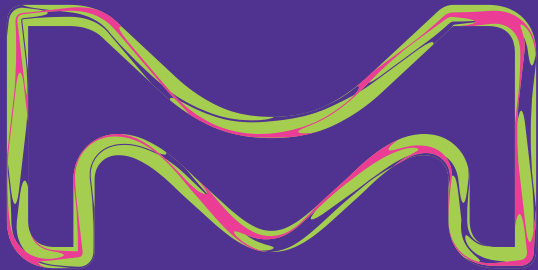




MERCK KGAA, DARMSTADT, GERMANY – GOLDMAN SACHS SIXTH GERMAN CORPORATE CONFERENCE

Stefan Oschmann, CEO
Marcus Kuhnert, CFO

Munich, September 18, 2017





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Agenda

- 01 Business overview & strategy recap**
- 02 Healthcare – Funding for success**
- 03 Life Science – Focusing on profitable growth**
- 04 Performance Materials – Maintaining innovation leadership**
- 05 Business and financial review H1 2017**
- 06 Outlook**



01

BUSINESS OVERVIEW & STRATEGY RECAP

Group

Portfolio of three high-tech businesses



Healthcare

Leading in specialty pharma markets

- Biologics and small-molecules
- Research focus: Oncology, Immunology & Immuno-Oncology
- Over-the-counter medicine



Life Science

Leading life science company

- Tools and services for biotech research & production
- Tools and laboratory supply for the academic research and industrial testing



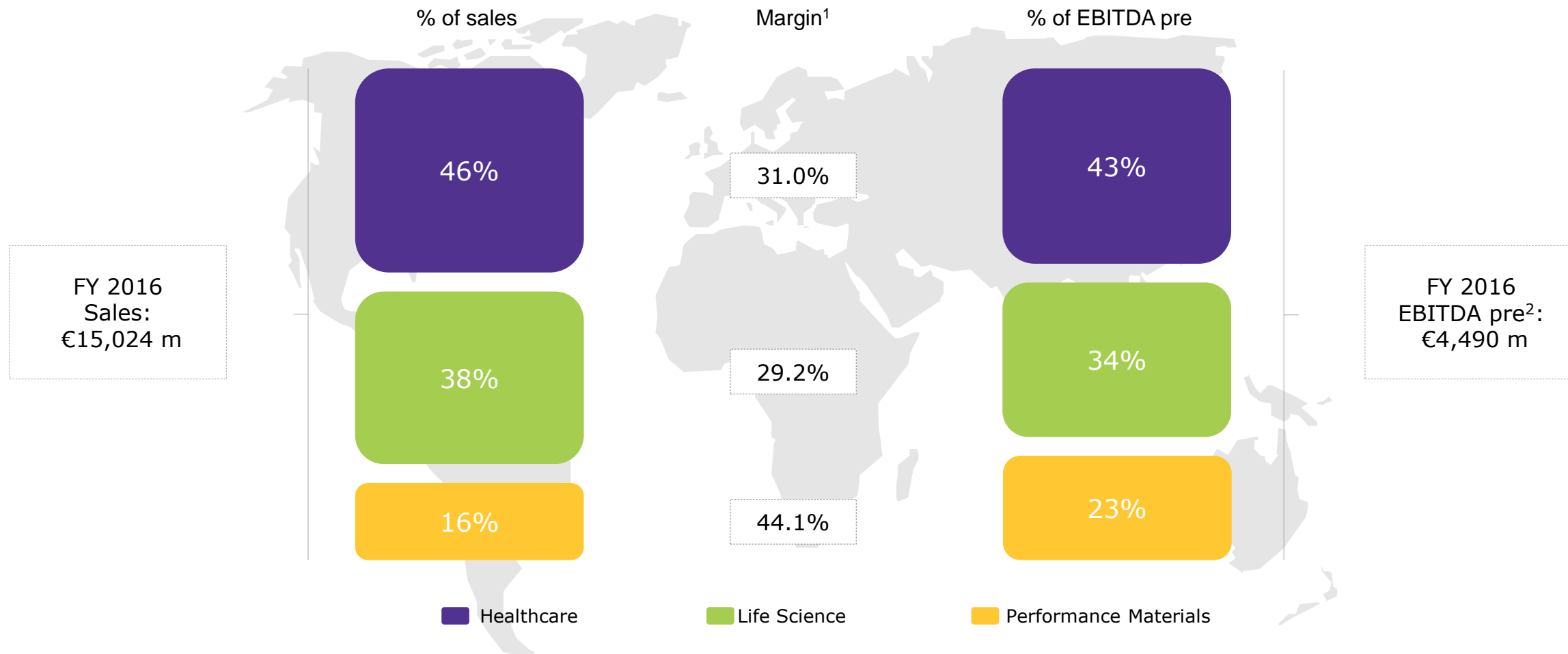
Performance Materials

Market leader in specialty materials

- Innovative display materials
- Effect pigments and functional materials
- High-tech materials for electronics

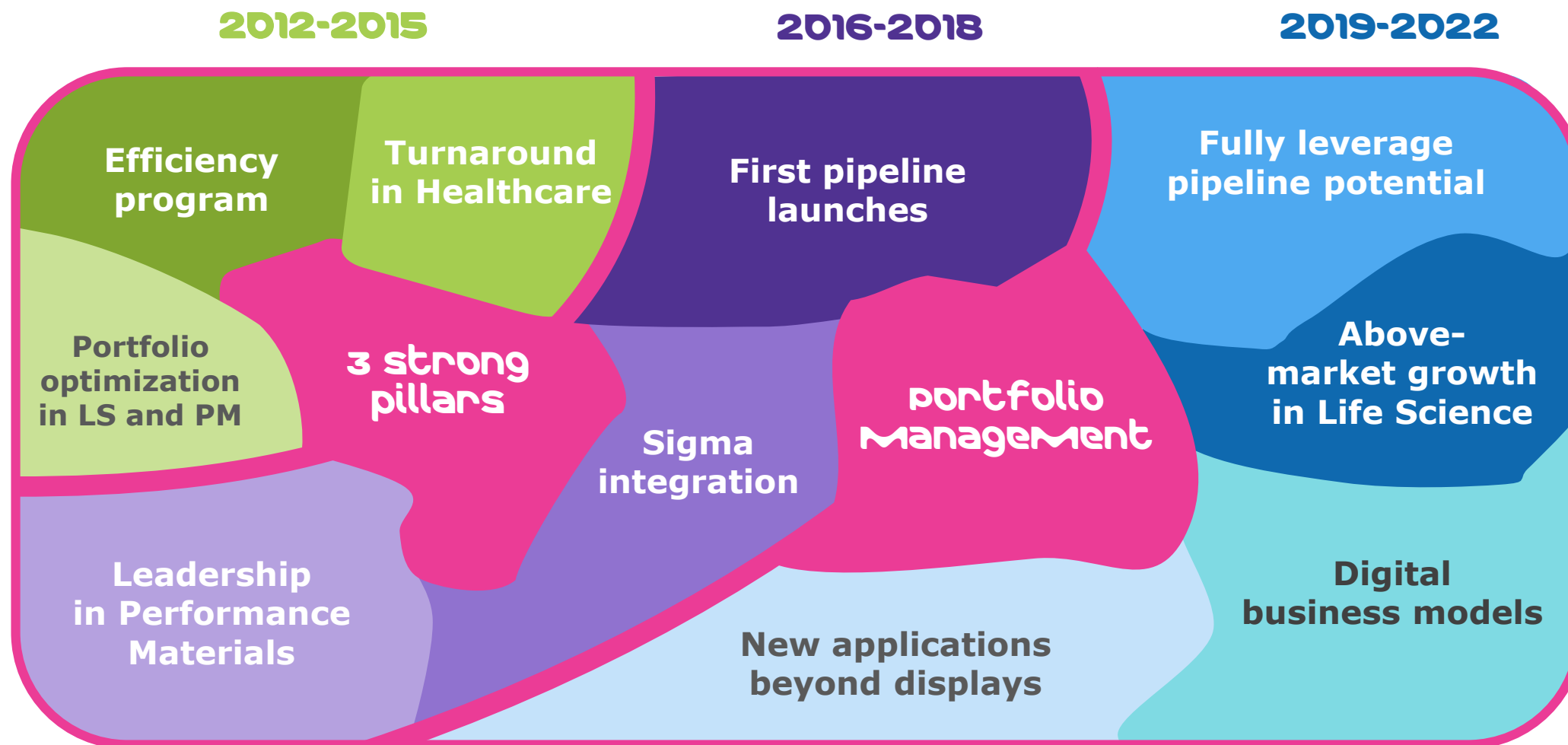
Group

Strong businesses with attractive margins



¹EBITDA pre margin in % of net sales; ²Including Corporate/Others (-€396 m)

Group Strategic roadmap 2016-2022

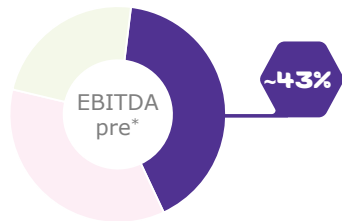


Group

Clear set of priority goals to be realized by 2018



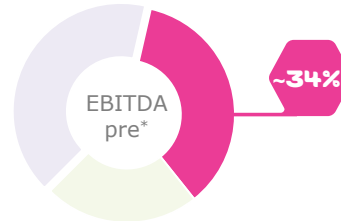
Healthcare



- Maximize growth of existing franchises
- Deliver pipeline: one product launch or indication p.a. from 2017



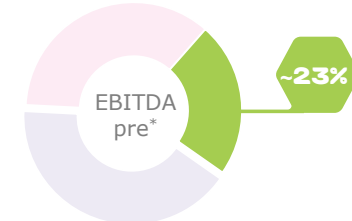
Life science



- Focus on seamless integration and deliver cost synergies
- Leverage strategic capabilities for value creation



Performance Materials



- Drive innovation and technology leadership across all businesses
- Innovate in applications also beyond displays

Merck KGaA,
Darmstadt,
Germany

- Deleverage to <2x net debt / EBITDA pre in 2018
- No large acquisitions (>€500 m) until end of 2018 (unless financed by divestments)
- Dividend policy reflects sustainable earnings trend



02

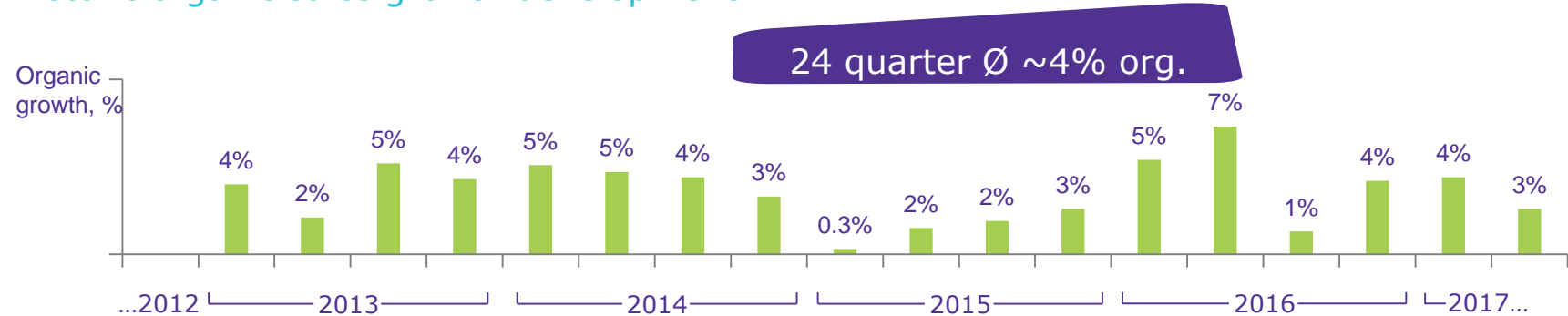
HEALTHCARE – FUNDING FOR SUCCESS

Healthcare

Operational excellence drives healthy growth of existing businesses

Organic growth
for 24
consecutive
quarters

Historic organic sales growth development



Commitment to
at least stable
organic sales
until 2018

Qualitative organic sales growth guidance per product/franchise until 2018

rebif®: Sales decline in line with interferon market

oncology: Stable sales

fertility: Mid single-digit growth

endocrinology: Low single-digit growth

general medicine: Mid to high single-digit growth

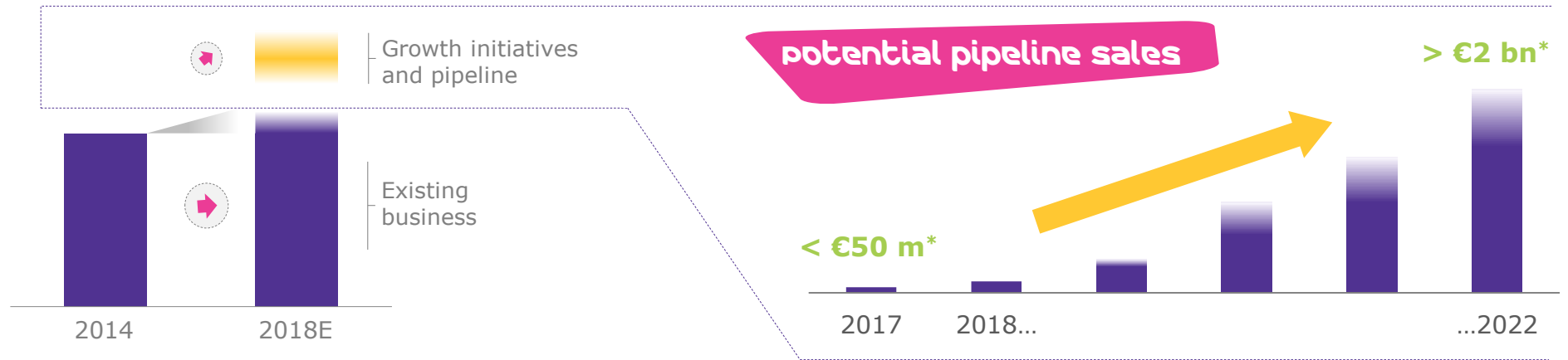
consumer health: Mid single-digit growth

Healthcare

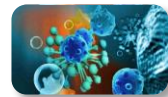
Well on track to deliver the pipeline

Deliver the pipeline

Increase R&D spending



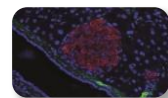
Key investments



Avelumab



BTK – inhibitor



TGF-beta trap

~€150 – 200 m higher R&D costs in 2017 vs. 2016

Main moving parts:

- Phase III progress of avelumab
- Dynamics of ramp-up for TGF-beta and BTK-i
- Regular prioritization in view of market dynamics

Healthcare

Increasing R&D productivity with focus on potentially transformative assets

phase I		phase II		phase III	registration
BTK-i (hematological tumors)	Avelumab (mono/combinations)	atacept (SLE)	tepotinib (HCC/NSCLC)	Avelumab (mono/combinations)	Avelumab (MCC)
DNA-PKi / ATRi (solid tumors)	M7824/TGF-b trap (basket trial)	BTK-i (RA, SLE)	Avelumab (MCC 1L)		
	NHS-IL 12 (solid tumors)	sprifermin (OA)	BTK-i (MS)		
■ Oncology		■ Immuno-Oncology		■ Immunology	
				■ Neurology	

Avelumab

- 30 clinical programs ongoing (>6,200 patients in >15 tumor types)
- Nine phase III trials and various Phase I cohorts ongoing
- For MCC, decision by EMA expected in H2 2017

TGF-b trap

- Enrolling in phase Ib cohorts (14 indications); >600 patients enrolled
- Preliminary data for selected cohorts expected end of 2017

BTK inhibitor

- Three immunology phase IIb trials initiated (RA, SLE, MS)
- One phase I trial in Oncology ongoing (different molecule)

DDR-Program

- Transition of in licensed ATRi and DNA-PKi compounds ongoing
- Analysis of M3814 Phase I data for RT combination expected in H2 2017

Cladribine Tablets

- Approval of Mavenclad in Europe, launch in Germany ongoing

2017 Milestones:

- **Bavencio successfully launched in MCC and mUC in the U.S.**
- **Mavenclad approval and launch in Europe**
- **Positive CHMP opinion for avelumab (MCC)**



03

**LIFE SCIENCE –
FOCUSING ON
PROFITABLE GROWTH**

Serving customers across the life science industry

RESEARCH



- Academic and government institutions
- Biopharma R&D
- Industry R&D

PROCESS



- Pharmaceutical companies
- Small biotech
- Contract manufacturing organizations

APPLIED



- Diagnostic manufacturers
- Clinical testing labs
- Food & Beverage manufacturers

We create sustainable value that is based on strong strategic levers



Wide, innovative portfolio

- A combined portfolio of +300,000 products
- Integrated offerings along the life science value chain
- Complete workflow solutions



Balanced geographic footprint

- Increased presence in North America
- Accelerating growth momentum in Asia
- Expanded geographic reach in 60+ countries



Industry-leading capabilities

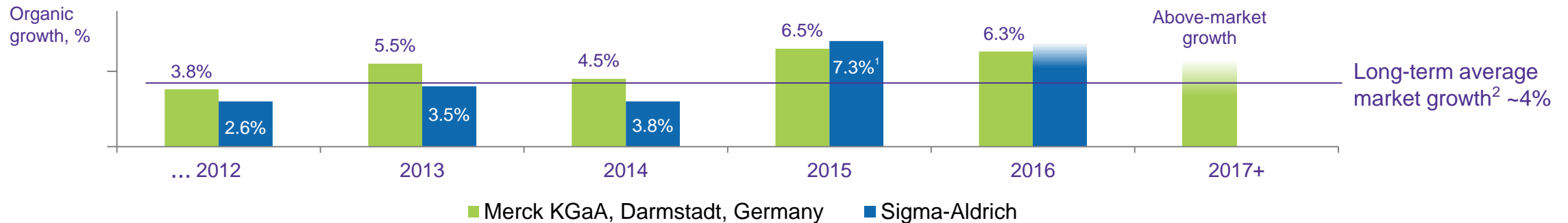
- Outstanding supply chain management (ability to deal with complexity)
- Simple e-commerce platform (customer interface with global coverage)
- Expertise to manage regulatory barriers

Our capabilities are the foundation for future topline growth in Life Science

Life Science

Above-market growth to be enhanced by top-line synergies

Merck KGaA, Darmstadt, Germany and Sigma-Aldrich organic growth rates versus market growth



Sources of market outperformance

1

Portfolio composition

- Exposure to biopharma
- Highest share of consumables
- Broad product offering

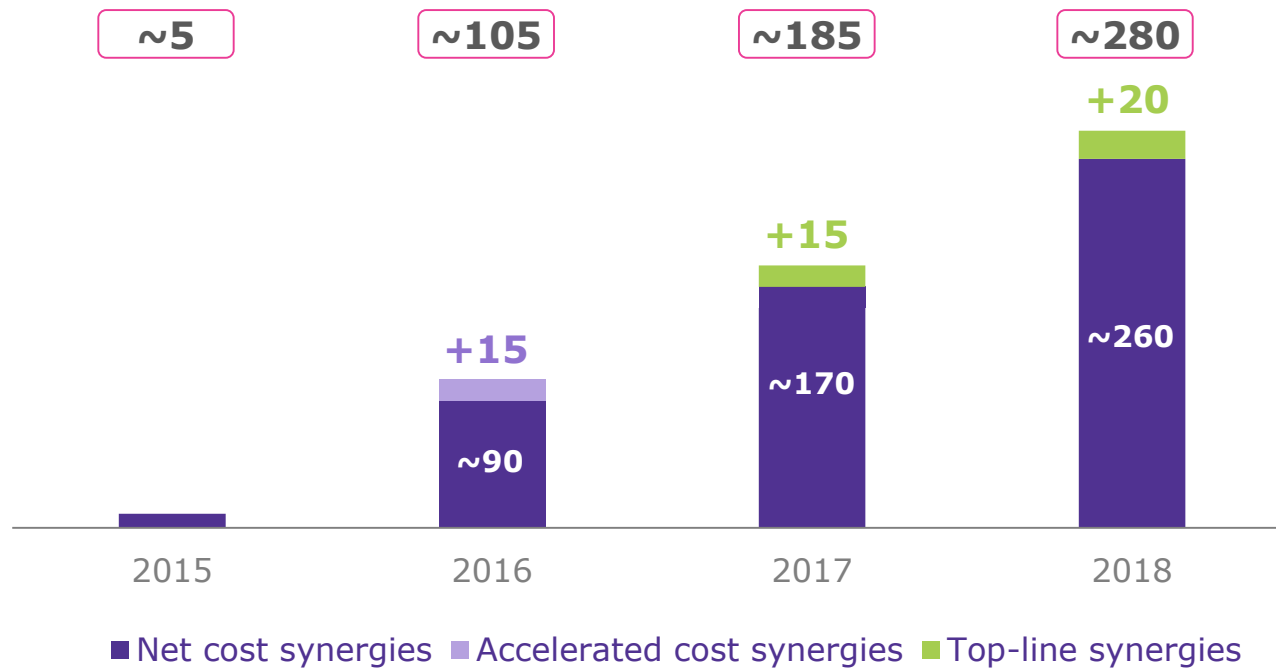
2

Top-line synergies

- Best in class eCommerce
- Excellent service capabilities
- Global reach

Synergy upgrade driven by fast 2016 execution and top-line synergies

EBITDA pre impact of synergy ramp-up [€ m]



Synergy upgrade of ~10% confirms strong integration capabilities

Sources

Cost synergy status (for 2016)

- **faster** implementation of synergy measures in all areas
- **2016** total cost synergies of **~€105 M**
- Integration costs remain unchanged at ~€400 m

Top-line synergies (from 2017)

- Strong eCommerce and **IT capabilities** applied to existing products
- Extensive **portfolio** and **customer** complementarity in Process and Applied Solutions
- Leverage **regional** Merck KGaA, Darmstadt, Germany – Asia and Sigma – North America footprint
- Expecting **~50-100 bps** in additional **sales growth** with average EBITDA pre margin















04

**PERFORMANCE
MATERIALS –
MAINTAINING INNOVATION
LEADERSHIP**

Performance Materials

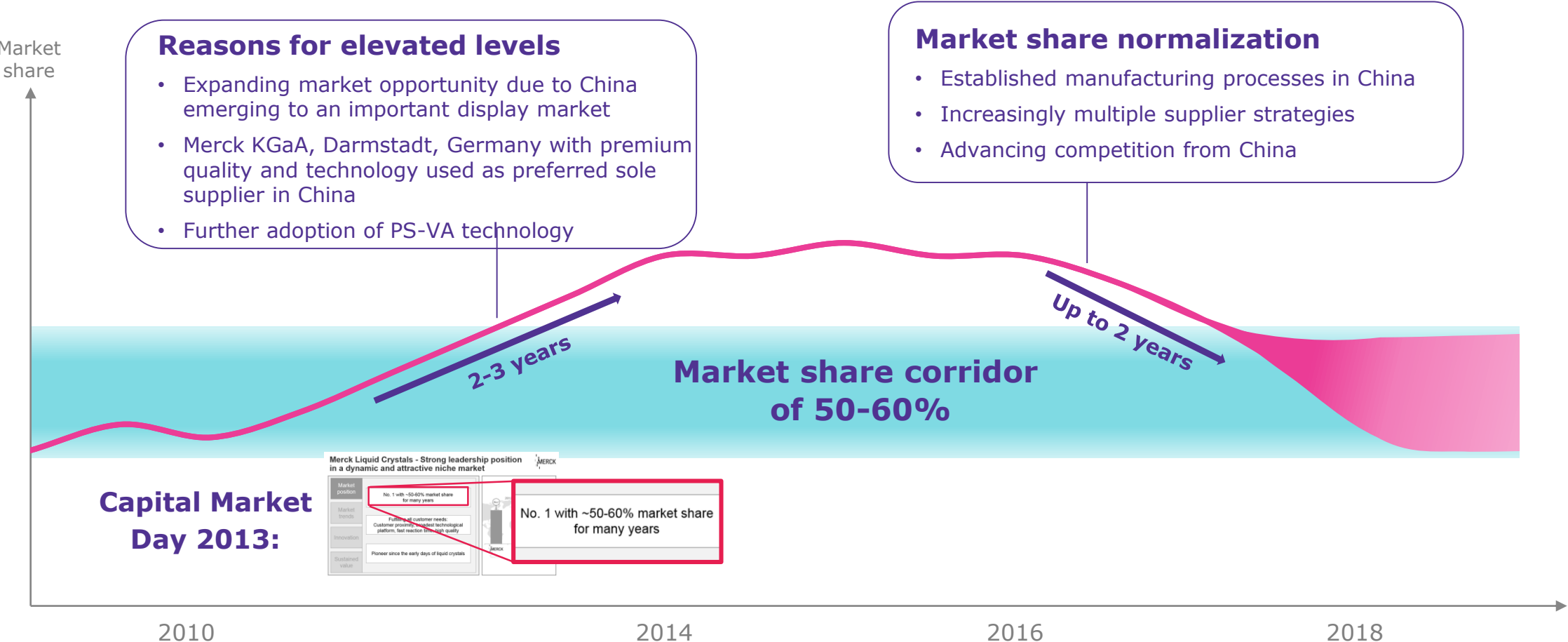
The four pillars are set for future growth

