistently for many quarters and we continue to diligently develop and manage our pipeline of innovative medicines. The 2018 news flow clearly shows that our pipeline contains highly attractive and innovative assets in key indications, in various stages of the clinical development process.

Going forward, in Healthcare, we will drive our positioning as a global specialty innovator by fully leveraging our pipeline potential. Here we aim to focus and prioritize development of key pipeline projects, deliver multiple study readouts in major tumor types and ensure a regular inflow of promising early-stage projects to ensure the long-term pipeline potential. We expect that our pipeline will continue to progress quickly. It therefore requires regular prioritization and de-risking decisions, with strategic partnerships and external financing being key. At the same time, it is our goal to continue to profitably deliver on our core business while further expanding our global reach.

In Life Science, we have achieved our € 280-million synergies target for 2018 and a net sales organic CAGR of around 6% since 2015, which is around 200 basis points (bps) above the market average – despite the integration of Sigma-Aldrich. Furthermore, we started various innovation projects to support our industry-leading growth and profitability in the future.

We are a highly differentiated leader, positioned for sustained and profitable growth, in Life Science. Working towards 2022, our strategy is to sustain above-market growth in our core businesses, with a focus on our leadership in Bioprocessing and delivering on our strategic initiatives such as End-to-End Bioprocessing and Gene Editing & Novel Modalities. The business sector will concentrate on advancing the already favorable portfolio mix with exposure to growth market segments, full operating leverage driving margin progression, ensuring that our strategic initiatives enable sustained above-market growth and making capacity investments that support industry growth dynamics.

Despite a decline in sales and profits at Performance Materials in 2018, we remain a market leader in this sector. In parallel we embarked on a transformation program to deliver on our strategy of becoming a leading electronics solutions provider and established a new R&D framework.

The focus of Performance Materials is on bringing the business back to a 2 – 3% organic sales growth trajectory from 2020 onwards, implementing our 5-year "Bright Future" transformation program and ensuring efficient resource allocation to foster the EBITDA pre margin of around 30%. We aim to further strengthen Performance Material's position as a leading electronics solutions provider, ensure a stronger focus on existing end market needs and implement a rigorous innovation and project prioritization process.

China is a major innovation hotspot and one of our strategically most important growth markets. Cornerstones of our strategy are further localization via our Healthcare and Life Science production sites in Nantong and the OLED application center in Shanghai, the engagement of key stakeholders in the local environment and tapping into the Chinese innovation ecosystem via our future innovation hubs in Shanghai and Guangzhou. The establishment of both these hubs is already well underway, with scheduled openings in the second half of 2019. Together they will create a strong platform for us and our partners to drive innovation, while also significantly contributing to the range of our activities and general footprint in China.

People

Our People Strategy aims at building the capability of the organization to shape the future and to address how we as a science and technology company can create a working environment that meets our employees' individual needs and allows curiosity to unfold. Our growth strategy calls for people with diverse experience and backgrounds who work together on the basis of shared values to create innovation and respond flexibly to changing demands.

Moreover, it is crucial to be perceived as an attractive employer in the market in order to continue to capture the interest of potential employees. The fact that we rank among the world's best employers was also confirmed by the distinction as "Global Top Employer 2018" by the Dutch Top Employers Institute. In addition, we were ranked fifth among employers worldwide in the field of biotechnology and pharmaceutics by Science magazine, a leading peer-reviewed international scientific publication.

Our leaders play a decisive role in our new "People Strategy". We aim to place next to our employees leaders who will develop them for future requirements, not just current needs, and foster the diversity and unique strengths within the organization. At the same time, we want the leadership style of our managers to enable strategic innovation. On top of this, we promote curious talents who can solve complex problems and are passionate about the work they do. We will also strengthen results-driven teams and networks by valuing team collaboration and providing flexible frames for teams and individuals to drive.

In this process, it is our goal to take data-driven decisions, both when hiring new members of staff and in the personnel development of employees (people analytics). Another element of this strategy is the promotion of diversity, with a special focus on women and talent in Asia, and the use of the unique strengths and understanding of key customers and markets that these employees bring. We have to value different perspectives and encourage constructive conflicts.

We place great importance on the continuous advanced training and further development of our managers. This is essential for them to address the diverse needs of their team members and the changing requirements of the businesses and of digitalization. Our leaders are responsible for pushing our strategy ahead by building up the right competences, thereby fostering innovation. As part of this, they take calculated risks, set clear and inspiring direction to their employees and provide the requisite structures and resources.

In the context of the "People Strategy" we also want to look at new forms of cooperation and experiment with methods that result in better decision-making. For example, pilot initiatives focus on expanding our "Science Network" further. Through this project we are promoting the establishment of a science community within the company to accelerate the exchange of innovative ideas and improve the collaboration between all employees in the Research and Development sector. In the Healthcare sector, we have begun to deepen the awareness of unbiased decision-making. We want to support leaders to help them reflect on their decision-making processes and take unbiased decisions.

Technology

Our priority area "Technology" is twofold. It is inherent in our business sectors through our innovations, product pipelines and digitalization strategies. In addition, the ways in which we address cross-sector innovations is reflected in our approach to potentially disruptive technologies. It covers the closely interlinked areas of innovation and digitalization. Developing and marketing innovative products and services are at the forefront of our Group strategy and all the business strategies. Our objective is to foster innovations both within the businesses and between them as well as beyond existing businesses into areas in which we are not yet active. In particular, we want to capture the opportunities that digitalization offers in order to create value for patients, customers and business associates. To us, digitalization means the digital integration of our entire value chain, the digitalization of our products, services and communication interfaces to customers as well as the development of new digital business models. This is supported by state-of the-art methods to collect and analyze vast amounts of data. Another example is Syntropy, our intended joint venture with Palantir Technologies to advance cancer research. Syntropy is expected to empower scientists and research centers with a collaborative technology platform to advance cancer research, help drive scientific discovery and improve human lives. Research institutions around the world are generating a rapidly growing amount of biomedical data, but much of it is trapped in silos within and between institutions. Today, this critical data is often inaccessible to the scientists and clinicians who need it to advance their work. Syntropy aims to unlock the value of this untapped data, enabling the world's leading experts to collaborate in the fight against cancer and many other diseases.

Furthermore, we opened our Innovation Center in Darmstadt as a Group-wide infrastructural commitment to our science- and technology-driven growth. The Innovation Center aims to develop entirely new businesses beyond the current spectrum as well as bring together people, scientific expertise, technologies and skills from different areas under one roof. Our cross- and beyond-sector innovation offers incremental and disruptive ideas and aims to keep us ahead of the game. We are focusing on our activities within three core innovation fields of interest: Liquid Biopsy, Clean Meat and Biosensing and Interfaces. With liquid biopsies, a variety of diseases can be diagnosed through the detection of biomarkers in body fluids. This could be a key technology for early disease detection and for expanding the delivery of precision medicine to more patients. The innovation field Clean Meat comprises technological innovations to meet the world's growing demand for protein- and nutrient-dense foods made by ethical, eco-friendly methods. The innovation field of Biosensing and Interfaces focuses on the integration of electronics with the human body to create a digital human/biological interface. This could enable faster and more accurate (remote) health monitoring and treatment.

Additionally we focus on disruptive innovation beyond our currently established business sectors. To achieve innovation success, we transform ideas into businesses through different pathways. They include M Ventures, our strategic corporate venture capital fund, with a total volume of € 300 million. M Ventures invests in promising start-ups and businesses within our core business areas and in innovations outside these areas by providing financial and/or strategic value. Furthermore, our Digital Office works to generate new digital business opportunities within our areas of expertise. It also supports the existing businesses in selecting digital projects where maximum value for our company can be generated. The Innovation Ecosystem is responsible for scouting, ideating and delivering new internal projects across and beyond our current scope.

The transformation of our company towards a science and technology company is evident at our Darmstadt site, which we are growing into a center of excellence for science and technology. Our largest site in the world already stands for excellent research and development as well as production that creates value. Darmstadt is the only site at which all three of our business sectors have a presence. In addition to being global Group headquarters, Darmstadt is home to our Executive Board and Group functions. At our new Innovation Center in Darmstadt, internal and external experts collaborate on identifying trends of significance to our business and markets as well as generating technology-driven growth going forward. All in all, this site offers a very good foundation for implementing our Group strategy successfully.

Business strategies

HEALTHCARE

Our Healthcare business sector comprises the Biopharma and Allergopharma businesses. Our businesses specialize in key franchises and specific diseases. Global megatrends such as a growing world population and an increase in average life expectancy continue to drive the demand for our healthcare products. To meet these demands and respond appropriately to the dynamics of our healthcare markets, we have significantly transformed our Healthcare business sector in recent years.

Following on from the successes over the past two years, we continue to drive pipeline projects with the aim of bringing groundbreaking medicines to patients, maximizing our existing portfolio and continuing our expansion in growth markets. The ambition of the Healthcare business sector is to become a global specialty innovator, operating in franchises with significant unmet medical need and

bringing high value to patients and consumers. Therefore, we continue to invest in research and development to discover new treatment options and improve existing ones. Together with our stakeholders and partners, we want to ensure that people can access the medicines they need to stay healthy and live longer.

The first pillar of our strategy is to reinforce our global footprint, e.g. bringing the innovation of our pipeline to patients and grow our presence in the United States and in China. The emerging markets and China are expected to be the largest growth driver for our established products in the future. Managing the balance between delivery of innovative medicines while expanding reach and ensuring profitable growth of the existing business will be one of the strategic challenges.

The second pillar of our strategy is the focus on specialty medicine franchises. Here, we expect oncology, immuno-oncology and immunology markets to remain highly attractive in terms of size, growth prospects, and profitability. Within each specialty franchise, our approach is to develop deep internal expertise and insight from internal research to commercialization, augmented by external talent sourcing, strategic partnering and asset acquisitions. Fertility and Endocrinology offer significant opportunities to bring value to patients, with high profitability and growth potential; maximizing the commercial potential of these areas will remain important.

The third pillar of our aspiration is innovation: to develop high-quality, first-to-market and best-in-class therapies, and to build a portfolio in each of our franchises. We have streamlined our pipeline and expanded our innovation capabilities with strong investigational drug candidates. In order to maximize the output of our R&D investments and increase our chances of success in discovering and developing new therapies, we focus our expertise on specific franchises and are exploiting synergies in disease mechanisms and biological pathways. We are investing in digital technologies as well as personalized and translational medicine in order to drive continued pipeline success.

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 in strengthening our current portfolio. Here, we focus on balancing the right blend of internal capabilities and external partnerships, building strong collaborations with other leaders in the industry.

On December 1, 2018, we announced the completion of the sale of our Consumer Health business to Procter & Gamble. The divestment of Consumer Health was aligned with our strategy of focusing on our pipeline of innovative medicines.

LIFE SCIENCE

Since closing the acquisition of Sigma-Aldrich, in November 2015, Life Science's organic sales growth has exceeded that of the industry and has remained the highest among integrated peers.

The Life Science business sector is executing an ambitious strategy to capture near-term opportunities and to invest for future growth. Our integration is on track, and we have consistently outperformed the market during the largest integration in our history and that of the industry.

Our aspiration remains to reinforce our leadership position as a tools and equipment supplier that is solving the toughest problems in life science. This has allowed us to achieve quality growth with a well-leveraged balance sheet.

To sustain our leadership for the future, Life Science has established a strategy based on three key pillars:

1. Ensure operational excellence by focusing on creating value, building a strong organization and implementing consistent processes
2. Strengthen the core organization by rejuvenating chemistry and reagents, expanding our leadership in bioprocessing, continuing to access new growth areas and strengthening our e-commerce platform to maintain our leadership position
3. Establish new growth pillars through our four strategic initiatives: Gene Editing & Novel Modalities, BioReliance® End-to-End Solutions, BioContinuum® Platform and BrightLab™.

We began the year 2018 with a recently signed commercial supply agreement to manufacture viral vectors for bluebird bio, Inc., of Cambridge (Massachusetts, United States), a clinical-stage company that develops potentially transformative gene and cell therapies for severe genetic diseases and T-cell-based immunotherapies for cancer. As part of the multi-year agreement, we will manufacture lentiviral vectors for bluebird bio's drug products developed to treat a variety of rare genetic diseases.

Throughout 2018, we streamlined our business through integrating strategic initiatives, such as single-use technologies for Bioprocessing, into the base business. We expanded our foundational intellectual property for our CRISPR technology with patents in key markets in Asia Pacific, the Middle East and Europe. We also expanded our business sector through the opening of new facilities throughout Asia and South America.

Looking ahead, we expect our strategy to continue to deliver net sales growth ahead of the market and maintain our market leading EBITDA pre margin. Our priorities for 2019 are to continue to support new growth pillars with our Gene Editing & Novel Modalities offerings, as well as differentiated gene editing tools, drug safety systems and models, and clinical viral manufacturing. In addition, we will further develop our BioReliance® End-to-End Solutions, a service offering for process development and manufacturing for emerging biotechs as well as our BioContinuum™ Platform, to address intensified bioprocessing and continuous manufacturing. We will also focus on expanding the use of BrightLab™, our digital ecosystem for complete lab management.

PERFORMANCE MATERIALS

Performance Materials targets attractive end markets that are driven by megatrends: digitalization, urbanization, mobility and affluency will drive advanced electronic systems with semiconductors at their heart. As a result, electronics demand is expected to grow for the foreseeable future. Roughly 80% of our sales are currently linked to the electronics market, which of course includes our Semiconductor Solutions and Display Solutions business units, but also parts of Surface Solutions.

The remaining 20% of our sales relate to the automotive and cosmetics market served by Surface Solutions. We expect demand in these segments to likewise benefit from global trends such as increasing affluency in developing countries.

Within the electronics market, we are active in the field of semiconductor and display solutions, targeting a material market of about € 85 billion. We are already one of the largest players in this field, while operating in selected and highly attractive market segments. In coming years, we expect that the market for liquid crystal materials for TVs – still our largest business and one of the most attractive – will continue to decline. For us, after 2019, this development is expected to be more than offset by growth in OLED materials and photoresists as well as in semiconductor materials and our solutions for surfaces. As a result, we want to achieve an attractive average sales growth of 2 – 3% after 2019 and to generate EBITDA pre margins of around 30%, substantially above the specialty chemicals industry average.

We have a solid foundation: a strong global customer network, a proven track record of delivering high-tech solutions, an efficient production infrastructure and the highest quality standards throughout the industry. Our innovative solutions allow us to establish intimate and long-term customer relationships, and understand the changing requirements of end customers in markets as diverse as consumer electronics, automotive and cosmetics.

The market segments we operate in represent a well-balanced mix of new and fast-growing areas (such as deposition materials in Semiconductor Solutions or OLED materials in Display Solutions), but also more mature segments where we have established ourselves as the clear market leader (liquid crystals for Display Solutions, for example, or pearlescent pigments used for coatings).

Our priorities are:

- Focus on the attractive electronics market to achieve long-term organic growth perspective of 2 – 3% per year (CAGR)
- Allocate our resources more efficiently to maintain an above-industry EBITDA pre margin of around 30%
- Actively manage our portfolio and expand our partnership network
- Foster our customer-centric orientation with an integrated R&D approach to better serve market and customer needs

Strategic finance 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 can fulfill our obligations at all times. In this context, we pursue a conservative, proactive financing strategy in which we deploy a variety of financial instruments. We have diversified and profitable business activities as the basis for our strong and sustainable cash flow generation capacity. In addition, we have several sources of financing, including a € 2 billion syndicated loan facility that was renewed in 2018 and is in place until 2023 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 have a commercial paper program with a volume of € 2 billion at our disposal. Within the scope of this program, we can issue short-term commercial paper with a maturity of up to one year. Furthermore, in 2018 we used bilateral bank loan agreements with first-class banks in order to optimize the funding structure and cost.

The bond market additionally represents a key source of financing. The most recent bond issues took place in 2014 and 2015 in connection with the acquisition of Sigma-Aldrich. They have terms that run to 2025, with the first redemption options for hybrid bonds in 2021 and 2024. The use of various instruments provides a broad financing basis and addresses different investor groups.

MAINTAINING SUSTAINABLE AND RELIABLE BUSINESS RELATIONS WITH A CORE GROUP OF BANKS

We mainly work with a well-diversified, financially stable and reliable group of banks. 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, we involve them in important financing transactions.

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, an A rating from Standard & Poor's (S&P), and an A– rating from Scope, each with a stable outlook.

DIVIDEND POLICY

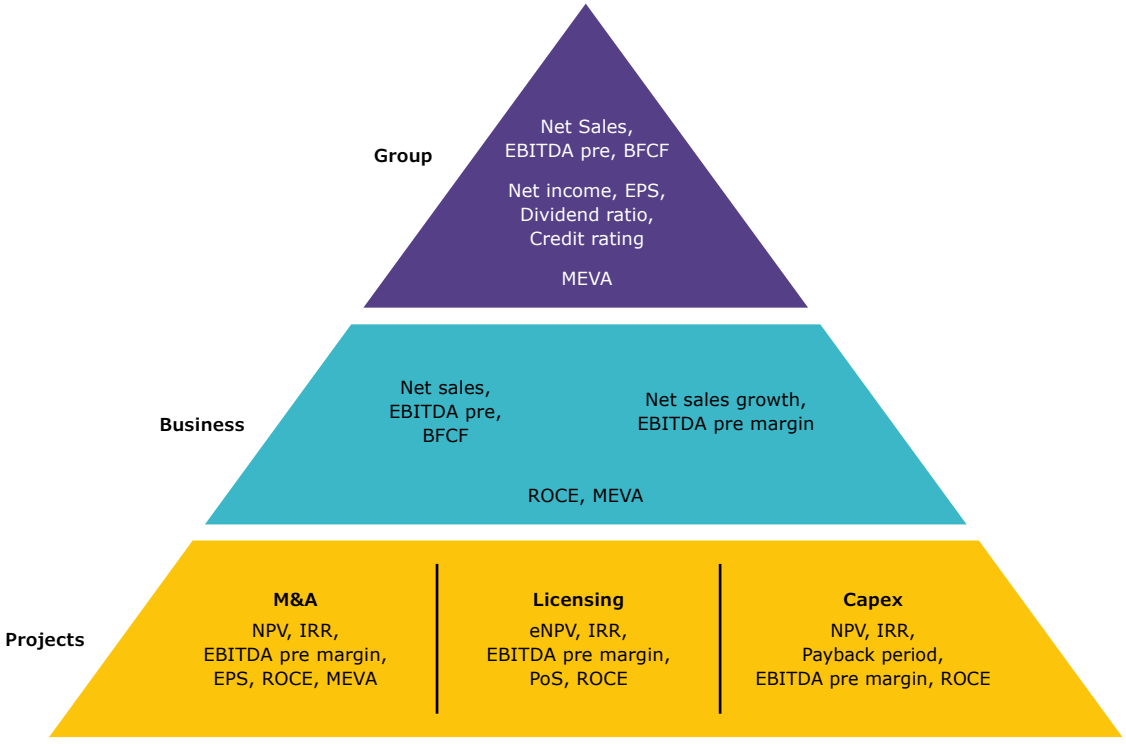
We are pursuing a sustainable dividend policy. Provided that the economic environment develops in a stable manner, the current dividend represents the minimum level for future dividend proposals.

The dividend policy is oriented towards 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 aim for a target corridor of 20% to 25% of earnings per share pre.

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[1].

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, namely Group, Business and Projects, each of which require the use of different indicators.



Abbreviations

EBITDA pre[1] = Earnings before interest, income tax, depreciation and amortization as well as adjustments
EPS = Earnings per share
MEVA[1] = Value added of Merck KGaA, Darmstadt, Germany
BFCF[1] = Business free cash flow
ROCE[1] = Return on capital employed
NPV[1] = Net present value
IRR[1] = Internal rate of return
eNPV[1] = expected Net present value
PoS[1] = Probability of success
M&A = Mergers & Acquisitions

[1] Not defined by International Financial Reporting Standards (IFRSs).

Key performance indicators of the Group and its businesses

The three key performance indicators of net sales, EBITDA pre and business free cash flow 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, services rendered to external customers, commission income and profit-sharing from collaborations, 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. Organic sales growth shows the percentage change in net sales versus a comparative period, adjusted for exchange rate and portfolio effects. Exchange rate effects may arise as a result of foreign exchange fluctuation between the functional non-euro currency of a consolidated company and the reporting currency (euro). By contrast, portfolio effects reflect sales changes due to acquisitions and divestments of consolidated companies or businesses.

GROUP

Net sales[1]

			Change	
€ million	**2018**	2017	€ million	in %
Net sales	**14,836**	**14,517**	**319**	**2.2%**

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.

EBITDA PRE

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

GROUP

Reconciliation EBIT to EBITDA pre[1,2]

			Change	
€ million	**2018**	2017	€ million	in %
Operating result (EBIT)[2]	**1,727**	**2,423**	**–696**	**–28.7%**
Depreciation and amortization	1,743	1,742	1	–
Impairment losses/reversals of impairment losses	58	–1	58	>100.0%
EBITDA[2]	**3,528**	**4,164**	**–636**	**–15.3%**
Restructuring expenses	46	61	–15	–24.6%
Integration expenses/IT expenses	142	188	–46	–24.4%
Gains (–)/losses (+) on the divestment of businesses	25	–310	335	>100.0%
Acquisition-related adjustments	2	63	–61	–97.2%
Other adjustments	58	81	–23	–28.1%
EBITDA pre[2]	**3,800**	**4,246**	**–446**	**–10.5%**

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.
[2] Not defined by International Financial Reporting Standards (IFRSs).

BUSINESS FREE CASH FLOW (BFCF)

Business free cash flow comprises the major cash-relevant items that the operating businesses can influence and are under their full control. It comprises EBITDA pre less investments in property, plant and equipment, software, advance payments for intangible assets, changes in inventories, trade accounts receivable as well as receivables from royalties and licenses. To manage working capital on a regional and local level, the businesses use the two indicators days sales outstanding and days in inventory.

GROUP

Business free cash flow[1,2]

			Change	
€ million	**2018**	2017	€ million	in %
EBITDA pre[2]	**3,800**	**4,246**	**–446**	**–10.5%**
Investments in property, plant and equipment as well as software and advance payments for intangible assets	–932	–1,012	80	–7.9%
Changes in inventories	–214	–18	–197	>100.0%
Changes in trade accounts receivable as well as receivables from royalties and licenses	–145	–22	–123	>100.0%
Elimination first-time consolidation of BioControl Systems	–	–2	2	–
Business free cash flow[2]	**2,508**	**3,193**	**–685**	**–21.4%**

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.
[2] Not defined by International Financial Reporting Standards (IFRSs).

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

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. 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 as well as intangible assets. 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 adjusted operating result (EBIT) pre 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 in property, plant and equipment as well as intangible assets 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, EARNINGS PER SHARE (EPS) AND EARNINGS PER SHARE PRE (EPS PRE)[1]

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 an alternative view, we also report earnings per share pre, in other words after the elimination of the effects of integration expenses, IT expenses for selected projects, restructuring expenses, gains/losses on the divestment of businesses, acquisition expenses and other adjustments. Moreover, amortization of acquired intangible assets as well as impairment losses on property, plant and equipment and intangible assets are eliminated. The adjustment excludes impairment losses on intangible assets for acquired research and development (R&D) projects below a threshold value of € 50 million. Income tax is calculated on the basis of the company's underlying tax rate. The following table presents the reconciliation of net income to net income pre for the calculation of EPS pre.

RECONCILIATION OF NET INCOME TO NET INCOME PRE[1, 2]

			Change	
€ million	**2018**	2017	€ million	in %
Net income	**3,374**	**2,605**	**769**	**29.5%**
Non-controlling interests	22	10	12	>100.0%
Profit after tax from discontinued operation	−2,303	−57	−2,246	>100.0%
Income tax	368	−428	796	>100.0%
Amortization of acquired intangible assets	1,175	1,198	−23	−1.9%
Adjustments[2]	327	64	264	>100.0%
Income taxes on the basis of the underlying tax rate[2]	−741	−814	73	−9.0%
Non-controlling interests to be adjusted	−3	−3	–	0.4%
Net income pre[2]	**2,219**	**2,574**	**−355**	**−13.8%**
Earnings per share pre[2] (in €)	**5.10**	**5.92**	**−0.82**	**−13.9%**

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.
[2] Not defined by International Financial Reporting Standards (IFRSs).

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, Standard & Poor's and Scope. 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 for our shareholders, we are pursuing a reliable dividend policy with a target payout ratio based on EPS pre (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.

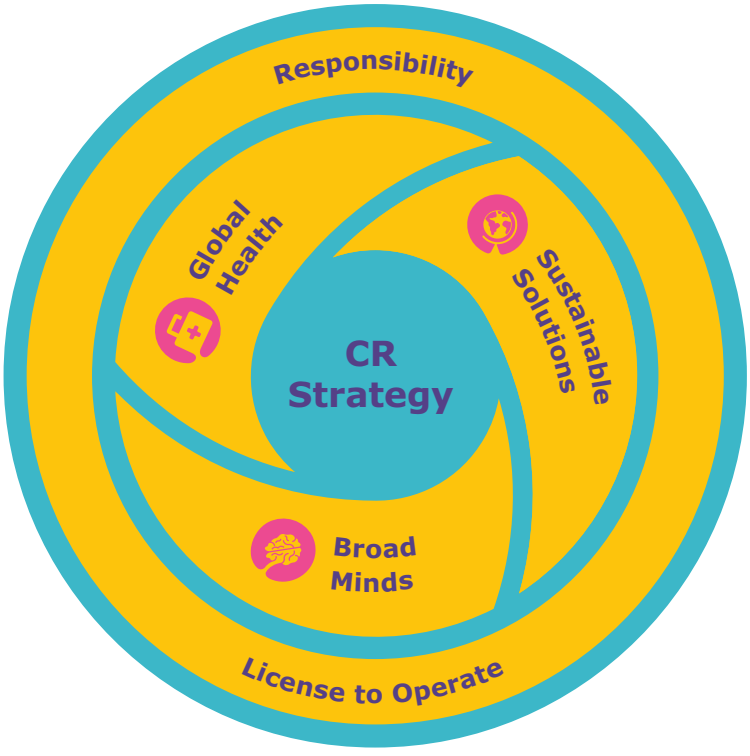
Corporate Responsibility

We take responsibility every day – and have been doing so for 350 years. This commitment is codified 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 steered by our CR Committee, which consists of representatives from our business sectors and relevant Group functions. The Chairman of the Executive Board and CEO is responsible for the committee, which is chaired by the head of the Group Corporate Responsibility unit.

Humankind is being confronted with global societal challenges such as climate change, resource scarcity and insufficient access to healthcare in low- and middle-income countries. Responsible governance can help solve these global issues. We believe that in pursuing this approach, we can also strengthen our financial performance. In 2018, we strategically repositioned ourselves: We focus even more on creating sustainable value for both our company and society. To achieve this, we are taking a shared value approach. We have adapted our three strategic spheres of activity to bring them more in line with our business. These spheres are organized under the headings of "Global Health", "Sustainable Solutions" and "Broad Minds". We focus our resources on those areas where we can have the greatest impact. The effects our actions have on society – such as the development of new products – should be considered strategically in their own right. Needless to say, we respect the interests of our employees, customers, investors and the community, and work to minimize ethical, economic and social risks, thereby sustainably contributing to our long-term corporate success.

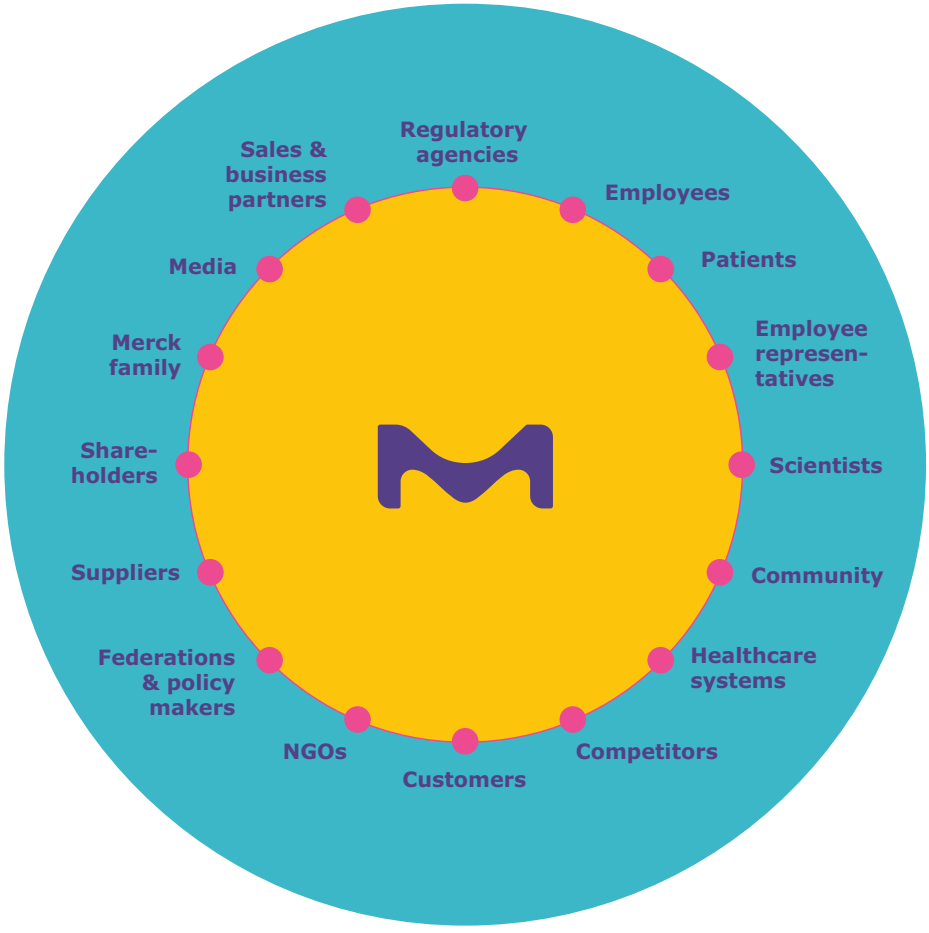


Global Health: In low- and middle-income countries, many people lack access to high-quality health solutions. We join forces with partners to provide local solutions and develop treatments for neglected tropical diseases in Africa. For instance, we are using praziquantel tablets to fight schistosomiasis. Through our Global Health Institute, we are developing diagnostics, therapies and preventive solutions to address infectious diseases such as malaria and therapeutic challenges such as antimicrobial resistance.

Sustainable Solutions: We are constantly working to improve the sustainability footprint of our products – even during their use phase – which also helps our customers achieve their own sustainability goals. To this end, we have established systematic approaches for product development such as Design for Sustainability, a program within our Life Science business sector that allows us to assess the sustainability of our products during development. Product developers use various tools, such as product lifecycle analyses.

Broad Minds: As a science and technology company, we endeavor to excite people about science, inspire curiosity and help creativity to soar. Our goal is to strengthen our reputation in the field of science, especially in those areas where we have particular expertise. We not only support educational programs for schools, but also back pioneering research at institutes of higher learning. Reflecting the way that music and literature inspire people, we promote a range of cultural initiatives worldwide. Creativity and curiosity are the bedrock of science, culture and art, and also underpin our holistic approach.

Our corporate responsibility efforts are aligned with the United Nations (UN) Sustainable Development Goals (SDGs), and we are working to help achieve this ambitious agenda by 2030. In addition to promoting the SDGs, we also support relevant responsible governance initiatives. Through our membership in the UN Global Compact we are committed to upholding the Compact's principles on human rights, labor standards, environmental protection and anti-corruption. We ensure that we live our own corporate responsibility



principles by following the guidelines of the Responsible Care Global Charter, which is an initiative of the International Council of Chemical Associations (ICCA). Responsible Care aims to help the chemical industry enhance its environmental, health and safety performance. We are also a member of the Chemie[3] initiative in Germany, 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). This globally unique alliance seeks to make sustainability a core part of the chemical industry's guiding principles and to drive the sector's position within the German economy as a key contributor to sustainable development.

To us, corporate responsibility means listening and taking action, and so we place great importance on dialogue with our various stakeholders. These stakeholders include employees, business associates, the Merck family, investors, regulatory agencies and industry associations. This continuous exchange creates transparency and clearly demonstrates how we live our values. In recognition of our dedication to responsible and sustainable business practices, we were again listed on the FTSE4Good index in 2018. Inclusion in this leading international sustainability index is only possible if a company meets stringent social, environmental and ethical behavior criteria.

Our good standing in other major sustainability indices was also maintained in 2018, with our inclusion in the STOXX Global ESG Leaders index, the Euronext Vigeo Eurozone 120 index and the Ethibel Sustainability Index (ESI) Excellence Europe. In early 2019, EcoVadis, an independent rating agency, granted us Gold status for our sustainability performance. EcoVadis assesses around 45,000 suppliers from 150 countries across the four categories of Environment, Social, Ethics and Sustainable Procurement.

Strategic sphere of activity: Global Health

Our aim is to create a healthier future for all: for individuals, communities and countries. We want to use innovation in science and technology to improve the health of underserved populations in low- and middle-income countries. To achieve this, we are leveraging our expertise from all business sectors and collaborating closely with a wide range of partners. We also participate in industry-wide initiatives and work closely with other businesses to develop new approaches.

In 2018, we refined our strategy for addressing the global needs that impact access to healthcare. Our strategy is designed to overcome barriers to access for underserved populations and communities in developing countries in a business-integrated and sustainable manner, thereby creating "shared value". For us, creating shared value means developing business models that increase the value and competitiveness of our company and at the same time solve unmet health needs and bring value to underserved populations. We want to be instrumental in the elimination of schistosomiasis and fight malaria and other infectious diseases while helping to build local capacity across the value chain and positioning our company as a leading and reliable partner.

The 2018 Access to Medicine Index continues to rank us in fourth place. Every two years, this index assesses the world's leading pharmaceutical companies on activities and initiatives they have implemented to promote access to medicine in developing countries. We received particular recognition for leading practices such as establishing our Global Health Institute to accelerate research and development (R&D) targeting schistosomiasis, malaria and bacterial infections, strengthening commitment to open innovation and establishing the Capacity Advancement Program to improve access to better diabetes, cancer, hypertension and fertility therapies in underserved regions.

Strengthen the availability of healthcare solutions

We research, develop and refine healthcare solutions that address unmet needs, tailoring them to local environments. With our Global Health Institute, we have defined a comprehensive portfolio of R&D projects to develop integrated health solutions. This includes treatments, diagnostics, preventive measures against infections and approaches to strengthen health systems, targeting schistosomiasis, malaria and bacterial infections. The Institute operates as a social business enterprise delivering innovations for the most vulnerable – with a special focus on women and children in the developing world.

This portfolio also includes the development of a new pediatric formulation of praziquantel to treat the worm disease schistosomiasis in children under the age of six, through the Pediatric Praziquantel Consortium, which is a public-private partnership. Marketing Authorization Application is planned for 2020, and we expect the product to be ready to launch in the first endemic countries in Africa in 2021.

For malaria, we are completing the Phase I/Ib clinical activities of our anti-malarial compound, which has the clear potential to treat and prevent malaria. In the drug discovery area, our strategic collaboration with the University of Cape Town in South Africa has led a new research and development platform. In 2018, this collaboration (including Medicines for Malaria Venture) was extended to continue screening activities with the aim of identifying new therapeutic solutions while building up research capacity in and for Africa. This program continues to leverage our proprietary chemical library of almost 100,000 compounds to identify new lead programs for the treatment of malaria. The program is co-funded by the German Federal Ministry of Education and Research.

We have developed a kit for malaria diagnosis based on our Muse® cell analyzer. It aims to accurately diagnose malaria and measure the type of malaria parasite as well as the infection level. The malaria kit was launched for research use in 2018. At the end of 2018, we divested the technology platform developed by our Life Science business sector to the U.S. laboratory supplier Luminex, which is now marketing the diagnostic kit.

Additionally, we are working towards demonstrating the efficacy of our product IR3535® for malaria prevention in Africa. The insect

repellent is already used for complementary prevention from vector-borne diseases, such as dengue fever or ZIKA. Products containing this active ingredient stand out due to their particularly good tolerance in young children and pregnant women. In 2018, we entered a collaboration to support the National Malaria Control Program in Ghana. Here we develop malaria prevention solutions based on IR3535®.

Address affordability challenges

Through intellectual property initiatives and equitable pricing strategies we are able to provide assistance to those people who are unable to pay for the health solutions they need. Publicly available databases enable us to be transparent about our patents and patent applications. To strengthen our commitment to the London Declaration to fight neglected tropical diseases, we formed a partnership with the Drugs for Neglected Diseases initiative (DNDi), under which we are involved in the Drug Discovery Booster project for neglected tropical diseases. The objective is to find potential cures for leishmaniasis and Chagas disease.

As one of more than 100 members of WIPO Re:Search, an open innovation platform sponsored by the World Intellectual Property Organization (WIPO), we share intellectual property and knowledge with the aim of accelerating early discovery for infectious diseases. Through WIPO we are collaborating with the University of Buea (Cameroon) and University of California San Diego (United States) to find potential cures for onchocerciasis, leishmaniasis, Chagas disease and African trypanosomiasis (sleeping sickness).

We continue to work with the World Health Organization (WHO) to combat the worm disease schistosomiasis in Africa. In 2018, we donated approximately 200 million praziquantel tablets for distribution in 34 African countries, and this year our donation program was expanded to include Burkina Faso, Niger and Sierra Leone. We keep production capacities at a level sufficient for manufacturing 250 million tablets a year. Since 2007 we have supplied almost 900 million tablets free of charge, which is equivalent to the treatment of around 360 million schoolchildren. As a founding member of the Global Schistosomiasis Alliance, we are helping to eliminate schistosomiasis worldwide.

Raising awareness

Health professionals, communities and patients are empowered through access to the appropriate tools, knowledge and skills to help them make informed decisions about prevention, diagnostics, treatment and care. Our regular campaigns help to increase awareness of certain diseases globally, with a focus on those diseases where we have extensive expertise, such as cancer, thyroid disorders, diabetes and multiple sclerosis. In addition, we have championed World Malaria Day with awareness campaigns and through engagement around the We for Malaria program. In 2018, we hosted events in Ghana that created the opportunity for collaborations in research and business activities to tackle preventive methods against malaria. Via our charitable organization, we bring together some of our activities in underserved regions of the world. Our Access Dialogues series promote discussion with numerous public and private stakeholders on access-to-healthcare challenges. Dialogues in 2018 covered the topics of innovation and intellectual property as well as supply chain and delivery.

A schistosomiasis health education project in Ethiopia was launched jointly with the NALA Foundation at the end of 2017, with the aim of promoting the long-term behavioral change that is needed to eliminate schistosomiasis. The project targets a rural area in Ethiopia, focusing on approximately 260,000 students in 290 schools through activities such as distribution of customized educational material. In 2018, we reached 74 schools with nearly 70,000 students. The goal is to extend this model to other regions in Africa.

The Global Pharma Health Fund (GPHF), a non-profit organization funded by our company, works to combat falsified medicines in developing and emerging countries. To date, the GPHF has supplied 843 Minilabs at cost to detect falsified medicines in around 100 countries. In 2018, the GPHF developed testing methods for five additional active ingredients so that the Minilab can now test 90 active ingredients, ranging from antimalarials, antimycobacterials and antivirals to antipyretics and antibiotics.

Promoting accessibility and improving supply chains

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. We are a founding member of the Accessibility Platform, an informal, private-sector initiative that is working on a comprehensive approach to meeting supply chain and distribution challenges in developing countries. The platform promotes information exchanges between the various stakeholders and creates joint options for action.

NTDeliver is our digital information tool, which facilitates transparency in supply chains for medicine donations. Deliveries from companies running donation programs are clearly displayed – from purchase orders made by the WHO through to delivery to the first warehouse in the destination country. This improves coordination and provides a more transparent overview of the in-country inventory. Following a pilot in 2017, we carried out two implementation rounds in 2018, including using NTDeliver last mile tracking as a standard reporting tool in the school-based schistosomiasis program in Kenya. The system is collecting and consolidating field information and has helped us to reach out to more than 12,000 teachers throughout Kenya.

In 2018, we started the CURAFA™ project as part of our vision to improve primary healthcare for everyone everywhere. So-called CURAFA™ points of care for integrated primary healthcare services are run by local pharmacists and nurses, who provide pharmaceutical and clinical services, medicine, digital health solutions, and insurance and financing schemes. The project was implemented in collaboration with the non-governmental organization Amref Health Africa. We rolled out five primary healthcare points in Kenya during 2018.

Strategic sphere of activity: Sustainable Solutions

Through our products, we are helping overcome global challenges such as climate impact and resource scarcity. In doing so, we are also supporting our customers in reducing the impacts of their own activities and achieving their own sustainability goals.

Life Science: reducing environmental impacts throughout the product life cycle

It is important to us that we improve the environmental impact of our products. This applies to the entire life cycle – from production and use through to the disposal of our products. With our Design for Sustainability (DfS) program, we have developed a comprehensive approach for more sustainable life science products. This keeps sustainability criteria in the foreground during product development or re-engineering, and documents them in a scorecard. When developing a new product, our aim is to improve on as many of these criteria scores as possible. The objective is to lower environmental impacts of devices and instruments, also during use by customers. Beginning with the concept stage, product teams identify potential environmental impacts and opportunities to make improvements. By the end of 2018, 27% of these product development projects met three or more sustainability criteria.

In addition, our researchers are developing innovative solutions in line with the "12 Principles of Green Chemistry" developed by chemists Paul T. Anastas and John C. Warner. The objective is to permit research that is as environmentally compatible as possible, and to minimize adverse effects on human health. More than 750 greener alternatives to conventional products are available so far. With DOZN®, we have developed a web-based quantitative Green Chemistry analysis tool. To date, we have used this matrix to assess and improve more than 40 products. It is our goal to make this system available to our customers in 2019, so that they can measure the environmental impact of their research and make more environmentally conscious decisions.

We are expanding our portfolio to include greener alternatives, such as the new bio-based solvent, Cyrene™, which is derived from waste cellulose and is employed as an alternative to solvents that are widely used but are under increasing regulatory restriction due to their associated toxicity.

The focus is not just on the current life of our products, as we also look ahead to end-of-life considerations and potential future product lives as well. The application of single-use products – many of which pose a challenge to recycle in the current infrastructure – is growing as life science markets are expanding and adopting new technologies. We have therefore developed innovative recycling programs, which led to the recycling of more than 2,738 metric tons of our customers' products from 2015 to 2018.

Performance Materials: increasing the sustainability of manufacturing processes and end products

In 2018, our Performance Materials launched the new liquid crystal technology SA-VA (Self-Aligned Vertical Alignment). We have been developing the materials and process in the scope of close technical partnerships with our customers. SA-VA is an eco-friendly and resource-conserving technology that requires less energy and creates fewer waste products than conventional technologies during display manufacture. SA-VA also provides a more efficient display manufacturing process. Since SA-VA technology can be applied at lower temperatures, it is also suitable for sensitive materials such as those used in premium products, or for forward-looking applications such as flexible displays.

Organic light-emitting diodes (OLEDs) likewise increase the energy efficiency of displays while also providing brilliant colors and razor-sharp images. To further enable unique display applications and efficient production of large-area OLED displays, we are developing high-performance OLED materials for vacuum evaporation methods or printing processes.

To utilize our market and technological leadership in liquid crystals beyond applications in energy-saving displays, we started manufacturing liquid crystal window modules at a new site in Veldhoven (Netherlands). According to initial measurement results, our smart windows can cut energy use in climate-controlled buildings by up to 40% and replace conventional sun shading solutions. In this way, we help builders to save resources and costs. These windows can be manually or automatically controlled to darken and provide sun protection or can create privacy by switching from transparent to opaque. In contrast to competing technologies, our newly branded Eyrise™ products switch within seconds and are highly color-neutral. Architects and builders can customize the desired color to suit the setting. In response to market demand, we have prioritized solar control during 2018, and we have three sophisticated architectural projects in the pipeline. We were able to realize the first commercial project in October 2018: large solar control windows for the company Orkla in Oslo (Norway). Furthermore, we presented a selection of these innovative architectural solutions at the trade fair "BAU 2019", where we focused on our eyrise™ technology. Among other things, we showed an iconic building design by renowned Brazilian architect Oscar Niemeyer. The building is currently being constructed for the company Kirow Ardelt in Leipzig (Germany).

For the semiconductor industry, we have developed a series of environmentally sustainable specialty chemicals and materials – including PFOS-free antireflective and photoresist coatings.

In the cosmetics industry, we are addressing the continuing trend for ingredients that meet stringent sustainability criteria. Our portfolio of fillers eliminates the need for microplastic particles that are heavily criticized for polluting waters and damaging marine life. We are also committed to continuously increasing the energy efficiency of our production processes. Our cosmetic formulations comply with strict criteria. By the end of 2018, 68 of our cosmetic pigments and active ingredients were certified according to Ecocert's COSMOS standard for organic and natural cosmetics.

Strategic sphere of activity: Broad Minds

The promotion of science, education and culture in an integrated manner constitutes one of the central concerns of our engagement in society. This is in line with our 350-year tradition of advancing art and culture. In this way we champion characteristics that are indispensable for our business activities as a high-tech company: creativity, the passion for new discoveries and curiosity, together with the courage to transcend boundaries.

Boosting scientific 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 creativity. We therefore support educational projects at many of our sites and grant scholarships, for instance, or help define the curricula of selected classes in schools. We want to spark an interest in science, particularly among young people. This is why we have been supporting the "Jugend forscht" (Young Researchers) competition for more than 35 years. Since 1996, we have been organizing the state-level competition for the German Federal State of Hesse. In 2018, we hosted the nationals for the third time.

Through our Junior Labs, we want young people to enjoy conducting experiments. These learnings labs at the Technical University of Darmstadt combine classroom instruction with trending topics and modern research methods. In 2018, around 2,500 school students used the chemistry laboratory and around 1,000 school students experimented in the biology laboratory.

In 2017, we launched a pilot project for the continuing education of teachers in order to transfer our commitment to STEM education in an international context for the first time. We started in India, followed by projects in Chile, Kenya and Tanzania in 2018. By the end of the year, we had trained almost 100 teachers who act as multipliers and will reach thousands of school students.

As part of SPARK, our global volunteer program, employees from our Life Science business sector share their skills and experience with students and support our local communities. The program is intended to spark curiosity in science and inspire students to consider a STEM-related career. In 2018, over 2,800 employees invested more than 19,000 hours in the program, reaching over 66,000 young people. As part of SPARK, in 2018 we once again sent our Curiosity Cube™ on a journey through the United States and Canada. This is a freight container that transforms into a mobile laboratory and is equipped with state-of-the-art technology. Directed by our employees, school students can use it to carry out scientific experiments. In 2018, the Cube traveled approximately 30,000 kilometers across the United States and engaged students in 108 communities. 94% of schools visited fall under the "Title 1" category, where students mainly come from low-income backgrounds.

The Deutsche Philharmonie, sponsored by Merck KGaA, Darmstadt, Germany

The Deutsche Philharmonie, sponsored by 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 represent an integral part of the cultural life in the vicinity of our Group headquarters in Darmstadt and remain highly popular, with around 31,000 people attending them in 2018. In the orchestra workshop, children and young people gained their first experience in a professional orchestra. We also fostered enthusiasm for classical music among young people through seat cushion concerts for children aged four years and above as well as through youth concerts. In addition, the orchestra again toured internationally. Concerts took place in Austria, the United States and China in 2018. In Beijing, the musicians held an orchestra workshop with music students at the local university. The subsequent concert in front of an audience of around 1,700 was a huge joint success.

Promoting literature

Like music, literature is an important mediator between cultures. That is why we support five literary prizes around the world. The awards primarily recognize those authors who build bridges between cultures, as well as between literature and science. We awarded four of the prizes in 2018: The Johann Heinrich Merck Award for Literary Critique and Essay of Merck KGaA, Darmstadt, Germany, in Germany went to author and translator Martin Pollack. The Italian Premio Letterario of Merck KGaA, Darmstadt, Germany, was awarded to natural scientist, author and professor Carl Safina, and to physicist and science historian Lucio Russo. The winners of the Japanese Kakehashi Literature Award of Merck KGaA, Darmstadt, Germany, were author Clemens J. Setz and his translator Ayano Inukai. The Translation Award of Merck KGaA, Darmstadt, Germany, in Russia went to authors Nina Federowa, Ekaterina Aralova, Natalia Stillmark and Tatiana Zborovskaja. The Tagore Literature Award of Merck KGaA, Darmstadt, Germany, in India will once again be offered in 2019.

Responsibility for our products

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

In our pharmaceutical marketing activities, the focus is always on the health and well-being of patients because we want them to receive effective and high-quality treatment. All guidelines pertaining to marketing and advertising are part of our Group-wide compliance program, which is complemented by our internal guidelines and various voluntary commitments that, in many cases, far exceed the applicable statutory regulations.

Safety of our chemical products

Numerous regulations are in place to ensure that chemicals pose no risk to humans or the environment. Compliance with these regulatory requirements is an important part of our work. Through a Group-wide policy, we have established global processes for defining, directing and implementing product safety, as well as the corresponding management structures. We incorporate all relevant national and international chemical regulations into our policies and guidelines, and adhere to them. This includes 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.

In 2018, we successfully completed the third and final phase of the REACH registration process by registering all substances annually produced or imported in quantities ranging from one to 100 metric tons with respect to the risks they pose in terms of their use, storage, transport and disposal. All the chemical substances concerned in our portfolio were registered on schedule. This process also includes substances added to our portfolio from the Sigma-Aldrich acquisition.

Safety of our Healthcare products

Patient safety has a top priority in everything we do. During the entire life cycle of our medicines, we provide patients and physicians with up-to-date risk-benefit evaluations. To this end, company 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 the Medical Safety and Ethics Board. Our Global Patient Safety unit continuously monitors and evaluates the safety and risk-benefit ratio of our medicines worldwide (pharmacovigilance). For products in our Allergopharma business, we have also developed comprehensive clinical efficacy and safety profiles that we continuously update. For the safety of patients, we have established a global pharmacovigilance system that we are always working to enhance.

