



MERCK KGAA, DARMSTADT, GERMANY – Q1 2018 ROADSHOW

Investor Relations

May 2018



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Agenda

- 01 Business overview**
- 02 Transforming the company**
- 03 Healthcare – Funding for success**
- 04 Life Science – Focusing on profitable growth**
- 05 Performance Materials – Maintaining leadership and innovation**
- 06 Executive summary and guidance**



01

BUSINESS OVERVIEW

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



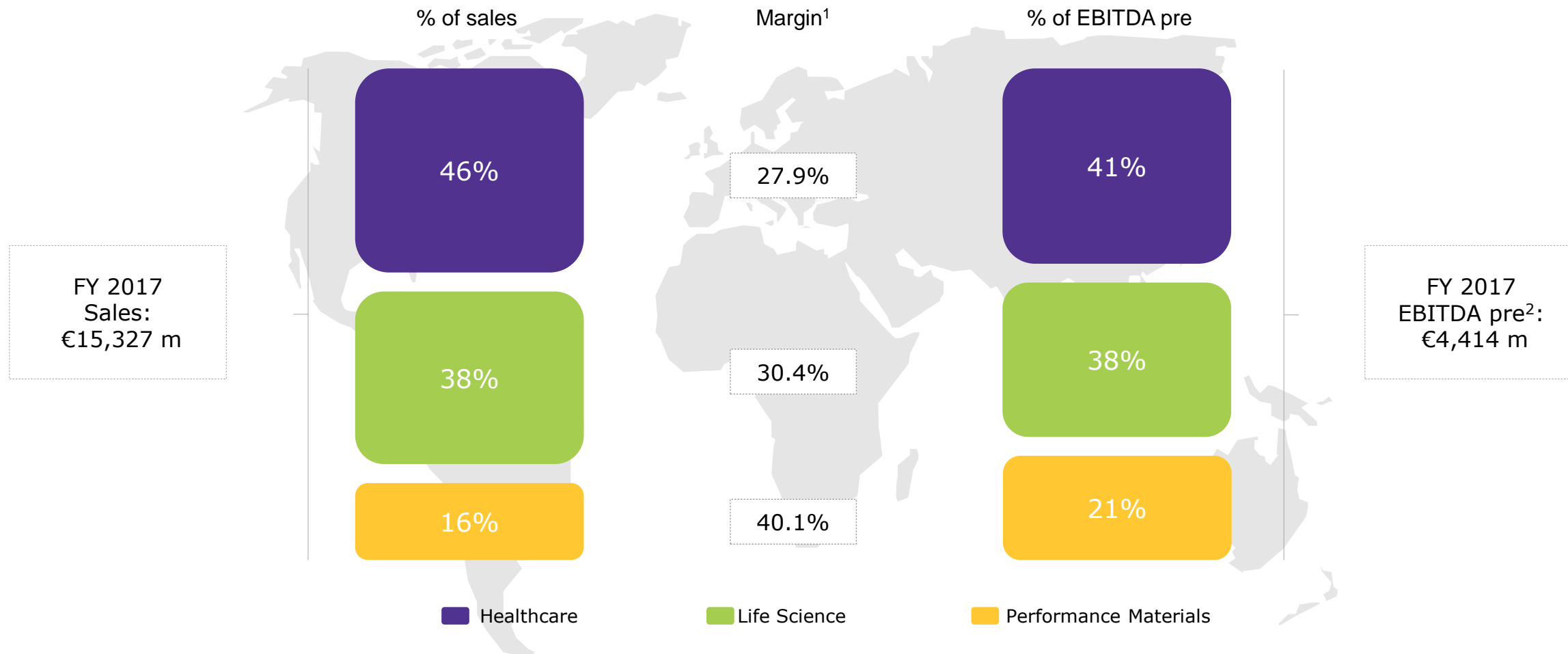
Performance Materials

Market leader in specialty materials

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

Group

Strong businesses with attractive margins

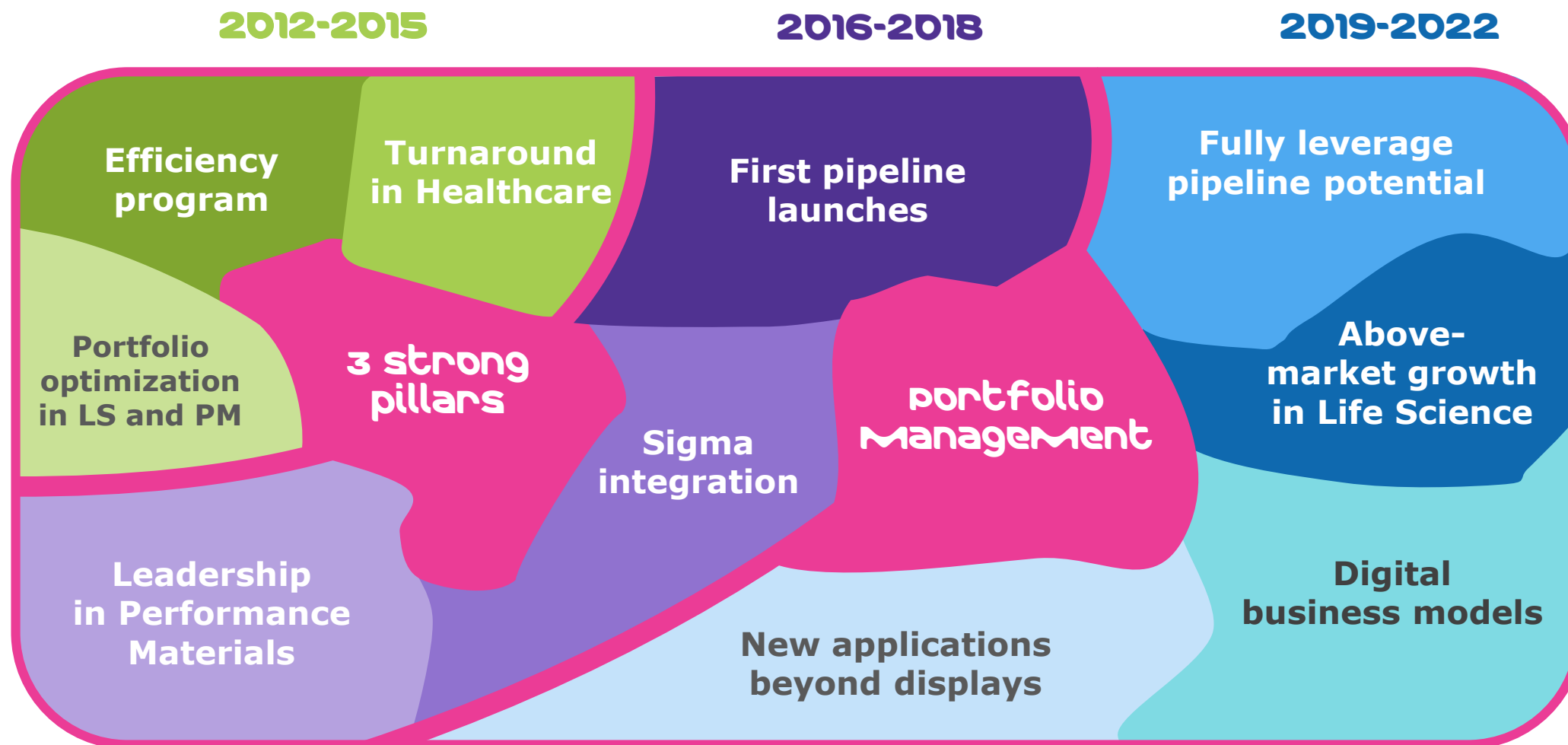


¹EBITDA pre margin in % of net sales; ²Including Corporate/Others (-€301 m)



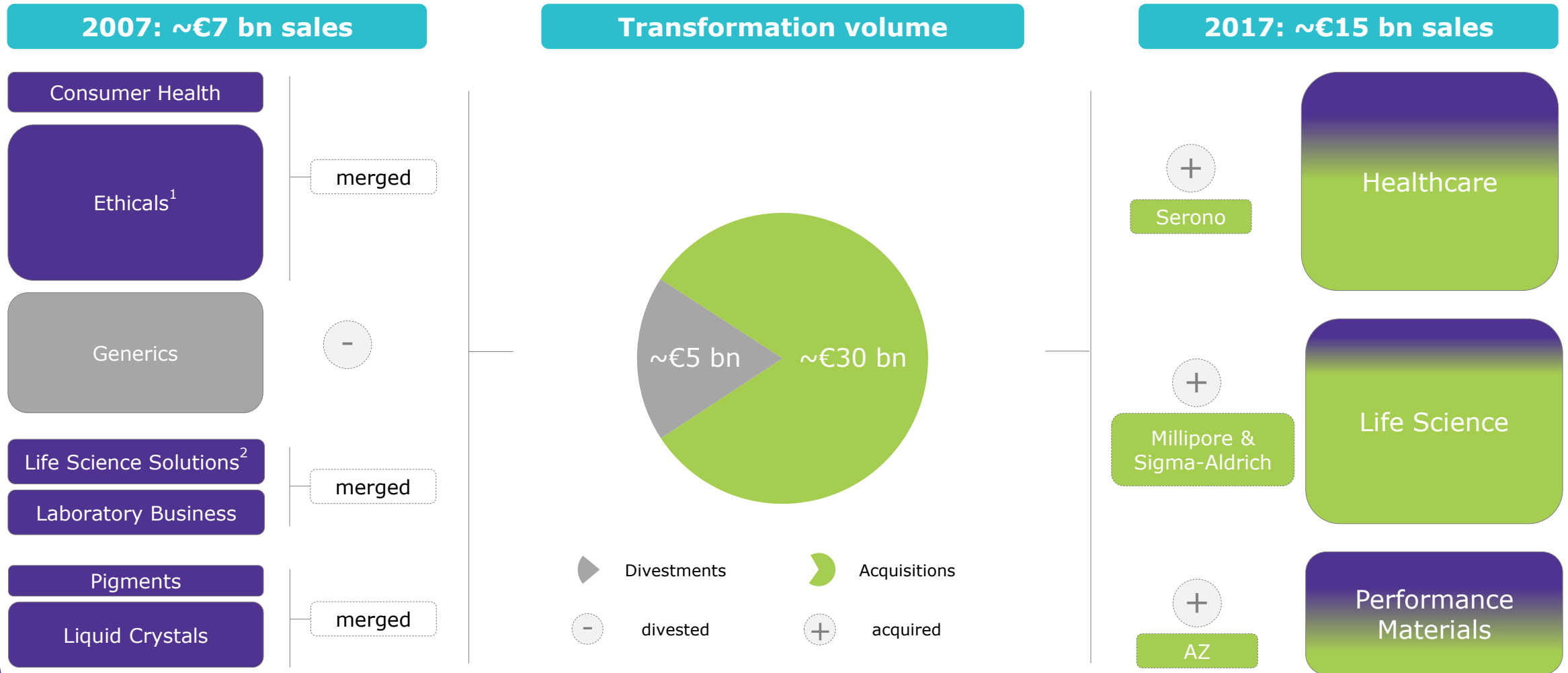
02 TRANSFORMING THE COMPANY

Group Strategic roadmap 2016-2022



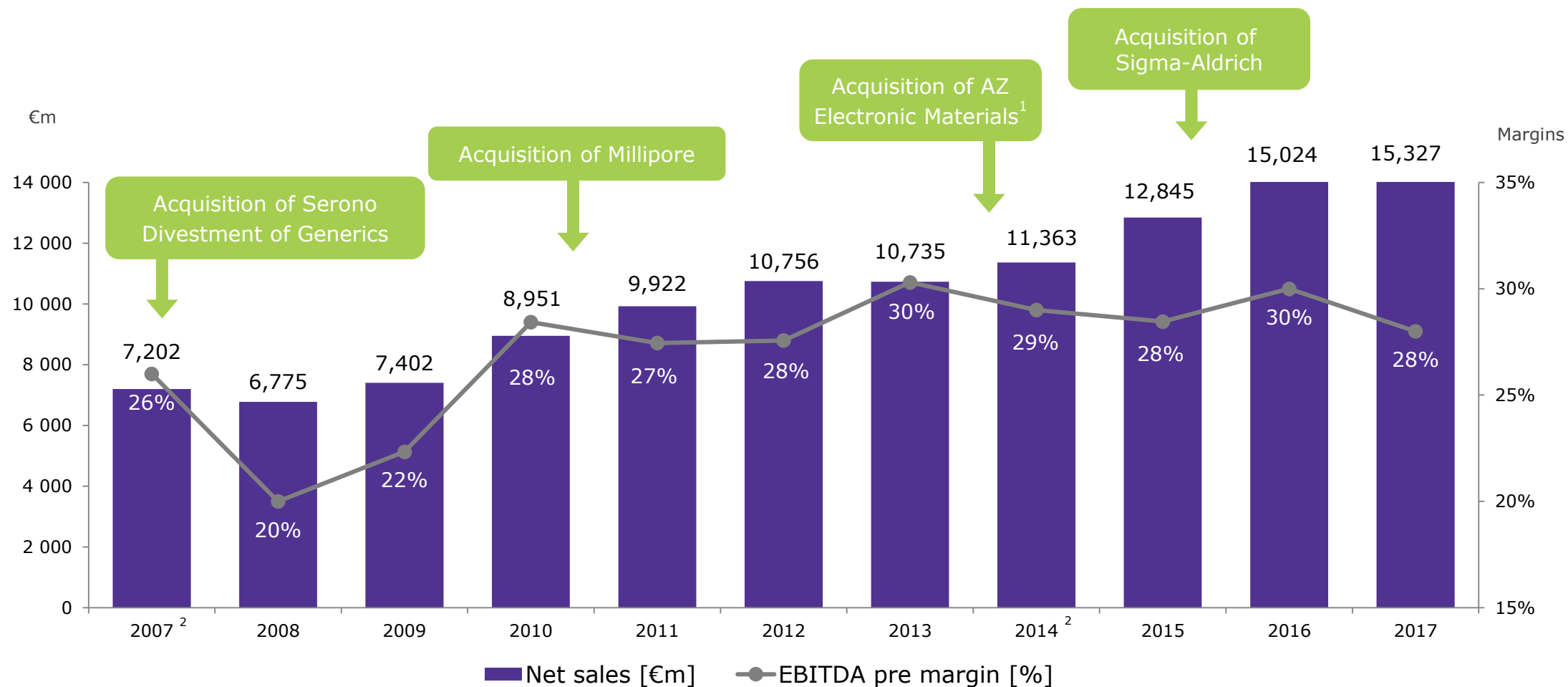
Group

We have added scale and strengthened the attractiveness of its portfolio



Group

Profitability improved fundamentally



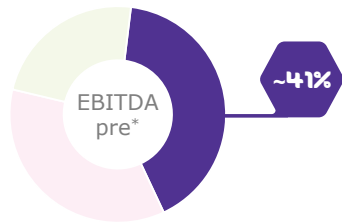
¹Included since 2 May 2014; ²2007 and 2014 EBITDA pre margin adjusted for comparability

Group

Clear set of priority goals to be realized by 2018



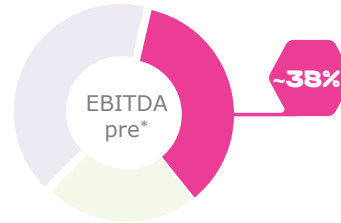
Healthcare



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



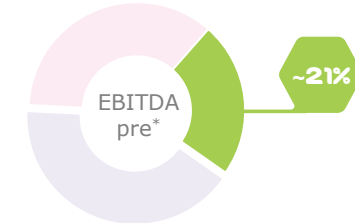
Life science



- 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 that ensures a sustainable and resilient development

Regular portfolio review and optimization remains key

- Acquisitions and divestments are part of company's history
- Licensing transactions remain on our agenda
- All prior transactions earned their required cost of capital

Regular portfolio review and active capital allocation will continue

**DNA and
track
record**

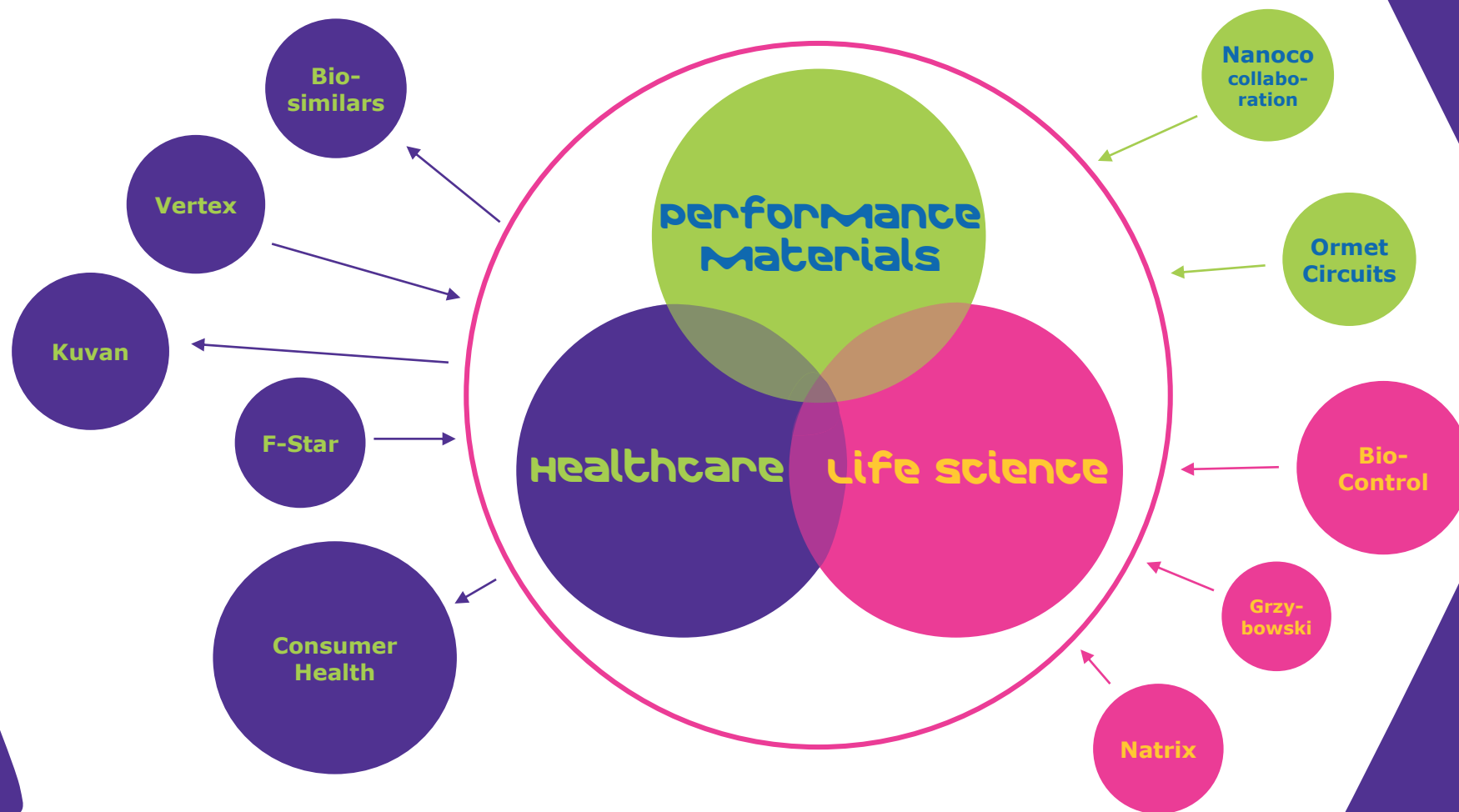
**clear
criteria**

- Supporting mid-term strategy and strengthening core business
- Growing in attractive markets
- Proven track record: strong ability to win
- Compelling financials:
 - $IRR > WACC$
 - EPS pre accretive
 - Maintain investment-grade credit rating

Disciplined approach to portfolio management will persist

Group

Stronger portfolio through active management



profitable growth and value creation

- Well-balanced approach to organic and inorganic growth
- Strengthened all three businesses
- Increased resilience of Group

Consumer Health disposal agreement

Transaction highlights

1

Strong buyer: P&G committed to combine two leading and complementary OTC businesses and will be a great home for our employees as capabilities will be key to fully capture growth opportunities

2

Full sale: Agreement foresees the sale of the complete Consumer Health business across 44 countries to P&G

3

All-cash transaction: €3.4 bn all-cash disposal price will accelerate deleveraging with closing expected by the end of Q4 2018

4

Attractive valuation: Implicit multiples are above recent industry transactions and imply significant value generation with net proceeds exceeding going concern

disposal of
consumer
health
to P&G

Consumer Health disposal agreement

Key transaction details



Key financial conditions

- Full sale, all-cash
- Disposal proceeds (EV) €3.4 bn¹, debt/cash-free
- Expected disposal gain up to €3 bn, taxed at 15-20%
- Break-up fee in place



Attractive valuation

- Multiples above recent industry transactions
- EV/sales² ~3.7x
- Pro-forma² EV/EBITDA pre ~19.5x
- EV/EBITDA² ~21.8x



Comprehensive Consumer Health business

- 2017 net sales €911 m²
- >900 products worldwide
- 2 production sites in Austria and India
- ~3,300 employees globally
- Comprehensive transitional agreements in place



Closing conditions and transaction structure

- Closing expected by the end of Q4 2018
- Subject to customary closing conditions including regulatory approvals
- Divestment takes place as a combination of share and asset deals
- Indian business will be fully sold due to local-entity listing, but non-Consumer Health activities will be bought back



