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FUNDAMENTAL INFORMATION ABOUT THE GROUP

The Group

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

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

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

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

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

Healthcare

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

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

Biopharma

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Consumer Health

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

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

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

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

Biosimilars

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

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

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

Allergopharma

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

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

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

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

Life Science

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Performance Materials

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

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

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

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

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

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

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

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

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

Objectives and Strategies

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

General principles and Group strategy

General principles

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

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

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

Group strategy

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

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

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

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

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

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

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

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

Strategic initiatives

Capability initiatives

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

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

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

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

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

Business strategies

Healthcare business sector

Biopharma

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

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

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

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

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

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

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

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

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

Life Science business sector

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

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

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

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

Performance Materials business sector

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

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

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

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

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

Strategic financial and dividend policy

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

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

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

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

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

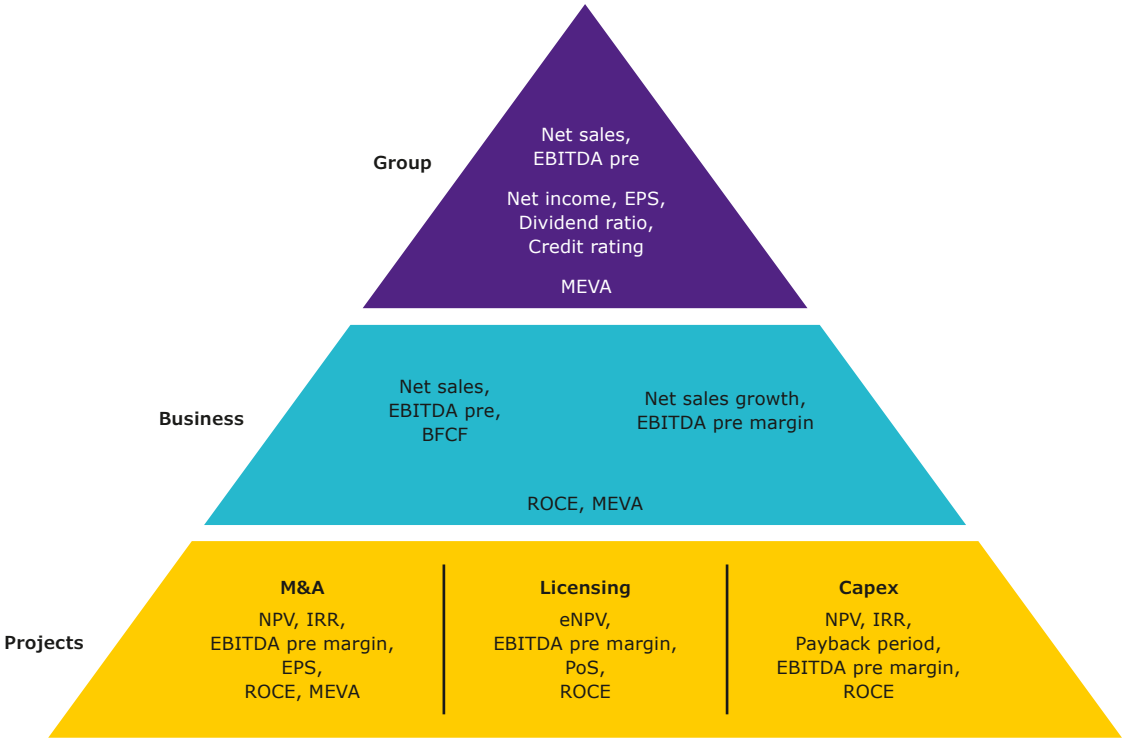
Strong investment grade rating
The rating of our creditworthiness by external rating agencies is an important indicator of the company's financial stability. A strong investment grade rating is an important cornerstone of our financial policy, as it safeguards access to capital markets at attractive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

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

Internal Management System

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

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



Abbreviations

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

Key performance indicators of the Group and its businesses

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

Net sales

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

GROUP

Net sales

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

EBITDA pre exceptionals

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

GROUP

Reconciliation EBIT to EBITDA pre exceptionals[1]