Quality of our products

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

Supplier management

We procure many raw materials, packaging materials, technical products, components and services worldwide. Our overarching goal is to protect the stability of these supply chains and always provide our customers with the best products and services, while offering them optimal quality and service. Our supplier management focuses on compliance with fundamental environmental and social standards, in addition to high quality, delivery reliability and competitive prices. They 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. Due to the global focus of our procurement, we are continuously working to ensure adherence to our supply chain standards.

As a member of the industry initiative “Together for Sustainability” (TfS), we are able to use the supplier self-assessments and audit results shared among all member companies, who in turn abide by all restrictions stipulated within competition law. Through the shared platform approach, we has access to the sustainability assessment scorecards of more than 10,700 companies as well as over 1,000 audits reports.

Responsibility for our employees

Our employees contribute to groundbreaking progress in science and technology across the world. They are the basis of our success and therefore play a central role for the success of our business. In accordance with the our company values, we live a culture of mutual esteem and respect. To remain successful in the future we want to attract people to our company who contribute their curiosity, their courage and spirit of invention. We therefore place a strategic focus on employee development, leadership and performance management. Furthermore, we strive to foster diversity among our employees (more information can be found under “People”).

Responsibility for the environment

We seek to impact the environment as little as possible while doing business. 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 Environment, Health and Safety Policy, which is applicable Group-wide, we have defined our principles and strategies for environment, health and safety. It is an integral component of our EHS management system, which is certified annually by external auditors in accordance with the international standard ISO 14001. At all our sites, local EHS managers oversee operational environmental protection measures. These employees continually receive training and obtain additional qualifications. Since our businesses are constantly changing, our environmental management system is subject to internal and external audits on a regular basis to ensure that the ISO 14001 requirements are still being met. In 2018, we obtained an ISO 14001 group certificate for the tenth consecutive year. This certificate covers 81 sites around the world.

All reported environmental key figures do not include data on the Consumer Health business, since these operations were transferred to Procter & Gamble – effective December 1, 2018 – and have been classified as discontinued operations within the meaning of IFRS 5 since April 2018.

Focus areas: Energy efficiency, greenhouse gas emissions, water, waste and recycling

Climate impact and resource scarcity are key challenges facing society in the 21st century. As a responsible company, it is especially important for us to do our part. We have therefore set ourselves the goal of reducing total direct and indirect greenhouse gas emissions by 20% by 2020 (2006 baseline), irrespective of production growth. In 2018, the CDP (formerly the Carbon Disclosure Project) gave our efforts for the sustainable use of energy a "C" rating (2017: B). The CDP assesses companies in terms of their performance and transparency in climate impact and water management.

ENERGY CONSUMPTION[1, 2]

In gigawatt hours	2015	2016	2017	**2018**
Total energy consumption	**2,141**	**2,117**	**2,194**	**2,232**
Direct energy consumption	**1,343**	**1,330**	**1,319**	**1,322**
Natural gas	1,200	1,260	1,254	1,256
Liquid fossil fuels[3]	110	36	32	32
Biomass and self-generated renewable energy	33	34	33	34
Indirect energy consumption	**798**	**787**	**875**	**910**
Electricity	702	692	729	761
Steam, heat, cold	96	95	146	149
Total energy sold	**0.3**	**0.3**	**0.1**	**0.0**
Electricity	0.3	0.3	0.1	0.0
Steam, heat, cold	0.0	0.0	0.0	0.0

In terajoules	2015	2016	2017	**2018**
Total energy consumption	**7,708**	**7,621**	**7,898**	**8,035**
Direct energy consumption	**4,835**	**4,788**	**4,748**	**4,759**
Natural gas	4,320	4,536	4,514	4,522
Liquid fossil fuels[3]	396	130	115	115
Biomass and self-generated renewable energy	119	122	119	122
Indirect energy consumption	**2,873**	**2,833**	**3,150**	**3,276**
Electricity	2,527	2,491	2,624	2,740
Steam, heat, cold	346	342	526	536
Total energy sold	**1.1**	**1.1**	**0.4**	**0.0**
Electricity	1.1	1.1	0.4	0.0
Steam, heat, cold	0.0	0.0	0.0	0.0

[1] In line with the Greenhouse Gas Protocol, for all previous years (up to the 2006 baseline) the energy consumption has been calculated based on the corporate structure as of December 31 of the reporting year and retroactively adjusted for acquisitions or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted).

[2] All reported environmental key figures do not include data on the Consumer Health business, since these operations were transferred to Procter & Gamble – effective December 1, 2018 – and have been classified as discontinued operations within the meaning of IFRS 5 since April 2018.

[3] Light and heavy fuel oil, liquefied petroleum gas (LPG), diesel and gasoline.

TOTAL GREENHOUSE GAS EMISSIONS (SCOPE 1 AND 2 OF THE GHG PROTOCOL)[1, 2]

In metric kilotons	2006[3]	2015	2016	2017	2018
Total CO_2eq[4] emissions	**786**	**722**	**689**	**704**	**698**
thereof					
direct CO_2eq emissions	378	391	384	373	354
Indirect CO_2eq emissions	408	331	305	331	344
Biogenic CO_2 emissions	**0**	**13**	**14**	**13**	**13**

[1] In line with the Greenhouse Gas Protocol, for all previous years (up to the 2006 baseline) the greenhouse gas emissions have been calculated based on the corporate structure as of December 31 of the reporting year and retroactively adjusted for acquisitions or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted).
[2] All reported environmental key figures do not include data on the Consumer Health business, since these operations were transferred to Procter & Gamble – effective December 1, 2018 – and have been classified as discontinued operations within the meaning of IFRS 5 since April 2018.
[3] Baseline for our emission targets is 2006.
[4] eq = equivalent.

To achieve our climate impact mitigation goals, we have launched the EDISON program, which consolidates all our climate impact mitigation and energy efficiency activities. Through the more than 360 EDISON projects initiated since 2012, we aim to annually save around 177 metric kilotons of CO_2 in the medium term. Overall, thanks to the EDISON projects we have saved approximately 89,000 megawatt hours of energy since 2012.

At the same time, we are pushing forward with the changeover to renewable energies. In 2017, we installed a solar voltaic system in Burlington, Massachusetts, United States. It has an installed capacity of 182 kilowatts and generated 136,000 kilowatt hours in 2018. Energy management plays a key role in our efforts for energy efficiency and climate impact mitigation. Our production sites in Darmstadt and Gernsheim account for 29% of our global energy consumption. Both these facilities have fulfilled the international energy management standard ISO 50001 since 2012. Currently, 12 of our production sites have a certified energy management system. We are working to implement further measures to achieve our climate goal. For example, we are steadily reducing our process-related emissions in our Life Science business sector through process optimization. In 2018, this enabled us to save 16,000 metric kilotons of CO_2 equivalents.

Alongside energy efficiency and climate protection, we also focus on water. Since 2016, we have been pursuing the goal of implementing a sustainable water management system at sites with high consumption levels by 2020. At sites with relevant water use located in areas of high water stress, we are aiming to cut our water consumption by 10% by 2020 (2014 baseline). At the end of 2018, we had lowered our water consumption at the relevant sites by 11% in comparison with 2014. In 2018, the CDP gave our efforts to conserve water a "B–" rating (2017: B). Natural resources are becoming scarcer. We therefore want to use raw materials as efficiently as possible and to limit the loss of raw materials. In this way, we intend to minimize the environmental impacts of our waste as far as possible. In 2016, we developed a company Waste Score, which allows us to compare the amount of waste our sites are producing and monitor the development of the amount of waste we produce. Based on this score, we have set ourselves the goal of reducing the environmental impact of our waste by 5% by 2025 (2016 baseline). For this purpose, we continuously analyze the improvement potential of our production processes and disposal routes. In 2018, we also established two expert panels on the topic of waste management. They regularly discuss best practice examples and thus facilitate an exchange of experience between our global sites.

Responsibility for society

We see ourselves as part of society – both at our individual sites and worldwide. 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 culture projects and furthermore support education, especially in the natural sciences. Additionally, we provide disaster relief and support people in need in the areas in which we operate.

Our subsidiaries are engaged in a wide variety of local projects. We have defined a general set of criteria for selecting projects, and the decisions concerning specific projects are made by our subsidiaries. In 2018, we spent a total of € 36 million on community engagement activities. For the first eleven months this amount includes the Consumer Health business, which was divested as of December 1, 2018. This figure does not include contributions from our charitable organization.

To mark our 350-year anniversary, we stepped up our commitment and carried out more than 350 charitable projects in 60 countries in 2018. In more than 60% of all initiatives our colleagues joined us in our efforts, whether through donations in cash or in kind or through their active collaboration in projects.

Research and Development

We conduct research and development (R&D) worldwide in order to develop new products and services designed to improve the quality of life of patients and to satisfy the needs of our customers. Further optimizing the relevance and efficiency of our research and development activities – either on our own or in cooperation with third parties – is one of our top priorities.

In 2018, approximately 7,200 employees worked for our company researching innovations to serve long-term health and technology trends in both established and growth markets (in 2017: approximately 6,800).

Our company spent around € 2.2 billion on research and development (R&D) in 2018 (2017: around € 2.1 billion). In our research and development activities, we focus on both in-house research and external collaborations that enable us to increase the productivity of our research while simultaneously reducing financial outlay. The organizational set-up of our R&D activities reflects the structure of our company with three business sectors.

Healthcare

BIOPHARMA

Oncology and Immuno-Oncology

Oncology and immuno-oncology are core focus areas in our R&D portfolio. With an emphasis on biomarker-driven research, we aim to deliver personalized treatments and a transformative pipeline. Translational research is embedded into the whole R&D process, with several projects addressing unmet needs in hard-to-treat cancers through innovative treatment approaches and novel combinations. In 2018, we achieved a number of significant milestones across our oncology and immuno-oncology pipeline.

We continue to develop much-needed new treatment options for patients with hard-to-treat cancers and have made key progress in this area with avelumab, an anti-PD-L1 antibody that we are co-developing and co-commercializing with Pfizer. To date, avelumab has received approval in 46 countries across the world under the brand name Bavencio®. In 2018, approvals were granted in several countries, including Australia and Brazil, for Merkel cell carcinoma (MCC) as well as Israel for MCC and urothelial carcinoma (UC) and Canada for UC.

In September, we announced positive top-line results from the pivotal Phase III JAVELIN Renal 101 study evaluating avelumab in combination with Inlyta® (axitinib), compared with Sutent® (sunitinib) as initial therapy for patients with advanced renal cell carcinoma (RCC). As part of a planned interim analysis, an independent data monitoring committee confirmed that the trial showed a statistically significant improvement in progression-free survival (PFS) by central review for patients treated with the combination whose tumors had PD-L1+ expression greater than 1% (primary objective), as well as in the entire study population regardless of PD-L1 tumor expression (secondary objective). The detailed analysis of this clinical trial readout was presented at the 2018 European Society for Medical Oncology (ESMO) Congress. The US Food and Drug Administration (FDA) granted Breakthrough Therapy Designation for avelumab in combination with Inlyta® for treatment-naive patients with advanced RCC in December 2017.

Through our strategic alliance with Pfizer, we continue to explore the therapeutic potential of avelumab. Our clinical development program JAVELIN comprises more than 30 clinical programs, including various Phase III trials, involving over 9,000 patients across more than 15 different tumor types. In addition to MCC, UC and RCC, these cancers include breast, gastric/gastro-esophageal junction and head and neck cancers, non-small cell lung cancer and ovarian cancer.

We provided an update on our Phase III JAVELIN Lung 200 trial in February, Phase III JAVELIN Ovarian 200 trial in November and Phase III JAVELIN Ovarian 100 trial in December. While these studies did not meet or were not expected to meet their pre-specified primary endpoints of overall survival (JAVELIN Lung 200), superior overall survival or PFS (JAVELIN Ovarian 200) and PFS (JAVELIN Ovarian 100), the data are being further examined to better understand the results.

As part of our ongoing commitment to developing new treatment options for patients with hard-to-treat cancers who would otherwise have a low chance of survival, and to exploring all potential options, we entered into various new strategic collaborations in 2018 with avelumab. The first was in July, when our collaboration with Vyriad to evaluate avelumab in combination with Voyager-V1, an oncolytic virus therapy, in a Phase I clinical trial in patients with solid tumors was announced. A few days later, we announced a collaboration with Leap Therapeutics to investigate avelumab in combination with Leap Therapeutics' GITR agonist, TRX518, and chemotherapy in a Phase I/II clinical trial in advanced solid tumors including expansion populations in patients with relapsed/refractory ovarian, breast and prostate cancers.

In September, together with Pfizer, we entered into a clinical trial collaboration and supply agreement with Checkmate Pharmaceuticals to evaluate CMP-001, a TLR9 agonist, in combination with avelumab.

The collaboration will evaluate the safety and effectiveness of CMP-001 administered in combination with avelumab in selected previously treated patients with advanced squamous cell carcinoma of the head and neck (SCCHN) whose disease has progressed.

Also in September, we announced a collaboration with Immutep to evaluate avelumab in combination with eftilagimod alpha ("efti" or "IMP321"), an investigational LAG-3Ig fusion protein, in a Phase I trial in patients with advanced solid malignancies. Shortly afterwards, in October we entered into a clinical trial collaboration agreement with Daiichi Sankyo Company to study the combination of avelumab and/or our investigational DNA damage repair (DDR) inhibitor with [fam-] trastuzumab deruxtecan (DS-8201), an investigational HER2-targeting antibody drug conjugate, in patients with HER2-expressing or mutated solid tumors.

Finally, in November, we entered into two collaboration agreements. The first was with Kyowa Hakko Kirin to study avelumab with Kyowa Hakko Kirin's novel IDO inhibitor, KHK2455, in a Phase I clinical trial of patients with solid tumors. The second agreement was with Immunicum to investigate avelumab in combination with ilixadencel, an off-the-shelf, cell-based, cancer immune primer, in a planned multi-indication Phase Ib/II clinical trial of patients with advanced head and neck cancer and gastric adenocarcinoma.

In 2018, we celebrated several important milestones for our leading oncology pipeline molecules we discovered in-house, including tepotinib, an investigational oral MET inhibitor, and M7824, an investigational bifunctional immunotherapy.

In March, tepotinib received its first regulatory designation when the Japanese Ministry of Health, Labor and Welfare (MHLW) granted SAKIGAKE "fast-track" designation to tepotinib for patients with advanced non-small cell lung cancer (NSCLC) harboring MET exon 14 skipping mutations. The SAKIGAKE designation promotes research and development in Japan, aiming at early practical application for innovative pharmaceutical products, medical devices and regenerative medicines, and can reduce a drug's review period down from 12 months to a target of 6 months. The SAKIGAKE designation system is a core component of the MHLW's "Strategy of SAKIGAKE". The system's objective is to designate drugs that have the potential of prominent effectiveness against serious and life-threatening diseases in order to make them available to patients in Japan ahead of the rest of the world.

In August, we initiated a trial to investigate M7824 compared with pembrolizumab as a first-line treatment in patients with PD-L1-expressing advanced NSCLC. In December, the FDA and the European Medicines Agency (EMA) granted orphan drug designation (ODD) to M7824 for the treatment of biliary tract cancer (BTC). The FDA's ODD follows the recent presentation of the first clinical data for M7824 in BTC at the ESMO Congress (see below). BTC is a collective term for a group of rare and aggressive gastrointestinal cancers, including intrahepatic cholangiocarcinoma, extrahepatic cholangiocarcinoma and gallbladder carcinoma. Approximately 16,000 cases of BTC are estimated to occur every year in the United States. These cancers present late in the majority of patients and treatment options are limited. The median survival rate in the advanced setting is less than one year and the objective tumor response with commonly used chemotherapy is typically less than 10% with a short duration of response.

Our integrated R&D capacity is strongly supported by external innovation to complement our pipeline, strengthen our technology base and enhance our scientific capabilities. In 2018, we initiated new pipeline collaborations to further diversify our development risks and enable a more efficient pipeline prioritization.

In January, we announced a multi-project and licensing deal with Cancer Research UK's Commercial Partnerships Team and The Institute of Cancer Research (ICR), London, to discover and develop new anticancer drugs. Together we will collaborate on three independent research projects spanning discovery to preclinical candidate nomination. This work will progress the discovery and development of potential cancer drugs, as well as develop biomarkers for target engagement and patient selection. Under the terms of the deal, we have worldwide rights to take molecules discovered through the collaboration forward into clinical development. Cancer Research UK and the ICR will receive milestone payments based on the achievement of research and development, regulatory and sales goals plus royalty payments on net sales of future products discovered or developed under the agreement. Any payments made to Cancer Research UK and the ICR will be invested in future lifesaving research.

In April, we announced a development and risk-sharing collaboration with the SFJ Pharmaceuticals Group (SFJ), a U.S.-based company focused on increasing R&D output and productivity through innovative models. In a novel innovation model recently emerging in the biopharma industry, SFJ – one of the pioneers of such collaborations – will finance and be responsible for Phase II/III development of abituzumab, our IgG1 monoclonal antibody, as a first-line treatment for metastatic colorectal cancer (mCRC) in combination with Erbitux® and chemotherapy.

Additionally, we are currently assessing the potential of investigating tepotinib in combination with novel therapies for the treatment of advanced heptocellular carcinoma (HCC) after the two HCC Phase II trials met their primary endpoints, with clinical activity demonstrated both as first-line and second-line treatment and safety findings in line with earlier studies.

At the 2018 ASCO Annual Meeting (June 1 – 5 in Chicago, Illinois, United States), we shared results from our increasingly broad oncology portfolio, from immuno-oncology to DDR approaches, in a wide range of hard-to-treat cancers. Representing seven therapeutic agents and eight tumor types, we showcased the significant potential in not only later-stage priority programs, but also in early pipeline programs that could make a real difference for patients. We presented data across our oncology and immuno-oncology pipeline for molecules including avelumab and Erbitux®, and pipeline updates

on M7824, tepotinib, the p70S6K/AKT targeted agent M2698, the DNA-PK inhibitors M3814 and M6620.

Multiple presentations on avelumab at ASCO included two-year safety and efficacy data in metastatic MCC for avelumab from the pivotal JAVELIN Merkel 200 trial, as well as data in NSCLC and UC. Pipeline updates at ASCO also included early clinical results for tepotinib patients with NSCLC harboring MET exon 14 skipping mutations, M7824 in patients with HPV-associated cancers and NSCLC, M6620 in NSCLC and advanced solid tumors as well as data for M3814 and M2698 in solid tumors.

At the 2018 ESMO Congress (October 19 – 23 in Munich, Germany), we presented a total of 41 abstracts representing eight therapeutic agents and 14 tumor types. The data presented showcased the diversity of our pipeline, with results from a number of high-priority clinical development programs.

They included the first presentation of data from the pivotal Phase III study JAVELIN Renal 101 evaluating avelumab in combination with axitinib compared with sunitinib as initial therapy for patients with advanced RCC. For avelumab, updated data in MCC and advanced gastric or gastroesophageal junction cancer were also presented.

Additionally, new data for M7824 were presented from expansion cohorts of two ongoing Phase I clinical trials, including the first presentation data for SCCHN, BTC and esophageal cancers. In addition, updated data for M7824 in NSCLC and gastric cancer were shared. Data presented for tepotinib included results from three Phase II trials, two in advanced HCC and one in NSCLC, providing further evidence of this precision medicine's promising clinical activity in solid tumors. In DDR, results were presented from a Phase I trial investigating M6620 (formerly VX-970) in combination with gemcitabine in patients with advanced NSCLC; and two Phase I trials of DNA-dependent protein kinase inhibitor M3814. From the broader pipeline, results were also shared from the Phase I/II trial of M7583, a Bruton's tyrosine kinase (BTK) inhibitor, in patients with B cell malignancies, as well as a retrospective analysis of the Phase I/II Poseidon study investigating abituzumab in patients with mCRC.

Moreover, data from our legacy brand Erbitux® (cetuximab) were presented, adding to the growing body of real-world evidence supporting the therapy's role as a standard of care in RAS wild-type mCRC, first-line recurrent or metastatic SCCHN and for patients with locally advanced SCCHN who may not be able to tolerate cisplatin-based regimens in full.

Neurology & Immunology

Multiple sclerosis (MS) is one of the world's most common neurological disorders. Despite the emergence of several therapies in the last two decades, there are still significant unmet needs for MS patients, particularly those with highly active relapsing MS (RMS).

On July 30, we announced that a resubmission of the New Drug Application (NDA) for cladribine tablets as a potential treatment for patients with relapsing forms of MS was accepted for review by the FDA. The acceptance indicates that the FDA found the company's resubmission sufficiently complete to permit a substantive review. The resubmission was in response to the Complete Response Letter issued by the FDA in 2011 requesting an improved understanding of safety risks and the overall benefit-risk profile. The NDA acceptance follows global approvals of cladribine tablets under the trade name Mavenclad® in more than 40 countries since August 2017, including the European Union (EU), Canada, Australia, Israel, Argentina, United Arab Emirates, Chile and Lebanon. In 2018, Mavenclad® was approved in a total of 11 countries. Additional filings in other countries are planned.

The results from the key magnetic resonance imaging (MRI) findings of the CLARITY Extension study of Mavenclad® (cladribine tablets) were published in January in the journal Therapeutic Advances in Neurological Disorders. The findings suggest that two-year treatment with Mavenclad® (given over 20 days) has a durable effect on MRI during observation in years 3 and 4.

On March 7, we announced positive results from our Phase IIb study in RMS of evobrutinib, an investigational, highly specific, oral BTK inhibitor and the first BTK inhibitor to show clinical proof-of-concept in RMS. The study met its primary endpoint, demonstrating that oral evobrutinib resulted in a clinically meaningful reduction of gadolinium-enhancing T1 lesions on MRI scans measured at weeks 12, 16, 20 and 24 in comparison to patients receiving placebo.

In April, data for Mavenclad® and Rebif® (interferon beta-1a) were presented at the American Academy of Neurology (AAN) 70th Annual Meeting, April 21 – 27 in Los Angeles (California, United States). Mavenclad® data presented included poster presentations highlighting analyses of the CLARITY, CLARITY Extension and ORACLE-MS trials evaluating long-term safety and durable efficacy in patients with MS.

In May, the Multiple Sclerosis Journal published data outlining the effects of Mavenclad® treatment on patients with highly active RMS. The data showed that Mavenclad® reduced the risk of 6-month Expanded Disability Status Scale (EDSS) progression by 82% vs placebo.

In June, 14 abstracts were presented further characterizing the complementary profiles of Mavenclad® and Rebif® at the 4th Congress of the European Academy of Neurology (EAN) in Lisbon, Portugal.

In October, we presented 23 abstracts, including new safety and efficacy data on Mavenclad®, Rebif® and investigational therapy evobrutinib at the 34th Congress of the European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS) in Berlin, Germany. The data presented at ECTRIMS build on the existing real-world and clinical evidence around the safety and efficacy of Mavenclad® and reaffirm a positive benefit-risk profile of the oral treatment, which is taken for a maximum of 20 days over two years.

Based on an integrated analysis of patients from the CLARITY, CLARITY EXT and ORACLE-MS trials, including two additional years of data from the long-term PREMIERE Registry, the treatment emergent adverse event (TEAE) profile associated with Mavenclad® in patients with RMS was confirmed, with no new safety findings. Late-breaking data from the multi-sponsored European IFNβ Pregnancy Registry and Nordic health registers demonstrated that treatment with interferon beta formulations – including Rebif® – before conception or during pregnancy did not affect outcomes for the pregnancy or for the infant. Positive late-breaking data from the 24-week results of the double-blind, randomized, placebo-controlled, 48-week, Phase II study of evobrutinib in patients with RMS were presented at ECTRIMS. The study met its primary endpoint, with evobrutinib 75mg QD (once daily) and 75mg BID (twice daily) significantly reducing the number of gadolinium-enhancing T1 (T1 Gd+) lesions measured at weeks 12, 16, 20 and 24 in comparison to patients receiving placebo.

In addition, following the #MSInsideOut campaign launch on World MS Day at the end of May, we premiered the MS Inside Out Documentary film executively produced by Shift.ms during an event on October 11. At the event, we shone a light on the untold stories of MS, as well as revealing the findings from a new global MS carers survey conducted in collaboration between leading international carer organizations IACO (International Alliance of Carer Organizations) and Eurocarers. The data presented at ECTRIMS further demonstrated the need for a deeper understanding of those affected by MS and their carers.

We also announced in Berlin (Germany) the winners of the annual Grant for Multiple Sclerosis Innovation (GMSI) Award, which supports the advancement of science and medical research in the field of MS and provides a grant of up to € 1,000,000 per year to one or more selected research projects. The winners were Professor Franca Deriu of the University of Sassari (Italy); Professor Jennifer Gommerman and Dr. Valeria Ramaglia of the University of Toronto (Canada); Professor Edgar Meinl of the Institute of Clinical Neuroimmunology of the University of Munich (Germany); as well as Dr. Gerd Meyer zu Hörste and Professor Heinz Wiendl of Münster University Hospital (Germany).

At the Osteoarthritis Research Society International (OARSI) 2018 World Congress – held in April in Liverpool (United Kingdom) – 16 abstracts, including two oral presentations, were presented. Our presence at OARSI reflects the company's dedication to helping optimize outcomes for patients living with chronic progressive diseases, with the goal of developing novel disease-modifying therapies for osteoarthritis (OA). Oral presentations on sprifermin offer further insights supporting its dose-response structural effect in patients with knee OA, observed in earlier studies.

At the European Lupus Society in March (Düsseldorf, Germany), data were presented on atacicept, a recombinant fusion protein thought to target the cytokines APRIL and BLyS. Two oral presentations of analyses of the Phase II ADDRESS II clinical trial assessing atacicept in patients with systemic lupus erythematosus (SLE) reported attainment of low-disease activity and reduction of flares in patients with high SLE disease activity.

Fertility

At the Grant for Fertility Innovation (GFI) ceremony at the annual meeting of the European Society of Human Reproduction and Embryology (ESHRE) in Barcelona, Spain, we confirmed our commitment to supporting potential breakthrough research projects in the field of fertility. With an amount of € 300,000, the GFI is again supporting the advancement of medical science, aiming to bring innovation to life. The two winners – Louise Glover from Ireland and Cinzia Di Pietro from Italy – received their awards during the ceremony, which was also attended by Louise Brown, the world's first person to be conceived using in vitro fertilization (IVF), as well as IVF pioneer Professor Bruno Lunenfeld.

General Medicine & Endocrinology

During 2018, we received further authorizations for Glucophage® (metformin) for the reduction in the risk or delay of the onset of type 2 diabetes when intensive lifestyle changes have failed. We now have this indication in 40 countries, among them Brazil, United Kingdom, Singapore and Saudi Arabia. Global roll-out in other countries is ongoing.

In July, the EU worksharing procedure was finalized and the German Federal Institute for Drugs and Medical Devices (BfArM) recommended the approval of our new formulation of Euthyrox® (levothyroxine) in 21 EU countries. The German BfArM decision was based on a study demonstrating bioequivalence between the old and new formulations and a dose form proportionality study with the new formulation. The new formulation came at the request of several health authorities worldwide. It was introduced in France in March 2017 and Switzerland in April 2018. Since October the product has been available on the Turkish market. Following the positive recommendation from BfArM, which is acting as a representative of all 21 EU countries involved in the EU worksharing procedure, we expect the new formulation of Euthyrox® to be available in these countries from 2019 onwards.

On September 28, we announced the recipients of the Grant for Growth Innovation (GGI) for 2018 during the 57th European Society of Paediatric Endocrinology (ESPE) meeting in Athens, Greece. Applications were reviewed by an independent scientific steering committee consisting of six internationally renowned endocrinologists and researchers. Research groups based in Finland and Italy were each awarded a grant for innovation projects in the field of growth and growth disorders.

BIOPHARMA PIPELINE

as of December 31, 2018

Therapeutic area Compound	Indication	Status
Neurology		
Cladribine tablets (lymphocyte-targeting agent)	Relapsing multiple sclerosis	Registration[1]
Evobrutinib (BTK inhibitor)	Multiple sclerosis	Phase II
Oncology		
Tepotinib (MET kinase inhibitor)	Non-small cell lung cancer	Phase II
Tepotinib (MET kinase inhibitor)	Hepatocellular cancer	Phase II
M2698 (p70S6K and Akt inhibitor)	Solid tumors	Phase I
M3814 (DNA-PK inhibitor)	Solid tumors	Phase I
M6620 (VX-970, ATR inhibitor)	Solid tumors	Phase I
M4344 (VX-803, ATR inhibitor)	Solid tumors	Phase I
M3541 (ATM inhibitor)	Solid tumors	Phase I
M8891 (MetAP2 inhibitor)	Solid tumors	Phase I
M7583 (BTK inhibitor)	Hematological malignancies	Phase I
Immuno-Oncology		
Avelumab (anti-PD-L1 mAb)	Non-small cell lung cancer, 1st line	Phase III
Avelumab (anti-PD-L1 mAb)	Gastric cancer, 1st line maintenance	Phase III
Avelumab (anti-PD-L1 mAb)	Ovarian cancer, 1st line	Phase III[2]
Avelumab (anti-PD-L1 mAb)	Urothelial cancer, 1st line maintenance	Phase III
Avelumab (anti-PD-L1 mAb)	Renal cell cancer, 1st line	Phase III
Avelumab (anti-PD-L1 mAb)	Locally advanced head and neck cancer	Phase III
Avelumab (anti-PD-L1 mAb)	Merkel cell carcinoma, 1st line	Phase II
Avelumab (anti-PD-L1 mAb)	Solid tumors	Phase II[3]
Avelumab (anti-PD-L1 mAb)	Non-small cell lung cancer	Phase II[3]
Avelumab (anti-PD-L1 mAb)	Urothelial cancer	Phase II[3]
Abituzumab (pan-αv integrin inhibiting mAb)	Colorectal cancer, 1st line	Phase II[4]
M7824 (anti-PD-L1/TGF-β trap)	Non-small cell lung cancer, 1st line	Phase II
Avelumab (anti-PD-L1 mAb)	Solid tumors	Phase I
Avelumab (anti-PD-L1 mAb)	Hematological malignancies	Phase I
M9241 (NHS-IL12, cancer immunotherapy)	Solid tumors	Phase I
M7824 (anti-PD-L1/TGF-β trap)	Solid tumors	Phase I

BIOPHARMA PIPELINE

as of December 31, 2018

Therapeutic area

Compound	Indication	Status
Immunology		
Sprifermin (fibroblast growth factor 18)	Osteoarthritis	Phase II
Atacicept (anti-BLyS/anti-APRIL fusion protein)	Systemic lupus erythematosus	Phase II
Atacicept (anti-BLyS/anti-APRIL fusion protein)	IgA nephropathy	Phase II
Evobrutinib (BTK inhibitor)	Rheumatoid arthritis	Phase II
Evobrutinib (BTK inhibitor)	Systemic lupus erythematosus	Phase II
M1095 (ALX-0761, anti-IL-17 A/F nanobody)	Psoriasis	Phase II[5]
M6495 (anti-ADAMTS-5 nanobody)	Osteoarthritis	Phase I
M5049 (immune receptor inhibitor)	Immunology	Phase I
General Medicine		
M5717 (PeEF2 inhibitor)	Malaria	Phase I

More information on the ongoing clinical trials can be found at www.clinicaltrials.gov. Pipeline products are under clinical investigation and have not been proven to be safe and effective. There is no guarantee any product will be approved in the sought-after indication.

[1] As announced on July 30, 2018, the U.S. Food and Drug Administration (FDA) accepted the resubmission of the New Drug Application (NDA) for cladribine tablets.

[2] Avelumab in combination with talazoparib.

[3] Avelumab combination studies with talazoparib, axitinib, ALK inhibitors, chemotherapy or novel immunotherapies.

[4] As announced on May 2, 2018, in an agreement with SFJ Pharmaceuticals Group, abituzumab will be developed by SFJ for colorectal cancer through Phase II/III clinical trials.

[5] As announced on March 30, 2017, in an agreement with Avillion, anti-IL-17 A/F nanobody will be developed by Avillion for plaque psoriasis and commercialized by our company.

ADAMTS-5	A disintegrin and metalloproteinase with thrombospondin motifs
Akt	Protein kinase B
APRIL	A proliferation-inducing ligand
ATM	Ataxia Telangiectasia Mutated kinase
ATR	Ataxia Telangiectasia and Rad3-related kinase
BLyS	B-lymphocyte stimulator
BTK	Bruton's tyrosine kinase
IgA	Immunoglobulin A
IL	Interleukin
mAb	Monoclonal antibody
MetAP2	Methionine aminopeptidase 2
PD-L1	Programmed cell death ligand 1
PeEF2	*Plasmodium* eukaryotic elongation factor 2
PK	Protein kinase
TGFβ	Transforming growth factor β

Allergopharma
Allergopharma, our allergy business, is one of the leading manufacturers of diagnostics and prescription drugs for allergen immunotherapy. As experts, we are determined to fully understand allergies as well as be able to discover new solutions and therapeutic concepts. In close cooperation with research institutions and other partners throughout the world, we gain valuable insights regarding the complex immunological mechanisms responsible for allergy development. And we pursue new paths in developing innovative treatments. Thus, we want to create the best conditions today for the next generation of products for optimally taking care of patients suffering from allergies.

Life Science

Across our three Life Science business units of Research Solutions, Process Solutions and Applied Solutions, our R&D teams are dedicated to finding innovative solutions to our customers' toughest challenges. In our Life Science business sector, we invest significantly in R&D, with more than 1,750 employees working in various R&D functions around the world.

In 2018, we continued to focus on delivering the promise of accelerating access to health for people everywhere. We launched nearly 13,000 products, including nearly 6,000 chemicals, while aiming to:

- Improve and expand our portfolio
- Invest in new and disruptive technologies for the long term
- Partner with the global scientific community
- Meet customer needs

Advancing the global availability of our CRISPR technology
In early 2018, we received two patents for our CRISPR technology: the first from the Korean Intellectual Property Office and the second from the Israel Patent Office. These patents address cutting of the chromosomal sequence of eukaryotic cells (such as mammalian and plant cells) and insertion of an external or donor DNA sequence into those cells using CRISPR.

In April, we were granted a patent for this CRISPR insertion technology in China. Shortly thereafter, a paper we co-authored entitled, "Ethical Considerations in the Manufacture, Sale and Distribution of Genome-Editing Technologies," was published in *The American Journal of Bioethics*. The paper highlights the importance of science-based bioethics in genome editing and novel processes to ensure products meet the highest standards.

To complete an active year advancing the intellectual property (IP) of our CRISPR technology, in October and December, respectively, we were awarded Australian and European CRISPR patents for foundational genome-editing technology. The patents covered paired Cas9 nickase technology to reduce off-target effects, advance gene therapy and research. A second patent covering CRISPR insertion was also awarded to our company by the European Patent Office in December.

These patents expand the foundational CRISPR cutting and integration IP necessary to correct genetic defects in gene therapy patients and to fix diseased genes while not affecting healthy ones. Further, this allows us to license CRISPR-related patents to interested parties and further supports genome-editing research under ethical and legal standards. In total, we have achieved foundational CRISPR patents in seven markets, including Canada and Europe.

Partnerships and agreements to broaden our reach
In March, we signed a Memorandum of Understanding (MoU) with Schneider Electric, a global specialist in energy management and automation. The MoU aims to automate biopharmaceutical processes for China's biopharmaceutical industry and to help our biopharma customers in their quest for reliable, less expensive and better medical solutions.

In May, we announced a collaboration with Solvias, a Swiss contract research and service provider, to offer our PyroMAT™ System, a new Monocyte Activation Test (MAT) kit for pyrogen detection. The system offers a high-quality, ready-to-use in vitro method that does not require live animal testing and detects the broad spectrum of pyrogens. The new kit also eliminates the laboratory work required to maintain the cell line.

In June, we signed an agreement with HistoCyte Laboratories Ltd, Tyne and Wear, United Kingdom, to be the exclusive multinational distributor of the company's portfolio of cell lines in the United States and other select geographies. For our customers, the agreement provides a cost-effective and practical solution to the problem of tissue heterogeneity.

As we began the second half of 2018, we entered into a global cooperation agreement with InnoCore Pharmaceuticals to provide its proprietary SynBiosys® biodegradable polymer platform to develop sustained release solutions for biologicals in injectable formulations. This proprietary technology allows the development of injectable sustained release biological formulations with conserved bioactivity of these sensitive molecules.

An expanded portfolio to benefit our customers
We launched innovations across all segments of our portfolio throughout 2018. In January, Applied Solutions released Steritest NEO, a new product that replaces the current Steritest EZ for sterility testing, which is a flagship for our business. In February, Process Solutions introduced Viresolve® Barrier capsule filters designed to remove viruses, mycoplasma and bacteria from cell culture media, protecting against bioreactor contamination. These filters are a key component of our Viral Safety Assurance program to mitigate the risk of viral contamination in upstream bioprocesses and minimize the potential impact on drug supply and patient safety.

In April, Applied Solutions launched our new CellStream™ benchtop flow cytometry system, a compact, customizable flow cytometer that uses a camera for detection. The system expands the limits of sensitivity, allowing scientists to tailor their instruments to their needs in immunology, cancer research and many other areas.

In May, Applied Solutions also released its new PyroMAT™ in vitro system for Pyrogen Detection, a new robust and sensitive solution for pyrogen detection. It is the only cell-line based Monocyte Activation Test (MAT) provided as a ready-to-use kit on the market, providing an alternative to animal-based testing. In July, we released Milli-Q® HX 7000 SD, a new series of all-in-one water purification systems to purify, store, distribute, monitor and control a type 2 pure water supply entirely from one Milli-Q® HX 7000 SD system.

Over the course of 2018, we expanded our nanomaterials portfolio with the launch of more than 250 new products. Our portfolio includes inorganic and carbon nanomaterials for biomedical applications, novel 2D inorganics and alternative energy materials for use in flexible electronics, implantable wearable sensors, batteries and solar energy generation.

Nanomaterials possess unique properties that drive the development of advanced technology. In biomedical research, nanomaterials are used to develop probes for high-sensitivity assays and imaging. In theranostics, innovative nanomaterials enable breakthroughs in nanomedicines for cancer therapies by improving therapeutic efficacy and tumor-specific delivery, and minimize side-effects to improve patient care. In applications beyond life science such as energy and electronics, the unique properties of nanomaterials enable more vibrant displays; they will also make enhanced energy storage and flexible and wearable electronics a reality.

In September, Process Solutions announced three new products to help biomanufacturers navigate the evolving biopharma landscape with increased speed, greater flexibility and enhanced quality. The Eshmuno® CP-FT resin is a first-of-its kind CEX chromatography resin for the flow-through removal of aggregates from mAb therapeutics. Two modified amino acids (Phospho-L-Tyrosine Disodium Salt EMPROVE® EXPERT, L-Cysteine S-Sulfate Sodium Sesquihydrate EMPROVE® EXPERT) simplify feeding and reduce total volume in cell culture.

In October, Applied Solutions released the new Milli-Q® IQ 7003/7005 Integrated Ultrapure & Pure Water System. It is a fully integrated Type 1 and Type 2 water purification solution that is intelligent, easy to use and environmentally friendly.

In November, Process Solutions launched its new BioContinuum™ platform to advance biotherapeutic drug manufacturing through improved efficiency, simplified plant operations, and greater quality and consistency. This continuous bioprocessing platform integrates what are typically batch-based, separate manufacturing steps into a connected process, enabling continuous flow from the addition of raw materials through product harvest, purification and testing. Pilot studies suggest that conversion to continuous manufacturing may reduce manufacturing costs by up to 50%.

Recognized for award-winning innovation

As a result of our long-standing efforts in Asia, in March we were named the “Best Bioprocessing Supplier” and we received the “Best Bioprocessing Supplier Award for Single-use Systems” at the Asia-Pacific Bioprocessing Excellence Awards 2018 ceremony in Singapore.

In April, our Millistak+® HC Pro portfolio won an INTERPHEX Exhibitor Award for Best Technological Innovation. The Millistak+® HC Pro portfolio is a family of synthetic depth filters providing cleaner, more consistent depth filtration media than other DE- and cellulose-based filter offerings.

In October, we won two 2018 Convention on Pharmaceutical Ingredients (CPhI) awards. Our Parteck® MXP Excipient won the “Excellence in Excipients” category and our modified amino acids won the “Excellence in Bioprocessing and Manufacturing” category.

In November, our BioReliance® Viral and Gene Therapy Assay Portfolio and proxy-CRISPR technology took top honors for innovation at the R&D 100 Awards. These awards honor the 100 most innovative and significant technologies introduced in the past year. Over the past six years, we have won nine R&D 100 awards.

Performance Materials

With our Performance Materials business sector, we are the market and technology leader in most of our businesses. As a science and technology company we are, in many cases, able to offer innovative products and solutions, which allow us to stand out from the competition. Successful Research & Development (R&D) is therefore a material part of the strategy deployed by Performance Materials. In 2018, the part of our R&D activities that is not close to the products in the business units was combined with a central innovation unit, Early Research & Business Development. Our goals in taking this step were to sharpen our focus on our customers' needs as well as to centrally decide on the assessment of projects and the related use of resources as part of an integrated approach to research and development.

The unit develops a technology vision for Performance Materials and supports the business units in identifying projects with growth potential and tapping new markets. We evaluate the economic success of our projects and expand our activities to encompass neighboring areas in growing markets.

Display Solutions

In our Display Solutions business unit, our liquid crystal technology UB-FFS (ultra-brightness fringe-field switching) continues its successful growth thanks to new product qualifications and rising demand in the liquid crystal displays (LCD) sector for mobile devices, especially mobile phones and tablet PCs.

The development of high-resolution 4K and 8K TV sets continues to pose a challenge to the light efficiency of LC displays. We are therefore actively working to expand UB-FFS technology with our UB-Plus liquid crystal materials.

Our aim is to increase the efficiency of applications for large-format TV sets and display panels by 10% to 15%. The liquid crystal technology PS-VA (polymer-stabilized vertical alignment) remains predominant when it comes to large-format TV sets. Here, our latest materials provide additional performance benefits and improve the processing efficiency in the production of TV sets that are based on PS-VA technology. Moreover, we have successfully demonstrated our manufacturing expertise with respect to the new liquid crystal technology SA-VA (self-aligned vertical alignment). We are now focusing our attention on applications for spezialized display products from the premium segment through to TV applications produced in large numbers, as this technology offers the high contrast and image quality of the PS-VA technology while also enabling improvements in display design and panel production, for example through the reduction of waste and energy consumption in the production of LCDs.

Semiconductor Solutions

The technology area of gas-phase deposition materials (such as atomic layer deposition, ALD) is an area with high growth rates for our Semiconductor Solutions business unit. Thanks to increased research activities in collaboration with original equipment manufacturers and chip producers, we are steadily improving our positioning. Our research projects seek to identify new materials for metallization processes with low resistance and various dielectric characteristics for faster and better processors, servers and data storage density.

We have also invested in the development of advanced removers used in the photolithographic process to provide customers with a green alternative in compliance with upcoming environmental regulations.

We are currently refocusing our product portfolio to better meet the requirements of our customers operating in various compound semiconductor markets such as sensors, radio frequency filters or integrated circuits. Our conductive paste materials offer value propositions to our customers as compared with existing interconnect materials, which are reaching end-of-life status.

To better support our customers, we have expanded our research capacities in the United States, Germany and Taiwan, and are planning further research and production capacity expansions in Korea, Japan and China.

Surface Solutions

In our business with pigments for the automotive industry, we are currently focusing on the development of achromatic pigments. The latest example is our Iriodin® Icy White Pristine for silky, three-coat white stylings. Furthermore, we have expanded our regional application labs to better support the marketing of our innovative clear-coat additives, for example those manufactured on a polysilazane basis. As part of the Smart Effects initiative, we are focusing the development of cosmetic pigments on matte effects (Allure series) and luster effects (Lights series). In addition, active ingredients of natural origin are a focal topic for new cosmetic solutions.

People

"Bring Your Curiosity to Life" – our promise as an employer describes how we collaborate, how we advance our business, how our employees can develop within the company and who we are. Our development into a global science and technology company over the past 350 years would not have been possible without the passion, creativity and curiosity of our employees. And we are certain that our current and future employees safeguard our economic success. They create innovations for patients and customers, and secure our ability to compete. For this reason, the development of all our employees is such an important concern to us. In short, we are working to create an environment where people are able to develop and to reach their full potential.

A career with Merck KGaA, Darmstadt, Germany, is enriching – both from a professional and a personal perspective. We offer the necessary framework conditions that meet the individual needs of our employees, that encompass an exciting range of tasks and advanced training possibilities, furthering flexible forms of cooperation and a culture of mutual esteem and respect. The latter is particularly important as our workforce represents a broad range of nationalities, cultures, religions and age groups as well as a variety of personal and professional backgrounds. We are convinced that this diversity paired with a corporate culture based on mutual respect strengthens our innovative potential and contributes to our success.

OVERVIEW OF OUR HEADCOUNT FIGURES

As of December 31, 2018, we had 51,749 employees worldwide[1] (2017: 52,941). In 2018, we were represented by a total of 207 legal entities with employees in 66 countries.[2]

DISTRIBUTION OF EMPLOYEES

by region

Driving innovation through curious people

As a science and technology company, we are always looking for new solutions and working to continuously evolve our approaches. Engaged, curious employees are key to our ability to innovate – and therefore also for our success. We need a corporate culture that broadens the knowledge base of our employees, one that creates exciting opportunities and motivates them to take a proactive role in shaping the development of our company.

FOSTERING INNOVATIVE POTENTIAL

Curiosity and a focus on new ideas provide a fruitful basis for innovation and have a positive impact on company performance. In order to create a place – supplementing classic research and development, where we can develop ideas into viable businesses beyond the current scope – we opened the modular Innovation Center in Darmstadt back in 2015. It serves as the prototype for our Innovation Center that we opened in March 2018 as part of the 350-year anniversary festivities. The Innovation Center offers our employees the opportunity to explore new ideas in an inspiring setting and to work on selected projects. Sufficient scope and adequate support, also in the form of a suitable working environment, actively promote the innovative strength of our employees. The strategic orientation of our innovation activities is determined by innovation fields that are related to our business fields and provide potential for revolutionary technologies and business ideas. In 2018, in addition to the existing innovation field of Biosensing and Interfaces, we defined two further fields: Clean Meat and Liquid Biopsy technologies.

In order to contribute external ideas and offer the opportunity of open innovation for our innovation projects, we are building strong relationships with external partners in all industries and target the start-up community via our Accelerator.

Apart from initiatives to generate ideas and advance projects, the Innovation Center offers our employees various training courses on topics such as innovative methods, creative techniques and developing business models. In 2018, initial projects in the Innovation Center reached a milestone by becoming minimum viable products. This includes a solution where our company anchors real objects, such as products, in a blockchain to make supply chains secure and thus protect companies as well as end consumers.

[1] The Consumer Health business was transferred to Procter & Gamble (P&G) on December 1, 2018, and was already classified as a discontinued operation according to IFRS 5 in April 2018. With the completion of the sale, around 3,300 employees joined P&G.
[2] The Group also has employees at sites which are not fully consolidated subsidiaries. These figures refer to all people directly employed by the Group and therefore may deviate from figures in the financial section of this report.

VALUING CULTURAL DIVERSITY

We are a global science and technology company with employees who represent a varied cross-section of gender identities, nationalities, cultures, religions, age groups and sexual orientations. They contribute their professional backgrounds, individual life experience and perspectives to their work. We believe that a diverse workforce – paired with a respectful corporate culture – strengthens our ability to innovate and contributes significantly to our business success.

Our Chief Diversity Officer is responsible for the strategic management of diversity and inclusion. The Diversity Council, a body consisting of senior leaders from all business sectors and selected Group functions, is specifically working on the implementation of our diversity strategy, revised in 2018. Key elements of this are recruiting people representing a breadth of qualifications, skills and experiences as well as developing and retaining these people. In addition, we support specific employee networks in order to foster exchange among like-minded individuals. Apart from our women's networks in various countries, we also support networks that promote the interests of the LGBTIQ (lesbian, gay, bisexual, trans, intersex, questioning) community as well as African-American and international employees. Our carer network brings together employees from all over the world who care for a relative.

Our aim is to raise awareness for diversity and inclusion among our employees. We piloted initial training sessions in 2018 to create awareness of unconscious bias, which will be rolled out globally in 2019. Accordingly, around 380 employees have already been given the opportunity to identify their own unconscious thought patterns and stereotypes to help them avoid any unconscious unfair treatment resulting from such bias. We also introduced the Job Analyzer, an online tool that allows job advertisements to be checked for critical wordings prior to their publication, thus fostering gender-neutral communication with those applying for jobs.

As a global employer with intercultural expertise, people from a total of 136 nations work for our company; 24.1% of our employees are German citizens and 73.9% of our employees work outside Germany. At our headquarters in Darmstadt, 11% of our staff comes from 89 different countries.

Women currently make up 44% of our workforce. However, the ratio of women to men varies widely across the different regions, businesses and functions. We are therefore working to raise the proportion of women wherever they are underrepresented, taking into account the situation typical for the industry as well as regional differences.

Demographic change is posing challenges to the society in Germany as well as several other EU countries, the United States, China and Japan. The average age of our employees is slightly above 41. We assume that this figure will continue to rise in the coming years and are preparing for this situation. As part of our range of "Health and Well-being" offers, we specifically promote employee physical and psychological well-being. These offers vary from country to country and are adapted to local circumstances. In addition, we offer multifaceted continuing education throughout our employees' careers.

In Germany, we signed the "Charta der Vielfalt" (Diversity Charter) in 2013, the "Charta der Gleichstellung" (Equal Opportunity Charter) in 2015 and the Inclusion Action Plan of the German Mining, Chemical and Energy Industrial Union (IG BCE) in 2017. By joining these initiatives, we underscore our commitment to fairness and tolerance in the workplace.

Furthering and asking more of talent

We endeavor to identify and develop the abilities of our employees early on. Our objective is to extensively develop current and future employees and offer them interesting advanced training opportunities in order to prepare them for more challenging tasks.