HEALTHCARE

Funding for success

Healthcare

Healthcare is set to deliver on promising pipeline candidates

Deliver

on organic growth

Focus

on pipeline



Stable existing business



Solid pipeline of oncology, immuno-oncology and immunology molecules



Competitive R&D funding in our focus areas



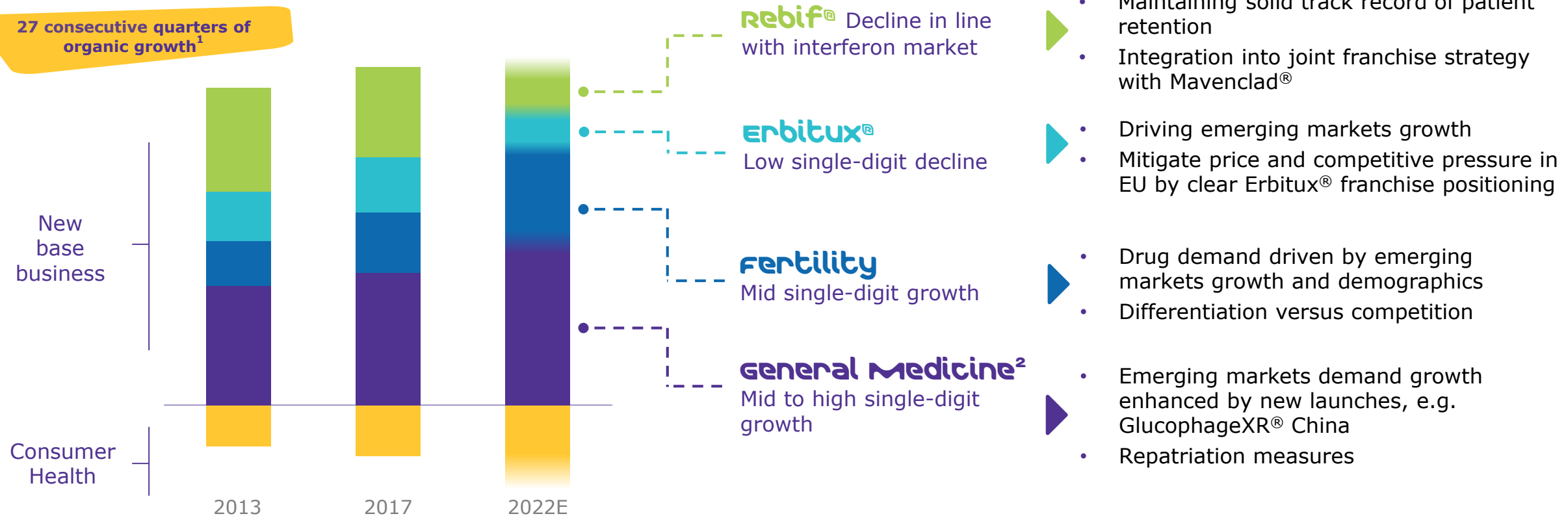
Cost discipline and efficient execution



Healthcare

Ambition to keep core business sales organically stable until 2022

Healthcare core business net sales until 2022

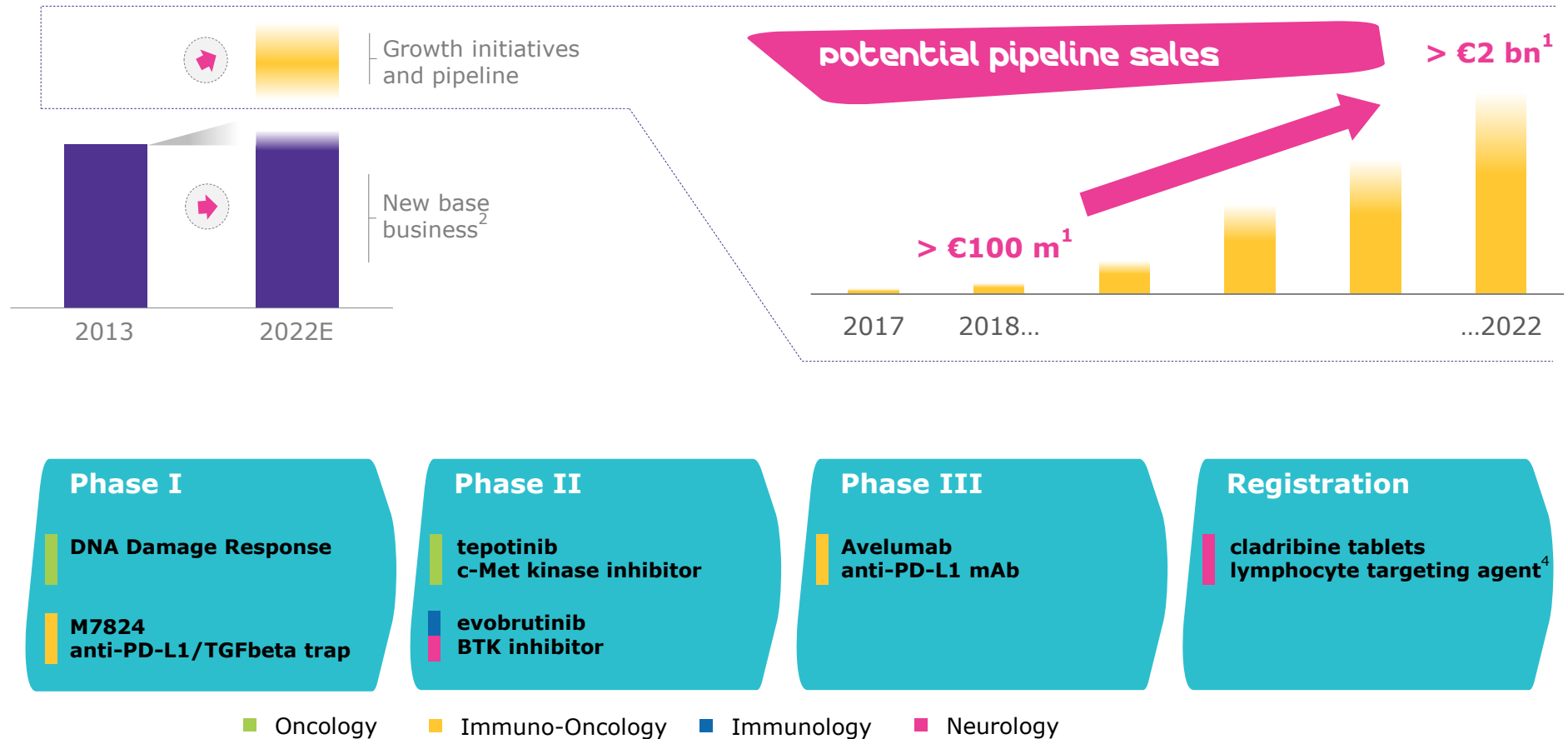


Healthcare

Well on track to deliver the pipeline

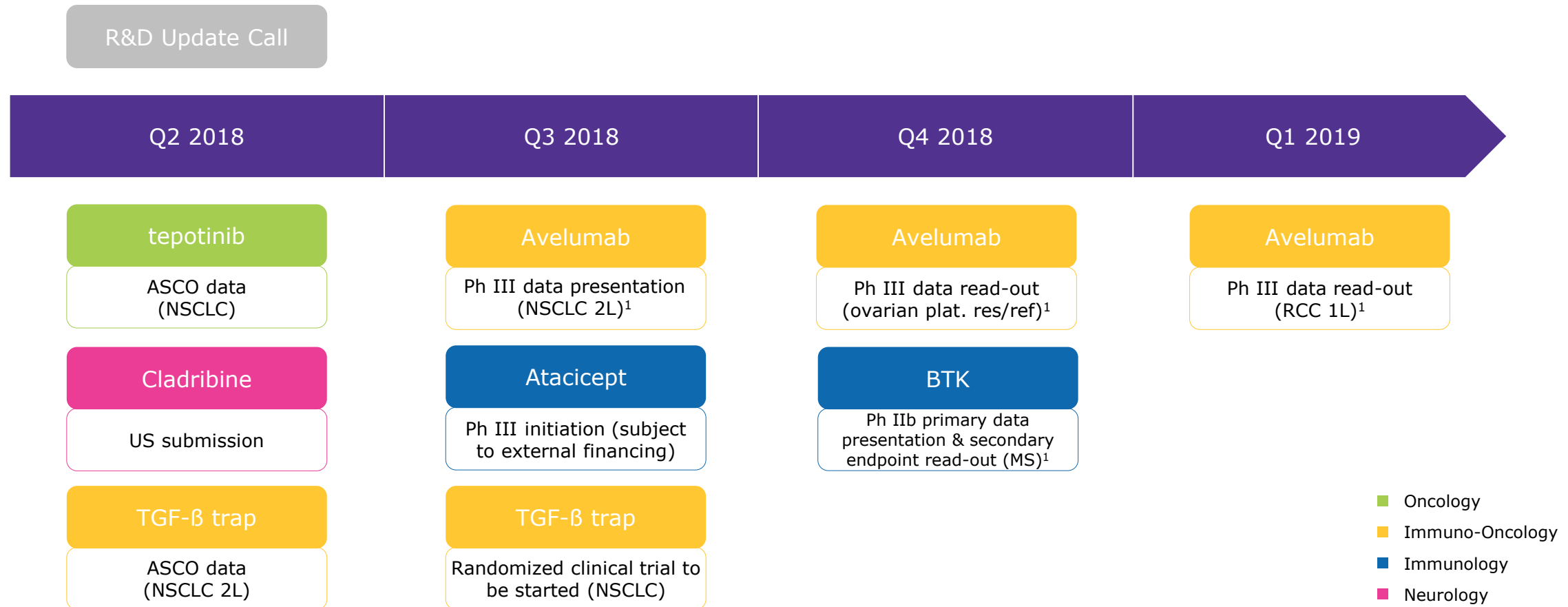
Deliver the pipeline

Key investments³



¹Illustrations; risk adjusted; ²after Consumer Health divestment; ³illustrative pipeline as of February 15, 2018; 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; ⁴As announced on August 25 2017, the European Commission has granted marketing authorization for cladribine tablets for the treatment of highly active relapsing multiple sclerosis in the 28 countries of the European Union in addition to Norway, Liechtenstein and Iceland.

Upcoming catalysts: Major read-outs and development progress expected



¹ Note: timelines are event-driven and may change.
Acronyms: NSCLC – Non small cell lung cancer; MS – Multiple Sclerosis; RCC – Renal Cell Carcinoma



LIFE SCIENCE

Focus 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

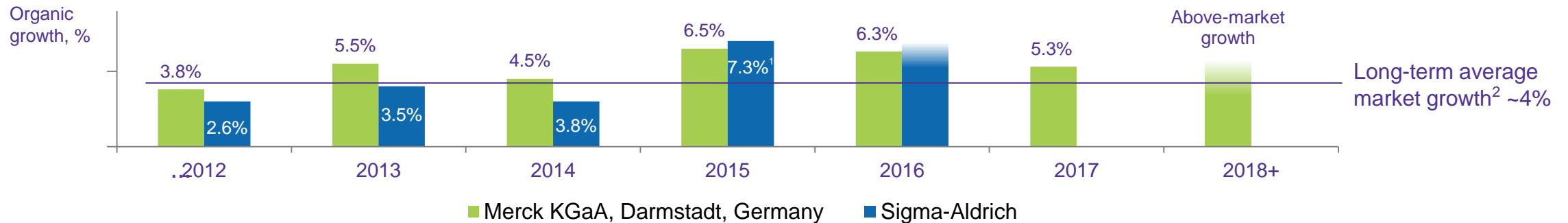


- Diagnostic manufacturers
- Clinical testing labs
- Food & Beverage manufacturers

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

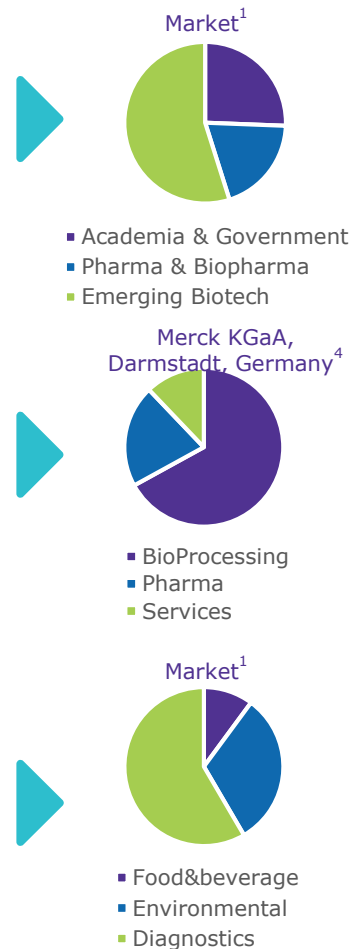
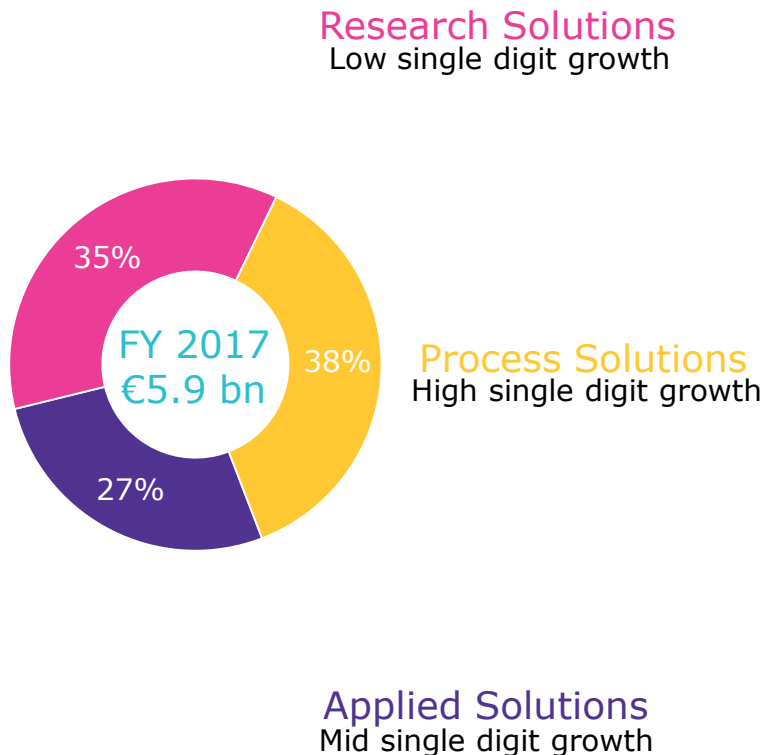
Top-line synergies

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

Life Science

Business is on track to deliver above-market organic growth

Life Science



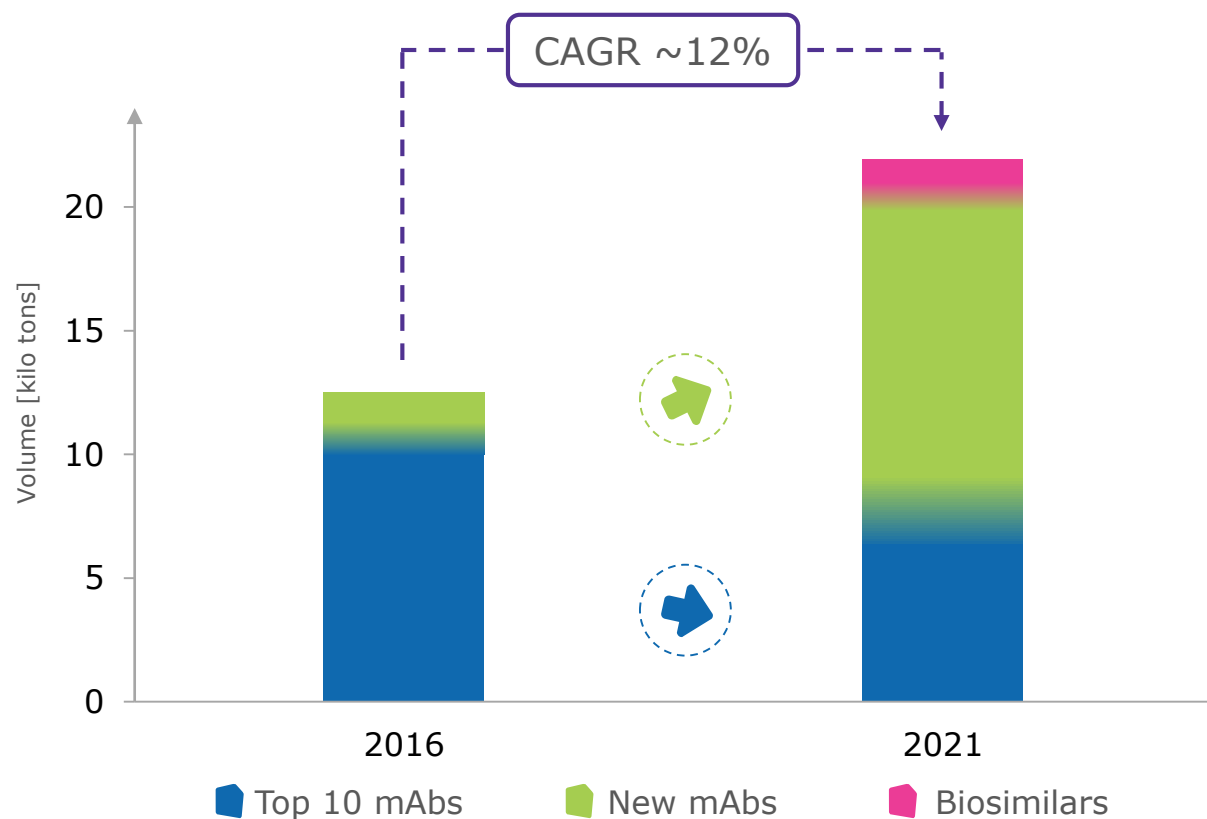
Long-term growth drivers

- **Research activity:** >3,000 projects in research pipelines², rising number of experiments and newly emerging therapies/technologies backs healthy growth in biotech and CROs³
 - **Public and private funding:** availability, access and predictability drive demand from academia and emerging biotech customers
 - **Regulation:** rising requirements foster long-term customer partnerships
-
- **Biologics:** mAbs production⁵ growing by ~12% p.a. for 2016-2021 driven by new molecules and biosimilars
 - **Diversification:** contribution by top 10 molecules will decline to ~30% until 2021 from 80% today⁶
 - **Noval modalities:** innovation in complex-to-deliver therapies, e.g. gene and cell therapy, will drive demand for single-use, end-to-end and new technology solutions
-
- **Regulation:** testing volumes overall are rising globally rise in quality standards and increased demand for testing across customer segments
 - **Population and economic growth:** demand for access to more sophisticated products and services rises, e.g. in emerging markets
 - **Speed:** need for fast testing results raises requirements for Applied customers, esp. in clinical testing and food & beverage testing

¹Source: Merck KGaA, Darmstadt, Germany Factbook; ²Source: PhRMA; ³CRO = Contract Research Organization; ⁴Indicative only; ⁵mAbs = monoclonal antibodies; ⁶Source: EvaluatePharma April 2017

Democratization of mAbs market will drive diversification, change, variability

mAb volume projections 2016 to 2021



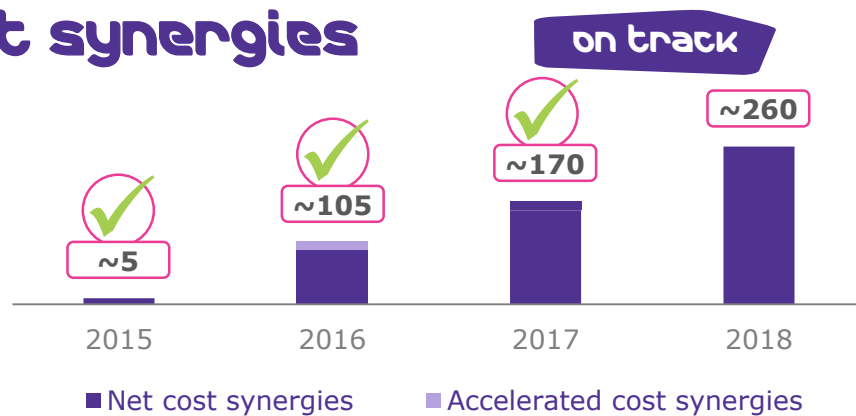
Market development

- Overall mAbs market will grow ~12% CAGR
- Top 10 originator mAbs represent ~ 80% of market volume
- In 2021 ~ 90% of the volume will be shared between Top 35 mAbs
- Biosimilars will gain share, but remain a minority mid-term

Integration of Sigma and synergy generation progressing well

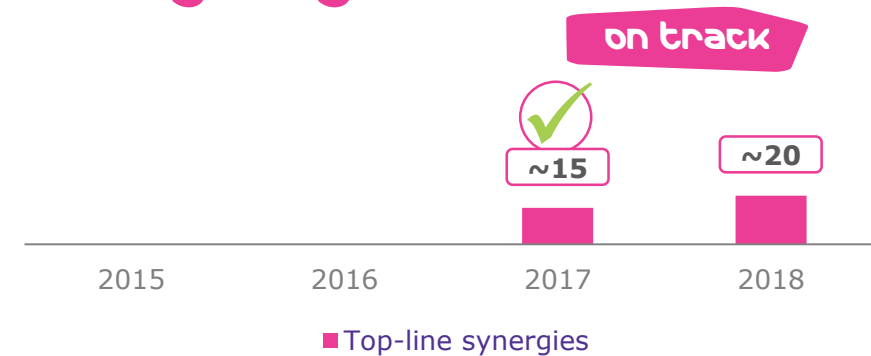
on track to deliver planned synergies of ~ €280 M until 2018

cost synergies



- **Network consolidation and operational transformation ongoing**
 - Consolidated 10 manufacturing and distribution sites
 - Announced consolidation of 5 further sites
- **Combination of customer service centers and offshoring of transactional tasks**

topline synergies



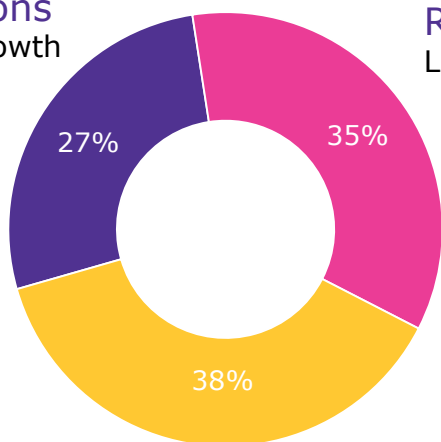
- **Continued integration of sigmaaldrich.com**
 - ~80% of relevant products in U.S. and EU are available online
 - >1/3 of Merck KGaA, Darmstadt, Germany eCommerce orders now contain products from both legacy companies
- **Complete offering in Process Solutions**

Life Science

We aim to be the profitability champion of the sector

Sales breakdown as of FY 2017

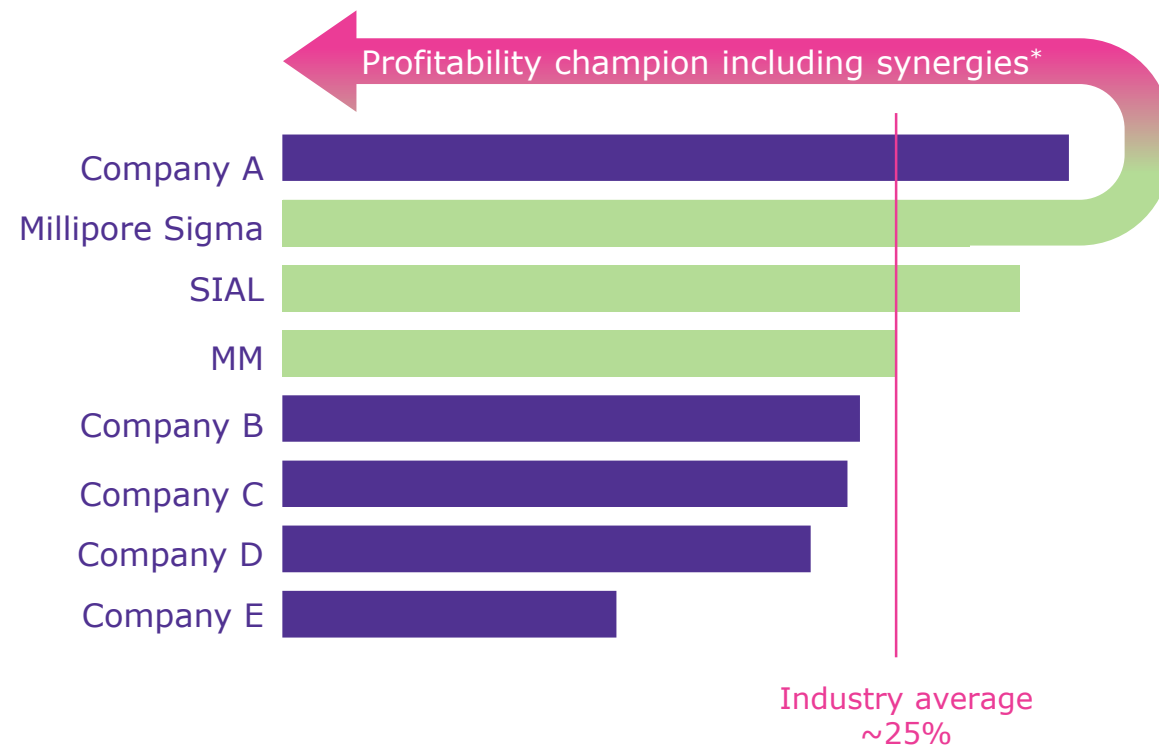
Applied Solutions
Mid single digit growth



Research Solutions
Low single digit growth

Process Solutions
High single digit growth

Above industry margin levels



Life Science is well set for sustainable growth and profitability



05

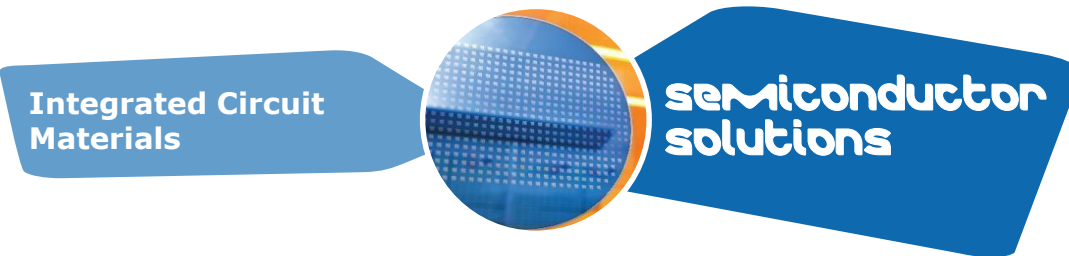
PERFORMANCE MATERIALS

Maintaining leadership and innovation

Performance Materials

New structure combines LC with OLED, serving same customer group

Business allocation within Performance Materials



% sales



Products

- Dielectrics, colloidal silica, lithography materials, yield enhancers, edge-bead removers
- Polyimide raw materials and printing materials



- Liquid crystals (LC) and photoresists for TVs, smartphones and tablet computers
- Other display and non-display applications (e.g. LC Windows)
- Organic and inorganic light emitting diodes