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

Business free cash flow (BFCF)

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

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

GROUP

Business free cash flow[1]

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

Investments and value management

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

Net present value (NPV)

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

Internal rate of return (IRR)

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

Return on capital employed (ROCE)

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

Payback period

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

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

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

Capital-market-related parameters

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

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

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

Credit rating

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

Dividend ratio

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

Other relevant / non-financial performance measures

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

Innovation

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

Talent retention

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

Corporate Responsibility

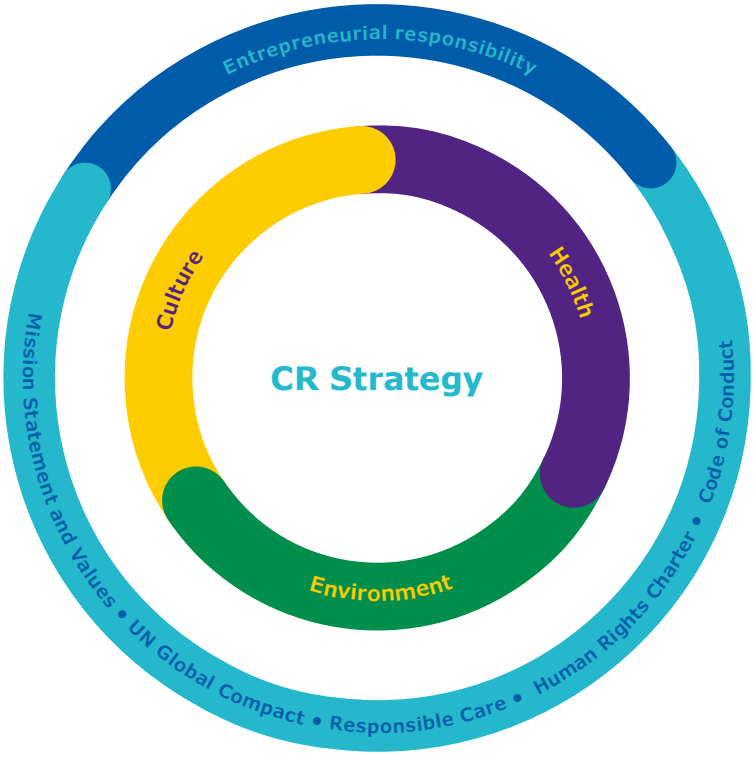
We take responsibility every day – and have been doing so for nearly 350 years. This is reflected in our corporate strategy and values. Responsible conduct with respect to employees, products, the environment and society is a fundamental prerequisite for our business success.

Strategy and management

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

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

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



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

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

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

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

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

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

Strategic sphere of activity: Health

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

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

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

Availability

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

Affordability

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

Awareness

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

Accessibility

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

Strategic sphere of activity: Environment

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

Developing sustainable products

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

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

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

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

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

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

Strategic sphere of activity: Culture

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

Deutsche Philharmonie of Merck KGaA, Darmstadt, Germany

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

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

Fostering literature

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

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

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

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

Education

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

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

Responsibility for our products

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

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

Safety of our chemical products

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

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

Safety of our healthcare products

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

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

Quality of our products

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

Supplier management

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

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

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

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

Responsibility for our employees

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

Responsibility for the environment

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

Environmental management system

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

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

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

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

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

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

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

ENERGY CONSUMPTION

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

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

CO_2EQ EMISSIONS (EQ= EQUIVALENTS)