Business unit	% sales	Products	Mid-term growth trend
 Display Materials	 ~50-55%	<ul style="list-style-type: none"> Liquid crystals (LC) and photoresists for TVs, smartphones and tablet computers Other display and non-display applications (e.g. LC Windows) 	
 Integrated Circuit Materials	 ~15-20%	<ul style="list-style-type: none"> Dielectrics, colloidal silica, lithography materials, yield enhancers, edge-bead removers Polyimide raw materials and printing materials 	
 Pigments and Functional Materials	 ~15-20%	<ul style="list-style-type: none"> Effect pigments and functional materials for coatings, plastics, printing and cosmetics Functional materials for cosmetics & special applications 	
 Advanced Technologies	 ~5-10%	<ul style="list-style-type: none"> Organic and inorganic light emitting diodes Functional materials for electronics and energy solutions 	

Well-founded medium-term low single-digit growth profile

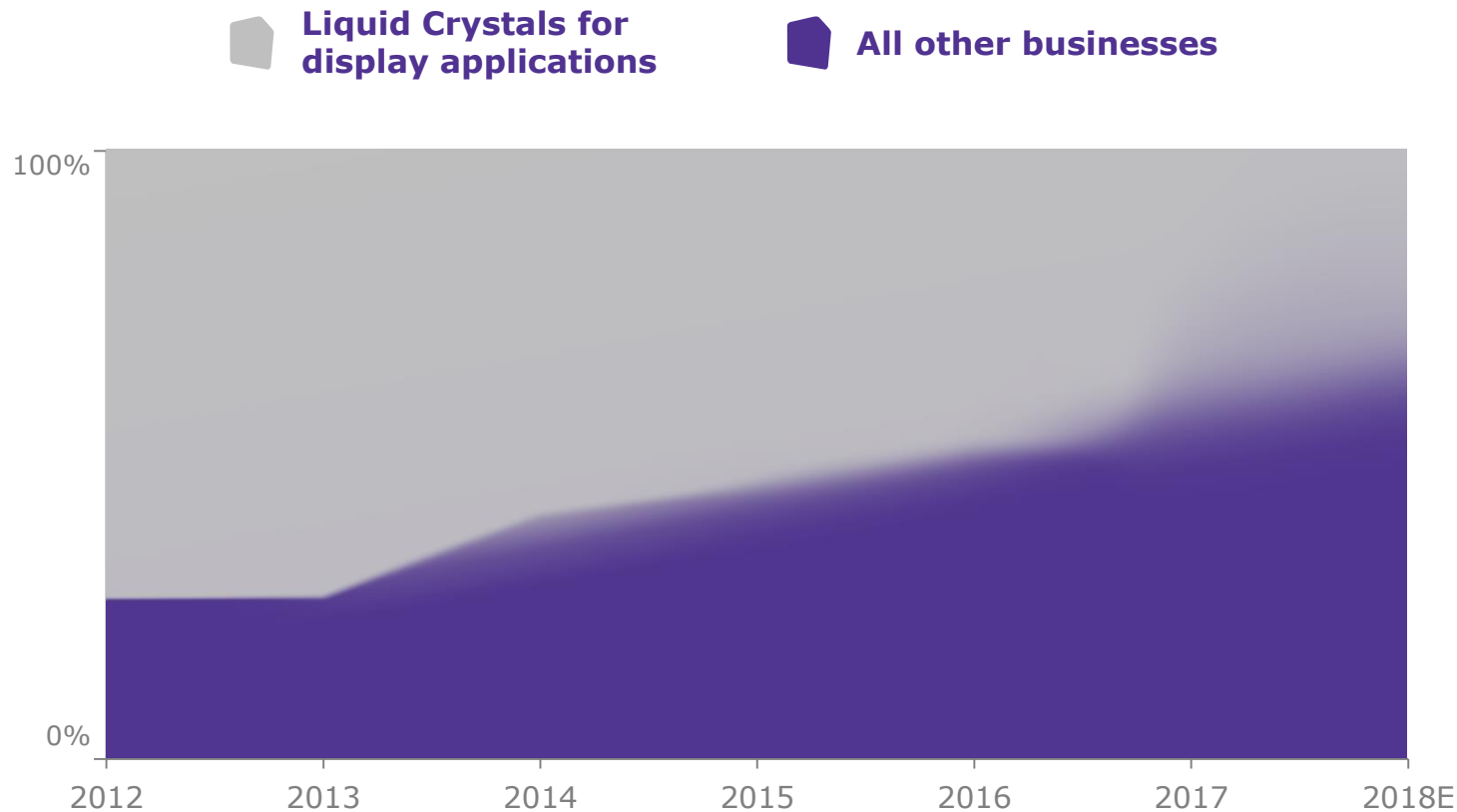
Market shares are returning to normal levels

Merck KGaA, Darmstadt, Germany global liquid crystal market share development



Four-pillar-strategy drives Performance Materials to a higher level of diversification

Sales share of Liquid Crystals for displays versus all other businesses

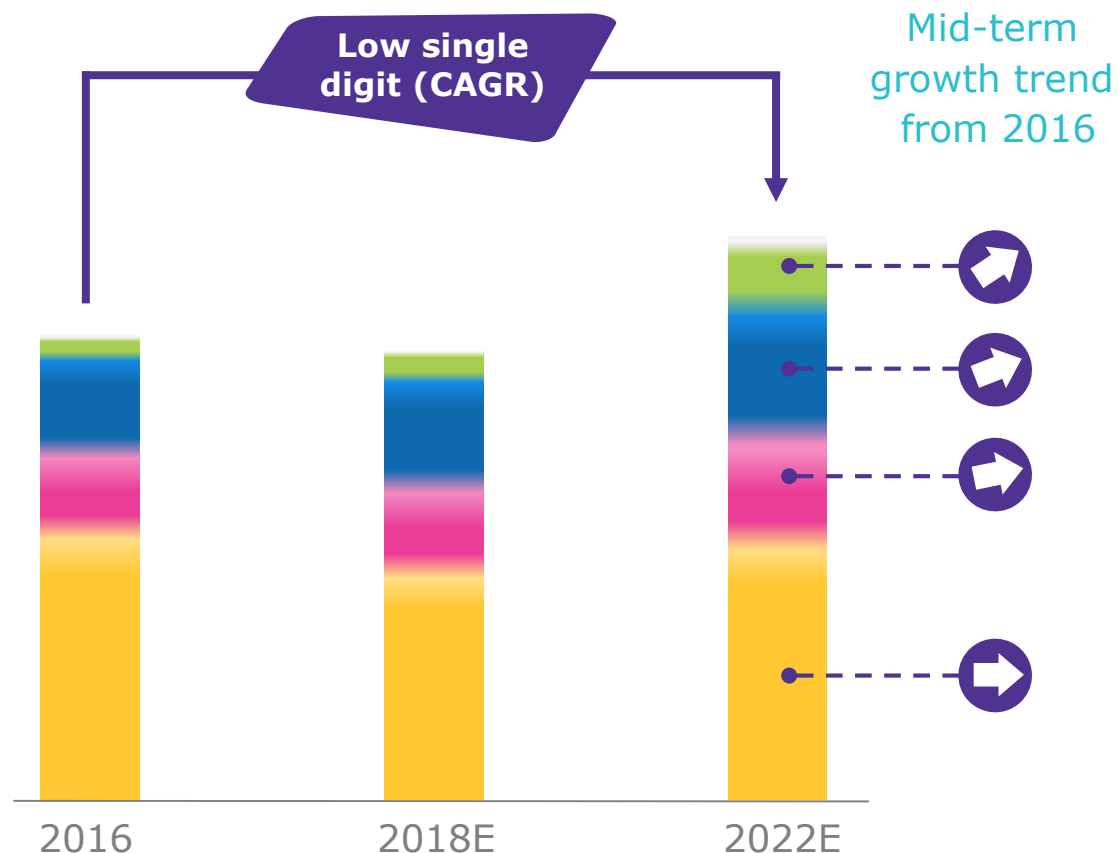


Diversification of Performance Materials increased due to

- AZ acquisition in 2014
- LC market shares returning to more normal levels
- Higher growth of non-LC businesses

Performance Materials on track to achieve solid growth path

Performance Materials mid-term sales development and drivers



Advanced Technologies

Enhance and exploit leading position in OLED

Integrated Circuit Materials

Outpace market growth with specialty materials assisting miniaturization

Pigments & Functional Materials

Expansion into larger functional material markets

Display Materials

- Assumed market share stabilization after 2018
- Area demand and capacity growth of ~4%
- New modes mitigating price declines (SA-VA, UB-Plus,...)
- Liquid Crystals initiatives beyond displays to contribute from 2018 onwards (windows, antennas, light guiding)



05

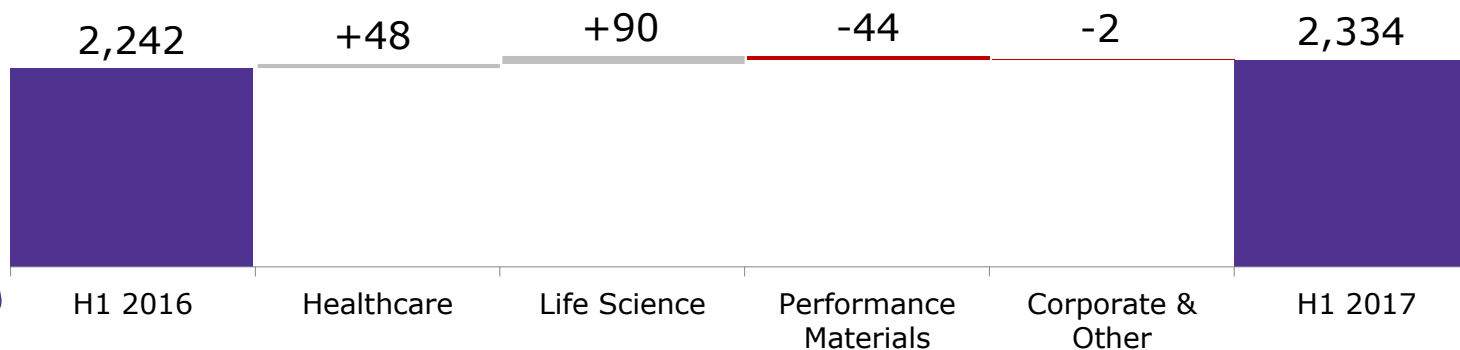
**BUSINESS AND
FINANCIAL REVIEW
H1 2017**

Life Science and Healthcare drive growth and profitability

H1 2017 YoY net sales

	Organic	Currency	Portfolio	Total
Healthcare	3.5%	1.0%	-1.0%	3.5%
Life Science	3.7%	1.2%	0.3%	5.3%
Performance Materials	-2.0%	3.2%	0.0%	1.1%
Group	2.7%	1.5%	-0.3%	3.8%

H1 YoY EBITDA pre contributors [€ m]



- Healthcare reflects strong growth in General Medicine, especially Glucophage in China
- Organic performance in Life Science driven by all business units
- Performance Materials organically lower as market share normalization in LC outweighs growth of other businesses
- HC benefits from organic growth, approval milestones and royalty swap (~€100 m) outweighing higher M&S and R&D costs
- Life Science driven by organic growth and ongoing synergy realization
- Performance Materials burdened by negative business mix & usual price declines
- Corporate EBITDA pre contains hedging and investments in corporate initiatives

H1 2017: Overview

Key figures

[€m]	H1 2016	H1 2017	Δ
Net sales	7,470	7,752	3.8%
EBITDA pre	2,242	2,334	4.1%
Margin (in % of net sales)	30.0%	30.1%	
EPS pre	3.09	3.34	8.1%
Operating cash flow	663	1,297	95.5%

[€m]	Dec. 31, 2016	Jun. 30, 2017	Δ
Net financial debt	11,513	11,248	-2.3%
Working capital	3,486	3,775	8.3%
Employees	50,414	52,233	3.6%

Comments

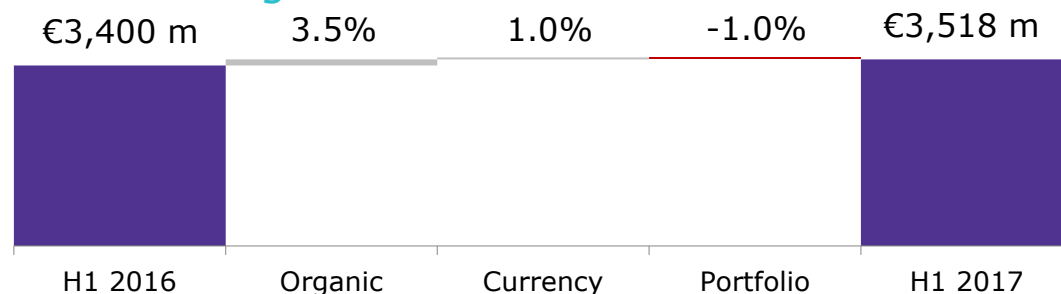
- EBITDA pre increase driven by royalty income swap, synergies and organic performance
- EPS pre increases due to higher EBITDA pre and improved financial result
- Strong increase in operating cash flow mainly driven by high tax burden LY
- Net financial debt reflects operating cash flow versus dividend payment
- Working capital reflects increased receivables mainly due to Glucophage repatriation
- Higher headcount due to investments in growth markets and takeover of temporary workers

Healthcare: Royalty swap and milestone payments drive profitability

Healthcare P&L

[€m]	H1 2016	H1 2017
Net sales	3,400	3,518
Marketing and selling	-1,256	-1,367
Administration	-137	-154
Research and development	-756	-765
EBIT	939	794
EBITDA	1,387	1,095
EBITDA pre	1,065	1,113
Margin (in % of net sales)	31.3%	31.6%

Net sales bridge

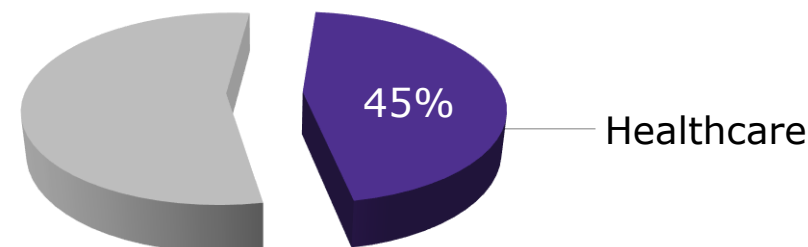


*Productive Development Partnership
Totals may not add up due to rounding

Comments

- Rebif still impacted by competition in U.S. & EU, while U.S. pricing and Q2 inventory stocking as well as PDP* in Brazil support performance
- Erbitux shows slight organic decline - volume increase in growth markets outweighed by competition and price reductions in Europe
- Marketing & selling reflects investments for launches and costs for Glucophage repatriation in China
- R&D spend slightly higher, expected ramp-up in H2
- EBIT reflects Kuvan disposal gain of €324 m in Q1 2016
- Profitability benefits from royalty swap, Bavencio approval milestones and organic performance outweighing investments in M&S and R&D

H1 2017 share of group net sales

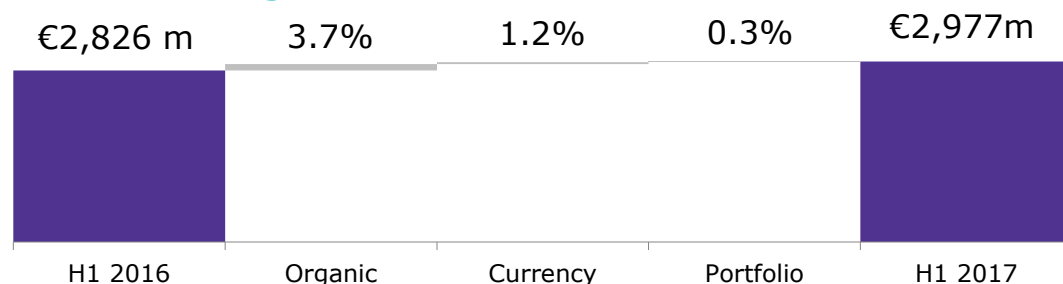


Life Science: Ongoing synergy realization drives margin progression

Life Science P&L

[€m]	H1 2016	H1 2017
Net sales	2,826	2,977
Marketing and selling	-833	-891
Administration	-121	-135
Research and development	-126	-129
EBIT	271	457
EBITDA	627	841
EBITDA pre	810	900
Margin (in % of net sales)	28.6%	30.2%

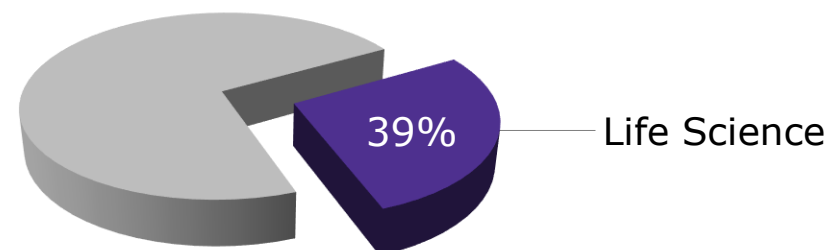
Net sales bridge



Comments

- Process Solutions benefits from robust demand for single-use, services & virus removal, against tough comps & soft start at some larger accounts
- Applied Solutions shows solid organic growth, fueled by robust demand for food & beverage and analytical testing as well as lab water platform
- Research Solutions posts slight organic growth driven by China across portfolio and offsetting soft academia market in the U.S. and Europe
- Marketing & selling increase in line with sales progression
- H1 2016 EBIT affected by inventory step-up for Sigma-Aldrich
- Profitability reflects ongoing synergy realization and organic growth

H1 2017 share of group net sales

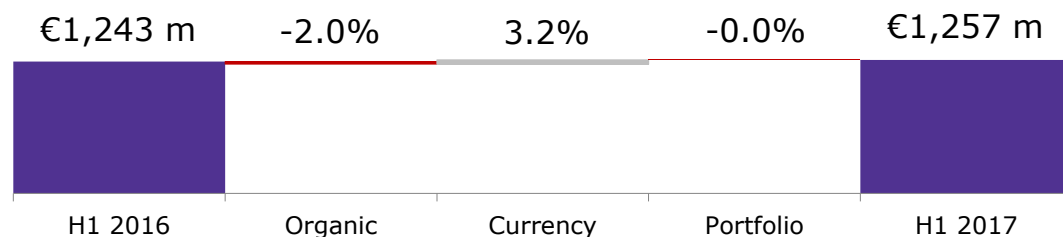


Performance Materials: Liquid Crystals sales decline burdens profitability

Performance Materials P&L

[€m]	H1 2016	H1 2017
Net sales	1,243	1,257
Marketing and selling	-116	-126
Administration	-31	-36
Research and development	-101	-116
EBIT	399	362
EBITDA	534	487
EBITDA pre	547	503
Margin (in % of net sales)	44.0%	40.0%

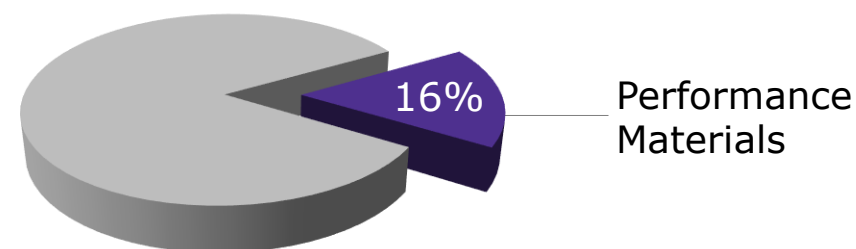
Net sales bridge



Comments

- Organic growth of Integrated Circuit Materials, Pigments and OLED cannot offset Liquid Crystal sales decline
- Ongoing LC market share normalization drives sales decline
- OLED continues to grow on industry capacity expansion & investments
- Strong growth of Integrated Circuit Materials driven by all major material classes, esp. strong dielectrics demand for complex chips
- Healthy growth of Pigments due to solid demand for decorative pigments especially in automotive applications; active cosmetics with tough comps
- Profitability reflects lower share of LC resulting in negative business mix as well as higher R&D for future growth projects

H1 2017 share of group net sales





06

EXECUTIVE SUMMARY AND GUIDANCE

Group

We are well on track to deliver on our promises



Group

Net debt reduced by ~€1.4 bn¹
Strict financial discipline supports rating



Healthcare

Base business growing
2 avelumab indications & cladribine-tablets launched



Life Science

Sigma-Aldrich synergies raised and well on track
Organic growth above market



Performance Materials

Market challenges well managed
New technologies in test phase

**Important
Milestones
reached
to deliver
on our
promises**

**CMD²
December
2015**

**Q2 2017
Results**

2018

Full-year 2017 guidance broadly confirmed

▶ Net sales: ~ €15.3 – 15.7 bn ◀

▶ EBITDA pre: ~ €4,400 – 4,600 m ◀

▶ EPS pre: ~ €6.15 – 6.50 ◀





Appendix

01 Guidance details

02 Healthcare

03 Life Science

04 Performance Materials

05 Financial details



01

GUIDANCE DETAILS

2017 business sector guidance



Healthcare

Net sales

- Slight organic growth
- Ongoing organic Rebif decline
- Other franchises growing; repatriation of Glucophage/China supportive

EBITDA pre

~ €1,900 – 2,000 m



Life Science

Net sales

- Organic growth slightly above market, driven by Process Solutions
- First minor contribution of top-line synergies

EBITDA pre

~ €1,780 – 1,850 m



Performance Materials

Net sales

- Slight to moderate organic decline
- Volume increases in all businesses
- Continuation of Liquid Crystal market share normalization in China

EBITDA pre

~ €950 – 1,050 m

Additional financial guidance 2017

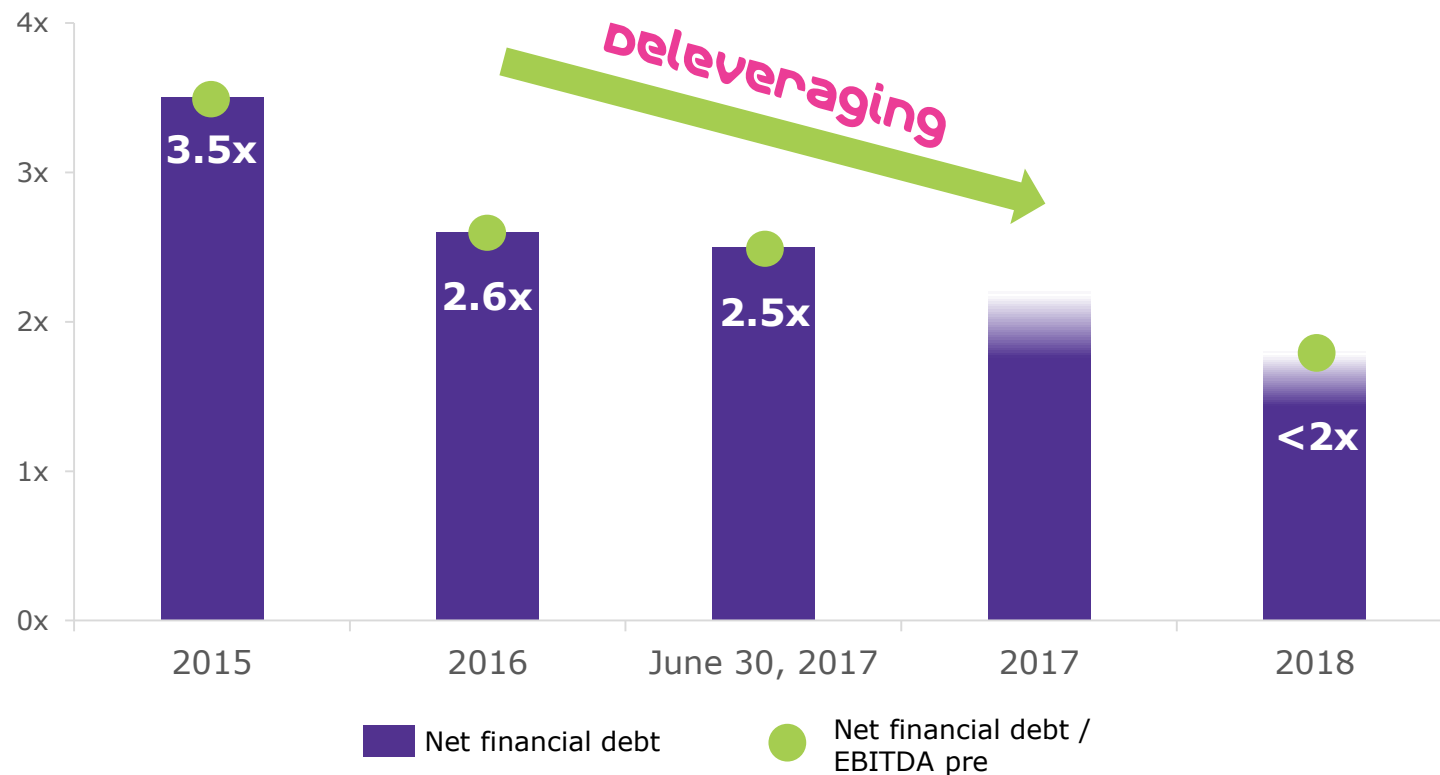
Further financial details

Corporate & Other EBITDA pre	~ -€350 – -400 m
Interest result	~ -€250 – -260 m
Effective tax rate	~ 23% to 25%
Capex on PPE	~ €850 – 900 m
Hedging/USD assumption	2017 hedge ratio ~60% at EUR/USD ~ 1.11 to 1.13
2017 Ø EUR/USD assumption	~ 1.09 – 1.13

Strong focus on cash generation to ensure swift deleveraging

Net financial debt* and leverage development

[Net financial debt/
EBITDA pre]



Focus on deleveraging

- Commitment to swift deleveraging to ensure a strong investment grade credit rating and financial flexibility
- Strong cash flow will be used to drive down leverage to expected <2x net debt/EBITDA pre in 2018
- Larger acquisitions (>€500 m) ruled out for the next two years (or financed by divestments)

Group

We have clear financial priorities for the next two years



Focus on **cash flow**
and **deleveraging**

- **Strong cash flow** will be used to drive down gearing to <2x net debt / EBITDA pre in 2018
- **Larger acquisitions (>€500 m) ruled out** for the next two years (or financed by divestments)
- **Dividend policy** reflects sustainable earnings trend



Ongoing cost discipline

- **Synergy generation** is utmost priority
- **Cost discipline** continues in all business sectors
- **Further efficiency gains** from ongoing improvement and harmonization of processes and systems



**Efficient capital
allocation**

- **All our businesses** have growth potential
- **Decisions on growth investments** are based on sound business cases and robust clinical data

Near-term financial priorities will secure our profitable growth path

Our successful regular portfolio optimization will continue

DNA

- Acquisitions and divestments are part of the company's history
- Licensing transactions remain on our agenda

Regular portfolio review and active capital allocation will continue

prerequisites

- Merck KGaA, Darmstadt, Germany is highly cash-generative with free cash flow¹ ~€2 bn p.a.
- Financial flexibility is a prerequisite for transactions

Larger transactions will return once financial flexibility is restored

experience

- 28 transactions since 2002 for ~€38 bn²
- Track record of value-generating integration

All prior transactions earned their required cost of capital

clear criteria

- Supporting mid-term strategy and strengthening core business
- Growing in attractive markets
- Proven track record: strong ability to win
- Compelling financials

Disciplined approach to portfolio management will persist

Life Science and Healthcare with natural hedge, while Performance Materials affected by currency swings



Healthcare

Sales

- Global presence
- ~40% of sales in Europe

Costs

- High Swiss franc cost base due to manufacturing sites
- R&D hub and notable sales force in U.S.