A HOLISTIC RECRUITMENT APPROACH

When filling job vacancies, we pursue a holistic recruitment approach coupled with globally uniform and binding procedures. This starts with an internal job posting before external channels such as job portals and recruitment agencies are used. This process enables us to offer employees better development opportunities. For employees with leadership responsibility, we offer targeted interview coaching to support them in selecting candidates and to establish uniform quality standards.

A globally accessible welcome portal is available to new employees in order to help them prepare for their new job at Merck KGaA, Darmstadt, Germany, and to support their onboarding phase. To further improve the onboarding process, supervisors, Human Resources and new employees can exchange information and documents before their first day of work. In addition, all new employees are assigned an experienced colleague who can help them to familiarize themselves with the daily working routine. Our managers are also given detailed information such as onboarding plans and process descriptions to support them with this task.

VOCATIONAL TRAINING TO RECRUIT YOUNG PEOPLE

In 2018, we again maintained a constant, high vocational training rate in Darmstadt, our largest site. A total of 562 young people were enrolled in vocational training in 24 different occupations at our headquarters in the reporting period. We give unlimited employment contracts to all employees in vocational training who work in occupations for which we have sustainable demand. On average, the post-vocational training hiring rate – taking voluntary terminations into account – was more than 90% over the past five years. We also offer vocational training at other sites in Germany, in which a total of 60 young employees participated.

We promote the professional and social expertise of our employees in vocational training through numerous regional and global project activities. This included the support of a foundation for street children in South Africa in 2018. Furthermore, through our "Start in die Ausbildung" (Starting vocational training) program, we help prepare young people who have not been able to find a vocational training position. The number of interns increased slightly compared to the previous year with 21 participants aged between 16 and 25 years. Although they have a school leaving qualification, they had been searching for a vocational training position for at least one year without success.

Since 2016, we have also been working on a specially developed program to help refugees enter the job market. As part of the "Integrating refugees through training" program, a further group of twelve young people who were forced to flee their home countries started language, technical, cultural, and career-related training to prepare them for vocational training and thus for the labor market.

TARGETED ADVANCED TRAINING AND MAXIMIZING PERFORMANCE CAPABILITY

Our focus on systematic personnel development allows us to sustainably strengthen the performance potential within our company and to increase the motivation of our people. Only by expanding the abilities of each individual can we count on innovative and curious employees and managers in the future and flexibly respond to different requirements.

Employee development at our company is founded on regular exchanges and a culture in which employees aspire to high levels of performance and engagement. As the basis for internal strategic talent management, the performance and potential management process is globally aligned for all employees in accordance with the same principles and is part of a shared IT system. We systematically combine talent recognition with performance assessments based on employee target agreements, as we are convinced that ongoing feedback helps all employees to grow in terms of their performance and potential. Regular individual assessments permit us to more readily identify high-potential employees and to further them accordingly. Clear objectives, differentiated and open feedback, and individual development plans are thus important prerequisites for both the personal development of every individual and the success of the company.

Furthermore, we have established our "Science Network". Due to the broad positioning of our company, we do not have a central research and development organization that unites expertise across our businesses. Through this project we are promoting the establishment of a science community within the company to accelerate the exchange of innovative ideas and facilitate collaboration among all our R&D employees. One element of this project is the "Continuous Performance Dialogues" between 1,300 employees and their supervisors to align performance and potential appraisals with research and development needs. Other aspects focus on the advanced training of experts and their career paths and on the transfer of knowledge within the network.

Global classroom training courses and workshops developed specifically for teams help our employees develop and build individual abilities in line with new requirements and perspectives. In 2018, more than 4,100 employees participated. Digital solutions in the form of more than 3,735 e-learning and languages courses are available to our employees. To enable our employees to realize their full potential, we also provide local business- and function-related offers. All measures are documented in a globally standardized development plan.

Individual development opportunities are also supported by our job architecture. It applies globally and enables us to harmonize all positions and to simplify their classification. This job architecture defines three fundamental career types: managers, experts and project managers. They are all equivalent. Employees who wish to advance in their careers and aim for a top position within the company can also do so via the expert and project manager career paths.

Building empowered leaders

One of the major duties of our managers is to motivate and encourage employees to show their innovative strength. A dialog in a spirit of partnership, the development of strategic competencies and the continuous further development of our leaders help to build trust and to strengthen our company's success over the long term.

STRATEGIC COMPETENCY DEVELOPMENT

A transparent competency model is a further pillar of our personnel development efforts. Managers and employees should show strategic competence by being purposeful, future-oriented, innovative, results-driven, collaborative and empowering. By demonstrating these qualities, our managers can build a strong culture of collaboration based on curiosity, creativity and trust. In addition, our leaders are expected to set an example by living our company values and taking responsibility for their own decisions. Based on this competency model, we have defined six leadership behaviors that summarize the conduct we expect from our leaders.

To assess the performance and potential of every individual and to establish an effective leadership culture, regular and differentiated feedback is of utmost importance. In this way, employees and supervisors can develop a shared vision, execute the business strategy and further develop a unifying corporate culture.

USING THE OPPORTUNITIES PROVIDED BY DIGITALIZATION

The digital transformation has been leaving its mark on the world of work for a long time now. New, agile ways of working are thus increasingly gaining in importance. At our company, we want to support this trend actively, which is why we are offering our employees many opportunities for digital and innovative working.

Using the big data applications developed by People Analytics within Human Resources, managers receive quick and targeted answers to personnel-related questions. In addition to the traditional master data, the software also holds information on compensation, performance and potential as well as on commitment or succession planning and is able to link this data. This means that leaders have a comprehensive data set at their disposal, which they are able to use taking into account data protection provisions. The analyses are based on algorithms and allow the early identification of trends (predictive analysis) and data-based decisions.

Our manager and employee self-services are another good example of modern working methods. Employees can use these services to manage their own data, retrieve information and perform personnel-related tasks independently.

Digitalization also features in our training and advanced training programs as IT skills are becoming increasingly important. At the same time, digital media create new ways of learning. For this reason, we are integrating topics such as 3D printing and artificial intelligence into our training content with increasing frequency. We are also increasingly relying on new kinds of learning and innovation methods, such as scrum or design thinking.

DIVERSITY AND MANAGEMENT

In order to manage our global and diverse organization, we need managers who can build international teams and promote international collaboration so as to contribute to a productive and flexible working environment. We seek managers whose inclusive leadership style also reflects different employee and customer traits. This opens up career opportunities for talented employees from all areas of our company and ensures a broad experience base as well as differentiated decision-making.

At our company, many teams work across sites and internationally. The diversity of competencies and experiences among the team members offers tremendous potential that our leaders can make use of. Internationality and a global mindset characterize our company culture and are therefore mirrored by our international management team. In 2018, 63.6% of our executives were not German citizens. Altogether, 70 different nationalities are represented in such positions.

Our goal for the period until 2021 is to maintain the proportion of women leaders at a stable level of 30%, and we are working to further increase the representation of women in leadership positions and business units where they are still underrepresented. To achieve this objective, during the reporting period we formed special teams that are responsible for developing goals and measures at departmental level to help us move female candidates into positions in different areas and hierarchies. At the end of 2018, women occupied 32.3% of leadership roles Group-wide. These figures are steadily increasing across the company as a whole, but not consistently across business units, Group functions and hierarchical levels. The report on stipulations to promote the proportion of women in leadership positions at Merck KGaA, Darmstadt, Germany, pursuant to section 76 (4) and section 111 (5) of the German Stock Corporation Act (AktG) can be found in the Corporate Governance section of this report.

MANAGEMENT PROGRAMS FOR EXECUTIVES

We use targeted advanced training to nurture our top talent and senior executives. The eight-month International Management Program strengthens the leadership competencies and global thinking of top talent at the start of their career. In cooperation with leading international universities, our Company University has been offering a cross-regional, modular advanced training program since 1999. To date, 397 members of top management have taken part. Furthermore, our company cooperates globally with academic institutions in order to support employees who wish to earn an MBA. In 2015, we launched management programs specifically for people managers in growth markets, which focus on business management and Group-

specific topics. These programs are offered in China, the Middle East, Africa and Latin America, for example. Moreover, in 2018 we ran the "Managerial Foundation Program" (MFP) for new people managers in 20 countries with 795 participants. The "Advanced Management Program" (AMP) for experienced leaders ("managers of managers") builds on the MFP and was attended by 242 people managers in five countries. For the top management we also offer a "Global Leadership Program" (GLP). This program addresses issues such as leadership culture and prepares participants for the leadership challenges of tomorrow. Since 2016, 678 leaders have participated in the GLP.

In 2018, we once again expanded our workforce pool to internally fill management positions when they become vacant. In 2018 once again, most management position vacancies were filled by internal candidates. In addition, we recruited highly qualified external executives in order to add new perspectives to our long-standing in-house expertise.

Differentiated solutions to support employee well-being

As an employer, we take on responsibility for the well-being of our people and offer a wide range of opportunities to optimize work-life balance and to protect their health and safety.

FOSTERING WORK-LIFE BALANCE

As a responsible employer, the physical and mental well-being of our employees is extremely important to us. To enable employees to plan their lives independently and to stabilize their long-term satisfaction at a high level, providing a flexible and health-oriented working environment is a special focus of our human resources work.

A healthy work-life balance is a crucial precondition for the performance ability and motivation of our people. We plan to roll out a Group-wide guideline on flexible working in 2019. At present, we offer our employees at many sites around the world various flexible and innovative working models. The Mywork at Merck KGaA, Darmstadt, Germany, working model allows employees at the German sites in Darmstadt and Gernsheim, for example, to freely choose their working hours and location in agreement with their teams and supervisors. In addition, we also introduced the Mywork at Merck KGaA, Darmstadt, Germany, for Merck Accounting Solutions & Services Europe GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, Merck Export GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany, Merck Schuchardt OHG, Hohenbrunn, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany, Merck Selbstmedikation GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany, and Merck Chemicals GmbH GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany. Employees no longer record their time electronically and must document their hours only if they exceed their standard working hours within the agreed working time framework. At the end of December 2018, a total of 5,698 employees made use of this model. In 2018, 4.8% of our employees worldwide worked part-time, 12.5% of whom are men.

By offering information, advice and assistance in finding childcare and nursing care as home and garden services, we help employees to reconcile the demands of their professional and personal lives. At various sites, employees benefit from childcare options that we subsidize. For example, a daycare center has been operating at the Darmstadt site, looking after children between the ages of one and twelve, for over 50 years. The adjacent new building houses a nursery for up to 60 children between the ages of one and three years. During the orientation phase, our employees can make use of additional offices for parents at the daycare center. In addition, a good ratio of staff to children is important to us to reliably supervise the children.

A TRANSPARENT AND FLEXIBLE EMPLOYEE REWARD SYSTEM

At our company, we reward the performance of every individual through appropriate and competitive total compensation. For years, we have been achieving this through global processes and programs that are supported by digital platforms. We also offer our managers flexible, market- and needs-oriented compensation tools. These support well-informed decisions and thus provide comprehensible, performance- and position-based compensation. Apart from monetary compensation components, we also offer our employees attractive fringe and social benefits. Our fringe benefits feature globally under the internal "benefits4me" brand. Its offerings comprise three pillars:

- Company benefits including a company pension
- Health and well-being
- Service offers

Specific benefit packages are in place at a national level to meet the different needs of our employees using well-established management mechanisms. Focusing more closely on individualized fringe and social benefits in the future will continue to enable our employees to individually choose those benefits that best meet their personal situation and stage of life.

A CONSTANT FOCUS ON HEALTH AND SAFETY

Workplace safety and health protection are the highest priority at Merck KGaA, Darmstadt, Germany. 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 one day or more per one million working hours. After having reached the goal of 2.5 that we had set in 2010, in 2015 we set ourselves a new, ambitious goal: By 2020 we intend to sustainably lower the LTIR to 1.5. With an LTIR of 1.3 in 2018, we overachieved this goal.

Since 2010, we have been using the "BeSafe!" program to further expand our occupational safety activities. Uniform standards as well as local modules to meet specific safety requirements at individual sites can help achieve a steady improvement in the current situation. The program focuses on engaging managers in the safety culture and building their buy-in; it aims to make safety an intrinsic value and empower our employees to take responsibility for their own safety. In 2018, we continued to sensitize our employees to workplace hazards through numerous awareness campaigns.

Since 2010, our company has 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 2018, it was awarded to 62 out of 90 sites.

REGULAR GLOBAL EMPLOYEE SURVEYS

We want to create a working environment that empowers our employees to think outside of the box and find new solutions, opening the door to creative ideas and the discovery of new market opportunities. In order to promote this and to allow us to carry out even better comparisons both within the company and with our competitors, we conduct Group-wide employee engagement surveys every year. In this way we ensure a regular exchange between employees, leaders and the top management. The honest feedback we receive from staff shows us whether the aforementioned measures and initiatives are successful as well as highlighting areas where we can improve further.

In October 2018, the global employee engagement survey was again conducted in 22 languages and the status of implementation reviewed. Around 45,000 employees (86%) took part. Our Group-wide score, which indicates how attached our employees feel to the company, was 61%. We are thus on a par with other pharmaceutical and chemical companies. These surveys are supplemented by smaller "snapshot surveys", where employees are asked about selected strategic issues or projects.

The results are used to identify strategic focus areas and they feed into the company-wide work on an ongoing basis.

OVERVIEW OF EMPLOYEE FIGURES[1]

			Group (overall) Dec. 31, 2016	Group (overall) Dec. 31, 2017	**Group (overall) Dec. 31, 2018[2]**
Number of employees	global, total		50,414	52,941	51,749
	by region	Asia-Pacific (APAC)	10,754	11,294	10,486
		Europe	24,438	25,980	25,792
		Latin America	4,140	4,050	3,340
		Middle East and Africa (MEA)	1,045	1,097	1,153
		North America	10,037	10,520	10,978
Number of employees (FTE – full-time equivalents)	global, total		49,652.7	52,223.5	51,039.8
	by region	Asia-Pacific (APAC)	10,725.3	11,272.1	10,462.9
		Europe	23,727.1	25,302.5	25,126.8
		Latin America	4,136.5	4,046.2	3,339.5
		Middle East and Africa (MEA)	1,041.8	1,096.1	1,151.1
		North America	10,022.0	10,506.7	10,959.6
Number of countries			66	66	66
Number of legal entities	global, total		215	217	207
Number of nationalities	global, total		129	131	136
Number of nationalities working in Germany			91	97	95
Percentage of employees with German citizenship			23.1%	23.2%	24.1%
Percentage of employees working outside Germany			75.3%	74.9%	73.9%
Percentage of employees with global managers			9.7%	10.2%	10.6%
Percentage of women in the workforce	global, total		42.8%	43.1%	44.0%
	in Germany		38.6%	39.1%	38.9%
Percentage of women in leadership positions (= role 4 or higher)	global, total		28.8%[3]	30.3%[3]	32.3%[5]
	in Germany		28.7%[3]	29.7%[3]	30.9%[5]
Percentage of executives (= role 4 or higher)	global, total		5.7%[3]	6.0%[3,4]	6.5%[5]
	Percentage of executives who are not German citizens		64.7%[3]	64.4%[3]	63.6%[5]
	Number of nationalities		70[3]	65[3]	70[5]
Number of employees in vocational training in Germany			576	588	604
Vocational training rate			5.1%	4.4%	4.1%
Number of employees in the model (Germany) of the Mywork at Merck KGaA, Darmstadt, Germany			4,507	5,267	5,698
Percentage of employees working part-time	global, total		4.7%	4.6%	4.8%
	Men		10.6%	10.7%	12.5%
Percentage of employees aged 17 – 29 years	global, total		14.7%	14.5%	14.5%
Percentage of employees aged 30 – 49 years	global, total		62.5%	62.1%	61.1%
Percentage of employees aged 50+	global, total		22.8%	23.4%	24.4%
Average age globally			41.3	41.4	41.7
Average age by region	Asia-Pacific (APAC)		36.7	36.9	36.9
	Europe		42.4	42.5	42.8
	Latin America		39.9	40.3	40.4
	Middle East and Africa (MEA)		39.3	39.4	39.2
	North America		44.3	44.1	44.1
	Germany		42.9	43.0	43.3
Average length of service	global, total		9.9	9.8	10.0
Average length of service in Germany			14.2	14.0	14.5

[1] The Group also has employees at sites that are not fully consolidated subsidiaries. These figures refer to all people directly employed by the Group and therefore may deviate from figures in the financial section of this report.

[2] The Consumer Health business was transferred to Procter & Gamble (P&G) on December 1, 2018, and was already classified as a discontinued operation according to IFRS 5 in April 2018. With the completion of the sale, around 3,300 employees joined P&G.

[3] Not including Sigma-Aldrich legal entities in Germany or Allergopharma.

[4] Ratio adjusted retrospectively.

[5] Not including the Sigma-Aldrich legal entity in Steinheim (Germany) or Allergopharma.

REPORT ON ECONOMIC POSITION

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REPORT ON ECONOMIC POSITION

Report on Economic Position

Macroeconomic and Sector-Specific Environment

According to the most recently available figures from the International Monetary Fund (IMF), the global economy faced rising growth expectations in 2018. Forecast growth in 2019 is expected to be slightly below the level of the two previous years. Although the global economy thus continues to expand, growth in the third quarter of 2018 fell short of expectations in a number of economies. Risks to global growth include, in particular, a further rise in trade barriers and the outflow of capital from emerging economies.

Expressed in figures, according to the latest IMF forecasts global gross domestic product (GDP) rose by 3.7% in 2018, equivalent to a slight decline in the growth rate in comparison with 2017 (3.8%). Strong regional differences and differences between industrial nations and emerging economies could be seen. Industrial nations registered a slight weakening of growth to 2.3% (2017: 2.4%). At 4.6% (2017: 4.7%), growth in the emerging economies and developing countries also declined slightly. The GDP of the United States, the world's largest economy, grew by 2.9% (2017: 2.2%). By contrast, the eurozone recorded a weakening of GDP growth to 1.8% (2017: 2.4%). The emerging economies of Asia registered stable growth of 6.5% (2017: 6.5%). As in 2017, India at 7.3% (2017: 6.7%) and China at 6.6% (2017: 6.9%) were the strongest growth drivers. In the industrialized countries of Asia, the GDP of Japan grew by 0.9% (2017: 1.7%) and that of Taiwan by 2.7% (2017: 2.9%). Korea registered growth of 2.8% (2017: 3.1%).

Organic sales growth of the Group was above the IMF's global growth expectations in 2018 and came to 6.1%. It was supported by all regions. Asia-Pacific accounted for the largest share of growth across the Group at around 42%, followed by Europe at 24.6%, North America at 20.2%, Latin America at 11.5% and the Middle East and Africa at 1.8%. Growth was driven primarily by the Healthcare and Life Science business sectors, while Performance Materials came in slightly above the 2017 figure. Growth in the Asia-Pacific region was supported by all business sectors. Healthcare and Life Science made a positive contribution in Europe as well as in the Latin America region. Growth in North America was principally the result of operations in the Life Science business sector.

	Development 2018[1]	Development 2017
Healthcare		
Global pharmaceutical market	4.8%	2.7%
Market for multiple sclerosis therapies[2]	2.6%	7.4%
Market for type 2 diabetes therapies[2]	9.7%	9.2%
Market for fertility treatment[2]	9.2%	7.4%
Market for the treatment of colorectal cancer[3]	5.1%	–0.7%
Life Science		
Market for laboratory products	3.6%	3.4%
Share of biopharmaceuticals in the global pharmaceutical market[2]	27.9%	25.9%
Performance Materials		
Growth of wafer area for semiconductor chips	7.6%	10.0%
Growth of LC display surface area[4]	8.6%	6.0%
Global sales of cosmetics and care products	3.3%	3.5%
Global automobile sales volumes	0.0%	2.2%

[1] Predicted development. Final development rates for 2018 were not available for all industries when this report was prepared.
[2] Growth rates based on market data in local currency, translated at a constant euro exchange rate. The IQVIA market data on the growth of indications are based on current figures, including the third quarter of 2018. Annual growth based on the values for the past 12 months. The type 2 diabetes market excludes the United States, since this market is insignificant to the Group.
[3] Growth rates 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.
[4] Growth of display area is a pure volume indicator, which is counteracted by a negative price momentum.

HEALTHCARE

In the latest study published in October 2018 by the pharmaceutical market research firm IQVIA entitled "Market Prognosis 2018 – 2022", the growth of the global pharmaceutical market for 2018 is quantified at 4.8%. By comparison, in 2017, sales growth was only 2.7%. As was already the case in 2017, the EMEA and Latin America regions were the main contributors to growth in 2018. North America also fueled growth. In the United States, growth accelerated substantially to 5.2% (2017: 1.4%). Latin America continued to see strong growth of 8.3% (2017: 8.0%). The EMEA region generated growth of 5.0% (2017: 3.6%). The Asia-Pacific region recorded a slight increase in growth to 3.2% (2017: 2.8%).

Not only the growth of the pharmaceutical sector as a whole, but also in particular the development of the biopharmaceutical market is relevant for our business. According to IQVIA, the market volume of biological pharmaceuticals was approximately € 249 billion in 2018. In recent years, the share of the global pharmaceutical market accounted for by these products has grown continuously and already amounted to 27.9% in 2018 (2017: 25.9%). Globally, the largest share, or 37.8%, was attributable to the U.S. market.

The developments in the therapeutic areas of relevance to the Group generally reflect robust growth, albeit with different trends. The market for the therapeutic area type 2 diabetes excluding the United States showed a positive trend with a growth rate of 9.7% (2017: 9.2%) and those for fertility and the treatment of colorectal cancer also saw positive growth rates of 9.2% (2017: 7.4%) and 5.1% (2017: –0.7%), respectively, whereas the market for multiple sclerosis patients registered a weakening of growth to 2.6% (2017: 7.4%).

LIFE SCIENCE

Our Life Science business sector is a leading supplier of products and services for both research and applied laboratory applications, as well as for formulating, purifying, manufacturing and quality-assuring drug therapies of chemical and biological origin.

According to the market research firm Frost & Sullivan, the laboratory product market relevant to Research Solutions and Applied Solutions achieved growth of 3.6% in 2018 (2017: 3.4%). Strong growth continued over the course of the year and was driven primarily by customers in the biopharmaceutical industry, specifically emerging biotech companies. The European market grew by 2.4% compared with the previous year (2017: 3.5%). The weakening of growth is attributable to continuing uncertainties, for example resulting from Brexit. The market in the United States grew by 4.2% (2017: 3.1%), driven by increased National Institutes of Health (NIH) funding and the tax reform. The emerging countries recorded higher growth rates, particularly in China and India. The Chinese market grew by 7.0% (2017: 7.8%). Although Chinese GDP growth is slowing down and the tariff and trade relationships have led to uncertainties in procurement, China remains interested in financing scientific tools and in product investments in the laboratory area, which are considered key priorities of the 13th Five-Year Plan. India generated growth of 8.2% (2017: 8.0%) with laboratory products, and is focusing more strongly on supporting academic and government research.

The demand for Process Solutions products depends heavily on the sales of biopharmaceutical companies with biologics as well as on the productivity of their research & development activities.

According to IQVIA, the market volume of biotechnological pharmaceuticals grew in 2018 to € 249 billion (equivalent to 27.9% of the global pharmaceutical market). Around 7,800 biotechnological drug candidates were in preclinical phase 2 of clinical development. In 2018, monoclonal antibodies accounted for around 25% of these drug candidates (2017: 23%). Biosimilars are a small, but fast-growing part of the pharmaceutical market. For 2018, annual sales of biosimilars were estimated at US$ 5.95 billion; this figure is expected to increase to US$ 23.63 billion by 2023.

PERFORMANCE MATERIALS

The semiconductor industry is the most important market for business with material for integrated circuits (IC Materials). The growth rates of the wafer area for semiconductor chips is independent of cyclical prices, for example for memory, and is a good indicator of demand for semiconductor materials. According to the global industry association SEMI, the area of delivered wafers rose by just under 8% in 2018, mainly thanks to consistently strong demand from consumers. Sales of semiconductor manufacturers, which have grown even more sharply, are affected by the price trend of DRAM and NAND memory chips.

With its Liquid Crystals business, the Group is the leading producer of liquid crystal mixtures for the display industry. The growth rates of display surfaces totaled on average around 7% in 2017 and 2018, according to surveys by market researchers at IHS Display-Search. This growth was mainly attributable to increasing average display size amid slightly declining sales volumes. Liquid crystals will continue to play a key role in the display industry in the future. OLED technology, for which the Group also ranks 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 IHS, global automobile sales in 2018 remained at the 2017 level. Only a few emerging economies recorded growth while Europe, North America and China showed a slightly negative trend after high 2017 figures. In the second half of 2018, in particular, economic relationships between the United States and China together with political uncertainties in Europe contributed to a weakening of demand. According to Statista, global sales of cosmetics and care products rose by approximately 3%.

Review of Forecast against Actual Business Developments

The forecast of the Group for fiscal 2018 published in the Annual Report for fiscal 2017 comprised the three business sectors of Healthcare, Life Science and Performance Materials. On September 5, 2017, our company had announced that it was examining strategic options for its Consumer Health business. This analysis had not been completed by the time the 2017 Annual Report was prepared, and as of December 31, 2017, the Executive Board concluded that a divestment of the Consumer Health business within twelve months was not regarded as highly likely. As a result, the forecast at the time included the Consumer Health business.

On April 19, 2018, we announced the signing of an agreement to divest our global consumer health business to Procter & Gamble (P&G) for around € 3.4 billion in cash. At the time, the transaction was expected to be signed at the end of the fourth quarter of 2018. Signing took place on November 30, 2018. In order to ensure the systematic continuation of the forecast from the 2017 Annual Report and assess the further development with respect to the Consumer Health business, we presented our forecast for the expected sales and earnings of the Group and our Healthcare business sector as of the first quarter of 2018 both with and without the Consumer Health business. In its report on the second quarter of 2018, the Consumer Health business was classified as a "discontinued operation" in accordance with IFRS 5. Consequently, the prior-year figures and the figures for the first quarter of 2018 were adjusted accordingly, as was our forecast. At the same time, the key drivers of the forecast – organic sales and EBITDA pre growth for the Group and for the business sectors together with their exchange rate effects in each case – remained unchanged.

Due to this portfolio change, the following analysis reflects the new structure of the Group: it takes the Consumer Health business into account as "discontinued operation".

NET SALES

For 2018, we had forecast moderate organic net sales growth for the Group. In the second half of 2018 we recorded more dynamic sales growth in all business sectors than expected at the start of the year; this means that for 2018 as a whole we realized a strong organic rise in net sales of +6.1%, thereby slightly exceeding our forecast.

Due to the emerging unfavorable development of the exchange rate between the euro and the U.S. dollar and various currencies in the growth markets at the start of the year, we anticipated a moderately negative exchange rate effect on our net sales. At the same time, we assumed that the charges would be greater in the first half than in the second half of 2018. This assessment was confirmed: the negative exchange rate effect in 2018 as a whole was –3.9%. From the middle of 2018 onward a perceptible easing of the exchange rate between the euro and the U.S. dollar was observed, as expected, although a number of different currencies in the growth markets, particularly the Latin American currencies, showed a less favorable than expected development in the second half of 2018.

Healthcare

In 2018, our Healthcare business sector generated solid organic sales growth of +5.2% (or € 324 million), thus meeting our forecast of moderate organic growth. Sales growth in 2018 was supported by the continuation of good organic sales growth in the General Medicine & Endocrinology and Fertility business units in our growth markets (€ 179 million) and the contribution to sales made by our newly approved products Bavencio® and Mavenclad®, which slightly exceeded our expectations. Both products together generated sales of € 160 million in 2018 and thus contributed € 138 million to organic sales growth.

Life Science

For our Life Science business sector, at the beginning of the year we had forecast solid organic sales growth, slightly above expected medium-term market growth of around +4% per year. The business sector achieved very strong organic growth of +8.8% in 2018. This means that it exceeded the top end of our forecast of between +7% and +8% that we had raised in our report on the third quarter of 2018, thanks to the very positive organic sales development in the fourth quarter of 2018. As expected, Process Solutions was the most dynamic business unit, delivering the largest contribution to organic sales growth within Life Science. As expected, Applied Solutions and Research Solutions also contributed positively to the organic sales performance, albeit to a significantly lesser extent than Process Solutions.

Performance Materials

Contrary to our original expectation of a slight to moderate decline in organic sales, the Performance Materials business sector generated a slight increase in organic sales of +1.7% in 2018. Since the third quarter of 2018, various capacity expansion projects by our customers in the display industry have prompted an increase in

demand for our liquid crystal materials in the Display Solutions business unit. Prompted by this development and by sales growth of Semiconductor Solutions in line with our expectations, we raised our estimate of organic sales growth to between –1% and +1% in our report on the third quarter of 2018. This temporary upturn continued in the liquid crystal business in the fourth quarter of 2018, as a result of which organic sales growth of the Performance Materials business sector in 2018 slightly exceeded our updated forecast range, at +1.7%.

EBITDA PRE

For 2018 we expected a slight organic decline in EBITDA pre over the prior year for the Group. Furthermore, because of the difficult foreign exchange environment, we expected negative exchange rate effects to depress EBITDA pre by between –4% and –6% over the prior year. In 2018, EBITDA pre came to € 3,880 million, equivalent to a decrease of –10.5% compared with the prior year (2017: € 4,246 million). The organic decline of –1.6% entailed by this figure was in line with our forecast. By contrast, at –8.9% the foreign exchange effect on EBITDA pre in 2018 as a whole was substantially more negative than expected at the start of the year although it was in line with the range of between –8% and –10% which we had adjusted in the course of our reporting on the third quarter of 2018. The expected advantageous development of the euro against the U.S. dollar in the second half of 2018 was more than offset by the continuing depreciation of various emerging market currencies versus the euro, particularly of the Latin American currencies. During this period in 2018, the Argentine peso and the Brazilian real performed significantly worse than we had expected at the start of the year.

Healthcare

For our Healthcare business sector we are forecasting a slight organic decrease in EBITDA pre over the prior year due to the continuing rise in research and development expenses to develop our pipeline, particularly in immuno-oncology, and the disappearance of exceptional income from the prior year and a slight decline in organic EBITDA pre over the prior year. In addition, we had expected moderately negative exchange rate effects. In 2018, EBITDA pre in Healthcare amounted to € 1,556 million (2017: € 1,773 million). This is equivalent to a decline of –12.2% over 2017; the organic drop of –1.6% corresponded to the forecast we issued at the start of the year. The exchange rate effects had a substantially greater negative impact than expected at the start of the year. As a result, in our reporting on the third quarter of 2018 we changed our forecast range to between –9% and –11% and closed out the year 2018 at –10.7%.

Life Science

For Life Science we had expected organic EBITDA pre growth to be similarly dynamic as in 2017 at around +8% due to the expected organic sales growth and continuing realization of synergies from the acquisition of Sigma-Aldrich, which remain on schedule. With € 1,840 million, the business sector delivered organic growth of +7.0% and was thus below the forecast range we had given at the beginning of the year. The exchange rate developments depressed EBITDA pre by –3.9% and thus corresponded to our forecast of a moderately negative exchange rate effect.

Performance Materials

Owing to the expected corrections in the Display Solutions business, we forecast an organic percentage decline in EBITDA pre for the Performance Materials business sector totaling a mid-teen percentage figure at the start of the year. For the exchange rate effects we moreover projected a moderately negative charge on EBITDA pre over 2017. For 2018 as a whole, Performance Materials achieved EBITDA pre of € 786 million. This corresponded to a drop of –19.8% over 2017, of which –12.9% was attributable to the organic business performance and a further –6.9% to exchange rate developments. Both key financial indicators were thus within the ranges we had indicated at the start of the year.

Corporate and Other

EBITDA pre of Corporate and Other, which reached a level of € –381 million in 2018, was within our forecast range of € –360 million to € –400 million that we specified at mid-year. Compared with the prior-year figure of € –292 million this corresponded to a rise in costs of 30.6%. This development was primarily attributable to losses from our currency hedging, which were higher in the second half of 2018 than had been expected at the start of the year. We did, however, reach the forecast we issued at the start of the year, which provided for an increase in expenses for Corporate and Other amounting to a low single-digit percentage figure.

BUSINESS FREE CASH FLOW

For 2018, we expected business free cash flow of the Group to see a low double-digit percentage decline. We met this forecast with a decrease of 21.4%. The Healthcare business sector reported a decline of 22.0% compared with the previous year, which was lower than the single-digit percentage fall we had forecast at the start of the year. This development was primarily attributable to the sale of the Consumer Health business, which had not yet been anticipated when the forecast was made at the start of the year. The transfer of the EBITDA pre of the divested business had a particularly significant impact. The business free cash flow of the Life Science business sector was more or less stable, declining by 0.7%. This is in line with the small percentage decrease we had forecast. For the Performance Materials business sector we anticipated a double-digit decline in 2018. The drop of 35.1% – essentially the result of lower EBITDA pre – thus corresponded to our expectations.

GROUP

	Net sales	EBITDA pre	Business free cash flow	EPS pre
Actual results 2017 in € million	14,517	4,246	3,193	€ 5.92
Forecast for 2018 in the 2017 Annual Report[1]	Moderate organic growth Moderately negative exchange rate effect	Slight organic decline Moderately negative foreign exchange effect of –4% to –6%	Low double-digit percentage decline	
Main comments	Moderate organic growth in Healthcare due to strong dynamics in growth markets as well as increasing sales of Mavenclad® and Bavencio® Solid organic growth in Life Science, slightly above expected market growth Slight to moderate organic decrease in Performance Materials owing to the ongoing adjustment processes in the Liquid Crystals business Negative foreign exchange effect, driven primarily by the exchange rate of the U.S. dollar and currencies of various growth markets	In Healthcare continued high investments in research and development as well as in marketing and sales; absence of positive one-time effects from the previous year Organic sales growth and continued realization of planned synergies from the integration of Sigma-Aldrich in Life Science Ongoing adjustment processes in the Liquid Crystals business that will not be offset despite the enhanced diversification of Performance Materials and active cost management Moderately negative foreign exchange effect, particularly owing to the development of the U.S. dollar and currencies of various growth markets	Lower EBITDA pre and investments in property, plant and equipment, as well as digitalization initiatives, higher inventories due to changes in the product mix and volume growth	
Forecasts for 2018 in the interim report:				
Q1/2018	Organic growth +3% to +5% Exchange rate effect –4% to –6% ~15,000 to 15,500 (excluding Consumer Health ~14,000 to 14,500)	Organic decline –1% to –3% vs. 2017 Exchange rate effect –5% to –7% ~3,950 to 4,150 (excluding Consumer Health ~3,750 to 4,000)	~2,460 to 2,770 (excluding Consumer Health ~2,310 to 2,620)	EPS pre € 5.30 to € 5.65 (excluding Consumer Health business € 5.00 to € 5.40)
Q2/2018	~14,100 to 14,600 Organic growth +3% to +5% vs. 2017 Moderately negative foreign exchange effect –3% to –5%	~3,750 to 4,000 Organic decline –1% to –3% vs. 2017 Exchange rate effect –5% to –7%	~2,380 to 2,670	€ 5.00 to € 5.40
Q3/2018	~14,400 to 14,800 Organic decline +4% to +6% vs. 2017 Moderately negative foreign exchange effect –3% to –5%	~3,700 to 3,900 Organic decline –1% to –3% vs. 2017 Exchange rate effect –8% to –10%	~2,340 to 2,630	€ 5.00 to € 5.30
Results 2018 in € million	14,836 (+2.2%: +6.1% Organic, 0.0% Portfolio, –3.9% Currency)	3,800 (–10.5%: –1.6% Organic, 0.0% Portfolio, –8.9% Currency)	2,508 –21.4%	5.10 –13.9%

[1] The 2018 forecast in the 2017 Annual Report included the Consumer Health business.

HEALTHCARE

	Net sales	EBITDA pre	Business free cash flow
Actual results 2017 in € million	6,190	1,773	1,314
Forecast for 2018 in the 2017 Annual Report[1]	Moderate organic growth Moderately negative exchange rate effect		Single-digit percentage decline
Main comments	Organic sales growth in growth markets will compensate for the organic decline in Rebif® sales, which is expected to be in the high single-digit percentage range Continued price pressure in Europe and also in the Asia-Pacific as well as Middle East and Africa regions Bavencio® and Mavenclad® will contribute visibly to sales growth Solid organic growth of our Consumer Health business Negative foreign exchange effect, driven primarily by the exchange rate of the U.S. dollar and currencies of various growth markets	Continued high investments in research and development as well as in marketing and sales; absence of positive one-time effects from the previous year Negative foreign exchange effect, particularly owing to the development of the U.S. dollar and currencies of various growth markets	Decline in EBITDA pre Increase in working capital due to product mix effects
Forecasts for 2018 in the interim report:			
Q1/2018	Moderate organic growth Moderately negative foreign exchange effect	Organic decline of –1% to –2% Exchange rate effect –5% to –7% ~1,770 to 1,830 (excluding Consumer Health ~1,580 to 1,650)	~1,140 to 1,240 (excluding Consumer Health ~1,000 to 1,080)
Q2/2018	Moderate organic growth +3% to +5% Moderately negative foreign exchange effect –4% to –6%	~1,580 to 1,650 Organic decline of –1% to –2% Exchange rate effect –5% to –7%	~1,060 to 1,140
Q3/2018	Solid organic growth +4% to +5% Moderately negative foreign exchange effect –4% to –6%	~1,540 to 1,600 Organic decline of –1% to –2% Significantly negative foreign exchange effect –9% to –11%	~1,030 to 1,110
Results 2018 in € million	6,246 (+0.9%: +5.2% Organic, 0.0% Portfolio, –4.3% Currency)	1,556 (–12.2%: –1.6% Organic, 0.0% Portfolio, –10.7% Currency)	1,025 –22.0%

[1] The 2018 forecast in the 2017 Annual Report included the Consumer Health business.

LIFE SCIENCE

	Net sales	EBITDA pre	Business free cash flow
Actual results 2017 in € million	5,882	1,786	1,402
Forecast for 2018 in the 2017 Annual Report[1]	Solid organic growth, slightly above expected market growth Moderately negative foreign exchange effect	Organic earnings growth with a similar dynamic as in 2017 Moderately negative foreign exchange effect	Slightly below the prior-year level
Main comments	Process Solutions is likely to remain the strongest growth driver, followed by Applied Solutions Research Solutions will also contribute positively to organic sales development, albeit to a smaller extent No significant portfolio effect from the acquisition of Natrix Separations Negative foreign exchange effect, particularly owing to the development of the U.S. dollar	Positive development resulting from expected sales growth Continuation of the planned realization of synergies from the Sigma-Aldrich acquisition Negative foreign exchange effect, particularly owing to the development of the U.S. dollar	Improved EBITDA pre Higher inventories reflect the expected sales growth and changed product mix
Forecasts for 2018 in the interim report:			
Q1/2018	Organic growth slightly above the medium-term market average of 4% p.a. Moderately negative foreign exchange effect	Organic growth at around the previous year's level of +8% Exchange rate effect −4% to −6% ~1,820 to 1,870	~1,310 to 1,400
Q2/2018	Organic growth of +5% to +6%, slightly above medium-term average market growth of 4% p.a. Moderately negative foreign exchange effect −3% to −5%	~1,830 to 1,880 Organic growth of around +8% Exchange rate effect −3% to −5%	~1,310 to 1,400
Q3/2018	Organic growth +7% to +8%, considerably above medium-term average market growth of 4% p.a. Moderately negative foreign exchange effect −3% to −5%	~1,830 to 1,880 Organic growth of around +8% Exchange rate effect −3% to −5%	~1,300 to 1,390
Results 2018 in € million	6,185 (+5.2%: +8.8% Organic, 0.0% Portfolio, −3.6% Currency)	1,840 (+3.0%: +7.0% Organic, 0.0% Portfolio, −3.9% Currency)	1,393 −0.7%

[1] The 2018 forecast in the 2017 Annual Report included the Consumer Health business.

PERFORMANCE MATERIALS

	Net sales	EBITDA pre	Business free cash flow
Actual results 2017 in € million	2,446	980	906
Forecast for 2018 in the 2017 Annual Report[1]	Organically slightly to moderately below the year-earlier level Moderately negative foreign exchange effect	Organic percentage decline in the mid teens range Moderately negative foreign exchange effect	Double-digit percentage decline
Main comments	Volume increase in all businesses; strong dynamics particularly in Advanced Technologies and IC Materials Market share adjustment and price decline in the Liquid Crystals business Negative exchange rate effect, especially due to the forecast development of the U.S. dollar and currencies in key Asian markets	The decline in market shares and prices in the Liquid Crystals business cannot be offset by growth of the other businesses and active cost management Negative foreign exchange effect, particularly owing to the development of the U.S. dollar and currencies in key Asian markets	Decline in EBITDA pre, sustained high investments in property, plant and equipment and higher inventory levels due to volume increases
Forecasts for 2018 in the interim report:			
Q1/2018	Slight to moderate organic decline Moderately negative foreign exchange effect	Organic decline –14% to –16% vs. 2017 Exchange rate effect –8% to –10% ~725 to 765	~480 to 550
Q2/2018	Slight to moderate organic decline –2% to –4% Moderately negative foreign exchange effect –3% to –5%	~745 to 785 Organic decline –14% to –16% Exchange rate effect –6% to –8%	~510 to 580
Q3/2018	Organic sales performance at the level of 2017, i.e. –1% to +1% Moderately negative foreign exchange effect –3% to –5%	~745 to 785 Organic decline –14% to –16% Exchange rate effect –6% to –8%	~510 to 580
Results 2018 in € million	2,406 (–1.7%: +1.7% Organic, 0.0% Portfolio, –3.4% Currency)	786 (–19.8%: –12.9% Organic, 0.0% Portfolio, –6.9% Currency)	588 –35.1%

[1] The 2018 forecast in the 2017 Annual Report included the Consumer Health business.

CORPORATE AND OTHER

	EBITDA pre	Business free cash flow
Actual results 2017 in € million	–292	–429
Forecast for 2018 in the 2017 Annual Report[1]	Low double-digit percentage increase	–
Main comments	The increase in costs is attributable to investments in innovation and digitalization initiatives; these costs were previously incurred in the business sectors and are now recorded centrally under Corporate and Other In contrast, expected currency hedging gains should have a compensating effect in 2018	
Forecasts for 2018 in the interim report:		
Q1/2018	~ –360 to –320	~ –490 to –440
Q2/2018	~ –400 to –360	~ –500 to –550
Q3/2018	~ –400 to –360	~ –500 to –450
Results 2018	–381	–497
in € million	30.6%	15.9%

[1] The 2018 forecast in the 2017 Annual Report included the Consumer Health business.

Course of Business and Economic Position

Group

Overview of 2018

- Group net sales increased to € 14.8 billion; strong organic growth (6.1%) was reduced by negative exchange rate effects (–3.9%)
- All business sectors contributed to the Group's organic sales growth
- EBITDA pre declined by –10.5% and came to € 3.8 billion (2017: € 4.2 billion)
- At 25.6% (2017: 29.3%), EBITDA pre margin of the Group did not achieve prior-year profitability
- Earnings per share pre declined to € 5.10 (2017: € 5.92)
- Decrease in business free cash flow to € 2.5 billion (2017: € 3.2 billion)
- Net financial liabilities reduced by –33.9% to € 6.7 billion (December 31, 2017: € 10.1 billion)

GROUP

Key figures[1]

			Change	
€ million	**2018**	2017	€ million	in %
Net sales	14,836	14,517	319	2.2%
Operating result (EBIT)[2]	1,727	2,423	–696	–28.7%
Margin (% of net sales)[2]	11.6%	16.7%		
EBITDA[2]	3,528	4,164	–636	–15.3%
Margin (% of net sales)[2]	23.8%	28.7%		
EBITDA pre[2]	3,800	4,246	–446	–10.5%
Margin (% of net sales)[2]	25.6%	29.3%		
Profit after tax	3,396	2,615	781	29.9%
Earnings per share (€)	7.76	5.99	1.77	29.5%
Earnings per share pre (€)[2]	5.10	5.92	–0.82	–13.9%
Business free cash flow[2]	2,508	3,193	–685	–21.4%

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.
[2] Not defined by International Financial Reporting Standards (IFRSs).

DEVELOPMENT OF NET SALES AND RESULTS OF OPERATIONS

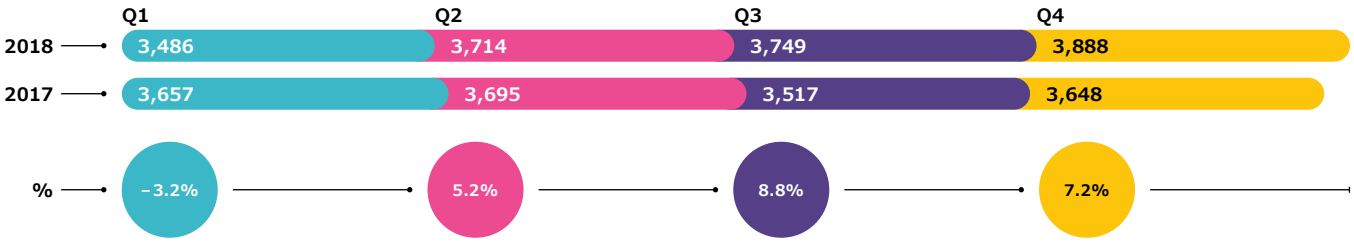
The presentation of net sales refers to the continuing business areas of the Group. Net sales of the Consumer Health business were no longer reported in Group sales, as this business was to be classified as a discontinued operation pursuant to IFRS 5. The prior-year periods were adjusted accordingly (further information on the sale of the Consumer Health business is included in Note (5) "Acquisitions and divestments" in the notes to the Note to the Consolidated Financial Statements.

In 2018, net sales of the Group increased by € 319 million or 2.2% to € 14,836 million (2017: € 14,517 million). This rise was attributable to organic sales growth of € 882 million, or 6.1%, to which all business sectors contributed. The stronger euro led to negative exchange rate effects of € –563 million or –3.9% in 2018, which affected all regions. In particular, this affected the regions North America due to the exchange rate development of the U.S. dollar, as well as Asia-Pacific as a result of negative exchange rate effects of the Chinese renminbi, the Korean won and the Taiwan dollar, and the region of Latin America.

The net sales in the individual quarters as well as the respective organic growth rates in 2018 are presented in the following graph:

GROUP

Net sales and organic growth[1] by quarter[2,3]
€ million/organic growth in %

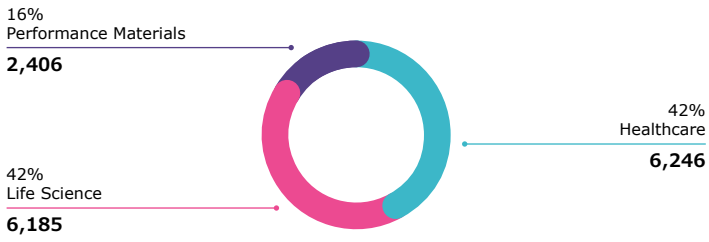


[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Quarterly breakdown unaudited.
[3] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.

Based on organic sales growth of 5.2%, net sales of the Healthcare business sector rose by € 56 million, or 0.9%, to € 6,246 million (2017: € 6,190 million). Healthcare therefore remained the strongest business sector in terms of sales with a share of 42% (2017: 43%) of Group sales. In 2018, the share of Group sales accounted for by Life Science increased by 2 percentage points to 42% (2017: 40%). With organic growth of 8.8% and a total increase in net sales of 5.2% to € 6,185 million (2017: € 5,882 million), the Life Science business sector recorded the sharpest rise in sales. Net sales of the Performance Materials business sector declined by –1.7% to € 2,406 million in 2018 (2017: € 2,446 million), as organic growth of 1.7% was more than offset by negative exchange rate effects of –3.4%. Performance Materials thus accounted for 16% (2017: 17%) of Group net sales.

GROUP

Net sales by business sector – 2018
€ million/% of net sales



GROUP

Net sales by business sector[1]

€ million	2018	Share	Organic growth[2]	Exchange rate effects	Acquisitions/ divestments	Total change	2017	Share
Healthcare	6,246	42%	5.2%	–4.3%	–	0.9%	6,190	43%
Life Science	6,185	42%	8.8%	–3.6%	–	5.2%	5,882	40%
Performance Materials	2,406	16%	1.7%	–3.4%	–	–1.7%	2,446	17%
Group	**14,836**	**100%**	**6.1%**	**–3.9%**	**–**	**2.2%**	**14,517**	**100%**

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.
[2] Not defined by International Financial Reporting Standards (IFRSs).

In 2018, the Group recorded the following regional sales performance:

GROUP

Net sales by region[1]

€ million	2018	Share	Organic growth[2]	Exchange rate effects	Acquisitions/ divestments	Total change	2017	Share
Europe	4,559	31%	4.9%	–1.5%	–	3.5%	4,406	30%
North America	3,818	26%	4.7%	–4.5%	–	0.2%	3,810	26%
Asia-Pacific (APAC)	4,965	33%	7.8%	–3.5%	–	4.3%	4,761	33%
Latin America	950	6%	10.2%	–14.8%	–	–4.6%	996	7%
Middle East and Africa (MEA)	544	4%	2.9%	–2.9%	–	–	544	4%
Group	**14,836**	**100%**	**6.1%**	**–3.9%**	**–**	**2.2%**	**14,517**	**100%**

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.
[2] Not defined by International Financial Reporting Standards (IFRSs).