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

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

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

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

Responsibility for society

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

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

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

Research and Development

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

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

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

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

Healthcare

Biopharma

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

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

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

Oncology

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

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

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

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

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

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

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

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

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

Immuno-Oncology

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

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

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

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

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

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

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

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

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

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

Neurology/Immunology

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

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

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

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

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

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

Fertility

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

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

Endocrinology

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

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

General Medicine

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

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

Neglected diseases

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

BIOPHARMA PIPELINE

as of December 31, 2015

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

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

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

Consumer Health

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

Biosimilars

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

Allergopharma

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

Life Science

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

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

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

Portfolio expansion

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

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

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

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

New and disruptive technologies

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

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

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

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

Partnerships

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

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

Driving scientific dialogues

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

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

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

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

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

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

Performance Materials

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

Display Materials

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

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

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

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

High-quality pigments and functional materials

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

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

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

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

Integrated Circuit Materials

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

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

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

Advanced Technologies

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

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

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

People

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

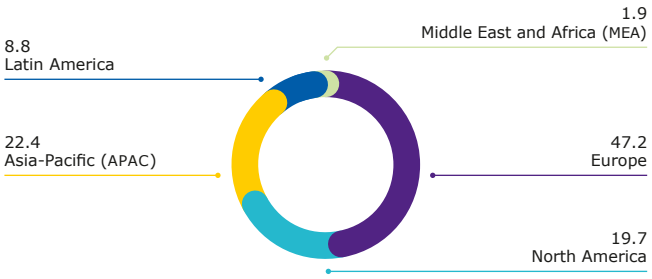
Overview of our headcount figures

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

BREAKDOWN OF EMPLOYEES

by region (Group incl. Sigma-Aldrich)

in %



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

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

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

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

Enabling business growth and transformation

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

Innovation is shaping our future

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

Long-term success through employee development

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

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

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

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

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

Enhancing leadership, talent and performance management

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

Enhancing and developing a common understanding of leadership

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

Promoting talent within the company, attracting talent from outside

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

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

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

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

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

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

Making performance worthwhile

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

Build and foster the corporate culture

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

Competitiveness through diversity

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

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

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

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

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

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

Diversity enriches our management team

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

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

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

Safety in day-to-day work

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

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

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

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

Reconciling the demands of a career and family

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

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

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

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

Dedicated employees contribute to success

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

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

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

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

OVERVIEW OF EMPLOYEE FIGURES

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

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

REPORT ON ECONOMIC POSITION

Macroeconomic and Sector-Specific Environment

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

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

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

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

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

Healthcare

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

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

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

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

Life Science

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

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

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

Performance Materials

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

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

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

REVIEW OF FORECAST AGAINST ACTUAL BUSINESS DEVELOPMENTS

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

Net sales

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

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

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

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

EBITDA pre exceptionals

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

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

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

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

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

Business free cash flow

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

Review of forecast against actual business developments in 2015

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

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

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

COURSE OF BUSINESS AND ECONOMIC POSITION

Group

Overview of 2015

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

GROUP

Key figures

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

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

Development of net sales and results of operations

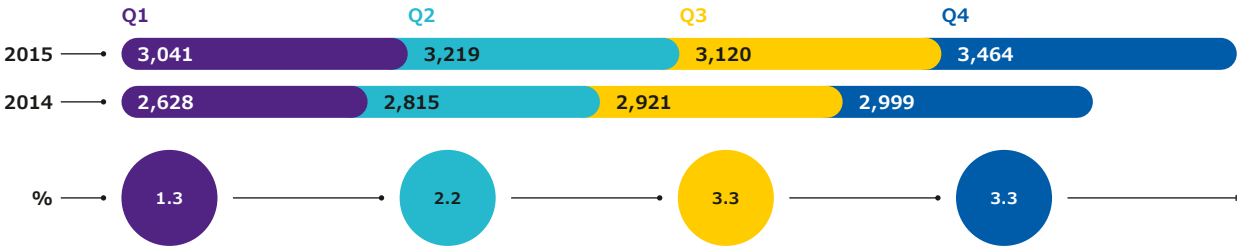
In 2015, we generated net sales of € 12,845 million (2014: € 11,363 million), representing an increase of 13.0% or € 1,482 million over 2014. This positive sales development was due to organic growth, positive exchange rate effects and acquisition-related increases. In 2015, the organic increase in sales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

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

GROUP

Net sales and organic growth by quarter[1]

€ million/organic growth in %



[1] Quarterly breakdown unaudited.