FX Impact



Life Science

Sales

- Balanced regional sales split between EU, NA and RoW

Costs

- Extensive manufacturing and research footprint in the U.S.
- Global customer proximity requires broad-based sales force

FX Impact



Performance Materials

Sales

- ~80% of sales in Asia-Pacific
- Industry is USD-driven

Costs

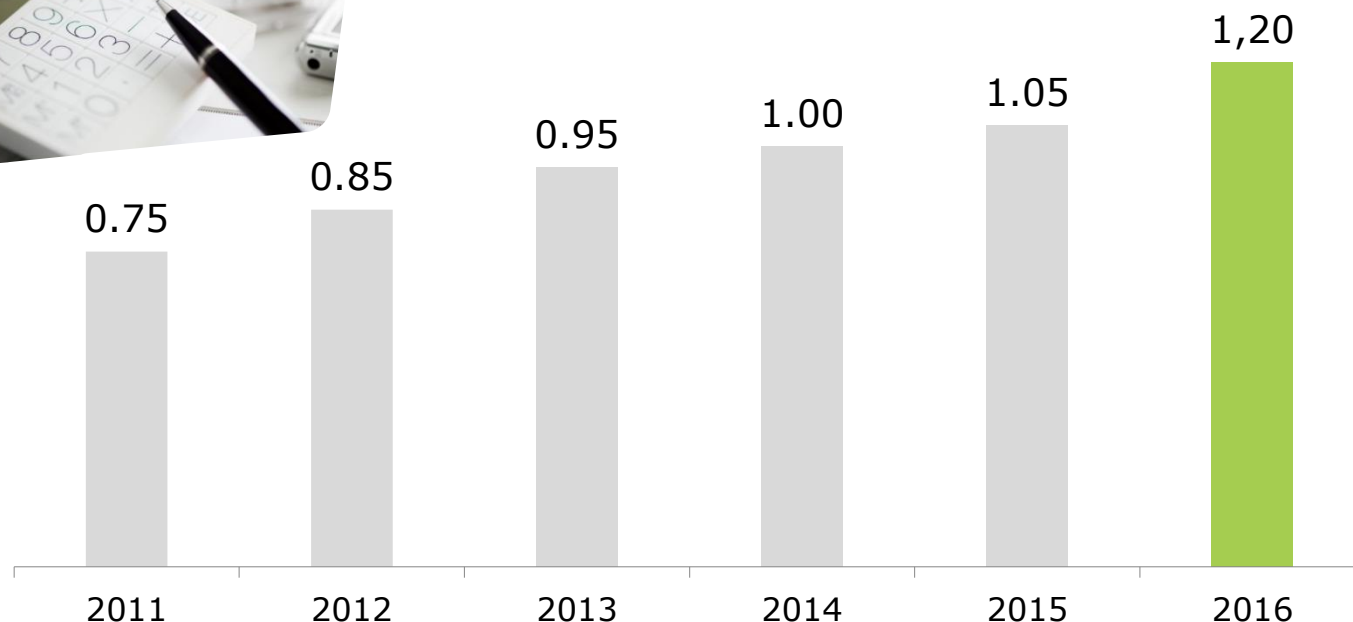
- Main production sites in Germany
- Several R&D and mixing facilities in Asia

FX Impact



Sustainable dividend development

Dividend¹ development 2011-2016



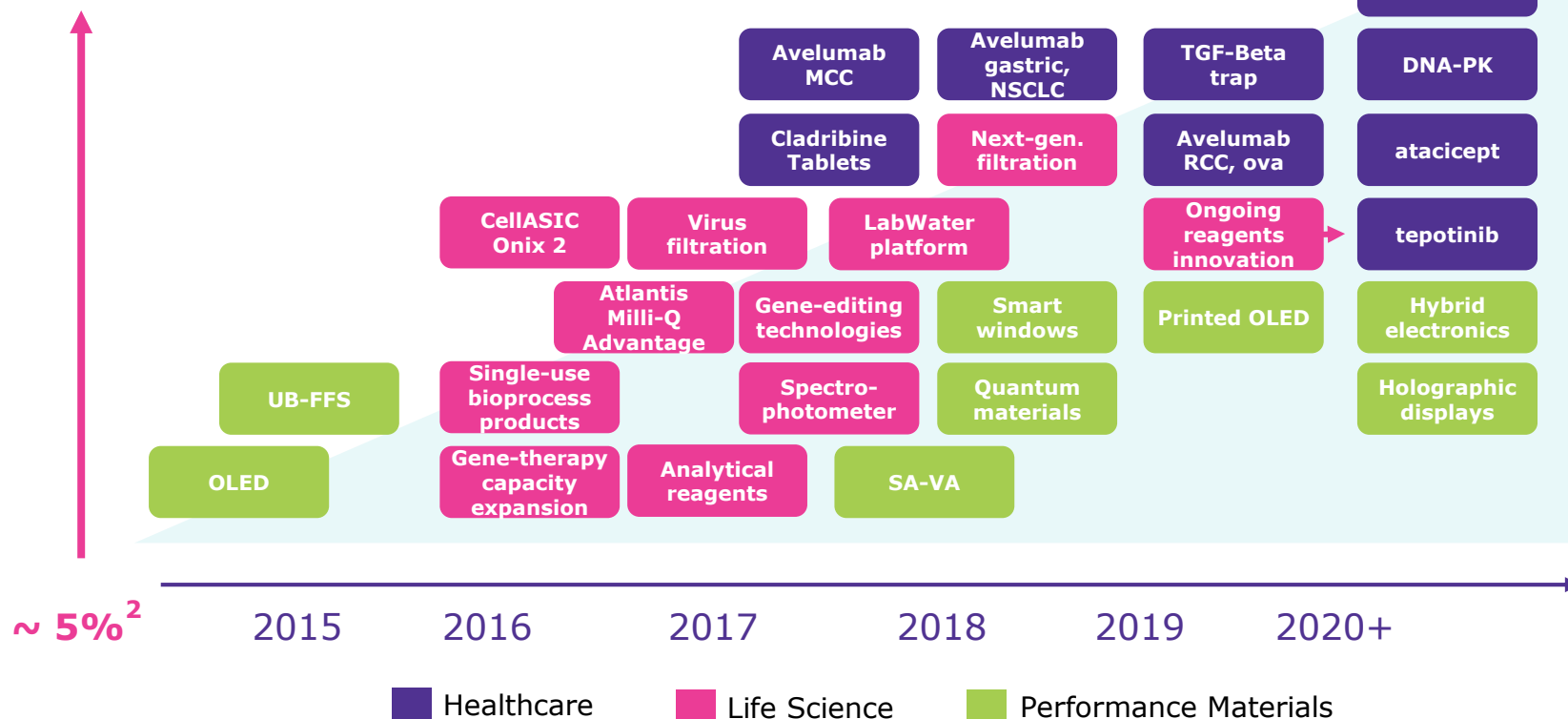
2016 dividend

- Dividend of €1.20 per share for 2016, reflecting 19.3% of EPS pre
- Dividend development in line with business performance and earnings progression
- Dividend yield² of 1.21%

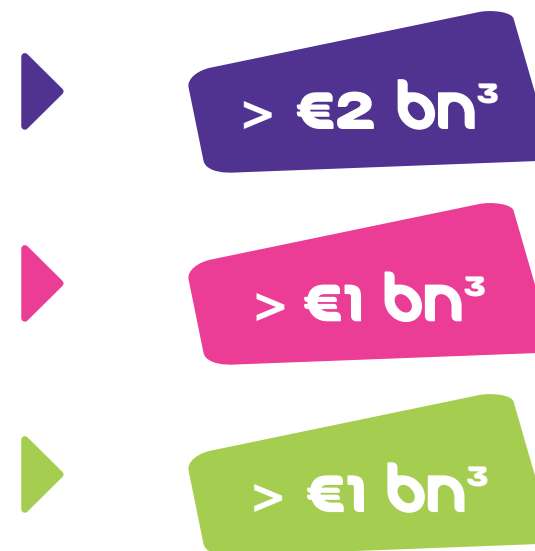
Our strong innovation capabilities will drive growth

New product launch cadence¹ by business sector

~ 20%²



New product sales³ potential 2022



Our rich pipeline will strongly drive sales

¹Illustration: timelines may change as product introductions are subject to customer adoption and implementation; pharma pipeline products are under clinical investigation and there is no guarantee any product will be approved in the sought-after indication; ²Share of total Group net sales from new products launched over the past 5 years, risk-adjusted; ³risk-adjusted



02 HEALTHCARE

Portfolio management: Differentiating across diverse business models

General Medicine portfolio



- Limited risk with high cash generation
- Sustainable steady growth fueled by Emerging Markets



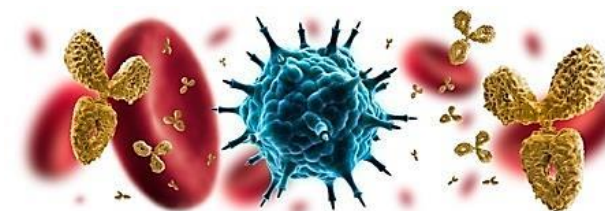
Biologicals portfolio



- Moderate risk and reward profile
- Economies of scale due to state-of-the-art production capabilities
- Emerging Markets gain importance



Oncology & Immunology innovation portfolio



- High reward at high risk
- Innovation key success factor – high R&D spend
- Promising pipeline projects



Mid-term, all parts of the portfolio need to earn their cost of capital

The road to maximizing Healthcare's existing franchises is clear

	Continue to drive mCRC* share by increasing patient testing and expanding head and neck coverage
	Ongoing 3x3 growth strategy implementation to strengthen sales and marketing activities delivering above-market organic sales growth
	Capitalize on strong efficacy and new smart devices to maximize differentiation and defend franchise
	Build on No.1 position and ART* channel access with embryo diagnostics and other innovative technologies
	Harness strengths of existing business and build a new focus area driven by innovative devices and services for patients
	Build on existing track record in emerging markets, drive brand and lifecycle management and expand business including asset repatriation



Clinical pipeline

Phase I

M2698 – p70S6K & Akt inhibitor
Solid tumors

M3814 – DNA-PK inhibitor
Solid tumors

M9831 (VX-984) – DNA-PK inhibitor
Solid tumors

M6620 (VX-970) – ATR inhibitor
Solid tumors

M4344 (VX-803) – ATR inhibitor
Solid tumors

M7583 – BTK inhibitor
Hematological malignancies

Avelumab – Anti-PD-L1 mAb
Solid tumors

Avelumab – Anti-PD-L1 mAb
Hematological malignancies

M9241 (NHS-IL12)⁶
Cancer immunotherapy
Solid tumors

M7824 - anti-PD-L1/TGF-beta trap
Solid tumors

M1095⁷ (ALX-0761)
Anti-IL-17 A/F nanobody
Psoriasis

Phase II

Tepotinib
c-Met kinase inhibitor
Non-small cell lung cancer

Tepotinib
c-Met kinase inhibitor
Hepatocellular cancer

Avelumab – Anti-PD-L1 mAb
Merkel cell carcinoma 1L¹

Sprifermin
Fibroblast growth factor 18
Osteoarthritis

Atacicept
Anti-Blys/anti-APRIL fusion protein
Systemic lupus erythematosus

Atacicept
Anti-Blys/anti-APRIL fusion protein
IgA nephropathy

Abituzumab
anti-CD 51 mAb
Systemic sclerosis with interstitial lung disease

Evobrutinib
BTK inhibitor
Rheumatoid arthritis

Evobrutinib
BTK inhibitor
Systemic lupus erythematosus

Evobrutinib
BTK inhibitor
Multiple sclerosis

Phase III

Avelumab – Anti-PD-L1 mAb
Non-small cell lung cancer 1L¹

Avelumab – Anti-PD-L1 mAb
Non-small cell lung cancer 2L²

Avelumab – Anti-PD-L1 mAb
Gastric cancer 1L^{1M}

Avelumab – Anti-PD-L1 mAb
Gastric cancer 3L³

Avelumab – Anti-PD-L1 mAb
Urothelial cancer 1L^{1M}

Avelumab – Anti-PD-L1 mAb
Ovarian cancer platinum resistant/refractory

Avelumab – Anti-PD-L1 mAb
Ovarian cancer 1L¹

Avelumab – Anti-PD-L1 mAb
Renal cell cancer 1L¹

Avelumab – Anti-PD-L1 mAb
Locally advanced head and neck cancer

Registration

Cladribine⁴ Tablets –
Lymphocyte targeting agent
Relapsing-remitting multiple sclerosis

Avelumab⁵ – Anti-PD-L1 mAb
Merkel cell carcinoma

- Neurology
- Oncology
- Immunology
- Immuno-Oncology

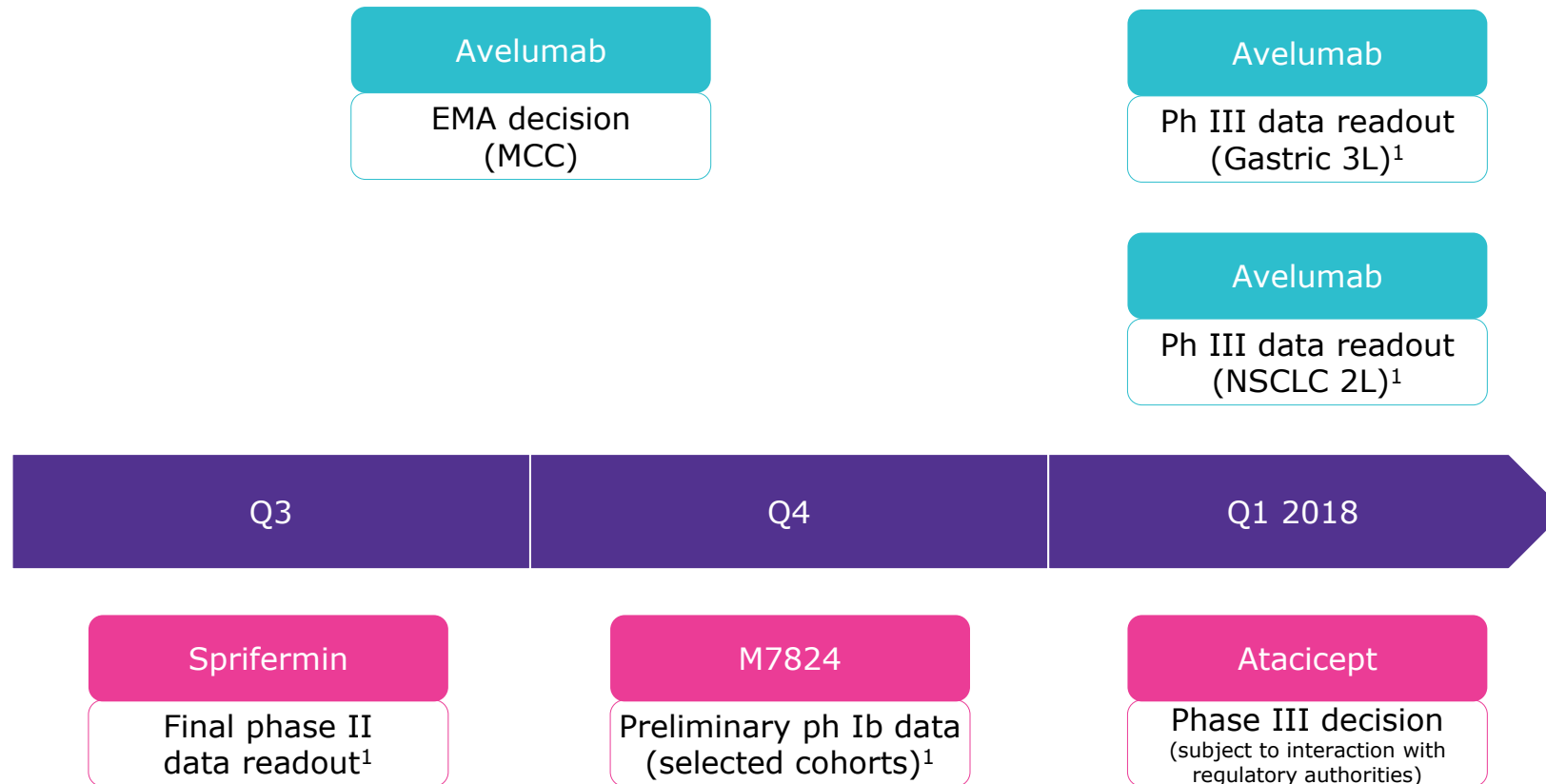
Pipeline as of July 28th, 2017

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 1st line treatment; ^{1M} First Line maintenance treatment; ² 2nd line treatment; ³ 3rd line treatment; ⁴ European Medicines Agency (EMA) accepted Marketing Authorization Application (MAA) from Merck KGaA, Darmstadt, Germany in July 2016; ⁵ EMA accepted MMA from Merck KGaA, Darmstadt, Germany in July 2016 and on March 23, 2017, the US FDA has approved avelumab for the treatment of adults and pediatric patients 12 years and older; ⁶ Sponsored by the National Cancer Institute (USA); ⁷ 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 Merck KGaA, Darmstadt, Germany

Outlook

2 potential launches, 4 pivotal catalysts and major value inflection points



Oncology

Strategy anchored on four foundational pillars

1	Avelumab	<ol style="list-style-type: none">1. Monotherapy as a basis for combinations2. Establish immunogenic priming in combination or sequence with CT/RT¹3. Proprietary novel combinations4. Establish value of unique molecular characteristics (ADCC)	<ol style="list-style-type: none">1. MCC, UC 2L, Gastric 3L, NSCLC 1L/2L,2. Maintenance in UC 1L, gastric 1L, ovarian 1L3. Avelumab + Inlyta (RCC 1L), plus 5 phase 1 combinations4. DLBCL, NSCLC 1L (high intensity), unique combinations leveraging ADCC
2	IO bi-functionals	Engineer or access platforms where biology is best addressed by a bi-functional approach	<ul style="list-style-type: none">• anti-PD-L1/TGF-beta trap• anti-PD-L1/anti-LAG-3• NHS-IL 12
3	DNA Damage Response (DDR)	Establish leadership in DDR and leverage synergies across portfolio (immuno-oncology plus emerging platforms)	<ul style="list-style-type: none">• DNA-PK-i• ATR-i• ATM-i
4	Emerging Platforms	Invest in complementary discovery areas	<ul style="list-style-type: none">• Antibody-Drug-Conjugates (ADC, e.g. partnership with Mersana/Sutro)• Oncogenic signaling• Bi-functional fusion proteins• Bi-specific antibodies

External Innovation

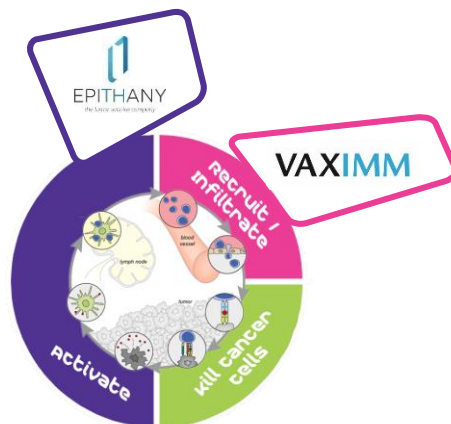
2017 deal activity aligned with strategic pillars

1

Clinical collaborations for avelumab combinations

expand across the immunity cycle

- **EpiThany:** EP-101 STEMVAC vaccine (breast cancer)
- **Vaximm:** Oral T-cell immunotherapy (glioblastoma, colorectal cancer)

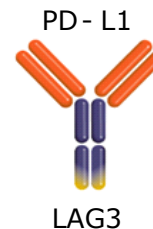


2



Leading bi-specific platform

- **Option deal**
- **Bi-specific antibodies** (promising lead asset **Anti-LAG3/ PD-L1**)
- FS118 shows superior activity pre-clinically (**expected in clinic 2018**)
- Potential in PDx-refractory setting
- Four additional mAb2 programs



3



strengthen DDR platform

- **Acquisition (license) deal**
- **Leadership** in DDR-i
- Combination of Vertex' Oncology and Merck KGaA, Darmstadt, Germany's DNA-PK inhibitor programs