The consolidated income statement of the Group is as follows:

GROUP

Consolidated Income Statement[1]

					Change	
€ million	2018	in %	2017	in %	€ million	in %
Net sales	**14,836**	**100.0%**	**14,517**	**100.0%**	**319**	**2.2%**
Cost of sales	–5,382	–36.3%	–5,071	–34.9%	–311	6.1%
Gross profit	**9,454**	**63.7%**	**9,446**	**65.1%**	**8**	**0.1%**
Marketing and selling expenses	–4,384	–29.5%	–4,349	–30.0%	–35	0.8%
Administration expenses	–993	–6.7%	–899	–6.2%	–95	10.5%
Research and development costs	–2,225	–15.0%	–2,108	–14.5%	–117	5.6%
Remaining operating expenses and income	–126	–0.8%	332	2.3%	–458	>100.0%
Operating result (EBIT)[2]	**1,727**	**11.6%**	**2,423**	**16.7%**	**–696**	**–28.7%**
Financial result	–266	–1.8%	–294	–2.0%	28	–9.6%
Profit before income tax	**1,461**	**9.8%**	**2,129**	**14.7%**	**–668**	**–31.4%**
Income tax	–368	–2.5%	428	3.0%	–796	>100.0%
Profit after tax from continuing operations	**1,093**	**7.4%**	**2,557**	**17.6%**	**–1,464**	**–57.3%**
Profit after tax from discontinued operation	**2,303**	**15.5%**	**57**	**0.4%**	**2,246**	**>100.0%**
Profit after tax	**3,396**	**22.9%**	**2,615**	**18.0%**	**781**	**29.9%**
Non-controlling interests	–22	–0.2%	–10	–0.1%	–12	>100.0%
Net income	**3,374**	**22.7%**	**2,605**	**17.9%**	**769**	**29.5%**

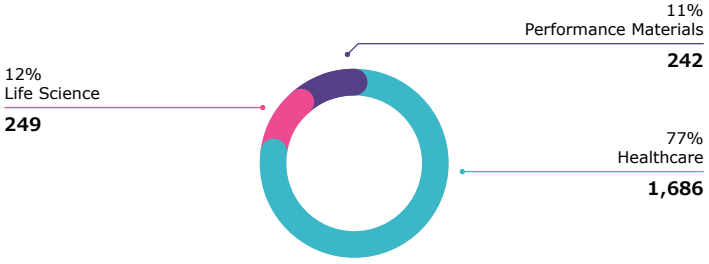
[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.
[2] Not defined by International Financial Reporting Standards (IFRSs).

In 2018, gross profit of the Group came to € 9,454 million and thus exceeded the 2017 figure of € 9,446 million only slightly. The positive development of this key indicator for the Life Science business sector, which generated an increase of € 169 million, was eaten up by declining profits in the other two business sectors. The gross margin of the Group, i.e. gross profit as a percentage of net sales, amounted to 63.7% (2017: 65.1%).

Group research and development costs rose by 5.6% to € 2,225 million and led to a research spending ratio (research and development costs as a percentage of net sales) of 15.0% (2017: 14.5%). Accounting for an unchanged 77% of Group R&D spending (2017: 77%), Healthcare remained the most research-intensive business sector of the Group.

GROUP

Research and development costs by business sector[1] – 2018
€ million/in %



[1] Not presented: Research and development costs of € 47 million allocated to Corporate and Other.

Other operating expenses and income showed an expense balance of € 126 million in 2018, after an income balance of € 332 million in 2017. This strong change was mainly due to developments in the Healthcare business sector (see explanations under "Healthcare"). In particular, the gain on the divestment of the Biosimilars business activities amounting to € 319 million had a positive effect in 2017. Detailed information about the development and composition of other operating expenses and income can be found in Note (12) "Other operating income", Note (13) "Other operating expenses" and Note (38) "Management of financial risks" in the Notes to the Consolidated Financial Statements.

The increase in provisions for obligations from long-term variable compensation programs (Long-Term Incentive Plan) negatively impacted the operating result in 2018; the increase in the intrinsic value of the Share Units of Merck KGaA, Darmstadt, Germany, – depending on the fields of activity of the eligible participants – was reflected in the respective functional costs (see Note (26) "Other provisions").

The improvement in the negative financial result by € 28 million or 9.6% to € –266 million (2017: € –294 million) resulted mainly from higher interest income. Details with respect to the development of finance income and finance expenses of the Group are shown in Note (32) "Financial result/net profit and losses from financial instruments" in the Notes to the Consolidated Financial Statements.

Income tax expense came to € 368 million in 2018 and resulted in a tax ratio of 25.2%. The income balance of € 428 million in 2017 was due to one-time effects from deferred taxes in connection with the tax reform in the United States. Further information on income taxes are included in Note (14) "Income taxes" in the Notes to the Consolidated Financial Statements.

Profit after tax from discontinued operation of € 2,303 million (2017: € 57 million) included the Consumer Health business, which must be reported separately in the Group income statement pursuant to IFRS 5. In 2018, this profit figure also includes the gain on the divestment of the Consumer Health business amounting to € 2,244 million. Further information on the divestment of the Consumer Health business is found in Note (5) "Acquisitions and divestments" in the Notes to the Consolidated Financial Statements.

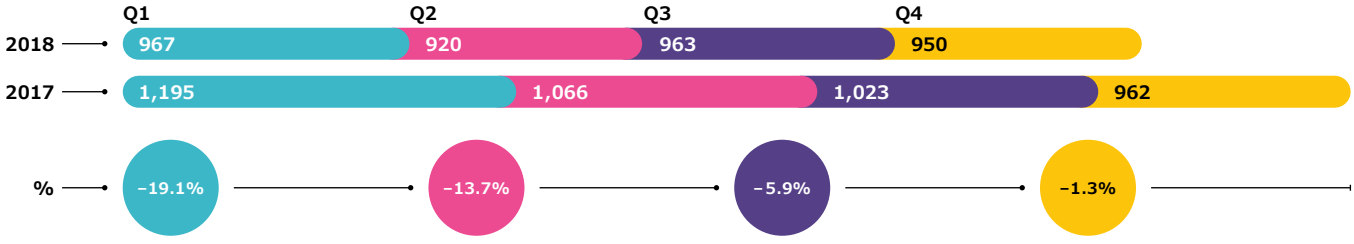
Thanks to the gain on the divestment of the Consumer Health business, in particular, net income rose by € 769 million to € 3,374 million (2017: € 2,605 million). In 2017, an exceptional tax income in connection with the tax reform in the United States of € 906 million boosted net income. Earnings per share increased accordingly to € 7.76 (2017: € 5.99).

EBITDA pre, the key financial indicator used to steer operating business, declined by € –446 million or –10.5% to € 3,800 million (2017: € 4,246 million). Unfavorable foreign exchange effects lowered EBITDA pre by –8.9%. Relative to net sales, the EBITDA pre margin was 25.6% in 2018 (2017: 29.3%). The reconciliation of the operating result (EBIT) to EBITDA pre is presented in the chapter entitled "Internal Management System".

The development of EBITDA pre in the individual quarters in comparison with 2017 as well as the respective growth rates are presented in the following overview:

GROUP

EBITDA pre[1] and change by quarter[2,3]
€ million/change in %

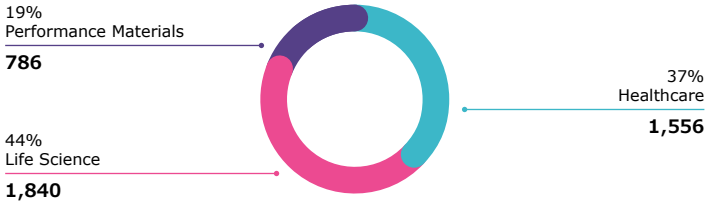


[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Quarterly breakdown unaudited.
[3] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.

The decrease in Group EBITDA pre was attributable to the Healthcare and Performance Materials business sectors. By contrast, in Life Science the good business development had a positive effect on this key figure. Consequently, at € 1,840 million (2017: € 1,786 million) the business sector for the first time generated the highest EBITDA pre of all the business sectors within the Group. This meant that the share of Group EBITDA pre accounted for by Life Science (not taking into account the € –381 million reduction due to Corporate and Other) rose to 44% (2017: 39%). EBITDA pre of Healthcare declined by –12.2% to € 1,556 million. The business sector thus contributed 37% (2017: 39%) to EBITDA pre for the Group. With an EBITDA pre of € 786 million (2017: € 980 million), the share of this Group key performance indicator attributable to Performance Materials decreased to 19% (2017: 22%).

GROUP

EBITDA pre[1] by business sector[2] – 2018
€ million/in %



[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Not presented: Decline in Group EBITDA pre by € –381 million due to Corporate and Other.

GROUP

Balance sheet structure

	Dec. 31, 2018		Dec. 31, 2017		Change	
	€ million	**in %**	€ million	in %	€ million	in %
Non-current assets	**27,652**	**75.0%**	**28,166**	**79.1%**	**–513**	**–1.8%**
of which:						
Goodwill	13,764		13,582		183	
Other intangible assets	7,237		8,317		–1,080	
Property, plant and equipment	4,811		4,512		299	
Other non-current assets	1,840		1,755		85	
Current assets	**9,236**	**25.0%**	**7,455**	**20.9%**	**1,781**	**23.9%**
of which:						
Inventories	2,764		2,632		133	
Trade accounts receivable	2,931		2,923		8	
Current financial assets	24		90		–66	
Other current assets	1,345		1,221		124	
Cash and cash equivalents	2,170		589		1,582	
Total assets	**36,888**	**100.0%**	**35,621**	**100.0%**	**1,267**	**3.6%**
Equity	**17,233**	**46.7%**	**14,066**	**39.5%**	**3,167**	**22.5%**
Non-current liabilities	**11,138**	**30.2%**	**12,919**	**36.3%**	**–1,782**	**–13.8%**
of which:						
Provisions for pensions and other post-employment benefits	2,336		2,257		80	
Other non-current provisions	780		788		–7	
Non-current financial liabilities	6,681		8,033		–1,352	
Other non-current liabilities	1,340		1,842		–502	
Current liabilities	**8,517**	**23.1%**	**8,635**	**24.2%**	**–117**	**–1.4%**
of which:						
Current provisions[1]	600		457		143	
Current financial liabilities	2,215		2,790		–576	
Trade accounts payable/Refund liabilities	2,238		2,195		43	
Other current liabilities[1]	3,464		3,191		273	
Total equity and liabilities	**36,888**	**100.0%**	**35,621**	**100.0%**	**1,267**	**3.6%**

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.

The total assets of the Group amounted to € 36,888 million as of December 31, 2018 (December 31, 2017: € 35,621 million), representing an increase of 3.6% or € 1,267 million. One main reason for this rise was the cash inflow from the sale of the Consumer Health business amounting to € 3,052 million. Details of this transaction and its impact on the consolidated balance sheet are included in Note (5) "Acquisitions and divestments" in the Notes to the Consolidated Financial Statements. Due to exchange rate developments, total assets rose by around € 0.8 billion. This development was primarily the result of the trend of the exchange rate between the euro and the U.S. dollar, which had an impact on intangible assets, in particular.

The rise in net working capital of 2.9% to € 3,486 million (2017: € 3,387 million) was mainly attributable to the slight build-up in inventories.

GROUP

Working capital[1]

€ million	Dec. 31, 2018	Dec. 31, 2017	Change € million	Change in %
Trade accounts receivable	2,931	2,923	8	0.3%
Receivables from royalties and licenses	29	28	1	1.8%
Inventories	2,764	2,632	133	5.0%
Trade accounts payable/Refund liabilities	–2,238	–2,195	–43	1.9%
Working capital[1]	**3,486**	**3,387**	**99**	**2.9%**

[1] Not defined by International Financial Reporting Standards (IFRSs).

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

GROUP

Net financial debt[1]

€ million	Dec. 31, 2018	Dec. 31, 2017	Change € million	Change in %
Bonds and commercial papers	7,286	8,213	–927	–11.3%
Bank loans	620	1,653	–1,034	–62.5%
Liabilities to related parties	824	767	57	7.4%
Loans from third parties and other financial liabilities	72	73	–1	–1.4%
Liabilities from derivatives (financial transactions)	90	113	–23	–20.6%
Finance lease liabilities	4	4	–	11.4%
Financial liabilities	**8,896**	**10,823**	**–1,928**	**–17.8%**
less:				
Cash and cash equivalents	2,170	589	1,582	>100.0%
Current financial assets	24	90	–66	–72.9%
Net financial debt[1]	**6,701**	**10,144**	**–3,443**	**–33.9%**

[1] Not defined by International Financial Reporting Standards (IFRSs).

GROUP

Reconciliation of net financial debt[1]

€ million	2018	2017
January 1	**10,144**	**11,513**
Currency translation	126	–429
Dividend payments to shareholders and to E. Merck KG, Darmstadt, Germany[2]	768	624
Acquisitions[2]	–	17
Payments from the disposal of assets held for sale and from other divestments[2]	–3,129	–167
Free cash flow[1]	–1,301	–1,433
Other	93	19
Dec. 31	**6,701**	**10,144**

[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] According to the consolidated cash flow statement.

In 2018, equity of the Group rose by 22.5% or € 3,167 million to € 17,233 million (December 31, 2017: € 14,066 million). The increase reflected mainly the strong profit after tax of € 3,396 million (2017: € 2,615 million). In addition, the currency translation of foreign currency assets to the reporting currency (euro) had a positive effect. Dividend payments and the profit transfer to E. Merck KG, Darmstadt, Germany, reduced consolidated net equity accordingly (see "Consolidated Statement of Comprehensive Income" and "Consolidated Statement of Changes in Net Equity" in the Consolidated Financial Statements). The increase in equity led to an improvement in the equity ratio by 7 percentage points to 46.7% (December 31, 2017: 39.5%).

The composition of free cash flow as well as the development of the relevant items are presented in the following table:

GROUP

Free cash flow[1]

			Change	
€ million	**2018**	2017	€ million	in %
Cash flow from operating activities according to the cash flow statement	2,219	2,696	–477	–17.7%
Payments for investments in intangible assets	–106	–392	286	–72.9%
Payments from the disposal of intangible assets	67	4	62	> 100.0%
Payments for investments in property, plant and equipment	–910	–919	9	–0.9%
Payments from the disposal of property, plant and equipment	31	44	–12	–28.0%
Free cash flow[1]	**1,301**	**1,433**	**–132**	**–9.2%**

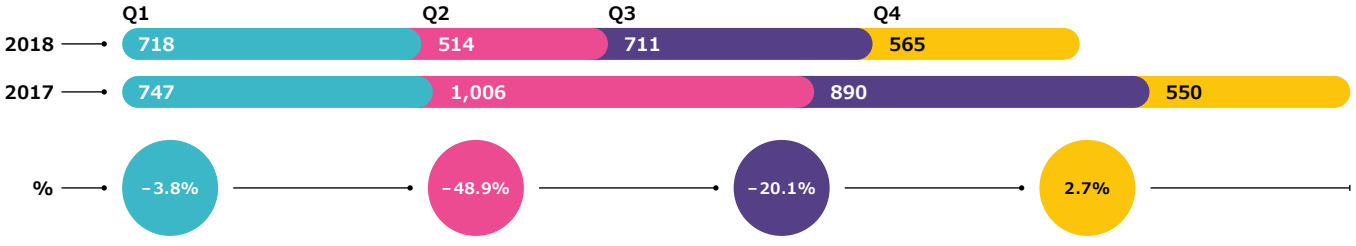
[1] Not defined by International Financial Reporting Standards (IFRSs).

Business free cash flow of the Group declined to € 2,508 million in 2018 (2017: € 3,193 million). This development was primarily due to the lower EBITDA pre, the increase in inventories and higher receivables as of the 2018 balance sheet date. 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 2017 were as follows:

GROUP

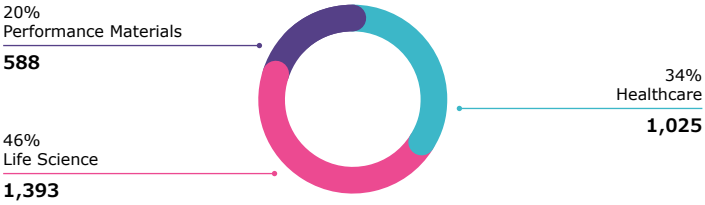
Business free cash flow[1] and change by quarter[2]
€ million/change in %



[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Quarterly breakdown unaudited.

GROUP

Business free cash flow[1] by business sector[2] – 2018
€ million/in %



[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Not presented: Decline in Group business free cash flow by € –497 million due to Corporate and Other.

The contributions of the operating business sectors to business free cash flow of the Group in 2018 developed as follows: Life Science generated business free cash flow amounting to € 1,393 million (2017: € 1,402 million). Consequently, with a 46% share (2017: 39%) of Group business free cash flow (excluding the decline of € –497 million due to Corporate and Other), Life Science was the business sector with the highest cash inflows. In 2018, the Healthcare business sector showed a decline of 22.0% to € 1,025 million (2017: € 1,314 million), thus contributing a share of 34% to Group business free cash flow (2017: 36%). With business free cash flow of € 588 million (2017: € 906 million), Performance Materials contributed 20% (2017: 25%) to this Group key performance indicator.

The investments in property, plant, equipment and software as well as advance payments for intangible assets included in the calculation of business free cash flow decreased in 2018 by –7.9% to € 932 million (2017: € 1,012 million). The investments in property, plant and equipment included therein amounted to € 890 million in 2018 (2017: € 936 million), of which € 480 million (2017: € 438 million) was attributable to strategic investment projects each with a project volume of more than € 2 million; the remainder was attributable to smaller investment projects.

Strategic investments made in 2018 included € 161 million (2017: € 212 million) to expand the Darmstadt site, of which the Healthcare business sector invested € 68 million, among other things in a new packaging center (€ 29 million).

Outside Germany, high levels of strategic investments were made particularly in China (€ 70 million) and the United States (€ 67 million). In China, the Healthcare business sector invested € 15 million in new production facilities and € 17 million in a new logistics center; the Life Science business sector invested € 29 million in new production facilities in China. In the United States, Life Science invested € 51 million, of which € 26 million in the expansion of the Sheboygan site in Wisconsin.

Our credit ratings from the independent rating agencies did not change in 2018. Our company is currently rated by Standard & Poor's, Moody's and Scope. Standard & Poor's has issued a long-term credit rating of A with a stable outlook, Moody's a rating of Baa1 with a stable outlook and Scope a rating of A–, likewise with a stable 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, 2018	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2015	Dec. 31, 2014
Equity ratio[1]	Equity / Total assets	46.7%	39.5%	36.7%	33.8%	45.4%
Asset ratio[1]	Non-current assets / Total assets	75.0%	79.1%	80.0%	80.7%	59.7%
Asset coverage[1]	Equity / Non-current assets	62.3%	49.9%	45.9%	41.8%	76.0%
Finance structure[1]	Current liabilities / Liabilities (total)	43.3%	40.1%	37.5%	37.2%	46.5%

[1] Not defined by International Financial Reporting Standards (IFRSs).

OVERALL ASSESSMENT OF BUSINESS PERFORMANCE AND ECONOMIC SITUATION

2018 was a year of transition for our company in terms of the operating business activities of the Group. We generated solid results amid a challenging market environment. At the same time, important strategic decisions were made to allow us to generate profitable growth again in the future. The financial targets that we had set ourselves for 2018 were achieved. Satisfying organic growth of 6.1% enabled Group net sales to increase to € 14,836 million (2017: € 14,517 million). In 2018, EBITDA pre amounted to € 3,800 million (2017: € 4,246 million) and recorded an organic decline of –1.6% over the prior year.

Our Healthcare business sector benefited from the approval of Bavencio® and Mavenclad® in 2017. The steady further development and optimum use of our promising pipeline remains a high priority. In 2018, we also pushed ahead with the forming of alliances for selected active substances, such as the collaboration agreement with the SFJ Pharmaceuticals Group to develop abituzumab. The disposal of the Consumer Health business was successfully completed in 2018. The cash inflow it generated helped reduce net debt substantially and thereby strengthen our financial flexibility. As a result, despite investment activity remaining strong, we reduced our net financial debt by € –3,443 million to € 6,701 million (2017: € 10,144 million).

Net sales in Life Science showed a very strong performance in 2018. Following the integration of Sigma-Aldrich, which we completed in 2018, and our growth initiatives we are well-equipped for the future.

Our Performance Materials business sector launched the “Bright Future” transformation program in 2018 in order to pave the way for future growth.

Our key balance sheet figures showed a further improvement in 2018. For instance, the equity ratio rose by 7 percentage points to 46.7% (2017: 39.5%) and has thus reached a very good level. We will continue to assign high priority to the planned reduction of our financial liabilities. In 2018, there were no changes to our credit ratings by the independent rating agencies Standard & Poor’s (A with a stable outlook), Moody’s (Baa1 with a stable outlook) and Scope (A– with a stable outlook).

The economic position and business development of the Group can be assessed positively overall. A foundation has been laid for profitable organic growth going forward. We are seeking to help shape the important technological developments for our business sectors and take optimum advantage of the opportunities this creates.

Healthcare

HEALTHCARE

Key figures[1]

€ million	2018	2017	Change € million	Change in %
Net sales	6,246	6,190	56	0.9%
Operating result (EBIT)[2]	731	1,337	–605	–45.3%
Margin (% of net sales)[2]	11.7%	21.6%		
EBITDA[2]	1,492	2,028	–536	–26.4%
Margin (% of net sales)[2]	23.9%	32.8%		
EBITDA pre[2]	1,556	1,773	–217	–12.2%
Margin (% of net sales)[2]	24.9%	28.6%		
Business free cash flow[2]	1,025	1,314	–289	–22.0%

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.
[2] Not defined by International Financial Reporting Standards (IFRSs).

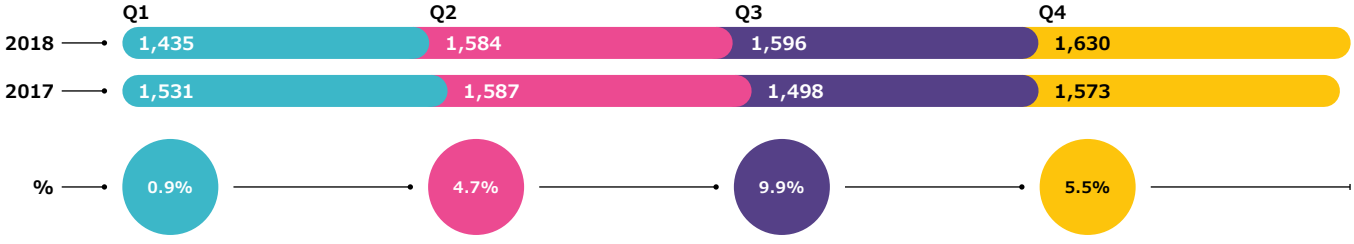
DEVELOPMENT OF NET SALES AND RESULTS OF OPERATIONS

In 2018, generated organic sales growth of 5.2%. After negative foreign exchange effects of –4.3%, net sales rose to € 6,246 million (2017: € 6,190 million). The foreign exchange effect resulted essentially from the development of the U.S. dollar, the Turkish lira, the Russian ruble and a number of Latin American currencies.

The net sales in the individual quarters as well as the respective organic growth rates in 2018 are presented in the following graph:

HEALTHCARE

Net sales and organic growth[1] by quarter[2,3]
€ million/organic growth in %



[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Quarterly breakdown unaudited.
[3] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.

Net sales of the key product lines and products developed as follows in 2018:

HEALTHCARE

Net sales by major product lines/products[1]

€ million	2018	Share	Organic growth[2]	Exchange rate effects	Total change	2017	Share
Oncology	**944**	**15%**	**4.2%**	**–4.5%**	**–0.3%**	**946**	**15%**
of which: Erbitux®	816	13%	0.4%	–4.8%	–4.3%	853	14%
of which: Bavencio®	69	1%	>100.0%	–10.8%	>100.0%	21	0%
Neurology & Immunology	**1,529**	**24%**	**–1.1%**	**–4.2%**	**–5.4%**	**1,616**	**26%**
of which: Rebif®	1,438	23%	–6.5%	–4.1%	–10.7%	1,611	26%
of which: Mavenclad®	90	1%	>100.0%	–33.3%	>100.0%	5	0%
Fertility	**1,162**	**19%**	**11.1%**	**–5.0%**	**6.2%**	**1,094**	**18%**
of which: Gonal-f®	708	11%	5.3%	–4.8%	0.5%	704	11%
General Medicine & Endocrinology	**2,341**	**38%**	**5.8%**	**–4.4%**	**1.5%**	**2,308**	**37%**
of which: Glucophage®	733	12%	15.1%	–4.4%	10.7%	662	11%
of which: Concor®	475	8%	11.2%	–4.5%	6.7%	444	7%
of which: Euthyrox®	363	6%	1.9%	–3.8%	–1.9%	370	6%
of which: Saizen®	234	4%	–3.1%	–6.3%	–9.4%	259	4%
Other	**270**	**4%**				**226**	**4%**
Healthcare	**6,246**	**100%**	**5.2%**	**–4.3%**	**0.9%**	**6,190**	**100%**

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.
[2] Not defined by International Financial Reporting Standards (IFRSs).

Sales of the drug Rebif®, which is used to treat relapsing forms of multiple sclerosis, saw an organic sales decline of –6.5% in 2018. Including negative exchange rate effects of –4.1%, sales of € 1,438 million were recorded (2017: € 1,611 million). Sales in the biggest market, North America, declined by –5.0% in organic terms due to the persistently difficult competitive situation in the interferons market. A price increase made in February 2018 only partly offset this development. Consequently, sales in North America fell to € 920 million (2017: € 1,012 million). Competitive pressure in Europe was responsible for the organic sales decline of –11.7%. Taking into account slightly negative exchange rate effects, sales came to € 395 million (2017: € 456 million). The sales declines in the other regions, which generated total Rebif® sales of € 123 million (2017: € 142 million), were primarily due to negative exchange rate developments.

Sales of the oncology drug Erbitux® were stable in organic terms, and after negative exchange rate effects of –4.8%, sales decreased to € 816 million (2017: € 853 million). The negative organic development in Europe of –0.8% was the result of the difficult competitive setting and some price reductions. Erbitux® sales in the European market amounted to € 437 million (2017: € 447 million). Net sales of the oncology drug in the Asia-Pacific region were stable in organic terms (–0.3%). The drop in sales to € 255 million (2017: € 263 million) was attributable to negative exchange rate effects. Organic growth in Latin America was more than offset by very strong, negative foreign exchange rate effects, leading to a decline in sales to € 71 million (2017: € 87 million). In the Middle East and Africa, organic sales were at last year's level at € 54 million (2017: € 56 million).

HEALTHCARE

Sales and organic growth[1] of Rebif® and Erbitux® by region – 2018

		Total	Europe	North America	Asia-Pacific (APAC)	Latin America	Middle East and Africa (MEA)
Rebif®	€ million	1,438	395	920	12	48	62
	Organic growth[1] in %	–6.5%	–11.7%	–5.0%	–10.2%	–3.5%	4.3%
	% of sales	100%	28%	64%	1%	3%	4%
Erbitux®	€ million	816	437	–	255	71	54
	Organic growth[1] in %	0.4%	–0.8%	–	–0.3%	8.7%	0.1%
	% of sales	100%	53%	–	31%	9%	7%

[1] Not defined by International Financial Reporting Standards (IFRSs).

With the product Mavenclad®, a medicine for the oral short-course treatment of highly active relapsing multiple sclerosis, sales of € 90 million were generated in 2018 (2017: € 5 million). The product was approved in Europe in August 2017. Sales of Bavencio®, an immuno-oncology medicine, increased to € 69 million (2017: € 21 million).

Gonal-f®, the leading recombinant hormone used in the treatment of infertility, generated organic growth of 5.3%, to which the trend in the North America region, in particular, contributed with double-digit organic growth rates. Taking into account currency headwinds of –4.8%, global sales amounted to € 708 million (2017: € 704 million). The other products from the fertility portfolio also contributed to the increase in net sales with double-digit organic growth rates across all regions.

The General Medicine & Endocrinology franchise (including CardioMetabolic Care), which commercializes products to treat cardiovascular diseases, thyroid disorders, diabetes and growth disorders, among other things, generated organic growth of 5.8%. After negative foreign exchange effects of –4.4%, net sales rose to € 2,341 million (2017: € 2,308 million). Diabetes drug Glucophage®, the best-selling product in this area, made a significant contribution to this development with organic growth of 15.1%. While all regions reported positive growth, the Asia-Pacific region was the main driver of higher Glucophage® sales. A negative exchange rate effect of –4.4% reduced growth and resulted in total sales of € 733 million (2017: € 662 million). Double-digit organic growth rates (11.2%) were also achieved with beta-blocker Concor®. Despite adverse exchange rate effects (–4.5%), net sales of this medicine increased to € 475 million (2017: € 445 million). All regions contributed to this gratifying organic development, primarily Europe and Asia-Pacific. Euthyrox®, a medicine to treat thyroid disorders, recorded organic growth of 1.9%. However, this was not able to offset the exchange rate effect (–3.8%). As a result, sales at € 363 million fell slightly short of the prior-year figure (2017: € 370 million). Saizen®, the top-selling product in the Endocrinology franchise, generated sales of € 234 million (2017: € 259 million).

Net sales of the Healthcare business sector by region in 2018 developed as follows:

HEALTHCARE

Net sales by region[1]

€ million	2018	Share	Organic growth[2]	Exchange rate effects	Acquisitions/ divestments	Total change	2017	Share
Europe	2,203	35%	4.6%	–2.2%	–	2.4%	2,152	35%
North America	1,432	23%	0.1%	–4.2%	–	–4.1%	1,494	24%
Asia-Pacific (APAC)	1,501	24%	8.7%	–3.1%	–	5.6%	1,421	23%
Latin America	661	11%	10.9%	–14.5%	–	–3.7%	687	11%
Middle East and Africa (MEA)	448	7%	5.9%	–3.2%	–	2.8%	436	7%
Healthcare	**6,246**	**100%**	**5.2%**	**–4.3%**	**–**	**0.9%**	**6,190**	**100%**

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.

[2] Not defined by International Financial Reporting Standards (IFRSs).

The results of operations developed as follows:

HEALTHCARE

Results of operations[1]

€ million	2018	in %	2017	in %	Change € million	Change in %
Net sales	**6,246**	**100.0%**	**6,190**	**100.0%**	**56**	**0.9%**
Cost of sales	–1,425	–22.8%	–1,340	–21.6%	–85	6.4%
Gross profit	**4,820**	**77.2%**	**4,850**	**78.4%**	**–30**	**–0.6%**
Marketing and selling expenses	–2,339	–37.4%	–2,373	–38.3%	34	–1.4%
Administration expenses	–301	–4.8%	–271	–4.4%	–30	11.0%
Research and development costs	–1,686	–27.0%	–1,600	–25.8%	–86	5.4%
Remaining operating expenses and income	237	3.8%	731	11.8%	–494	–67.6%
Operating result (EBIT)[2]	**731**	**11.7%**	**1,337**	**21.6%**	**–605**	**–45.3%**
Depreciation/amortization/impairment losses/reversals of impairment losses	761	12.2%	691	11.2%	69	10.0%
(of which: adjustments)	*(11)*		*(–51)*		*(63)*	*(>100%)*
EBITDA[2]	**1,492**	**23.9%**	**2,028**	**32.8%**	**–536**	**–26.4%**
Restructuring expenses	12		17		–5	–31.9%
Integration expenses/IT expenses	18		27		–9	–34.5%
Gains (–)/losses (+) on the divestment of businesses	26		–316		342	>100%
Acquisition-related adjustments	–		–		–	–
Other adjustments	8		16		–8	–51.0%
EBITDA pre[2]	**1,556**	**24.9%**	**1,773**	**28.6%**	**–217**	**–12.2%**

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.
[2] Not defined by International Financial Reporting Standards (IFRSs).

Gross profit of the Healthcare business sector was weighed down by foreign exchange rate effects in 2018. At € 4,820 million (2017: € 4,850 million) it remained flat, resulting in a gross margin of 77.2% (2017: 78.4%).

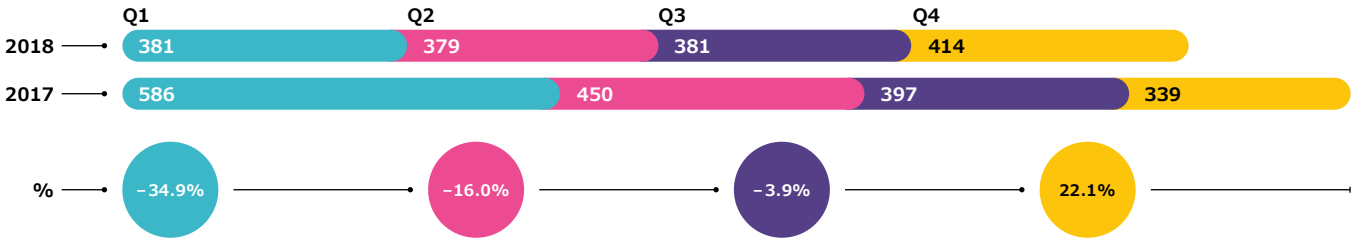
The decrease in marketing and selling expenses was due mainly to foreign exchange effects. Research and development costs reflected continued investments in the Biopharma development pipeline and amounted to € 1,686 million (2017: € 1,600 million). The decline in other operating expenses and income was due to multiple factors in both 2018 and 2017. Thus the 2017 figure included the gain on the divestment of the Biosimilars business amounting to € 319 million, which was adjusted when calculating EBITDA pre. The previous year's figures also included milestone payments for the approval of Bavencio® (€ 124 million) as well as income from an agreement on a one-time payment for future license payments (€ 116 million). The year 2018 included receipt of a milestone payment of € 50 million from BioMarin Pharmaceutical Inc., United States, in connection with the sale of PALYNZIQ® (Peg-Pal) in 2016. Moreover, income from license agreements and from the transfer of rights had a positive effect on the fourth quarter of 2018. The following impairments and reversals of impairment losses were also included in remaining other expenses and income. In 2017, the reversals of impairment losses on the intangible asset for cladribine of € 17 million as a result of the marketing authorization of Mavenclad® had boosted other operating expenses. In 2018, a reduction in the fair value of contingent consideration from the sale of the Biosimilars business led to expenses of € –27 million.

After eliminating depreciation, amortization, impairments and reversals of impairment losses as well as adjustments, EBITDA pre decreased by –12.2% to € 1,556 million (2017: € 1,773 million) in 2018. Negative foreign exchange effects of –10.7% had a material effect on the development of this key figure. The EBITDA pre margin relative to sales came to 24.9% (2017: 28.6%).

The development of EBITDA pre in the individual quarters in comparison with 2017 is presented in the following overview:

HEALTHCARE

EBITDA pre[1] and change by quarter[2,3]
€ million/change in %



[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Quarterly breakdown unaudited.
[3] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.

DEVELOPMENT OF BUSINESS FREE CASH FLOW

In 2018, business free cash flow amounted to € 1,025 million (2017: € 1,314 million). The decline was primarily attributable to lower EBITDA pre and a rise in receivables.

HEALTHCARE

Business free cash flow[1,2]

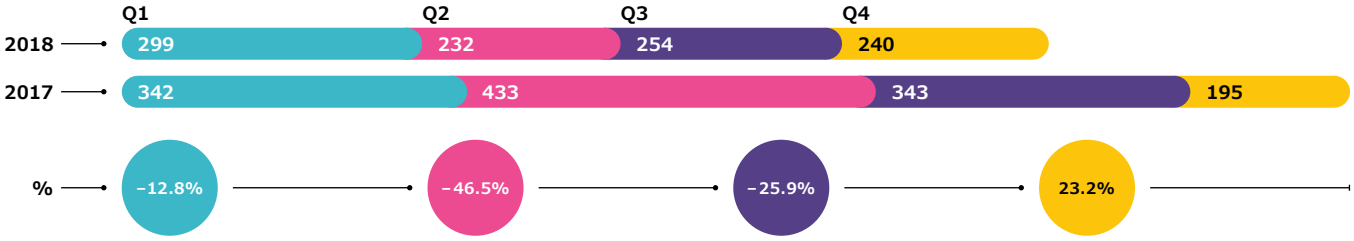
			Change	
€ million	**2018**	2017	€ million	in %
EBITDA pre[2]	1,556	1,773	–217	–12.2%
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–395	–375	–19	5.2%
Changes in inventories	–55	–34	–21	63.1%
Changes in trade accounts receivable as well as receivables from royalties and licenses	–81	–49	–32	64.6%
Business free cash flow[2]	**1,025**	**1,314**	**–289**	**–22.0%**

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.
[2] Not defined by International Financial Reporting Standards (IFRSs).

The development of business free cash flow items in the individual quarters in comparison with 2017 is presented in the following overview:

HEALTHCARE

Business free cash flow[1] and change by quarter[2,3]
€ million/change in %



[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Quarterly breakdown unaudited.
[3] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.

Life Science

LIFE SCIENCE

Key figures

€ million	2018	2017	Change € million	Change in %
Net sales	6,185	5,882	304	5.2%
Operating result (EBIT)[1]	1,036	834	202	24.2%
Margin (% of net sales)[1]	16.7%	14.2%		
EBITDA[1]	1,755	1,580	175	11.1%
Margin (% of net sales)[1]	28.4%	26.9%		
EBITDA pre[1]	1,840	1,786	54	3.0%
Margin (% of net sales)[1]	29.8%	30.4%		
Business free cash flow[1]	1,393	1,402	–9	–0.7%

[1] Not defined by International Financial Reporting Standards (IFRSs).

DEVELOPMENT OF NET SALES AND RESULTS OF OPERATIONS

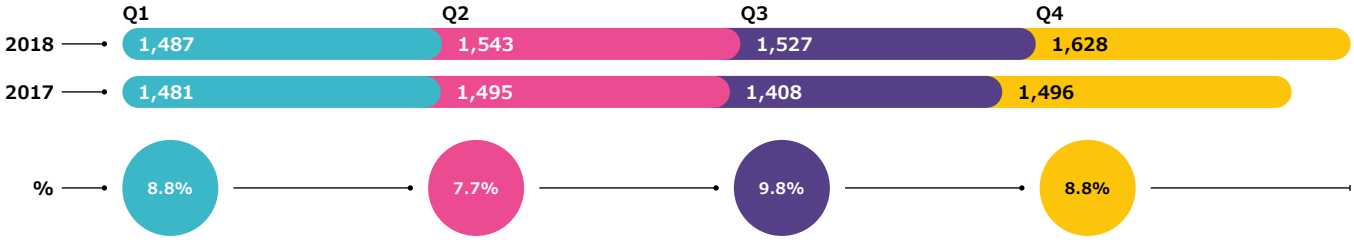
In 2018, Life Science posted organic sales growth of 8.8%, partially offset by negative foreign exchange effects of –3.6%. Net sales rose overall by 5.2% to € 6,185 million (2017: € 5,882 million).

All three business units of the business sector contributed favorably to the organic sales growth of Life Science. Process Solutions generated double-digit organic sales growth of 14.8%, attributable to high demand across the portfolio and was thus again the business sector's main growth driver in 2018. Applied Solutions continued to perform very well, posting organic growth of 6.3% and the Research Solutions business unit reported an organic sales increase of 4.1%.

The development of sales in the individual quarters in comparison with 2017 as well as the respective organic growth rates are presented in the following graph:

LIFE SCIENCE

Net sales and organic growth[1] by quarter[2]
€ million/organic growth in %



[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Quarterly breakdown unaudited.

LIFE SCIENCE

Net sales by business unit[1]

€ million	2018	Share	Organic growth[2]	Exchange rate effects	Acquisitions/ divestments	Total change	2017	Share
Process Solutions	2,487	40%	14.8%	–3.5%	–	11.3%	2,234	38%
Research Solutions	2,048	33%	4.1%	–3.6%	–	0.5%	2,038	35%
Applied Solutions	1,650	27%	6.3%	–3.8%	–	2.5%	1,609	27%
Life Science	**6,185**	**100%**	**8.8%**	**–3.6%**	**–**	**5.2%**	**5,882**	**100%**

[1] Previous year's figures have been adjusted due to an internal realignment.
[2] Not defined by International Financial Reporting Standards (IFRSs).

The Process Solutions business unit, which markets products and services for the entire pharmaceutical production value chain, generated double-digit growth of 14.8% and net sales of € 2,487 million (2017: € 2,234 million) in 2018. This means that Process Solutions accounted for 40% (2017: 38%) of Life Science net sales. All business areas of Process Solutions contributed to this strong performance. The key driver was the BioProcessing business unit, particularly in the Asia-Pacific and North America regions.

The Research Solutions business unit, which provides products and services to support life science work in pharmaceutical, biotechnology and academic research laboratories, recorded a moderate organic sales increase of 4.1% in 2018. Strong performance by both Lab & Specialty Chemicals and Reagents & Kits in particular led to the growth in net sales of Research Solutions, which increased to € 2,048 million (2017: € 2,038 million), representing 33% (2017: 35%) of the business sector's net sales. In regional terms, Asia-Pacific was the strongest growth driver for Research Solutions in 2018.

The Applied Solutions business unit generated strong organic sales growth of 6.3% with its broad range of products for researchers as well as scientific and industrial laboratories. Net sales increased to € 1,650 million (2017: € 1,609 million). Accordingly, the business unit contributed 27% (2017: 27%) to net sales of the Life Science business sector. The sales performance of Applied Solutions was driven by all business fields, and primarily by the North America and Asia-Pacific regions.

Net sales of the business sector by region developed as follows:

LIFE SCIENCE

Net sales by region

€ million	2018	Share	Organic growth[1]	Exchange rate effects	Acquisitions/ divestments	Total change	2017	Share
Europe	2,136	35%	6.4%	–0.8%	–	5.6%	2,022	34%
North America	2,173	35%	8.4%	–4.6%	–	3.8%	2,093	35%
Asia-Pacific (APAC)	1,532	25%	13.6%	–3.8%	–	9.8%	1,395	24%
Latin America	256	4%	10.5%	–16.5%	–	–6.0%	273	5%
Middle East and Africa (MEA)	88	1%	–8.7%	–1.7%	–	–10.4%	98	2%
Life Science	**6,185**	**100%**	**8.8%**	**–3.6%**	**–**	**5.2%**	**5,882**	**100%**

[1] Not defined by International Financial Reporting Standards (IFRSs).

The results of operations of the Life Science business sector developed as follows:

LIFE SCIENCE

Results of operations

					Change	
€ million	**2018**	**in %**	2017	in %	€ million	in %
Net sales	**6,185**	**100.0%**	**5,882**	**100.0%**	**304**	**5.2%**
Cost of sales	–2,723	–44.0%	–2,588	–44.0%	–135	5.2%
Gross profit	**3,463**	**56.0%**	**3,294**	**56.0%**	**169**	**5.1%**
Marketing and selling expenses	–1,775	–28.7%	–1,734	–29.5%	–41	2.4%
Administration expenses	–282	–4.6%	–261	–4.4%	–22	8.3%
Research and development costs	–249	–4.0%	–241	–4.1%	–8	3.4%
Remaining operating expenses and income	–121	–2.0%	–224	–3.8%	104	–46.2%
Operating result (EBIT)[1]	**1,036**	**16.7%**	**834**	**14.2%**	**202**	**24.2%**
Depreciation/amortization/impairment losses/ reversals of impairment losses	719	11.6%	746	12.7%	–27	–3.6%
(of which: adjustments)	*(23)*		*(3)*		*(20)*	*(>100%)*
EBITDA[1]	**1,755**	**28.4%**	**1,580**	**26.9%**	**175**	**11.1%**
Restructuring expenses	3		5		–2	–45.0%
Integration expenses/IT expenses	86		114		–29	–25.0%
Gains (–)/losses (+) on the divestment of businesses	–8		1		–9	>100%
Acquisition-related adjustments	2		63		–61	–97.2%
Other adjustments	3		22		–19	–86.5%
EBITDA pre[1]	**1,840**	**29.8%**	**1,786**	**30.4%**	**54**	**3.0%**

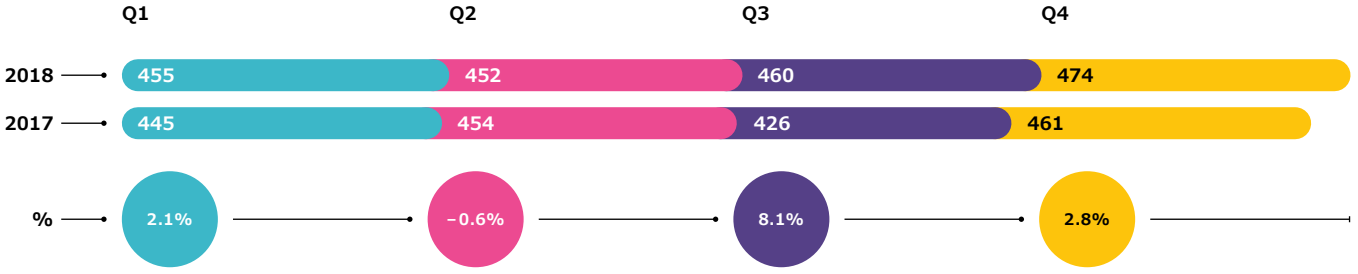
[1] Not defined by International Financial Reporting Standards (IFRSs).

Gross profit increased by 5.1% to € 3,463 million (2017: € 3,294 million). Despite currency headwinds, the strong increase was driven by organic growth in sales across all business units. Marketing and selling expenses increased by 2.4% to € 1,775 million (2017: € 1,734 million), while R&D expenses increased by 3.4% to € 249 million (2017: € 241 million). The decline in other operating expenses and income of –46.2% to € –121 million (2017: € –224 million) was the result of lower acquisition-related adjustments and a fall in adjustments for integration expenses/IT expenses that were included in this item. In comparison with 2017, the operating result (EBIT) of Life Science rose by € 202 million to € 1,036 million (2017: € 834 million). After eliminating depreciation and amortization as well as adjustments, EBITDA pre – the key indicator to assess the earning power – increased by 3.0% to € 1,840 million (2017: € 1,786 million). EBITDA pre improved by 7.0% over the prior year in organic terms, whereas negative foreign exchange rate effects depressed this key indicator by –3.9%.

The development of EBITDA pre in the individual quarters in comparison with 2017 is presented in the following overview:

LIFE SCIENCE

EBITDA pre[1] and change by quarter[2]
€ million/change in %



[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Quarterly breakdown unaudited.

DEVELOPMENT OF BUSINESS FREE CASH FLOW

In 2018, the business free cash flow of the Life Science business sector remained stable at the previous year's level at € 1,393 million (2017: € 1,402 million). Essentially, the inventory build-up to support sales growth was offset by higher EBITDA pre and lower investments.

LIFE SCIENCE

Business free cash flow[1]

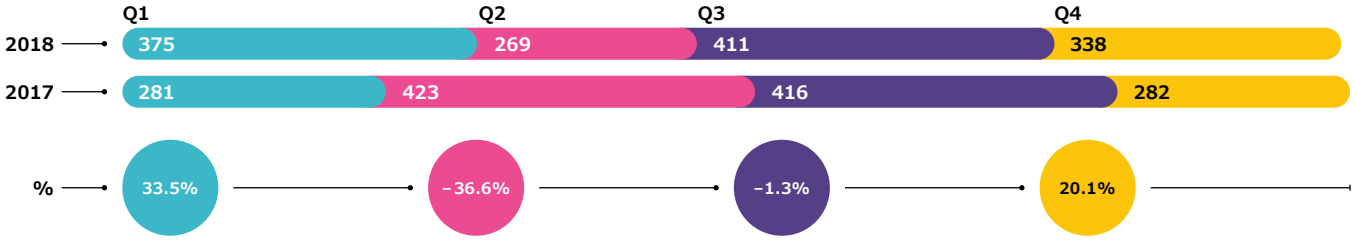
			Change	
€ million	**2018**	2017	€ million	in %
EBITDA pre[1]	1,840	1,786	54	3.0%
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–315	–371	56	–15.1%
Changes in inventories	–116	28	–144	>100.0%
Changes in trade accounts receivable as well as receivables from royalties and licenses	–17	–41	24	–59.3%
Business free cash flow[1]	**1,393**	**1,402**	**–9**	**–0.7%**

[1] Not defined by International Financial Reporting Standards (IFRSs).

The development of business free cash flow items in the individual quarters in comparison with 2017 is presented in the following overview:

LIFE SCIENCE

Business free cash flow[1] and change by quarter[2]
€ million/change in %



[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Quarterly breakdown unaudited.

Performance Materials

PERFORMANCE MATERIALS

Key figures

€ million	2018	2017	Change € million	Change in %
Net sales	2,406	2,446	–40	–1.7%
Operating result (EBIT)[1]	508	689	–181	–26.3%
Margin (% of net sales)[1]	21.1%	28.2%		
EBITDA[1]	769	947	–178	–18.8%
Margin (% of net sales)[1]	32.0%	38.7%		
EBITDA pre[1]	786	980	–194	–19.8%
Margin (% of net sales)[1]	32.7%	40.1%		
Business free cash flow[1]	588	906	–318	–35.1%

[1] Not defined by International Financial Reporting Standards (IFRSs).

DEVELOPMENT OF NET SALES AND RESULTS OF OPERATIONS

In 2018, net sales of the Performance Materials business sector decreased by –1.7% to € 2,406 million (2017: € 2,446 million). This drop was mainly attributable to adverse exchange rate effects of –3.4% or € 83 million. They resulted primarily from a weaker U.S. dollar over the previous year and declining Asian currencies such as the Taiwan dollar and the Japanese yen.

The Semiconductor Solutions business unit, which pools the business for materials to produce integrated circuits, generated strong organic sales growth in 2018, as expected.

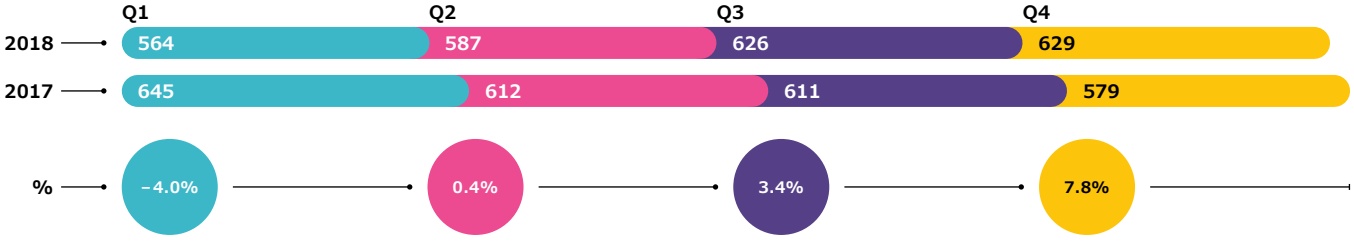
Sales in the Surface Solutions business unit fell short of expectations and were below the prior year's figure due to factors including the decline in demand for automobiles in Europe, North America and China.