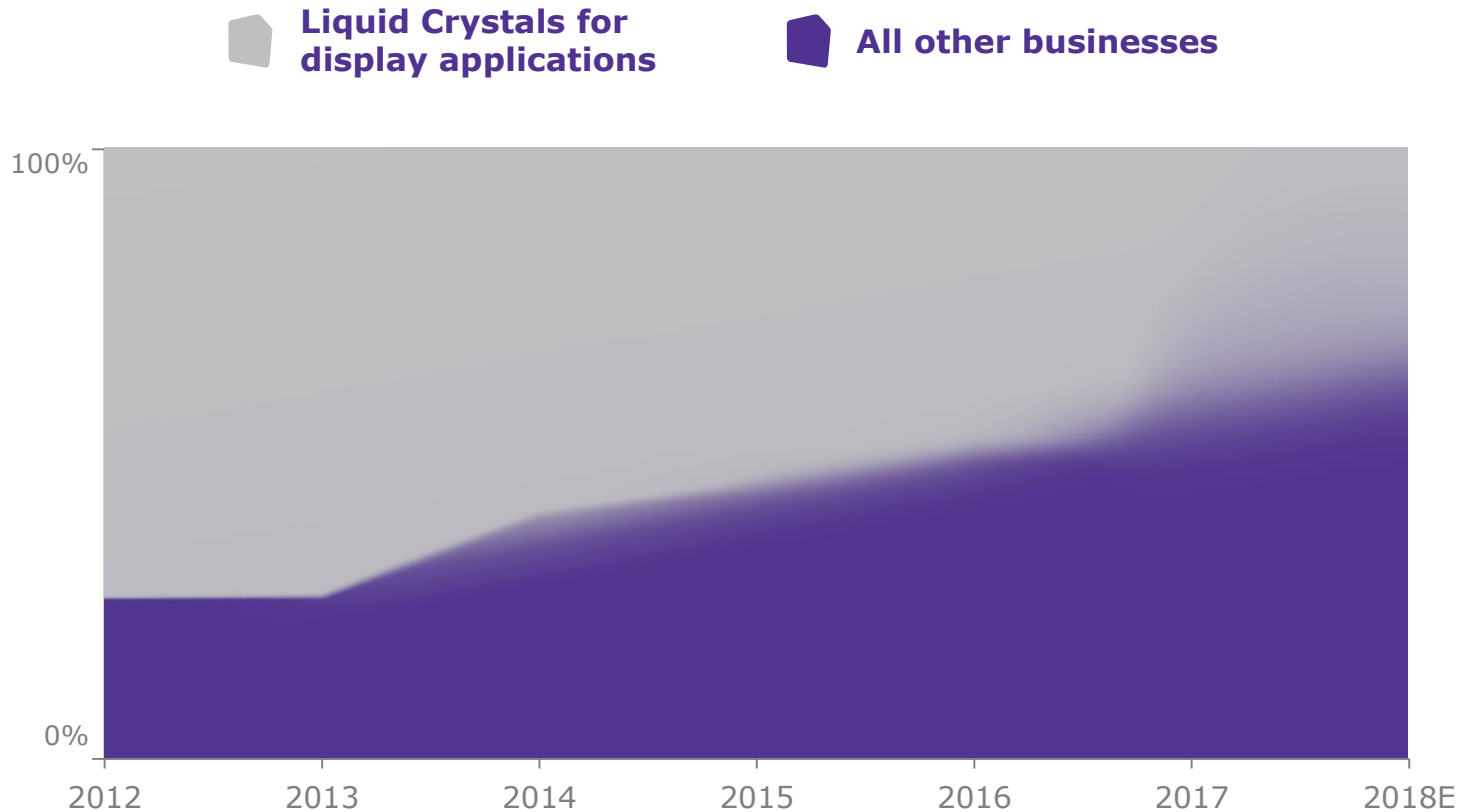


- Effect pigments and functional materials for coatings, plastics, printing and cosmetics
- Functional materials for cosmetics & special applications
- Functional materials for electronics and energy solutions

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

Three-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 share decline
- Higher growth of non-LC businesses

Liquid Crystal decline implies significant financial implications

sales:

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

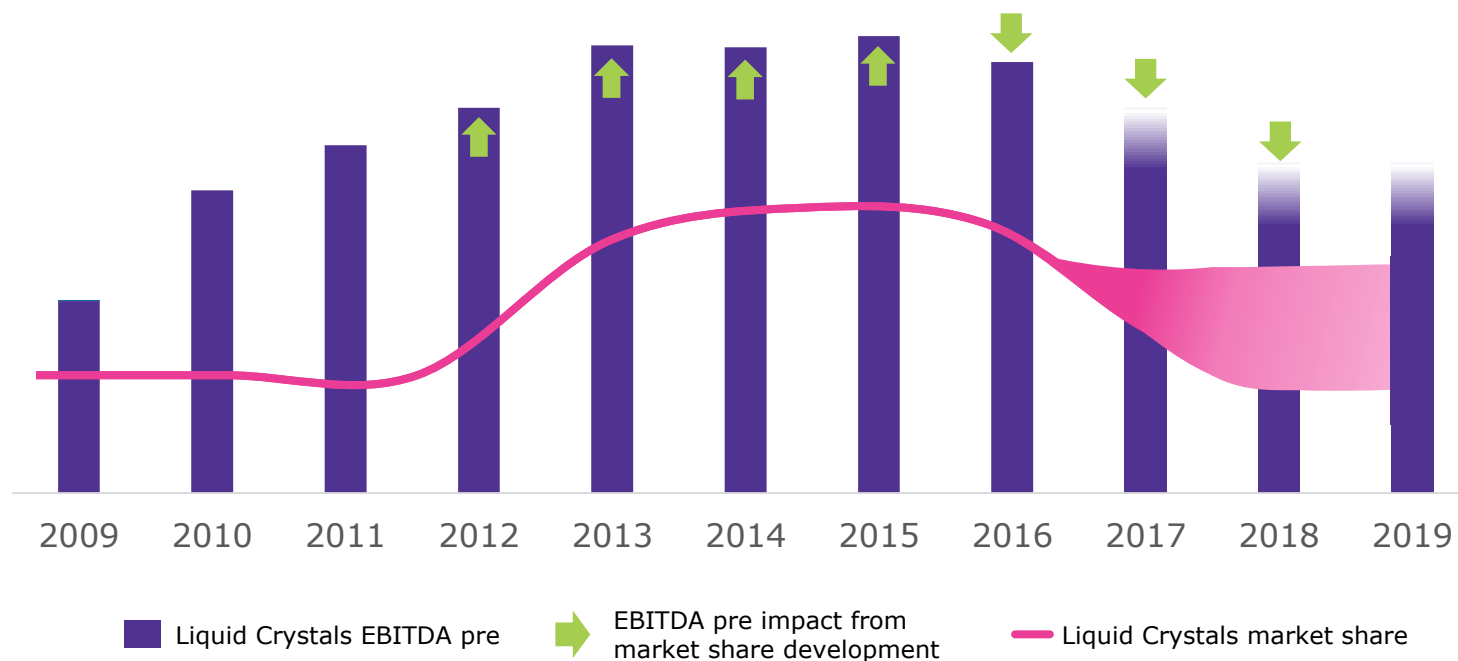
profitability :

- 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



06 EXECUTIVE SUMMARY AND GUIDANCE

Group

We are well on track to deliver on our promises



Group

Net debt reduced by >€2 bn¹
Strict financial discipline supports rating



Healthcare

Core business growing
2 Bavencio indications & Mavenclad 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**

FY 2015

FY 2017

2018

Key EBITDA pre* drivers



EBITDA-supporting factors

- Organic net sales growth by Healthcare and Life Science
- Sigma-Aldrich incremental cost and revenue synergies
~+€95 m YoY
- Biosimilars divestment frees up R&D budget
(2017: mid to high double-digit million R&D costs)
- First full-year sales contribution from newly launched pipeline products Mavenclad® and Bavencio®
- BioMarin milestone payment of €50 m



EBITDA-reducing factors

- Underlying R&D costs in Healthcare are budgeted above 2017, but actual development will be subject to clinical data outcome of priority projects and prioritization decisions
- Healthcare margins negatively impacted by product mix
- 2017 special gains of ~€200 m will not recur
- Performance Materials sales and earnings continuously affected by decline in Liquid Crystals
- First launch preparations for Mavenclad® U.S., driving M&S costs
- FX remains a strong headwind, esp. in H1 2018, and is slightly stronger than anticipated so far; expected EUR/USD 1.19-1.23 for FY 2018

Organic full-year 2018 guidance confirmed

Group „incl. CH”¹

Net sales:

Organic +3% to +5% YoY
FX ~ -4% to -6% YoY
~ €15.0 – 15.5 bn¹

EBITDA pre:

Organic -1% to -3% YoY
FX -5 to -7% YoY
~ €3,950 – 4,150 m¹

EPS pre:

~ €5.30 – 5.65¹

Disposal of Consumer Health

- Net sales ~€ 0.9-1.0 bn²
- EBITDA pre ~€170-200m²

Group „excl. CH”

Net sales:

Organic +3% to +5% YoY
FX ~ -4% to -6% YoY
~ €14.0 – 14.5 bn

EBITDA pre:

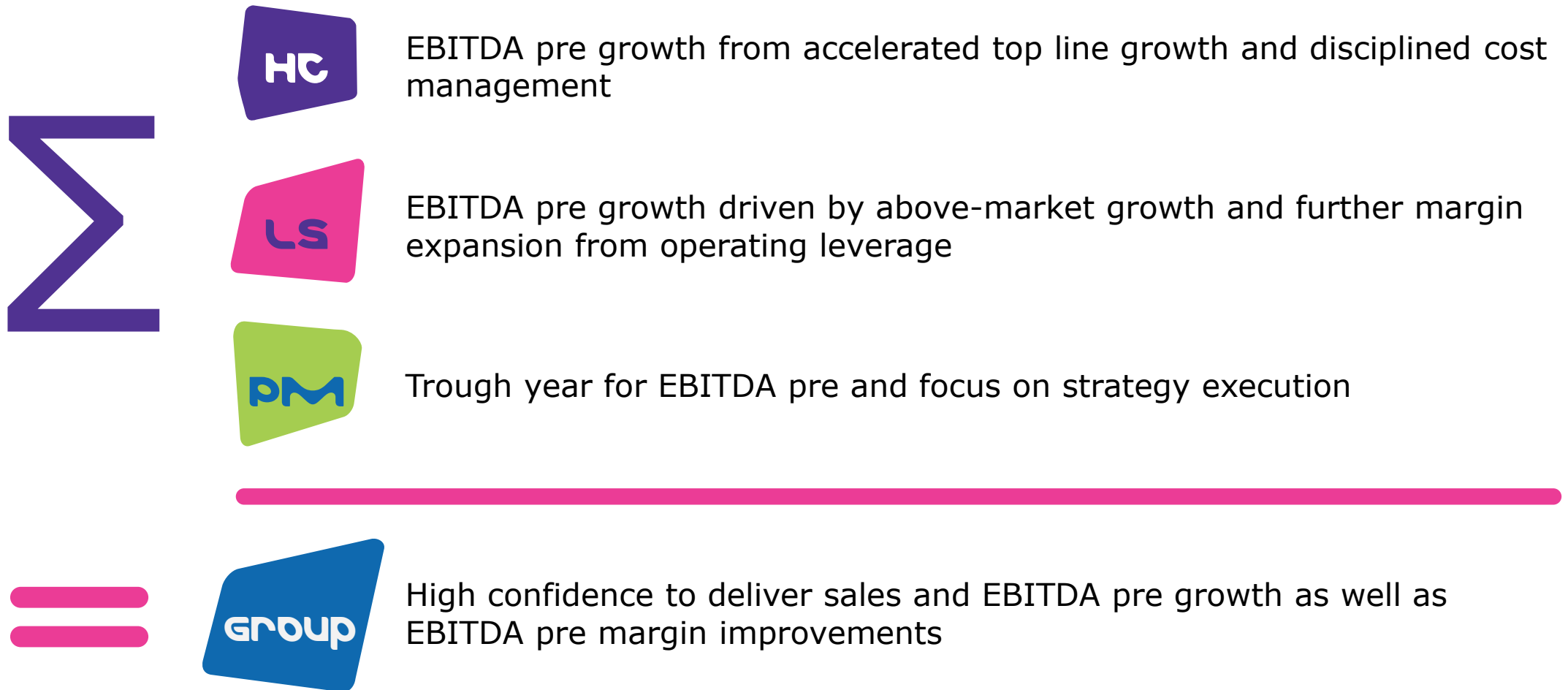
Organic -1% to -3% YoY
FX -5 to -7% YoY
~ €3,750 – 4,000 m

EPS pre:

~ €5.00-5.40

¹Constant portfolio; ²Indication only; the actual impact and 2017 restatement may differ as restatement process is currently ongoing; other business sectors may also see minor adjustments due to contractual agreements

Merck KGaA, Darmstadt, Germany to return to profitable growth track from 2019 onwards



Strong confidence and commitment for future growth

1

We offer a unique and promising portfolio with leading market positions and high innovation potential

2

We are highly profitable, invest strongly in our future potential and will generate sustainable profitable growth from 2019 onwards

3

We are financially rock solid and therefore able to finance its future organic growth

4

We will continue to deliver on our promises and communicate transparently



Appendix

01 Guidance details

02 Healthcare

03 Life Science

04 Performance Materials

05 Financial details



01

GUIDANCE DETAILS

2018 business sector guidance including Consumer Health



Healthcare

Net sales

- Moderate organic growth: ongoing organic Rebif decline offset by growth in other franchises
- Full-year contributions from 2017 launches

EBITDA pre

- Organic -1% to -2% YoY
- FX -5% to -7% YoY
- ~ €1,770 – 1,830 m (incl. CH)
- ~ €1,580 – 1,650 m (excl. CH)



Life Science

Net sales

- Organic growth again slightly above market; driven by Process Solutions
- Full realization of expected topline synergies

EBITDA pre

- Organic ~ +8% YoY
- FX -4% to -6% YoY
- ~€1,820 - 1,870 m



Performance Materials

Net sales

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

EBITDA pre

- Organic -14% to -16% YoY
- FX -8% to -10% YoY
- ~€725 – 765 m

Additional financial guidance 2018

Further financial details

Corporate & Other EBITDA pre	~ -€320 – -360 m
Interest result	~ -€230 – -240 m
Effective tax rate	~ 24% to 26%
Capex on PPE	~ €900 – 950 m
Hedging/USD assumption	2018 hedge ratio ~50-60% at EUR/USD ~ 1.19 to 1.20
2018 Ø EUR/USD assumption	~ 1.19 – 1.23 ¹

Group

Merck KGaA, Darmstadt, Germany has clear financial priorities



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



Ongoing cost discipline



**Efficient capital
allocation**

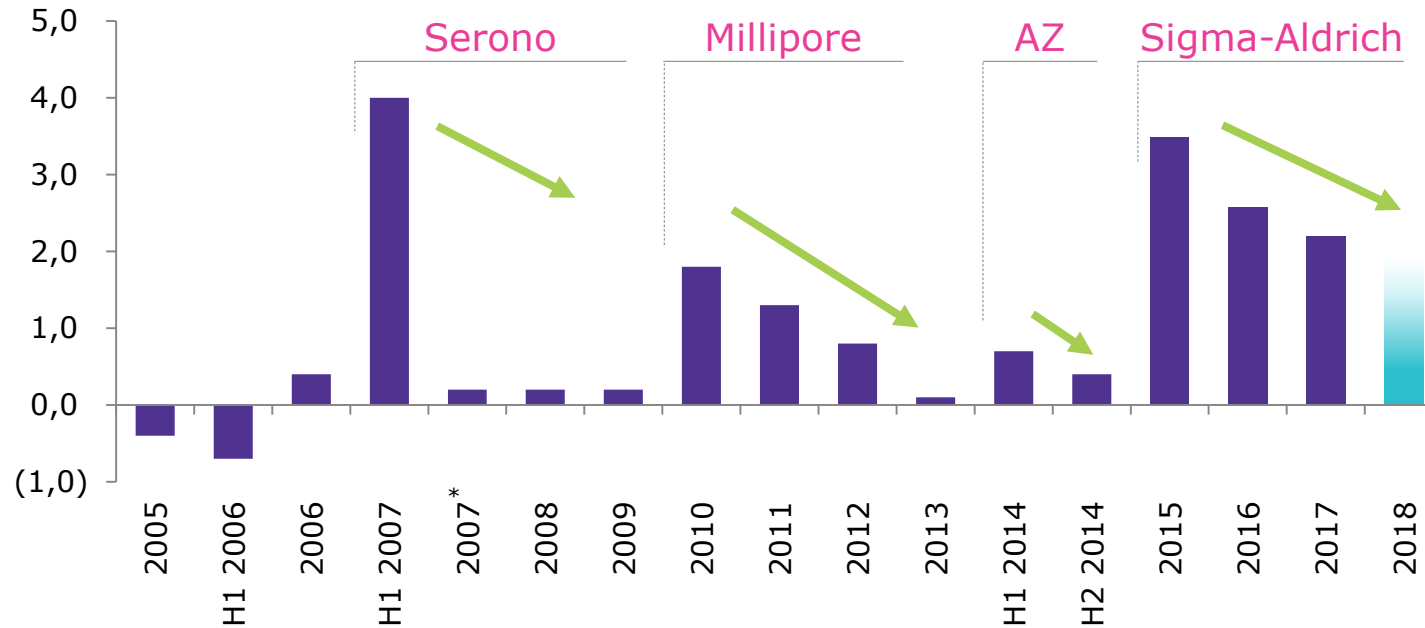
- **Strong cash flow** will be used to drive down gearing to <2x net debt / EBITDA pre in 2018
- **Larger acquisitions (>€500 m) ruled out** for 2018 (or financed by divestments)
- **Dividend policy** that ensures a sustainable and resilient development
- **Synergy generation** is utmost priority
- **Cost discipline** continues in all business sectors
- **Further efficiency gains** from ongoing improvement and harmonization of processes and systems
- **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

Group

Merck KGaA, Darmstadt, Germany remains focused on deleveraging

Net debt excl. pensions / EBITDA pre



- We have a strong track record of disciplined deleveraging after large acquisitions
- We stay focused on deleveraging to gain financial flexibility

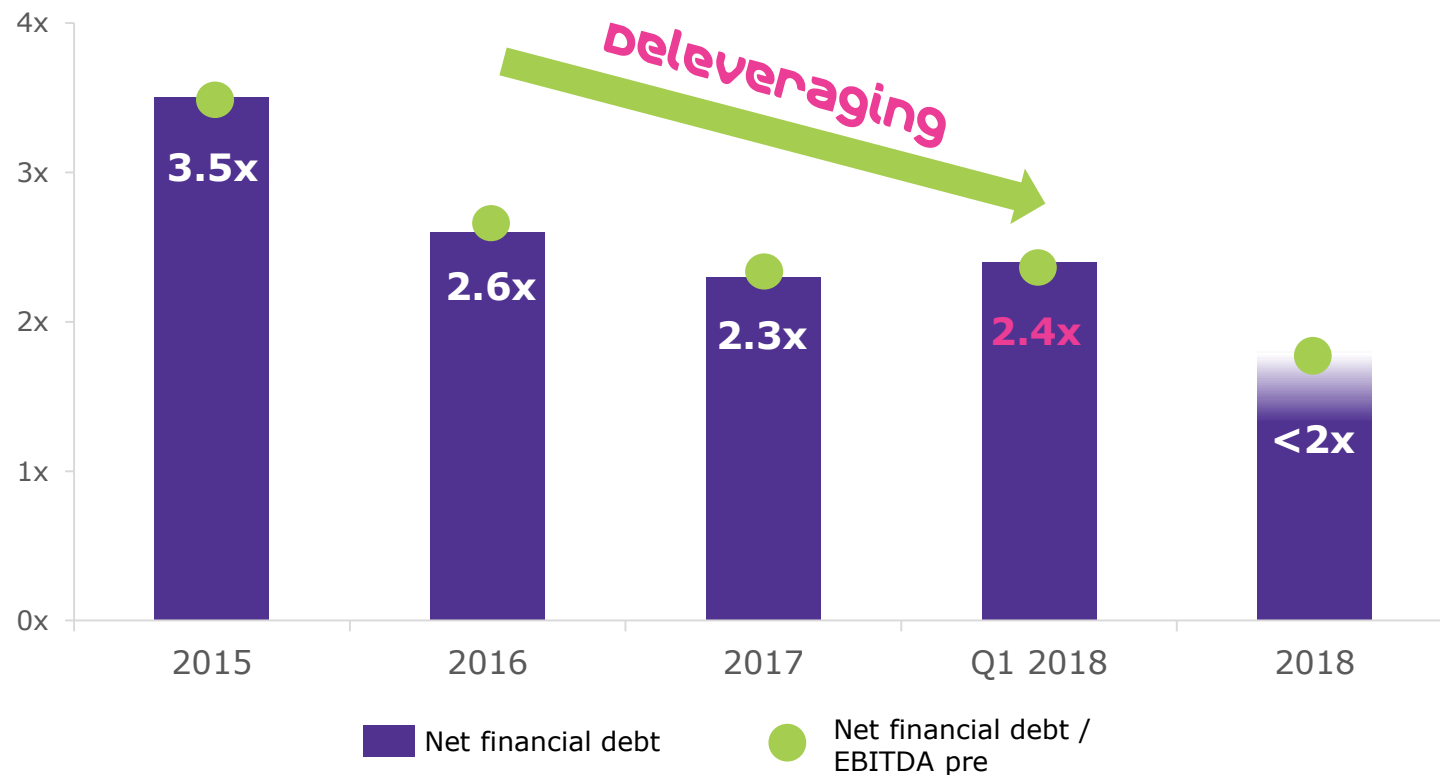
Merck KGaA,
Darmstadt,
Germany

- **Deleverage to <2x net debt / EBITDA pre in 2018**
- **No large acquisitions (>€500 m) until end of 2018 (unless financed by divestments)**
- **Dividend policy that ensures a sustainable and resilient development**