Vertex

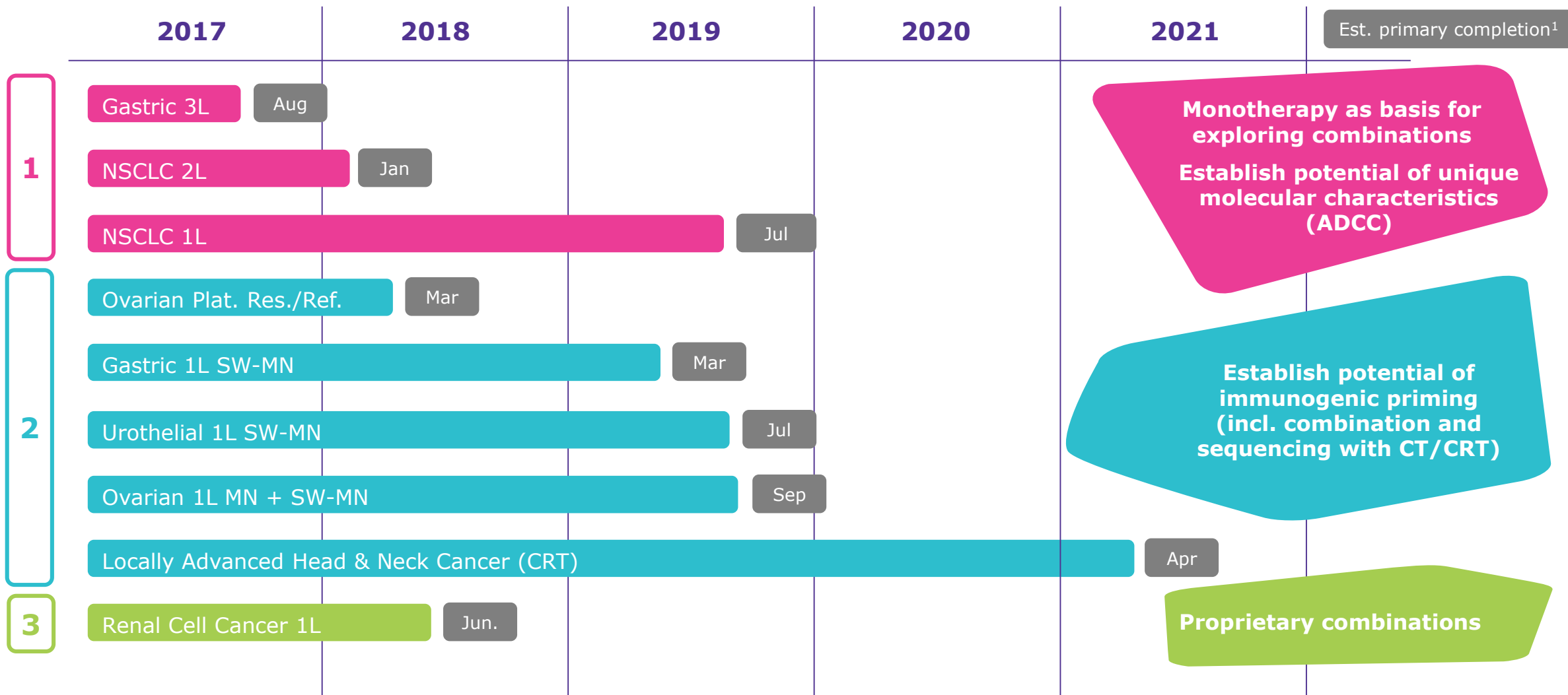
- Two **ATR-inhibitors**
- One **DNA-PK inhibitors**
- Two pre-clinical programs

Merck KGaA, Darmstadt, Germany

- DNA-PK inhibitor
- **ATM-inhibitor** (preclinical)

1 Avelumab

Nine ongoing pivotal studies with differentiation potential



¹ Estimated primary completion date according to Clinicaltrials.gov as of August 2, 2017

Acronyms: CT: Chemotherapy | CRT: Chemoradiotherapy | Plat. Res./Ref.: Platinum Resistant/Refractory | MN: Maintenance | SW: Switch

Avelumab

Clinical results support avelumab as therapeutic option for metastatic Merkel cell carcinoma

Encouraging response rates¹

- ORR: 31.8%
 - 9.1% complete response
 - 22.7% partial response
 - Rapid (78.6% responding within 7 weeks of treatment)
 - Durable (82.1% still responding at time of analysis)
- 6-mo OS: 69% (median OS: 11.3 months)
- 6-mo PFS rate: 40%
- Manageable safety profile; no unexpected safety signals

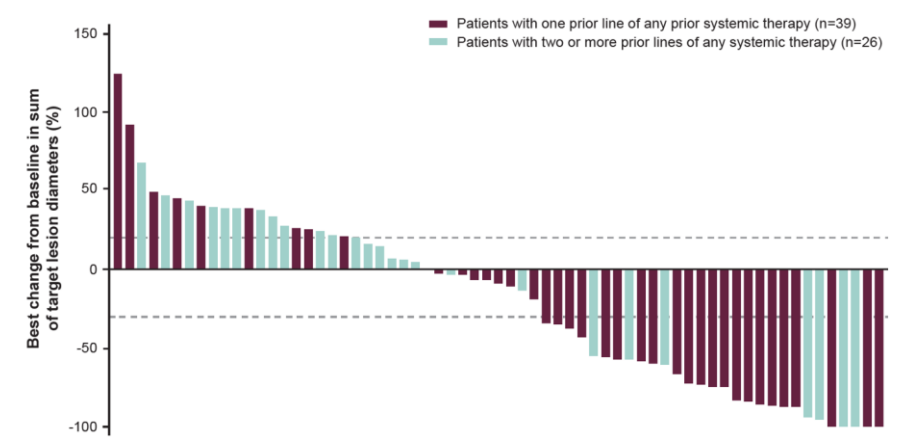


Note: timelines are event-driven and may change

¹Avelumab (MSB0010718C; anti-PD-L1) in patients with metastatic Merkel cell carcinoma previously treated with chemotherapy: results of the phase 2 JAVELIN Merkel 200 trial / Oral Presentation at the 52nd ASCO Annual Meeting, June 3-7, 2016; Chicago, Illinois. Abstract No. 9508; Howard Kaufman et al.

Potential for differentiation

- Largest international multicenter, open-label study of anti-PD-L1/PD-1 reported in this patient population (88 patients) – Responses observed in large number of patients
- Improved response rates observed when used earlier, i.e. fewer lines of prior chemotherapy appeared to be associated with better response to avelumab in MCC 2L and beyond
 - ORR of 40.4% for patients with one prior systematic treatment
 - ORR of 19.4% for patients with two and more prior treatments



Key ASCO abstracts at a glance (two oral presentations)

MCC (1L)

- Initial results from a cohort of chemotherapy-naïve pts with mMCC (ongoing study)
- Manageable safety profile, consistent with findings for 2L+ cohort
- **Unconfirmed ORR: 64.0%** (≥6 weeks follow-up) / **Confirmed ORR: 56.3%** (≥3 months follow-up)
- Avelumab is associated with early responses; preliminary results suggest that responses mature to become durable

NSCLC

- Exposure-response and PD-L1 expression analysis of NSCLC 2L (Phase I cohort)
- Patients in upper half of increased exposure ($C_{troughfirst}$ -dose quartiles Q3-Q4) showed increasing ORR (by higher PD-L1-staining level); **ORR: 25% (≥1%); 26% (≥5%); 33% (≥50%); 43% (≥80%)***
- Analysis provides rationale for the modification of the NSCLC 1L Phase III trial

Urothelial

- Updated efficacy and safety data of avelumab in metastatic urothelial carcinoma 2L (pooled Phase Ib)
- Durable responses in heavily pretreated patients, irrespective of tumor PD-L1 expression status
- **Confirmed ORR: 17.4%; 6.2% CR** (≥6m follow-up)

RCC (oral presentation)

- First line avelumab + Inlyta therapy in patients with advanced renal cell carcinoma 1L (Phase Ib)
- Preliminary findings confirm manageable safety profile and consistent with agents administered as monotherapy
- **Confirmed ORR: 58.2%**, based on 3 CR and 32 PR (follow-up ongoing)

Anti PD-L1/ TGF-beta trap (oral presentation)

- Preliminary results from Phase I dose-escalation study (bifunctional fusion protein targeting PD-L1 and TGF-β)
- Manageable safety profile in patients with heavily pre-treated advanced solid tumors
- Early signs of clinical efficacy: **1 ongoing confirmed CR** (cervical), **1 durable PR** (pancreatic), **1 unconfirmed PR** (anal)
- A 25% reduction in the sum of diameters of target lesions after 2 doses of M7824 (cervical), and 2 cases of prolonged stable disease (pancreatic; carcinoid).

Note: timelines are event-driven and may change

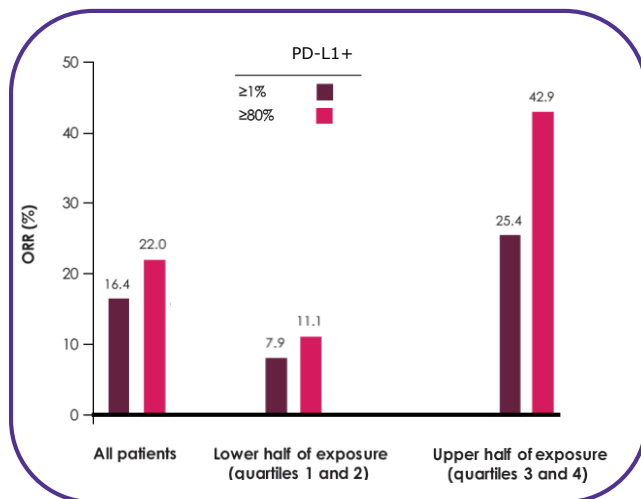
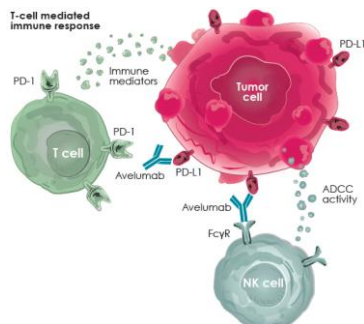
¹Avelumab (MSB0010718C; anti-PD-L1) in patients with metastatic Merkel cell carcinoma previously treated with chemotherapy: results of the phase 2 JAVELIN Merkel 200 trial / Oral Presentation at the 52nd ASCO Annual Meeting, June 3-7, 2016; Chicago, Illinois. Abstract No. 9508; Howard Kaufman et al.

1

Avelumab

NSCLC 1L: Assessing potential efficacy upside in mono-therapy¹

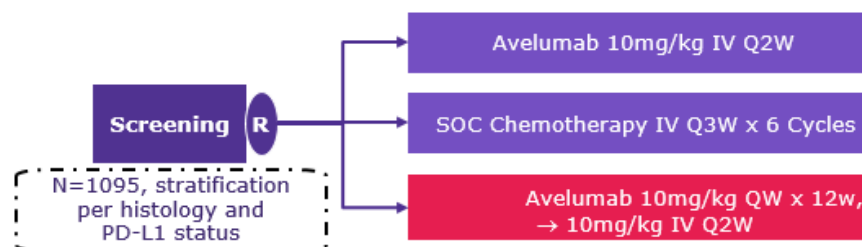
NSCLC 2L+: exposure response



NSCLC 1L: testing hypothesis of higher efficacy/intensity correlation

Hypothesis : higher drug intensity may result in greater efficacy (potentially driven by ADCC)

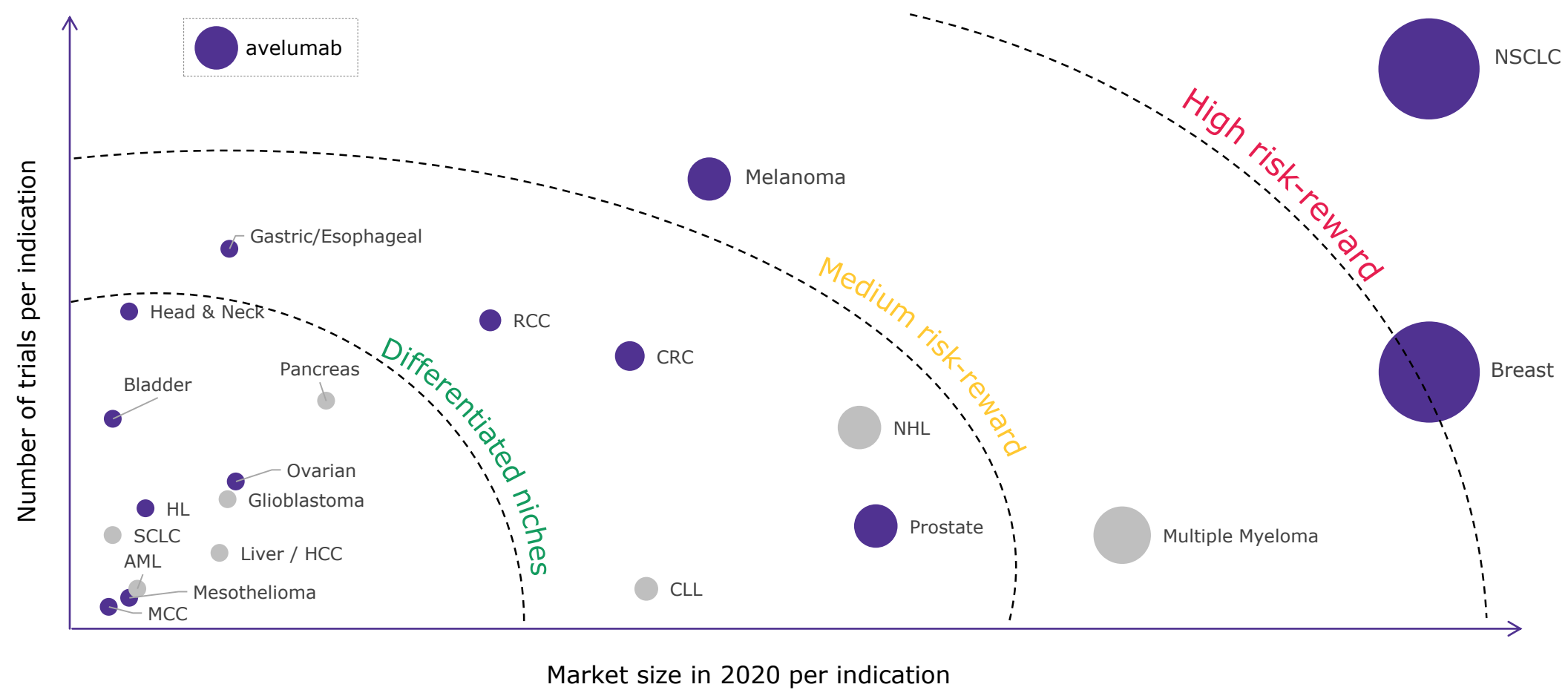
- Potential association between **higher ORR** and **higher avelumab exposure**
- ORR highest in patients with both higher avelumab **exposure** and tumors with higher levels of **PD-L1 expression**
- **NSCLC 1L phase III trial amended** to leverage high-intensity hypothesis (est. primary completion Apr 2019)



- **Primary endpoints:** PFS & OS @ high PD-L1-expression
- **Secondary endpoints:** PFS & OS @ moderate and low PD-L1-expression (BOR, DOR, Safety, QoL)
- **Hierarchical ordered hypothesis**

1 Avelumab

Avelumab plays predominantly in attractive and differentiated niches





Avelumab

Differentiation strategy varies according to chosen target indication and market

1

**Unsaturated
and / or niche
indications**

- Ambition to lead in niche indications (e.g. Merkel cell) or markets (e.g. Asia for gastric)
- Quick to market strategy (e.g. BTD designation for MCC)
- Small, but less crowded markets and sales potential with notable impact for us
- Strategic strength of Healthcare in niche markets

2

**Saturated
and / or major
indications**

- Learn from experience of incumbents/early movers in major indications (e.g. NSCLC, Bladder)
- Potential for combinations given breadth of combined development pipelines
- Differentiate in trial design and explore application of further biomarkers



1 Avelumab

Combinations will drive differentiation strategy



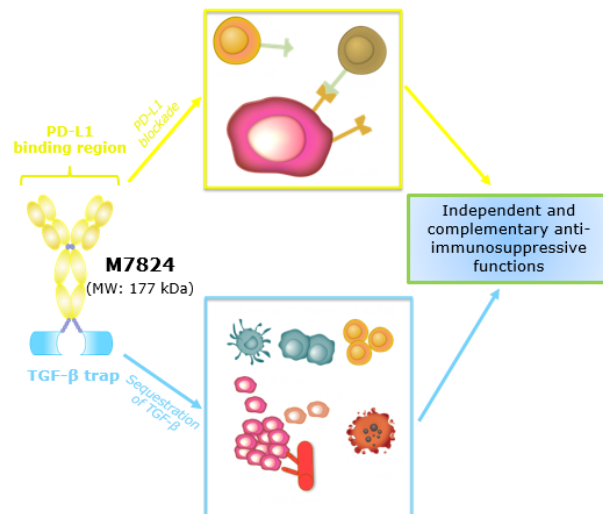
- **In registration: metastatic Merkel Cell (EU)**
- Phase III: Ovarian (1L & Plat. Res. Ref.)¹
- Phase III: Gastric (1L MN & 3L)
- Phase III: NSCLC (1L & 2L)
- Phase III: Urothelial (1L MN)
- Phase III: SCCHN (Locally advanced, Front line)
- Phase II: Merkel Cell (1L)
- Multiple other tumor types

- **Phase III: Ovarian 1L & Plat. Res. Ref.**¹
(Avelumab + Chemotherapy)
- **Phase III: Renal 1L**
(Avelumab + Inlyta)
- **Phase III: L/A Head and Neck**
(Avelumab + Chemoradiation)
- **Phase I: DLBCL**²
(Avelumab + various agents)
- **Phase I/II: Advanced malignancies**
(Avelumab + 4-1BB / + OX40)
- **Phase Ib/II: Ovarian**
(Avelumab + Entinostat; Syndax)
- **Phase I/Ib: Ovarian**
(Avelumab + VS-6063; Verastem)
- **Phase I/II: SCCHN**
(Avelumab + TG4001; Transgene)
- **Phase Ib/II: NSCLC**
(Avelumab + VX15/2503; Vaccinex)
- **Phase I/Ib: NSCLC**
(Avelumab + Debio1143; Debiopharm)
- **Phase I/Ib: Glioblastoma and Colorectal**
(Avelumab + VXM01; VAXIMM)

2

Anti-PD-L1/TGF- β trap

Dose escalation completed, showing first signs of clinical activity¹



- **Innovative first-in-class bifunctional fusion protein** designed to simultaneously target two immune suppressive pathways (blocking PD-L1 and reducing TGF- β signaling)
- **Manageable safety profile** (patients with heavily pretreated advanced solid tumors)
- **Saturated peripheral PD-L1 and sequestered all released plasma TGF- β 1, - β 2, and - β 3¹**

Patients with metastatic or locally advanced solid tumors for which no standard effective therapy exists or standard therapy has failed (N = 19)

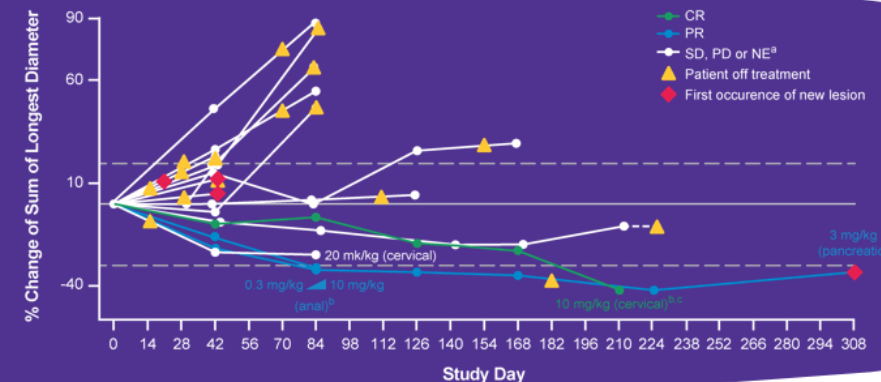
Dose Q2W, mg/kg	n
0.3 ∇ 10	3
1	3
3	3
10	3
20	7

Primary endpoints

- TEAEs
- DLTs
- Treatment-related AEs

Secondary endpoints

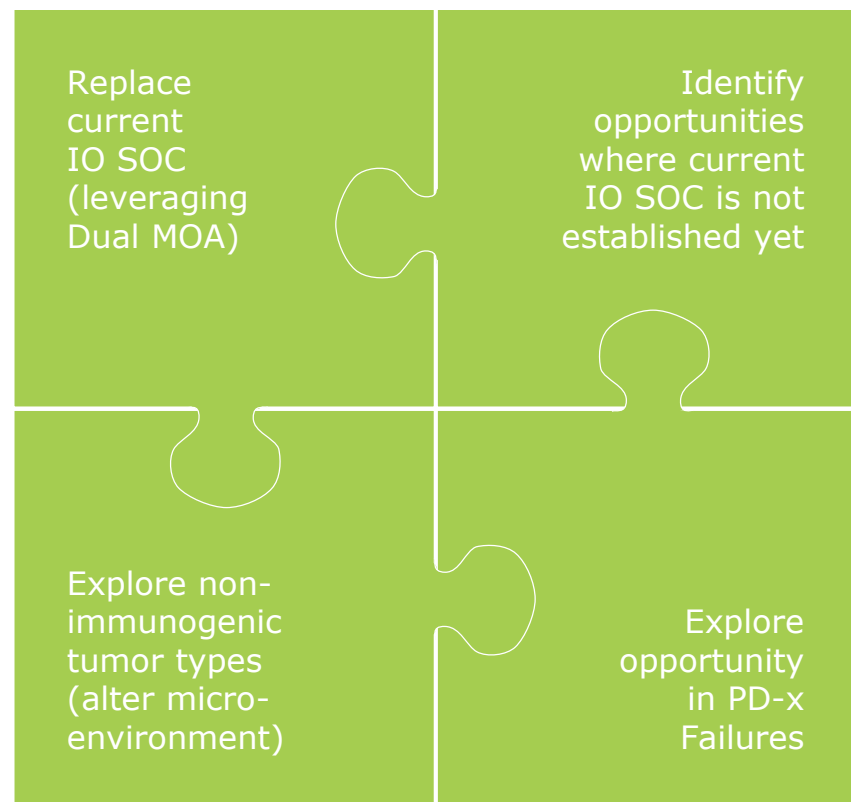
- PK
- M7824 immunogenicity
- BOR



Anti-PD-L1/TGF- β trap

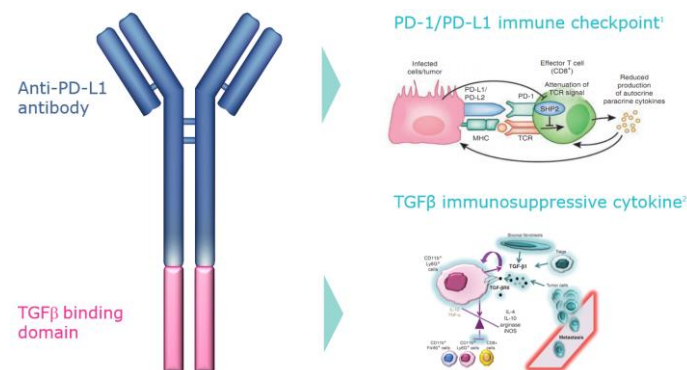
PD-L1–TGF-beta indicates potential to move beyond checkpoint inhibitors

Four focus areas for exploration



Status and next steps

- Novel, first-in-class bifunctional immunotherapy
- Bifunctional mode should result in broader application vs. respective mono-functional agents
- Great potential when combined with Standard of Care, immunotherapy and internal pipeline drug candidates
- Dose level finding of Phase I completed
- Recruiting into Ib expansion cohorts started in Q3 2016



2 Anti-PD-L1/TGF- β trap Cohort data will enable decision per indication/category

Dose escalation completed¹

14 cohorts in recruitment

Defined criteria allow timely decision

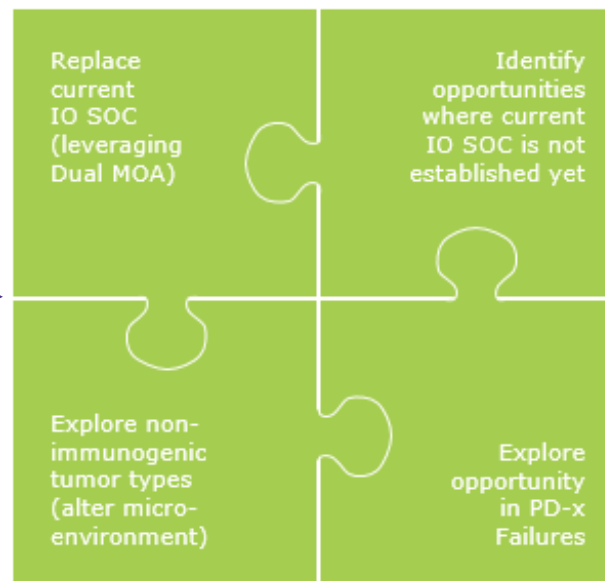
Preliminary results from a phase 1 trial of M7824 (MSB0011359C), a bifunctional fusion protein targeting PD-L1 and TGF- β , in advanced solid tumors

J. L. Gulley¹, C. R. Heery², J. Schlom³, R. A. Madan⁴, L. Cao¹, E. Lamping⁴, J. L. Marte¹, L. M. Cordes⁵, O. Christensen⁶, C. Helwig⁷, J. Strauss¹

¹National Cancer Institute at the National Institutes of Health, Bethesda, MD; ²Laboratory of Tumor Immunology and Biology, National Cancer Institute at the National Institutes of Health, Bethesda, MD; ³National Cancer Institute, Bethesda, MD; ⁴Gastrointestinal Malignancies Branch, National Cancer Institute, NIH, Bethesda, MD; ⁵National Institutes of Health, Bethesda, MD; ⁶EMD Serono, Billerica, MA; ⁷Merck KGaA, Darmstadt, Germany

ASCO ANNUAL MEETING '17 #ASCO17

- **Ongoing confirmed CR** (cervical, 10 mg/kg)
- **Durable confirmed PR** (pancreatic, 3 mg/kg)
- **Unconfirmed PR** (anal, 0.3 mg/kg 10 mg/kg)
- **Near-PR** (cervical, 20 mg/kg)
- **Prolonged SD** (pancreatic, 3 mg/kg)
- **Prolonged SD** (carcinoid, 1 mg/kg)