The Display Solutions business unit recorded organic sales that were just positive owing to rising demand and strong growth in the OLED area and to non-recurring project-related liquid crystal sales, above all in the third and fourth quarters of 2018.

The net sales in the individual quarters as well as the respective organic growth rates in 2018 are presented in the following graph:

PERFORMANCE MATERIALS

Net sales and organic growth[1] by quarters[2]
€ million/organic growth in %



[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Quarterly breakdown unaudited.

Net sales of the Performance Materials business sector by region developed as follows:

PERFORMANCE MATERIALS

Net sales by region

€ million	2018	Share	Organic growth[1]	Exchange rate effects	Acquisitions/ divestments	Total change	2017	Share
Europe	220	9%	–4.8%	–0.3%	–	–5.0%	231	9%
North America	214	9%	0.3%	–4.6%	–	–4.3%	223	9%
Asia-Pacific (APAC)	1,932	80%	2.9%	–3.5%	–	–0.7%	1,945	80%
Latin America	32	2%	–3.8%	–8.3%	–	–12.1%	37	2%
Middle East and Africa (MEA)	8	0%	–18.4%	–1.6%	–	–20.0%	10	0%
Performance Materials	**2,406**	**100%**	**1.7%**	**–3.4%**	**–**	**–1.7%**	**2,446**	**100%**

[1] Not defined by International Financial Reporting Standards (IFRSs).

The development of results of operations is set out below:

PERFORMANCE MATERIALS

Results of operations

					Change	
€ million	2018	in %	2017	in %	€ million	in %
Net sales	**2,406**	**100.0%**	**2,446**	**100.0%**	**–40**	**–1.7%**
Cost of sales	–1,231	–51.2%	–1,145	–46.8%	–86	7.5%
Gross profit	**1,175**	**48.8%**	**1,301**	**53.2%**	**–127**	**–9.7%**
Marketing and selling expenses	–255	–10.6%	–242	–9.9%	–13	5.2%
Administration expenses	–90	–3.7%	–72	–2.9%	–18	25.1%
Research and development costs	–242	–10.1%	–225	–9.2%	–17	7.5%
Remaining operating expenses and income	–81	–3.3%	–73	–3.0%	–7	9.8%
Operating result (EBIT)[1]	**508**	**21.1%**	**689**	**28.2%**	**–181**	**–26.3%**
Depreciation/amortization/impairment losses/ reversals of impairment losses	261	10.9%	258	10.5%	3	1.3%
(of which: adjustments)	*(21)*		*(26)*		*(–5)*	*(–19.1%)*
EBITDA[1]	**769**	**32.0%**	**947**	**38.7%**	**–178**	**–18.8%**
Restructuring expenses	1		5		–4	–78.5%
Integration expenses/IT expenses	15		20		–6	–27.1%
Gains (–)/losses (+) on the divestment of businesses	–		1		–1	–
Acquisition-related adjustments	–		–		–	–
Other adjustments	1		7		–6	–89.5%
EBITDA pre[1]	**786**	**32.7%**	**980**	**40.1%**	**–194**	**–19.8%**

[1] Not defined by International Financial Reporting Standards (IFRSs).

In 2018, gross profit was € 127 million below the previous year's level and amounted to € 1,175 million (2017: € 1,301 million), resulting in an expected reduction in the gross margin to 48.8% (2017: 53.2%). The development of the gross margin is essentially explained by the price declines observed in the display industry and by falling sales in the Surface Solutions business unit.

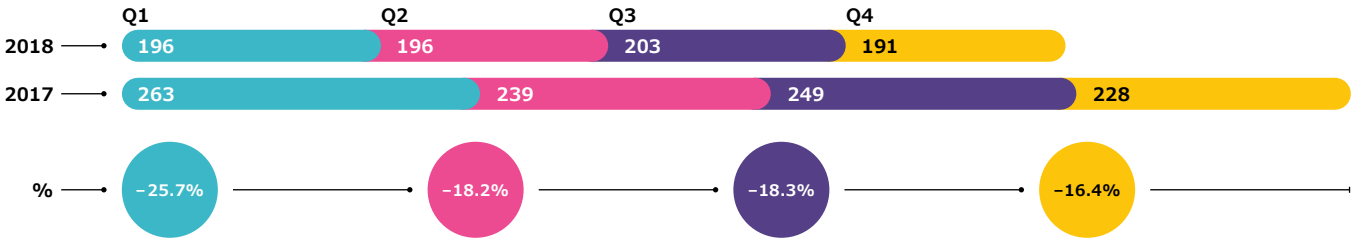
The operating result (EBIT) decreased to € 508 million in 2018 (2017: € 689 million). In addition to the sales and margin-related decline in gross profit, this was due to higher marketing and selling expenses as well as additional research and development costs. While the rise in marketing and selling expenses was primarily attributable to logistics costs, the increase in research costs was chiefly due to the tapping of new growth areas in materials for the production of integrated circuits.

EBITDA pre of the business sector declined by –19.8% to € 786 million (2017: € 980 million). The negative foreign exchange impact of –6.9% lowered this key performance indicator. Consequently, at 32.7%, the EBITDA pre margin was below the prior-year figure (2017: 40.1%).

The development of EBITDA pre in the individual quarters in comparison with 2017 is presented in the following overview:

PERFORMANCE MATERIALS

EBITDA pre[1] and change by quarter[2]
€ million/change in %



[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Quarterly breakdown unaudited.

DEVELOPMENT OF BUSINESS FREE CASH FLOW

At € 588 million, the business free cash flow of the Performance Materials business sector in 2018 fell short of the prior-year figure (2017: € 906 million). This resulted from the reduction in EBITDA pre, a rise in receivables as of the 2018 balance sheet date that was primarily due to one-time project-related sales of liquid crystals in the fourth quarter of 2018, and higher inventories in the Surface Solutions business unit.

PERFORMANCE MATERIALS

Business free cash flow[1]

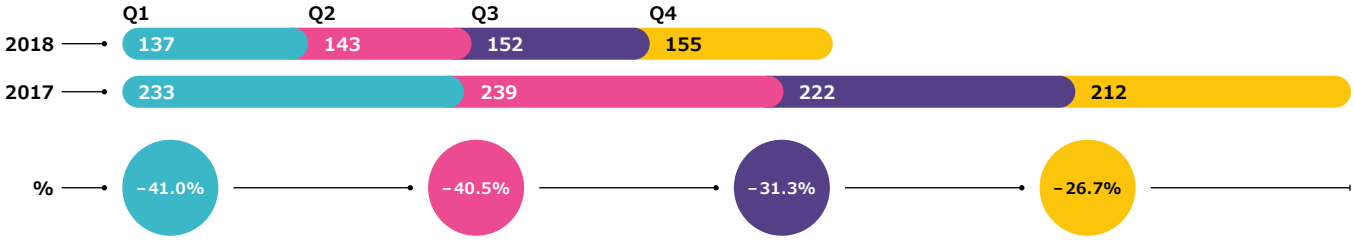
			Change	
€ million	**2018**	2017	€ million	in %
EBITDA pre[1]	786	980	–194	–19.8%
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–118	–125	7	–5.6%
Changes in inventories	–44	–14	–30	>100.0%
Changes in trade accounts receivable and receivables from royalties and licenses	–36	65	–101	>100.0%
Business free cash flow[1]	**588**	**906**	**–318**	**–35.1%**

[1] Not defined by International Financial Reporting Standards (IFRSs).

The development of business free cash flow items in the individual quarters in comparison with 2017 is presented in the following overview:

PERFORMANCE MATERIALS

Business free cash flow[1] and change by quarter[2]
€ million/change in %



[1] Not defined by International Financial Reporting Standards (IFRSs).
[2] Quarterly breakdown unaudited.

Corporate and Other

Corporate and Other comprises Group administration expenses for central 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 as well as research and development costs spanning business sectors.

CORPORATE AND OTHER

Key figures[1]

			Change	
€ million	**2018**	2017	€ million	in %
Operating result (EBIT)[2]	–548	–437	–111	25.5%
EBITDA[2]	–488	–391	–97	24.8%
EBITDA pre[2]	–381	–292	–89	30.6%
Business free cash flow[2]	–497	–429	–68	15.9%

[1] Previous year's figures have been adjusted, see Note (49) "Effects from new accounting standards and other presentation and measurement changes" in the Notes to the Consolidated Financial Statements.
[2] Not defined by International Financial Reporting Standards (IFRSs).

In 2018, administration expenses reported under Corporate and Other increased to € 320 million (2017: € 295 million). Cross-business research and development costs amounting to € 47 million in 2018 (2017: € 42 million), such as expenses for the Innovation Center, were allocated to Corporate. Other operating expenses (net) rose to € –197 million (2017: € –101 million), due among other things to a deterioration in the foreign exchange result. A reversal of an impairment loss for other receivables amounting to € 37 million had a positive effect on the operating result. The reversal was made in connection with contractual refund claims from the sale of the Generics business in 2007. After eliminating depreciation, amortization and adjustments, EBITDA pre amounted to € –381 million in 2018 (2017: € –292 million). The increase in negative business free cash flow to € –497 million (2017: € –429 million) was mainly due to the development of EBITDA pre.

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 planning and intra-year business plans.

Risk and opportunity management

Merck KGaA, Darmstadt, Germany, is 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 potential future events or developments that could lead to a negative deviation from our (financial) targets. In parallel, opportunities are defined as potential 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 potential 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.

Likewise, risk-mitigating measures are reported and assessed. The effectiveness of these measures and the planned implementation time frame are monitored by Group Risk Management.

The residual risk after the implementation of these measures is presented in the internal risk report as net risk.

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. This also encompasses a probability-weighted aggregation of risks at Group level using a Monte Carlo simulation. 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 Executive Board on an ad hoc basis.

For reporting risks with a potential negative impact on our EBIT, a minimum threshold is set at a value of € 5 million in the standard process and at a value of € 25 million in the ad hoc process. Risks below these thresholds 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, 2018. There were no relevant changes after the balance sheet date 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 context, 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.

Risk and opportunity assessment

RISKS

The significance of risks is calculated on the basis of their potential 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. General measures of the business functions are quantified during operational planning, usually in relation to sales, EBITDA pre 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. This system 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 combined management report.

KEY TOOLS

The internal control system aims to ensure the accuracy of the consolidated accounting process through functioning internal controls 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 all our subsidiaries must meet. At the same time, this function steers and monitors the scheduling and process-related requirements of the consolidated financial statements. Group Accounting centrally manages all changes to the equity holding structure and correspondingly adapts the Group's scope of consolidation. The proper elimination of intragroup transactions within the scope of the consolidation process is ensured. 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. For special issues, such as the accounting treatment of intangible assets within the scope of company acquisitions or pension obligations, external experts are additionally involved where necessary.

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 IFRSs (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.

For Group financial reporting purposes, most of our subsidiaries use standard SAP software. Consolidation software from SAP is also used for the elimination of intragroup transactions. A detailed authorization concept ensures the separation of duties with respect to both single-entity reporting and the consolidated financial statements. In principle, the accounting process is designed to ensure that all units involved adhere to the principle of dual control.

The effectiveness of our internal control system with regard to accounting and the compliance with 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. For the accounting treatment of balance sheet items, Group Accounting closely cooperates with Group Risk Management in order to correctly present potential balance sheet risks. 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 and reimbursement

In the Healthcare business sector, the known trend towards increasingly restrictive requirements in terms of drug pricing, reimbursement and expansion of high-rebate groups 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. Foreseeable effects are taken into account as far as possible in the business sector's plans. Close communication with health and regulatory authorities serves as a preventive measure to avert risks.

Remaining risks beyond the current plans resulting from restrictive regulatory requirements are classified as a medium risk owing to the possible critical or partly probable and moderate negative impact.

Risk of stricter regulations for the manufacturing, 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 manufacturing, 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 negative political and macroeconomic developments

The destabilization of political systems (as for example in Turkey or the Middle East), the possible establishment of trade barriers, sanctions and foreign exchange policy changes can lead to declines in sales in certain countries and regions. These risks are taken into account as far as possible in the business plans of the affected countries and regions and mitigated through product, industry and regional diversification.

Potential negative macroeconomic developments, for example in Argentina, can also impact our business. To minimize these impacts, corresponding measures pertaining to the sales strategy have been initiated in these countries.

The United Kingdom's intended exit from the European Union ("Brexit") gives rise to risks for our existing business in that country (2018: sales of € 636 million, 1,442 employees and 5 production sites), including the devaluation of the pound sterling, a weakening of the United Kingdom's economy, regulatory changes, the creation of trade barriers such as tariffs as well as, particularly in the event of a Brexit without a transition phase ("hard Brexit"), operational risks due to, for example, delays in the supply chain that could have an impact on our profitability. To analyze these risks and in order to counteract them early in a targeted manner, we established Group-internal working groups that considered various scenarios, including the possibility of a "hard Brexit". Mitigation measures exist for these scenarios, which shall ensure market access and the stability of the supply chain in the best possible way. They also include, for example, a relocation of the marketing authorization holder for drugs currently registered via the United Kingdom; changes to supply routes and the planned build-up of inventories of critical products, which are also designed to cushion the risk of delays in cross-border traffic, which is difficult to predict.

The net risk of negative political and macroeconomic developments is seen as possible and has critical negative effects on the net assets, financial position and results of operations. We thus 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 that can be sold and prices attainable for our products.

Opportunities due to new technologies in the manufacturing 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 being used in more and more large-area displays, such as televisions. In the future, OLED technology could also transform ceilings or walls in buildings into information boards. In order to realize such future applications, we are developing highly efficient OLED materials branded Livilux® for vacuum evaporation technology or printing processes. At the beginning of the second quarter of 2017, the HyperOLED project started within the scope of the Horizon 2020 initiative, an EU-funded program. As part of this project, together with four other partners, we will be developing high-performance, hyperfluorescence OLEDs for display and lighting applications over the next three years.

Furthermore, in 2018 we opened our new OLED Technology Center China in Shanghai. The new technology center will make tailored solutions for the development of innovative OLED applications available to local customers. It offers state-of-the-art equipment and clean room installations for the production and characterization of OLED construction elements. The site will service as venue for the collaboration between us and our customers to enable the joint development of ideal solutions for OLED display products.

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. For instance, we are pressing ahead to capture the future markets for liquid crystal windows (LCWs) and mobile antennas. Thanks to licrivision™ technology, LCWs create new architectural possibilities. Through continuously variable brightness control, they can for example increase a building's energy efficiency. Moreover, the dynamic solar shading product eyrise™ s350 launched in the EU and North America allows solar shading to be managed while the windows remain transparent and color-neutral. Due to growing demand for dynamic glass, we see great potential for the new eyrise™ product brand. Antennas that can receive signals transmitted in the high frequency range 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 take a few years.

Opportunities in the semiconductor industry

We see huge opportunities with our innovative Directed Self Assembly (DSA) technique for advanced lithography processing in Semiconductor Solutions. As semiconductor manufacturers continue to advance their device technologies, the image processing steps are becoming more complex and significantly more costly to enable device performance. Our novel DSA platform and recent material advancements enable improved device performance and reduce the cost of ownership (COO) to the customer. This has resulted in our company securing a leading position as Process of Record (POR) with several key semiconductor customers. Adoption of this disruptive lithography platform is expected to completely change how semiconductor manufacturing is conducted and could lead to a market leadership position for advanced lithography over the next few years.

We are developing new dielectric platforms in cooperation with our key customers for 3D NAND applications. There has been a change in 3D NAND device architecture and some of our customers are moving from floating gate to replacement gate. We are currently working with those customers on the new device architecture, which is expected to be introduced and ramped up in 2019 and beyond.

Opportunities from new active ingredients for cosmetics

In the current reporting year, we have systematically pushed ahead with the expansion of our research on cosmetic raw materials and supplies according to the principles of pharmaceutical drug development. The synergies from the knowledge and technology transfer from the Healthcare and Life Science Group areas have substantially improved the development times and efficiencies of new active ingredients for cosmetics. Taken together with the establishment of advanced 3D skin models, this results in a range of promising new cosmetic raw materials that are due to be launched over the coming quarters. Partnerships with leading providers from growth markets beyond Europe and North America increasingly play an important role when it comes to commercializing these products, which are offered for optimized management of the tanning or whitening of the skin, among other things.

Another growth driver is the growing demand for sustainably produced cosmetic raw materials that meet the substantially increased regulatory requirements on the main markets. Our company occupies a leading role in this field and is therefore increasingly used as a preferred supplier.

Opportunities from leveraging the e-commerce and distribution platform

With the acquisition of Sigma-Aldrich in 2015, we gained access to the leading life science e-commerce platform. Our customers are already benefiting from a portfolio of more than 300,000 products, including highly respected brands distributed via this e-commerce platform. We are further expanding this platform in order to continuously increase the number of products available on it. Making ordering processes faster and more convenient for our customers and offering support through individualized product recommendations could lead to higher sales volumes and enable us to win new customers. Consequently, this distribution channel could lead to an above-average development of sales in the medium term.

Risks due to increased competition and customer technology changes

In the 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 the Life Science and Performance Materials business sectors, risks are posed by not only cyclical business fluctuations but also changes in the technologies used or customer sourcing strategies, particularly with respect to liquid crystals. We use close customer relationships and in-house further developments as well as market proximity, including 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.

Opportunities offered by digitalization and activities to boost innovative strength

Digital technologies are becoming increasingly important for our markets and our world of work. Therefore, in 2015, we launched strategic digital initiatives geared to improving the efficiency of our internal processes and to evaluating the opportunities of digitalization with regard to our products and customers. In addition to collaborations with external partners to expand e-health solutions for patients, such as our MSdialog platform, the Accelerator program, which is being driven by our Innovation Center, is one component of our innovation strategy.

In the Healthcare business sector, in 2018 we signed an agreement for a strategic collaboration with Chinese online company Alibaba Health, which is active in the healthcare sector. The collaboration seeks

to improve access to healthcare services for patients and their families in China. The online portal www.fertility.com was launched in June 2018. It comprises a portal for physicians and one for patients. This platform allows patients and physicians to access information they require from anywhere at any time. We also introduced two new technologies to increase efficiency in reproductive laboratories. QBOX IVF optimizes the data transfer between laboratory instruments and systems for electronic patient files, while Geri® Assess 2.0 introduces the automatic identification of major development steps of embryos and blastocysts, thereby increasing evaluation efficiency. We entered into a partnership with Medisafe, a start-up based in the United States. Together the companies aim to help cardiometabolic patients better manage medication intake and adhere to prescribed treatment regimens. In the countries of scope, our patients will have access to a customized version of Medisafe's mobile platform that could combine reminders, motivation and support systems, targeted content, coupons and interventions in their local language.

In November 2018, our Life Science business sector launched its new BioContinuum™ platform to optimize biotherapeutic drug manufacturing through improved efficiency, simplified plant operations, and greater quality and consistency. This new, adaptive platform of products, applications and expertise will allow customers to bring urgently needed therapies to patients, faster and more cost-effectively than ever before, and represents the next development step in the biopharmaceutical sector.

In 2018, we expanded our competencies with a PMatX incubator for electronics of the next generation in Israel in the Performance Materials area.

Opportunities provided by the CRISPR technology

The CRISPR technology is used in genome editing. In 2018, we were awarded several patents for this. Fundamental CRISPR patents exist in Australia, China, Europe, Israel, Canada, Singapore and South Korea.

The CRISPR technologies open up promising new avenues for medical research and the treatment of some of the most difficult diseases to treat, such as cancer as well as hereditary and rare diseases.

Opportunities offered by customer proximity

In June 2018, we opened North America's first BioReliance® End-to-End Biodevelopment Center for drug manufacturers in Burlington, Massachusetts. The center provides practical experience and offers expert advice for each stage of biotechnological development and manufacture.

The manufacture of biopharmaceuticals, or biomanufacturing, is a growing industry that is increasingly focused on optimized production and high quality. However, the drug development process is long and complex, and requires biotech companies to make significant financial investments.

The new center is one of three worldwide supporting our biotech partners in developing their processes from early clinical stages to commercialization by providing end-to-end solutions.

Other centers are in Martillac (France) and Shanghai (China).

In October 2018, we opened another state-of-the-art customer collaboration center (M Lab™ Collaboration Center) in São Paulo, Brazil. The center includes non-GMP pilot and bench scale labs for customers to engage in process development support, troubleshooting and hands-on training. It is one of nine such centers around the world, each of which allows pharmaceutical manufacturers to explore new ways to increase productivity, improve processes and mitigate risks. Other M Lab™ Collaboration Center locations include China, Singapore, Japan, South Korea, India, France and the United States.

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 the Healthcare business sector. In the course of portfolio management, we regularly evaluate and, if necessary, refocus research areas and all R&D pipeline projects. Alliances with external partners and the outlicensing of programs also form part of the catalog of measures for the efficient allocation of resources. The conclusion and continuation of these partnerships and externalizations play an important role. A deviation from the strategic targets defined in this area could have a critical negative impact on net assets, financial position and results of operations. The occurrence of a risk of this magnitude is considered unlikely, which means that this is a medium risk.

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 the Healthcare business sector. We co-developed Bavencio® with Pfizer. Following its approval for the treatment of patients with metastatic Merkel cell carcinoma and locally advanced or metastatic urothelial cancer in 2017, it was not approved for any additional indications this year.

Mavenclad® was approved in 2017 by the European Commission. It is the first short-course oral treatment approved in Europe for the treatment of relapsing multiple sclerosis in patients with high disease activity. In 2018, approvals were also granted in the Middle East and Africa (United Arab Emirates) and Latin America (Argentina). Looking forward, we aim to seek approval for Mavenclad® in the United States.

In addition to marketing already approved medicines, we are pushing ahead with research projects in other important therapeutic areas. The portfolio of projects is evaluated on a regular basis. This may also lead to inlicensing or outlicensing or further strategic alliances.

For example, in 2018 a combination of BAVENCIO® (avelumab) and INLYTA® (axitinib) was shown to significantly extend the time to disease progression or death in patients with untreated, advanced renal cell carcinoma, according to the results of a Phase III trial. Based on the results, our company and Pfizer are planning to submit an application for approval in the United States.

We received fast-track designation for Tepotinib in Japan. The molecule may have the potential to treat patients with advanced non-small cell lung cancer (NSCLC) harboring MET exon 14 skipping mutations.

The expenses currently being incurred, especially in our Healthcare research and development, are already reflected in the current plans. The same applies to net sales generated by the products Bavencio® and Mavenclad® for approved indications on the relevant markets, as well as to the planned approval of Mavenclad in the United States. Further approvals may result in an increased sales potential.

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. 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.

Furthermore, there is the risk that regulatory authorities either do not grant or delay approval or grant only restricted approval. Additionally, there is the risk 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. Well-advanced programs in our pipeline and those of our partners result in potential new approvals; on the other hand, missing targets in this area may have critical negative effects on the financial position and operating result, for example due to lower net sales or the non-occurrence of milestone payments from collaboration agreements. Overall, these risks are considered to be medium risks, with probabilities ranging from unlikely to possible.

RISKS AND OPPORTUNITIES RELATED TO THE QUALITY AND AVAILABILITY OF PRODUCTS

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 manufacturing of pharmaceutical products (Good Manufacturing Practice or official pharmacopoeia). 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 make 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 with a critical negative impact 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 moderate negative impact on the net assets, financial position and results of operations. Therefore, we rate this as a medium risk.

Risks of production availability

Further risks include operational failures due to fire or 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 economically viable, the Group limits its damage risks with insurance coverage, the nature and extent of which is constantly adapted to current requirements. Likewise, we are exposed to risks of production outages and the related supply bottlenecks that can be triggered by technical problems in production facilities with very high capacity utilization. Furthermore, there are risks of supply bottlenecks due to a lack or disappearance of capacity. We are working to continuously mitigate the risks by making regular investments, setting up alternative sourcing options and maintaining inventory levels.

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 they are therefore classified 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 for a number of precursor products, packaging materials and finished goods. 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.

Product liability risks
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, loss of reputation 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 (“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 and regional aspects in particular. Our Corporate Security department 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
For numerous markets in Asia, the Middle East, Latin America and Africa, we expect that in the coming years all business sectors will continue to make above-average contributions to growth. In order to further expand this potential for our businesses, we have moved forward with several investment projects in recent years. For instance, in 2018 we invested around € 15 million in China to further expand the capacity of a pharmaceutical manufacturing facility and a further € 29 million in a manufacturing plant for our Life Science business sector. Moreover, we are continuing our engagement in Africa. 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.

RISKS AND OPPORTUNITIES FROM THE USE OF SOCIAL MEDIA

Our company and its employees are active on numerous social media channels. The consistent and legally compliant use of the channels and their content is important in terms of increasing awareness of our brand, among other things. We take precautions and implement processes to ensure awareness of the proper handling of social media, controlling publication and actively managing communication.

Nevertheless, reputational risks could result, for instance through public dialogs in social media.

Overall, we rate this as a low risk.

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. Therefore, to reduce potential liquidity risks, we have a central Group-wide liquidity management system in place and a balanced maturity profile. The maturities of our financial liabilities are aligned with our planned free cash flow. Furthermore, we have a multicurrency revolving credit facility of € 2 billion with a term until 2023, 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.

Overall, the liquidity risk is unlikely and 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" in Note (38) "Management of financial risks" in the Notes to the Consolidated Financial Statements).

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 Note (38) "Management of financial risks" in the Notes to the Consolidated Financial Statements). 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.

Variable interest and current financial liabilities are exposed to the risks and opportunities of interest rate fluctuations. These are also managed and reduced using derivatives. Interest rate risks 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 in Note (19) "Goodwill" and (20) "Other intangible assets" in the Notes to the Consolidated Financial Statements). All relevant risks were assessed during the preparation of the consolidated financial statements and taken into account accordingly. We rate risks beyond this as unlikely with a critical negative impact. Therefore, this is seen as a medium risk.

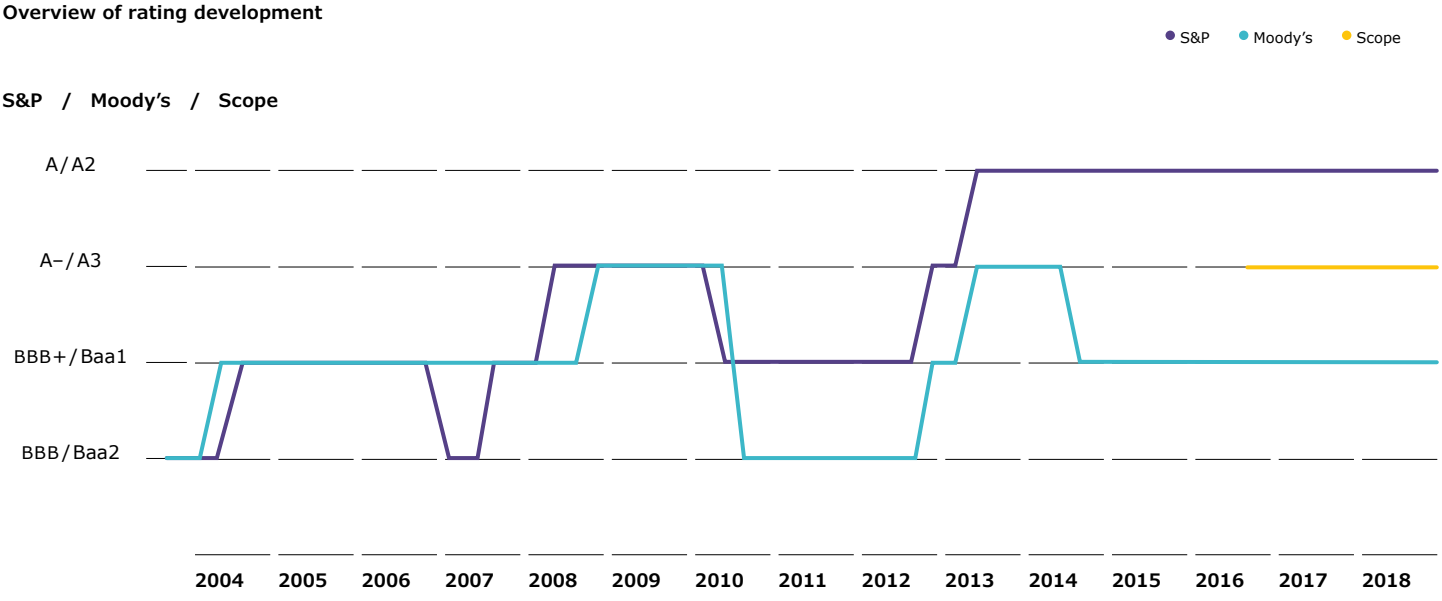
RISKS AND OPPORTUNITIES FROM PENSION OBLIGATIONS

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. The obligations are covered by the pension provisions reported in the balance sheet based on the assumptions as of the balance sheet date. Some of these obligations are funded by plan assets (further information can be found in Note (25) "Provisions for pensions and other post-employment benefits" in the Notes to the Consolidated Financial Statements). 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 unlikely risk due to pension obligations could have moderate negative effects on the net assets, financial position and results of operations, and is classified as low.

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 used by our company. We are currently rated by Standard & Poor's (S&P), Moody's and Scope. Standard & Poor's has issued a long-term credit rating of A with a stable outlook, Moody's a rating of Baa1 with a stable outlook and Scope a rating of A–, likewise with a stable outlook. 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.

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, trademark law, data protection 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.

For instance, we are currently involved in litigation with Merck & Co. Inc., Kenilworth, NJ, USA (outside the United States and Canada: Merck Sharp & Dohme Corp. (MSD)), against whom we have filed lawsuits in various countries. This company has also sued us in the United States for trademark infringement, among other things.

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.

Despite extensive precautionary measures, non-compliance with laws and regulations leading to related consequences can never be completely excluded.

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 with Biogen Inc., Massachusetts (United States), (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 the United States in 2009. 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 is invalid and not infringed on by our actions. In the first instance, a jury recognized the invalidity of the patent. This jury verdict was overturned by a first-instance federal judge. For the time being the patent is thus deemed to be legally valid and to have been infringed. We filed a complaint with the United States Court of Appeals of the Federal Circuit (CAFC – second instance) against the first-instance ruling in October 2018. We have taken appropriate accounting measures.

Nevertheless, potentially critical negative impacts of the litigation on the financial position cannot be ruled out.

In the Performance Materials business sector, we are involved in a legal dispute with JNC Corporation, Japan, (JNC). JNC claims that by manufacturing and marketing certain liquid crystals mixtures, our company has infringed JNC patents. We maintain that JNC's patent infringement assertion is invalid owing to relevant prior art and has filed the corresponding nullity actions, which in three cases were already successful in first-instance proceedings. JNC has filed complaints in each case. In a correction trial, a decision in favor of JNC was issued in the second instance. Both our company and the Korean Patent Office have filed complaints with the Korean Supreme Court. In parallel, JNC filed two patent infringement suits. In each of the cases, a first-instance and a second-instance decision was taken in our favor, against which JNC has appealed or is highly likely to appeal. We are prepared for this matter and the dispute, and have taken appropriate accounting measures. Nevertheless, a potentially critical negative impact of the litigation on the financial position cannot be ruled out.

In July 2017, BMS, E.R. Squibb & Sons L.L.C., Ono Pharmaceutical Co., Ltd., and Tasuku Honjo filed suit in the United States District Court of Delaware against our company and Pfizer Inc., based on the allegation that Bavencio® infringes a U.S. patent. The lawsuit was settled based on a settlement agreement signed between Pfizer and the claimants after the balance sheet date. For this reason, the last year's reported risk is obsolete.

RISKS DUE TO ANTITRUST AND OTHER GOVERNMENT PROCEEDINGS

Raptiva®: In December 2011, the federal state of São Paulo, Brazil, 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, which relate to various legal cases. 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.

On July 6, 2017, we received notice from the European Commission (EU Commission) in connection with the antitrust review proceedings for the acquisition of Sigma-Aldrich, in which the EU Commission informed our company of its preliminary conclusion that our company and Sigma-Aldrich allegedly transmitted incorrect and/or misleading information within the scope of the acquisition of Sigma-Aldrich. The EU Commission received registration of the merger on April 21, 2015 and granted clearance on June 15, 2015 subject to the condition that our company and Sigma-Aldrich divest parts of the European solvents and inorganic chemicals businesses of Sigma-Aldrich in order to resolve antitrust concerns. According to the preliminary viewpoint of the EU Commission communicated in the letter dated July 6, 2017, our company and Sigma-Aldrich withheld in this connection important information about an innovation project. According to the EU Commission, the innovation project should have been included in the remedies package. At the present time, an EU Commission administrative procedure is still pending that could lead to a fine being imposed by the EU Commission. Our company is entitled to legal recourse should a fine be imposed. The ongoing investigations are limited to the examination of violations of EU merger control procedures and do not affect the validity of the EU Commission's decision to approve the merger. As the risk is considered to have a potential critical negative impact on the net assets and financial position, a provision has been set up.

RISKS OWING TO A SETTLEMENT AGREEMENT OF 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 subsidiaries of GlaxoSmithKline plc, United Kingdom 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 have taken legal action against this fine. Appropriate accounting measures have been taken. As things stand at present, a decision and outflow of resources are not expected until 2019 because the Appeals Tribunal has since submitted the relevant legal questions to the European Court of Justice (CJEU) for a preliminary ruling. This is currently classified 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 the challenge of being perceived by the public as an attractive employer. 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 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 our company, such as the failure of central IT systems, the disclosure or loss of the data integrity of confidential data from research and business activities, the manipulation of IT systems in process control, or an increased burden or adverse impact on IT systems as a result of virus attacks.

The Group operates an information protection management system based on ISO 27001 comprising security guidelines as well as organizational and technical measures to prevent and address IT security incidents. Globally used IT applications 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 and the quality of our products. This also applies to the failure of a data center. To achieve the required service quality, we use a quality management system certified to 9001 that also applies to the provision of IT. In addition, to reduce the risk of failure, we operate several redundantly designed data centers. Furthermore, insurance solutions for cybercrime offenses are in place at Group level.

Likewise, complications with the changeover of IT systems could negatively impact the earnings situation. Close monitoring of critical IT projects serves to mitigate this risk.

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 high risks owing to likely and potentially critical negative 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. 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 or additional expenses, for instance through indemnity clauses and guarantee commitments or long-term supply contracts. Through strong due diligence processes and closely managed integration processes, we seek to reduce the probability of occurrence of this risk. Therefore, we classify this as a low risk with an unlikely probability of occurrence and potentially moderate negative effects on the net assets, financial position and results of operations.

Overall view of the risk and opportunity situation and management assessment

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 occurred, as the assessment of the individual risks has of course shifted over the fiscal year due to changing external and internal conditions, while the overall risk profile 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 – we take counteraction, in particular against significant individual risks.

The overall risk of the Group, which is derived from the probability-weighted aggregation of the identified risks, leads to the assessment that we are not exposed to risks of a nature to threaten the existence of the Group as a going concern or for which coverage and financing of the losses is questionable. We are confident that we will continue to successfully master the challenges arising from the above risks in the future as well. Our company also benefits from diversification through our different products and markets.

In our view, business-related opportunities offer the greatest potential. An important element here is the continuous expansion of our businesses in Asia, Latin America, Africa and the Middle East. With the successful focusing and continued intensification 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 with industrial partners as well as various universities and international organizations. We are making targeted investments in future-oriented companies and start-ups via our corporate venture capital Fund and our Accelerator programs. 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 specify their expected effects in the forecast development of net sales, EBITDA pre 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 2019 of the development of Merck KGaA, Darmstadt, Germany, and its three business sectors: Healthcare, Life Science and Performance Materials.

The sale of the Consumer Health business to Procter & Gamble (P&G) was completed as of December 1, 2018. The 2018 figures already reflect this sale. For this reason, the sale has not been recorded as a portfolio effect in the comparison of the forecast with the figures for fiscal 2018.

We define organic earnings growth as currency-adjusted and portfolio-adjusted growth. Accordingly, the effects resulting from the first-time application of the new accounting standard for leases (IFRS 16) are reflected in organic earnings growth.

FORECAST FOR THE GROUP

€ million	Actual results 2018	Forecast for 2019	Key assumptions
Net sales	14,836	– Moderate organic growth – Slightly negative foreign exchange effect of –1% to –2%	– Growth driven by Life Science and Healthcare, which more than offsets the decline of Performance Materials – Foreign exchange effect primarily resulting from several emerging market currencies
EBITDA pre	3,800	– Pronounced organic percentage growth in the low teens range – Negative foreign exchange effect of between –3% and –4%	– Growth driven by Healthcare and Life Science, which more than offsets the decline of Performance Materials – First-time application of IFRS 16 with a positive contribution of around € 130 million – Foreign exchange effect primarily resulting from several emerging market currencies
Business free cash flow	2,508	– Moderate increase	– Higher EBITDA pre and positive effects in working capital offset higher investments in property, plant and equipment as well as digitalization initiatives

NET SALES

For the Group, in 2019 we expect moderate organic sales growth in comparison with the previous year. With regard to foreign currencies, we continue to expect a volatile environment due to political and macroeconomic developments. Our forecast for 2019 is based on an exchange rate of the euro against the U.S. dollar in the range of 1.15–1.20. This means that the foreign exchange effect from the development of the exchange rate between the euro and the U.S. dollar is likely to be neutral when compared with the prior year. All told, however, due to the unfavorable trend of exchange rates on several growth markets – Latin America, in particular – we expect a slightly negative foreign exchange effect of between –1% and –2% when compared with the previous year.

EBITDA PRE

EBITDA pre is our key financial indicator to steer operating business. On an organic basis, we forecast an increase in EBITDA pre in the low double-digit percentage range for the Group in 2019 compared with the prior year. This includes effects from the first-time application of the accounting standard IFRS 16, which contains new provisions on reporting for leases. Based on the current accounting provisions with respect to leases, EBITDA pre will increase by around € 130 million compared with the prior year. Most of the effects will probably be accounted for by the Life Science and Healthcare business sectors, while the impact on Performance Materials as well as Corporate and Other will be less pronounced.

The projected trend of exchange rates will likely reduce EBITDA pre for the Group by between –3% and –4% compared with the prior year and will thus have a disproportionate effect compared with sales, particularly in the Healthcare business sector. While we expect the development of the euro against the U.S. dollar to be neutral for the Groups' EBITDA pre, the negative trend of currencies on several growth markets will weigh on EBITDA pre. In the affected countries, the cost base is low relative to sales owing to our regional structures. In addition, due to high hedging costs, these emerging market currencies are not hedged. Therefore, a compensating effect from currency hedging cannot be expected.

BUSINESS FREE CASH FLOW

For business free cash flow of the Group, we expect a moderate rise in 2019 owing to higher EBITDA pre and positive effects from the management of working capital. Both effects combined will be able to more than offset the rising investments in property, plant and equipment as well as digitalization initiatives.

FORECAST FOR THE HEALTHCARE BUSINESS SECTOR

€ million	Actual results 2018	Forecast for 2019	Key assumptions
Net sales	6,246	– Moderate organic growth – Moderately negative foreign exchange effect	– At least stable sales development of the base business in organic terms – Substantial growth contribution of our newly approved products, particularly Mavenclad®; expected market approval in the United States has been taken into account – Negative foreign exchange effect due to trend of exchange rates on several growth markets
EBITDA pre	1,556	– Pronounced organic growth rate in the low-to-mid-twenties percentage range – Strongly negative foreign exchange effect	– Expected substantial earnings contributions from our new products, especially Mavenclad®, more than offset negative mix effects associated with the projected decline of Rebif® sales – Moderate increase in research and development expenses due to the development of our pipeline, but down in relation to sales – Earnings contributions from the strategic alliance with GlaxoSmithKline plc of approximately € 100 million and owing to license payments for Erbitux® that were lower than expected – Negative foreign exchange effect due to trend of exchange rates on several growth markets
Business free cash flow	1,025	– Increase in the low teens percentage range	– Rise in EBITDA pre – Positive net working capital effects (including positive effects from the sale of the Consumer Health business)

NET SALES

For the Healthcare business sector, we expect moderate organic sales growth in 2019. We project an at least stable sales trend for our base business. The persistently strong demand for our products in the General Medicine & Endocrinology business unit on the growth markets will make a major contribution to this trend, as will our business with products for the treatment of infertility. These positive effects should compensate for the expected decline in sales of Rebif® and the continuing price pressure on major markets in the Europe, Asia-Pacific, and Middle East and Africa regions. Moreover, we expect our new products, above all Mavenclad®, to make a significant contribution to growth. For 2019, we forecast Bavencio® sales totaling a euro figure in the high double-digit millions and Mavenclad® sales up to a figure in the mid-triple-digit millions. These forecasts include the expected market approval of Mavenclad® in the United States. In particular, the unfavorable currency trend on several growth markets should lead to a moderately negative foreign exchange effect on Healthcare sales.

EBITDA PRE

For 2019, we forecast organic EBITDA pre of the Healthcare business sector to record strong growth in the low-to-mid-twenties percentage range compared with the previous year. Foreign exchange effects are expected to weigh heavily on EBITDA pre.

The negative earnings effects resulting from the projected decline of Rebif® sales should be more than offset by expected, substantial earnings contributions from our new products, particularly Mavenclad®. The disappearance of one-time effects from fiscal 2018 totaling some € 180 million should be more than offset by expected earnings contributions from the active management of our pipeline assets and milestone payments. The conclusion of a global strategic alliance with GlaxoSmithKline plc (GSK) on February 5, 2019, for the joint development and marketing of M7824 (Bintrafusp alfa[1]) is an initial major contribution in this respect. For 2019, we expect an income effect from the upfront cash payment of around € 100 million in other operating income. License payments for Erbitux® that were lower than expected had the effect of enhancing earnings. Research and developments costs to develop our pipeline, especially in immunoncology, will continue to rise; based on current forecasts this trend is likely to weaken. This budgeted cost increase does, however, depend on the development of clinical data and on prioritization decisions. We also expect our marketing and selling costs to increase further, driven primarily by preparations for the launch of Mavenclad®, particularly in the United States. However, we expect research and development costs as well as marketing and selling costs to decline or at least remain stable in relation to sales.

[1] Bintrafusp alfa is the proposed International Nonproprietary Name (INN) for bifunctional immunotherapy M7824. Bintrafusp alfa is currently in clinical trials and not approved for any indication worldwide.

BUSINESS FREE CASH FLOW

In 2019, we expect business free cash flow of the Healthcare business sector to show an increase in the low twenties percentage range. The main drivers will be the expected rise in EBITDA pre and positive developments of net working capital (including positive effects from the sale of the Consumer Health business).

FORECAST FOR THE LIFE SCIENCE BUSINESS SECTOR

€ million	Actual results 2018	Forecast for 2019	Key assumptions
Net sales	6,185	– Organic growth slightly above medium-term market growth of 4% p.a. – Slightly negative foreign exchange effect	– Process Solutions is expected to remain the main driver of growth, followed by Applied Solutions – Research Solutions will also make a moderately positive contribution to the organic sales development – No material portfolio effect as a result of the sale of the flow cytometry business – Negative foreign exchange effect, particularly on account of the development of emerging market currencies
EBITDA pre	1,840	– Organic growth ranging from strong to a double-digit percentage rate – Moderately negative foreign exchange effect	– Organic income growth on account of the expected sales growth and slight margin expansion – In addition, positive contribution to organic income growth from the switch to IFRS 16 – Negative foreign exchange effect, particularly on account of the development of emerging market currencies
Business free cash flow	1,393	– Moderately below 2018 levels	– Improved EBITDA pre – Increase in investments in property, plant and equipment in strategic projects

NET SALES

For the Life Science business sector in 2019, we project organic growth in net sales over the previous year that is slightly above medium-term market growth, which we put at around 4% per year. We expect all business units to make a positive contribution to organic growth. In 2019, the Process Solutions business unit is again likely to remain the strongest driver of organic growth, followed by Applied Solutions. The Research Solutions business unit should also make a moderate contribution to the sales development, albeit to a lesser extent than the other two business units. We sold the flow cytometry business at the end of 2018. The divestment will not have a material portfolio effect. Due to the development of currencies on various growth markets, we project a slightly negative foreign exchange effect.

EBITDA PRE

In 2019, the Life Science business sector is expected to show a sharp increase in organic EBITDA pre totaling nearly double-digit growth rates compared with the previous year. The persistently dynamic demand trend, a further slight increase in the margin and the IFRS 16 effects will all contribute to the organic growth in income. Cost and sales synergies from the acquisition of Sigma-Aldrich were realized as planned in 2018. All told, these synergies came to € 280 million. No incremental synergies are expected for 2019.

In fiscal 2019, we forecast organic EBITDA pre growth of the Life Science business sector that will be reduced by a moderately negative foreign exchange effect, driven by the devaluation of several emerging market currencies.

BUSINESS FREE CASH FLOW

We expect business free cash flow of our Life Science business sector to be moderately below the prior-year level. Higher EBITDA pre will be more than offset by investments in strategic projects.

FORECAST FOR THE PERFORMANCE MATERIALS BUSINESS SECTOR

€ million	Actual results 2018	Forecast for 2019	Key assumptions
Net sales	2,406	– Organically moderate decline from the prior-year level – Foreign exchange effect roughly neutral	– Strong growth momentum in the Semiconductor Solutions business unit – Continuing price decline in Liquid Crystals business, which is mitigated by a temporary rise in volume due to capacity expansions of customers in China – Neutral foreign exchange effect due to the development of the exchange rate of the euro against the U.S. dollar
EBITDA pre	786	– Organic high single-digit to low double-digit percentage decline – Foreign exchange effect roughly neutral	– Drop in liquid crystal prices cannot be offset by growth in other businesses and active cost management – Neutral foreign exchange effect due to the development of the exchange rate of the euro against the U.S. dollar
Business free cash flow	588	– Decline in the low teens percentage range	– Decline in EBITDA pre

NET SALES

We forecast a moderate organic sales decline in the Performance Materials business sector in 2019 compared with the prior year. We also project a drop in sales and prices in the Liquid Crystals business in fiscal 2019. Despite selected capacity expansion projects by our customers, which benefited our Liquid Crystals business in recent months and which are expected to continue providing a benefit in the first half of 2019, we expect that the price pressure characteristic of this industry cannot be compensated for by corresponding volume growth in 2019 as a whole. This development can probably not be offset by good organic growth in other business areas either, for example our business with semiconductor materials or OLED. Due to the development of the euro against the U.S. dollar, we project a neutral foreign exchange effect for the Performance Materials business sector in 2019.

EBITDA PRE

Our Performance Materials business sector will probably not be able to absorb the expected decline in sales of the highly profitable Liquid Crystals business in 2019, despite a good expected development in other business areas and strict cost discipline. Consequently, we expect that organic EBITDA pre will decline in the high single-digit to low teens percentage range in comparison with 2018. Due to the development of the euro against the U.S. dollar, we expect a neutral foreign exchange effect for the Performance Materials business sector.

BUSINESS FREE CASH FLOW

For the Performance Materials business sector we forecast a decline of business free cash flow in the low teens range, essentially as a result of the expected negative development of EBITDA pre.

Corporate and Other

The expenses for Corporate and Other will, in our opinion, show an increase in the low-to-mid-teens range on an organic basis in 2019. This increase will be based on a further expansion of our innovation and digitalization initiatives. A greater focus on the costs of the administrative functions and substantially reduced strain from foreign exchange effects are likely to partly offset the increase.

Report in accordance with Section 315a (1) of the German Commercial Code (HGB)

The following information is provided in accordance with section 315a (1) of the German Commercial Code (HGB) 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, a related party of Merck KGaA, 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, 2018, no shareholders owned direct or indirect investments exceeding 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 be a general partner not holding an equity interest only 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. Notwithstanding any statutory provisions to the contrary, the resolutions of the General Meeting are 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 encompass authorized and contingent capital.

The Executive Board is authorized to increase the company's share capital with the approval of the Supervisory Board and of E. Merck KG, Darmstadt, Germany, once or repeatedly up to and including April 27, 2022 by up to a total of € 56,521,124.19 by issuing new no-par value bearer shares against cash and/or non-cash contributions ("Authorized Capital 2017"). Limited liability shareholders shall be generally granted the statutory right to subscribe to the new shares. However, the Executive Board is authorized, with the approval of the Supervisory Board, to exclude the limited liability shareholders' subscription right in full or in part in case of a capital increase against cash contributions pursuant to or by analogous application of section 186 (3) sentence 4 AktG if the issue price of the new shares is not substantially lower than the stock exchange price of the company's shares already listed and if the new shares which are issued under exclusion of the subscription right do not exceed a proportional amount of 10% of the share capital either at the time of the Authorized Capital 2017 taking effect or at the time of the Authorized Capital 2017 being utilized. This restriction to 10% of the share capital shall include the proportional amount of the share capital that is attributable to shares which are issued under exclusion of the subscription right or sold during the term of the Authorized Capital 2017 based on an authorization to issue new shares or sell own shares by direct or analogous application of section 186 (3) sentence 4 AktG. Further, this restriction shall also include the proportional amount of the share capital that is attributable to shares which may or must be issued in order to service bonds carrying a conversion or option right or a conversion or option obligation, if the bonds are issued during the term of the Authorized Capital 2017 under exclusion of the limited liability shareholders' subscription right by analogous application of section 186 (3) sentence 4 AktG. It is likewise possible to exclude the subscription right of the limited liability shareholders with the approval of the Supervisory Board in the case of capital increases through non-cash contributions, particularly for the purpose of acquiring enterprises, parts of enterprises or interests in enterprises. In addition, with the approval of the Supervisory Board, the limited liability shareholders' subscription rights 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 of the company to participate in a capital increase by issuing shares or freely transferable share subscription rights.