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

GROUP

Net sales by business sector – 2015

€ million/% of net sales

GROUP

Net sales components by business sector – 2015

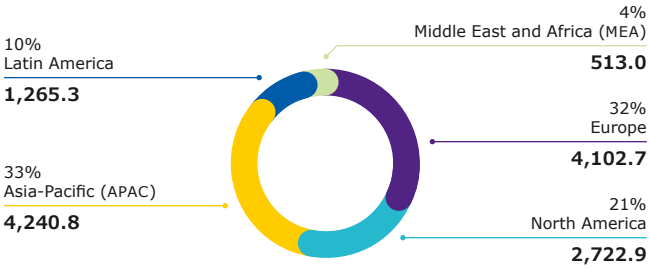
€ million/change in %	Net sales	Organic growth	Exchange rate effects	Acquisitions/ divestments	Total change
Healthcare	6,933.8	1.6	3.1	–	4.7
Life Science	3,355.3	6.5	8.4	10.2	25.1
Performance Materials	2,555.6	0.6	13.1	10.4	24.1
Group	**12,844.7**	**2.6**	**6.2**	**4.3**	**13.0**

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

GROUP

Net sales by region – 2015

€ million / % of net sales



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

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

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

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

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

GROUP

Net sales components by region – 2015

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

The consolidated income statement of the Group is as follows:

GROUP

Consolidated Income Statement[1]

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

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

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

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

GROUP

Research and development costs by business sector – 2015

€ million / in %

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

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

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

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

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

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

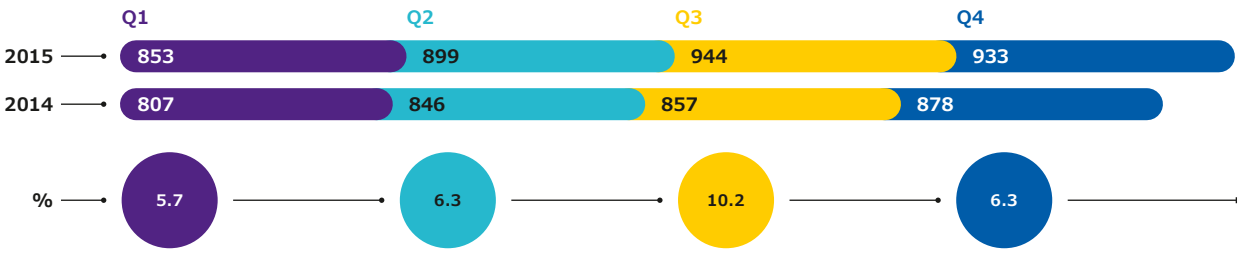
The key financial indicator used to steer operating business, EBITDA pre exceptionals, climbed 7.1% to € 3,630 million (2014: € 3,388 million). The resulting EBITDA margin pre exceptionals of 28.3% nearly reached the year-earlier level (29.8%). The reconciliation of the operating result (EBIT) to EBITDA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

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

GROUP

EBITDA pre exceptionals and change by quarter[1]

€ million / change in %



[1] Quarterly breakdown unaudited.

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

GROUP

EBITDA pre exceptionals by business sector – 2015

€ million / in %

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

Net assets and financial position

GROUP

Balance sheet structure[1]

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

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

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

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

GROUP

Net financial debt

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

GROUP

Reconciliation of net financial debt

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

[1] According to the consolidated cash flow statement.

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

GROUP

Working capital

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

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

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

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

GROUP

Free cash flow

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

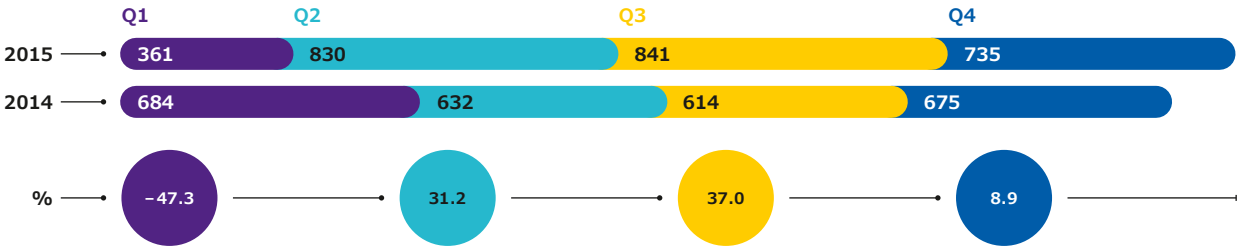
Driven by the development of EBITDA pre exceptionals, business free cash flow of the Group rose in 2015 by 6.2% to € 2,766 million (2014: € 2,605 million). The composition of this financial indicator is presented under "Internal Management System".