Expand cohort and/or explore single-arm path-to-registration

Expand cohorts to confirm signal and/or follow with randomized comparative trial

Explore biomarker driven pan-tumor opportunities

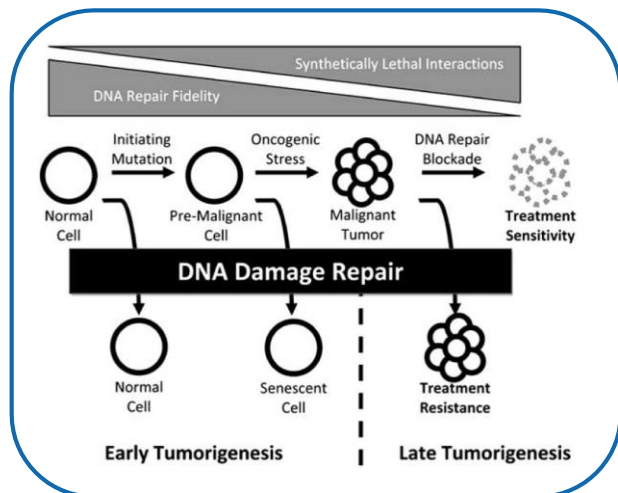
De-prioritize cohort

¹ As presented by J. L. Gulley at ASCO Annual Meeting 2017, June 5, 2017.
Acronyms: CR: complete response | PR: partial response

3

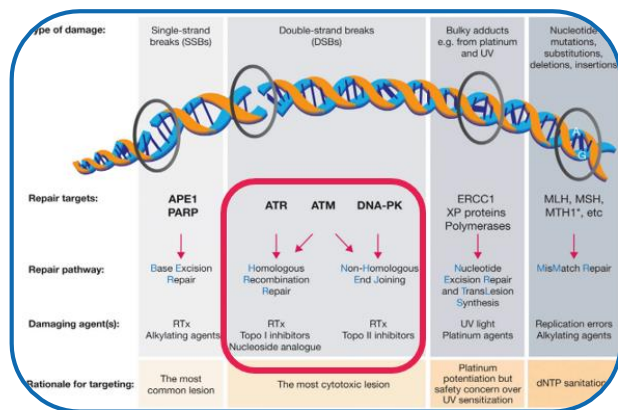
DNA damage response (DDR)

Complete portfolio supporting leadership in a potentially disruptive class



Genomic instability: a hallmark of late stage cancers¹

- DNA damage response (DDR) keeps genetic information intact
- In many cancers DDR pathways are defected, leading to greater dependency on remaining functional DDR pathways
- Preferentially inhibiting remaining DDR pathways can result in cancer cell death ("synthetic lethality")



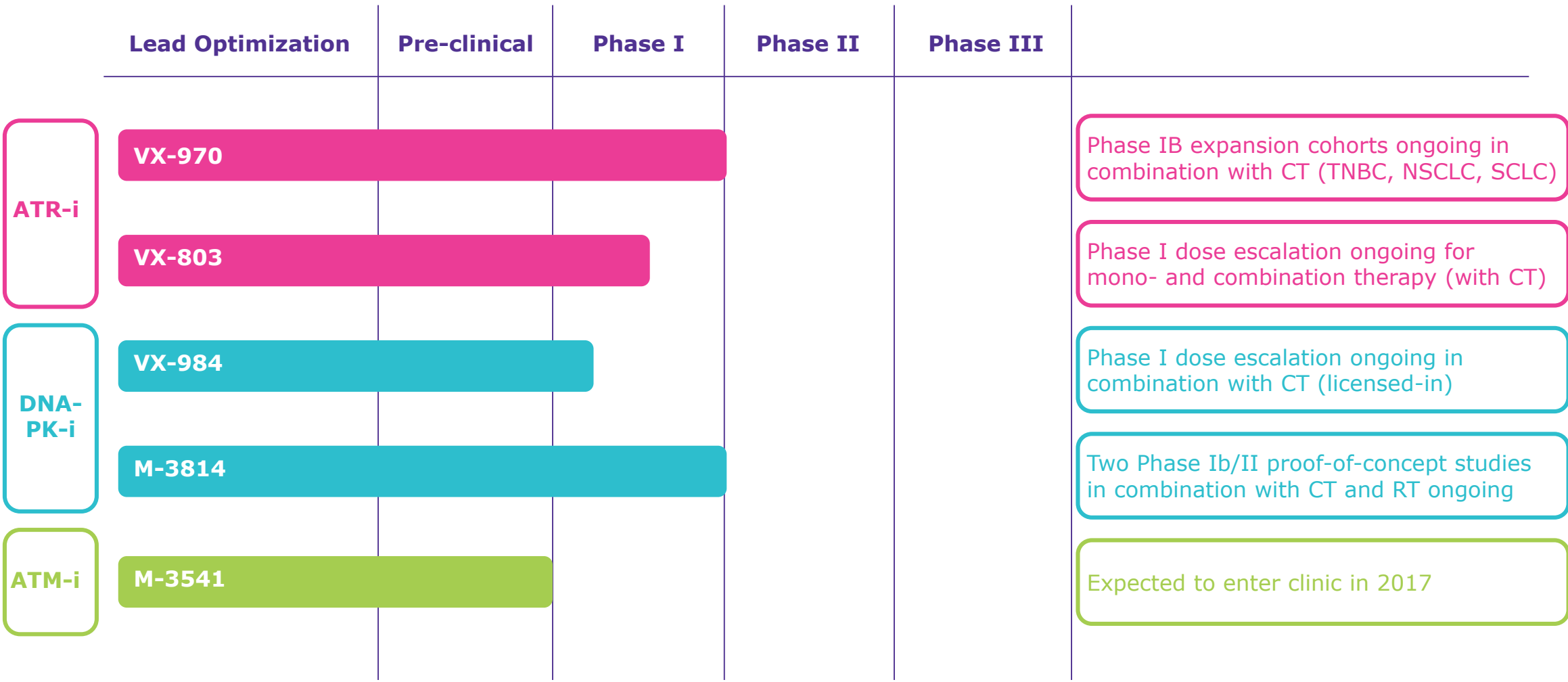
Amplifying cytotoxic effects of conventional and novel cancer treatments potentially bears combination potential

1. Inhibitor portfolio targets all three leading pathways of double stranded breaks – enabling unique synergies
2. ASCO 2017: leading DNA-PK-I (M3814) found safe and tolerable in a phase I study, with limited single-agent activity (20% of patients with stable disease for at least 18 weeks)²

¹ Sources: O'Connor, Molecular Cell, 2015 | Benjamin et al., Current Drug Targets, 2010, 11, 1336-1340

² "A multicenter phase I trial of the DNA-dependent protein kinase (DNA-PK) inhibitor M3814 in patients with solid tumors", Mark van Bussel, ASCO 2017
 Acronyms: ATM: ataxia-telangiectasia mutated | ATR: ataxia telangiectasia and Rad3 | DNA-PK: DNA-dependent protein kinase |

3 DNA damage response (DDR) Clinical program targets all three DDR pathways, in mono- and combination



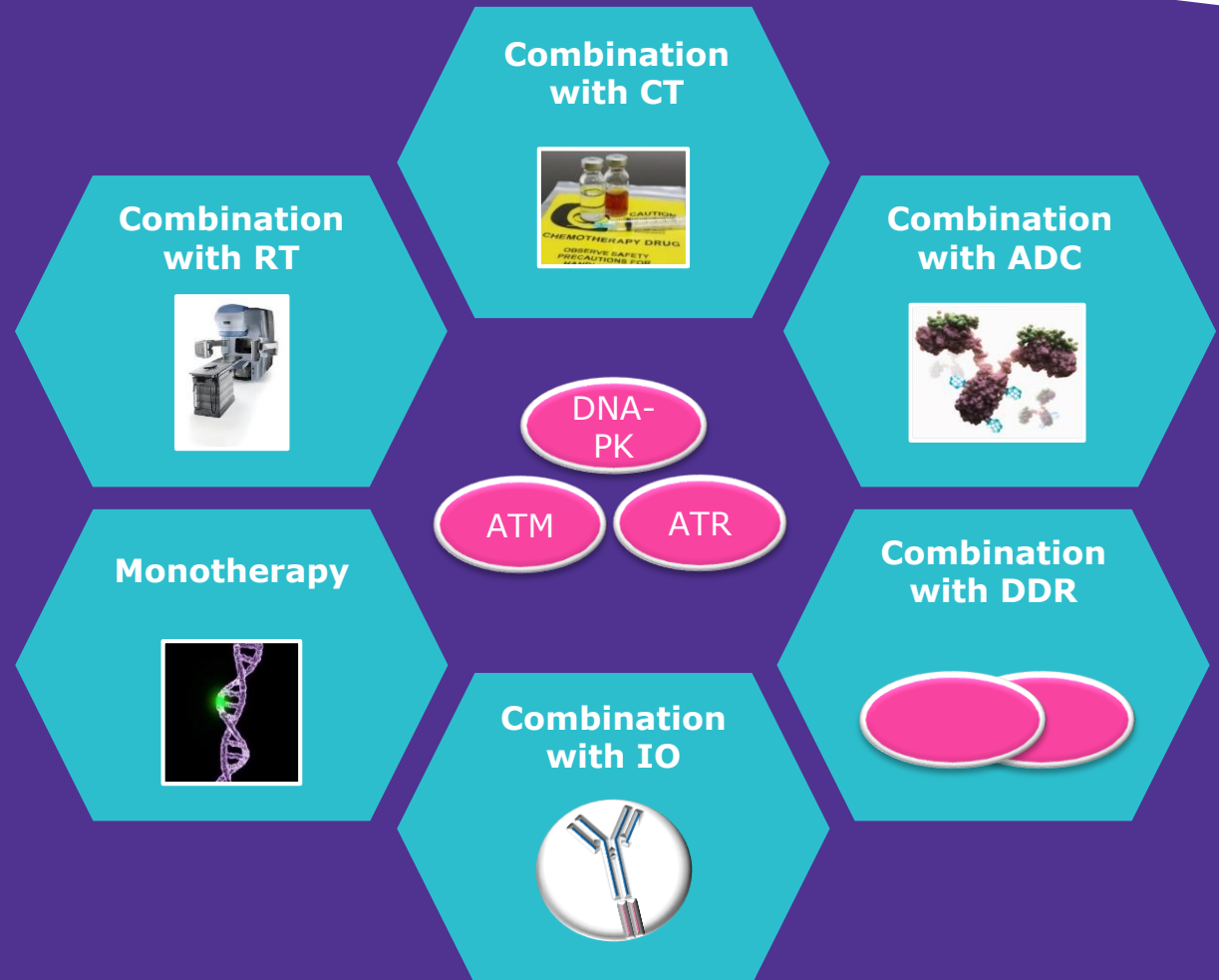
Acronyms: ATM: ataxia-telangiectasia mutated | ATR: ataxia telangiectasia and Rad3 | DNA-PK: DNA-dependent protein kinase | CT: Chemotherapy | RT: Radiotherapy | NSCLC: non-small cell lung cancer | SCLC: small cell lung cancer | TNBC: triple negative breast cancer | Note: timelines are event-driven and may change

3 DNA damage response (DDR) Broad combination potential across multiple mechanisms

At least **50%** of all cancer patients receive some type of **RADIATION** therapy (NCI 2016)

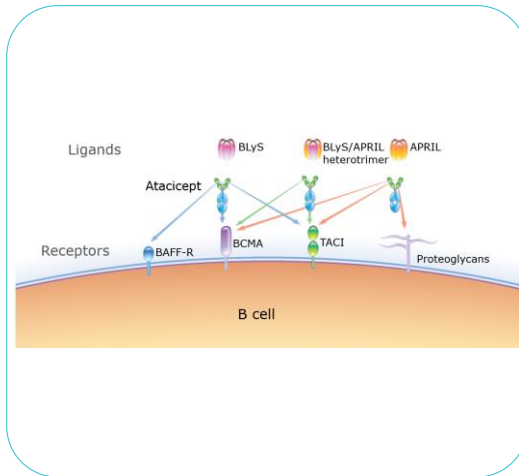
At least **70%** of all cancer patients receive some type of **CHEMOTHERAPY** (NCI 2016)

Significant share of patients to be treated with **CHECKPOINT INHIBITORS**



Update on selected assets

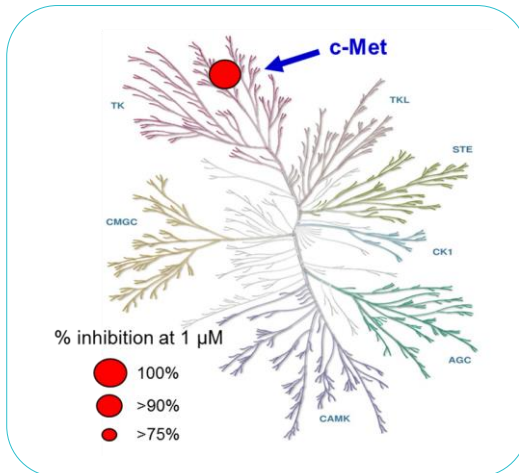
Atacicept



- Binds to receptors of two cytokines regulating maturation, function, and survival of B cells (B-lymphocyte stimulator (BLyS) & a proliferation-inducing ligand (APRIL))
- ADDRESS II (Phase IIb) in SLE patients (n=306):
- Primary endpoint not met, but analyses of predefined subpopulation with high disease activity (HDA; n=158) demonstrated statistically significant treatment effects (e.g. SRI-6 response at week 24 significantly greater with atacicept 150 mg vs. placebo); both doses led to significant reductions in BILAG A and SFI flares

Phase III decision subject to interactions with authorities

Tepotinib

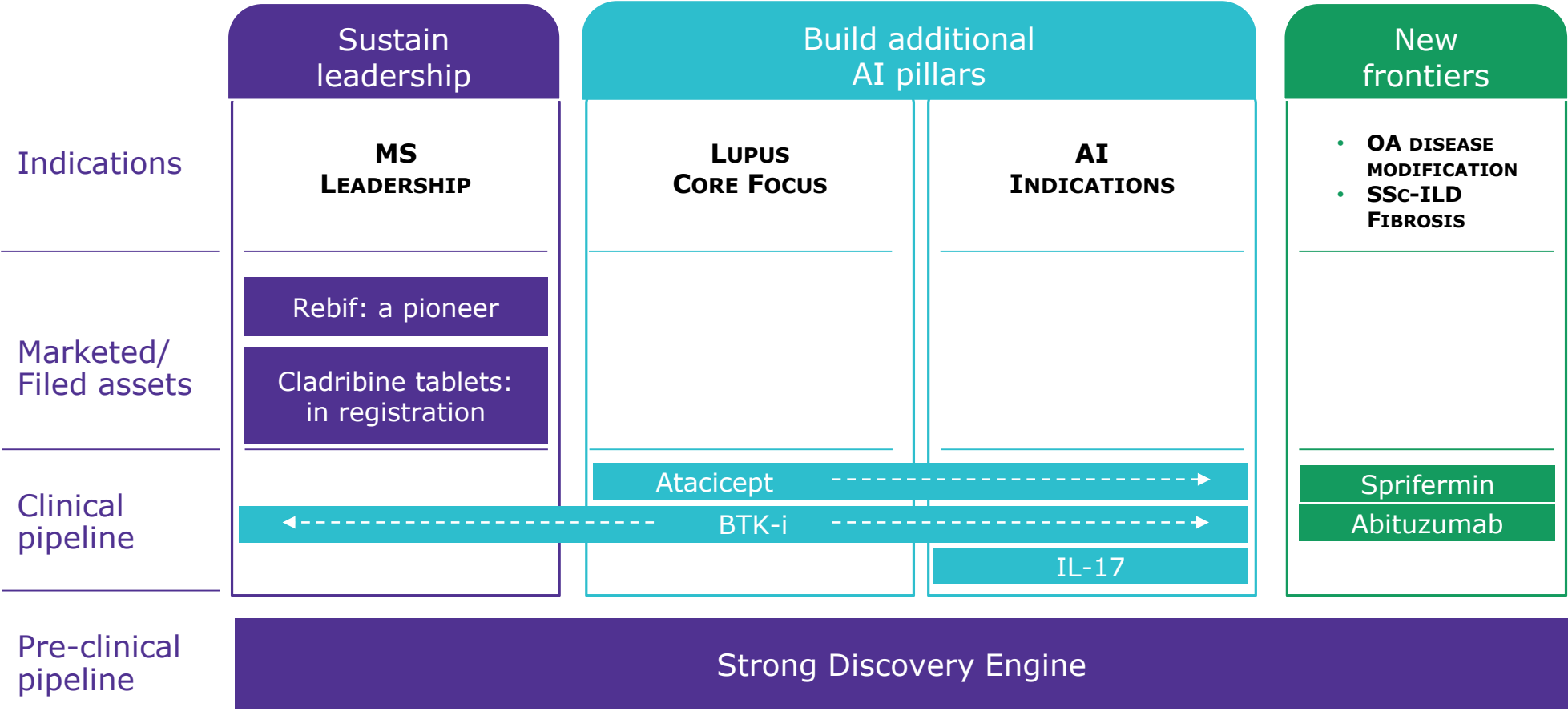


- Highly selective small molecule c-Met inhibitor
- Active in ligand-dependent and ligand-independent tumor models
- Biomarker-driven approach for patient selection
- Preliminary data show encouraging signs of anti-tumor activity in c-Met positive patients in NSCLC and HCC
- Phase II trials in progress in NSCLC and HCC

Analysis of Phase II data for HCC and NSCLC expected in H1 2018

Immunology

Strategy anchored on leadership in selected disease areas



Cladribine tablets – Decision by EC expected in Q3 2017

Background

- Targets lymphocytes (both B and T cells), integral to MS pathogenesis
- Two Phase III and one Phase IIIb extension studies conducted in RRMS and early MS^{1,2,3}; Phase II study in patients failing IFN beta therapy⁵
- Substantial new efficacy & safety characterization including data from long-term follow up (>10,000 patient-years)
- Most recent analyses provide relevant information on benefit/risk profile of cladribine tablets in RRMS:
 - ARR reduction (58%)
 - Risk of disability progression (33% reduction)
 - Relative reduction in mean number of lesion (86% reduction in T1 gadolinium-enhanced lesions)
 - 47% of patients experience NEDA over 2 years⁴

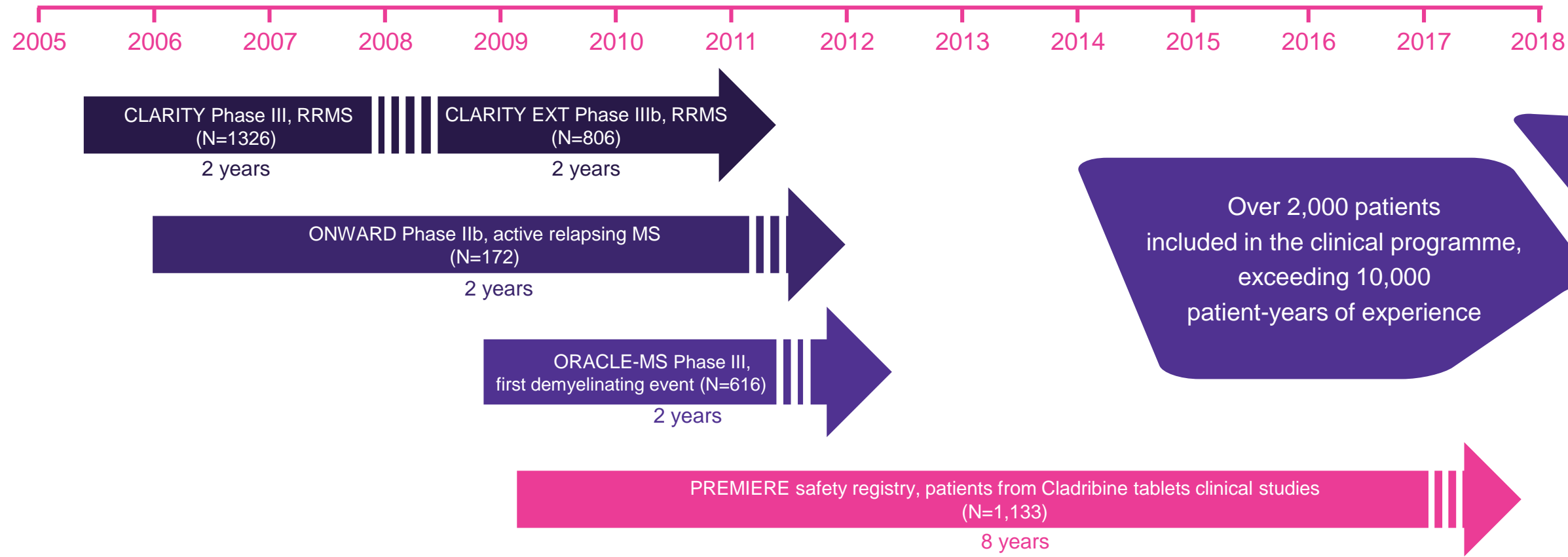
Potential for differentiation

- Merck KGaA, Darmstadt, Germany aims to address significant unmet needs for agents delivering high efficacy with favorable safety profile in a convenient dosing regimen
- Administered orally (tablet formulation)
- Extremely short treatment courses (8–10 days per year) leading to long-term efficacy¹

Note: timelines are event-driven and may change

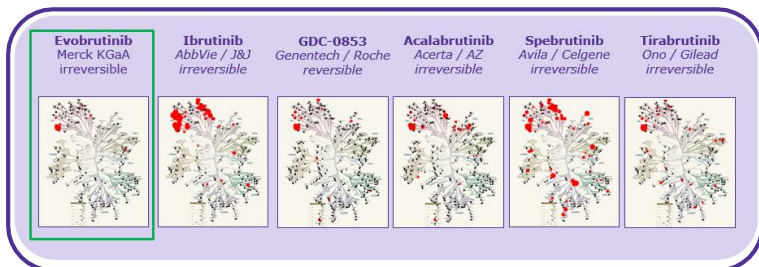
EC = European Commission; ARR = Annualized Relapse Rate; MAA = Marketing Authorization Application; MS = multiple sclerosis; NEDA = no evidence of disease activity; RRMS = relapsing-remitting multiple sclerosis. ¹ Giovannoni G et al. New Engl J Med 2010;362:416–26; ² Giovannoni G et al. 65th annual meeting of the American Academy of Neurology 2013. P07.119. ³ Leist TP et al. Lancet Neurol 2014;13:257–67. ⁴ Giovannoni G et al. Lancet Neurol. 2011;10:329–37. ⁵ Montalban X et al. 65th annual meeting of the American Academy of Neurology 2013. P07.099.