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) remain ruled out for 2018

FX sensitivity per business sector



Sales

- Global presence
- ~35% of sales in Europe

Costs

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

Net Sales currency exposure¹



FX impact on EBITDA pre²



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

Net Sales currency exposure¹



FX impact on EBITDA pre²



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

Net Sales currency exposure¹

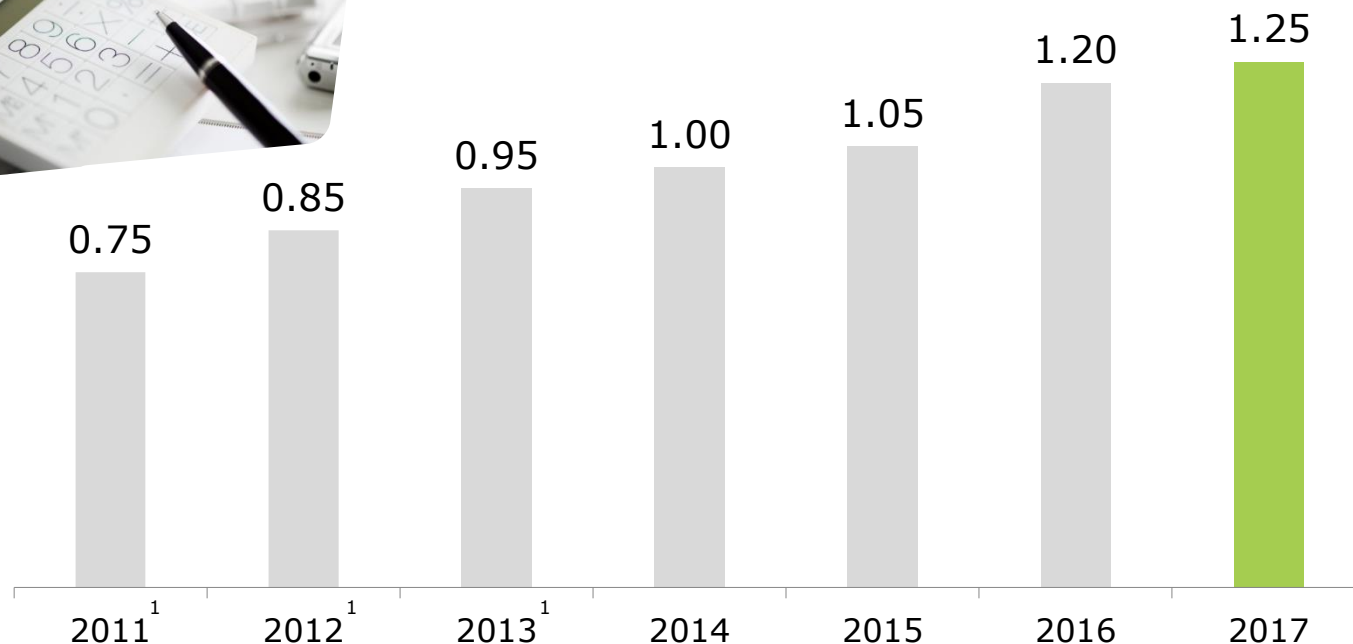


FX impact on EBITDA pre²



Dividend growth sustained

Dividend¹ development 2011-2017



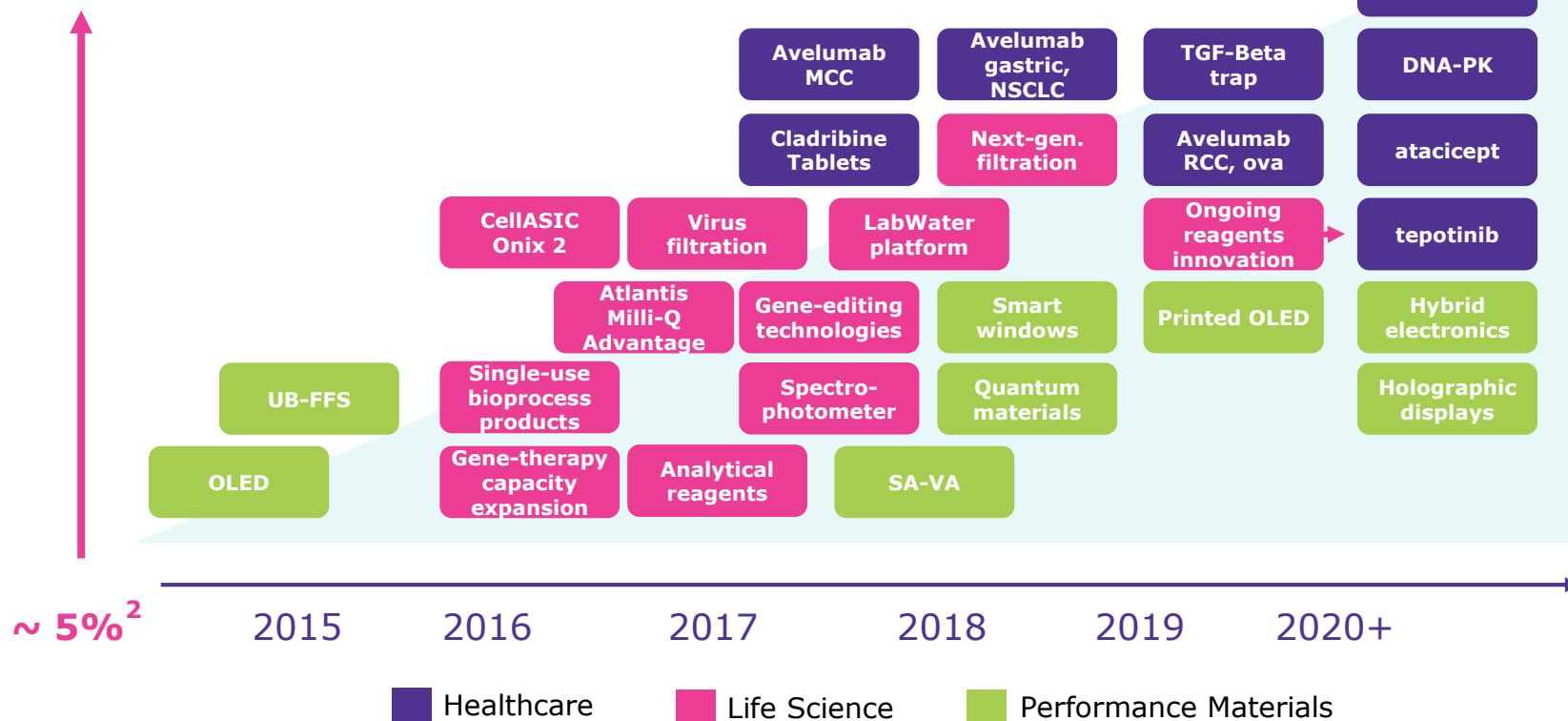
2017 dividend

- Dividend of €1.25 (+4% YoY) per share approved for 2017
- 20.3% of EPS pre
- Sustainable dividend growth
- Dividend yield² of 1.4%

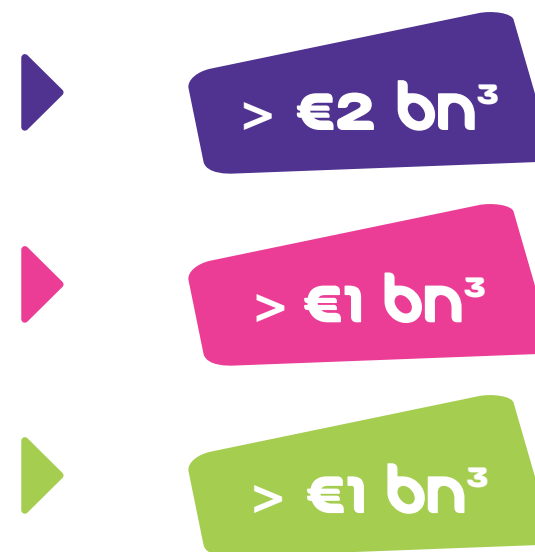
Our strong innovation capabilities will drive growth

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



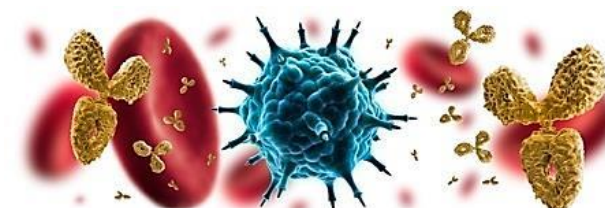
Biologicals portfolio



- 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

May 2, 2018

Phase I

M2698
p70S6K & Akt inhibitor
Solid tumors

M3814
DNA-PK inhibitor
Solid tumors

M6620 (VX-970)
ATR inhibitor
Solid tumors

M4344 (VX-803)
ATR inhibitor
Solid tumors

M3541
ATM inhibitor
Solid tumors

M8891
MetAP2 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)
Cancer immunotherapy
Solid tumors

M7824
anti-PD-L1/TGFbeta trap
Solid tumors

M4112
Cancer immunotherapy
Solid tumors

M6495
anti-ADAMTS-5 nanobody
Osteoarthritis

M1095 (ALX-0761)²
anti-IL-17 A/F nanobody
Psoriasis

M5717
PeEF2 inhibitor
Malaria

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 cancer 1L¹

abrituzumab³
pan-αv integrin inhibiting mAb
Colorectal cancer 1L¹

sprifermin
fibroblast growth factor 18
Osteoarthritis

atacept
anti-BlyS/anti-APRIL fusion protein
Systemic lupus erythematosus

atacept
anti-BlyS/anti-APRIL fusion protein
IgA nephropathy

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
Gastric cancer 1L-M^{1M}

avelumab - anti-PD-L1 mAb
Ovarian cancer platinum resistant/refractory

avelumab - anti-PD-L1 mAb
Ovarian cancer 1L¹

avelumab - anti-PD-L1 mAb
Urothelial cancer 1L-M^{1M}

avelumab - anti-PD-L1 mAb
Renal cell cancer 1L¹

avelumab - anti-PD-L1 mAb
Locally advanced head and neck cancer

Registration

cladribine tablets
lymphocyte-targeting agent
Relapsing multiple sclerosis⁴

- Oncology
- Immuno-Oncology
- Immunology
- Neurology
- General Medicine

¹ First Line treatment; ^{1M} First Line maintenance treatment.

² 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

³ As announced on May 2 2018, in an agreement with SFJ Pharmaceuticals Group, abrituzumab will be developed by SFJ for colorectal cancer through Phase II/III clinical trials.

⁴ As announced on August 25 2017, the European Commission has granted marketing authorization for cladribine tablets for the treatment of highly active relapsing multiple sclerosis in the 28 countries of the European Union in addition to Norway, Liechtenstein and Iceland.

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, NSCLC 1L,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

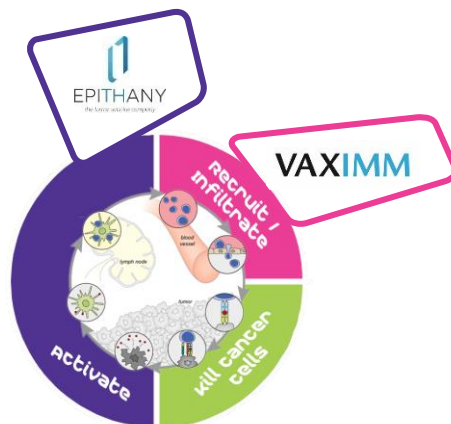
2017 deal activity aligned with strategic pillars

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)

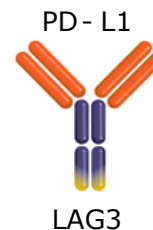


2



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's KGaA, Darmstadt, Germany DNA-PK inhibitor programs

Vertex

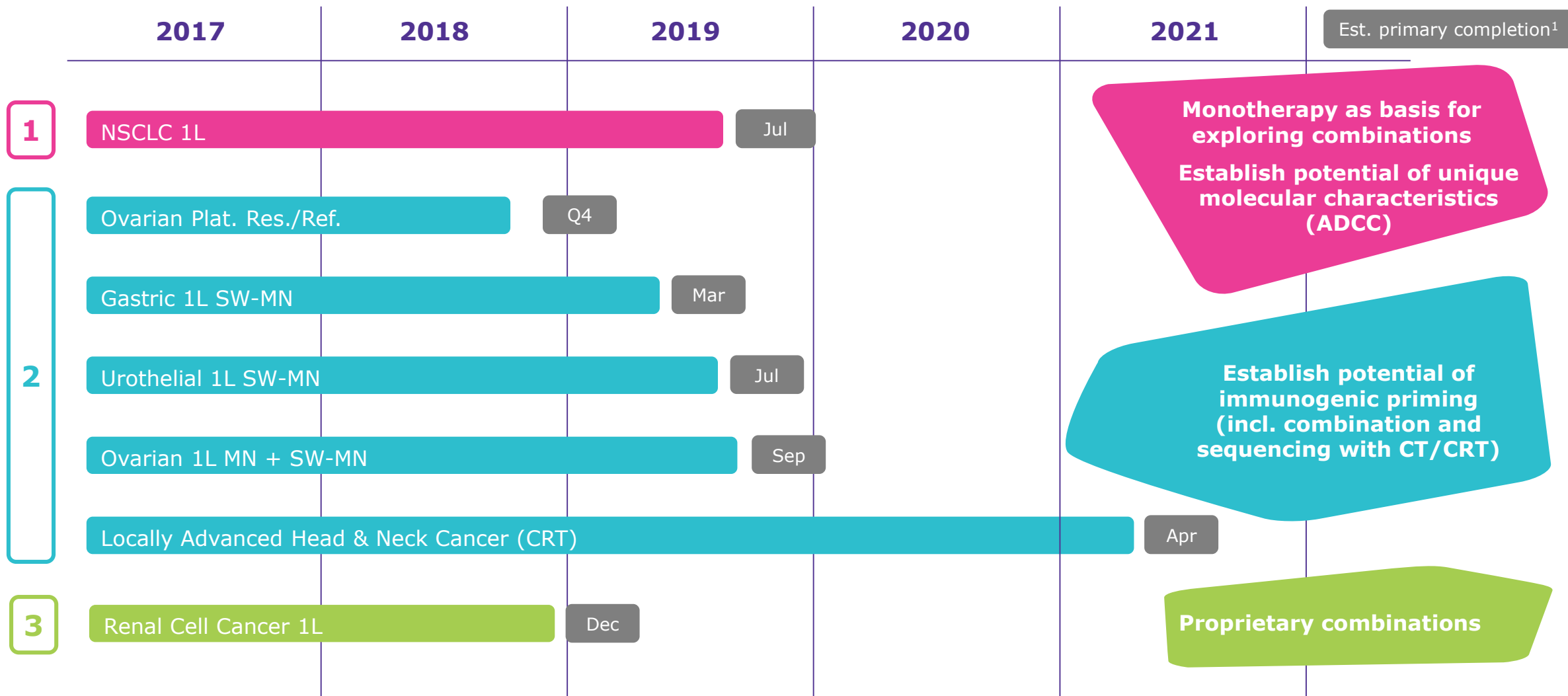
- Two **ATR-inhibitors**
- One **DNA-PK inhibitors**
- Two pre-clinical programs

MERCK KGaA, DARMSTADT, GERMANY

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

1 Avelumab

Seven ongoing pivotal studies with differentiation potential



¹ Estimated primary completion date according to Clinicaltrials.gov as of May 14, 2018

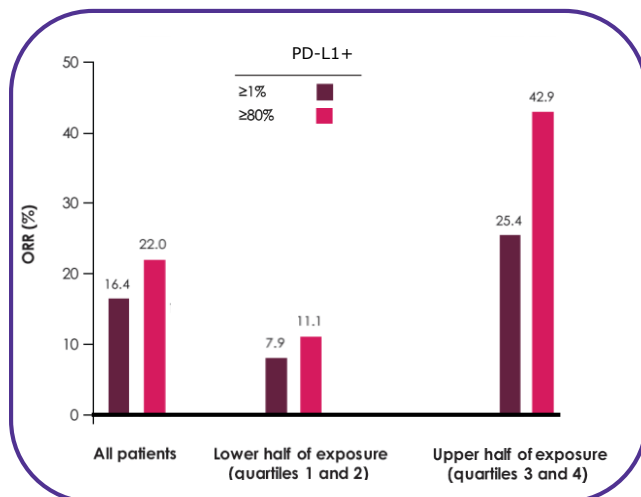
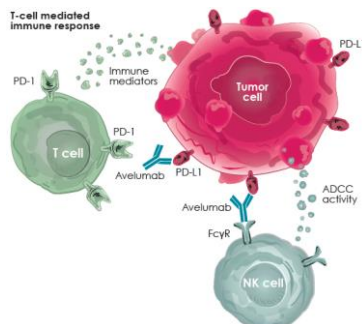
Acronyms: NSCLC: Non Small Cell Lung Cancer | CT: Chemotherapy | CRT: Chemoradiotherapy | Plat. Res./Ref.: Platinum Resistant/Refractory | MN: Maintenance | SW: Switch

1

Avelumab

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

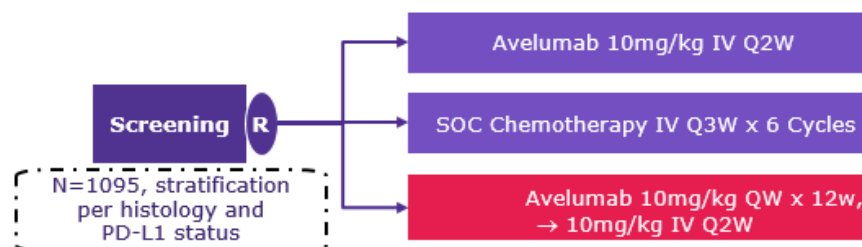
NSCLC 2L+: exposure response



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 Jul 2019)

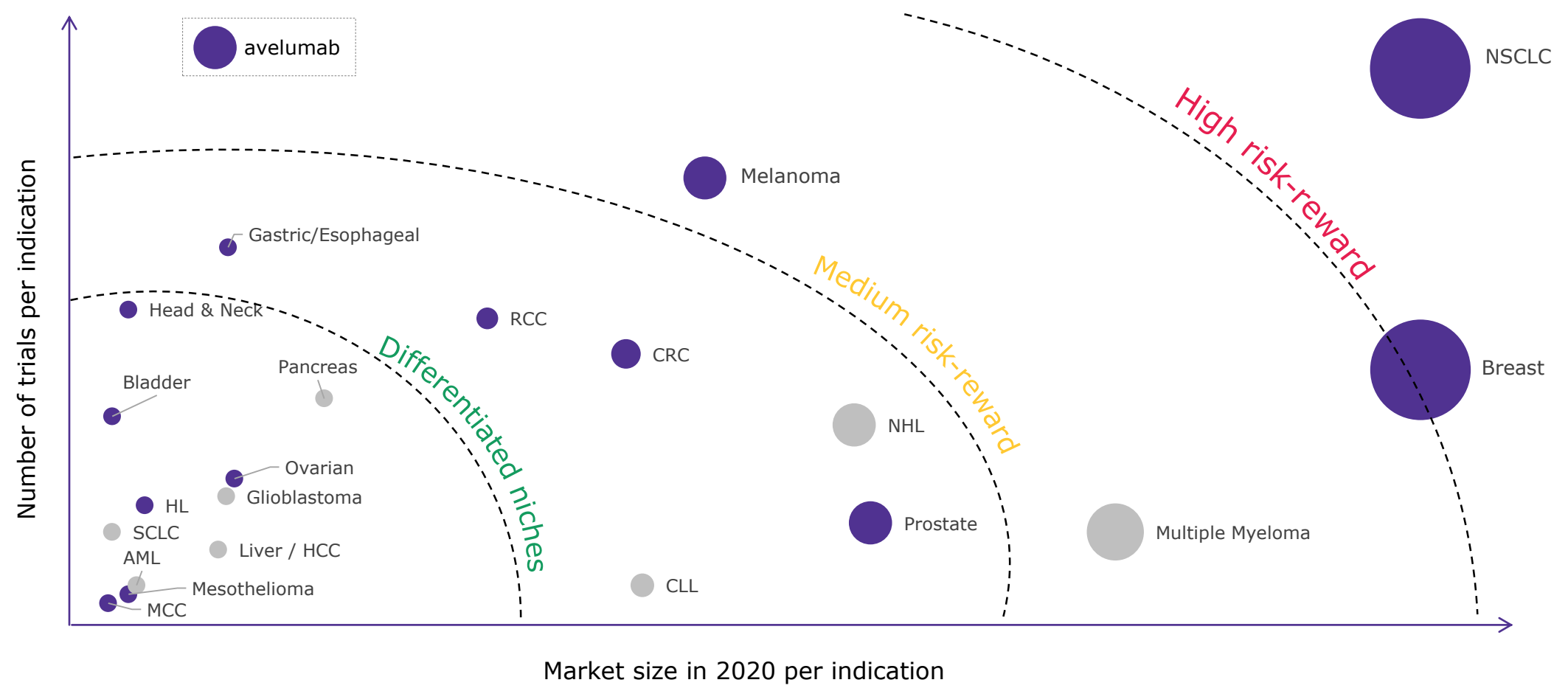


- **Primary endpoints:** PFS & OS @ high PD-L1-expression
- **Secondary endpoints:** PFS & OS @ moderate and low PD-L1-expression (BOR, DOR, Safety, QoL)
- **Hierarchical ordered hypothesis**

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. BTB 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

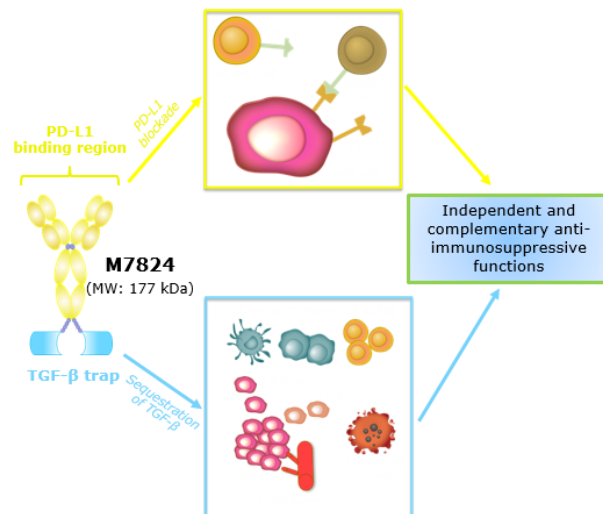
- Learn from experience of incumbents/early movers in major indications (e.g. NSCLC, Bladder)
- Potential for combinations given breadth of combined development pipelines
- Differentiate in trial design and explore application of further biomarkers



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)

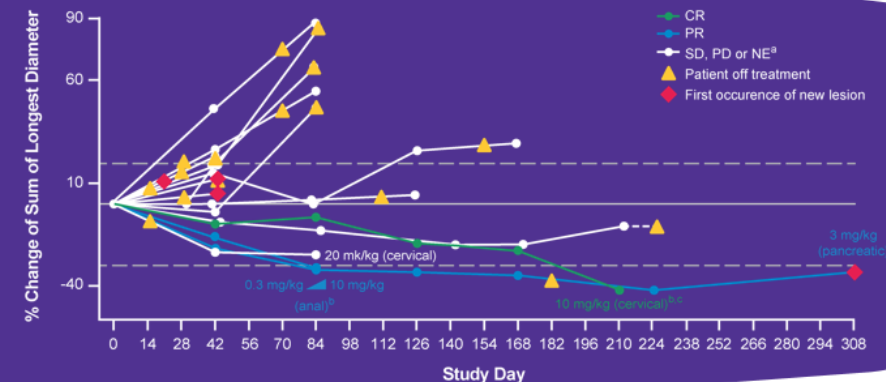
Dose Q2W, mg/kg	n
0.3 ∇ 10	3
1	3
3	3
10	3
20	7

Primary endpoints

- TEAEs
- DLTs
- Treatment-related AEs

Secondary endpoints

- PK
- M7824 immunogenicity
- BOR

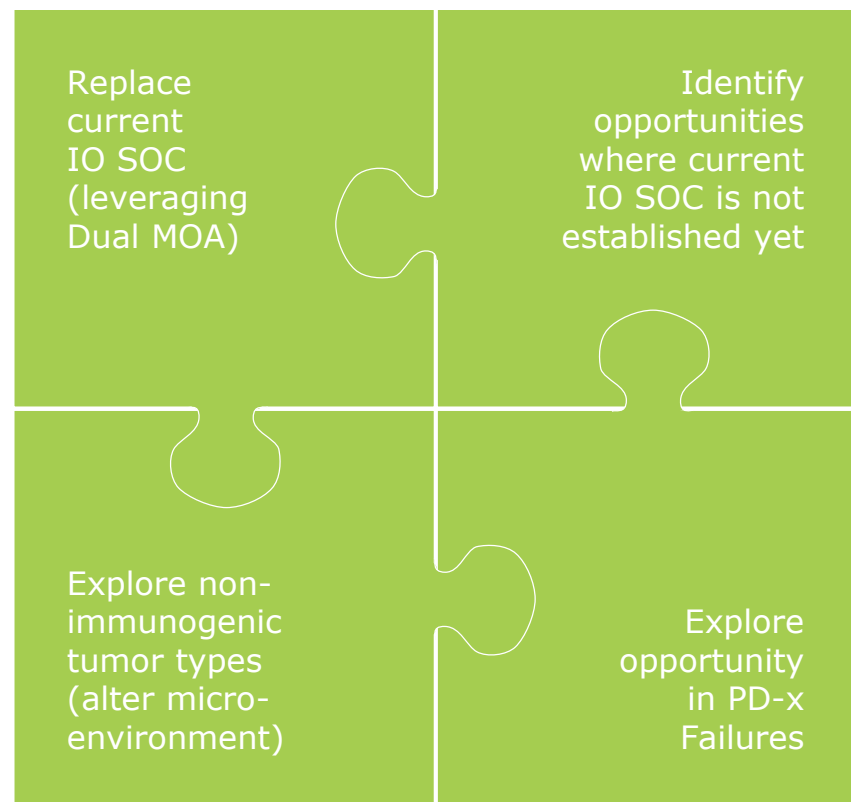


2

Anti-PD-L1/TGF- β trap

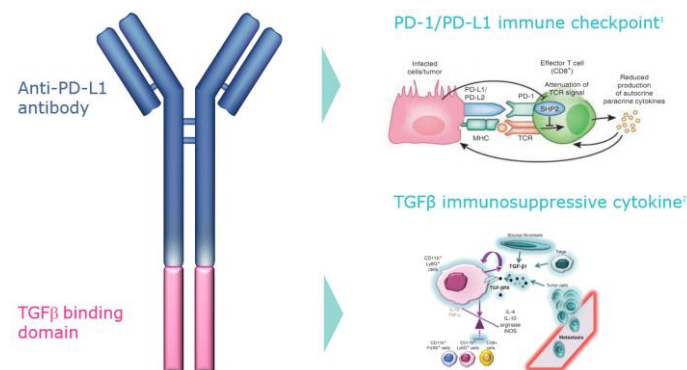
PD-L1–TGF-beta indicates potential to move beyond checkpoint inhibitors