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

GROUP

Business free cash flow and change by quarter[1]

€ million/change in %



[1] Quarterly breakdown unaudited.

GROUP

Business free cash flow by business sector – 2015

€ million/in %

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

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

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

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

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

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

The development of key balance sheet figures was as follows:

GROUP

Key balance sheet figures

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

Overall assessment of business performance and economic situation

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

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

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

Healthcare

HEALTHCARE

Key figures

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

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

Development of net sales and results of operations

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

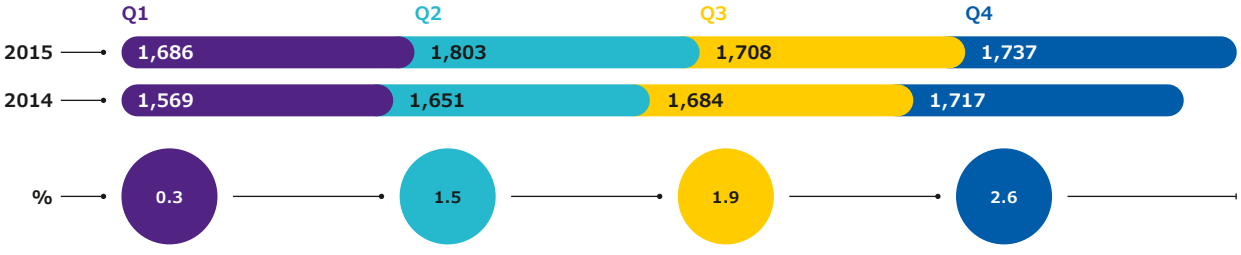
Commission income, which is also included in net sales, rose to € 103 million in 2015 (2014: € 71 million). The agreement reached with Bristol-Myers Squibb in 2013 on the co-promotion of Glucophage® in China had a positive effect on commission income in 2015.

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

HEALTHCARE

Net sales and organic growth by quarter[1]

€ million / organic growth in %

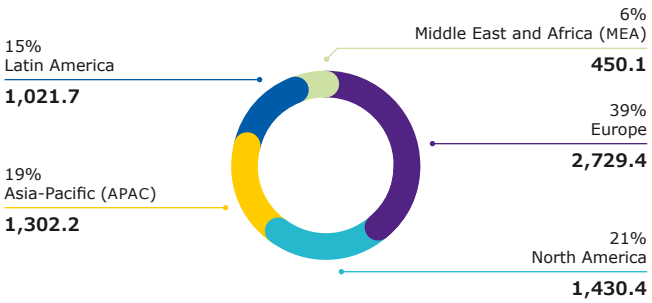


[1] Quarterly breakdown unaudited.