Cladribine tablets supported by 10,000 patient years of experience collected over 13 years including an 8 year safety registry



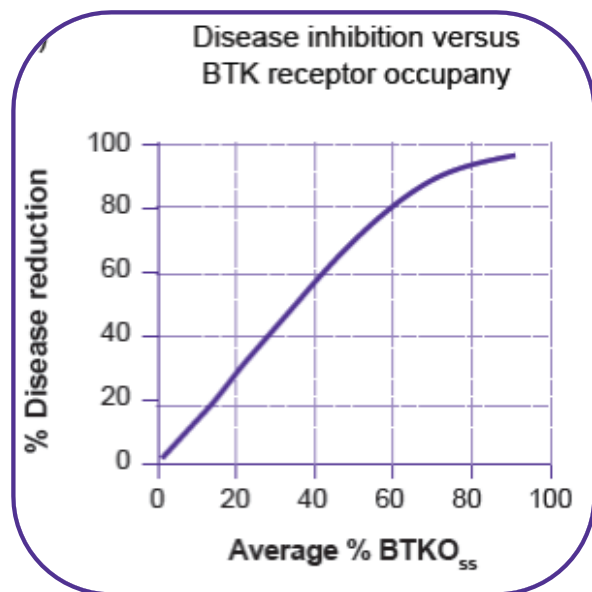
Evobrutinib

Highly selective BTK-i to be explored as chronic therapy



Safety: promising kinase selectivity minimizing off-target effects¹

- Greater selectivity vs. in-class competitors in kinase screen (>270 kinases)
- Besides BTK, two more kinases inhibited (vs. 25 off-target kinases by others)
- Kinase selectivity may result in lower AE rate vs. existing treatments

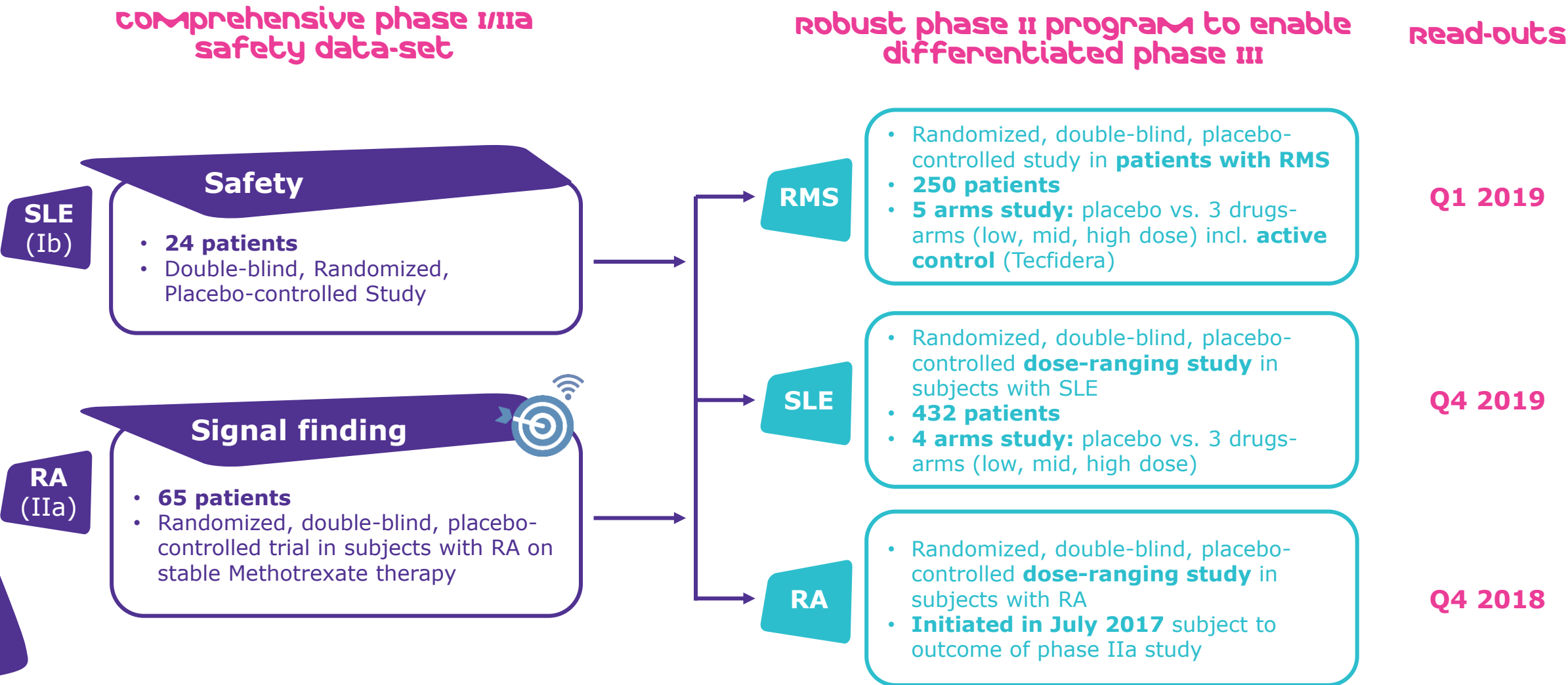


Efficacy: oral, highly efficacious in pre-clinical models¹

- Evobrutinib (irreversible antagonist) inhibiting signal transduction until protein is naturally degraded (no B-cell depletion)
- Occupancy/efficacy correlation: average BTK occupancy of >80% correlated with near complete inhibition of disease activity¹
- Clinical benefit of addressing B cell biology demonstrated by anti-CD20 targeting agents
- Insights from phase IIa trial (RA) leveraged in broad clinical development program (three phase IIb trials ongoing in MS, SLE, and RA)

Evobrutinib

Comprehensive development plan across immune-mediated diseases



Outlook

Healthcare is well set for future growth

Stable existing
business



Base business delivering solidly with stable outlook

R&D pipeline
optionality



High quality assets across all three areas continuously complemented with short- and longer term optionalities

Innovative
partnerships



Joint investments and innovative deals models to maximize potential of assets and maintain focus

Disciplined
execution



Systematic pipeline review and timely decision making ensure efficient resource and budget allocation

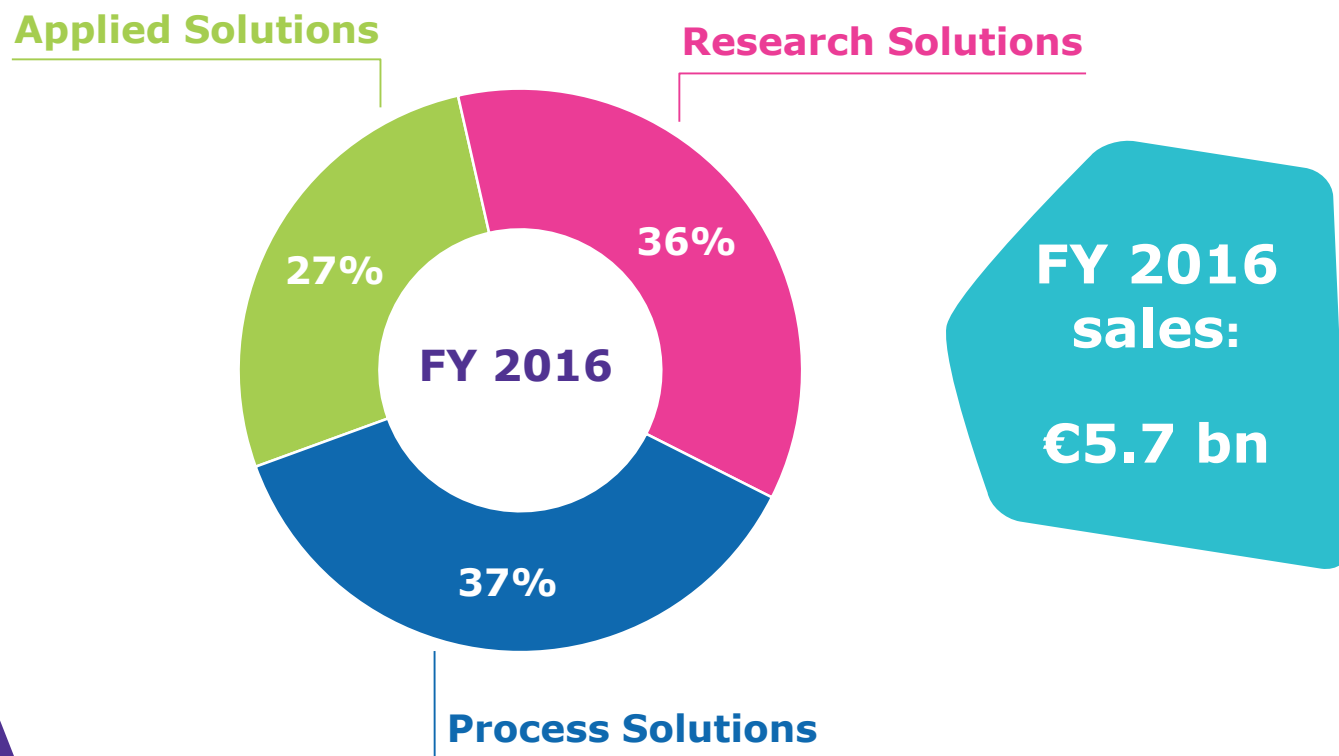




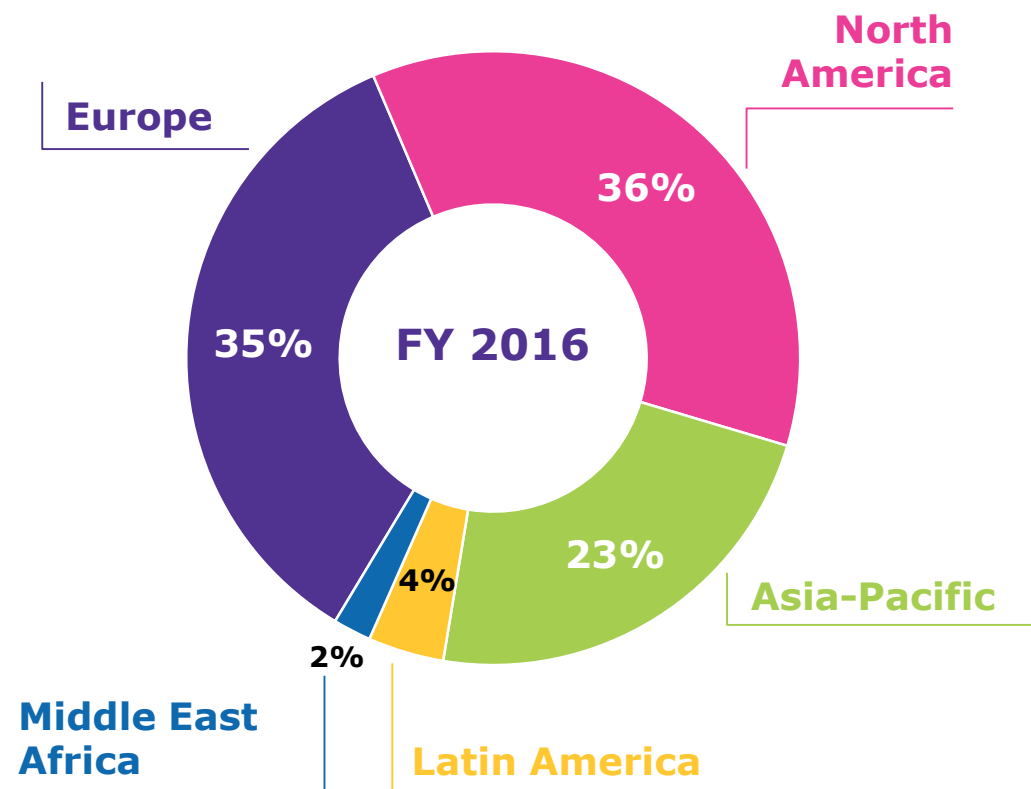
03 LIFE SCIENCE

A balanced portfolio and geographic presence

Sales by business unit



Sales by region



Life Science is an attractive market

RESEARCH

~€42 bn

Low single digit



- Growth in volume of experiments
- Mild growth in academic funding
- Investment in industry R&D

PROCESS

~€38 bn

High single digit



- Drug volume growth
 - from biologics
 - from emerging modalities
- Continued shift to single-use

APPLIED

~€45 bn

Mid single digit



- Volume growth from
 - Population growth
 - Increased testing needs

Success driven by portfolio breadth and differentiation, a customer-centric approach and world-class capabilities

RESEARCH



Broad, relevant and innovative portfolio

Simple customer interface

Ability to manage complexity across organization (e.g., reliability of supply)

PROCESS



Developed market:
Deep expertise in each unit operation

Emerging market:
Broad portfolio

Demonstrated quality & regulatory leadership

APPLIED



Customized workflows for specific applications

Ability to manage complexity across organization (e.g., reliability of supply)

Demonstrated quality & regulatory leadership

Process Solutions

Our end-to-end portfolio for manufacturing mAbs



MAKE

Produce antibodies



PURIFY

Remove cell debris, virus, etc.



FORMULATE

Final drug product



EX-CELL®
Advanced™
CHO Fed-batch
Medium
**Cell culture media
to enhance cell
growth**



2000L CellReady
bioreactor
**Tank for
cultivating cells**



Clarisolve®
clarification
filters
**Removing cell
debris**



FlexReady®
chromatography
Purifying mAbs



Viresolve® Pro
solution
**Removing viruses
from protein
solutions**



Pellicon®
cassette filters
**Washing and
removing cells,
lipids, particles**



Opticap® capsules
Sterile filtration

Provantage®

BioReliance®

EMPROVE®

cGMP SOLUTIONS & SERVICES

#1 website in research life science industry

Industry leading e-commerce platform and supply chain capability



SEARCH



Hundreds of thousands of products at your fingertips



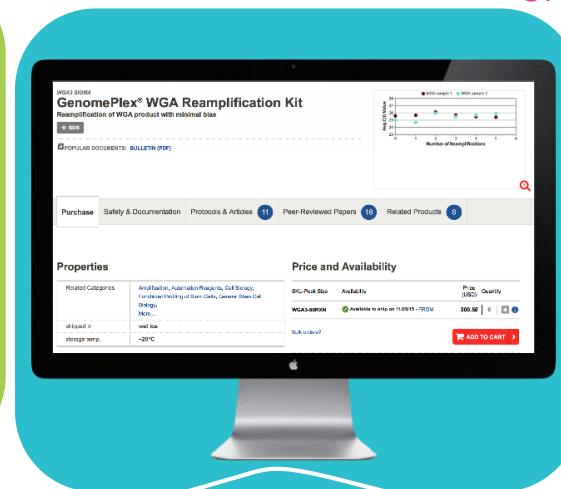
CONTENT



Online leader in scientific content: articles, protocols and peer reviewed papers



ORDER



Real-time pricing and availability



Convenient and simple customer interface: no more than 2 clicks from shopping cart

Life Science delivers synergies and integrates as planned

synergies

Delivery of 2016 synergy target of €105 m:

- HQ measures complete
- >50% of headcount targets met
- 4 site closures in progress
- Procurement actions moving
- Preparing distribution consolidation



integration

Smooth integration ongoing with early achievements:

- Organization structure implemented
- High engagement from organization
- Common definition and implementation of processes well underway, e.g. pricing, customer excellence

No disruption of growth momentum during integration



04

PERFORMANCE MATERIALS

Market share normalization will have financial implications

sales:

- ~ €200 – 300 m Liquid Crystals sales decline, depending on market share assumptions
- Started end of 2016; expected to last up to end of 2018

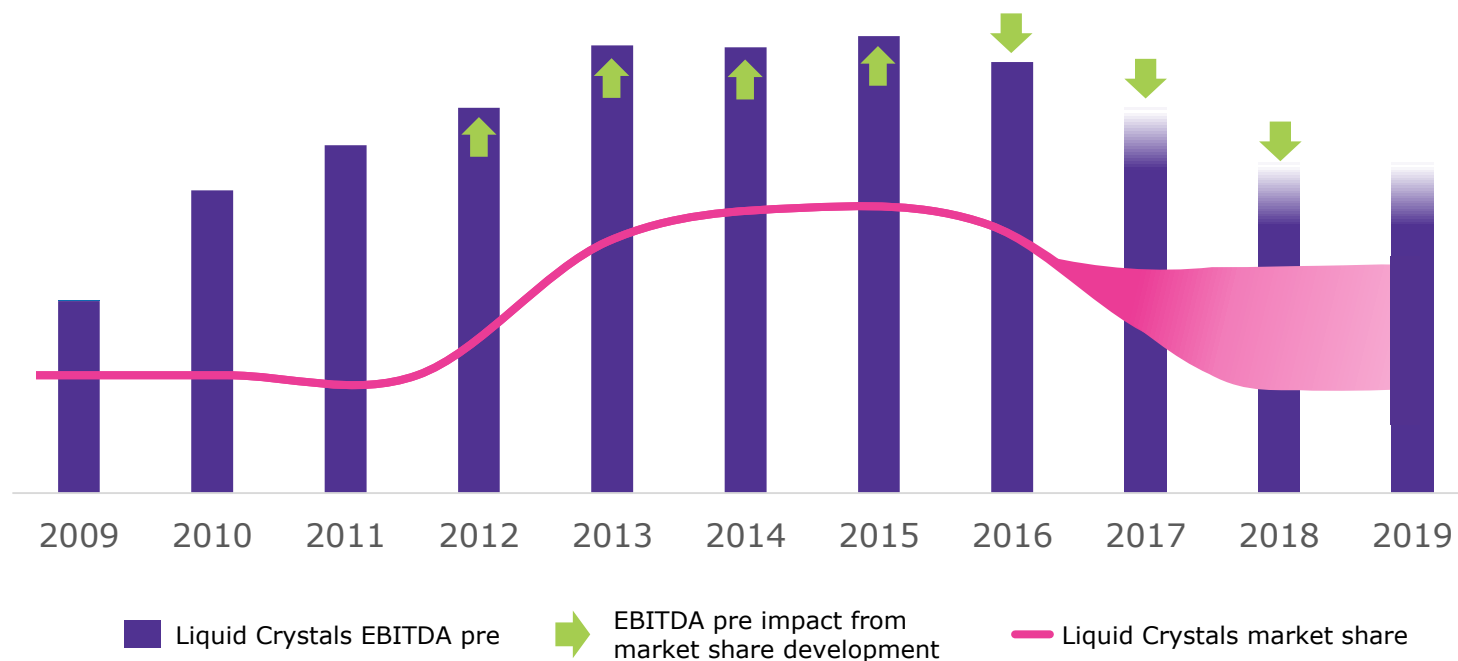
profitability :

- Volume growth temporarily below typical price decline
- Lower volume growth limits operational efficiencies
- Lower share of business with highest profitability causes negative mix

Earnings:

- Significant EBITDA pre impact

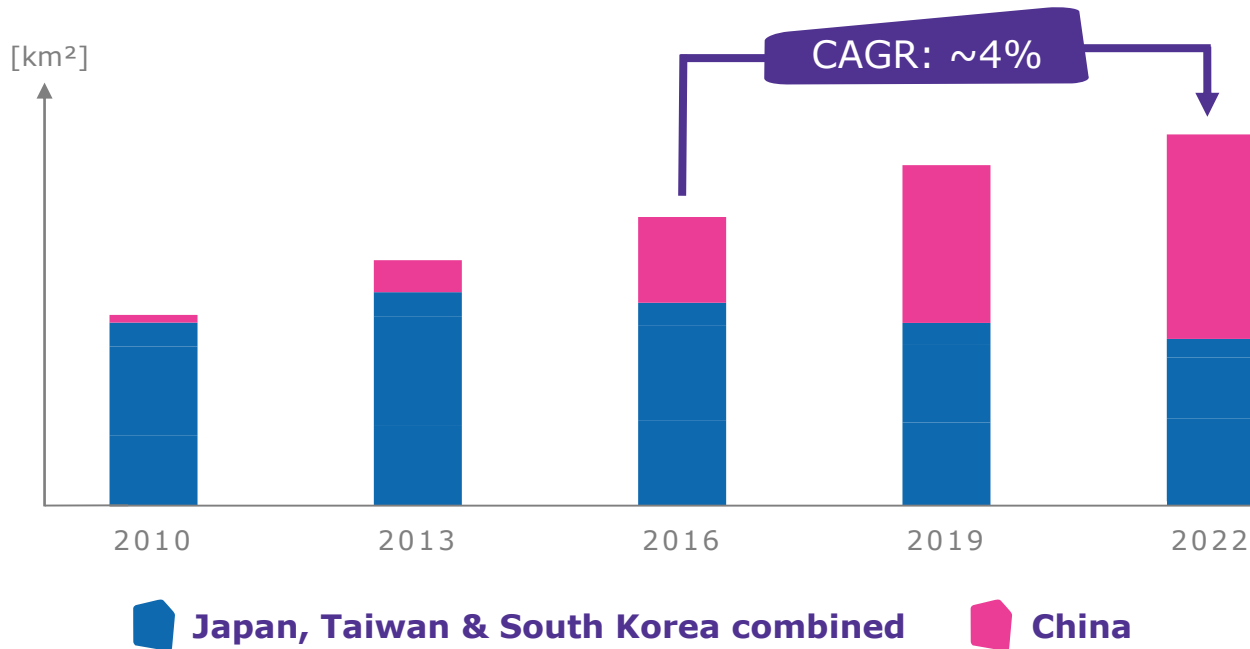
Liquid Crystals: Organic EBITDA pre and market share illustration



Strong sales and EBITDA pre contribution from 2012-2015 to reverse from 2017 onwards

Merck KGaA, Darmstadt, Germany will leverage its capabilities to address shift towards more dynamic Chinese market

Share of global display production capacities by region [km²]*



Panel market dynamics in China

- Strong capacity build-up since 2012
- Historically main focus on local market supply with low to medium end displays
- Possibility to enter into global and higher-end markets in the future

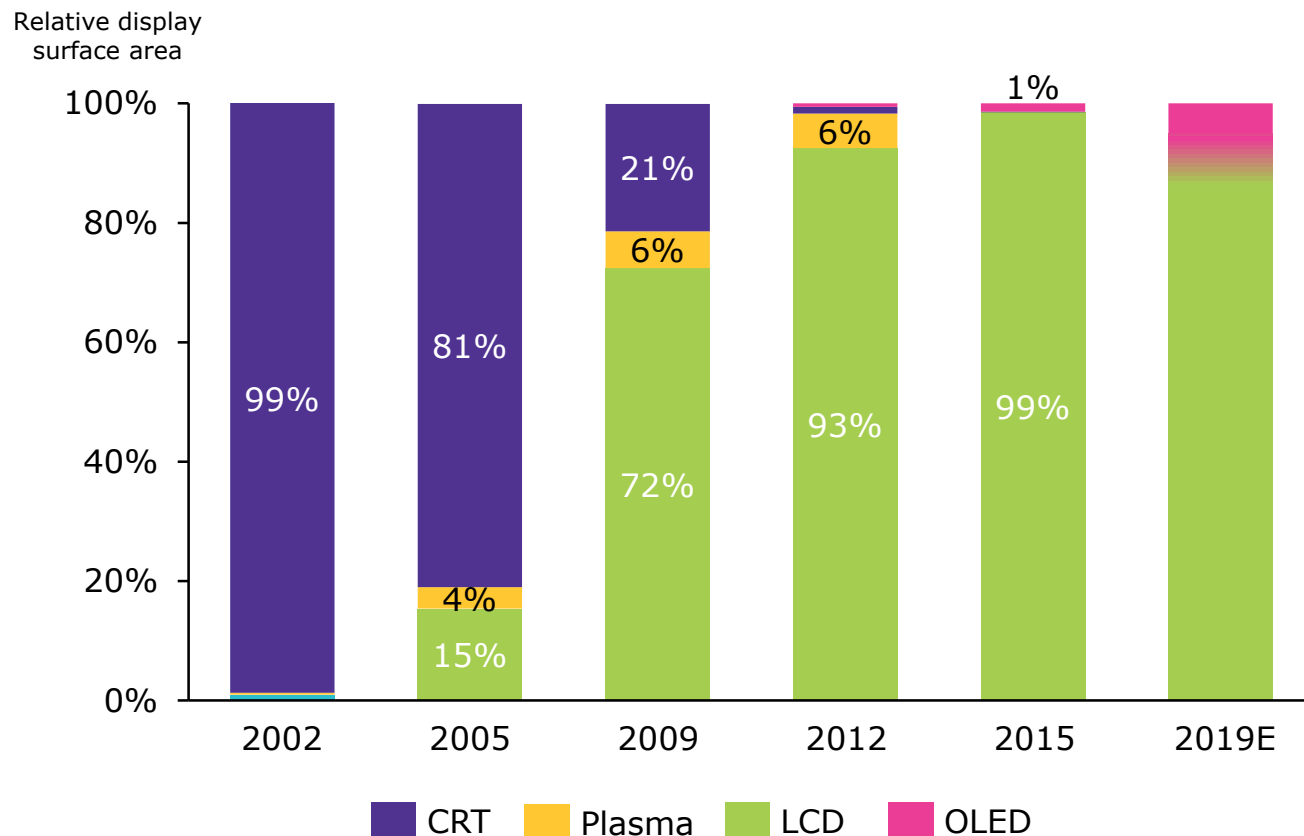
Leverage Company's competitive advantage

- *Customer proximity:* Reallocate resources to improve specific customer support
- *Application and production know-how:* Develop technologies that translate into commercial value
- *Continuous innovation:* Investments in Shanghai R&D hub to support local customers

Capacity growth will benefit our leading supply capabilities especially from 2019

Liquid crystals are clearly the dominant display technology

Market share by display technology



Rationale for LCD leadership

For consumers:

- Price
- Thinner frames
- Higher resolution in all sizes
- Proven track record of extreme reliability

For manufacturers:

- Price and scalability
- Production costs and capacities

LCD progress creates higher technological and commercial entry barriers

OLED share will increase in mobile applications

Our leading OLED business is well set to exploit display market opportunities

Market position

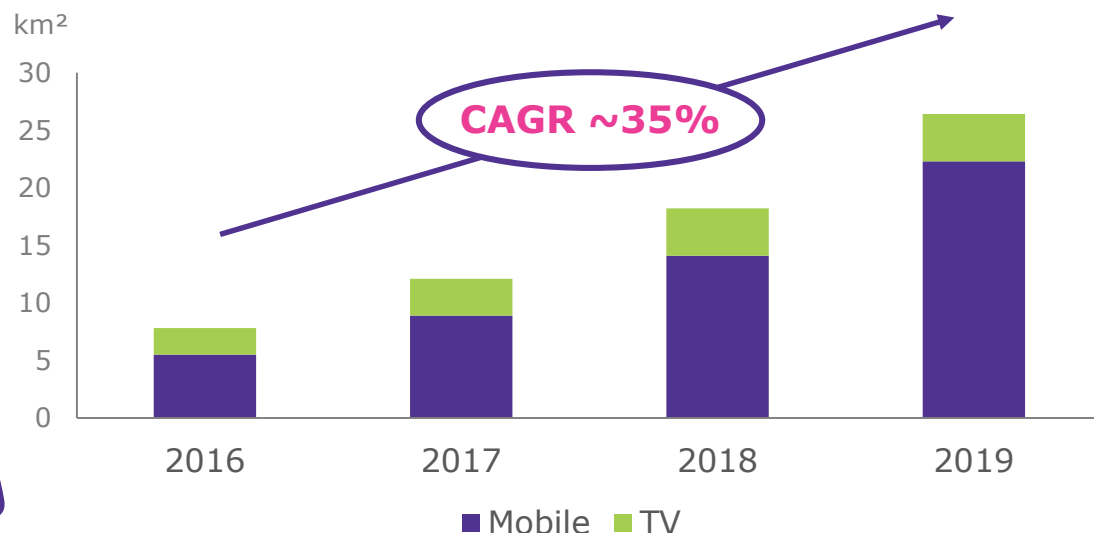
- Among top 3 OLED material provider
- Unrivalled experience and expertise in displays
- Long & intimate relationships with all display producers
- Recent capacity expansion to serve growing demand

our ambition

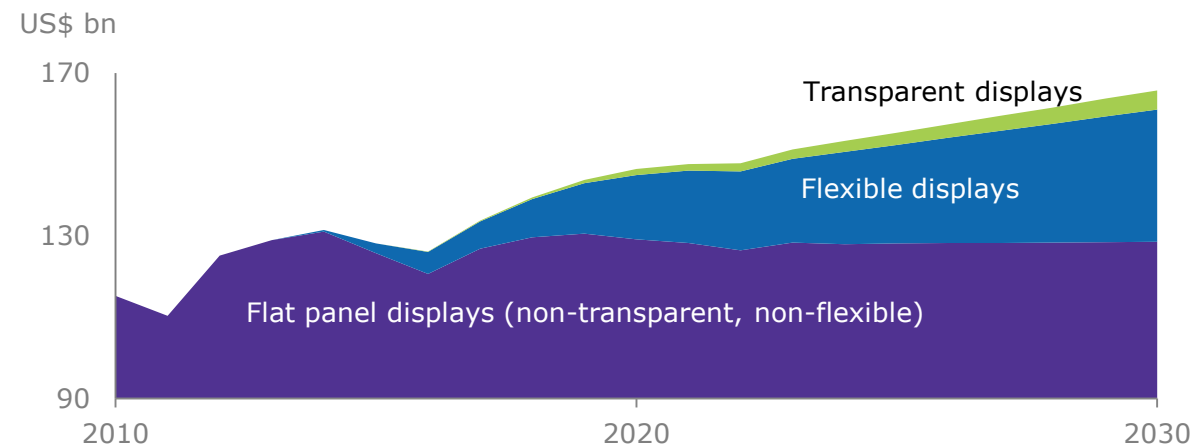
solution provider

- Supplier of all OLED stack layers
- Excellence in vapor & printable materials
- In-house testing of materials
- Tailor-made solutions for customers

Announced OLED capacity expansion¹



Display market development¹



Liquid crystals OFFER a variety of opportunities



1

3

4

5

2

6

1. Adaptive lighting for automotive
2. Adaptive lighting for architecture
3. Smart antenna
4. Liquid crystal windows for architecture
5. Holography
6. Free form LCD

Merck KGaA, Darmstadt, Germany has a strong position and will benefit further from complex technological advances and underlying market trends

Market drivers and technological trends

Miniaturization: Devices are becoming smaller with better performance

- Need for enabling materials to reduce size (Moore's law)

Mobility: Everyone is continuously connected without direct power supply

- More chips needed for local energy production
- Energy storage → smaller batteries with higher density

Internet of Things: Everything is continuously connected

- More gadgets and devices that include chips
- Increasing amount of communication and sensor chips

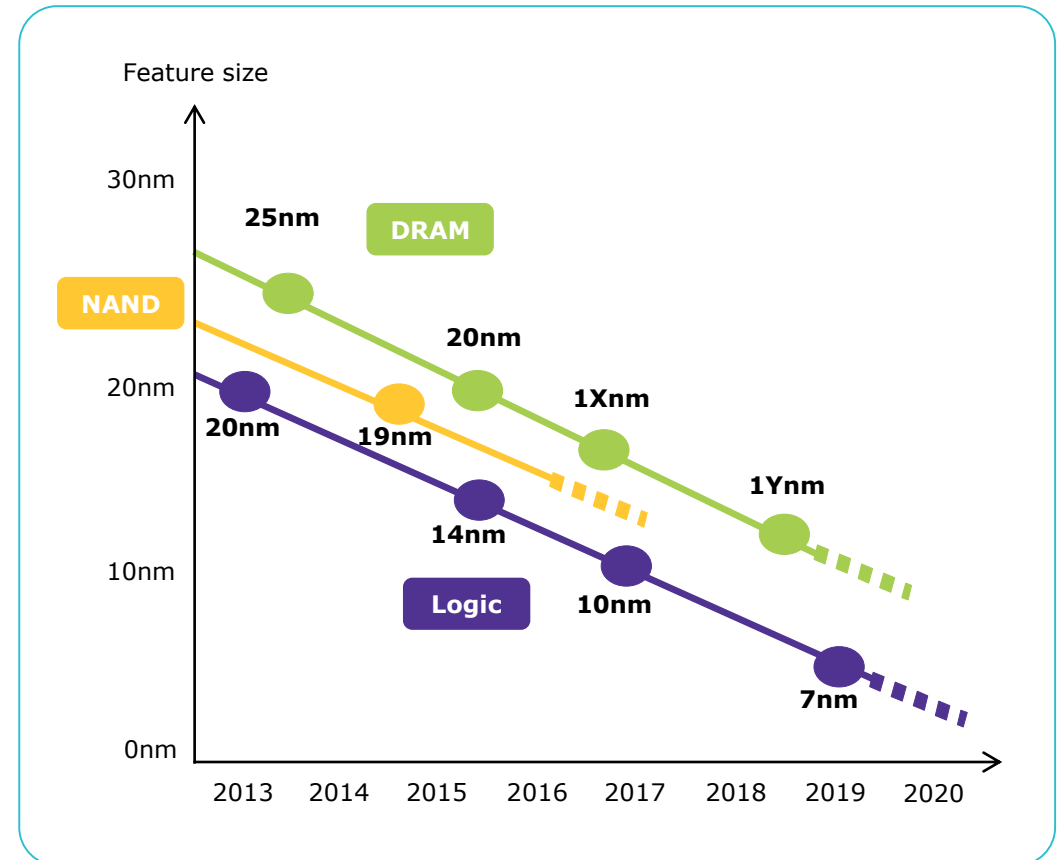
Big Data: Increasing need for intelligent data storage

- Switch from hard disk drives (HDD) to solid state drives (SSD)

Selected competitors

- Tokyo Ohka Kogyo
- Dow Electronic Materials
- Nissan Chemicals
- JSR

Feature sizes develop as predicted by Moore's law



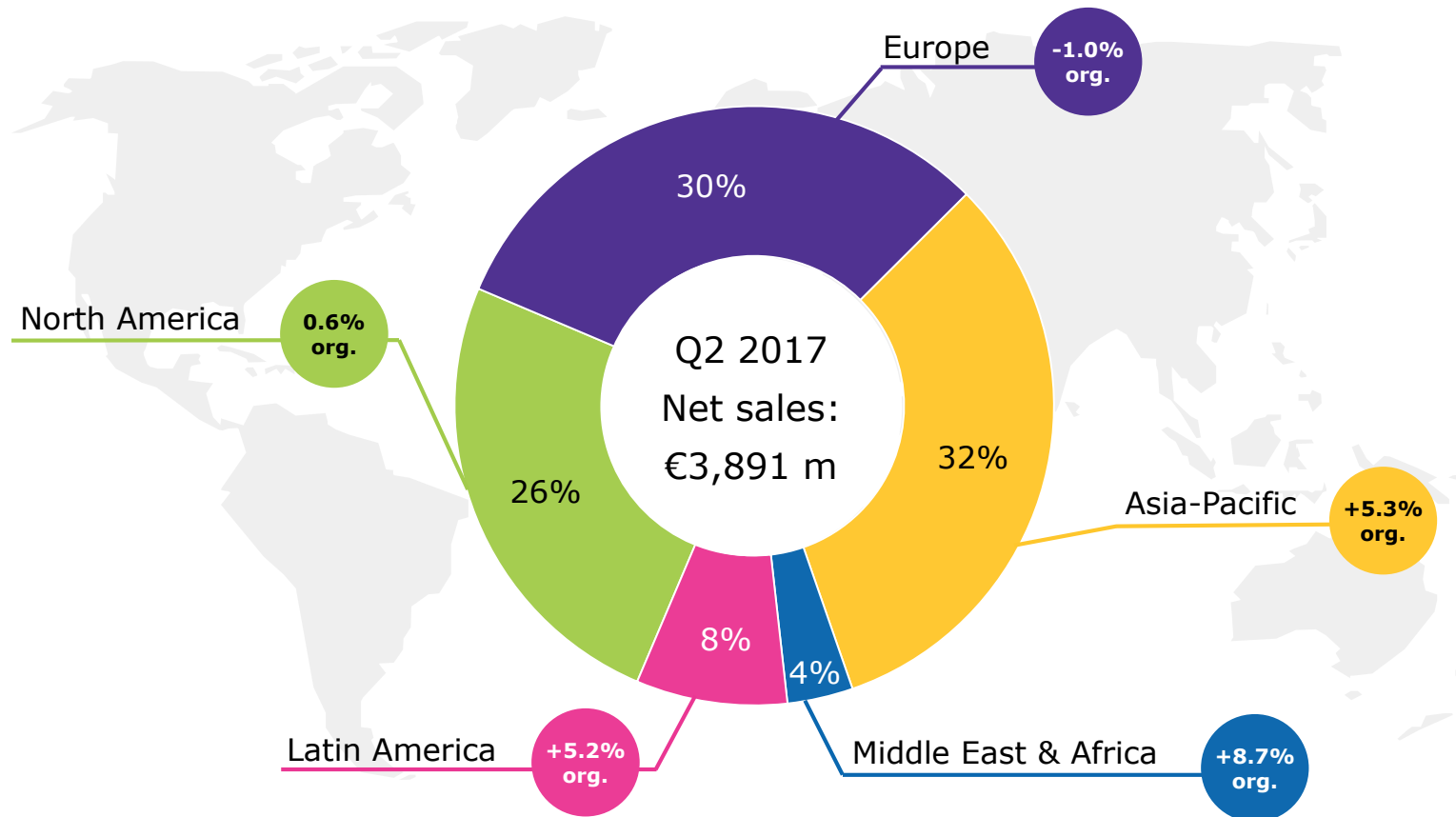


05

FINANCIAL OVERVIEW

Organic growth driven by APAC, LATAM and MEA

Regional breakdown of net sales [€ m]



Regional organic development

- Slight decline in Europe reflects competition for Rebif, Erbitux and Gonal-f, mitigated by solid demand in Life Science
- Slight growth in North America from Life Science and Rebif pricing offset tough Gonal-f comparables
- Solid growth in APAC supported by Gluco-phage repatriation and strong Life Science demand in China, outweighing LC softness
- Strong performance in LATAM and MEA across all major businesses

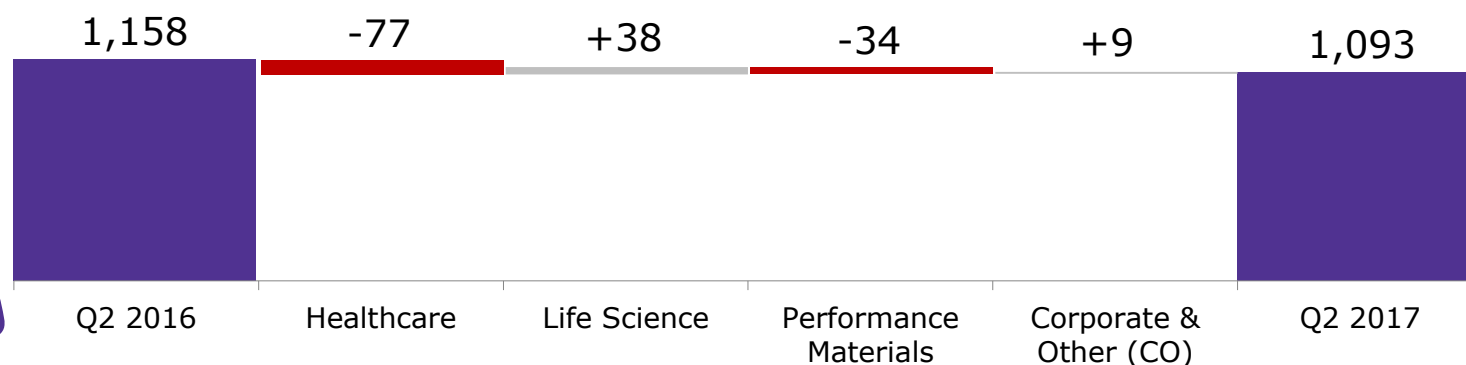
Investments in Healthcare and softness in Liquid Crystals burden EBITDA pre

Q2 2017 YoY net sales

	Organic	Currency	Portfolio	Total
Healthcare	2.6%	0.1%	-1.0%	1.7%
Life Science	4.2%	0.1%	0.3%	4.6%
Performance Materials	-3.2%	1.8%	0.0%	-1.3%
Group	2.3%	0.4%	-0.3%	2.3%

- Healthcare reflects strong growth in General Medicine, especially Glucophage in China and resilience of portfolio
- Solid growth in Life Science driven by all business segments
- Organic growth of ICM*, Pigments and OLED is outweighed by ongoing market share normalization in Liquid Crystals

Q2 YoY EBITDA pre contributors [€ m]



- Healthcare reflects investments in marketing & selling and R&D as well as negative product mix effects
- Life Science driven by organic growth and synergy realization
- Performance Materials lower due to unfavorable business mix & usual price declines
- CO contains positive FX hedging Δ vs. LY

*Integrated Circuit Materials
Totals may not add up due to rounding

Q2 2017: Overview

Key figures

[€m]	Q2 2016	Q2 2017	Δ
Net sales	3,805	3,891	2.3%
EBITDA pre	1,158	1,093	-5.6%
Margin (in % of net sales)	30.4%	28.1%	
EPS pre	1.55	1.54	-0.6%
Operating cash flow	311	520	67.1%

[€m]	Dec. 31, 2016	June 30, 2017	Δ
Net financial debt	11,513	11,248	-2.3%
Working capital	3,486	3,775	8.3%
Employees	50,414	52,233	3.6%

Comments

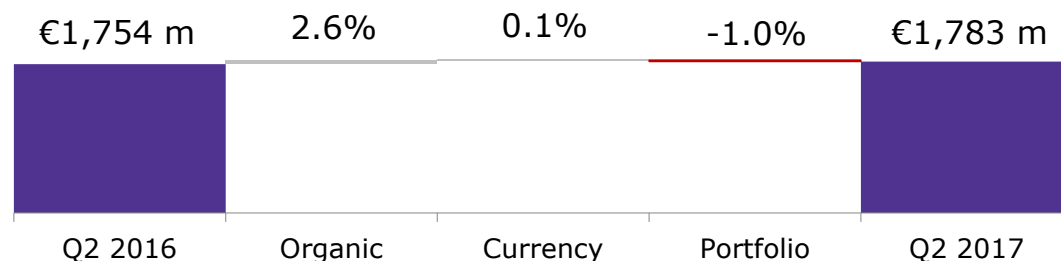
- EBITDA pre & margin reduction reflect investments in Healthcare and ongoing LC market share normalization
- EPS pre stable despite EBITDA pre decrease due to improved financial result
- Strong increase in operating cash flow driven by lower tax payments
- Net financial debt reflects strong operating cash flow amid dividend payment
- Working capital reflects increased receivables mainly due to Glucophage repatriation
- Higher headcount due to investments in growth markets and takeover of temporary workers

Healthcare: Investments in future growth weigh on profitability

Healthcare P&L

[€m]	Q2 2016	Q2 2017
Net sales	1,754	1,783
Marketing and selling	-643	-710
Administration	-66	-78
Research and development	-378	-389
EBIT	298	348
EBITDA	558	465
EBITDA pre	557	480
Margin (in % of net sales)	31.8%	26.9%

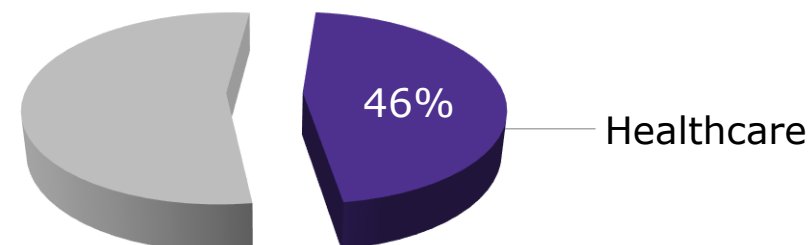
Net sales bridge



Comments

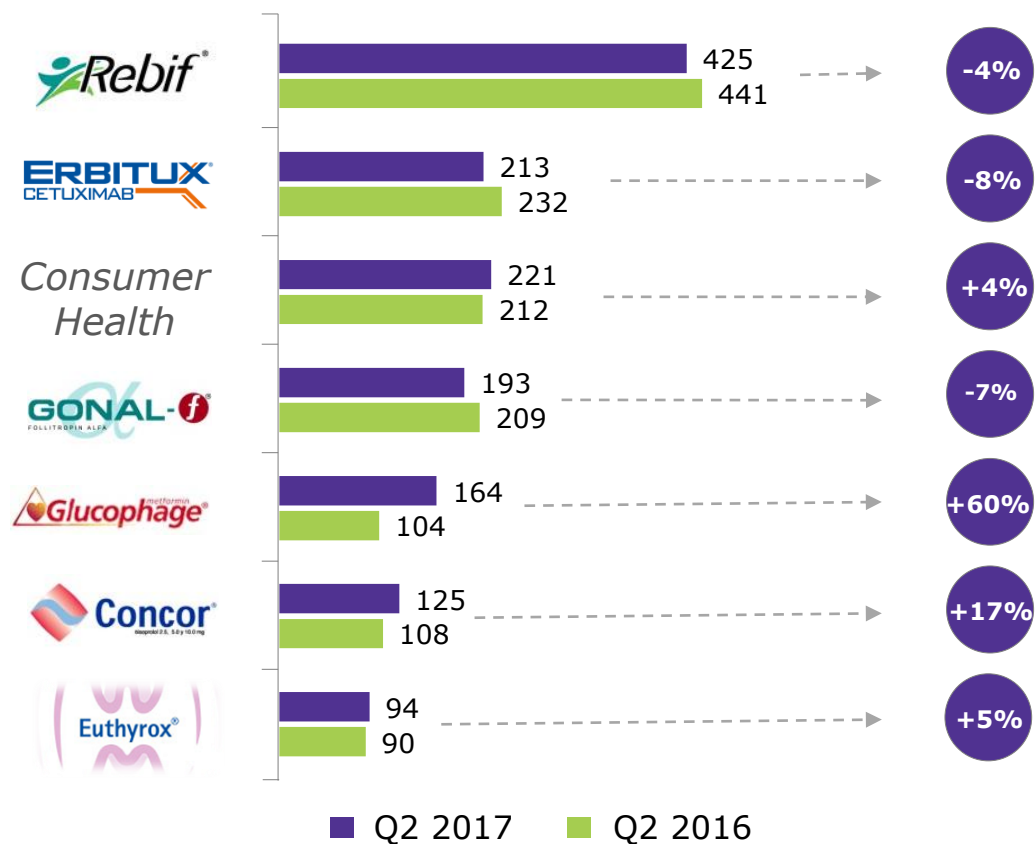
- Rebif organically lower as competition in U.S. & E.U. as well as tender phasing in Russia outweigh pricing and positive inventory effect in the U.S.
- Organic decline of Erbitux due to competitive and price pressure in EU outpaces growth in China & LATAM, but also facing strong base LY
- Fertility slightly lower, mainly due to Gonal-f with record quarter LY
- Marketing & selling reflects pre-launch investments for Bavencio and Mavenclad and Glucophage in China after full repatriation
- R&D investment picking up, expected further ramp-up in H2
- EBITDA pre reflects higher investments and negative mix effects exceeding income from milestone payment for Bavencio

Q2 2017 share of group net sales

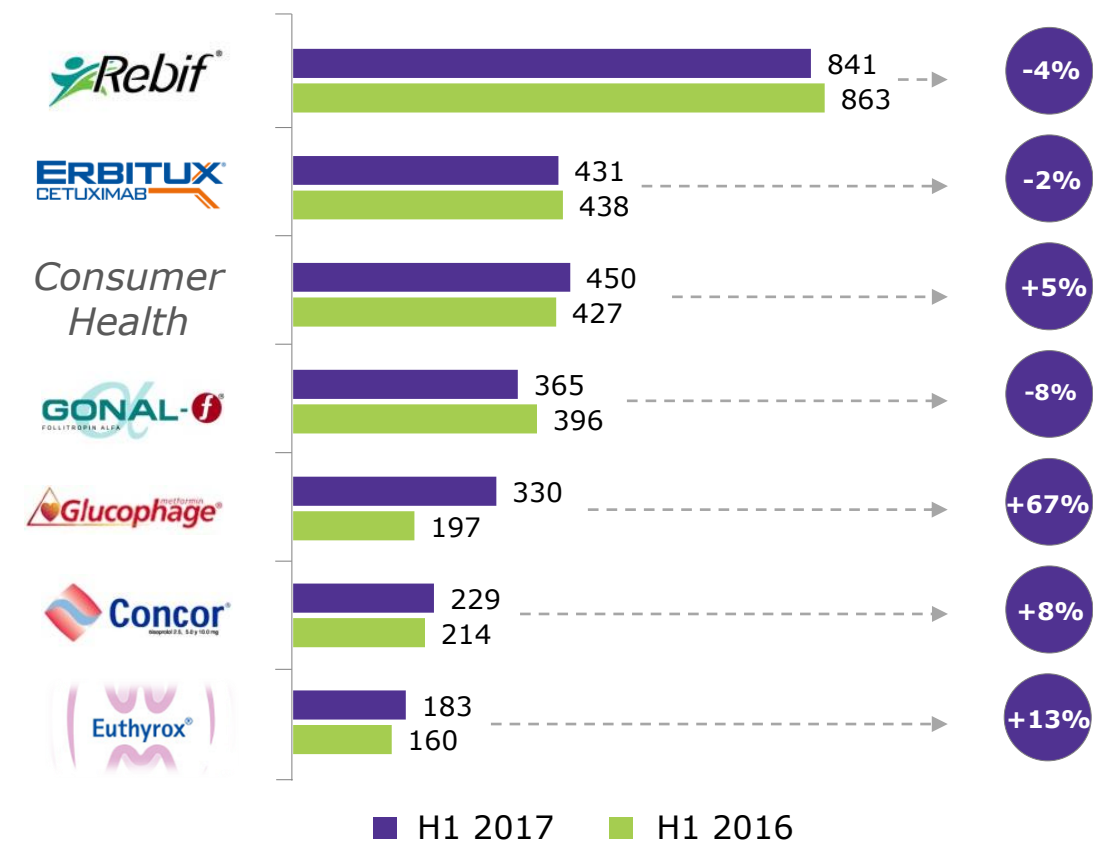


Healthcare organic growth by franchise/product

Q2 2017 organic sales growth [%]
by key product [€ m]



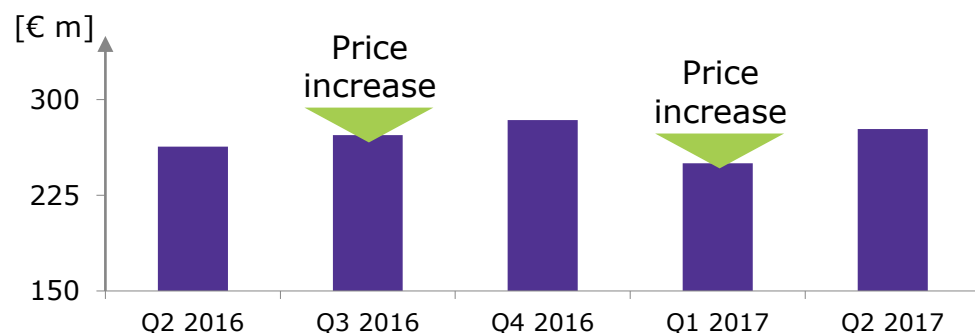
H1 2017 organic sales growth [%]
by key product [€ m]



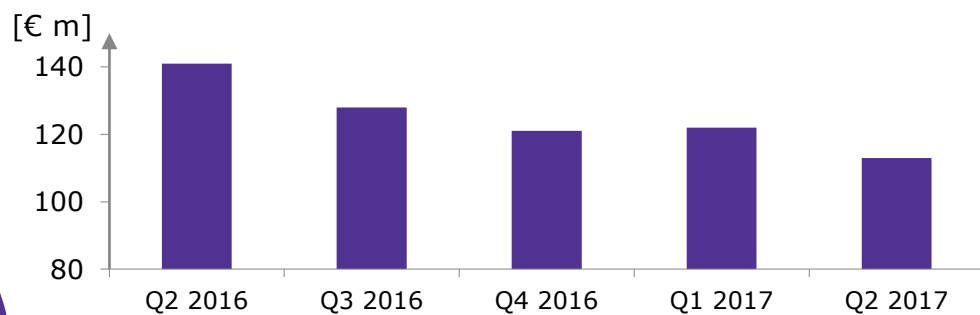
Rebif: Relief in the U.S. – competitive ramp-up in Europe ongoing

Rebif sales evolution

North America



Europe



Q2 drivers
4.4% org.