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

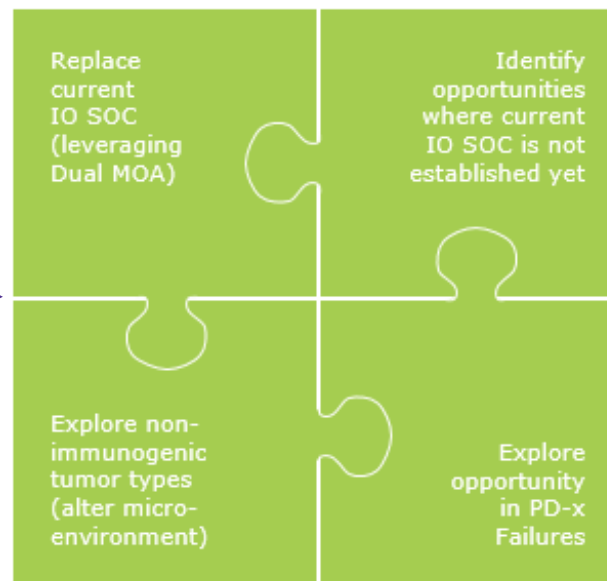
Preliminary results from a phase 1 trial of M7824 (MSB0011359C), a bifunctional fusion protein targeting PD-L1 and TGF-β, in advanced solid tumors

J. L. Gulley¹, C. R. Heery², J. Schlom³, R. A. Madan³, 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

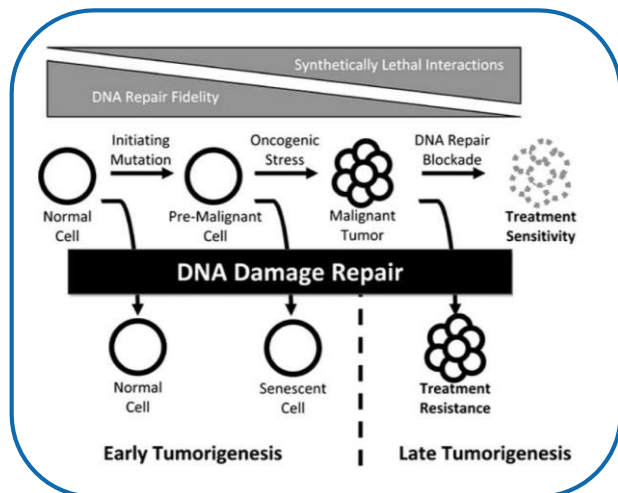
De-prioritize cohort

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

3

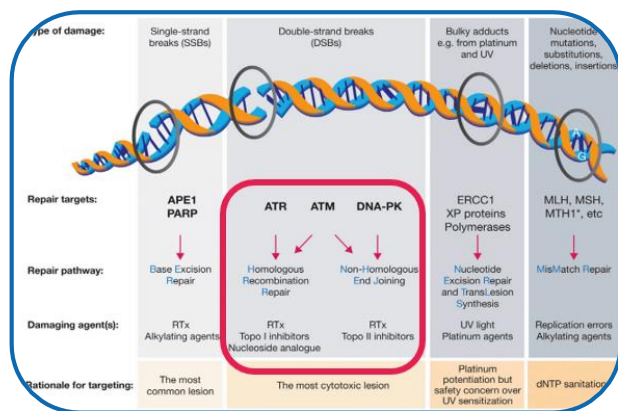
DNA damage response (DDR)

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

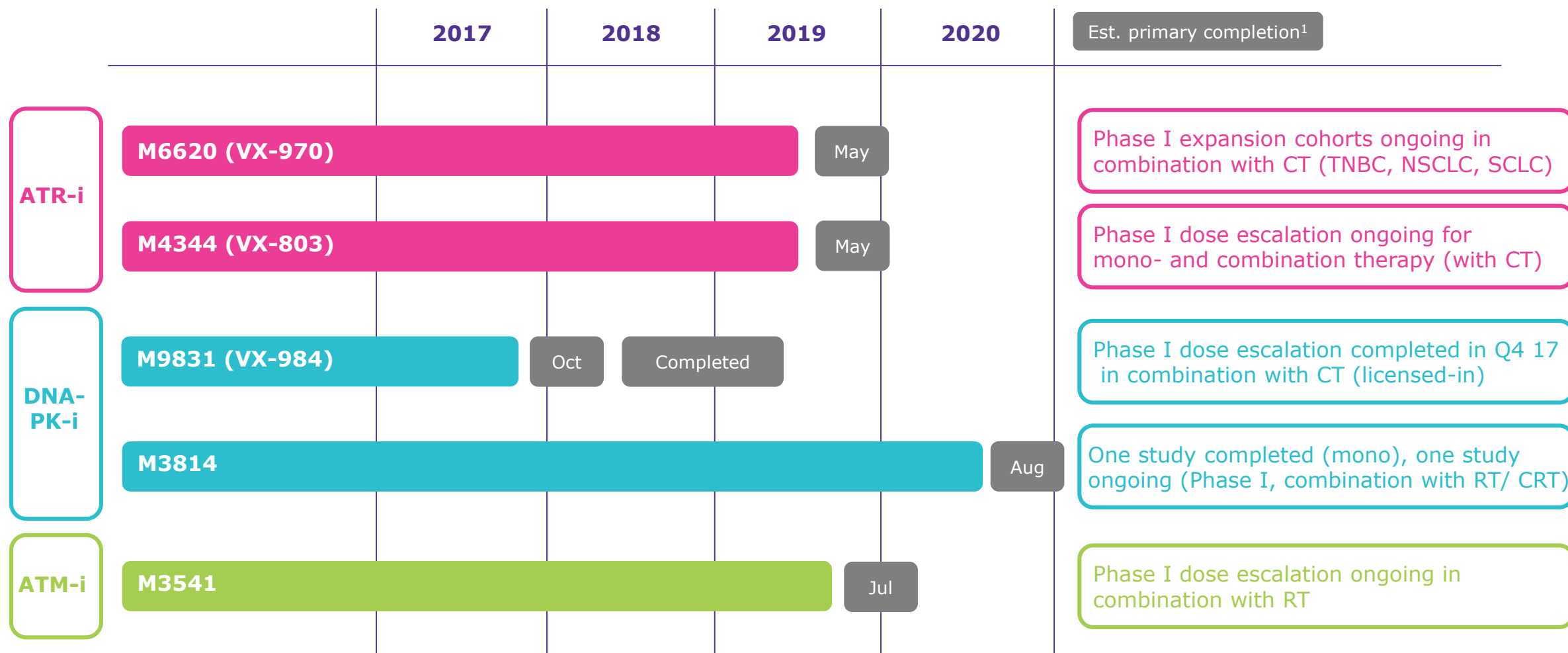
1. Inhibitor portfolio targets all three leading pathways of double stranded breaks – enabling unique synergies
2. ASCO 2017: leading DNA-PK-I (M3814) found safe and tolerable in a phase I study, with limited single-agent activity (20% of patients with stable disease for at least 18 weeks)²

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 three major DDR pathways, in mono- and combination



¹ Estimated primary completion date according to Clinicaltrials.gov as of May 14, 2018

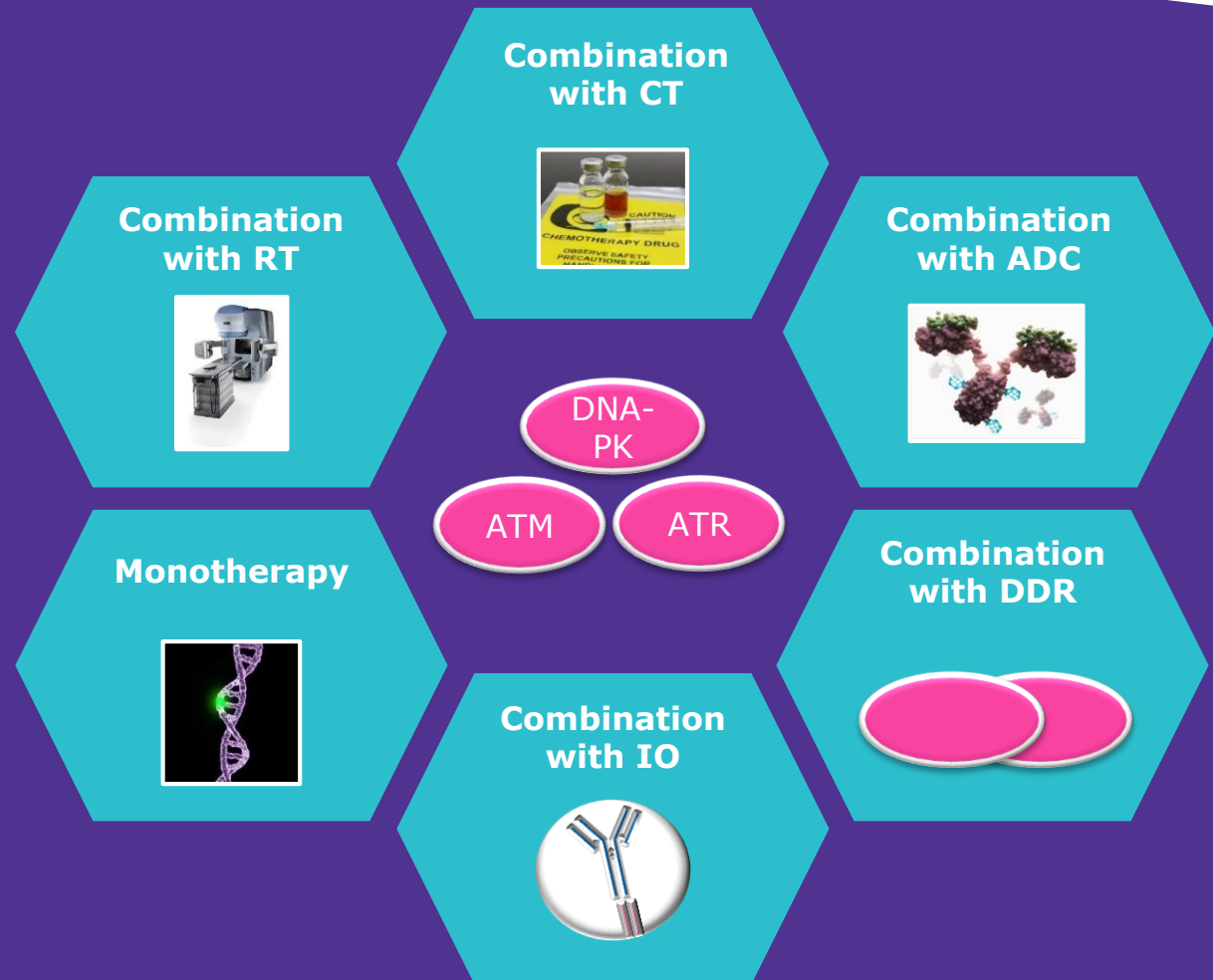
Acronyms: ATM: ataxia-telangiectasia mutated | ATR: ataxia telangiectasia and Rad3 | DNA-PK: DNA-dependent protein kinase | CT: Chemotherapy | RT: Radiotherapy | CRT: chemoradiotherapy | NSCLC: non-small cell lung cancer | SCLC: small cell lung cancer | TNBC: triple negative breast cancer | Note: timelines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

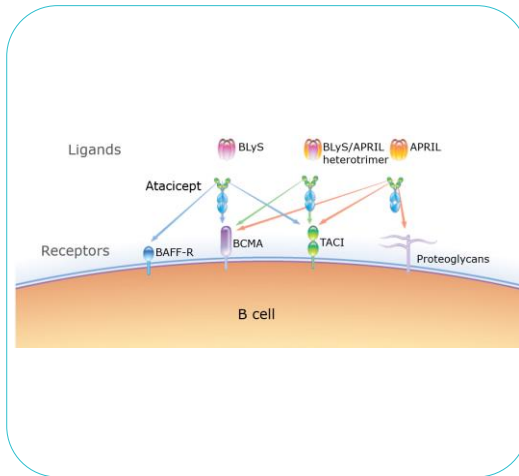
At least **70%** of all cancer patients receive some type of **CHEMOTHERAPY** (NCI 2016)

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



Update on selected assets

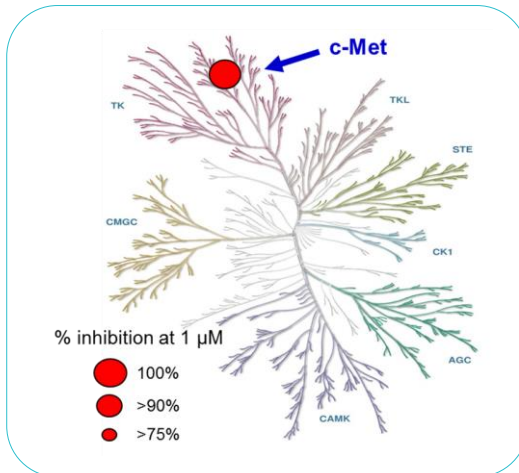
Atacicept



- 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

Initiation of phase III subject to external financing

Tepotinib

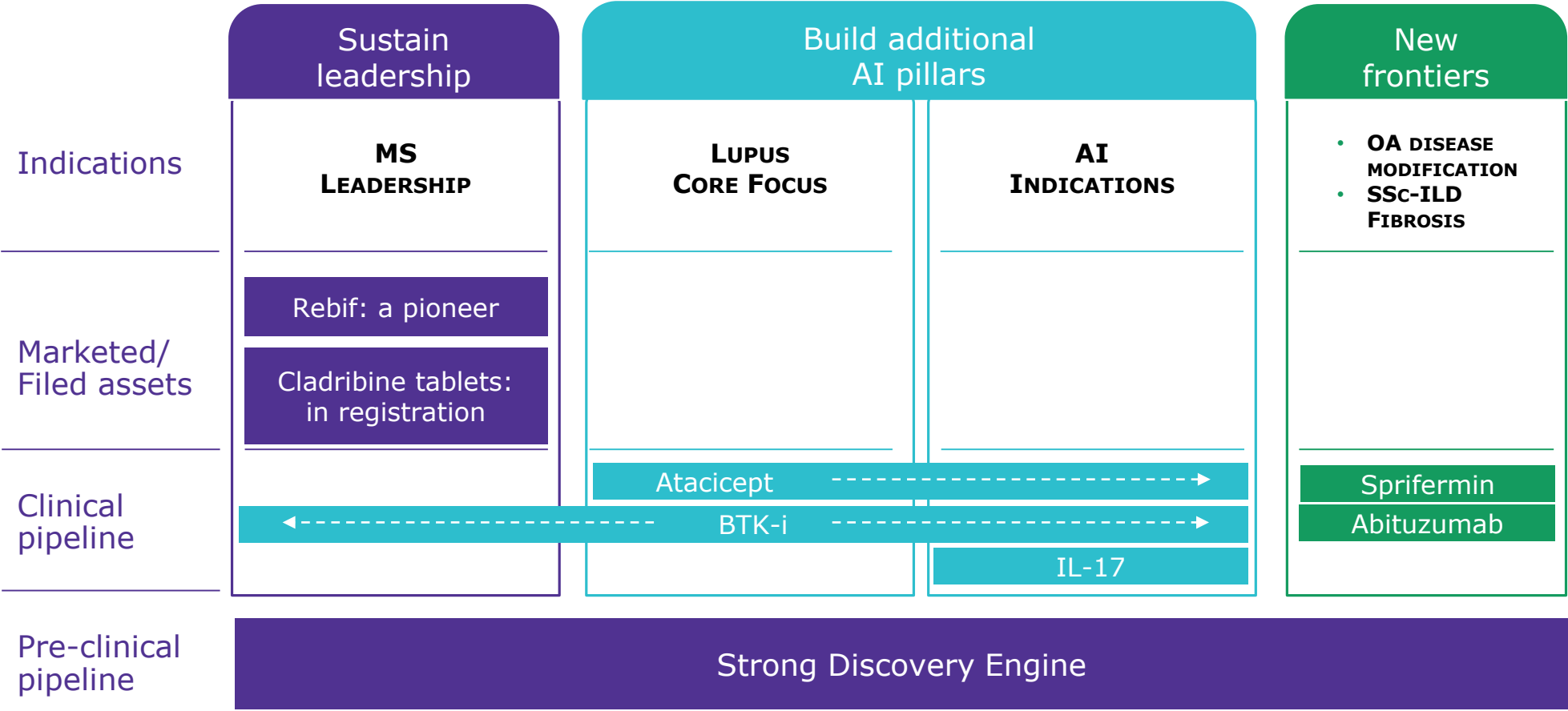


- Highly selective small molecule c-Met inhibitor
- Active in ligand-dependent and ligand-independent tumor models
- Biomarker-driven approach for patient selection
- Preliminary data show encouraging signs of anti-tumor activity in c-Met positive patients in NSCLC and HCC
- Phase II trials in progress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

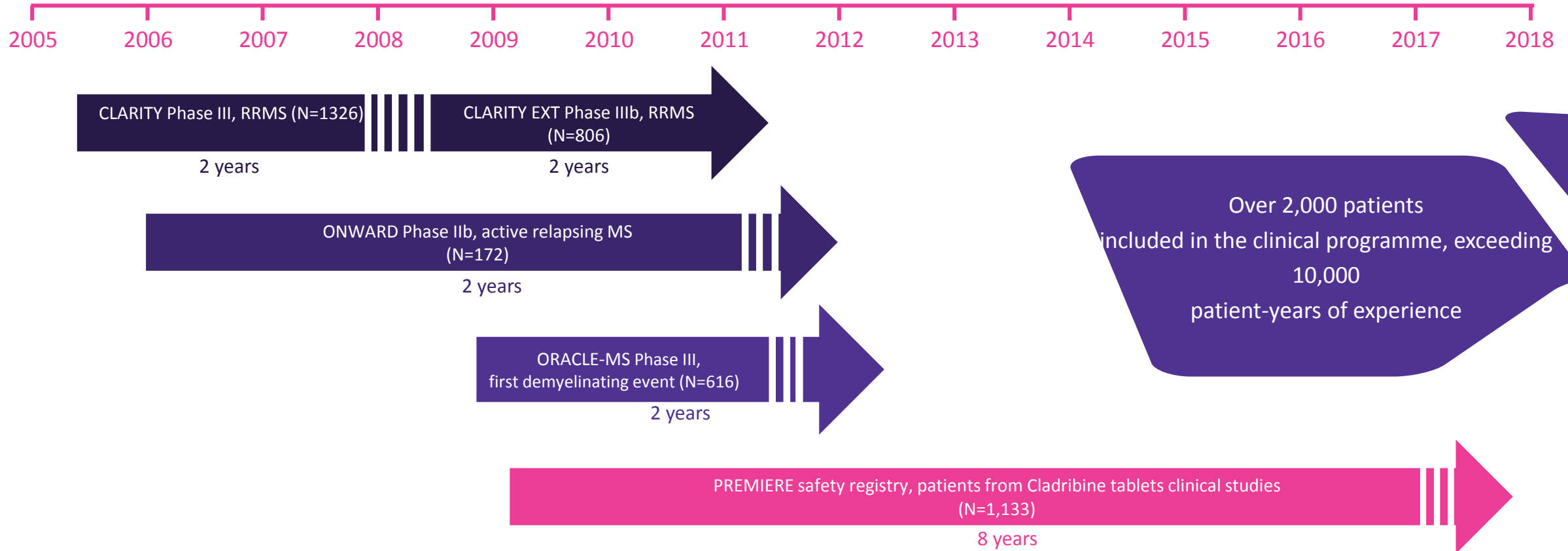
Analysis of Phase II data for HCC and NSCLC expected in H1 2018

Immunology

Strategy anchored on leadership in selected disease areas



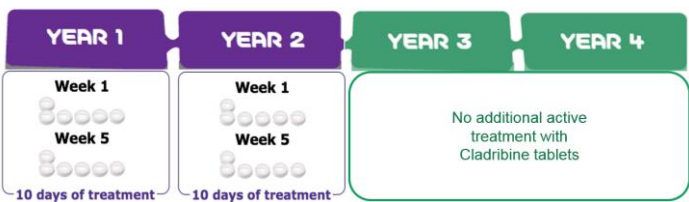
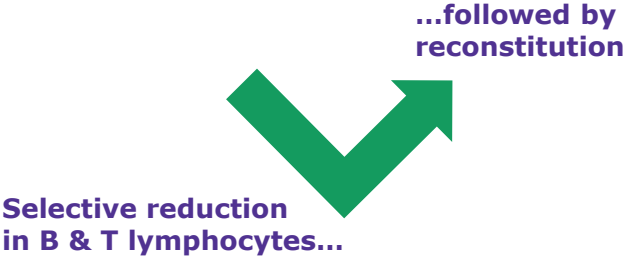
Cladribine tablets supported by 10,000 patient years of experience collected over 13 years including an 8 year safety registry



Healthcare

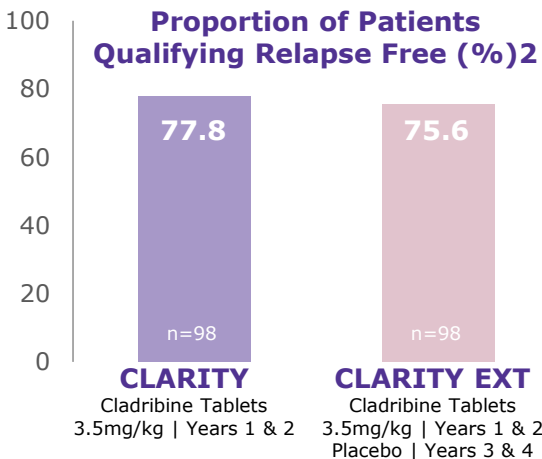
Mavenclad could change MS treatment paradigm

Selective immune reconstitution therapy (SIRT)¹



Unique posology: max. 20 days of oral treatment³

4 years disease control with treatment over 2 years²



		Key											
		Lymphocyte count			Treatment			MRI					
		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Prior to treatment initiation													
Year 1	TB/HBV/HCV screening ⁴	5 days of treatment	5 days of treatment										
Year 2	TB/HBV/HCV screening ⁴	5 days of treatment	5 days of treatment										

Low monitoring requirements⁴

¹ Giovannoni G. Neurotherapeutics 2017; Nov 22 [Epub ahead of print] | Wiendl H et al. Neurology 2017;89:1098-100 | Wiendl H. Nat Rev Neurol 2017; Sept 8 [Epub ahead of print]

² Giovannoni G et al. N Engl J Med 2010;362:416-26 | Giovannoni G et al. Mult Scler Aug 1 [Epub ahead of print]

³ Maximum of 20 days of oral dosing over 2 years with no further treatment required in the next 2 years. For important safety information, refer to the abbreviated Prescribing Information | Oral, weight-based dosing. For an average patient weighing 67 kg. Recommended treatment over 2 years. One treatment course per year, followed by observation for another 2 years. Each treatment course consists of two treatment weeks, one at the beginning of the first month and one at the beginning of the second month of the respective year | MAVENCLAD® EU SmPC, September 2017 | Giovannoni G et al. N Engl J Med 2010;362:416-26

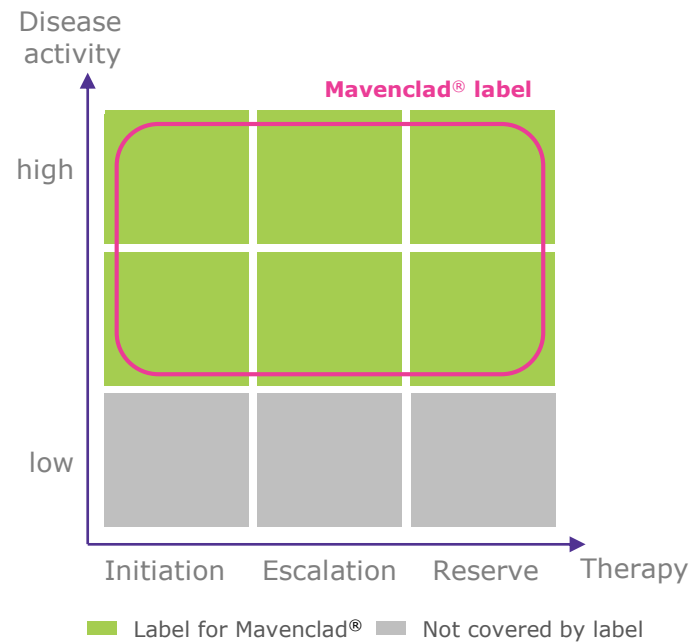
⁴ MAVENCLAD® EU SmPC September 2017 | Screening must be performed prior to initiation of therapy in Year 1 and Year 2. Vaccination of antibody-negative patients is recommended prior to initiation of Cladribine Tablets. AE, adverse event; HBV, hepatitis B virus; HCV, hepatitis C virus; MRI, magnetic resonance imaging; NEDA, no evidence of disease activity; TB, tuberculosis