HEALTHCARE

Net sales by region – 2015

€ million/% of net sales of the business sector



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

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

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

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

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

HEALTHCARE

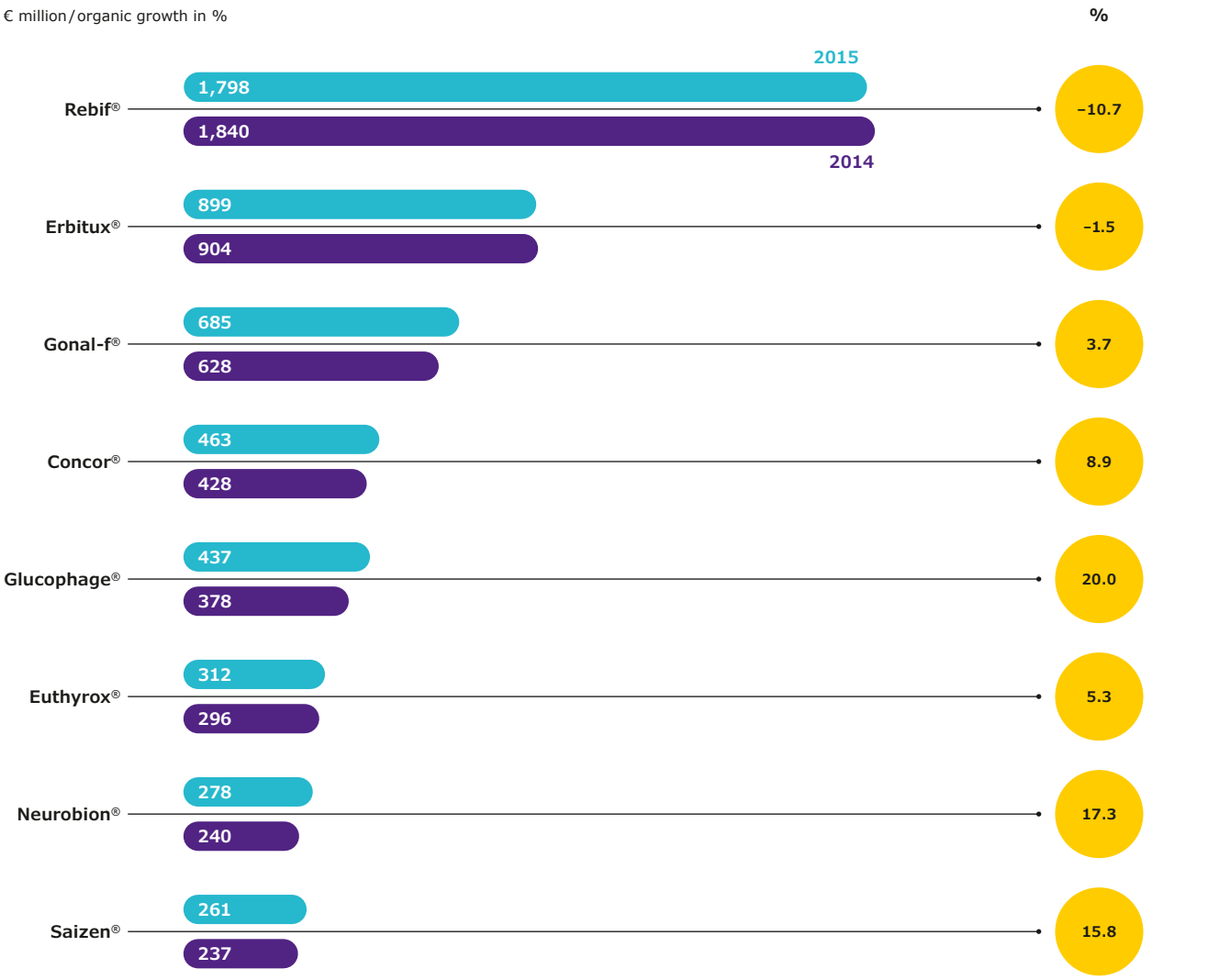
Net sales components by region – 2015

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

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

HEALTHCARE

Product sales and organic growth



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

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

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

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

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

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

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

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

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

HEALTHCARE

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

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

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

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

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

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

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

The results of operations developed as follows:

HEALTHCARE

Result of operations[1]