It is likewise possible to exclude, with the approval of the Supervisory Board, the subscription right of the limited liability shareholders in order to enable E. Merck KG, Darmstadt, Germany, to exercise its right pursuant to Article 33 of the Articles of Association to convert, in full or in part, its equity interest into share capital.

Moreover, with the approval of the Supervisory Board, the subscription right of the limited liability shareholders can be excluded if and to the extent this is necessary to grant the holders or creditors of conversion or option rights and/or the holders or creditors of financing instruments carrying conversion or option obligations, which were or are issued by the company or by a domestic or foreign company in which the company directly or indirectly holds the majority of the votes and capital, a subscription right to the extent to which they would be entitled after the exercise of the conversion or option rights or after the performance of a conversion or option obligation.

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

The sum of shares issued on the basis of the Authorized Capital 2017 under exclusion of the limited liability shareholders' subscription right must not exceed a proportional amount of 20% of the share capital, by taking into account other shares of the company which, during the term of the Authorized Capital 2017, are sold or issued under exclusion of the subscription right or are to be issued under bonds issued after April 28, 2017 under exclusion of the subscription right; this limitation shall apply both at the time of this authorization taking effect and at the time of this authorization being exercised.

To the extent that the subscription right is not excluded under the above provisions, it may also be granted to the limited liability shareholders by way of an indirect subscription right pursuant to section 186 (5) AktG or, in part, by way of a direct subscription right, and otherwise by way of an indirect subscription right pursuant to section 186 (5) AktG.

Furthermore, the Executive Board is authorized, with the approval of the Supervisory Board, to determine the additional details of the capital increase and its implementation, including the content of rights attached to the shares as well as the terms and conditions of the share issue.

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 with an obligation to convert or exercise options 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 April 27, 2018 to April 26, 2023, utilize their option or conversion rights or, to fulfill their conversion obligation or obligation to exercise options insofar as they are obliged to fulfill their conversion or option exercise 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 report of the Group and Merck KGaA, Darmstadt, Germany, for 2018 are being filed with the electronic German Federal Gazette (elektronischer Bundesanzeiger) and are available on the website of the German company register.

Merck KGaA, Darmstadt, Germany, headquartered in Darmstadt, is the parent company of the Group. In addition to its function of a holding company, Merck KGaA, Darmstadt, Germany, generated sales in the Healthcare, Life Science and Performance Materials business sectors. Merck KGaA, Darmstadt, Germany, bears a significant portion of the Group-wide research and development costs, and employs the majority of the 11,000-plus workforce in Darmstadt.

The financial statements of Merck KGaA, Darmstadt, Germany, have been prepared in accordance with the provisions of the German Commercial Code (HGB), as amended by the German Accounting Directive Implementation Act (BilRUG), and the German Stock Corporation Act (AktG). The full version of the annual financial statements together with the unqualified auditor's opinion has been submitted to the operator of the electronic Federal Gazette (elektronischer Bundesanzeiger), where they are published and forwarded to the Company Register.

Statement on Corporate Governance

The Statement of Corporate Governance according to section 289a of the German Commercial Code (HGB) is contained in the "Corporate Governance" section of the Annual Group Report.

Effects of material company agreements on the net assets, financial position and results of operations

SPIN-OFF OF OPERATING BUSINESS ACTIVITIES OF THE BUSINESS SECTORS AND TEMPORARY LEASEBACK OF THE SPUN-OFF BUSINESS ACTIVITIES

As part of the strategic development of Merck KGaA, Darmstadt, Germany, the existing operating activities of the Healthcare, Life Science and Performance Materials business sectors within Merck KGaA, Darmstadt, Germany, together with the relevant assets and liabilities (hereinafter: "operating sectors") were spun off at their carrying values into three separate companies (hereinafter: "OpCo" or plural "OpCos") with the legal form of a GmbH or German limited liability corporation (operating spin-off). This operating spin-off is based on the spin-off and takeover agreement concluded between Merck KGaA, Darmstadt, Germany, and the OpCos in notarized form on March 2, 2018. Following approval by the 2018 Annual General Meeting, the operating spin-off took place with economic effect as of 0:00 hours on January 1, 2018.

Immediately after the spin-off took effect, all shares held by Merck KGaA, Darmstadt, Germany, in the respective OpCos were transfered to holding companies via a further spin-off (holding company spin-off), as a result of which the OpCos are each indirectly held by Merck KGaA, Darmstadt, Germany, via an intermediate holding company. The acquiring legal entities within the scope of the holding company spin-off were Merck Healthcare Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, for the business shares of Healthcare OpCo, Merck Life Science Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, for the business shares of Life Science OpCo and Merck Performance Materials Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, for the business shares of Performance Materials OpCo (referred to individually as "HoldCo", independently of the sector, and jointly as "HoldCos"). To this end, Merck KGaA, Darmstadt, Germany, and the HoldCos signed a notarized spin-off and takeover agreement on March 2, 2018. The holding company spin-off took place with economic effect as of 0:00 hours on January 1, 2018.

Since the technical system requirements for the introduction of the sector-specific ERP systems as regards the OpCos were not in place at the time of the spin-off, the business activities spun off to the OpCos have been temporarily leased back by the relevant OpCos to Merck KGaA, Darmstadt, Germany, until the introduction of the sector-specific ERP systems. For this purpose, also on March 2, 2018, Merck KGaA, Darmstadt, Germany, entered into a business leasing contract with the respective OpCo with economic effect as of 0:00 hours on January 1, 2018, to lease back all the operating business previously spun off to the OpCo. Under the terms of the respective business leasing contract, Merck KGaA, Darmstadt, Germany, leases the entire operation from the respective OpCo, as well as all fixed assets in this context; it acquires the current assets as well as certain liabilities and provisions at their carrying amounts under German commercial law. The business lease allowed the spin-off measures to be implemented for all OpCos with economic effect at a uniform time, 0:00 hours on January 1, 2018, while retaining the flexibility of transitioning the management of the relevant operating business in accordance with the sector-specific ERP introduction at an individual time to the OpCo in question in a targeted manner. On the basis of the operating lease contract, Merck KGaA, Darmstadt, Germany, will

temporarily continue to operate the spun-off business as a leaseholder in its own name and for its own account. Once the relevant ERP systems have been introduced for the respective OpCo, the business lease with this OpCo will be terminated and the business previously leased out will pass to the OpCo.

The aforementioned spin-off and business leasing contracts form part of an overall entrepreneurial concept. They were submitted to the General Meeting of Merck KGaA, Darmstadt, Germany, for approval on April 27, 2018 (2018 Annual General Meeting) as a coherent restructuring measure and approved by it. The gradual implementation of the measures is due to be completed in 2020. In 2018, the Healthcare OpCo changed its legal form to that of a German corporation with general partners ("Kommanditgesellschaft auf Aktien") and has since been trading under the name of Merck Healthcare KGaA, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany.

The table below shows the balance sheet of Merck KGaA, Darmstadt, Germany, after the operating spin-off, holding company spin-off and temporary leaseback as of 0:00 hours on January 1, 2018. The impact in fiscal 2018 of the spin-offs was mainly lower depreciation, amortization and write-downs of fixed assets and lower pension expenses. On the other hand, business lease expenses and the passing-on of costs for personnel-related provisions led to an increase in other operating expenses.

€ million	Merck KGaA, Darmstadt, Germany Dec. 31, 2017	Merck KGaA, Darmstadt, Germany Jan. 1, 2018[1]
ASSETS		
A. Fixed assets		
Intangible assets	489.7	191.8
Tangible assets	1,173.0	821.6
Financial assets	16,485.7	17,510.7
	18,148.4	**18,524.2**
B. Current assets		
Inventories	688.3	688.3
Trade accounts receivable	181.3	181.3
Other receivables and other assets	891.6	591.6
Cash and cash equivalents	1.4	1.4
	1,762.6	**1,462.6**
C. Prepaid expenses	28.5	28.5
Total ASSETS	**19,939.5**	**20,015.3**
EQUITY AND LIABILITIES		
A. Net equity		
Subscribed capital	168.0	168.0
General partner's equity	397.2	397.2
Capital reserves	3,813.7	3,813.7
Retained earnings	701.6	701.6
Profit carried forward E. Merck KG, Darmstadt, Germany	60.3	60.3
Net retained profit: shareholders	187.1	187.1
	5,327.9	**5,327.9**
B. Provisions		
Provisions for pensions and other post-employment benefits	200.4	110.7
Other provisions	1,112.1	946.1
	1,312.5	**1,056.8**
C. Liabilities		
Financial liabilities	1,500.0	1,500.0
Trade accounts payable	292.1	292.1
Other liabilities	11,489.1	11,820.7
	13,281.3	**13,612.8**
D. Deferred income	17.9	17.9
Total LIABILITIES	**19,939.5**	**20,015.3**

[1] After operating spin-off, holding company spin-off and temporary leaseback.

Business development

Net sales of Merck KGaA, Darmstadt, Germany, decreased slightly in 2018. The decline of € 22 million resulted primarily from the Healthcare and Performance Materials business sectors, offset mainly by an increase in other sales.

			Change	
€ million	**2018**	2017	€ million	in %
Healthcare	2,310	2,404	–94	–3.9%
Life Science	780	777	3	0.4%
Performance Materials	1,386	1,399	–13	–0.9%
Other sales	309	228	82	35.8%
Total	**4,785**	**4,807**	**–22**	**–0.5%**

Other sales mainly included intragroup cross-charging for IT services, rent and other administrative services.

The share of sales with other Group companies (Group sales) amounted to 93.6% in 2018 (2017: 93.6%).

			Change	
€ million	**2018**	2017	€ million	in %
Group sales	4,477	4,500	–23	–0.5%
Sales to third parties	308	307	1	0.3%
Total	**4,785**	**4,807**	**–22**	**–0.5%**

At 86.7% (2017: 90.3%), the share of exports in 2018 was below the previous year's level.

			Change	
€ million	**2018**	2017	€ million	in %
Outside Germany	4,148	4,341	–193	–4.4%
Germany	637	467	170	36.5%
Total	**4,785**	**4,807**	**–22**	**–0.5%**

The decline in net sales of the Healthcare business sector was attributable to a one-time payment for future license payments in the previous year, which had increased sales. By contrast, net sales of products rose slightly in 2018. Business with cardiovascular medications (+5.1%), the oncology drug Erbitux® (+1.0%) and with thyroid medications (+3.8%) showed a moderate increase. All told, the business sector recorded declining sales in particular in the Middle East and Africa region, while sales rose especially in the Asia-Pacific region.

In the Performance Materials business sector, the previous year's sales level was not reached by the Display Solutions business unit (–0.8%). In addition, the Surface Solutions business unit recorded a slight drop in sales (–2.0%) mainly affecting sales in the Middle East and Africa region. From a regional perspective, sales in Asia-Pacific were flat, while Europe recorded moderate losses and North America generated sales growth.

Net sales of the Life Science business sector were slightly above the previous year's figure. The Research Solutions (–3.0%) and Applied Solutions (–5.0%) business units showed a slight decline in sales, which was offset by the increase in net sales in the Process Solutions business unit (+4.4%). Sales growth was generated in the North America and Asia-Pacific regions. By contrast, a slight fall was recorded in particular in the Europe and Middle East and Africa regions.

RESULTS OF OPERATIONS

			Change	
€ million	**2018**	2017	€ million	in %
Sales	4,785	4,807	–22	–0.5%
Other income	172	212	–40	–18.9%
Cost of materials	–1,776	–1,505	–271	18.0%
Personnel expenses	–1,305	–1,258	–47	3.7%
Depreciation, amortization and write-downs	–112	–183	71	–38.8%
Other operating expenses	–2,152	–1,801	–351	19.5%
Investment income/Write-downs of financial assets	1,234	847	387	45.7%
Financial result	–262	–201	–61	30.3%
Profit before profit transfers and taxes	**584**	**917**	**–334**	**–36.4%**
Profit transfers	–454	–553	99	–17.9%
Taxes	32	–193	225	–116.3%
Profit after profit transfers and taxes	**162**	**171**	**–9**	**–5.3%**

The decline in **other income** was mainly the result of lower gains from the release of provisions.

The increase in **cost of materials** was due to a higher amount of intragroup cross-charging and increased sales volume with declining prices in some cases; the cost of materials in relation to sales amounted to 37.1% (2017: 31.3%).

The rise in **personnel expenses** was due to higher wages and salaries as a result of the collectively agreed pay increase and the higher number of employees.

Depreciation, amortization and write-downs fell by 38.8% as a result of the decline in fixed assets following the spin-off.

The increase in **other operating expenses** was due to increased consulting costs and higher expenses in connection with the business lease as well as an increase in the passing-on of costs for personnel-related provisions; see section "Effects of material company agreements on the net assets, financial position and results of operations".

Investment income rose essentially on account of higher profit transfers by OpCo companies; see section "Effects of material company agreements on the net assets, financial position and results of operations". However, the reduced dividend payment by the Merck Holding GmbH, Gernsheim, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany had an offsetting effect.

The **Financial result** deteriorated due to lower fair values of plan assets.

ASSETS

			Change	
€ million	**Dec. 31, 2018**	Dec. 31, 2017	€ million	in %
Fixed assets	**18,670**	**18,148**	**522**	**2.9%**
Intangible assets	239	490	–251	–51.2%
Tangible assets	899	1,173	–274	–23.4%
Financial assets	17,532	16,486	1,046	6.3%
Current assets	**2,336**	**1,763**	**573**	**32.5%**
Inventories	725	688	37	5.3%
Trade accounts receivable	315	181	134	73.7%
Other receivables and other assets	1,293	892	401	45.0%
Cash and cash equivalents	3	1	2	142.9%
Prepaid expenses	**34**	**28**	6	**21.1%**
	21,040	**19,940**	**1,100**	**5.5%**

EQUITY AND LIABILITIES

€ million	Dec. 31, 2018	Dec. 31, 2017	Change € million	Change in %
Net equity	**5,329**	**5,328**	**1**	**0.0%**
Provisions	**1,119**	**1,312**	**–193**	**–14.7%**
Provisions for pensions and other post-employment benefits	288	200	87	43.2%
Other provisions	832	1,112	–280	–25.2%
Liabilities	**14,575**	**13,281**	**1,295**	**9.8%**
Financial liabilities	1,500	1,500	–	–
Trade accounts payable	446	292	154	52.7%
Other liabilities	12,629	11,489	1,141	9.9%
Deferred income	**17**	**18**	**–1**	**–6.1%**
	21,040	**19,940**	**1,100**	**5.5%**

The net assets and financial position of Merck KGaA, Darmstadt, Germany, changed only slightly in comparison with the previous year. With a 5.5% increase in total assets, the equity ratio amounted to 25.3% (2017: 26.7%).

The operating spin-off led to a decline in intangible and tangible assets, while financial assets increased; see section "Effects of material company agreements on the net assets, financial position and results of operations".

The increase in current assets (€ + 573 million) was mainly attributable to higher receivables from affiliates for profit transfers and other group cross-charging.

The drop in other provisions (€ – 280 million) resulted primarily from the operating spin-off; see section "Effects of material company agreements on the net assets, financial position and results of operations".

The rise in other liabilities resulted primarily from the clearing account with the Merck Financial Services GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany.

Research and development

In 2018, research and development spending on projects of Merck KGaA, Darmstadt, Germany, and other Group companies totaled € 923 million (2017: € 685 million). A large portion was also incurred by companies outside the Group. In Darmstadt, Healthcare mainly focuses on research in the areas of oncology as well as autoimmune and inflammatory diseases. The rise of € 196 million in R&D spending by the Healthcare business sector was reflected in the increase of € 238 million in overall R&D spending (34.7%). At the same time, the Healthcare business sector accounted for 65.4% (2017: 59.6%) and thus the largest share of research and development spending. The Performance Materials business sector focuses its research activities on developing new and improved basic materials and mixtures for LC displays, for innovative OLED applications and for materials for the production of integrated circuits. To strengthen the Pigments business, new effect pigments for the automotive, cosmetics and printing ink sectors have been developed. In the Life Science business sector, research activities focused in particular on technologies for laboratory and life science applications, and the promotion of new developments. Improved test kits, chromatography methods, substrates for separating active substances, and innovations continue to be in the focus in the fields of microbiology and hygiene monitoring.

RESEARCH AND DEVELOPMENT COSTS

€ million	2018	2017	Change € million	Change in %
Healthcare	604	408	196	48.0%
Life Science	46	35	11	31.4%
Performance Materials	260	220	40	18.2%
Other R&D spending that cannot be allocated to the individual business sectors	13	22	–9	–40.9%
Total	**923**	**685**	**238**	**34.7%**

The ratio of research and development spending to sales was 19.3% (2017: 14.3%). Overall, the average number of employees working in research and development was 2,674. Merck KGaA, Darmstadt, Germany, is one of the main research sites of the Group, accounting for a share of 41.6% (2017: 32.0%) of total Group research and development spending.

Dividend

For 2018, we are proposing to the General Meeting the payment of a dividend of € 1.25 per share.

Personnel

As of December 31, 2018, Merck KGaA, Darmstadt, Germany, had 11,133 employees, representing an increase over the previous year (2017: 10,677).

Average number of employees by functional area:

PERSONNEL

Average number of employees during the year	**2018**	2017
Production	3,756	3,536
Administration	3,213	3,072
Research	2,674	2,515
Logistics	671	648
Sales and marketing	590	574
Other	79	128
Total	**10,983**	**10,473**

Risks and opportunities

Merck KGaA, Darmstadt, Germany, is largely subject to the same opportunities and risks as the Group. More information can be found in the Report on Risks and Opportunities.

Forecast for Merck KGaA, Darmstadt, Germany

DEVIATIONS OF ACTUAL BUSINESS DEVELOPMENT IN 2018 FROM THE PREVIOUSLY REPORTED GUIDANCE:

In the 2017 combined management report, net sales were forecast to increase slightly in the Life Science and Healthcare business sectors in fiscal 2018. A slight drop in net sales was forecast for the Performance Materials business sector.

The sales decline in the Healthcare business sector (– 3.9%) resulted primarily from lower license income. Sales of products were slightly above the previous year's level. Sales growth was generated in the Oncology (+ 2.1%) and Fertility (+11.9%) business units. This sales growth was offset by declining sales in the other business units (Neurology & Immunology).

In 2018, sales in the Life Science business sector were flat overall. Declining sales in the Research Solutions (– 3.0%) and Applied Solutions (– 5.0%) business units were offset by rising sales in Process Solutions (+ 4.4%).

Continued high competitive pressure in the Display Solutions business unit (– 0.8%) led to a slight fall in Performance Materials net sales (– 0.9%). The Surface Solutions business unit additionally recorded a slight drop in sales (– 2.0%).

Net income was down compared to the previous year (– 5.3%). Higher other operating expenses (19.5%) contrast, in particular, with improved investment income (45.7%) and a reduction in tax expenses. Investment income rose primarily due to profit transfers of the newly established OpCo companies. However, the reduced dividend payment by the Merck Holding GmbH, Gernsheim, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany, had an offsetting effect.

Forecast 2019

For fiscal 2019, a decline in net sales is expected overall due to the planned termination of the business leasing contract with Merck Healthcare KGaA, a subsidiary of Merck KGaA, Darmstadt, Germany, and the resulting transfer of the Healthcare business sector's operating business.

A slight decline in net sales is forecast for the Performance Materials business sector. In the Life Science business sector, we expect a slight increase in net sales for fiscal 2019.

As in 2017, the financing costs of the Sigma-Aldrich acquisition continue to adversely affect net income. Nevertheless, positive investment income and dividend payments from subsidiaries will lead again to a slight increase in net income.

The Merck Financial Services GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany, will provide the company with sufficient financial resources and thus ensure liquidity.

Currently no risks can be identified that may jeopardize the continued existence of the company.

ANNUAL FINANCIAL STATEMENTS

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Balance Sheet as of December 31, 2018

ASSETS

€ million	Note	Dec. 31, 2018	Dec. 31, 2017
Fixed assets			
Intangible assets	→ 1	239.2	489.7
Tangible assets	→ 2	899.2	1,173.0
Financial assets	→ 3	17,531.9	16,485.7
		18,670.3	**18,148.4**
Current assets			
Inventories	→ 4	**725.3**	**688.3**
Receivables and other assets			
Trade accounts receivable	→ 5	314.7	181.3
Other receivables and other assets	→ 6	1,293.1	891.6
Cash and cash equivalents	→ 7	2.7	1.4
		1,610.5	**1,074.3**
		2,335.8	**1,762.6**
Prepaid expenses	→ 8	**34.1**	**28.5**
		21,040.2	**19,939.5**

EQUITY AND LIABILITIES

€ million	Note	Dec. 31, 2018	Dec. 31, 2017
Net equity	→ 9		
Subscribed capital		168.0	168.0
General partner's equity		397.2	397.2
Capital reserves		3,813.7	3,813.7
Retained earnings		701.6	701.6
Profit carried forward: E. Merck KG, Darmstadt, Germany		60.8	60.3
Net retained profit: shareholders		187.4	187.1
		5,328.7	**5,327.9**
Provisions	→ 10		
Provisions for pensions and other post-employment benefits		287.6	200.4
Other provisions		831.7	1,112.1
		1,119.3	**1,312.5**
Liabilities	→ 11		
Financial liabilities	→ 12	1,500.0	1,500.0
Trade accounts payable	→ 13	445.8	292.1
Other liabilities	→ 14	12,629.5	11,489.1
		14,575.3	**13,281.3**
Deferred income		**16.9**	**17.9**
		21,040.2	**19,939.5**

Income Statement for the period from January 1 to December 31, 2018

€ million	Note	**2018**	2017
Sales	→ 15	**4,785.0**	**4,807.2**
Changes in inventories		24.8	21.2
Other own work capitalized		35.8	33.9
Other operating income	→ 16	111.9	157.0
Total operating income		**4,957.5**	**5,019.3**
Cost of materials	→ 17	–1,776.1	–1,505.5
Personnel expenses	→ 18	–1,304.8	–1,258.3
Depreciation, amortization and write-downs		–112.1	–183.2
Other operating expenses	→ 19	–2,151.5	–1,800.7
Total operating expenses		**–5,344.5**	**–4,747.7**
Income/Expenses from investments	→ 20	1,234.2	846.8
Write-downs of financial assets	→ 21	–	–0.2
Financial result	→ 22	–262.4	–201.4
Profit transfer to E. Merck KG, Darmstadt, Germany	→ 23	–447.3	–547.9
Profit transfer from E. Merck KG, Darmstadt, Germany	→ 23	–7.1	–4.7
Income tax	→ 24	31.5	–193.3
Profit after tax/Net income		**161.9**	**170.9**

Statement of Changes in Fixed Assets

€ million	Intangible assets	Tangible assets	Financial assets	**Total**
Accumulated acquisition costs as of Jan. 1, 2018	**1,243.9**	**3,489.9**	**16,522.0**	**21,255.8**
Additions	91.6	147.4	2,217.7	2,456.7
Disposals	–899.5	–1,642.0	–1,171.5	–3,713.0
Transfers	–	–	–	–
Accumulated acquisition costs as of Dec. 31, 2018	**436.0**	**1,995.3**	**17,568.2**	**19,999.5**
Accumulated depreciation, amortization and write-downs as of Jan. 1, 2018	**754.2**	**2,316.9**	**36.3**	**3,107.4**
Depreciation, amortization and write-downs	41.2	71.0	–	112.1
Disposals	–598.6	–1,291.8	–	–1,890.3
Reversals of write-downs	–	–	–	–
Accumulated depreciation, amortization and write-downs as of Dec. 31, 2018	**196.8**	**1,096.1**	**36.3**	**1,329.2**
Net carrying amount as of Dec. 31, 2018	**239.2**	**899.2**	**17,531.9**	**18,670.3**

Notes to the Annual Financial Statements

General Disclosures

The annual financial statements of MERCK Kommanditgesellschaft auf Aktien, Darmstadt, Germany, (Merck KGaA, Darmstadt, Germany) have been prepared in accordance with the provisions of the German Commercial Code (HGB) applicable to large corporations, the German Stock Corporation Act (AktG) and the supplementary provisions of the Articles of Association. The income statement has been prepared in accordance with the total cost (nature of expense) method. Deferred taxes have not been reported as there is an excess of deferred tax assets. Plan assets are offset against the relevant provisions in accordance with section 246 HGB. For details, please see the Notes to the items of the balance sheet and the income statement. Merck KGaA, Darmstadt, Germany, prepares consolidated financial statements, which are contained in the Annual Report of the Group. In addition, Merck KGaA, Darmstadt, Germany, is included in the consolidated financial statements of the E. Merck KG, Darmstadt, Germany. Both sets of financial statements are filed with the German Federal Gazette (Bundesanzeiger) and are available at www.bundesanzeiger.de. Certain items of the balance sheet and income statement have been combined in order to enhance the clarity of presentation. These items are shown separately in the Notes.

Effects of material company agreements on the net assets, financial position and results of operations

SPIN-OFF OF OPERATING BUSINESS ACTIVITIES OF THE BUSINESS SECTORS AND TEMPORARY LEASEBACK OF THE SPUN-OFF BUSINESS ACTIVITIES

As part of the strategic further development of Merck KGaA, Darmstadt, Germany, the existing operating activities of the Healthcare, Life Science and Performance Materials business sectors within Merck KGaA, Darmstadt, Germany, together with the relevant assets and liabilities (hereinafter: “operating sectors”) were spun off at their carrying values into three separate companies (hereinafter: “OpCo” or plural “OpCos”) with the legal form of a GmbH or German limited liability corporation (operating spin-off). This operating spin-off is based on the spin-off and takeover agreement concluded between Merck KGaA, Darmstadt, Germany, and the OpCos in notarized form on March 2, 2018. Following approval by the 2018 Annual General Meeting, the operating spin-off took place with economic effect as of 0:00 hours on January 1, 2018.

Immediately after the spin-off took effect, all shares held by Merck KGaA, Darmstadt, Germany, in the respective OpCos were transfered to holding companies via a further spin-off (holding company spin-off), as a result of which the OpCos are each indirectly held by Merck KGaA, Darmstadt, Germany, via an intermediate holding company. The acquiring legal entities within the scope of the holding company spin-off were Merck Healthcare Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, for the business shares of Healthcare OpCo, Merck Life Science Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, for the business shares of Life Science OpCo and Merck Performance Materials Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, for the business shares of Performance Materials OpCo (referred to individually as “HoldCo”, independently of the sector, and jointly as “HoldCos”). To this end, Merck KGaA, Darmstadt, Germany, and the HoldCos signed a notarized spin-off and takeover agreement on March 2, 2018. The holding company spin-off took place with economic effect as of 0:00 hours on January 1, 2018.

Since the technical system requirements for the introduction of the sector-specific ERP systems as regards the OpCos were not in place at the time of the spin-off, the business activities spun off to the OpCos have been temporarily leased back by the relevant OpCos to Merck KGaA, Darmstadt, Germany, until the introduction of the sector-specific ERP systems. For this purpose, also on March 2, 2018, Merck KGaA, Darmstadt, Germany, entered into a business leasing contract with the respective OpCo with economic effect as of 0:00 hours on January 1, 2018, to lease back all the operating business previously spun off to the OpCo. Under the terms of the respective business leasing contract, Merck KGaA, Darmstadt, Germany, leases the entire operation from the respective OpCo, as well as all fixed assets in this context; it acquires the current assets as well as certain liabilities and provisions at their carrying amounts under German commercial law. The business lease allowed the spin-off measures to be implemented for all OpCos with economic effect at a uniform time, 0:00 hours on January 1, 2018, while retaining the flexibility of transitioning the management of the relevant operating business in accordance with the sector-specific ERP introduction at an individual time to the OpCo in question in a targeted manner. On the basis of the operating lease contract, Merck KGaA, Darmstadt, Germany, will temporarily continue to operate the spun-off business as a leaseholder in its own name and for its own account. Once the relevant ERP systems have been introduced for the respective OpCo, the business lease with this OpCo will be terminated and the business previously leased out will pass to the OpCo.

The aforementioned spin-off and business leasing contracts form part of an overall entrepreneurial concept. They were submitted to the General Meeting of Merck KGaA, Darmstadt, Germany, for approval on April 27, 2018 (2018 Annual General Meeting) as a coherent restructuring measure and approved by it. The gradual implementation of the measures is due to be completed in 2020. In 2018, the Healthcare OpCo changed its legal form to that of a German corporation with

general partners (“Kommanditgesellschaft auf Aktien”) and has since been trading under the name of Merck Healthcare KGaA, Darmstadt, a subsidiary of Merck KGaA, Darmstadt, Germany,.

The table below shows the balance sheet of Merck KGaA, Darmstadt, Germany, after the operating spin-off, holding company spin-off and temporary leaseback as of 0:00 hours on January 1, 2018. The impact in fiscal 2018 of the spin-offs was mainly lower depreciation, amortization and write-downs of fixed assets and lower pension expenses. On the other hand, business lease expenses and the passing-on of costs for personnel-related provisions led to an increase in other operating expenses.

€ million	Merck KGaA, Darmstadt, Germany Dec. 31, 2017	Merck KGaA, Darmstadt, Germany Jan. 1, 2018[1]
ASSETS		
A. Fixed assets		
Intangible assets	489.7	191.8
Tangible assets	1,173.0	821.6
Financial assets	16,485.7	17,510.7
	18,148.4	**18,524.2**
B. Current assets		
Inventories	688.3	688.3
Trade accounts receivable	181.3	181.3
Other receivables and other assets	891.6	591.6
Cash and cash equivalents	1.4	1.4
	1,762.6	**1,462.6**
C. Prepaid expenses	28.5	28.5
Total ASSETS	**19,939.5**	**20,015.3**
EQUITY AND LIABILITIES		
A. Net equity		
Subscribed capital	168.0	168.0
General partner’s equity	397.2	397.2
Capital reserves	3,813.7	3,813.7
Retained earnings	701.6	701.6
Profit carried forward E. Merck KG, Darmstadt, Germany	60.3	60.3
Net retained profit: shareholders	187.1	187.1
	5,327.9	**5,327.9**
B. Provisions		
Provisions for pensions and other post-employment benefits	200.4	110.7
Other provisions	1,112.1	946.1
	1,312.5	**1,056.8**
C. Liabilities		
Financial liabilities	1,500.0	1,500.0
Trade accounts payable	292.1	292.1
Other liabilities	11,489.1	11,820.7
	13,281.3	**13,612.8**
D. Deferred income	17.9	17.9
Total LIABILITIES	**19,939.5**	**20,015.3**

[1] After operating spin-off, holding company spin-off and temporary leaseback.

Notes to the Balance Sheet

(1) Intangible assets

€ million	Concessions, industrial property rights and similar rights and assets as well as licenses to such rights and assets	Goodwill	Advance payments	Total
Accumulated acquisition costs as of Jan. 1, 2018	**1,175.5**	**13.5**	**54.9**	**1,243.9**
Additions	70.7	–	20.9	91.6
Disposals[1]	–888.8	–10.7	–	–899.5
Transfers	42.0	–	–42.0	–
Accumulated acquisition costs as of Dec. 31, 2018	**399.4**	**2.8**	**33.8**	**436.0**
Accumulated amortization and write-downs as of Jan. 1, 2018	**740.7**	**13.5**	–	**754.2**
Amortization and write-downs	41.2	–	–	41.2
Disposals[1]	–587.9	–10.7	–	–598.6
Reversals of write-downs	–	–	–	–
Accumulated amortization and write-downs as of Dec. 31, 2018	**194.0**	**2.8**	**–**	**196.8**
Net carrying amount as of Dec. 31, 2018	**205.4**	**–**	**33.8**	**239.2**

[1] Includes transfers to Merck Healthcare KGaA, Merck Life Science Germany GmbH and Merck Performance Materials Germany GmbH, all of them are subsidiaries of Merck KGaA, Darmstadt, Germany.

Acquired intangible assets are carried at acquisition cost less straight-line amortization. In the case of concessions, industrial property rights, licenses, patents and software, the useful life is between 3 and 15 years. Goodwill acquired indirectly is amortized over a period of 5 years. Write-downs for impairment are recognized if other than temporary impairments are expected. There were no write-downs for impairment of intangible assets during the fiscal year (2017: € 14.3 million).

(2) Tangible assets

€ 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
Accumulated acquisition and production costs as of Jan. 1, 2018	**813.9**	**1,564.2**	**728.7**	**383.1**	**3,489.9**
Additions	38.8	5.2	22.3	81.1	147.4
Disposals[1]	–5.6	–1,187.6	–383.5	–65.3	–1,642.0
Transfers	164.9	8.7	30.4	–204.0	–
Accumulated acquisition and production costs as of Dec. 31, 2018	**1,012.0**	**390.5**	**397.9**	**194.9**	**1,995.3**
Accumulated depreciation and write-downs as of Jan. 1, 2018	**442.6**	**1,289.8**	**582.8**	**1.7**	**2,316.9**
Depreciation and write-downs	32.5	12.2	26.3	–	71.0
Disposals[1]	–4.7	–977.0	–308.4	–1.7	–1,291.8
Additions	–	–	–	–	–
Accumulated depreciation and write-downs as of Dec. 31, 2018	**470.4**	**325.0**	**300.7**	**–**	**1,096.1**
Net carrying amount as of Dec. 31, 2018	**541.6**	**65.5**	**97.2**	**194.9**	**899.2**

[1] Includes transfers to Merck Healthcare KGaA, Merck Life Science Germany GmbH and Merck Performance Materials Germany GmbH, all of them are subsidiaries of Merck KGaA, Darmstadt, Germany.

Tangible assets are carried at the acquisition or production cost less depreciation for wear and tear. In the case of internally generated tangible assets, the production cost is calculated on the basis of directly attributable unit costs plus an appropriate share of overheads. Production facilities are depreciated over a period of 25 years, administrative and social buildings over 33 and 40 years. The useful life of plant is mainly between 10 and 15 years. The useful life of other tangible assets is between 2 and 20 years. Write-downs for impairment are recognized if other than temporary impairments are expected. In fiscal 2018, they totaled € 3.9 million (2017: € 0.4 million).

(3) Financial assets

	Investments in:		Loans to:		
€ million	affiliates	other companies	affiliates	others	**Total**
Accumulated acquisition costs as of Jan. 1, 2018	**16,516.3**	**1.7**	**–**	**4.0**	**16,522.0**
Additions	2,217.5	–	–	0.2	2,217.7
Disposals[1]	–1,169.8	–0.8	–	–0.9	–1,171.5
Transfers	–	–	–	–	–
Accumulated acquisition costs as of Dec. 31, 2018	**17,564.0**	**0.9**	**–**	**3.3**	**17,568.2**
Accumulated write-downs as of Jan. 1, 2018	**35.4**	**0.9**	**–**	**–**	**36.3**
Write-downs	–	–	–	–	–
Disposals	–	–	–	–	–
Reversals of write-downs	–	–	–	–	–
Accumulated write-downs as of Dec. 31, 2018	**35.4**	**0.9**	**–**	**–**	**36.3**
Net carrying amount as of Dec. 31, 2018	**17,528.6**	**–**	**–**	**3.3**	**17,531.9**

[1] Includes transfers to Merck Healthcare KGaA, Merck Life Science Germany GmbH and Merck Performance Materials Germany GmbH, all of them are subsidiaries of Merck KGaA, Darmstadt, Germany.

Financial assets are carried at acquisition cost less any write-downs required to the lower fair value. The list of shareholdings can be found in the section “List of Shareholdings of Merck KGaA, Darmstadt, Germany” in the Notes to the Annual Financial Statements on pages 138 to 155.

(4) Inventories

€ million	**Dec. 31, 2018**	Dec. 31, 2017
Raw materials and production supplies	157.4	143.5
Work in progress	155.4	161.2
Finished goods and goods purchased for resale	407.5	378.4
Advance payments	5.0	5.2
	725.3	**688.3**

Work in progress and finished goods are carried at the production cost, which includes materials and production overheads, as well as appropriate amounts of depreciation charges on production facilities and directly attributable unit costs. Other inventories are carried at acquisition cost in compliance with the principle of the lower of cost or market. Where necessary, inventories are written down to the lower fair value.

(5) Trade accounts receivable

€ million	Total Dec. 31, 2018	thereof due after more than 1 year	Total Dec. 31, 2017	thereof due after more than 1 year
Receivables from affiliates	228.0	–	110.2	–
Receivables from other companies	86.7	–	71.1	–
	314.7	–	**181.3**	–

Trade accounts receivable are carried at their nominal amount. Adequate specific and global valuation allowances are charged for default and transfer risks unless these are covered by insurance. Short-term receivables denominated in foreign currencies were translated at the closing rates.

(6) Other receivables and other assets

€ million	Total Dec. 31, 2018	thereof due after more than 1 year	Total Dec. 31, 2017	thereof due after more than 1 year
Receivables from affiliates	1,059.0	–	587.2	–
– thereof from the general partner E. Merck KG, Darmstadt, Germany	(–)	(–)	(–)	(–)
Receivables from other companies	27.3	–	164.0	–
Tax receivables	203.1	–	131.8	–
Other assets	3.7	–	8.6	–
	1,293.1	–	**891.6**	–

Other receivables and other assets are carried at their nominal amount. Any default or other risks are covered by appropriate valuation allowances. Short-term receivables denominated in foreign currencies were translated at the closing rates. This item principally relates to clearing accounts and short-term loans with other companies of the Group, recoverable taxes, and other advance payments.

(7) Cash and cash equivalents

Cash and cash equivalents relate principally to credit balances at various banks in a variety of currencies. Foreign currency amounts are measured at the closing rate.

(8) Prepaid expenses

Prepaid expenses comprise amounts that will only be expensed after the end of the reporting period. This item mainly includes IT services as well as a discount of € 2.9 million (2017: € 4.0 million).

(9) Net equity

The share capital is reported under subscribed capital. The total capital consists of the share capital (Article 5 (1) of the company's Articles of Association) of € 168,014,927.60, composed of shares, and the equity interest held by the general partner E. Merck KG, Darmstadt, Germany, Frankfurter Straße 250, 64293 Darmstadt, Germany, (Article 8 (1) of the company's Articles of Association) of € 397,196,314.35. The company's share capital is composed of 129,242,251 shares and one registered share. The accounting par value of one share is € 1.30. The Executive Board is authorized, with the approval of the Supervisory Board and of the E. Merck KG, Darmstadt, Germany, to increase the share capital on one or several occasions until April 27, 2022, by up to a total of € 56,521,124.19 by issuing new shares against cash and/or contributions in kind (Authorized Capital 2017). The new shares may be assumed by certain banks appointed by the Executive Board with the obligation to offer them to the limited liability shareholders (indirect subscription right). The Executive Board is authorized, with the approval of the Supervisory Board, to exclude the legal subscription right of the limited liability shareholders in the following cases:

- 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 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. The upper limit of 10% of the share capital shall be reduced by the prorated amount of shares that are sold during the term of the authorized capital 2017 under exclusion of shareholders' subscription rights in accordance with section 71 (1) no. 8 sentence 5 and section 186 (3) sentence 4 AktG, as well as shares that must be issued to redeem option or convertible bonds with option or conversion privileges or to fulfill an option or conversion obligation, as long as the bonds have been issued during the term of this authorization under exclusion of subscription rights in accordance with section 221 (4) and section 186 (3) sentence 4 AktG;
- In the case of capital increases through non-cash contributions, particularly for the purpose of acquiring enterprises, parts of enterprises or interests in enterprises;
- To enable the E. Merck KG, Darmstadt, Germany, to exercise its right in accordance with Article 32 (3) of the company's Articles of Association to participate in a capital increase by issuing shares or freely transferable share subscription rights;
- To enable the E. Merck KG, Darmstadt, Germany, to exercise its right in accordance with Article 33 of the company's Articles of Association to convert its equity interest into share capital;
- As far as this is necessary, 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 or conversion rights or after fulfilling their option and conversion obligations; and
- To exclude fractional amounts from the subscription right.

The Executive Board is authorized, with the approval of the Supervisory Board, to determine the additional details of the capital increase and its execution, including the content of the share rights as well as the terms and conditions of the share issue. The Supervisory Board is authorized to amend Article 5 (3) of the Articles of Association according to the respective utilization of authorized capital 2017 or after expiration of the authorization period. 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 the E. Merck KG, Darmstadt, Germany, in accordance with Article 33 of the company's Articles of Association to enable it to convert its equity interest into shares. The shares carry dividend rights from the beginning of the fiscal year following the year in which the conversion option is exercised. The share capital is contingently increased by up to € 16,801,491.20, divided into 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 holders of conversion obligations on warrant bonds, option participation certificates, option participation bonds, convertible bonds, convertible participation certificates or convertible participation bonds that are issued against cash contributions and 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 April 27, 2018 up to April 26, 2023, utilize their option or conversion rights, or fulfill their obligation to convert or exercise options insofar as they are obliged to fulfill their obligation to convert or exercise options, 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 issued 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 the E. Merck KG, Darmstadt, Germany, to stipulate the further details of the implementation of the increase in contingent capital.

€ million	Jan. 1, 2018	Capital ratios Jan. 1, 2018	Dividend distribution 2018	Net income 2018	Allocation to profit carried forward	Dec. 31, 2018	Dividend distribution (proposal)	Expected status: April 26, 2019	**Capital ratios April 26, 2019**
Share capital	168.0	(29.726%)	–	–	–	168.0	–	–	(29.726%)
General partner's equity E. Merck KG, Darmstadt, Germany	397.2	(70.274%)	–	–	–	397.2	–	–	(70.274%)
Total capital	565.2	(100%)	–	–	–	565.2	–	565.2	(100%)
Capital reserves	3,813.7		–	–	–	3,813.7	–	3,813.7	
Retained earnings	701.6		–	–	–	701.6	–	701.6	
Profit carried forward E. Merck KG, Darmstadt, Germany	60.3		–	–	0.5	60.8	–	60.8	
Net retained profit shareholders	187.1		–161.6	161.9	–	187.4	–161.6	25.8	
Total	**5,327.9**		**–161.6**	**161.9**	**0.5**	**5,328.7**	**–161.6**	**5,167.1**	

The general partners and the Supervisory Board will propose to the General Meeting the payment of a dividend of € 1.25 per share from the reported net retained profit of € 187.4 million. Based on the existing share capital, this corresponds to a total dividend payment of € 161.6 million. The remaining net retained profit of € 25.8 million is to be carried forward to new account. In the expectation that the General Meeting will resolve that the net retained profit established as of December 31, 2018 in accordance with Article 31 (3) in conjunction with Article 31 (1) of the company's Articles of Association shall be utilized to distribute a dividend of € 1.25 per share, the E. Merck KG, Darmstadt, Germany, will transfer an amount of € 0.5 million to the profit carried forward, in accordance with its equity interest. This contribution was already recognized in the balance sheet in the reporting period. In the event that, contrary to this expectation, the General Meeting passes a different resolution on the utilization of the net retained profit, the above-mentioned contribution by the E. Merck KG, Darmstadt, Germany, will be adjusted accordingly.

(10) Provisions

€ million	Provisions for pensions and other post-employment benefits	Provisions for tax liabilities	Obligations relating to personnel expenses	Provisions for licenses, commissions and rebates	Provisions for outstanding supplier invoices	Provisions for litigation	Other provisions	**Total**
Jan. 1, 2018	**200.4**	**201.4**	**224.8**	**30.2**	**296.7**	**183.5**	**175.5**	**1,312.5**
Utilization[1]	–82.1	–23.6	–208.0	–28.2	–260.7	–100.7	–44.7	–748.0
Reversals	–	–96.6	–2.3	–2.0	–34.9	–0.5	–6.8	–143.1
Additions	169.3	57.9	160.5	23.6	222.7	7.0	56.9	697.9
Dec. 31, 2018	**287.6**	**139.1**	**175.0**	**23.6**	**223.8**	**89.3**	**180.9**	**1,119.3**

[1] Includes transfers to Merck Healthcare KGaA, Merck Life Science Germany GmbH and Merck Performance Materials Germany GmbH, all of them are subsidiaries of Merck KGaA, Darmstadt, Germany.

The pension provisions are based on actuarial calculations. Pension obligations are calculated using the internationally recognized projected unit credit method.

The carrying values in the financial statements under German commercial law are based on the 2018 G Heubeck mortality tables. The amount calculated is discounted lump sum using the average market interest rate for an assumed term of 15 years. The discount rate was determined using a ten-year average of 3.21% (2017: 3.68%) in accordance with the Deutsche Bundesbank. The difference in the discount rate resulting from the change in 2016 from a seven-year average to a ten-year average amounted to € 176.2 million as of December 31, 2018 (December 31, 2017: € 295.9 million) and according to law is barred from distribution.

Other key parameters are, as in 2017, a salary trend of 3% for exempt employees and 2.5% for non-exempt employees, as well as a pension trend of 1% for obligations under the Pension Plan 2005 and 1.75% for obligations prior to that.

After adjusting for the partial transfer of plan assets to the OpCos, Merck KGaA, Darmstadt, Germany, paid its share of contributions of € 502.9 million to the Merck Pensionstreuhand e. V., Darmstadt, Germany, under a trust agreement in order to secure employees' future pension entitlements. These contributions qualify as plan assets, which must be offset against pension provisions in accordance with section 246 (2) sentence 2 HGB. The plan assets mainly consist of exchange-traded securities and were measured at current fair value. They had a fair value of € 589.2 million as of December 31, 2018 (2017: € 1,163.5 million), and were offset against pension provisions. The decline in fair value of € 24.7 million (2017: € 60.5 million) was included in the interest expense resulting from the additions to pension provisions. In accordance with section 268 (8) HGB, an amount of € 86.3 million (2017: € 205.1 million) is barred from distribution. The effect of deferred taxes is already taken into account. The settlement amount of pension obligations disclosed in the balance sheet amounted to € 876.8 million (2017: € 1,363.9 million).

The other provisions cover all identifiable risks and uncertain obligations. These are carried in the settlement amount dictated by prudent business practice, taking into account any price and cost increases. Long-term provisions are discounted at the average market interest rate of the preceding seven years in line with their maturity.

Obligations relating to personnel expenses include provisions of € 145.1 million (2017: € 155.1 million) for bonus payments, anniversaries and vacation as well as working time credits. Also reported in this item are provisions of € 9.0 million (2017: € 27.2 million) for obligations under the partial retirement program.

The provisions for obligations under the partial retirement program relate to outstanding obligations for work performed, the top-up amount and severance payments to compensate for pension reductions due to early retirement. The provisions for obligations under the partial retirement program and anniversaries are based on actuarial calculations.

A demography fund was set up for all non-exempt employees on the basis of the "Lebensarbeitszeit und Demografie Chemie" (Working Life and Demographic Change – Collective Agreement for the German Chemical Industry) dated April 16, 2008. Payments are regularly made into this fund and are invested with a trust under a trust agreement. The corresponding provisions were offset against associated receivables from the trust arising from the amounts invested (plan assets) in accordance with section 246 (2) sentence 2 HGB. The cost of the offset plan assets, which were calculated by the weighted average method in the case of investments in securities, is € 31.3 million (2017: € 59.2 million); the fair value is € 31.7 million (2017: € 60.5 million). The settlement amount of the offset liabilities is € 31.7 million (2017: € 60.5 million). The remaining obligations of € 4.0 million (2017: € 7.6 million) reported in this item relate to vacation entitlements of employees within the framework of the future use of long-term time accounts.

The provisions for legal disputes include the following issues:

Antitrust review proceedings for the Sigma-Aldrich acquisition: In connection with the antitrust review proceedings for the Sigma-Aldrich acquisition, on July 6, 2017, Merck KGaA, Darmstadt, Germany, received notice from the European Commission (EU Commission), in which the EU Commission informed Merck KGaA, Darmstadt, Germany, of its preliminary conclusion that Merck KGaA, Darmstadt, Germany, and Sigma-Aldrich allegedly transmitted incorrect and/or misleading information within the scope of the acquisition of Sigma-Aldrich. The EU Commission received registration of the merger on April 21, 2015 and granted clearance on June 15, 2015 subject to the condition that Merck KGaA, Darmstadt, Germany, and Sigma-Aldrich divest parts of the European solvents and inorganic chemicals businesses of Sigma-Aldrich in order to resolve antitrust concerns. According to the preliminary viewpoint of the EU Commission communicated in the letter dated July 6, 2017, Merck KGaA, Darmstadt, Germany, and Sigma-Aldrich withheld in this connection important information about an innovation project. According to the EU Commission, the innovation project should have been included in the remedies package. At the present time, an EU Commission administrative procedure is still pending that could lead to a fine being imposed. Merck KGaA, Darmstadt, Germany, is entitled to legal recourse should a fine be imposed. The ongoing investigations are limited to the examination of violations of EU merger control procedures and do not affect the validity of the EU Commission's decision to approve the merger. A provision in the mid double-digit million euro range was recognized for these issues. A potential outflow of resources is expected in 2019.

Paroxetine: In connection with the divested generics business, Merck KGaA, Darmstadt, Germany, is subject to antitrust investigations by the British Competition and Market Authority (CMA) in the United Kingdom. In March 2013, the authorities informed Merck KGaA, Darmstadt, Germany, of the assumption that a settlement agreement entered into in 2002 between Generics (UK) Ltd. and several subsidiaries of GlaxoSmithKline plc., United Kingdom in connection with the antidepressant drug paroxetine violates British and European competition law. Merck KGaA, Darmstadt, Germany, 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 Merck KGaA, Darmstadt, Germany. On February 11, 2016, the CMA imposed a fine in this matter. Merck KGaA, Darmstadt, Germany, has taken legal action against this fine. Appropriate accounting measures have been taken. As things stand at present, a decision and an outflow of resources are not expected to occur within the next 12 months because the Appeals Tribunal has since submitted the relevant legal questions to the European Court of Justice (CJEU) for a preliminary ruling.

In addition to provisions for the mentioned litigation, provisions existed as of the balance sheet date for various pending legal disputes.

(11) Liabilities

Liabilities are generally carried at their settlement amount; with pension and installment liabilities carried at their present value. Short-term liabilities denominated in foreign currencies were translated at the closing rates. No securities have been provided other than standard retention of title.