- Price
- Volume
- FX

Q2 drivers
-18.7% org.

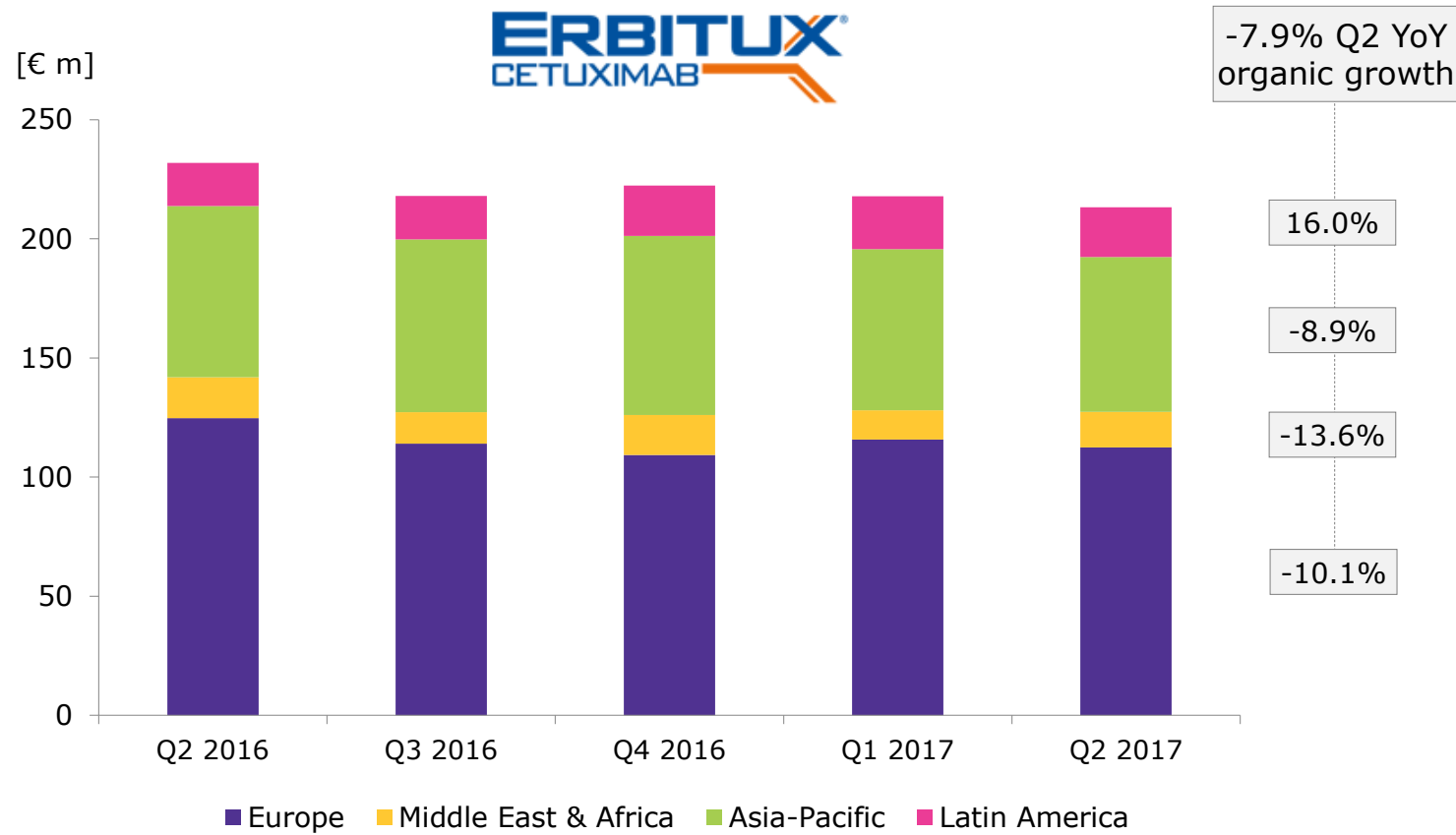
- Price
- Volume

Q2 2017 Rebif performance

- Rebif sales of €425 m in Q2 2017 reflect organic decline, while FX is almost neutral
- U.S. price increases and wholesaler inventory stocking outweigh competition-driven U.S. volume erosion
- Market shares within interferons stable due to high retention rates and known long-term track record
- Phased market entry of orals in Europe as well as tender phasing in Russia cause ongoing organic decline

Erbitux: A challenging market environment

Erbitux sales by region



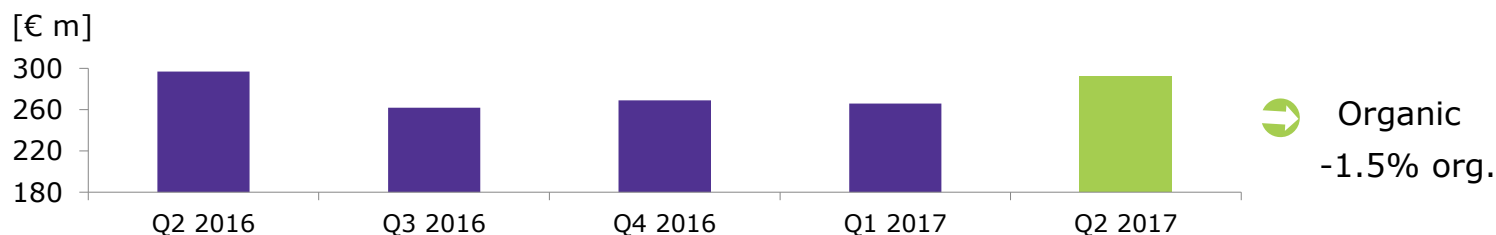
Q2 2017 Erbitux performance

- Sales decline organically to €213 m comparing to strong base LY
- Europe impacted by competition, price reductions and shrinking market size due to increasing immuno-oncology trials
- APAC lower as healthy organic growth in China is more than offset by inventory destocking in Japan
- LATAM strong, while MEA affected by tender phasing from Q1 2017

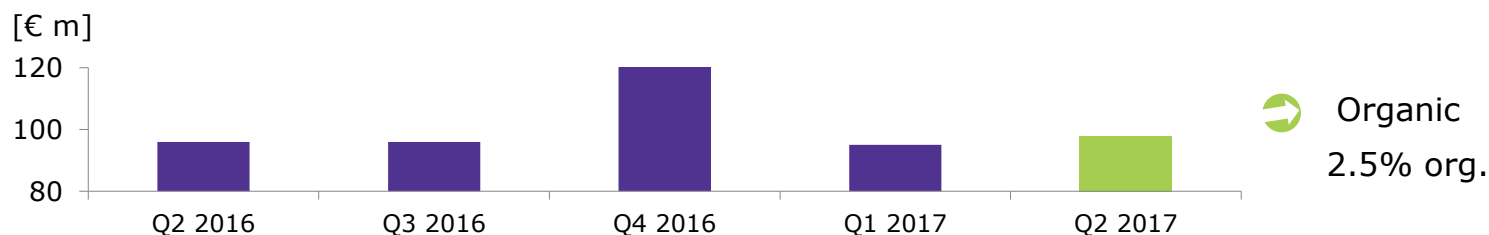
Strong organic growth of General Medicine driven by all major products

Sales evolution

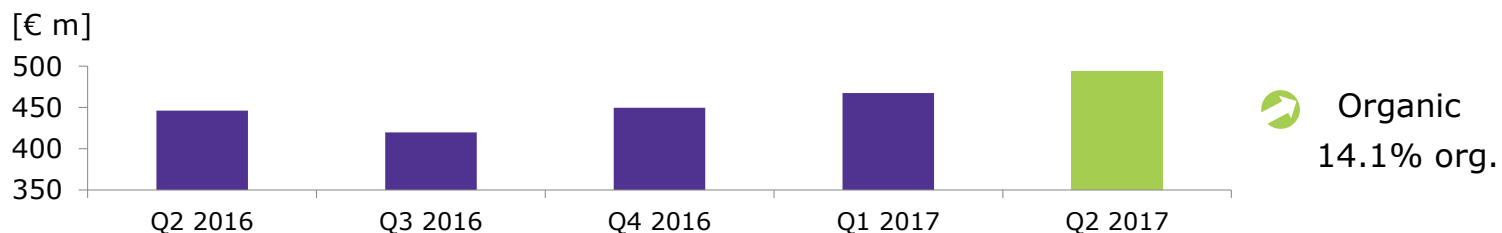
Fertility



Endocrinology



General Medicine*



Q2 2017 organic drivers

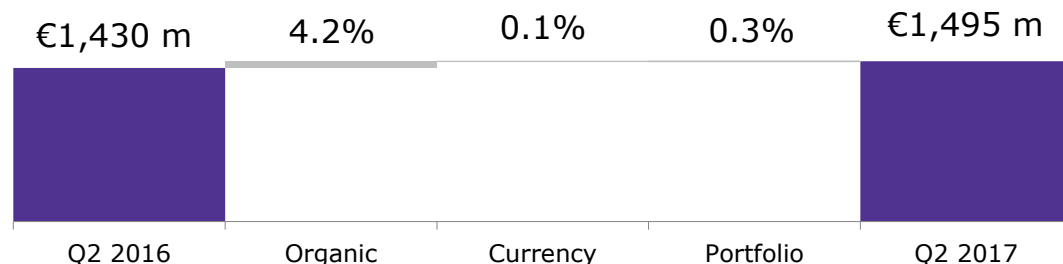
- Fertility slightly lower, mainly due to Gonal-f facing high base LY and ongoing competition from biosimilars in Europe
- LY Gonal-f benefited from favorable competitive situation in the U.S.
- Rest of Fertility portfolio continues to perform well across most regions
- Endocrinology growth supported by release of accruals for rebates in U.S.
- General Medicine benefits from Glucophage repatriation in China
- Concor with strong volume increase especially in growth markets

Life Science: Solid organic growth and synergy realization drive EBITDA pre

Life Science P&L

[€m]	Q2 2016	Q2 2017
Net sales	1,430	1,495
Marketing and selling	-413	-443
Administration	-58	-65
Research and development	-65	-67
EBIT	166	221
EBITDA	343	411
EBITDA pre	417	454
Margin (in % of net sales)	29.1%	30.4%

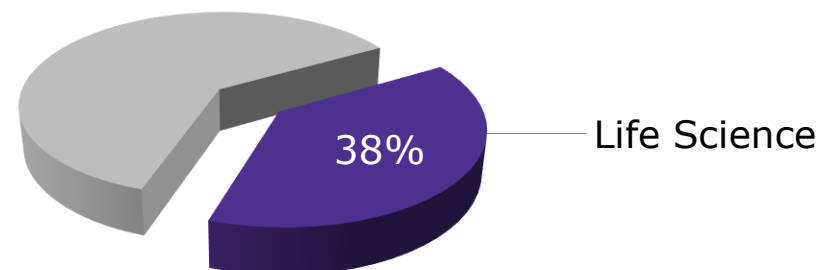
Net sales bridge



Comments

- Growth of Process Solutions picks up due to ongoing strength in single-use, service activities and improved small molecule business
- Applied Solutions shows moderate organic growth, driven by bio-monitoring products for pharma & pick up of Lab Water
- Research Solutions benefits from strong demand in China, U.S. slightly improving while Europe remains soft
- Q2 2016 EBIT affected by inventory step-up for Sigma-Aldrich
- Profitability reflects organic growth and synergies

Q2 2017 share of group net sales

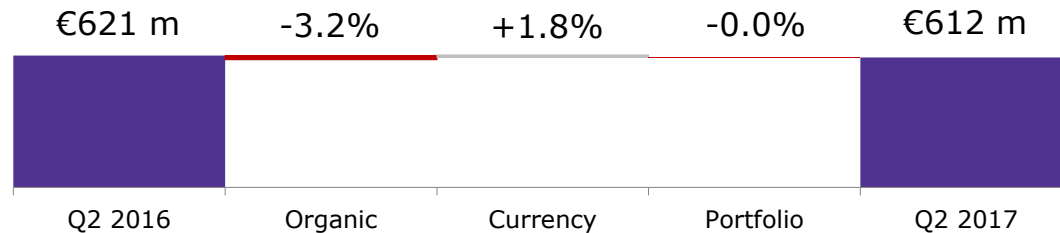


Performance Materials: Ongoing LC market share normalization burdens profitability

Performance Materials P&L

[€m]	Q2 2016	Q2 2017
Net sales	621	612
Marketing and selling	-59	-64
Administration	-14	-19
Research and development	-53	-59
EBIT	193	167
EBITDA	267	231
EBITDA pre	273	239
Margin (in % of net sales)	44.1%	39.1%

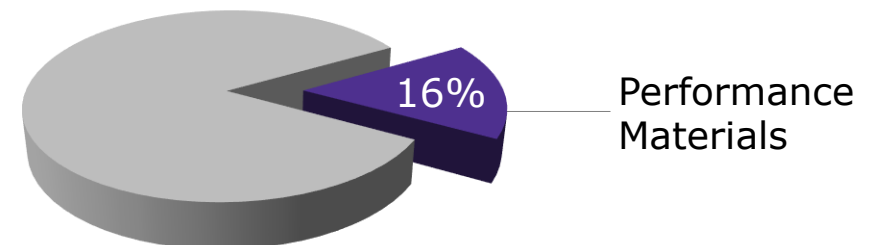
Net sales bridge



Comments

- Organic growth of Integrated Circuit Materials, Pigments and OLED not fully offsetting Liquid Crystal market share normalization
- LC volume development temporarily below usual price reductions
- OLED continues to grow on industry capacity expansion & investments
- Strong growth in ICM mainly driven by demand for dielectric materials (AZ) and deposition materials (SAFC from Sigma)
- Growth of Pigments due to solid demand for decorative pigments, while LYs demand for insect repellents sets tough comps for active cosmetics
- Profitability reflects negative business mix, typical LC price reductions as well as higher R&D for future growth projects

Q2 2017 share of group net sales



Reported figures reflect business performance and impairments

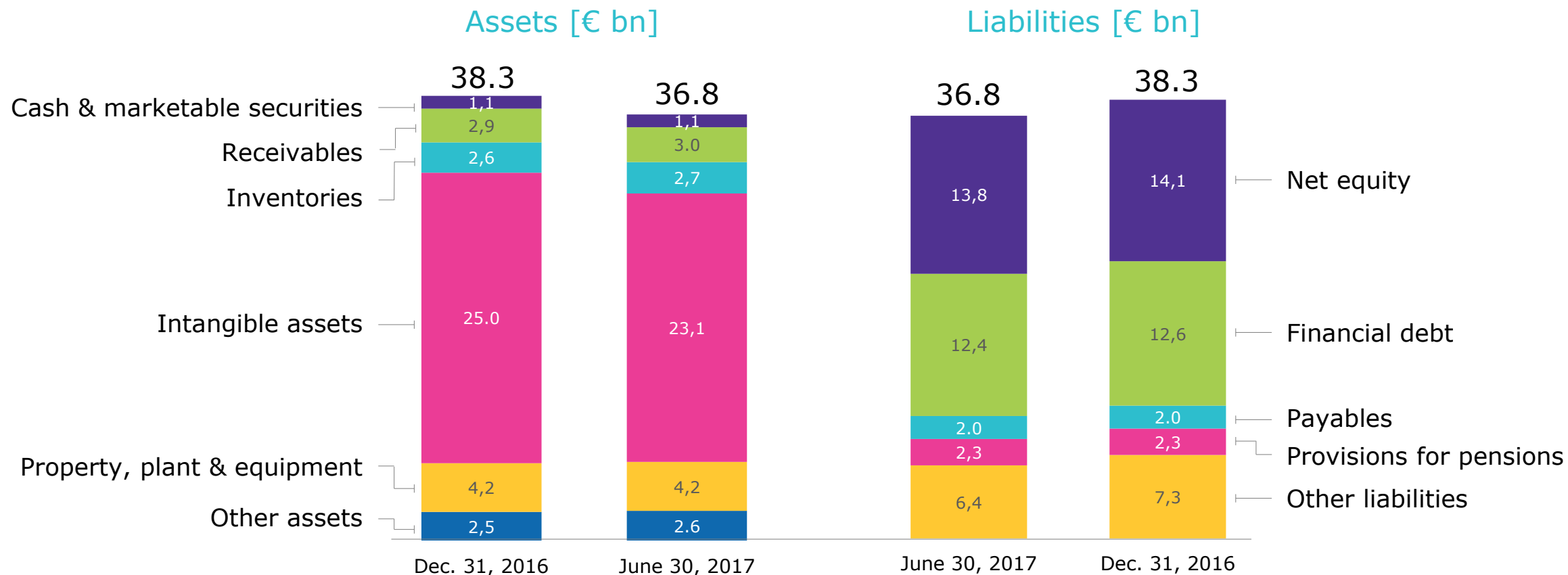
Reported results

[€m]	Q2 2016	Q2 2017	Δ
EBIT	550	628	14.0%
Financial result	-121	-71	-41.5%
Profit before tax	429	557	29.7%
Income tax	-115	-134	16.4%
<i>Effective tax rate (%)</i>	26.7%	24.0%	
Net income	312	421	35.1%
EPS (€)	0.72	0.97	34.7%

Comments

- EBIT higher despite lower EBITDA pre due to write-up of Vevey site (~ -€70 m) and Xalkori impairment (~ €70 m) LY
- Financial result LY contained significant adverse effects from LTIP*
- Effective tax rate within guidance range of ~23-25%; LY impacted by Xalkori impairment

Balance sheet – deleveraging in progress after Sigma acquisition



- Total assets decrease, while equity ratio increases to 37.4%
- Reduction in intangible assets reflects D&A (-€0.6 bn) and FX (-€1.5 bn)
- Lower net equity reflects negative FX mitigated by H1 profit
- Other liabilities decrease driven by profit transfer to E. Merck KG, Darmstadt, Germany as well as bonus payments

Healthy operating cash flow supported by lower tax payments

Q2 2017 – cash flow statement

[€m]	Q2 2016	Q2 2017	Δ
Profit after tax	314	423	109
D&A	519	380	-139
Changes in provisions	-67	21	88
Changes in other assets/liabilities	-397	-333	64
Other operating activities	-28	-11	17
Changes in working capital	-30	40	70
Operating cash flow	311	520	209
Investing cash flow	-114	-302	-188
thereof Capex on PPE	-125	-172	-47
Financing cash flow	-357	-184	173

Cash flow drivers

- D&A reduction reflects write up of Vevey site (~ -€70 m) and Xalkori impairment (~ €70 m) LY
- Changes in other assets/liabilities driven by lower tax payments
- Investing cash flow contains higher Capex & payments for F-star cooperation
- Capex mainly driven by investments in Healthcare and Sigma integration
- Financing cash flow reflects dividend payment, LY with higher redemption of debt

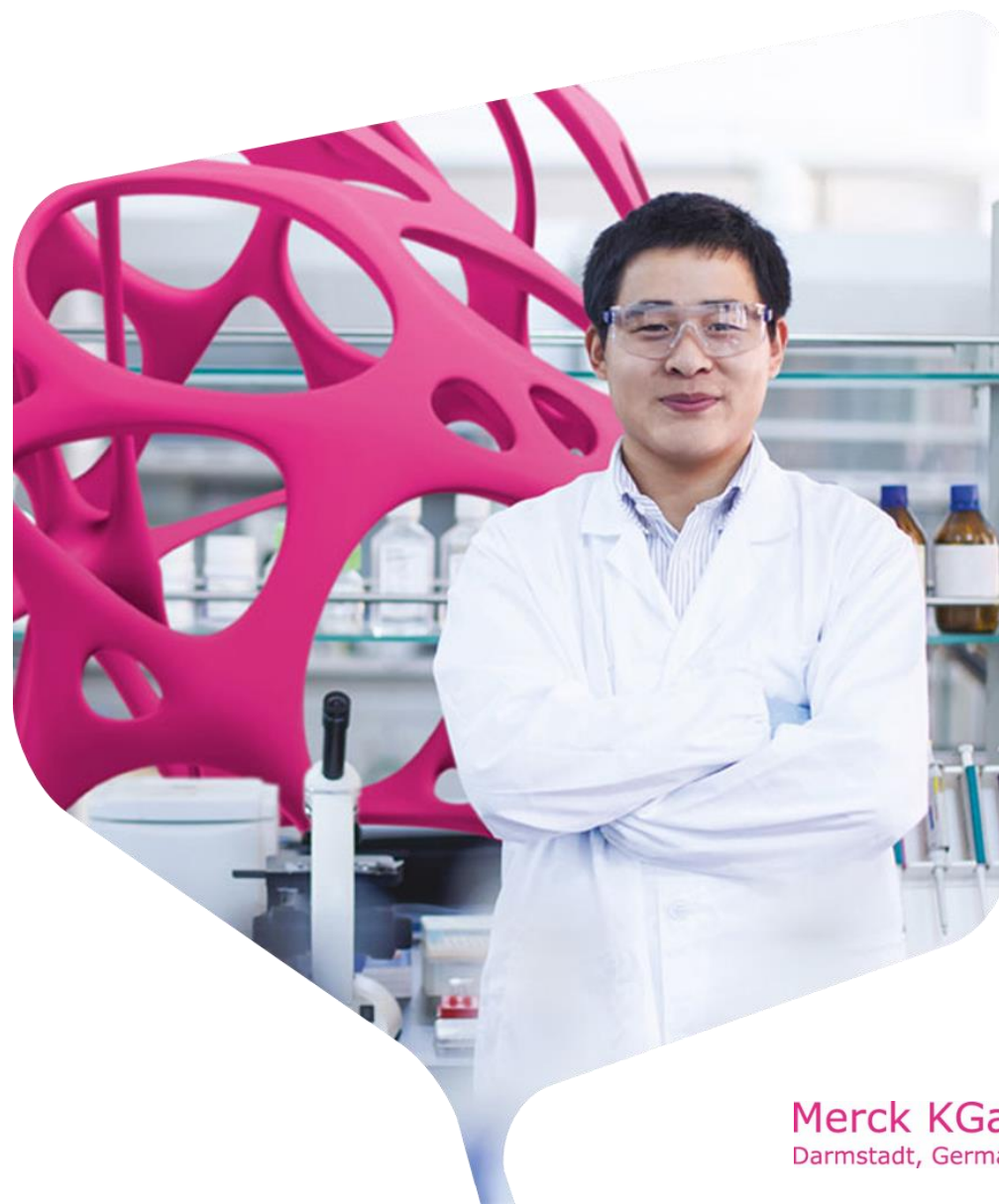
Exceptionals in Q2 2017

Exceptionals in EBIT

[€m]	Q2 2016		Q2 2017	
	Exceptionals	thereof D&A	Exceptionals	thereof D&A
Healthcare	70	71	-53	-68
Life Science	74	0	46	3
Performance Materials	7	0	16	7
Corporate & Other	10	0	16	-3
Total	160	71	25	-61

Financial calendar

Date	Event
September 28, 2017	M ³ - Meet Our Management
November 9, 2017	Q3 2017 Earnings release
March 8, 2018	Q4 2017 Earnings release
April 27, 2018	Annual General Meeting
May 15, 2018	Q1 2018 Earnings release



CONSTANTIN FEST



Head of Investor Relations
+49 6151 72-5271
constantin.fest@emdgroup.com

SVENJA BUNDSCHUH



Assistant Investor Relations
+49 6151 72-3744
svenja.bundschuh@emdgroup.com

ALESSANDRA HEINZ



Assistant Investor Relations
+49 6151 72-3321
alessandra.heinz@emdgroup.com

ANNETT WEBER



Institutional Investors /
Analysts
+49 6151 72-63723
annett.weber@emdgroup.com

NILS VON BOTH



Institutional Investors /
Analysts
+49 6151 72-7434
nils.von.both@emdgroup.com

EVA STERZEL



Retail Investors / AGM /
CMDs / IR Media
+49 6151 72-5355
eva.sterzel@emdgroup.com

OLLIVER LETTAU



Institutional Investors /
Analysts
+49 6151 72-34409
olliver.lettau@emdgroup.com

EMAIL: investor.relations@emdgroup.com

WEB: www.emdgroup.com/investors

FAX: +49 6151 72-913321