Healthcare

Mavenclad's attractive label¹ supports integrated franchise strategy

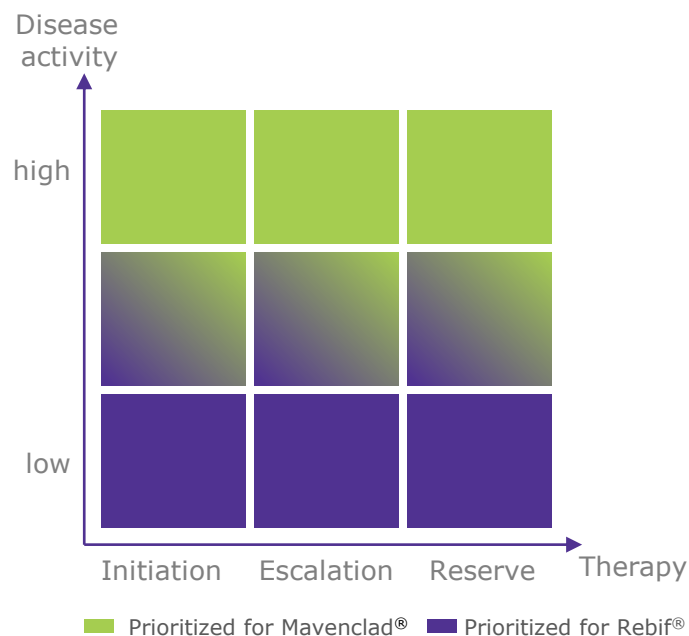
Mavenclad® label covers 60-70% of patients with RRMS² within the MS¹ patient population

MS patient population³



Our overall NDD franchise will cover a broad MS patient pool

RRMS patients, EU-5⁴



integrated franchise strategy

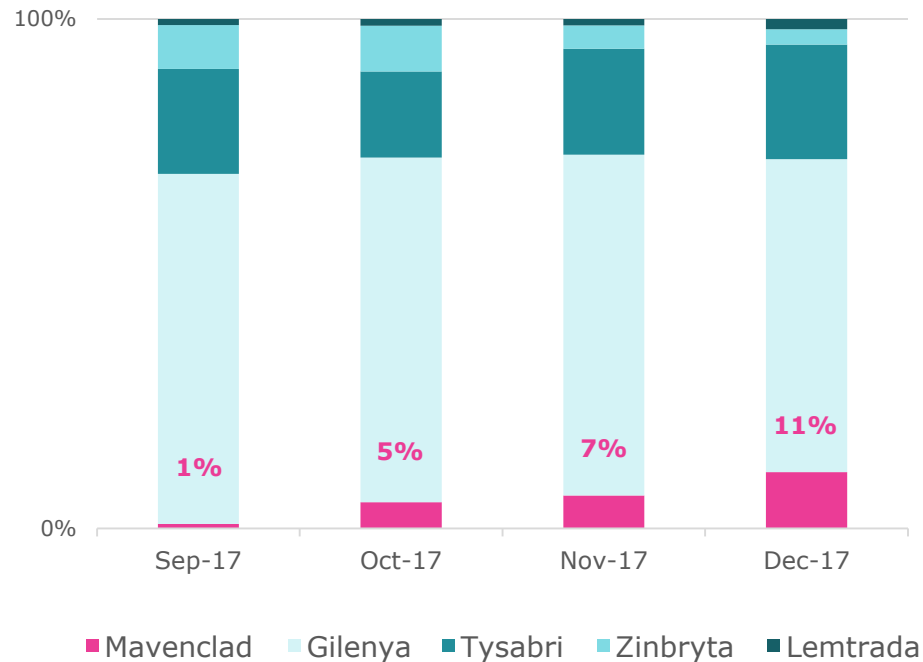
- At patient level: Rebif® and Mavenclad® are highly complementary
- At physician level: High overlap
- Franchise infrastructure investment benefits both brands

¹Mavenclad® label covers: RRMS+rSPMS+rPPMS; ²Abbreviations: RRMS relapsing-remitting multiple sclerosis, MS = multiple sclerosis, rSPMS = relapsing secondary progressive MS, rPPMS = relapsing primary progressive multiple sclerosis; ³Source: Merck KGaA, Darmstadt, Germany; ⁴Source: Merck KGaA, Darmstadt, Germany, Ipsos

Healthcare

Early commercial performance demonstrates ability to deliver innovation

Gaining market share in HE dynamic segment (Germany)¹



Targeting high double-digit €m sales in 2018

- Germany: continuously rising patient numbers
- UK: positive NICE recommendation; together with healthcare authorities secured immediate access and funding for patients
- Lowest-cost high-efficacy agent in multiple sclerosis
- Further submissions in planning
- U.S.: submission planned in Q2 2018

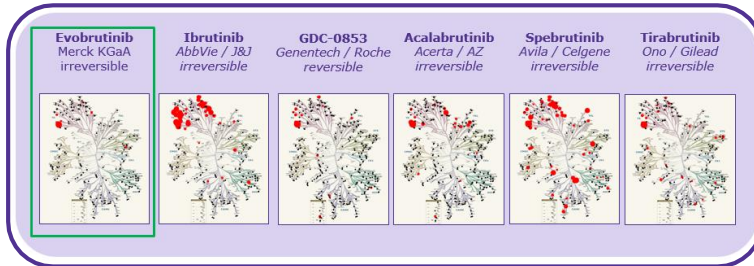
Expected peak sales ~€500 – 700 M in EU



High-double digit €m in 2018

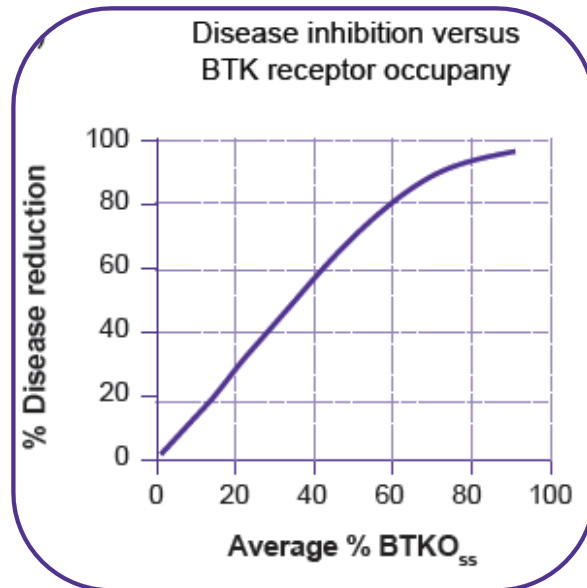
Evobrutinib

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

Comprehensive phase I/IIa
safety data-setSLE
(Ib)

Safety

- **24 patients**
- Double-blind, Randomized, Placebo-controlled Study

RA
(IIa)

Signal finding

- **65 patients**
- Randomized, double-blind, placebo-controlled trial in subjects with RA on stable Methotrexate therapy

Robust phase II program to enable
differentiated phase III

RMS

- Randomized, double-blind, placebo-controlled study in **patients with RMS**
- **267 patients**
- **5 arms study:** placebo vs. 3 drugs-arms (low, mid, high dose) incl. **active control** (Tecfidera)

Primary
endpoint metQ4 2018
(2nd endpoint)

SLE

- Randomized, double-blind, placebo-controlled **dose-ranging study** in subjects with SLE
- **451 patients**
- **4 arms study:** placebo vs. 3 drugs-arms (low, mid, high dose)

Q4 2019

RA

- Randomized, double-blind, placebo-controlled **dose-ranging study** in subjects with RA
- **360 patients**
- **4 arms study:** placebo vs. 3 drugs-arms (low, mid, high dose)

Q1 2019

Est. primary
completion

Outlook

Healthcare is well set for future growth

Stable existing
business



Core 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

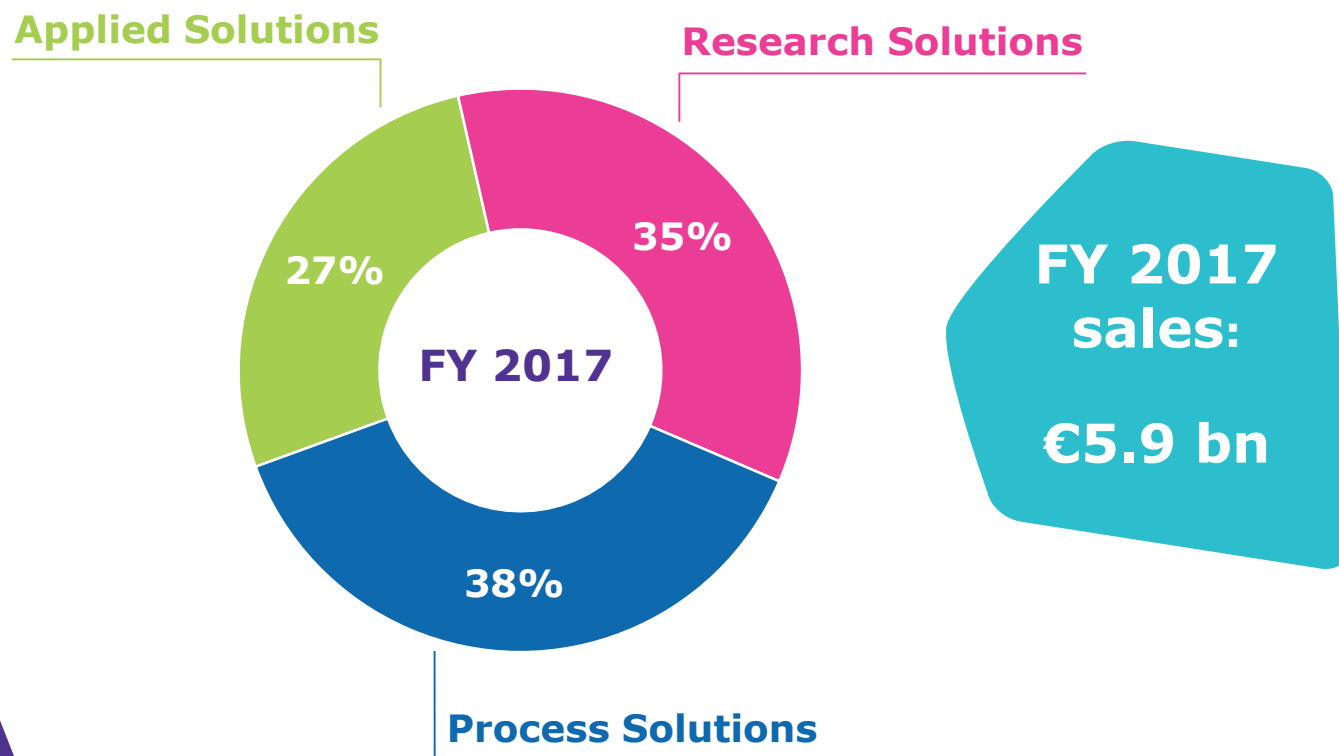




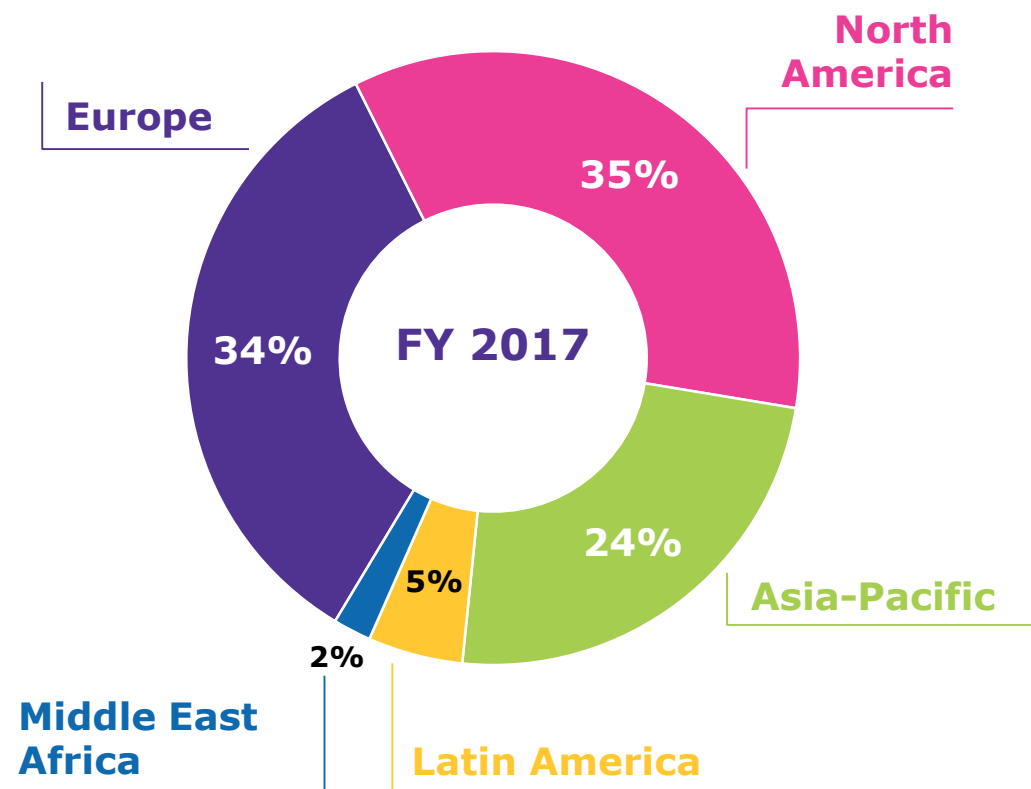
03 LIFE SCIENCE

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

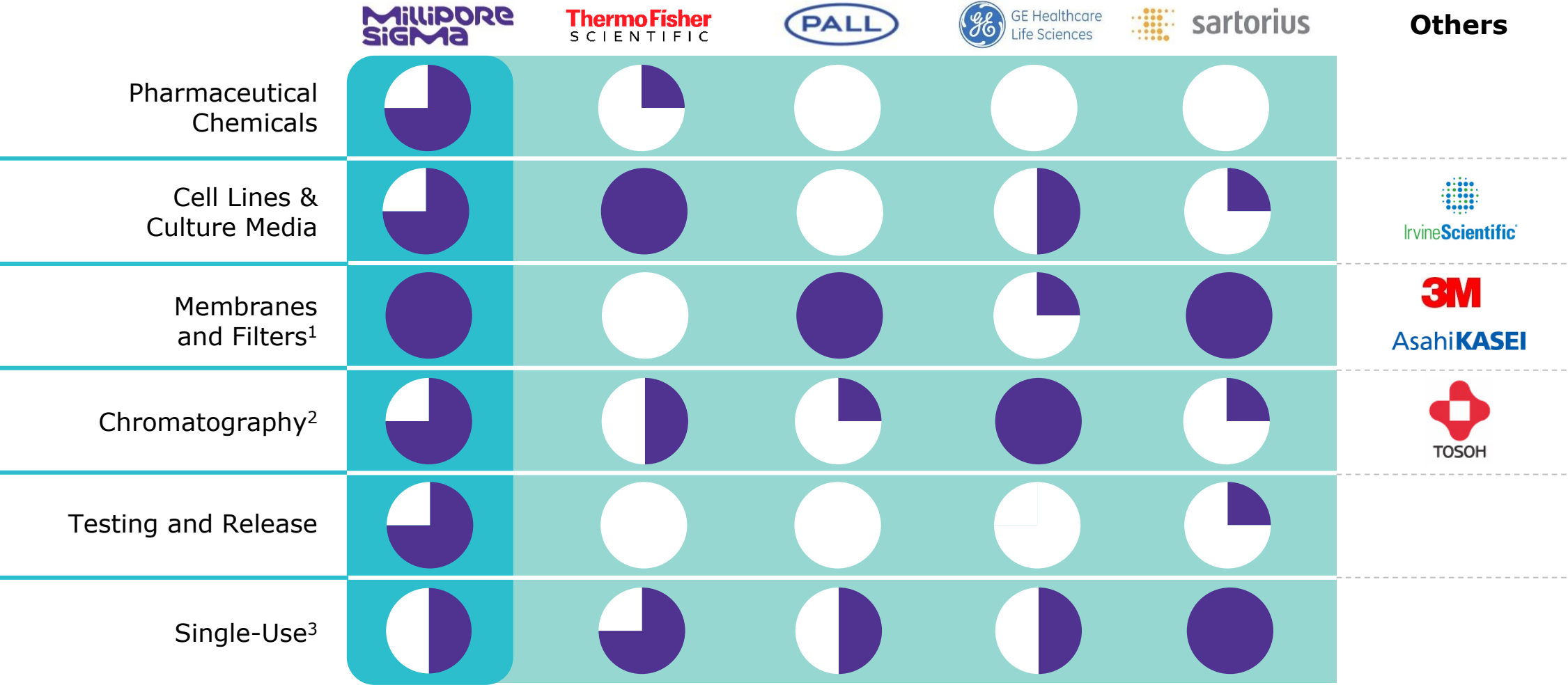
Provantage®

BioReliance®

EMPROVE®

cGMP SOLUTIONS & SERVICES

We are the only company to span the entire value chain of our customers



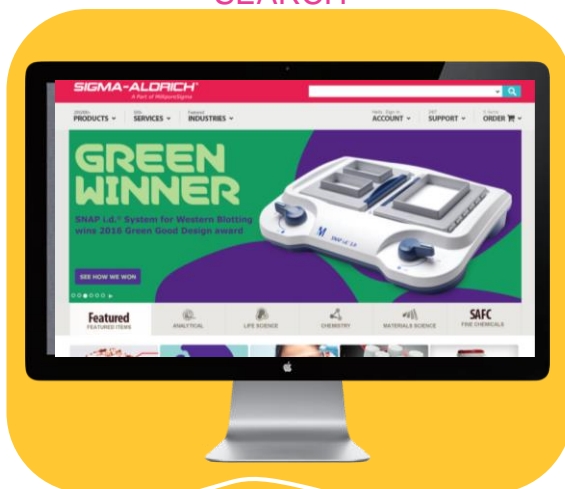
Pie Charts represent completeness of product offering; ¹Includes Aseptic, Virus, Clarification, TFF; ²Includes resins, columns and hardware for separation and purification; ³Includes assemblies, bioreactors and components

#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



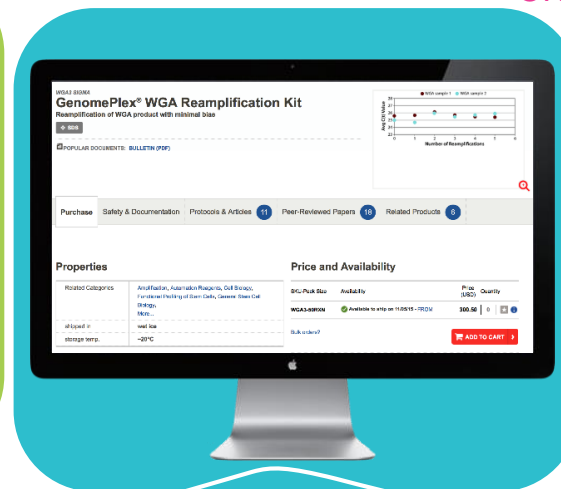
CONTENT



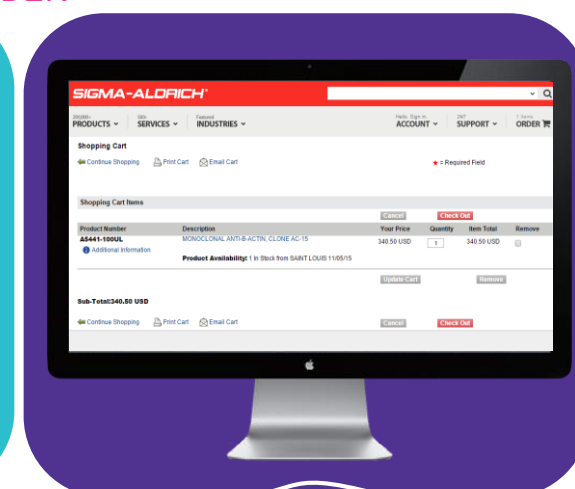
Online leader in scientific content: articles, protocols and peer reviewed papers



ORDER



Real-time pricing and availability



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

Focus on strategic growth initiatives will secure long-term growth



Evolutionary

Developing offerings to further existing platforms



Breakthrough

Developing new platforms and product categories

Strategic initiative



SINGLE-USE



END TO END



GENE EDITING & CELL THERAPY

Ambition

Establish leadership in the fast-growing **single-use** bioprocessing segment through standardization and capacity expansion

Offer **process development** services with our complete bioprocessing portfolio especially to small biotechs

Develop tools for **gene editing** and manufacturing services for **cell therapy**

Proof points

- ✓ **Customized offer** by segment
- ✓ **Facilities expanded** in Danvers & Shanghai

- ✓ **15 customers** in Martillac
- ✓ **Additional site in Shanghai** opened in 2018 to augment Martillac & Boston

- ✓ **Foundational patents** in cutting & replacement for CrisprCas9
- ✓ Viral vector manufacturing site in **Carlsbad EMA/FDA approved**
- ✓ Supports **9 out of 10 top gene therapy products** manufacturers