(12) Financial liabilities

€ million	Remaining maturity up to 1 year	Remaining maturity 1 to 5 years	Remaining maturity more than 5 years	**Total Dec. 31, 2018**	**Dec. 31, 2017**
Bonds	–	–	1,500.0	1,500.0	1,500.0

In 2014, the company issued a hybrid bond at a volume of € 1,500 million for the financing of the Sigma-Aldrich acquisition. The bond was issued in two tranches, each with a maturity of 60 years. The first tranche with a volume of € 1,000 million pays a coupon of 2.625% and contains an early bond redemption option after 6.5 years. The second tranche, with a nominal volume of € 500 million and carrying coupon of 3.375%, includes an early redemption right for Merck KGaA, Darmstadt, Germany, after ten years.

(13) Trade accounts payable

€ million	Remaining maturity up to 1 year	Remaining maturity 1 to 5 years	Remaining maturity more than 5 years	**Total Dec. 31, 2018**	**Dec. 31, 2017**
to affiliates	149.7	–	–	149.7	15.1
to other companies	294.6	1.5	–	296.1	277.0
	444.3	**1.5**	**–**	**445.8**	**292.1**

(14) Other liabilities

€ million	Remaining maturity up to 1 year	Remaining maturity 1 to 5 years	Remaining maturity more than 5 years	**Total Dec. 31, 2018**	**Dec. 31, 2017**
to affiliates	12,545.1	–	–	12,545.1	11,430.2
– thereof to the general partner E. Merck KG, Darmstadt, Germany	(453.9)	–	–	(453.9)	(530.8)
Advance payments from customers	0.7	–	–	0.7	0.9
Other liabilities	83.7	–	–	83.7	58.0
– thereof tax liabilities	(30.2)	–	–	(30.2)	(31.2)
– thereof social security liabilities	(0.1)	–	–	(0.1)	(0.1)
	12,629.5	**–**	**–**	**12,629.5**	**11,489.1**

The liabilities to affiliates relate to short-term loans amounting to € 8.5 billion as well as liabilities of € 3.5 billion from the clearing account with the Merck Financial Services GmbH, Darmstadt, a subsidiary of Merck KGaA, Darmstadt, Germany. The other liabilities include obligations of € 2.7 million (2017: € 3.6 million) from recourse factoring. Employee loans were transferred, with Merck KGaA, Darmstadt, Germany, maintaining a contingent liability. These liabilities are secured in this respect by receivables from employees.

Notes to the Income Statement

(15) Sales

€ million	2018	2017
By sales market		
Germany	636.8	466.7
Rest of Europe	1,834.9	1,971.6
Asia-Pacific	1,773.8	1,759.8
North and Latin America	404.7	444.1
Rest of world	134.8	165.0
	4,785.0	**4,807.2**
By business sector		
Healthcare	2,309.8	2,403.6
Life Science	780.4	776.9
Performance Materials	1,385.6	1,399.2
	4,475.8	**4,579.7**
Other sales	309.2	227.5
	4,785.0	**4,807.2**

Other sales mainly consist of internal recharges for IT and research services, rental expenses as well as other administrative costs.

(16) Other operating income

€ million	2018	2017
Exchange rate gains from operating activities	44.6	37.1
Gains from the disposal of fixed assets	3.9	0.1
Grants received	4.0	6.1
Income from the reversal of provisions	46.5	89.6
Other income	12.9	24.1
	111.9	**157.0**

Income from other accounting periods relates almost exclusively to income from the reversal of provisions and gains from the disposal of fixed assets. During fiscal 2018, mainly provisions for outstanding invoices were reversed.

(17) Cost of materials

€ million	2018	2017
Cost of raw materials, production supplies and goods purchased for resale	913.2	864.9
Cost of purchased services	862.9	640.6
	1,776.1	**1,505.5**

(18) Personnel expenses and employees

€ million	2018	2017
Wages and salaries	1,043.9	968.3
Pension expenses	117.3	155.3
Compulsory social security contributions and special financial assistance	143.6	134.7
	1,304.8	**1,258.3**
Average number of employees during the year		
Production	3,756	3,536
Administration	3,213	3,072
Research	2,674	2,515
Logistics	671	648
Sales and marketing	590	574
Others	79	128
	10,983	**10,473**

The increase in personnel expenses is primarily due to higher wages and salaries. The increase in wages and salaries mainly resulted from the collectively agreed pay increase as of October 1, 2018 and the higher number of employees.

The reported employee figures do not include employees in vocational training. In 2018, an average number of 482 (2017: 535) employees were enrolled in vocational training.

(19) Other operating expenses

€ million	2018	2017
Purchased sales and advertising services	568.0	565.4
Purchased repair services	96.2	75.3
Purchased research services	382.1	295.9
Other purchased services and procurements	773.0	467.8
Fees, contributions and insurance premiums	266.2	228.0
Exchange rate losses from operating activities	42.2	36.1
Losses from the disposal of fixed assets	2.1	1.6
Addition to provisions for litigations	6.6	80.1
Others	15.1	50.5
	2,151.5	**1,800.7**

The increase in other operating expenses was due to higher expenses in connection with the business lease and higher cost recharges for pensions; see section "Effects of material company agreements on the net assets, financial position and results of operations".

(20) Income/Expense from investments

€ million	2018	2017
Income from profit and loss transfer agreements	747.6	140.8
Investment income from affiliates	493.6	742.5
Expenses from profit and loss transfer agreements	–7.0	–36.5
	1,234.2	**846.8**

The increase in investment income is primarily due to the profit transfers of the three OpCo companies and the Merck 12. Allgemeine Beteiligungs-GmbH, Darmstadt, a subsidiary of Merck KGaA, Darmstadt, Germany. However, the reduced dividend payment of € 490 million (2017: € 700.0 million) by the Merck Holding GmbH, Gernsheim, a subsidiary of Merck KGaA, Darmstadt, Germany, had an offsetting effect.

(21) Write-downs of financial assets

There were no write-downs of financial assets due to expected permanent impairment during the fiscal year.

(22) Financial result

€ million	2018	thereof affiliates	2017	thereof affiliates
Other interest and similar income	28.3	15.7	16.4	16.4
Interest and similar expenses	–230.8	–178.8	–219.9	–165.3
Net interest	**–202.5**	**–163.1**	**–203.5**	**–148.9**
Exchange rate differences from financing activities	0.4	–	–0.7	–
Interest component of the addition to pension provisions and of other long-term provisions	–60.3	–	2.8	–
	–262.4	**–163.1**	**–201.4**	**–148.9**

Interest income mainly includes payments for a credit default guarantee provided within the Group, also in connection with the acquisition of Sigma-Aldrich. The interest component of the addition to pension provisions is offset against interest income and changes in fair value from plan assets.

(23) Profit transfers between Merck KGaA, Darmstadt, Germany, and E. Merck KG, Darmstadt, Germany

In accordance with Articles 26 to 30 of the Articles of Association, the profit of Merck KGaA, Darmstadt, Germany, is attributed between the E. Merck KG, Darmstadt, Germany, and the limited liability shareholders as follows:

PROFIT TRANSFER TO E. MERCK KG, DARMSTADT, GERMANY

Net income of Merck KGaA, Darmstadt, Germany (before reciprocal profit transfers)	616,261,036.32
Less corporation tax	–20,305,194.13
Basis for calculation of the profit transferred between Merck KGaA, Darmstadt, Germany, and E. Merck KG, Darmstadt, Germany	636,566,230.45
The share of E. Merck KG, Darmstadt, Germany, in the profit of Merck KGaA, Darmstadt, Germany, is (397,196,314/565,211,242)	447,340,289.45

PROFIT TRANSFER FROM E. MERCK KG, DARMSTADT, GERMANY

Net loss of the E. Merck KG. Darmstadt, Germany, (before reciprocal profit transfers, adjusted for trade income tax) Basis for calculation of the profit transferred between E. Merck KG, Darmstadt, Germany, and Merck KGaA, Darmstadt, Germany	–24,005,696.67
The share of Merck KGaA, Darmstadt, Germany, in the profit of E. Merck KG, Darmstadt, Germany, is (168,014,928/565,211,242)	–7,135,943.32

(24) Income tax

Income tax consists of trade tax income of € 51.8 million and corporate tax expense of € –20.3 million. The carrying amounts of assets, liabilities and deferred items under commercial and tax law resulted in an excess of deferred tax assets. The company exercised its option in accordance with section 274 (1) sentence 2 HGB not to recognize this excess. Material differences occur in the carrying amounts of assets and liabilities regarding the items intangible assets, inventories, other assets, pension provisions and other provisions (deferred tax assets) as well as tangible assets (deferred tax liabilities). If recognized, a tax rate of 20.25% would largely be applied. For financial assets, a tax rate of 1.01% would apply as a result of special tax treatment.

Other Disclosures

CONTINGENT LIABILITIES

€ million	Dec. 31, 2018	thereof for affiliates	Dec. 31, 2017	thereof for affiliates
Guarantees	8,118.9	8,118.9	11,200.4	11,200.4
Warranties	–	–	–	–
	8,118.9	**8,118.9**	**11,200.4**	**11,200.4**

In order to fully ensure the Group financing activity of the Merck Financial Services GmbH, GmbH, Darmstadt, a subsidiary of Merck KGaA, Darmstadt, Germany, Merck KGaA, Darmstadt, Germany, provided guarantees for the Merck Financial Services GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany, to financing partners of our Group. The type and scope of these are in line with the financial obligations actually entered into by the Merck Financial Services GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany. On account of the Group's good credit rating, the probability of the guarantees and warranties being utilized is estimated as very low. Guarantees include warranties amounting to US$ 3.3 billion (€ 2.9 billion) for the EMD Holding, United States, and amounting to € 4.0 billion for the Merck Financial Services GmbH, Darmstadt, a subsidiary of Merck KGaA, Darmstadt, Germany, which are primarily in connection with the acquisition of Sigma-Aldrich.

OTHER FINANCIAL OBLIGATIONS

€ million	Dec. 31, 2018	thereof for affiliates	Dec. 31, 2017	thereof for affiliates
Purchase commitments	131.1	–	166.5	–
Rental and lease obligations	35.8	–	33.3	0.1
Acceptance obligations from orders	24.3		34.4	–
Obligations to acquire intangible assets	541.3	–	568.7	–
	732.5	**–**	**802.9**	**0.1**

Obligations to acquire intangible assets exist in particular within the scope of research and development collaborations in the Healthcare business sector. Here Merck KGaA, Darmstadt, Germany, has obligations to make milestone payments if certain objectives are achieved. In the unlikely event that all contract partners achieve all the milestones, Merck KGaA, Darmstadt, Germany, would be obliged to pay up to € 541.3 million (2017: € 568.7 million) for the acquisition of intangible assets.

CORPORATE GOVERNANCE

The latest version of the Declaration of Conformity in accordance with section 161 AktG has been published on our website (www.emdgroup.com/investors/corporate_governance) and thus made permanently available.

FINANCIAL INSTRUMENTS

We use derivative financial instruments solely to hedge currency and interest rate positions, so as to minimize currency risks and financing costs caused by exchange rate or interest rate fluctuations. The instruments used are standard market forward exchange transactions and currency options. Corresponding valuation units were designated. The value changes of the derivatives are reported under the balance sheet item "other assets", respectively under "provisions for valuation units". The use of such derivatives is governed by internal regulations. Derivative transactions are subject to constant risk controls. The trading, settlement and control functions are strictly separated, and this separation is monitored by our internal audit department. Derivative contracts are only entered into with banks with good credit ratings and are restricted to the hedging of our business operations and related financing transactions.

The following derivative financial positions were held as of December 31, 2018:

	Nominal volume		Fair value	
€ million	**Dec. 31, 2018**	Dec. 31, 2017	**Dec. 31, 2018**	Dec. 31, 2017
Forward exchange contracts	50.5	48.0	–0.6	–0.4
– thereof operating	(50.5)	(48.0)	(–0.6)	(–0.4)
	50.5	**48.0**	**–0.6**	**–0.4**

€ million	Remaining maturity up to 1 year	Remaining maturity more than 1 year	**Total Dec. 31, 2018**	Remaining maturity up to 1 year	Remaining maturity more than 1 year	Total Dec. 31, 2017
Forward exchange contracts	50.5	–	50.5	48.0	–	48.0
	50.5	**–**	**50.5**	**48.0**	**–**	**48.0**

The nominal volume is the aggregate of all buy and sell amounts relating to derivative financial transactions.

The "thereof operating" item comprises the derivative exposures used to hedge probable future cash flows, which mainly consist of expected future sales and receivables disclosed in the balance sheet (excluding loans granted to affiliates). As of December 31, 2018, no derivative financial instruments were being used to hedge pending transactions against foreign exchange risks.

The fair values are determined by valuing open positions at market prices, ignoring any opposite movements in the value of the underlyings. They correspond to the income or expenses that would result if the derivatives were closed out at the balance sheet date. The fair values are calculated on the basis of quoted prices or from current market data provided by a recognized information service. They are measured with the aid of middle spot rates that are observable in the market and maturity-specific interest premiums to or discounts on the traded market prices.

The reported operating forward exchange transactions are used to hedge exchange rate fluctuations in respect to future sales in the following currencies: USD (42.6 million), GBP (11.8 million), CHF (1.6 million), IDR (12.0 billion), JPY (82.0 million), TRY (14.6 million, CAD (1.0 million).

A theoretical default risk for the existing derivative financial instruments exists up to the amount of the positive fair values. As of December 31, 2018, these amounted to € –0.6 million (2017: € –0.4 million) and exist solely with companies of the Group.

FURTHER INFORMATION

Merck KGaA, Frankfurter Straße 250, 64293 Darmstadt, Germany is registered with the German Commercial Register under No. HRB 6164. The competent register court is Darmstadt district court.

In accordance with the provisions of the German financial reporting disclosure law (Publizitätsgesetz), as the ultimate parent company within the Group, E. Merck Kommanditgesellschaft, Darmstadt, Germany, (E. Merck KG, Darmstadt, Germany) prepares consolidated financial statements, which include Merck KGaA, Darmstadt, Germany, and its subsidiaries. Merck KGaA, Darmstadt, Germany, which manages the operations of the Group, prepares consolidated financial statements for the smallest group of companies within the Group. Both sets of consolidated financial statements as of December 31, 2018, are available at www.bundesanzeiger.de.

The information relating to the German Securities Trading Act (WpHG), the Executive Board and the Supervisory Board is published in the Notes to the Annual Financial Statements of Merck KGaA, Darmstadt, Germany, on pages 134 to 137.

COMPENSATION OF THE EXECUTIVE BOARD

The Executive Board of Merck KGaA, Darmstadt, Germany, receives its compensation from the general partner, E. Merck KG, Darmstadt, Germany.

For the period from January to December 2018, fixed salaries of € 5.9 million (2017: € 6.0 million), variable compensation of € 17.2 million (2017: € 16.3 million), and additional benefits of € 0.4 million (2017: € 0.3 million) were recorded for members of the Executive Board of Merck KGaA, Darmstadt, Germany. Furthermore, additions to provisions included for the "Long-Term Incentive Plan" for members of the Executive Board of Merck KGaA, Darmstadt, Germany, resulted in expenses of € 15.9 million (2017: income of € 1.8 million from the reversal of provisions), and additions to the pension provisions for members of the Executive Board of Merck KGaA, Darmstadt, Germany, included current service costs of € 3.1 million (2017: € 3.2 million) as well as, in 2017, past service costs of € 0.9 million.

TOTAL COMPENSATION OF THE SUPERVISORY BOARD

The compensation of the Supervisory Board amounting to € 869.0 thousand (2017: € 868.3 thousand) consisted of a fixed portion of € 822.5 thousand (2017: € 822.5 thousand) and meeting attendance compensation of € 46.5 thousand (2017: € 45.8 thousand). Further individualized information and details can be found in the Compensation Report on pages 168 et seq. of the Annual Group Report.

AUDITORS' FEES

Information on the statutory auditors' fees is contained in the Consolidated Financial Statements of Merck KGaA, Darmstadt, Germany. In addition to the audit of the financial statements, other audit-related services, tax consultancy services and other services for the company and/or controlled companies were provided by the auditor. Other audit-related services pertain to various statutory or contractually agreed audits. Tax consultancy services encompass services in connection with the preparation of tax returns for employees delegated abroad.

SUBSEQUENT EVENTS

Subsequent to the balance sheet date, no events of special importance occurred that could have a material impact on the net assets, financial position and results of operations.

PROPOSAL FOR THE APPROPRIATION OF NET RETAINED PROFIT

A proposal will be made to the General Meeting for the payment of a dividend of € 1.25 per no-par value share from the portion of net retained profit to which limited liability shareholders are entitled, amounting to € 187,277,260.03 (see Note (9)). Based on the current share capital, the resulting total dividend payment for fiscal 2018 is thus € 161,552,815.00.

It is also proposed to carry forward to new account the remaining portion of the shareholders' net retained profit in the amount of € 25,724,445.03.

Darmstadt, February 14, 2019

Stefan Oschmann

Udit Batra

Kai Beckmann

Belén Garijo

Marcus Kuhnert

Members of the Executive Board of Merck KGaA, Darmstadt, Germany

Information 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
Stefan Oschmann Munich, Chairman	no board positions
Udit Batra Wellesley (Massachusetts, United States), CEO Life Science	(b) – EMD Millipore Corporation, Billerica, Massachusetts, United States (President)
Kai Beckmann Darmstadt, CEO Performance Materials	(a) – Bundesdruckerei GmbH, Berlin
Walter Galinat Eppertshausen, Member of the Executive Board until September 30, 2018	no board positions
Belén Garijo 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

Supervisory Board

Information on memberships of other 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) other statutory supervisory boards and (b) comparable German and foreign supervisory bodies of corporations
Wolfgang Büchele Munich, CEO of Exyte AG, Stuttgart	(a) – Gelita AG, Eberbach (Vice Chairman) (b) – E. Merck KG, Darmstadt, Germany, Darmstadt[1] – Kemira Oyj, Helsinki (Finland)
Michael Fletterich Gernsheim, Chairman of the Joint Works Council of Merck KGaA, Darmstadt, Germany	no board positions
Crocifissa Attardo Darmstadt, Full-time member of the Joint Works Council of Merck KGaA, Darmstadt, Germany	(b) – BKK of Merck KGaA, Darmstadt, Germany (rotating chairperson)
Mechthild Auge Wehrheim, Full-time member of the Joint Works Council of Merck KGaA, Darmstadt, Germany	no board positions
Gabriele Eismann Seeheim-Jugenheim, Senior Product Manager	no board positions
Edeltraud Glänzer Hannover, Vice Chairperson of IG Bergbau, Chemie, Energie (IG BCE), Hannover	(a) – B. Braun Melsungen AG, Melsungen – Evonik Industries AG, Essen (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 Joint Works Council of Merck KGaA, Darmstadt, Germany	no board positions
Helga Rübsamen-Schaeff Langenburg, Chairperson of the Advisory Board of AiCuris Antiinfective Cures GmbH, Wuppertal	(a) – 4SC AG, Martinsried – Bonn University Hospital, Bonn (b) – E. Merck KG, Darmstadt, Germany, Darmstadt[1]
Gregor Schulz Umkirch, Pediatrician	(b) – E. Merck KG, Darmstadt, Germany. Darmstadt[1]
Theo Siegert Düsseldorf, Managing Partner of de Haen Carstanjen & Söhne KG, Düsseldorf	(a) – 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]
Veit Ulshöfer Sachsenheim, Global Head of Research and Bioinformatics	no board positions

[1] Internal board position.
[2] Members appointed according to Article 6 (5) of the Articles of Association.

Disclosures in accordance with section 160 (1) no. 8 of the German Stock Corporation Act (AktG)

In accordance with the German Securities Trading Act (Wertpapierhandelsgesetz, WpHG), any shareholder whose equity interest reaches, exceeds, or falls below the thresholds of 3, 5, 10, 15, 20, 25, 30, 50, or 75 percent of the voting rights in a listed company must notify the company and the German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin) of this without delay. The Company was informed of the existence of the following equity interests until the preparation of the annual financial statements (the number of shares or the percentage equity interest is taken from the most recent voting rights notification sent to Merck KGaA, Darmstadt, Germany, and may therefore no longer be correct):

BlackRock, Inc., Wilmington, Delaware, United States, notified us that on November 10, 2017, its share of the voting rights amounted to 7.20%. 7.20% of the voting rights (9,303,989 voting rights) are attributed to BlackRock, Inc. in accordance with section 22 WpHG (obsolete version)[1]. 0.03% of the voting rights (37,444 voting rights) are attributed to BlackRock, Inc. as instruments pursuant to section 25 (1) no. 1 WpHG (obsolete version)[1] (Securities Lending). 0.18% of the voting rights (230,800 voting rights) were attributed to BlackRock, Inc. as instruments pursuant to section 25 (1) no. 2 WpHG (obsolete version)[1] (Contract for Difference).

Templeton Global Advisors Limited, Nassau, Bahamas, notified us that on April 19, 2018, its share of the voting rights exceeded the threshold of 3% of the voting rights due to the acquisition of shares and amounted to 3.0058% on that date. 3.0058% of the voting rights (3,884,739 voting rights) were attributed to Templeton Global Advisors Limited in accordance with section 34 WpHG.

We received the following notification on July 17, 2015 in accordance with section 21 (1) WpHG (obsolete version)[1]:

On July 16, 2015, the share of the voting rights of Sun Life Global Investments Inc., Toronto, Ontario, Canada, in Merck KGaA, Darmstadt, Germany, fell below the threshold of 5% of the voting rights due to the disposal of shares and amounted to 4.91% (6,342,586 voting rights) on that date.

4.91% of the voting rights (6,342,586 voting rights) are attributed to the Company in accordance with section 22 (1) sentence 1 no. 6 WpHG in conjunction with section 22 (1) sentence 2 WpHG (obsolete version)[1].

On July 16, 2015, the share of the voting rights of Sun Life Assurance Company of Canada – U.S. Operations Holdings, Inc., Wellesley Hills, Massachusetts, United States, in Merck KGaA, Darmstadt, Germany, fell below the threshold of 5% of the voting rights due to the disposal of shares and amounted to 4.91% (6,342,586 voting rights) on that date.

4.91% of the voting rights (6,342,586 voting rights) are attributed to the Company in accordance with section 22 (1) sentence 1 no. 6 WpHG in conjunction with section 22 (1) sentence 2 WpHG (obsolete version)[1].

On July 16, 2015, the share of the voting rights of Sun Life Financial (U.S.) Holdings, Inc., Wellesley Hills, Massachusetts, United States, in Merck KGaA, Darmstadt, Germany, fell below the threshold of 5% of the voting rights due to the disposal of shares and amounted to 4.91% (6,342,586 voting rights) on that date.

4.91% of the voting rights (6,342,586 voting rights) are attributed to the Company in accordance with section 22 (1) sentence 1 no. 6 WpHG in conjunction with section 22 (1) sentence 2 WpHG (obsolete version)[1].

On July 16, 2015, the share of the voting rights of Sun Life Financial (U.S.) Investments LLC, Wellesley Hills, Massachusetts, United States, in Merck KGaA, Darmstadt, Germany, fell below the threshold of 5% of the voting rights due to the disposal of shares and amounted to 4.91% (6,342,586 voting rights) on that date.

4.91% of the voting rights (6,342,586 voting rights) are attributed to the Company in accordance with section 22 (1) sentence 1 no. 6 WpHG in conjunction with section 22 (1) sentence 2 WpHG (obsolete version)[1].

On July 16, 2015, the share of the voting rights of Sun Life of Canada (U.S.) Financial Services Holdings, Inc., Boston, Massachusetts, United States, in Merck KGaA, Darmstadt, Germany, fell below the threshold of 5% of the voting rights due to the disposal of shares and amounted to 4.91% (6,342,586 voting rights) on that date.

[1] Obsolete version; as of January 3, 2018, the numbering of WpHG has changed. The sections of the obsolete version correspond to the following sections of the current version:
section 21 WpHG corresponds to section 33 WpHG
section 22 WpHG corresponds to section 34 WpHG
section 25 WpHG corresponds to section 38 WpHG

4.91% of the voting rights (6,342,586 voting rights) are attributed to the Company in accordance with section 22 (1) sentence 1 no. 6 WpHG in conjunction with section 22 (1) sentence 2 WpHG (obsolete version)[1].

On July 16, 2015, the share of the voting rights of Massachusetts Financial Services Company (MFS), Boston, Massachusetts, United States, in Merck KGaA, Darmstadt, Germany, fell below the threshold of 5% of the voting rights due to the disposal of shares and amounted to 4.91% (6,342,586 voting rights) on that date.

3.20% of the voting rights (4,138,232 voting rights) are attributed to the Company in accordance with section 22 (1) sentence 1 no. 6 WpHG in conjunction with section 22 (1) sentence 2 WpHG (obsolete version)[1].

1.71% of the voting rights (2,204,354 voting rights) are attributed to the Company in accordance with section 22 (1) sentence 1 no. 6 WpHG (obsolete version)[1].

[1] Obsolete version; as of January 3, 2018, the numbering of WpHG has changed. The sections of the obsolete version correspond to the following sections of the current version:
section 21 WpHG corresponds to section 33 WpHG
section 22 WpHG corresponds to section 34 WpHG
section 25 WpHG corresponds to section 38 WpHG

List of Shareholdings of Merck KGaA, Darmstadt, Germany, as of December 31, 2018

Country	Company	Registered office
Germany		
Germany	AB Allgemeine Pensions GmbH & Co. KG	Zossen
Germany	AB Pensionsverwaltung GmbH	Zossen
Germany	Alcan Systems GmbH	Darmstadt
Germany	Allergopharma GmbH & Co. KG	Reinbek
Germany	Allergopharma Verwaltungs GmbH[a)]	Darmstadt
Germany	Azelis Deutschland Kosmetik GmbH	Moers
Germany	Biochrom GmbH[a)]	Berlin
Germany	Chemitra GmbH[a)]	Darmstadt
Germany	Emedia Export Company mbH	Gernsheim
Germany	InfraServ GmbH & Co. Wiesbaden KG	Wiesbaden
Germany	Inuru GmbH	Berlin
Germany	IOmx Therapeutics AG	Martinsried
Germany	Litec-LLL GmbH[a)]	Greifswald
Germany	Merck 12. Allgemeine Beteiligungs-GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 13. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 15. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 16. Allgemeine Beteiligungs-GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 20. Allgemeine Beteiligungs-GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 21. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 24. Allgemeine Beteiligungs-GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 25. Allgemeine Beteiligungs-GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 26. Allgemeine Beteiligungs-GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 27. Allgemeine Beteiligungs-GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 28. Allgemeine Beteiligungs-GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 29. Allgemeine Beteiligungs-GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 30. Allgemeine Beteiligungs-GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 31. Allgemeine Beteiligungs-GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 36. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt

a) Profit and loss transfer agreement.
b) Not disclosed owing to minor significance acc. to section 286 (3) no. 1 HGB
c) Operational site of Merck KGaA, Darmstadt, Germany.

Equity interest (%)	thereof Merck KGaA, Darmstadt, Germany (%)	Reporting currency (ISO code)	IFRS net equity in thousand €	IFRS profit after tax in thousand €	IFRS net equity in thousand reporting currency	IFRS profit after tax in thousand reporting currency
100.00	100.00	EUR	78,710.86	−28,210.29	78,710.86	−28,210.29
100.00	100.00	b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
100.00		EUR	−3,974.97	−8,897.83	−3,974.97	−8,897.83
100.00	100.00	EUR	23.40	−0.00	23.40	−0.00
< 20,00	< 20,00	b)	b)	b)	b)	b)
100.00		EUR	7,756.07	−122.64	7,756.07	−122.64
100.00	100.00	EUR	631,870.87	−0.00	631,870.87	−0.00
100.00		EUR	25.60	0.00	25.60	0.00
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
100.00	100.00	EUR	1,871.87	−27.31	1,871.87	−27.31
100.00	100.00	EUR	12,473,687.20	0.00	12,473,687.20	0.00
100.00		EUR	12,488,185.89	−127,909.79	12,488,185.89	−127,909.79
100.00		EUR	1,121,531.14	0.00	1,121,531.14	0.00
100.00		EUR	3,740,596.88	0.00	3,740,596.88	0.00
100.00		EUR	4,034,931.81	0.00	4,034,931.81	0.00
100.00		EUR	4,089,776.64	8.96	4,089,776.64	8.96
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	b)	b)	b)	b)	b)

Country	Company	Registered office
Germany	Merck 37. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 38. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 39. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 40. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck 41. Allgemeine Beteiligungs-GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Accounting Solutions & Services Europe GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Chemicals GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck China Chemicals Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Consumer Health Holding Germany GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Export GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Financial Services GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Financial Trading GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Gernsheim
Germany	Merck Healthcare Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Healthcare KGaA[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Gernsheim
Germany	Merck International GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Internationale Beteiligungen GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Life Science Germany GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Life Science GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Eppelheim
Germany	Merck Life Science Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Patent GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Performance Materials Germany GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Performance Materials GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Wiesbaden
Germany	Merck Performance Materials Holding GmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Real Estate GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Schuchardt OHG, a subsidiary of Merck KGaA, Darmstadt, Germany	Hohenbrunn
Germany	Merck Serono GmbH[a)], a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Merck Vierte Allgemeine Beteiligungsgesellschaft mbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Gernsheim
Germany	Merck Wohnungs- und Grundstücksverwaltungsgesellschaft mbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Darmstadt
Germany	Millipart GmbH	Gernsheim
Germany	pharma mall Gesellschaft für Electronic Commerce mbH	Sankt Augustin
Germany	PharmLog Pharma Logistik GmbH	Bönen
Germany	PrintCity GmbH & Co. KG	Neuried
Germany	Sigma-Aldrich Biochemie GmbH	Steinheim

a) Profit and loss transfer agreement.
b) Not disclosed owing to minor significance acc. to section 286 (3) no. 1 HGB
c) Operational site of Merck KGaA, Darmstadt, Germany.

Equity interest (%)	thereof Merck KGaA, Darmstadt, Germany (%)	Reporting currency (ISO code)	IFRS net equity in thousand €	IFRS profit after tax in thousand €	IFRS net equity in thousand reporting currency	IFRS profit after tax in thousand reporting currency
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	b)	b)	b)	b)	b)
100.00	100.00	EUR	−4,473.15	−1,469.22	−4,473.15	−1,469.22
100.00		EUR	3,191.06	3,460.58	3,191.06	3,460.58
100.00		EUR	5,615.38	−2.17	5,615.38	−2.17
100.00	100.00	EUR	1,953,239.43	1,840,160.93	1,953,239.43	1,840,160.93
100.00	100.00	EUR	−26,011.22	2,011.85	−26,011.22	2,011.85
100.00	100.00	EUR	386,756.71	3,292.03	386,756.71	3,292.03
100.00	100.00	EUR	154,755.55	−19,639.43	154,755.55	−19,639.43
100.00	100.00	EUR	356,670.38	−14.15	356,670.38	−14.15
100.00		EUR	325,068.68	31,194.95	325,068.68	31,194.95
100.00	100.00	EUR	7,670,999.94	428,438.47	7,670,999.94	428,438.47
100.00	100.00	EUR	3,837,248.17	120,930.56	3,837,248.17	120,930.56
100.00		EUR	3,374,009.16	0.00	3,374,009.16	0.00
100.00		EUR	267,080.66	23,639.47	267,080.66	23,639.47
100.00	100.00	EUR	31,468.79	−37.39	31,468.79	−37.39
100.00	100.00	EUR	294,455.11	−8.00	294,455.11	−8.00
100.00		EUR	−247.68	−273.28	−247.68	−273.28
100.00		EUR	233,676.78	−73,505.98	233,676.78	−73,505.98
100.00		EUR	35,366.54	−5,989.10	35,366.54	−5,989.10
100.00	100.00	EUR	374,301.62	−14.21	374,301.62	−14.21
100.00	100.00	EUR	−6,332.78	−1,753.30	−6,332.78	−1,753.30
100.00	100.00	EUR	c)	c)	c)	c)
100.00	100.00	EUR	11,905.73	6,448.43	11,905.73	6,448.43
100.00		EUR	7,577,243.42	0.00	7,577,243.42	0.00
100.00	100.00	EUR	10,678.13	−2,385.39	10,678.13	−2,385.39
100.00		EUR	663,731.44	−808.37	663,731.44	−808.37
< 20,00		b)	b)	b)	b)	b)
< 20,00	< 20,00	b)	b)	b)	b)	b)
< 20,00	< 20,00	b)	b)	b)	b)	b)
100.00		EUR	45,265.20	785.77	45,265.20	785.77

Country	Company	Registered office
Germany	Sigma-Aldrich Chemie GmbH	Steinheim
Germany	Sigma-Aldrich Chemie Holding GmbH	Taufkirchen
Germany	Sigma-Aldrich Grundstücks GmbH & Co. KG	Steinheim
Germany	Sigma-Aldrich Logistik GmbH	Steinheim
Germany	Sigma-Aldrich Produktions GmbH	Steinheim
Germany	Sigma-Aldrich Verwaltungs GmbH	Steinheim
Rest of Europe		
Belgium	Merck Chemicals N.V./S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Overijse
Belgium	Merck N.V.-S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Overijse
Belgium	Sigma-Aldrich BVBA/SPRL	Overijse
Belgium	ReWind Therapeutics N.V.	Leuven-Heverlee
Bulgaria	Merck Bulgaria EAD, a subsidiary of Merck KGaA, Darmstadt, Germany	Sofia
Denmark	Merck A/S, a subsidiary of Merck KGaA, Darmstadt, Germany	Soborg
Denmark	Merck Life Science A/S, a subsidiary of Merck KGaA, Darmstadt, Germany	Soborg
Denmark	Sigma-Aldrich Denmark ApS	Soborg
Denmark	Survac ApS	Frederiksberg
Estonia	Merck Serono OÜ, a subsidiary of Merck KGaA, Darmstadt, Germany	Tallinn
Finland	Merck Life Science OY, a subsidiary of Merck KGaA, Darmstadt, Germany	Espoo
Finland	Merck OY, a subsidiary of Merck KGaA, Darmstadt, Germany	Espoo
Finland	Sigma-Aldrich Finland OY	Espoo
Finland	Abacus Diagnostica OY	Turku
Finland	Forendo Pharma OY	Turku
France	Gonnon S.A.S.	Lyon
France	Merck Biodevelopment S.A.S., a subsidiary of Merck KGaA, Darmstadt, Germany	Lyon
France	Merck Chimie S.A.S., a subsidiary of Merck KGaA, Darmstadt, Germany	Fontenay-sous-Bois
France	Merck Performance Materials S.A.S., a subsidiary of Merck KGaA, Darmstadt, Germany	Trosly Breuil
France	Merck S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Lyon
France	Merck Santé S.A.S., a subsidiary of Merck KGaA, Darmstadt, Germany	Lyon
France	Merck Serono S.A.S., a subsidiary of Merck KGaA, Darmstadt, Germany	Lyon
France	Millipore S.A.S.	Molsheim
France	Sigma-Aldrich Chimie S.a.r.l.	Saint Quentin Fallavier
France	Sigma-Aldrich Chimie SNC	Saint Quentin Fallavier
France	Sigma-Aldrich Holding S.a.r.l.	Saint Quentin Fallavier
France	Aveni S.A.S.	Massy
France	DNA Script S.A.S.	Paris
Greece	Merck A.E., a subsidiary of Merck KGaA, Darmstadt, Germany	Maroussi, Athens
Greece	Sigma-Aldrich (OM) Ltd.	Athens
United Kingdom	Aldrich Chemical Co. Ltd.	Gillingham
United Kingdom	AZ Electronic Materials (UK) Ltd.	Feltham
United Kingdom	BioControl Systems Limited	London
United Kingdom	BioReliance Limited	Aberdeen
United Kingdom	BioReliance U.K. Acquisition Limited	London
United Kingdom	Epichem Group Limited	Gillingham
United Kingdom	Merck Chemicals Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Gillingham
United Kingdom	Merck Holding Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Feltham
United Kingdom	Merck Investments Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Feltham

a) Profit and loss transfer agreement.
b) Not disclosed owing to minor significance acc. to section 286 (3) no. 1 HGB
c) Operational site of Merck KGaA, Darmstadt, Germany.

Equity interest (%)	thereof Merck KGaA, Darmstadt, Germany (%)	Reporting currency (ISO code)	IFRS net equity in thousand €	IFRS profit after tax in thousand €	IFRS net equity in thousand reporting currency	IFRS profit after tax in thousand reporting currency
100.00		EUR	63,373.37	7,648.44	63,373.37	7,648.44
100.00		EUR	45,273.92	268.01	45,273.92	268.01
100.00		EUR	32,654.17	2,234.26	32,654.17	2,234.26
100.00		EUR	317.57	–0.46	317.57	–0.46
100.00		EUR	8,557.40	528.44	8,557.40	528.44
100.00	100.00	EUR	337.16	–5.24	337.16	–5.24
100.00		EUR	15,633.56	5,470.48	15,633.56	5,470.48
100.00		EUR	62,007.00	32,376.68	62,007.00	32,376.68
100.00		EUR	50,441.67	1,262.09	50,441.67	1,262.09
< 20,00		b)	b)	b)	b)	b)
100.00		BGN	4,965.07	507.44	9,711.69	992.48
100.00		DKK	4,093.77	1,384.57	30,566.12	10,318.47
100.00		DKK	4,631.20	625.29	34,578.85	4,659.98
100.00		DKK	9,055.49	1,951.77	67,612.79	14,545.53
100.00	100.00	DKK	431.37	–40.13	3,220.85	–299.06
100.00		EUR	259.57	8.57	259.57	8.57
100.00		EUR	1,125.75	138.87	1,125.75	138.87
100.00		EUR	3,775.18	427.19	3,775.18	427.19
100.00		EUR	1,549.42	345.65	1,549.42	345.65
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
100.00		EUR	2,557,967.80	59.71	2,557,967.80	59.71
100.00		EUR	152,024.24	3,884.00	152,024.24	3,884.00
100.00		EUR	87,551.93	8,760.76	87,551.93	8,760.76
100.00		EUR	26,181.70	1,504.72	26,181.70	1,504.72
99.84		EUR	3,084,144.40	802,606.16	3,084,144.40	802,606.16
100.00		EUR	204,594.68	29,845.38	204,594.68	29,845.38
100.00		EUR	51,875.37	1,757.19	51,875.37	1,757.19
100.00		EUR	407,081.75	99,517.94	407,081.75	99,517.94
100.00		EUR	38,969.49	2,438.72	38,969.49	2,438.72
100.00		EUR	13,643.13	1,155.45	13,643.13	1,155.45
100.00		EUR	5.37	–0.91	5.37	–0.91
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
100.00		EUR	20,811.63	3,216.11	20,811.63	3,216.11
100.00		b)	b)	b)	b)	b)
100.00		GBP	0.22	0.00	0.20	0.00
100.00		USD	0.00	10.15	0.00	11.99
100.00		GBP	1,494.78	139.66	1,343.06	123.78
100.00		GBP	39,681.16	19,934.11	35,653.53	17,667.40
100.00		GBP	21,788.90	77,074.04	19,577.33	68,309.95
100.00		GBP	30,815.33	15,651.14	27,687.57	13,871.45
100.00		GBP	11,421.28	1,282.44	10,262.02	1,136.61
100.00		EUR	1,519,037.60	719,123.42	1,519,037.60	719,123.42
100.00		GBP	–72.34	0.00	–65.00	0.00

Country	Company	Registered office
United Kingdom	Merck Performance Materials Services UK Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Feltham
United Kingdom	Merck Serono Europe Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	London
United Kingdom	Merck Serono Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Feltham
United Kingdom	Millipore (U.K.) Ltd.	Feltham
United Kingdom	Millipore UK Holdings LLP	Feltham
United Kingdom	SAFC Biosciences Limited	Gillingham
United Kingdom	SAFC Hitech Limited	Gillingham
United Kingdom	Sigma-Aldrich Company Limited	Gillingham
United Kingdom	Sigma-Aldrich Financial Services Limited	Gillingham
United Kingdom	Sigma-Aldrich Holdings Ltd.	Gillingham
United Kingdom	Sigma-Genosys Limited	Gillingham
United Kingdom	B-Line Systems Limited	Gillingham
United Kingdom	Bristol Organics Ltd.	Gillingham
United Kingdom	Fluka Chemicals Ltd.	Gillingham
United Kingdom	Merck Cross Border Trustees Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Feltham
United Kingdom	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Feltham
United Kingdom	Merck Pension Trustees Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Feltham
United Kingdom	Sigma Chemical Co. Ltd.	Gillingham
United Kingdom	Sigma Entity One Limited	Gillingham
United Kingdom	UFC Ltd.	Gillingham
United Kingdom	Ultrafine Limited	Gillingham
United Kingdom	Webnest Ltd.	Gillingham
United Kingdom	Wessex Biochemicals Ltd.	Gillingham
United Kingdom	Artios Pharma Limited	London
United Kingdom	Canbex Therapeutics Ltd.	London
United Kingdom	EiRx Therapeutics plc	London
United Kingdom	F-Star Alpha Limited	Cambridge
United Kingdom	F-Star Beta Limited	Cambridge
United Kingdom	F-Star Delta Limited	Cambridge
United Kingdom	Macrophage Pharma Limited	Windsor
United Kingdom	Peratech HoldCo Limited	Brompton-on-Swale
United Kingdom	Scancell Ltd.	Oxford
United Kingdom	Storm Therapeutics Limited	London
Ireland	Merck Finance Limited, a subsidiary of Merck KGaA, Darmstadt, Germany	Carrigtwohill
Ireland	Merck Millipore Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Carrigtwohill
Ireland	Merck Serono (Ireland) Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Dublin
Ireland	Millipore Cork Unlimited Company	Carrigtwohill
Ireland	Shrawdine Limited	Arklow
Ireland	Sigma-Aldrich Ireland Ltd.	Arklow
Ireland	Silverberry Limited	Arklow
Ireland	SAFC Arklow Ltd.	Arklow
Italy	Allergopharma S.p.A.	Rome
Italy	Istituto di Ricerche Biomediche Antoine Marxer RBM S.p.A.	Colleretto Giacosa
Italy	Merck S.p.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Milan
Italy	Merck Serono S.p.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Rome
Italy	Sigma-Aldrich S.r.l.	Milan
Italy	BioIndustry Park Silvano Fumero S.p.A.	Colleretto Giacosa
Italy	H-BIO Puglia S.c.r.l.	Bari

a) Profit and loss transfer agreement.
b) Not disclosed owing to minor significance acc. to section 286 (3) no. 1 HGB
c) Operational site of Merck KGaA, Darmstadt, Germany.

Equity interest (%)	thereof Merck KGaA, Darmstadt, Germany (%)	Reporting currency (ISO code)	IFRS net equity in thousand €	IFRS profit after tax in thousand €	IFRS net equity in thousand reporting currency	IFRS profit after tax in thousand reporting currency
100.00		USD	27.28	219.09	31.21	258.66
100.00		GBP	729.95	166.70	655.86	147.74
100.00		GBP	42,465.08	11,813.46	38,154.88	10,470.15
100.00		GBP	164,454.27	1,851.68	147,762.16	1,641.12
100.00		GBP	353,727.15	4,413.96	317,823.85	3,912.05
100.00		GBP	29,834.46	2,240.78	26,806.26	1,985.98
100.00		GBP	12,904.56	2,498.43	11,594.75	2,214.33
100.00		GBP	703,169.80	57,887.20	631,798.07	51,304.85
100.00		GBP	33,612.31	1,975.62	30,200.66	1,750.97
100.00		GBP	22,123.27	0.00	19,877.76	0.00
100.00		GBP	5,221.12	0.00	4,691.17	0.00
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
100.00		USD	70.56	−16.33	80.72	−19.28
100.00		EUR	483,490.88	46,847.98	483,490.88	46,847.98
100.00		EUR	6,147.48	233.58	6,147.48	233.58
100.00		EUR	219,088.07	−35.95	219,088.07	−35.95
100.00		EUR	34,088.62	2,000.00	34,088.62	2,000.00
100.00		EUR	32,140.27	4,877.74	32,140.27	4,877.74
100.00		EUR	0.00	2,000.00	0.00	2,000.00
100.00		b)	b)	b)	b)	b)
100.00		EUR	79.23	−107.38	79.23	−107.38
100.00		EUR	15,001.79	2,183.43	15,001.79	2,183.43
100.00		EUR	49,601.59	4,785.38	49,601.59	4,785.38
99.74		EUR	382,872.61	−24,691.95	382,872.61	−24,691.95
100.00		EUR	25,446.63	1,174.56	25,446.63	1,174.56
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)

Country	Company	Registered office
Italy	Tecnofarmaci S.p.A.	Pomezia
Croatia	Merck d.o.o., a subsidiary of Merck KGaA, Darmstadt, Germany	Zagreb
Latvia	Merck Serono SIA, a subsidiary of Merck KGaA, Darmstadt, Germany	Riga
Lithuania	Merck Serono, UAB, a subsidiary of Merck KGaA, Darmstadt, Germany	Vilnius
Luxembourg	AZ Electronic Materials S.a.r.l.	Luxembourg
Luxembourg	Mats Finance S.a.r.l.	Luxembourg
Luxembourg	Merck Chemicals Holding S.a.r.l., a subsidiary of Merck KGaA, Darmstadt, Germany	Luxembourg
Luxembourg	Merck Finance S.a.r.l., a subsidiary of Merck KGaA, Darmstadt, Germany	Luxembourg
Luxembourg	Merck Finanz S.a.r.l., a subsidiary of Merck KGaA, Darmstadt, Germany	Luxembourg
Luxembourg	Merck Holding S.a.r.l., a subsidiary of Merck KGaA, Darmstadt, Germany	Luxembourg
Luxembourg	Merck Invest SCS, a subsidiary of Merck KGaA, Darmstadt, Germany	Luxembourg
Luxembourg	Merck Re S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Luxembourg
Luxembourg	Millilux S.a.r.l.	Luxembourg
Luxembourg	Millipore International Holdings, S.a.r.l.	Luxembourg
Luxembourg	Ridgefield Acquisition S.a.r.l.	Luxembourg
Luxembourg	Sigma-Aldrich Global S.a.r.l.	Luxembourg
Luxembourg	Sigma-Aldrich S.a.r.l.	Luxembourg
Malta	Merck Capital Holding Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Pietà
Malta	Merck Capital Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Pietà
Netherlands	BioControl Systems B.V.	Nieuwerkerk Ad Ijssel
Netherlands	Merck B.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Schiphol-Rijk
Netherlands	Merck Chemicals B.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Amsterdam Zuidoost
Netherlands	Merck Holding Netherlands B.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Schiphol-Rijk
Netherlands	Merck Ventures B.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Amsterdam
Netherlands	Merck Window Technologies B.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Veldhoven
Netherlands	Serono Tri Holdings B.V.	Schiphol-Rijk
Netherlands	Sigma-Aldrich B.V.	Zwijndrecht
Netherlands	Sigma-Aldrich Chemie N.V.	Zwijndrecht
Netherlands	Merck Europe B.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Amsterdam
Netherlands	Calypso Biotech B.V.	Amsterdam
Netherlands	Mosa Meat B.V.	Maastricht
Netherlands	SynAffix B.V.	Nijmegen
Norway	Merck Life Science AS, a subsidiary of Merck KGaA, Darmstadt, Germany	Oslo
Norway	Sigma-Aldrich Norway AS	Oslo
Austria	Allergopharma Vertriebsgesellschaft mbH	Vienna
Austria	Merck Chemicals and Life Science GesmbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Vienna
Austria	Merck Gesellschaft mbH, a subsidiary of Merck KGaA, Darmstadt, Germany	Vienna
Austria	Sigma-Aldrich Handels GmbH	Vienna
Austria	f-star Biotechnologische Forschungs- und Entwicklungsgesellschaft mbH	Vienna
Poland	Merck Business Solutions Europe Sp.z.o.o., a subsidiary of Merck KGaA, Darmstadt, Germany	Wrocław
Poland	Merck Sp.z.o.o., a subsidiary of Merck KGaA, Darmstadt, Germany	Warsaw
Poland	Sigma-Aldrich Sp.z.o.o.	Poznań
Portugal	Laquifa Laboratorios S.A.	Algés
Portugal	Merck, S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Algés
Romania	Merck Romania S.R.L., a subsidiary of Merck KGaA, Darmstadt, Germany	Bucharest
Russia	Merck LLC, a subsidiary of Merck KGaA, Darmstadt, Germany	Moscow
Russia	Sigma-Aldrich Rus LLC	Moscow

a) Profit and loss transfer agreement.
b) Not disclosed owing to minor significance acc. to section 286 (3) no. 1 HGB
c) Operational site of Merck KGaA, Darmstadt, Germany.