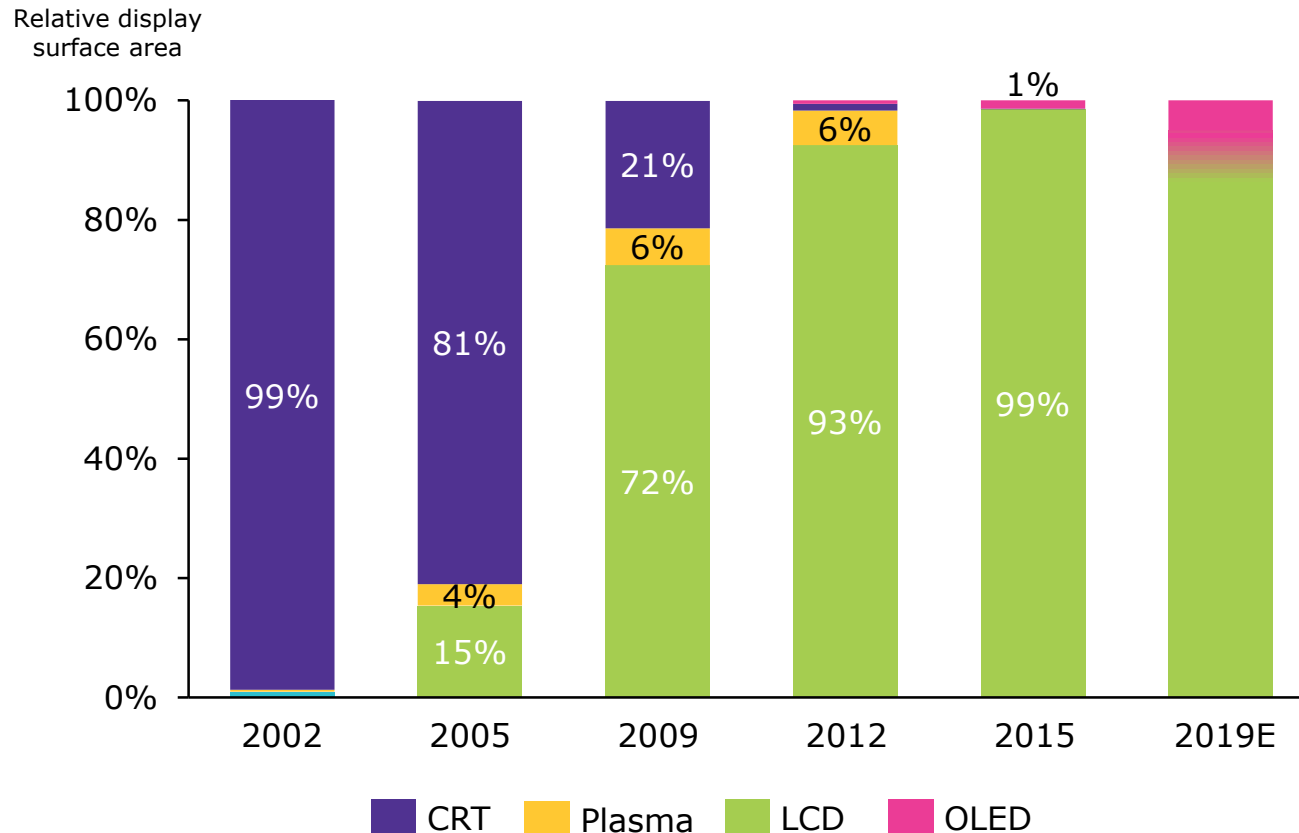
04

PERFORMANCE MATERIALS

Display Solutions

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

Display Solutions

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

Market position

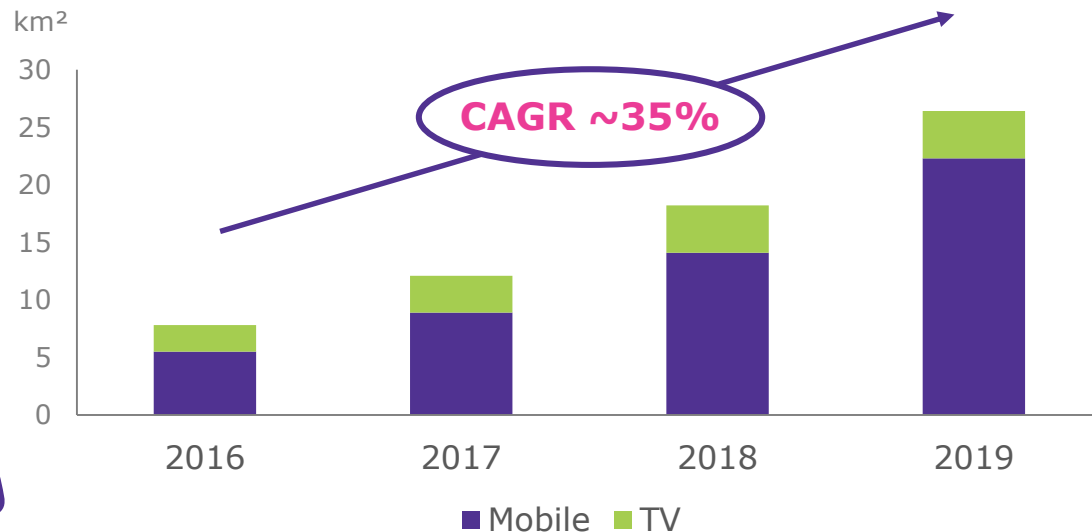
- Among top 3 OLED material provider
- Unrivalled experience and expertise in displays
- Long & intimate relationships with all display producers
- Recent capacity expansion to serve growing demand

our ambition

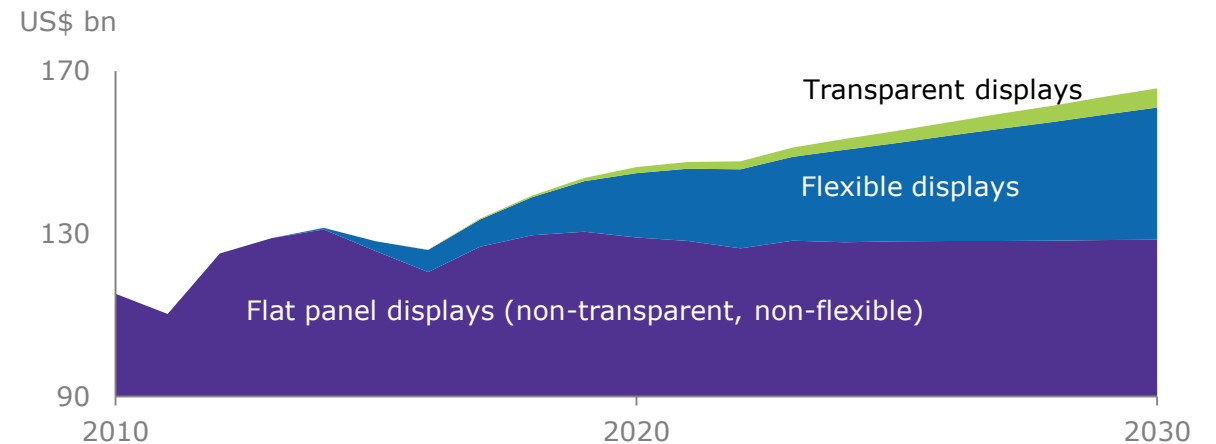
solution provider

- 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

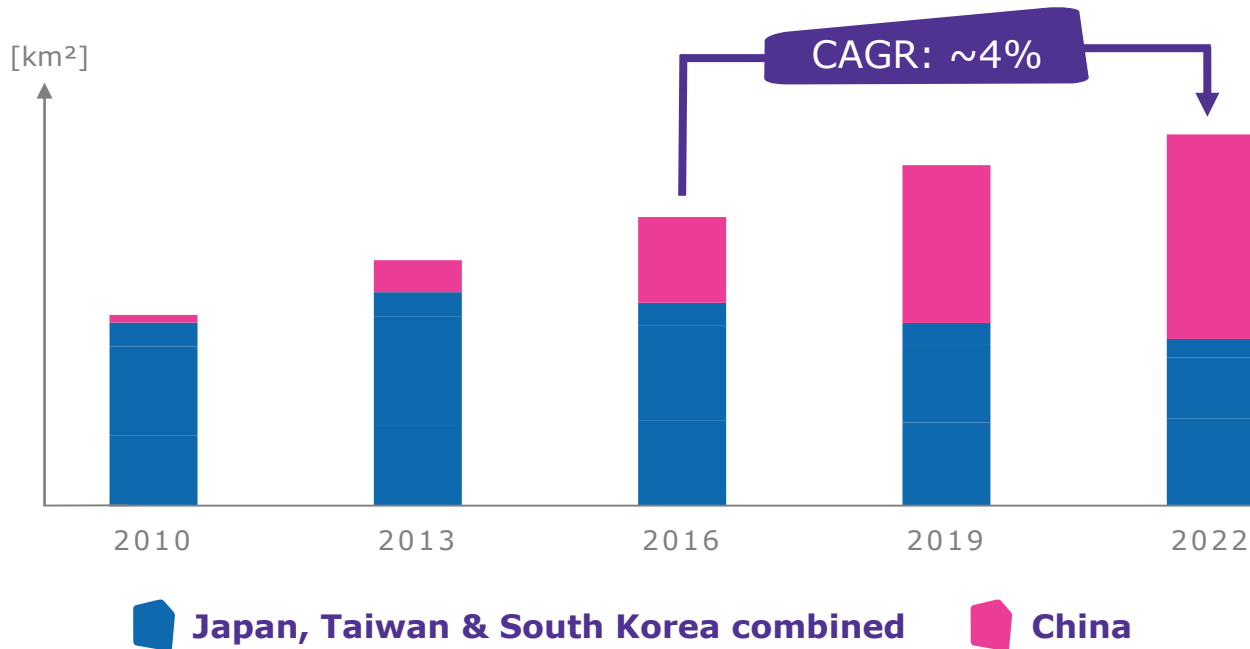


Display market development¹



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 our 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

Display Solutions

Challenges in LC displays amid various opportunities for novel applications

LC for display applications



Maintain leadership position in a more challenging environment:



Innovation

Two new modes SA-VA and UB-Plus in tests with several customers



Know-how

Unrivalled understanding of displays to solve customer challenges with new facilities, especially GEN 10



Customer

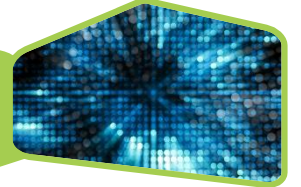
Presence in all customer locations versus more local focus of competitors



IP protection

>2,000 patents and rigorous enforcement of IP

NOVEL Liquid crystals applications



Drive innovation and create further market demand:



LC Windows

LC-Window production facility to start production in Q4 2017 – first project realizations expected in 2018



LC Antennas

Completed product testing with partner Kymeta – expected launch for special applications in 2018



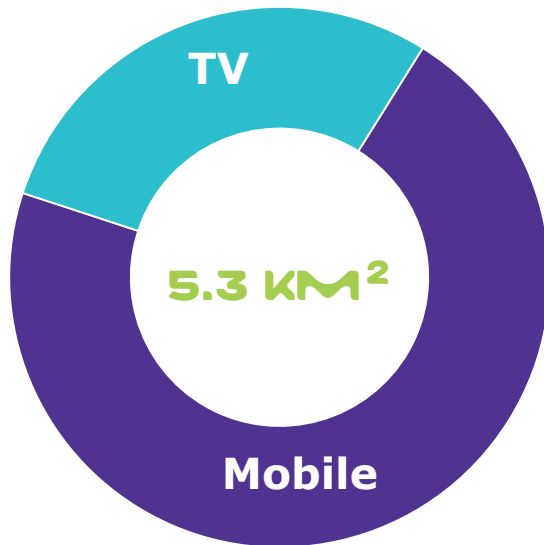
Lighting guiding

Collaboration with Hella and Porsche progressing well. Market demand for high resolution headlamps increasing.

Display Solutions

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

OLED Shipment Area*
[km²]



Product portfolio

Evaporable OLED Materials



Printable OLED Materials



Growth drivers and differentiation

- Volume growth is driven by large investments of OLED panel manufacturers, especially in the mobile market segment
- Strong **R&D and licensing** activities to strengthen our market share
- Factors of differentiation:
 - Broad product portfolio of **evaporable and printable** high-end materials
 - Intimate **customer relations and application labs** in China, Taiwan & Korea
 - Strong supply chain, production capacity and **superior quality** standards

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

Semiconductor Solutions

Leading market positions in profitable niches supported by technology trends

Sales by end use



■ Memory ■ Logic
■ Foundry¹ ■ Packaging
■ Other

¹3rd party semiconductor production

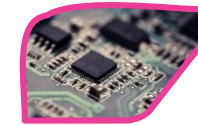
Product portfolio



Lithography materials



Dielectric materials



Conductive pastes



Process materials



Silica materials



Deposition materials

Growth drivers and differentiation

- Volume growth is generally driven by wafer starts, estimated to grow with a CAGR of ~5% until 2022
- Merck KGaA, Darmstadt, Germany **outgrowing market** due to:
 - **Innovative** solutions, **broad** portfolio offering and **global** company footprint
 - Benefit from **smaller and more complex** structures (3D chip architecture)
 - Strong **process expertise & application knowhow** enabling cost-efficient production for our customers (improved yield, lower energy, less material)

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

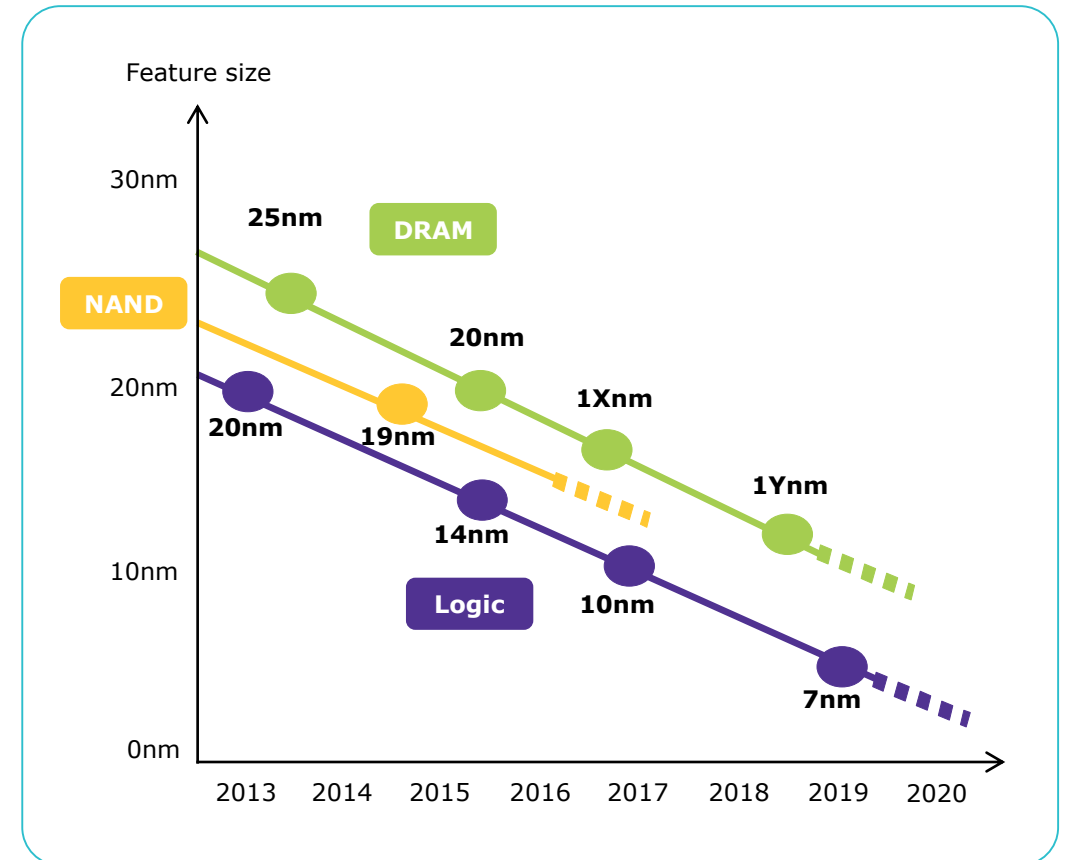
Big Data: Increasing need for intelligent data storage

- 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



Surface Solutions

Driving innovation by combining color & function

Sales by end use



■ Decorative Materials

Product portfolio

Decorative



Color cosmetics

Plastics

Printing

Car coatings

Functional



Laser marking

Coating & Printing

Personal care

Security

Growth drivers and differentiation

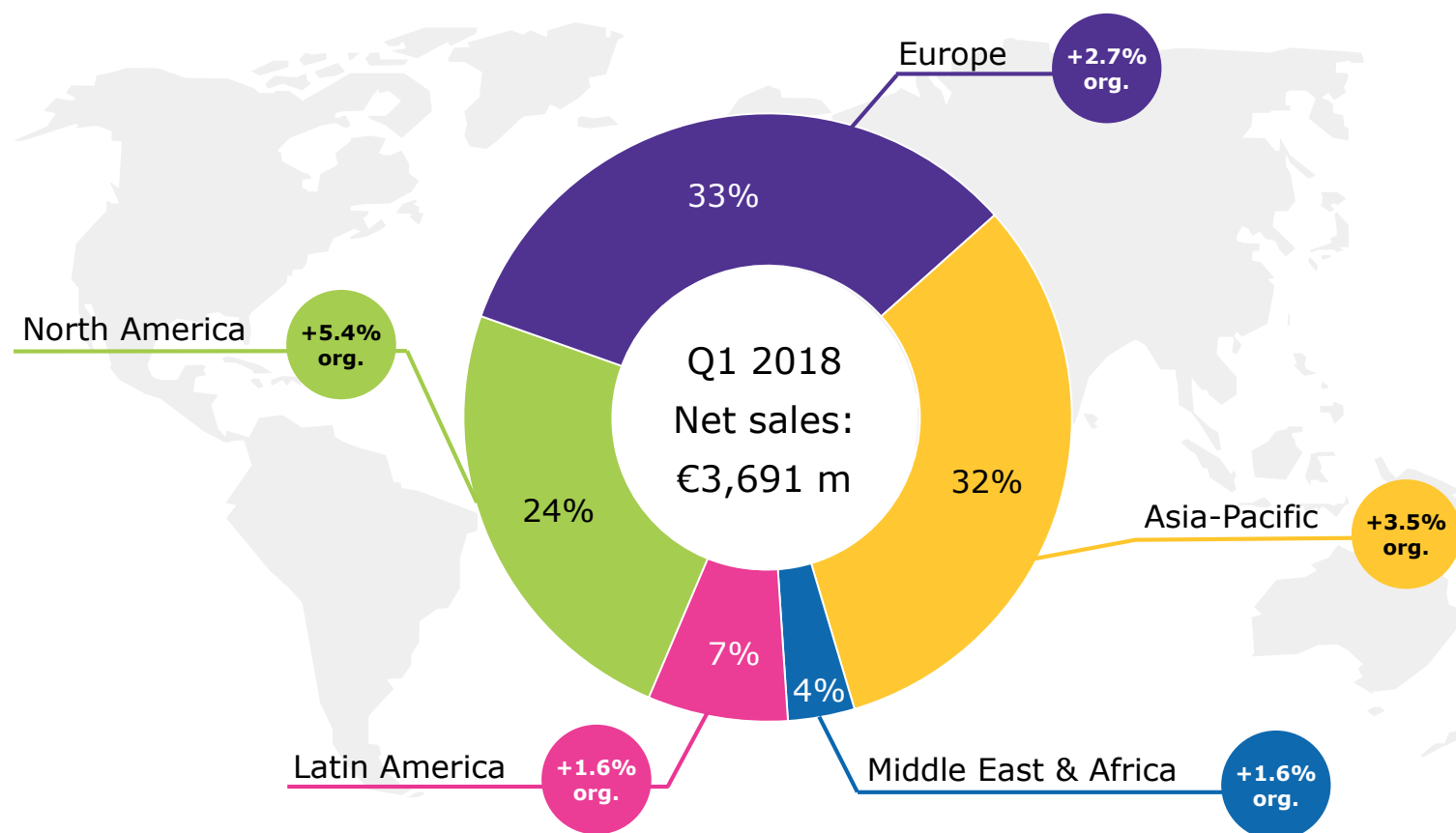
- Volume growth for established decorative business is generally driven by rising living standards in line with GDP
- Addressable market increasing from €2 bn to €5 bn due to **further expansion into functional markets** combining color and function
- Factors of differentiation to outperform market growth:
 - Broad product portfolio with **unique high-end products**
 - **Global footprint** and diverse customer base ensuring good market access
 - Strong know-how of end applications of our customers enabling **increase of share-of-wallet** and **expansion into new applications**



05 FINANCIAL OVERVIEW

All regions deliver organic growth

Regional breakdown of net sales [€ m]



Regional organic development

- Growth in Europe reflects solid Life Science, contributions from Mavenclad and GM, overcompensating competition-driven decline in Rebif, Erbitux and Gonal-f and softer Surface Solutions
- North America shows solid growth fueled by Life Science strength, growth of Bavencio and Gonal-f, offsetting continued Rebif decline
- Slight growth in Asia-Pacific mainly driven by Life Science, Fertility, CH and Semiconductor Solutions, fully offsetting LC decline
- Growth in LATAM due to Life Science, CH and Fertility, mitigated by Rebif decline
- MEA with slight growth mainly driven by Healthcare, mitigating slower Life Science

Q1 2018: Overview

Key figures

[€m]	Q1 2017	Q1 2018	Δ
Net sales	3,861	3,691	-4.4%
EBITDA pre	1,240	1,015	-18.2%
Margin (in % of net sales)	32.1%	27.5%	
EPS pre	1.80	1.41	-21.7%
Operating cash flow	777	380	-51.1%

[€m]	Dec. 31, 2017	March 31, 2018	Δ
Net financial debt	10,144	9,974	-1.7%
Working capital	3,387	3,578	5.6%
Employees	52,941	53,358	0.8%

Comments

- Organic sales growth of Life Science and Healthcare more than offset by FX headwinds and LC decline
- EBITDA pre & margin as well as EPS pre decrease driven by LY one-time effects, FX headwinds and LC market share decline
- Operating cash flow reflects business performance and higher income tax payments
- Working capital reflects LY Glucophage repatriation and business dynamics

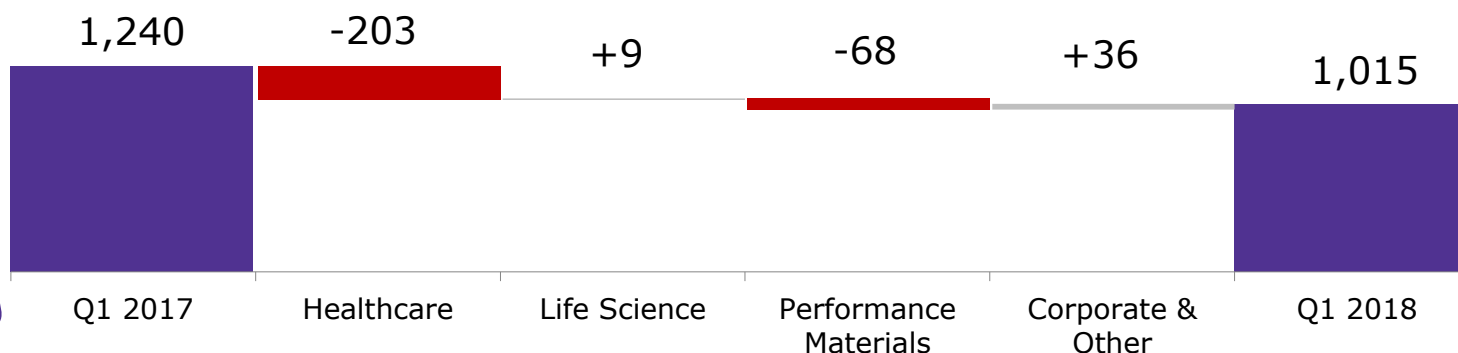
Organic growth driven by Healthcare and Life Science but more than offset by FX

Q1 2018 YoY net sales

	Organic	Currency	Portfolio	Total
Healthcare	1.8%	-7.2%	0.0%	-5.5%
Life Science	8.8%	-8.4%	0.0%	0.4%
Performance Materials	-4.0%	-8.5%	0.0%	-12.5%
Group	3.5%	-7.9%	0.0%	-4.4%

- Healthcare reflects strong growth in Fertility and CH, Mavenclad and Bavencio contributing positively, outweighing Rebif decline
- Above-market performance in Life Science driven by all business units
- Strong growth of Semiconductor Solutions and positive OLED mitigate LC decline
- Strong FX headwinds (-€305 m) in Q1 2018

Q1 YoY EBITDA pre contributors [€ m]



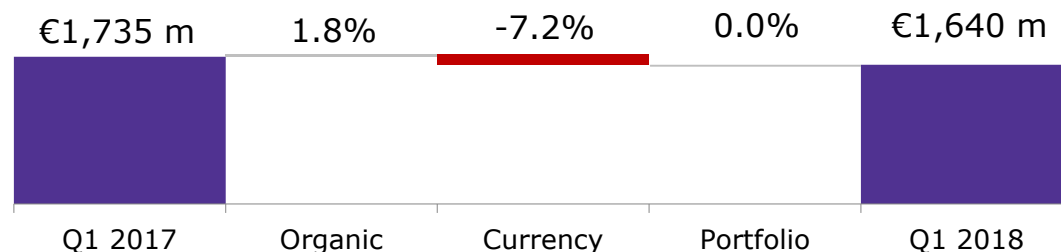
- HC reflects FX headwinds, one-time effects and negative business mix
- Life Science driven by organic growth and ongoing synergy realization, mitigated by FX
- PM with strong Semiconductor Solutions and OLED performance, more than offset by LC decline
- Corporate EBITDA pre contains hedging gains

Healthcare: Continued solid top line performance while profitability declines in relation to FX headwinds and LY's substantial favorable one-time effects

Healthcare P&L

[€m]	Q1 2017	Q1 2018
Net sales	1,735	1,640
Marketing and selling	-656	-636
Administration	-77	-81
Research and development	-376	-385
EBIT	445	211
EBITDA	629	401
EBITDA pre	633	430
Margin (in % of net sales)	36.5%	26.3%

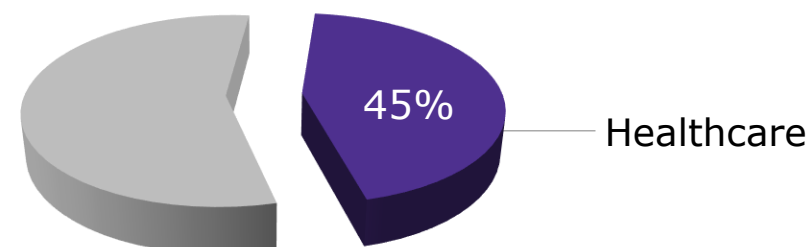
Net sales bridge



Comments

- Organic growth supported by strong Fertility and Consumer Health; Mavenclad and Bavencio contribution on track
- MS franchise back to growth in Europe driven by Mavenclad launch
- Rebif with ongoing volume and price declines in Europe and in line with Interferons market development in North America
- Erbitux shows moderate organic decline, facing ongoing competition and price pressure in major markets
- Marketing & selling and R&D reflect disciplined launch and pipeline investments, mitigated by supporting FX
- Profitability reflects significant FX headwinds and unfavorable product mix mitigated by Kuvan milestone payment (+€50 m) – LY included royalty income swap (€116 m) and Bavencio Milestone payment (€37 m)