Equity interest (%)	thereof Merck KGaA, Darmstadt, Germany (%)	Reporting currency (ISO code)	IFRS net equity in thousand €	IFRS profit after tax in thousand €	IFRS net equity in thousand reporting currency	IFRS profit after tax in thousand reporting currency
< 20,00		b)	b)	b)	b)	b)
100.00		HRK	1,350.04	189.12	10,013.63	1,403.75
100.00		EUR	5,875.24	1,050.83	5,875.24	1,050.83
100.00		EUR	205.13	−2.93	205.13	−2.93
100.00		USD	608,362.68	218,605.18	696,027.74	258,091.83
100.00		USD	11,108.32	2,254.82	12,709.03	2,662.11
100.00		EUR	1,518,850.27	723,238.28	1,518,850.27	723,238.28
100.00		USD	328,738.01	10,307.92	376,109.15	12,169.83
100.00		EUR	4,037,912.53	−70.33	4,037,912.53	−70.33
100.00		EUR	485,914.74	194,894.87	485,914.74	194,894.87
100.00		USD	53,928.35	4,305.08	61,699.43	5,082.70
100.00	100.00	EUR	56,545.00	7,640.00	56,545.00	7,640.00
100.00		EUR	6,281.78	420,059.32	6,281.78	420,059.32
100.00		EUR	2,934,624.37	1,722,626.55	2,934,624.37	1,722,626.55
100.00		USD	28,654.54	218,504.53	32,783.66	257,973.01
100.00		EUR	2,449.44	−72.86	2,449.44	−72.86
100.00		USD	9,354.59	−1,357.25	10,702.59	−1,602.41
100.00		EUR	2,095,071.14	−65.65-	2,095,071.14	−65.65
100.00		EUR	1,866,906.46	69,150.31	1,866,906.46	69,150.31
100.00		EUR	2,568.70	279.08	2,568.70	279.08
100.00		EUR	994,342.07	86,214.81	994,342.07	86,214.81
100.00		EUR	2,781,795.77	638,047.65	2,781,795.77	638,047.65
100.00		EUR	3,743,755.24	−92.65	3,743,755.24	−92.65
100.00		EUR	75,141.55	−7,397.25	75,141.55	−7,397.25
100.00	100.00	EUR	4,356.54	−780.99	4,356.54	−780.99
100.00		EUR	212,946.45	7,665.41	212,946.45	7,665.41
100.00		EUR	75,703.69	−0.78	75,703.69	−0.78
100.00		EUR	279,051.47	1,391.60	279,051.47	1,391.60
100.00		b)	b)	b)	b)	b)
38.81		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
100.00		NOK	714.83	146.25	7,104.45	1,410.95
100.00		NOK	2,091.69	147.80	20,788.42	1,425.91
100.00		EUR	667.58	113.64	667.58	113.64
100.00		EUR	16,141.03	2,271.76	16,141.03	2,271.76
100.00		EUR	14,740.80	8,189.60	14,740.80	8,189.60
100.00		EUR	2,600.04	534.75	2,600.04	534.75
< 20,00		b)	b)	b)	b)	b)
100.00		PLN	983.66	−358.19	4,236.05	−1,525.71
100.00		PLN	51,980.40	27,020.62	223,848.40	115,092.96
100.00		PLN	2,715.81	416.81	11,695.38	1,775.39
100.00		EUR	78.46	0.22	78.46	0.22
100.00		EUR	80,985.77	47,871.69	80,985.77	47,871.69
100.00		RON	3,195.77	61.32	14,888.45	285.44
100.00		RUB	86,521.55	−2,272.56	6,891,822.45	−167,560.92
100.00		RUB	1,946.55	954.92	155,051.12	70,408.52

Country	Company	Registered office
Russia	Chemical Trade Limited LLC	Moscow
Russia	MedChem Limited	Moscow
Russia	SAF-LAB LLC	Moscow
Sweden	Merck AB, a subsidiary of Merck KGaA, Darmstadt, Germany	Solna
Sweden	Merck Chemicals and Life Science AB, a subsidiary of Merck KGaA, Darmstadt, Germany	Solna
Sweden	Sigma-Aldrich Sweden AB	Stockholm
Sweden	Galecto Biotech AB	Lund
Switzerland	Allergopharma AG	Therwil
Switzerland	Ares Trading SA	Aubonne
Switzerland	Merck & Cie, a subsidiary of Merck KGaA, Darmstadt, Germany	Altdorf
Switzerland	Merck (Schweiz) AG, a subsidiary of Merck KGaA, Darmstadt, Germany	Zug
Switzerland	Merck Performance Materials (Suisse) SA, a subsidiary of Merck KGaA, Darmstadt, Germany	Coinsins
Switzerland	Merck Serono SA, a subsidiary of Merck KGaA, Darmstadt, Germany	Coinsins
Switzerland	SeroMer Holding SA	Coinsins
Switzerland	Sigma-Aldrich (Switzerland) Holding AG	Buchs
Switzerland	Sigma-Aldrich Chemie GmbH	Buchs
Switzerland	Sigma-Aldrich International GmbH	St. Gallen
Switzerland	Sigma-Aldrich Production GmbH	Buchs
Switzerland	iOnctura SA	Plan-les-Ouates
Switzerland	Asceneuron SA	Lausanne
Switzerland	CAMAG Chemie-Erzeugnisse und Adsorptionstechnik AG	Muttenz
Switzerland	Vaximm AG	Basel
Switzerland	Cridec SA	Eclepens
Switzerland	Inthera Bioscience AG	Schlieren
Switzerland	ObsEva SA	Cologny
Serbia	Merck d.o.o. Beograd, a subsidiary of Merck KGaA, Darmstadt, Germany	Belgrade
Slovakia	Merck spol. s r.o., a subsidiary of Merck KGaA, Darmstadt, Germany	Bratislava
Slovakia	Sigma-Aldrich, spol. s r.o.	Bratislava
Slovenia	Merck d.o.o., a subsidiary of Merck KGaA, Darmstadt, Germany	Ljubljana
Spain	Merck Chemicals and Life Science S.A.U., a subsidiary of Merck KGaA, Darmstadt, Germany	Madrid
Spain	Merck, S.L.U., a subsidiary of Merck KGaA, Darmstadt, Germany	Madrid
Spain	Sigma-Aldrich Quimica S.L.	Madrid
Czech Republic	Merck spol. s r.o., a subsidiary of Merck KGaA, Darmstadt, Germany	Prague
Czech Republic	Sigma-Aldrich spol s r.o.	Prague
Turkey	Merck Ilac Ecza ve Kimya Ticaret AS, a subsidiary of Merck KGaA, Darmstadt, Germany	Istanbul
Hungary	Merck Kft., a subsidiary of Merck KGaA, Darmstadt, Germany	Budapest
Hungary	Sigma-Aldrich Kft.	Budapest
North America		
Canada	EMD Chemicals Canada Inc.	Toronto
Canada	EMD Crop BioScience Canada Inc.	Toronto
Canada	EMD Inc.	Mississauga
Canada	Millipore (Canada) Ltd.	Toronto
Canada	Natrix Separations, Inc.	Burlington
Canada	Sigma-Aldrich Canada Co.	Oakville

a) Profit and loss transfer agreement.
b) Not disclosed owing to minor significance acc. to section 286 (3) no. 1 HGB
c) Operational site of Merck KGaA, Darmstadt, Germany.

Equity interest (%)	thereof Merck KGaA, Darmstadt, Germany (%)	Reporting currency (ISO code)	IFRS net equity in thousand €	IFRS profit after tax in thousand €	IFRS net equity in thousand reporting currency	IFRS profit after tax in thousand reporting currency
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		SEK	11,855.80	175.13	121,495.82	1,798.06
100.00		SEK	61,396.84	22,089.21	629,182.58	226,784.67
100.00		SEK	3,314.64	797.79	33,967.74	8,190.75
21.85		b)	b)	b)	b)	b)
100.00		CHF	2,307.94	374.81	2,602.90	432.10
100.00		EUR	1,749,490.41	240,243.03	1,749,490.41	240,243.03
51.63	51.63	CHF	–49,346.76	73,997.24	–55,653.27	85,306.98
100.00		CHF	8,814.00	1,398.70	9,940.42	1,612.48
100.00		CHF	220,702.55	8,758.18	248,908.34	10,096.78
100.00		EUR	2,564,407.26	1,391,265.65	2,564,407.26	1,391,265.65
100.00		EUR	3,274,295.07	–2,170.96	3,274,295.07	–2,170.96
100.00		CHF	5,617,043.84	138,111.79	6,334,902.05	159,220.80
100.00		CHF	128,230.68	14,343.60	144,618.56	16,535.88
100.00		USD	5,173,998.23	72,142.25	5,919,571.37	85,173.30
100.00		CHF	70,481.40	12,010.61	79,488.92	13,846.32
73.60		b)	b)	b)	b)	b)
25.35		b)	b)	b)	b)	b)
39.11		b)	b)	b)	b)	b)
22.06		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
23.28		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
100.00		RSD	6,184.60	816.27	730,767.20	96,515.41
100.00		EUR	17,137.45	4,414.69	17,137.45	4,414.69
100.00		EUR	–306.63	–311.28	–306.63	–311.28
100.00		EUR	1,716.67	119.16	1,716.67	119.16
100.00		EUR	33,390.16	5,558.82	33,390.16	5,558.82
100.00		EUR	208,478.93	23,463.65	208,478.93	23,463.65
100.00		EUR	10,346.85	1,278.33	10,346.85	1,278.33
100.00		CZK	35,851.63	9,684.23	922,207.85	248,571.94
100.00		CZK	3,708.25	445.17	95,386.89	11,426.54
100.00		TRY	32,985.61	573.63	199,483.77	3,212.77
100.00		HUF	27,799.92	10,198.39	8,934,909.90	3,256,336.37
100.00		HUF	3,108.34	191.15	999,022.22	61,032.53
100.00		CAD	208.85	17.18	325.31	26.31
100.00		CAD	6,104.48	50.78	9,508.34	77.78
100.00		CAD	22,243.23	11,624.65	34,646.06	17,804.67
100.00		CAD	4,841.94	1,217.90	7,541.81	1,865.38
100.00		CAD	–2,472.68	14,850.66	–3,851.45	22,745.71
100.00		CAD	11,118.63	35.37	17,318.38	54.17

Country	Company	Registered office
United States	Aldrich Chemical Co. LLC	Milwaukee
United States	Aldrich Chemical Foreign Holding LLC	St. Louis
United States	Aldrich-APL, LLC	Urbana
United States	Allergopharma USA, Inc.	Alexandria
United States	BioControl Systems, Inc.	Wilmington
United States	BioReliance Corporation	Rockville
United States	Cell Marque Corporation	Rocklin
United States	Cerilliant Corporation	Round Rock
United States	EMD Accounting Solutions & Services America, Inc.	Rockland
United States	EMD Digital Inc.	Burlington
United States	EMD Finance LLC	Wilmington
United States	EMD Holding Corp.	Rockland
United States	EMD Millipore Corporation	Burlington
United States	EMD Performance Materials Corp.	Philadelphia
United States	EMD Serono Holding, Inc.	Rockland
United States	EMD Serono Research & Development Institute, Inc.	Billerica
United States	EMD Serono, Inc.	Rockland
United States	Grzybowski Scientific Inventions Ltd.	Evanston
United States	Millipore Asia Ltd.	Wilmington
United States	Millipore UK Holdings I, LLC	Wilmington
United States	Millipore UK Holdings II, LLC	Wilmington
United States	Ormet Circuits, Inc.	San Diego
United States	Research Organics, LLC	Cleveland
United States	SAFC Biosciences, Inc.	Lenexa
United States	SAFC Carlsbad, Inc.	Carlsbad
United States	SAFC, Inc.	Madison
United States	Serono Laboratories, Inc.	Rockland
United States	Sigma Chemical Foreign Holding LLC	St. Louis
United States	Sigma Redevelopment Corporation	St. Louis
United States	Sigma-Aldrich Co. LLC	St. Louis
United States	Sigma-Aldrich Corporation	St. Louis
United States	Sigma-Aldrich Foreign Holding Co.	St. Louis
United States	Sigma-Aldrich Manufacturing LLC	St. Louis
United States	Sigma-Aldrich Missouri Insurance Company	St. Louis
United States	Sigma-Aldrich Research Biochemicals, Inc.	Natick
United States	Sigma-Aldrich RTC, Inc.	Laramie
United States	Fluka Chemical Corp.	St. Louis
United States	TocopheRx, Inc.	Burlington
United States	Sigma-Aldrich, Inc.	Milwaukee
United States	Sigma-Genosys of Texas LLC	The Woodlands
United States	Supelco, Inc.	Bellefonte
United States	Prolog Healthy Living Fund II, L.P.	St. Louis
United States	Prolog Healthy Living Fund, L.P.	St. Louis
United States	Akili Interactive Labs, Inc.	Boston
United States	Allozyne, Inc.	Seattle
United States	ApoGen Biotechnologies, Inc.	Seattle
United States	Archemix Corporation	Cambridge
United States	Biolinq Inc.	San Diego
United States	BioVascular, Inc.	La Jolla

a) Profit and loss transfer agreement.
b) Not disclosed owing to minor significance acc. to section 286 (3) no. 1 HGB
c) Operational site of Merck KGaA, Darmstadt, Germany.

Equity interest (%)	thereof Merck KGaA, Darmstadt, Germany (%)	Reporting currency (ISO code)	IFRS net equity in thousand €	IFRS profit after tax in thousand €	IFRS net equity in thousand reporting currency	IFRS profit after tax in thousand reporting currency
100.00		USD	207,013.25	135,398.33	236,843.86	159,855.33
100.00		USD	0.44	0.00	0.50	0.00
100.00		USD	6,189.00	1,894.51	7,080.83	2,236.71
100.00		USD	−370.56	−359.09	−423.96	−423.96
100.00		USD	70,205.34	3,093.94	80,321.93	3,652.80
100.00		USD	156,458.04	54,362.24	179,003.64	64,181.69
100.00		USD	66,197.24	11,650.64	75,736.26	13,755.10
100.00		USD	128,047.31	19,754.17	146,498.93	23,322.37
100.00		USD	−1,790.19	−476.25	−2,048.16	−562.28
100.00		USD	−801.08	−1,258.32	−916.51	−1,485.61
100.00		USD	47,424.39	11,815.46	54,258.24	13,949.68
100.00		USD	14,560,918.63	557,421.98	16,659,147.01	658,109.11
100.00		USD	3,085,017.08	91,983.12	3,529,568.04	108,598.03
100.00		USD	487,155.89	−22,605.98	557,355.06	−26,689.30
100.00		USD	863,374.69	77,371.66	987,786.98	91,347.30
100.00		USD	56,957.67	8,676.82	65,165.27	10,244.11
100.00		USD	−12,847.74	69,457.14	−14,699.10	82,003.18
100.00		USD	230.25	−98.95	263.43	−116.83
100.00		USD	23,279.49	39.39	26,634.07	46.51
100.00		EUR	671,317.28	−7.23	671,317.28	−7.23
100.00		EUR	0.00	0.00	0.00	0.00
100.00		USD	14,977.89	−8,039.85	17,136.21	−9,492.09
100.00		USD	28,700.81	5,751.91	32,836.60	6,790.88
100.00		USD	88,037.96	31,822.17	100,724.23	37,570.21
100.00		USD	30,650.99	11,497.08	35,067.80	13,573.79
100.00		USD	85,468.63	−447.91	97,784.66	−528.82
100.00		USD	144.15	0.00	164.92	0.00
100.00		USD	0.44	0.00	0.50	0.00
100.00		USD	76,700.79	6,096.19	87,753.37	7,197.35
100.00		USD	4,380,005.96	24,560.37	5,011,164.82	28,996.71
100.00		USD	1,359,528.31	687,294.77	1,555,436.34	811,440.83
100.00		USD	−2,146.53	8,289.03	−2,455.85	9,786.28
100.00		USD	131,268.24	51,301.26	150,183.99	60,567.80
100.00		USD	8,650.48	−3,030.75	9,897.02	−3,578.19
100.00		USD	19,074.62	3,069.28	21,823.27	3,623.69
100.00		USD	13,291.09	81.06	15,206.33	95.70
100.00		b)	b)	b)	b)	b)
62.83		b)	b)	b)	b)	b)
100.00		USD	481.99	17,860.61	551.44	21,086.77
100.00		USD	6,473.77	702.04	7,406.64	828.85
100.00		USD	207,118.71	−5,972.93	236,964.52	−7,051.82
50.58		b)	b)	b)	b)	b)
38.32		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00	< 20,00	b)	b)	b)	b)	b)

Country	Company	Registered office
United States	Bird Rock Bio, Inc.	La Jolla
United States	CLEARink Displays, Inc.	Fremont
United States	Deltanoid Pharmaceuticals, Inc.	Madison
United States	Dynamis Therapeutics, Inc.	Jenkintown
United States	Indi Molecular, Inc.	Culver City
United States	Intrexon Corporation	Germantown
United States	Kraig Biocraft Laboratories, Inc.	Ann Arbor
United States	Lumiode, Inc.	New York
United States	Progyny, Inc.	Menlo Park
United States	Raze Therapeutics, Inc.	Cambridge
United States	Ribometrix Inc.	Durham
United States	Robert W. Baird & Co.	Chicago
United States	Tioga Pharmaceuticals, Inc.	San Diego
United States	Translate Bio, Inc.	Cambridge
United States	ViuRx Pharmaceuticals, Inc.	Boston
Asia-Pacific (APAC)		
Australia	Merck Pty. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Bayswater
Australia	Merck Serono Australia Pty. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Sydney
Australia	Proligo Australia Pty. Ltd.	Castle Hill
Australia	SAFC Biociences Pty. Ltd.	Castle Hill
Australia	Sigma-Aldrich Oceania Pty. Ltd.	Castle Hill
Australia	Sigma-Aldrich Pty. Ltd.	Castle Hill
Australia	Biochrom Australia Pty. Ltd.	Bayswater
Australia	Immutep Limited	Sydney
China	Beijing Skywing Technology Co., Ltd.	Beijing
China	Merck Chemicals (Shanghai) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Shanghai
China	Merck Display Materials (Shanghai) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Shanghai
China	Merck Electronic Materials (Suzhou) Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Suzhou
China	Merck Holding (China) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Shanghai
China	Merck Life Science Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hong Kong
China	Merck Life Science Technologies (Nantong) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Nantong
China	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hong Kong
China	Merck Management Consulting (Shanghai) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Shanghai
China	Merck Performance Materials Hong Kong Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hong Kong
China	Merck Pharmaceutical (HK) Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Hong Kong
China	Merck Pharmaceutical Distribution (Jiangsu) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Nantong
China	Merck Pharmaceutical Manufacturing (Jiangsu) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Nantong
China	Merck Serono (Beijing) Pharmaceutical Distribution Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Beijing

a) Profit and loss transfer agreement.
b) Not disclosed owing to minor significance acc. to section 286 (3) no. 1 HGB
c) Operational site of Merck KGaA, Darmstadt, Germany.

Equity interest (%)	thereof Merck KGaA, Darmstadt, Germany (%)	Reporting currency (ISO code)	IFRS net equity in thousand €	IFRS profit after tax in thousand €	IFRS net equity in thousand reporting currency	IFRS profit after tax in thousand reporting currency
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00	< 20,00	b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00	< 20,00	b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
100.00		AUD	5,088.84	907.48	8,238.84	1,434.08
100.00		AUD	17,122.08	2,291.02	27,720.65	3,620.45
100.00		AUD	1,823.24	−2.41	2,951.82	−3.81
100.00		AUD	14,206.78	1,667.98	23,000.78	2,635.88
100.00		AUD	32,169.21	254.90	52,081.96	402.82
100.00		AUD	15,719.24	56.04	25,449.46	88.55
100.00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
100.00		CNY	705.24	−429.06	5,549.39	−3,353.15
100.00		CNY	27,019.17	884.35	212,608.42	6,911.25
100.00		CNY	42,964.30	10,497.41	338,077.52	82,038.41
100.00		CNY	54,000.48	−1,872.79	424,918.95	−14,636.08
100.00		CNY	133,075.23	−318.48	1,047,142.39	−2,488.96
100.00		USD	32,119.90	−10.33	36,748.37	−12.20
100.00		CNY	16,683.94	−6,970.98	131,282.59	−54,479.00
100.00		HKD	6,862.30	1,768.15	61,487.62	16,358.87
100.00		CNY	15,393.88	−30.80	121,131.39	−240.67
100.00		HKD	55,445.27	−2,225.49	496,800.69	−20,590.26
100.00		HKD	18,591.00	9,805.91	166,579.04	90,724.21
100.00		CNY	9,064.21	41.51	71,324.42	324.42
100.00		CNY	46,095.08	8,964.17	362,712.93	70,055.99
100.00		CNY	12,368.22	7,964.75	97,323.05	62,245.41

Country	Company	Registered office
China	Merck Serono (Beijing) Pharmaceutical R&D Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Beijing
China	Merck Serono Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Beijing
China	SAFC Hitech (Shanghai) Co., Ltd.	Shanghai
China	Sigma-Aldrich (Shanghai) Trading Co., Ltd.	Shanghai
China	Sigma-Aldrich (Wuxi) Life Science & Technology Co., Ltd.	Wuxi
China	Merck Innovation Hub (Guangdong) Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Guangzhou
India	Merck Life Science Pvt. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Mumbai
India	Merck Performance Materials Pvt. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Mumbai
India	Merck Specialities Pvt. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Mumbai
India	Sigma-Aldrich Chemicals Private Limited	Bangalore
Indonesia	P.T. Merck Chemicals and Life Sciences, a subsidiary of Merck KGaA, Darmstadt, Germany	Jakarta
Indonesia	P.T. Merck Tbk., a subsidiary of Merck KGaA, Darmstadt, Germany	Jakarta
Japan	BioReliance KK	Tokyo
Japan	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Tokyo
Japan	Merck Performance Materials Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Tokyo
Japan	Merck Serono Co., Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Tokyo
Japan	Sigma-Aldrich Japan G.K.	Tokyo
Malaysia	Merck Sdn Bhd, a subsidiary of Merck KGaA, Darmstadt, Germany	Petaling Jaya
Malaysia	Sigma-Aldrich (M) Sdn Bhd	Kuala Lumpur
New Zealand	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Palmerston North
New Zealand	Sigma-Aldrich New Zealand Co.	Christchurch
Philippines	Merck Business Solutions Asia Inc., a subsidiary of Merck KGaA, Darmstadt, Germany	Bonifacio Global City
Philippines	Merck Inc., a subsidiary of Merck KGaA, Darmstadt, Germany	Bonifacio Global City
Singapore	Merck Performance Materials Pte. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Singapore
Singapore	Merck Pte. Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Singapore
Singapore	Sigma-Aldrich Pte. Ltd.	Singapore
South Korea	Merck Electronic Materials Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Seoul
South Korea	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Seoul
South Korea	Merck Performance Materials Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Pyeongtaek-shi
South Korea	Sigma-Aldrich Korea Ltd.	Yongin City
Taiwan	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Taipeh
Taiwan	Merck Performance Materials Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Taipeh
Taiwan	SAFC Hitech Taiwan Co. Ltd.	Kaohsiung
Thailand	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Bangkok
Vietnam	Merck Vietnam Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Ho Chi Minh City
Latin America		
Argentina	Merck S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Buenos Aires
Argentina	Sigma-Aldrich de Argentina S.R.L.	Buenos Aires
Brazil	Merck S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Rio de Janeiro
Brazil	Sigma-Aldrich Brasil Ltda.	São Paulo
Chile	Merck S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Santiago de Chile
Chile	Sigma-Aldrich Quimica Ltda.	Santiago de Chile

a) Profit and loss transfer agreement.
b) Not disclosed owing to minor significance acc. to section 286 (3) no. 1 HGB
c) Operational site of Merck KGaA, Darmstadt, Germany.

Equity interest (%)	thereof Merck KGaA, Darmstadt, Germany (%)	Reporting currency (ISO code)	IFRS net equity in thousand €	IFRS profit after tax in thousand €	IFRS net equity in thousand reporting currency	IFRS profit after tax in thousand reporting currency
100.00		CNY	3,944.21	427.36	31,036.20	3,339.84
100.00		CNY	115,442.56	54,216.06	908,394.41	423,704.47
100.00		CNY	8,353.85	648.68	65,734.78	5,069.47
100.00		CNY	46,120.46	3,523.75	362,912.66	27,538.52
100.00		CNY	56,111.14	10,239.22	441,527.33	80,020.65
100.00		b)	b)	b)	b)	b)
100.00		INR	33,631.86	–23,675.48	2,686,018.41	–1,903,658.92
100.00		INR	10,130.94	–2,868.79	809,110.25	–230,668.63
100.00		INR	49,830.79	–79,179.95	3,979,751.30	–6,366,569.81
100.00		INR	65,317.08	4,487.19	5,216,568.03	360,798.43
100.00		IDR	6,502.80	601.94	107,491,290.78	10,083,987.89
86.65		IDR	32,898.65	69,896.86	543,814,626.89	1,170,954,209.91
100.00		JPY	534.21	45.39	67,381.05	5,917.31
100.00		JPY	394,057.17	60,555.67	49,702,943.53	7,894,757.03
100.00		JPY	437,111.16	55,789.20	55,133,398.81	7,273,343.03
100.00		JPY	48,683.52	5,957.95	6,140,515.26	776,749.10
100.00		JPY	61,261.37	3,999.11	7,726,975.79	521,370.94
100.00		MYR	13,833.26	2,905.40	65,501.89	13,848.86
100.00		MYR	1,834.29	15.16	8,685.56	72.26
100.00		NZD	1,953.41	276.14	3,326.07	471.66
100.00		NZD	855.51	76.49	1,456.68	130.65
99.99		PHP	6,107.46	1,763.40	367,097.52	109,277.13
100.00		PHP	19,157.82	10,342.65	1,151,507.48	640,928.44
100.00		USD	55,084.60	–3,003.45	63,022.29	–3,545.96
100.00		SGD	323,910.22	12,362.28	505,137.98	19,670.61
100.00		SGD	242,011.82	3,619.12	377,417.43	5,758.68
100.00		KRW	215,633.21	10,428.06	274,105,169.53	13,497,361.26
100.00		KRW	69,386.19	2,183.01	88,201,230.44	2,825,537.05
100.00		USD	98,097.44	32,973.87	112,233.28	38,929.94
100.00		KRW	36,417.90	860.54	46,293,121.04	1,113,822.00
100.00		TWD	6,576.32	1,328.84	229,895.04	47,232.85
100.00		TWD	257,883.34	4,989.78	9,015,085.66	177,358.42
100.00		TWD	55,752.86	17,782.01	1,949,008.40	632,049.51
45.11		THB	53,249.13	29,350.76	1,978,087.95	1,119,767.77
100.00		VND	4,266.95	601.30	113,306,888.47	16,338,766.86
100.00		ARS	6,808.47	–23,321.52	293,581.32	–1,005,623.91
100.00		ARS	242.91	–349.36	10,474.37	–15,064.26
100.00		BRL	180,823.54	11,292.20	803,362.84	48,532.63
100.00		BRL	–5,552.10	–2,011.75	–24,666.88	–8,646.28
100.00		CLP	41,206.67	–2,744.95	32,718,319.84	–2,076,419.62
100.00		CLP	880.79	19.64	699,349.58	14,858.30

Country	Company	Registered office
Dominican Republic	Merck Dominicana, S.R.L., a subsidiary of Merck KGaA, Darmstadt, Germany	Santo Domingo
Ecuador	Merck C.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Quito
Guatemala	Merck, S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Guatemala City
Colombia	Merck S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Bogota
Mexico	Merck Biopharma Distribution S.A. de C.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Mexico City
Mexico	Merck, S.A. de C.V., a subsidiary of Merck KGaA, Darmstadt, Germany	Mexico City
Mexico	Sigma-Aldrich Quimica, S. de R.L. de C.V.	Toluca
Panama	Mesofarma Corporation	Panama City
Peru	Merck Peruana S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Lima
Uruguay	Ares Trading Uruguay S.A.	Montevideo
Venezuela	Merck S.A., a subsidiary of Merck KGaA, Darmstadt, Germany	Caracas
Venezuela	Representaciones MEPRO S.A.	Caracas
Middle East and Africa (MEA)		
Egypt	Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Cairo
Algeria	Novapharm Production SARL	Wilaya de Tipiza
Israel	Inter-Lab Ltd.	Yavne
Israel	InterPharm Laboratories Ltd.	Yavne
Israel	Merck Serono Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Herzliya Pituach
Israel	PMatX Ltd.	Yavne
Israel	QLight Nanotech Ltd.	Jerusalem
Israel	Sigma-Aldrich Israel Ltd.	Rehovot
Israel	ARTSaVIT Ltd.	Yavne
Israel	Explore Bio 1 Ltd.	Yavne
Israel	Explore Bio 3 Ltd.	Yavne
Israel	MediSafe Project Ltd.	Haifa
Israel	Metabomed Ltd.	Yavne
Israel	Pantheon Biosciences Ltd.	Yavne
Israel	Wiliot Ltd.	Caesarea
Israel	Neviah Genomics Ltd.	Yavne
Kenya	Merck Healthcare and Life Science Limited, a subsidiary of Merck KGaA, Darmstadt, Germany	Nairobi
Morocco	Merck Maroc S.A.R.L., a subsidiary of Merck KGaA, Darmstadt, Germany	Casablanca
Nigeria	Merck Pharmaceutical and Life Sciences Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Lagos
South Africa	Merck (Pty) Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Halfway House
South Africa	Sigma-Aldrich (Pty) Ltd.	Kempton Park
Tunisia	Merck Promotion SARL, a subsidiary of Merck KGaA, Darmstadt, Germany	Tunis
Tunisia	Merck SARL, a subsidiary of Merck KGaA, Darmstadt, Germany	Tunis
United Arab Emirates	Merck Serono Middle East FZ-Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany	Dubai

a) Profit and loss transfer agreement.
b) Not disclosed owing to minor significance acc. to section 286 (3) no. 1 HGB
c) Operational site of Merck KGaA, Darmstadt, Germany.

Equity interest (%)	thereof Merck KGaA, Darmstadt, Germany (%)	Reporting currency (ISO code)	IFRS net equity in thousand €	IFRS profit after tax in thousand €	IFRS net equity in thousand reporting currency	IFRS profit after tax in thousand reporting currency
100.00		b)	b)	b)	b)	b)
100.00		USD	20,713.38	1,624.25	23,698.18	1,917.63
100.00		GTQ	18,097.82	4,504.64	160,200.12	39,975.63
100.00		COP	57,110.74	33,876.96	214,741,245.73	119,096,033.84
100.00		MXN	−17,257.74	−17,119.44	−388,100.72	−388,600.72
100.00		MXN	122,378.00	79,953.75	2,752,097.55	1,814,900.59
100.00		MXN	4,879.88	−239.23	109,741.13	−5,430.46
100.00		USD	63,027.02	3,316.49	72,109.21	3,915.55
100.00		PEN	24,905.73	3,620.46	95,994.16	14,036.60
100.00		USD	32,235.26	3,170.11	36,880.36	3,742.72
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		EGP	3,202.37	25.64	65,660.80	539.04
20.00		b)	b)	b)	b)	b)
100.00		USD	9,031.08	−14,239.62	10,332.46	−16,811.72
100.00		USD	139,811.57	−7,691.18	159,958.41	−9,080.43
100.00		USD	14,788.76	849.13	16,919.82	1,002.51
90.00		ILS	−147.03	−149.62	−634.02	−634.92
100.00		ILS	451.44	217.27	1,946.65	921.98
100.00		ILS	62,774.03	2,551.26	270,687.88	10,826.38
< 20,00		b)	b)	b)	b)	b)
20.00		b)	b)	b)	b)	b)
22.50		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
< 20,00		b)	b)	b)	b)	b)
69.00	7.75	b)	b)	b)	b)	b)
100.00		KES	3,546.26	−696.89	413,030.87	−83,497.94
100.00		b)	b)	b)	b)	b)
100.00		b)	b)	b)	b)	b)
100.00		ZAR	39,173.64	14,559.98	644,351.61	225,937.86
100.00		ZAR	2,254.55	606.81	37,084.17	9,416.30
100.00		TND	−63.50	−88.84	−217.37	−276.95
100.00		TND	6,625.59	8,128.11	22,678.73	25,337.75
100.00		AED	103,286.00	35,217.55	433,997.43	152,715.60

Independent Auditor's Report

To MERCK Kommanditgesellschaft auf Aktien, Darmstadt, Germany

Report on the Audit of the Annual Financial Statements and of the Combined Management Report

Opinions

We have audited the annual financial statements of MERCK Kommanditgesellschaft auf Aktien, Darmstadt, Germany, which comprise the balance sheet as of December 31, 2018, the income statement for the period from January 1 to December 31, 2018, and notes to the annual financial statements, including the recognition and measurement policies presented therein. In addition, we have audited the combined management report of MERCK Kommanditgesellschaft auf Aktien, Darmstadt, Germany, for the financial year from January 1, 2018, to December 31, 2018.

In our opinion, on the basis of the knowledge obtained in the audit,

- the accompanying annual financial statements comply, in all material respects, with the requirements of German commercial law applicable to business corporations and give a true and fair view of the assets, liabilities and financial position of the Company as of December 31, 2018, and of its financial performance for the financial year from January 1, 2018, to December 31, 2018 in compliance with German Legally Required Accounting Principles, and
- the accompanying combined management report as a whole provides an appropriate view of the Company's position. In all material respects, this combined management report is consistent with the annual financial statements, complies with German legal requirements and appropriately presents the opportunities and risks of future development.

Pursuant to Section 322 (3) sentence 1 HGB [Handelsgesetzbuch: German Commercial Code], we declare that our audit has not led to any reservations relating to the legal compliance of the annual financial statements and of the combined management report.

Basis for the Opinions

We conducted our audit of the annual financial statements and of the combined management report in accordance with Section 317 HGB and EU Audit Regulation No. 537/2014 (referred to subsequently as "EU Audit Regulation") and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer [Institute of Public Auditors in Germany] (IDW). Our responsibilities under those requirements and principles are further described in the "Auditor's Responsibilities for the Audit of the Annual Financial Statements and of the Combined Management Report" section of our auditor's report. We are independent of the Company in accordance with the requirements of European law and German commercial and professional law, and we have fulfilled our other German professional responsibilities in accordance with these requirements. In addition, in accordance with Article 10 (2) (f) of the EU Audit Regulation, we declare that we have not provided non-audit services prohibited under Article 5 (1) of the EU Audit Regulation. We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our opinions on the annual financial statements and on the combined management report.

Key Audit Matters in the Audit of the Annual Financial Statements

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the annual financial statements for the financial year from January 1, 2018, to December 31, 2018. These matters were addressed in the context of our audit of the annual financial statements as a whole, and in forming our opinion thereon, we do not provide a separate opinion on these matters.

VALUATION OF INVESTMENTS IN AFFILIATED COMPANIES

Information on financial assets can be found in the notes to the financial statements under note 3..

Financial statement risk

As of December 31, 2018, the Company reported investments in affiliated companies of EUR 17,529 million as part of financial assets. This amount represents 83% of total assets and thus a significant share of the Company's assets.

Investments in affiliated companies are recognized at cost or, if they are expected to be permanently impaired, at their lower fair value. Assessing whether investments in affiliated companies are impaired depends considerably on the Company's estimates and exercise of judgment.

In the financial year 2018, the Company did not recognize impairment losses on investments in affiliated companies (in 2017: EUR 0.1 million). There is a risk for the financial statements that impairment of investments in affiliated companies may not be recognized in the financial statements.

Our audit approach
In a first step, we obtained explanations from the Company's finance department and evaluated underlying documentation to obtain an understanding of the Company's process for testing investments in affiliated companies for impairment. In doing this, we analyzed the Company's approach to determining potentially impaired investments in affiliated companies and, based on the information obtained in the course of our audit, assessed whether there were any indicators for impairment that were not identified by the Company.

In a second step, we assessed the calculation model used by the Company to determine the value of investments and reconciled the assumptions concerning the discount rate to external information. For individual investments in affiliated companies that were selected by us using a risk based approach, we scrutinized the revenue and earnings forecasts as well as underlying assumptions prepared by the respective CFO (or other individuals, as applicable), whereby we used the current earnings situation as a starting point for our analysis. In addition, we reconciled these projections and assumptions with other internally available data, e.g. for tax purposes. For selected investments in affiliated companies, we also assessed the accuracy of the Company's forecasting process by comparing the budgets prepared in previous years with actual results and by analyzing deviations, if any.

Our conclusions
The Company's assumptions and estimates regarding the valuation of participations in affiliated companies are appropriate.

RECOGNITION AND MEASUREMENT OF PROVISIONS FOR TAX LIABILITIES

For changes in provisions for tax liabilities, please refer to note 10 in the notes to the financial statements.

Financial statement risk
As of December 31, 2018, the Company recorded provisions for tax liabilities in the amount of EUR 139 million.

Application of German regulations on income tax and tax incentives is complex and subject to risks. The recognition and measurement of income tax liabilities requires the company to exercise judgment in its assessment of tax matters and make estimates concerning tax risks. The company routinely engages external experts to support its own risk assessment with expert opinions from tax specialists.

There is a risk for the financial statements that provisions for tax liabilities may not be fully recognized or not appropriately measured.

Our audit approach
We involved our own specialists in tax law into the audit team in order to evaluate both the company's assessment of tax risks as well as the related opinions of external experts engaged by the company.

We obtained an understanding of existing tax risks through inquiry of management and employees of the tax department. We assessed the competence, capabilities and objectivity of the external experts and evaluated their expert opinions.

In addition, we analyzed correspondence with the relevant tax authorities and assessed the assumptions underlying the determination of tax liabilities based on our knowledge and experience of how the relevant legal requirements are currently applied by the tax authorities and courts.

Our conclusions
The assumptions applied by the company for recognition and measurement of provisions for tax liabilities are reasonable.

TRANSFER OF THE HEALTHCARE, LIFE SCIENCE AND PERFORMANCE MATERIALS AND BUSINESS SECTORS INTO THREE SUBSIDIARIES AND LEASE BACK OF THESE BUSINESSES AS PART OF BUSINESS LEASING CONTRACTS.

Disclosures on transfers to the subsidiaries made in the financial year can be found in the notes to the financial statements under section "Effects of material company agreements on the net assets, financial position and results of operations".

Financial statement risk
With retroactive effect as of January 1, 2018, the operative activities that were formerly undertaken in the legal entity Merck KGaA, Darmstadt, Germany, in the Healthcare, Life Science and Performance Materials business sectors were spun off into three separate companies (so called "OpCos") and subsequently leased back.

Due to the large number of individual items to be transferred and the extent of manual steps necessary to be performed in accounting for this non-routine transaction, the correct identification of the assets and liabilities to be transferred under the transfer agreements as well as the determination of the respective book values as of the transfer date involve an increased inherent risk of material misstatement. In addition, the Company had to determine whether the assets and liabilities that were leased back subsequent to the transfer should be recorded by Merck KGaA, Darmstadt, Germany, or by the OpCos, respectively, based on an assessment of beneficial ownership.

There is a risk for the financial statements that the transferred assets and liabilities may have been incompletely or inaccurately identified or not recorded by the beneficial owner.

Our audit approach
In a first step, we obtained explanations from the departments involved in the transaction and evaluated underlying documentation to obtain an understanding of the Company's process for identifying assets and liabilities to be transferred and for allocating them to the respective business sectors. In doing so, we assessed the Company's approach to determine the allocation of transferred items to the respective business sectors as well as related allocation rules. Through tests of details using specific items sampling we verified whether the assets and liabilities to be transferred to the respective OpCos and their respective carrying amounts were completely and accurately identified as of the transfer date in line with the provisions of transfer agreement. Furthermore, using the information gained in other areas our audit of the annual financial statements (e.g. analytical screening of balance sheet and income statement accounts), we assessed whether there was any indication that assets or liabilities to be transferred were not completely identified or transferred at incorrect amounts.

In addition, we evaluated whether the assets and liabilities that were leased back subsequent to the transfer were appropriately recorded by Merck KGaA, Darmstadt, Germany, or to the OpCos, respectively, based on an assessment of beneficial ownership, in accordance with the respective lease agreements.

Our conclusions
The approach used for identifying and allocating assets and liabilities transferred to the respective business sectors is appropriate and in line with the terms of the contract and the accounting policies to be applied. Assets were appropriately allocated to Merck KGaA, Darmstadt, Germany, or by the OpCos, respectively, based on beneficial ownership.

Other Information
Management is responsible for the other information. The other information comprises the annual report, with the exception of the audited annual financial statements and the combined management report and our auditor's report.

Our opinions on the annual financial statements and on the combined management report do not cover the other information, and consequently we do not express an opinion or any other form of assurance conclusion thereon.

In connection with our audit, our responsibility is to read the other information and, in so doing, to consider whether the other information
- is materially inconsistent with the annual financial statements, with the combined management report or our knowledge obtained in the audit, or
- otherwise appears to be materially misstated.

Responsibilities of Management and the Supervisory Board for the Annual Financial Statements and the Combined Management Report
Management is responsible for the preparation of the annual financial statements that comply, in all material respects, with the requirements of German commercial law applicable to business corporations, and that the annual financial statements give a true and fair view of the assets, liabilities, financial position and financial performance of the Company in compliance with German Legally Required Accounting Principles. In addition, management is responsible for such internal control as they, in accordance with German Legally Required Accounting Principles, have determined necessary to enable the preparation of annual financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the annual financial statements, management is responsible for assessing the Company's ability to continue as a going concern. They also have the responsibility for disclosing, as applicable, matters related to going concern. In addition, they are responsible for financial reporting based on the going concern basis of accounting, provided no actual or legal circumstances conflict therewith.

Furthermore, management is responsible for the preparation of the combined management report that as a whole provides an appropriate view of the Company's position and is, in all material respects, consistent with the annual financial statements, complies with German legal requirements, and appropriately presents the opportunities and risks of future development. In addition, management is responsible for such arrangements and measures (systems) as they have considered necessary to enable the preparation of a combined management report that is in accordance with the applicable German legal requirements, and to be able to provide sufficient appropriate evidence for the assertions in the combined management report.

The Supervisory Board is responsible for overseeing the Company's financial reporting process for the preparation of the annual financial statements and of the combined management report.

Auditor's Responsibilities for the Audit of the Annual Financial Statements and of the Combined Management Report
Our objectives are to obtain reasonable assurance about whether the annual financial statements as a whole are free from material misstatement, whether due to fraud or error, and whether the combined management report as a whole provides an appropriate view of the Company's position and, in all material respects, is consistent with the annual financial statements and the knowledge obtained in the audit, complies with the German legal requirements and appropriately presents the opportunities and risks of future development, as well as to issue an auditor's report that includes our opinions on the annual financial statements and on the combined management report.

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Section 317 HGB and the EU Audit Regulation and in compliance with German Generally Accepted Standards for Financial Statement Audits promulgated by the Institut der Wirtschaftsprüfer (IDW) will always detect a material misstatement. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these annual financial statements and this combined management report.

We exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the annual financial statements and of the combined management report, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinions. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal controls.
- Obtain an understanding of internal control relevant to the audit of the annual financial statements and of arrangements and measures (systems) relevant to the audit of the combined management report in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of these systems.
- Evaluate the appropriateness of accounting policies used by management and the reasonableness of estimates made by management and related disclosures.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in the auditor's report to the related disclosures in the annual financial statements and in the combined management report or, if such disclosures are inadequate, to modify our respective opinions. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Company to cease to be able to continue as a going concern.
- Evaluate the overall presentation, structure and content of the annual financial statements, including the disclosures, and whether the annual financial statements present the underlying transactions and events in a manner that the annual financial statements give a true and fair view of the assets, liabilities, financial position and financial performance of the Company in compliance with German Legally Required Accounting Principles.
- Evaluate the consistency of the combined management report with the annual financial statements, its conformity with [German] law, and the view of the Company's position it provides.
- Perform audit procedures on the prospective information presented by management in the combined management report. On the basis of sufficient appropriate audit evidence we evaluate, in particular, the significant assumptions used by management as a basis for the prospective information, and evaluate the proper derivation of the prospective information from these assumptions. We do not express a separate opinion on the prospective information and on the assumptions used as a basis. There is a substantial unavoidable risk that future events will differ materially from the prospective information.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with the relevant independence requirements, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, the related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the annual financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter.

Other Legal and Regulatory Requirements

Further Information pursuant to Article 10 of the EU Audit Regulation
We were elected as auditor by the Annual General Meeting on April 27, 2018. We were engaged by the Supervisory Board on June 25, 2018. We have been the auditor of MERCK Kommanditgesellschaft auf Aktien, Darmstadt, Germany, without interruption since the financial year 1995.

We declare that the opinions expressed in this auditor's report are consistent with the additional report to the Supervisory Board pursuant to Article 11 of the EU Audit Regulation (long-form audit report).

German Public Auditor Responsible for the Engagement

The German Public Auditor responsible for the engagement is Bodo Rackwitz.

Frankfurt am Main, 15 February 2019

KPMG AG
Wirtschaftsprüfungsgesellschaft
[Original German version signed by:]

Braun
[German Public Auditor]

Rackwitz
[German Public Auditor]

Responsibility Statement in accordance with section 264 (2) sentence 3 HGB and section 289 (1) sentence 5 HGB

To the best of our knowledge, and in accordance with the applicable reporting principles, the annual financial statements of Merck KGaA, Darmstadt, Germany, give a true and fair view of the assets, liabilities, financial position and profit or loss of Merck KGaA, Darmstadt, Germany, and the Management Report includes a fair review of the development and performance of the business and the position of the Company, together with a description of the material opportunities and risks associated with the expected development of Merck KGaA, Darmstadt, Germany.

Darmstadt, February 14, 2019

Stefan Oschmann

Udit Batra

Kai Beckmann

Belén Garijo

Marcus Kuhnert

Report of the Supervisory Board

The Supervisory Board again properly executed its duties in 2018 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 2018, 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 sectors. 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 2018. At these meetings, the Supervisory Board intensely discussed the reports of the Executive Board and company developments and strategic issues together with the Executive Board.

At the meeting held on February 28, 2018, the Executive Board first intensively addressed the annual financial statements and consolidated financial statements for 2017, the combined management report, the audit report of the auditor on the separate non-financial report (of the Group) for fiscal 2017 as well as the proposal for the appropriation of the net retained profit. The auditor explained the audit reports including the audit focuses. The Executive Board and the Head of Accounting reported on the financial statements. The Supervisory Board took note of the information on the "Operational Infrastructure" project, the restructuring of Merck KGaA, Darmstadt, Germany. Furthermore, the Supervisory Board resolved upon the report and the objectives of the Supervisory Board with respect to its composition and the profile of skills and expertise, the Declaration of Conformity 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 reported on business performance in 2017 and presented the plans for fiscal 2018. The "Roda" project, the divestment of the global Consumer Health business, was the subject of intense deliberations. The Supervisory Board also took note of the written risk report as well as the report from Group Internal Auditing for 2017.

The meeting held on May 9, 2018 focused on current business developments in the first quarter of 2018. The report of the Research and Development Committee Life Science/Performance Materials of the Board of Partners of the E. Merck KG, Darmstadt, Germany, was a further focus of the meeting. Lastly, the Supervisory Board dealt with the Compliance and Data Protection Report for 2017.

At its meeting on July 31, 2018, the Supervisory Board focused intensively on the report of the Executive Board on business performance in the second quarter of 2018. In addition, the auditor 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 2018. No risks that threaten the continued existence of the company were identified. In addition, the list of permitted non-audit services was updated, an external audit of the non-financial declaration was resolved upon and various developments in the Corporate Governance area were discussed. Finally, the Supervisory Board elected the new members of the Nomination Committee as regularly scheduled.

At its fourth meeting on November 9, 2018, the Supervisory Board dealt with the report of the Executive Board on the third quarter of 2018. Additional topics of focus were the 2018 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 current strategic direction of the Group were reported on and discussed. In addition, a revision of the Articles of Association due to the departure of Walter Galinat was discussed.

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. The audit opinion for the annual financial statements contained the following key audit matters, i.e. those matters that, in the professional judgment of the auditor, were of most significance in the audit of the annual financial statements:

- Measurement of selected financial assets
- Measurement of selected intangible assets
- Recognition and measurement of provisions for tax risks

For the consolidated financial statements prepared in accordance with International Financial Reporting Standards, as well as the com-

bined management report, the auditors issued the unqualified auditor's report reproduced in the Annual Report of the Group. The audit opinion for the consolidated financial statements contained the following audit topics of special importance:

- Measurement of selected intangible assets including goodwill
- Recognition and measurement of provisions for tax risks
- Completeness of provisions for legal risks
- Calculation of the gains on the disposal of the Consumer Health activities

In addition, the auditor audited the calculation of participation of Merck KGaA, Darmstadt, Germany, in the profit of the E. Merck KG, Darmstadt, Germany, in accordance with Article 27 (2) of the Articles of Association as well as the separate combined non-financial (Group) report. 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, the proposal of the Executive Board for the appropriation of net retained profit and the separate combined non-financial (Group) report were submitted to the Supervisory Board together with the auditor's report.

In accordance with Article 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. During its examination, it particularly focused on the above-mentioned key audit matters in the respective audit opinions, the resulting risks for the financial statements, the approach adopted during each audit as described and the conclusions drawn by the auditor. Furthermore, the Supervisory Board also examined the separate combined non-financial (Group) report and the memorandum on a limited assurance engagement prepared by the auditor on behalf of the Supervisory Board. The discussion of the relevant agenda item at the Supervisory Board's meeting on February 26, 2019 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 as well as the separate combined non-financial (Group) report. 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 and the separate non-financial (Group) report. The Supervisory Board gave its consent to the proposal of the Executive Board for the appropriation of net retained profit.

CORPORATE GOVERNANCE AND DECLARATION OF CONFORMITY

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 the year under review. In fiscal 2018, the Chairman of the Supervisory Board was prepared to hold talks with investors on topics pertaining to the Supervisory Board as appropriate and remains willing to do so. The next efficiency review of the Supervisory Board will be held in the coming fiscal following the last efficiency audit in fiscal 2017.

After discussing corporate governance issues in detail, the Executive Board and the Supervisory Board on February 14, 2019 (Executive Board) and February 26, 2019 (Supervisory Board), respectively, adopted the updated Declaration of Conformity and issued it jointly on February 26, 2019 in accordance with section 161 AktG. The statement is permanently available on the website of Merck KGaA, Darmstadt, Germany (www.emdgroup.com/en/investors/corporate-governance.html). 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 on Corporate Governance on pages 166 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 convened on November 9, 2018 in order to recommend suitable candidates to the Supervisory Board for the Supervisory Board elections in 2019. At its meeting the committee discussed potential candidates. The discussion took into account the statutory requirements as well as the insertion of the candidate in the full Supervisory Board, the objectives of the Supervisory Board regarding its composition, its profile of skills and expertise and the diversity policy. No report is given on the work of further committees.

PERSONNEL MATTERS

With the exception of Michael Fletterich, who was excused and absent from the meeting on November 9, 2018, all the Supervisory Board members attended all the Supervisory Board meetings.

Darmstadt, February 26, 2019

The Supervisory Board of Merck KGaA, Darmstadt, Germany

Wolfgang Büchele
Chairman

FINANCIAL CALENDAR
for 2019

March
3/7/2019
Annual Press Conference

August
8/8/2019
Half-yearly Financial Report

April
4/26/2019
Annual General Meeting

November
11/14/2019
Quarterly Statement Q3

May
5/14/2019
Quarterly Statement Q1