Q1 2018 share of group net sales

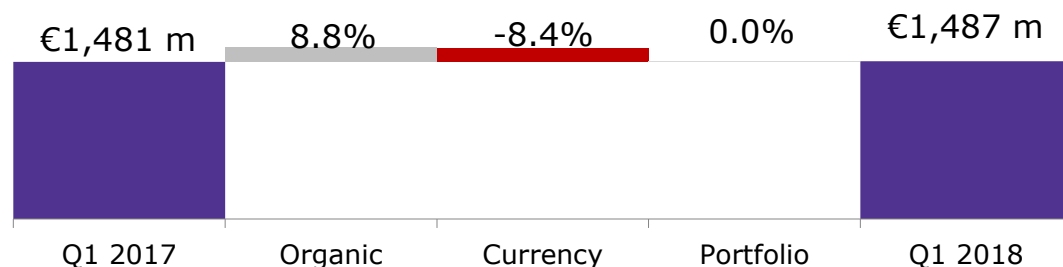


Life Science: Continued strong organic growth offset by FX

Life Science P&L

[€m]	Q1 2017	Q1 2018
Net sales	1,481	1,487
Marketing and selling	-449	-408
Administration	-70	-70
Research and development	-62	-59
EBIT	236	273
EBITDA	430	442
EBITDA pre	445	455
Margin (in % of net sales)	30.1%	30.6%

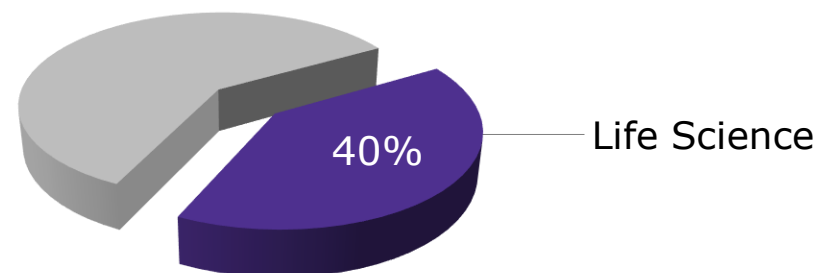
Net sales bridge



Comments

- Process Solutions with double-digit growth driven by all businesses, especially high demand for single use, cell-culture media and services
- Applied Solutions shows high single-digit organic growth, fueled by all major businesses across all major regions
- Research Solutions posts solid organic growth from high demand across all businesses, mainly laboratory and specialty chemicals
- Marketing & selling organically flat with additional benefit from FX
- Slight increase in profitability as solid organic growth including synergy realization are mostly offset by FX

Q1 2018 share of group net sales

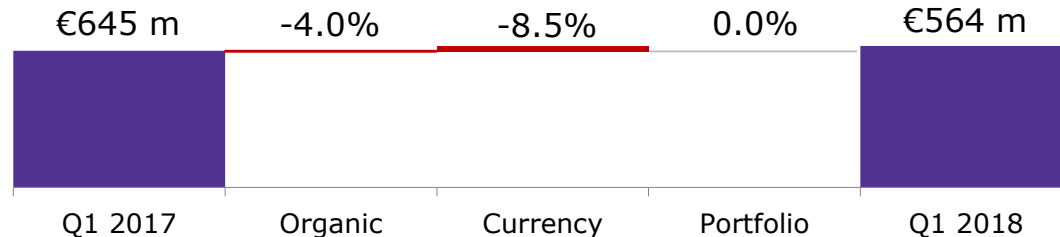


Performance Materials: Organic growth of Semiconductor Solutions and OLED mitigate ongoing LC market share decline

Performance Materials P&L

[€m]	Q1 2017	Q1 2018
Net sales	645	564
Marketing and selling	-62	-60
Administration	-18	-19
Research and development	-58	-59
EBIT	195	136
EBITDA	257	192
EBITDA pre	263	196
Margin (in % of net sales)	40.9%	34.7%

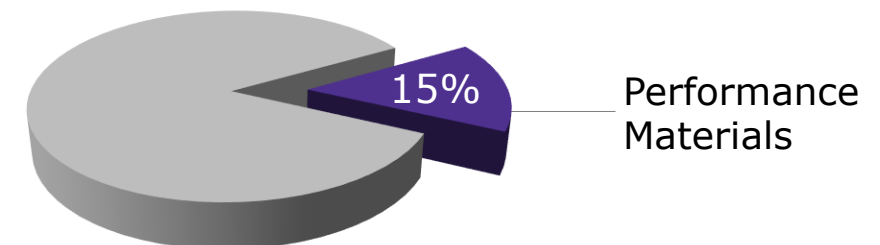
Net sales bridge



Comments

- Strong growth of Semiconductor Solutions and OLED more than offset by ongoing LC market share decline
- Strong demand for innovative UB-FFS technology
- Semiconductor Solutions with above-market growth due to strong demand from all major material classes, esp. dielectric materials
- Surface Solutions with slight organic decline reflects tough comparables from last year
- Lower profitability reflects FX headwinds, negative business mix and Liquid Crystals price decline

Q1 2018 share of group net sales



Reported figures

Reported results

[€m]	Q1 2017	Q1 2018	Δ
EBIT	755	518	-31.4%
Financial result*	-69	-62	-9.8%
Profit before tax*	686	456	-33.6%
Income tax	-161	-114	-29.6%
<i>Effective tax rate (%)</i>	23.5%	24.9%	
Net income*	523	341	-34.8%
EPS (€)	1.20	0.78	-35.0%

Comments

- Lower EBIT reflects decreased EBITDA pre, one-time effects, FX headwinds and LC market share decline
- Improved financial result – ongoing deleveraging supports interest result
- Effective tax rate within guidance range of ~24-26%

Operating cash flow reflects business performance

Q1 2018 – cash flow statement

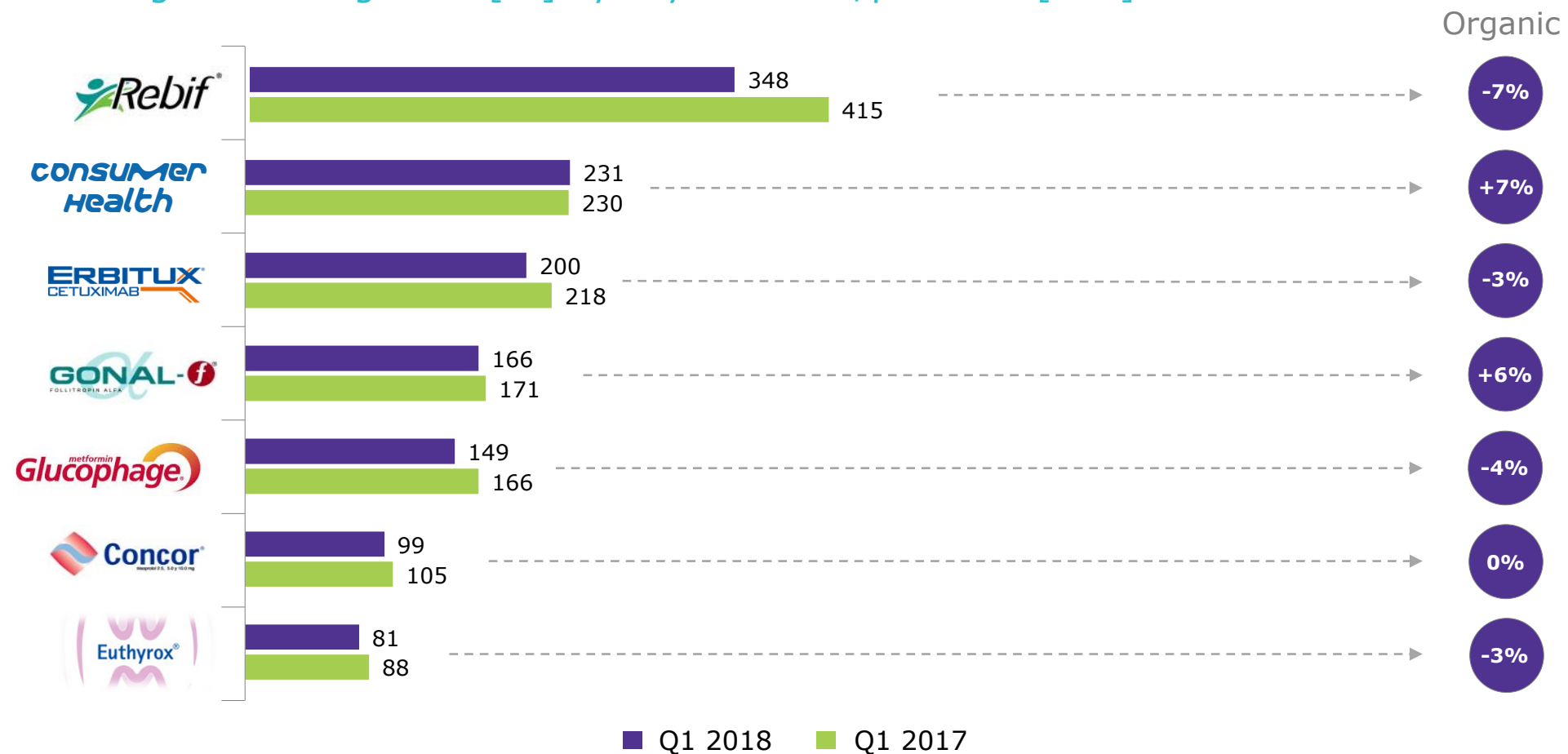
[€m]	Q1 2017	Q1 2018	Δ
Profit after tax	524	342	-182
D&A	448	428	-20
Changes in provisions	51	17	-34
Changes in other assets/liabilities	134	-235	-369
Other operating activities	-12	-10	2
Changes in working capital	-368	-161	207
Operating cash flow	777	380	-397
Investing cash flow	-402	-213	190
thereof Capex on PPE	-201	-228	-27
Financing cash flow	-290	-3	287

Cash flow drivers

- Profit after tax reflects lower EBIT
- LY changes in provisions contained favorable LTIP provisions
- Changes in other assets/liabilities driven by bonus payments to US employees and higher income tax payments
- Changes in working capital reflects LY Glucophage repatriation
- LY investing cash flow included Vertex oncology in-licensing agreement
- Financing cash flow reflects repayment of USD400 m bond, mitigated by increased bank loan and commercial paper

Healthcare organic growth by franchise/product

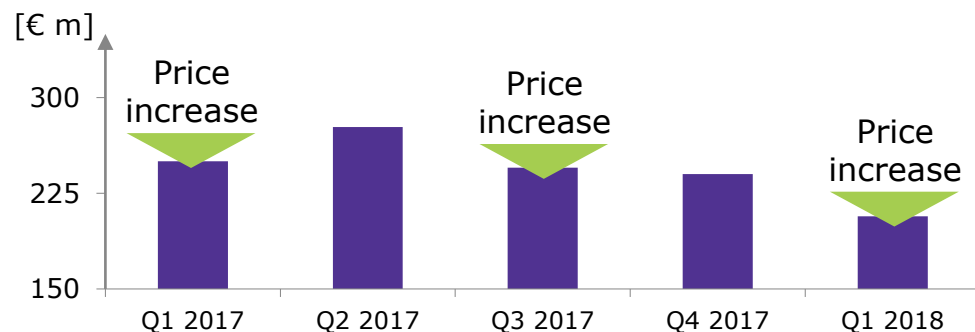
Q1 2018 organic sales growth [%] by key franchise/products [€ m]



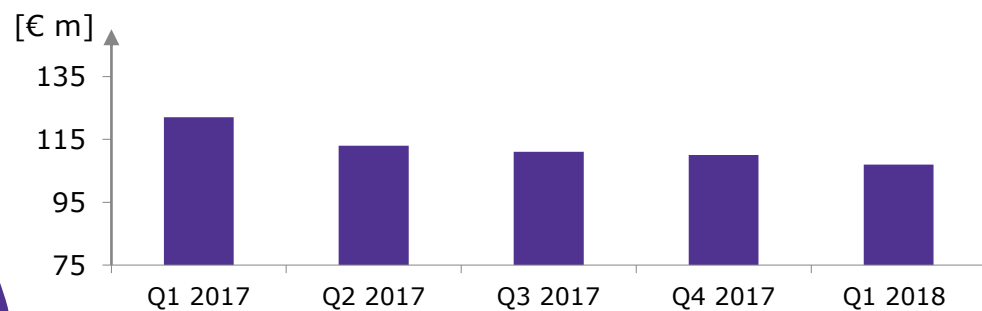
Rebif: Ongoing decline in line with interferon market

Rebif sales evolution

North America



Europe



Q1 drivers

-4.9% org.

- Price
- Volume
- FX

Q1 drivers

-9.8% org.

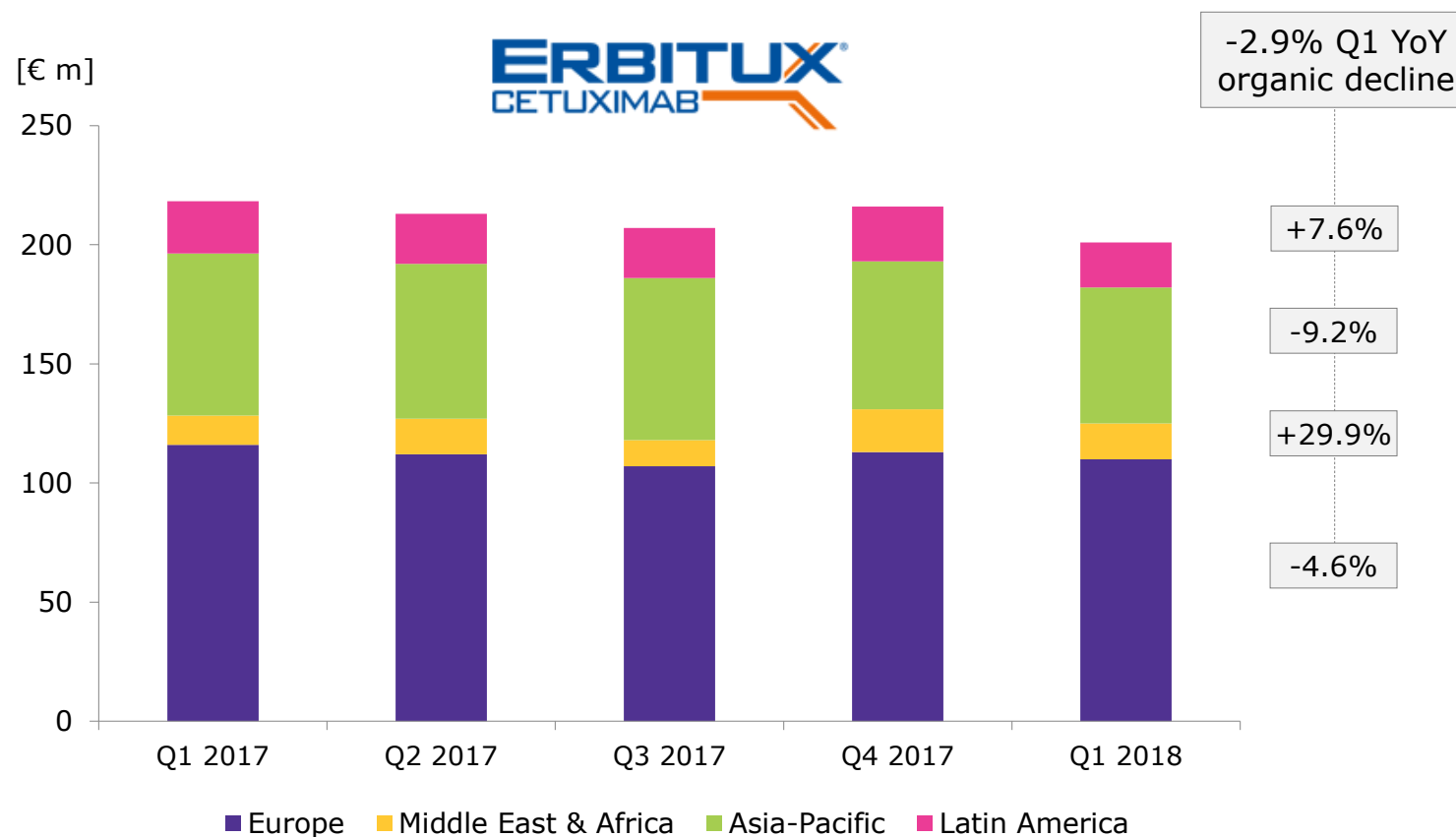
- Price
- Volume

Q1 2018 Rebif performance

- Rebif sales of €348 m in Q1 2018 reflect organic decline of -6.7% and negative FX effects mainly from the U.S.
- U.S. price increase in February more than offset by U.S. volume erosion
- Market shares within interferons stable due to high retention rates and known long-term track record
- Competitive environment incl. competition from orals cause ongoing organic decline in Europe

Erbitux: A challenging market environment

Erbitux sales by region



Q1 2018 Erbitux performance

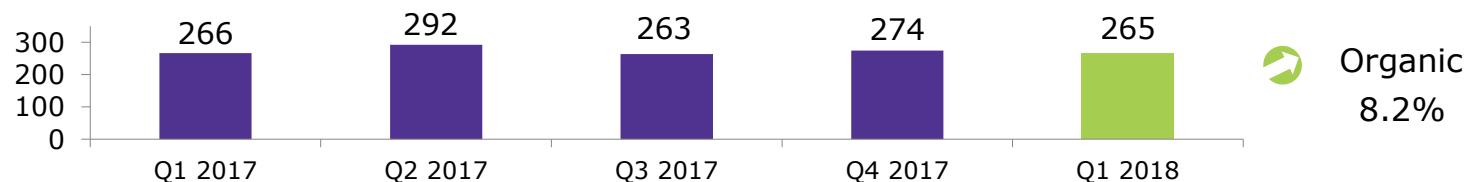
- Sales decrease to €200 m burdened by FX headwinds mainly from LATAM and APAC
- Europe impacted by competition, price reductions and shrinking market size due to increasing immuno-oncology trials
- APAC with ongoing volume and price erosion in China and Japan
- LATAM and MEA shows organic growth from higher demand, MEA also benefited from tender phasing

Strong organic growth of Fertility driven by all regions

Sales evolution

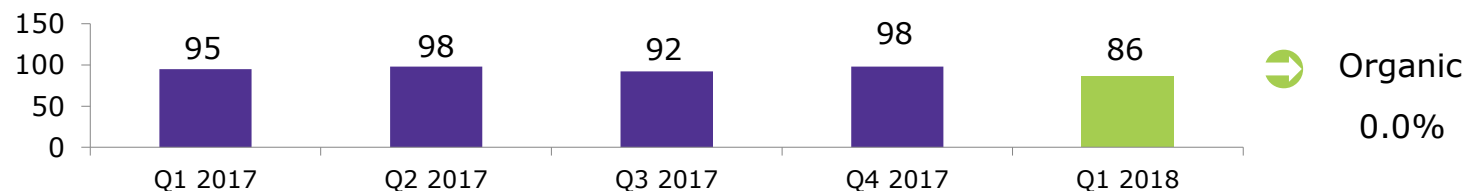
Fertility

[€ m]



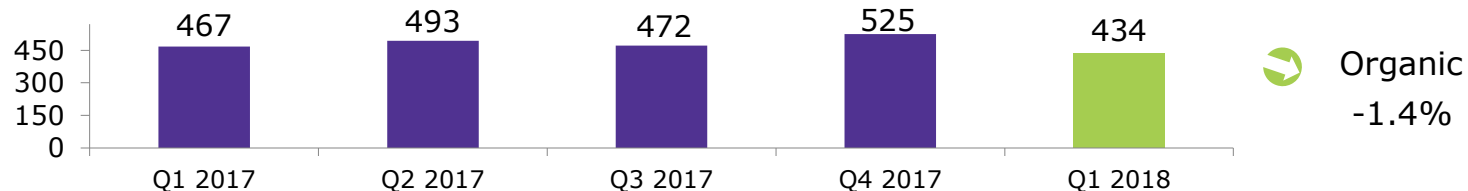
Endocrinology

[€ m]



General Medicine*

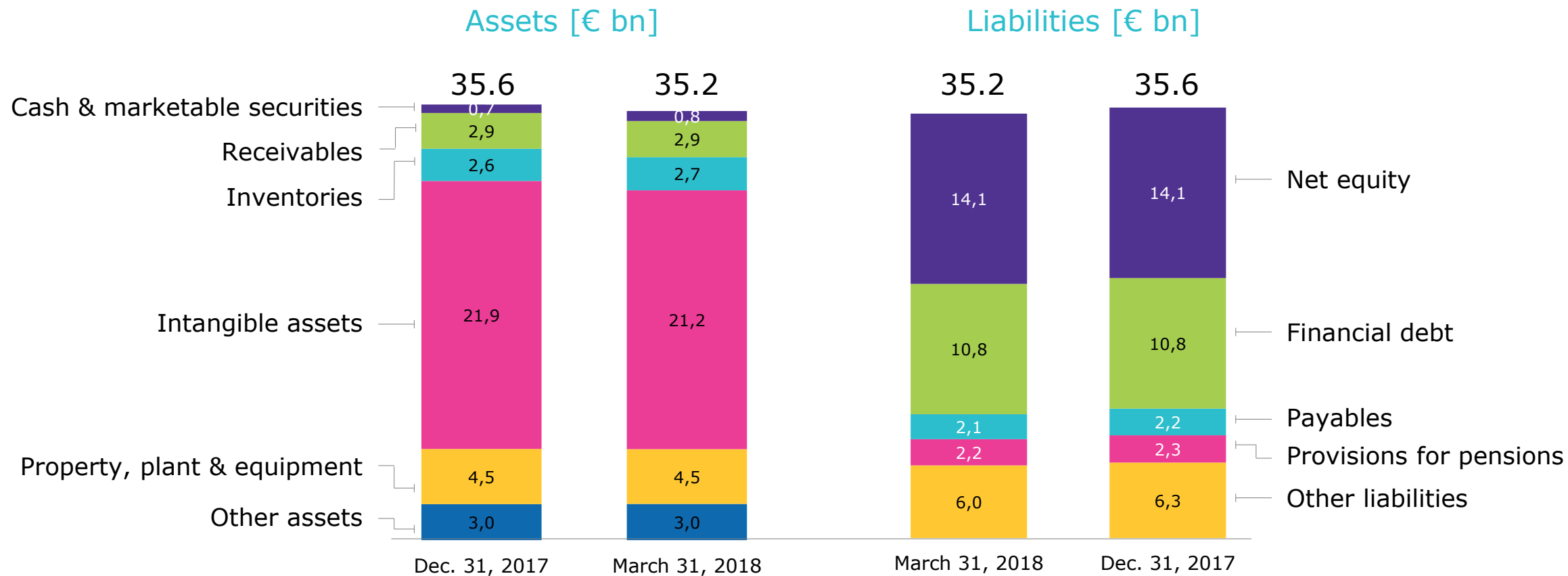
[€ m]



Q1 2018 organic drivers

- Fertility with strong growth across all regions, particularly North America with positive price and volume effects and increasing demand in APAC
- Gonal-f shows solid growth, supported by increasing demand and positive pricing, mitigated by competition from biosimilars in the EU
- Other Fertility drugs show further increases, especially in Europe
- General Medicine with slight decline, driven by tender phasing in MEA
- Endocrinology posts flat growth driven by organic growth in major markets, mitigated by decline in North America

Balance sheet – deleveraging remains in focus



- Total assets about stable, while equity ratio increases to 40.1%
- Reduction in intangible assets mainly reflects D&A and FX (~ -€700 m)
- Net financial debt reduced by €170 m
- Pension provisions down due to increased interest environment

Adjustments in Q1 2018

Adjustments in EBIT

[€m]	Q1 2017		Q1 2018	
	Adjustments	thereof D&A	Adjustments	thereof D&A
Healthcare	4	1	31	2
Life Science	16	0	13	0
Performance Materials	7	0	3	0
Corporate & Other	15	3	24	0
Total	41	4	71	2

Financial calendar

Date	Event
August 9, 2018	Q2 2018 Earnings release
November 14, 2018	Q3 2018 Earnings release
March 9, 2019	FY 2018 Earnings release



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