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

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

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

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

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

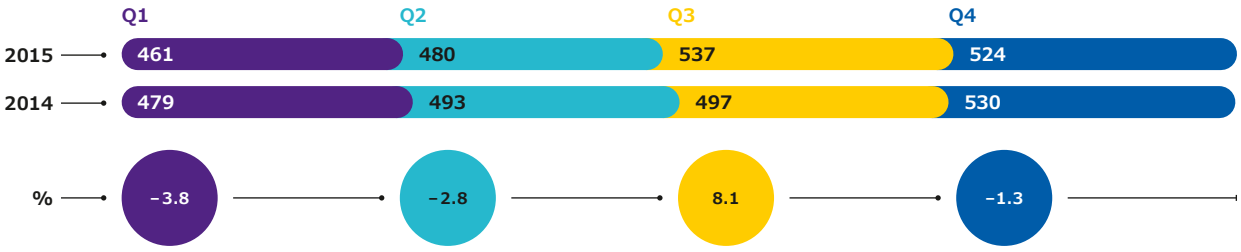
After adjusting for depreciation, amortization and exceptionals, EBITDA pre exceptionals, the key financial indicator used to steer operating business, amounted to € 2,002 million (2014: € 2,000 million), which was thus at the previous year's level. The EBITDA margin pre exceptionals declined to 28.9%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

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

HEALTHCARE

EBITDA pre exceptionals and change by quarter[1]

€ million/change in %



[1] Quarterly breakdown unaudited.

Development of business free cash flow

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

HEALTHCARE

Business free cash flow

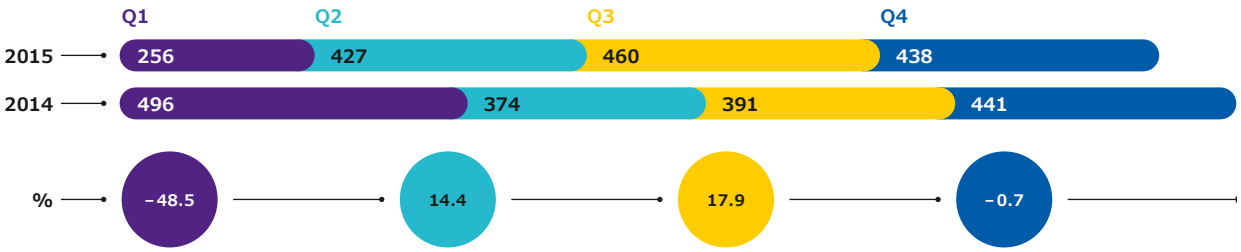
€ million	2015	2014	Change in %
EBITDA pre exceptionals	2,001.7	2,000.3	0.1
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–289.1	–240.0	20.4
Changes in inventories	–26.7	–42.4	–37.0
Changes in trade accounts receivables as well as receivables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

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

HEALTHCARE

Business free cash flow and change by quarter[1]

€ million/change in %



[1] Quarterly breakdown unaudited.

Life Science

LIFE SCIENCE

Key figures

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

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

Development of sales and results of operations

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

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

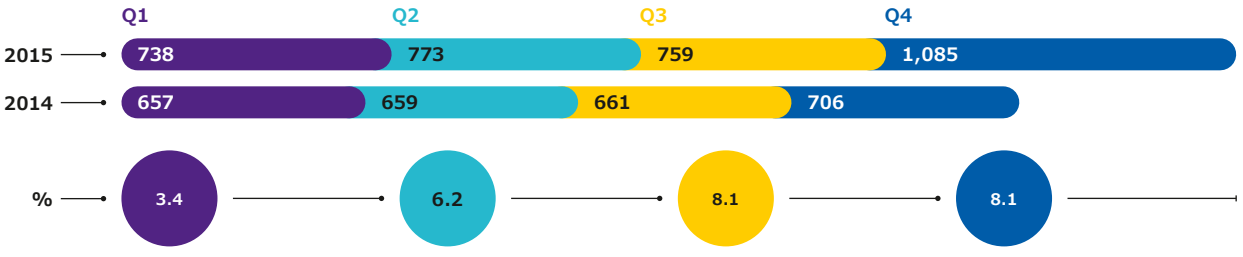
During the period from November 18, 2015 to December 31, 2015, Sigma-Aldrich contributed sales of € 279 million. This was slightly lowered by the divestment of the Discovery and Development Solutions business field in the first quarter of 2014.

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

LIFE SCIENCE

Net sales and organic growth by quarter[1]

€ million / organic growth in %

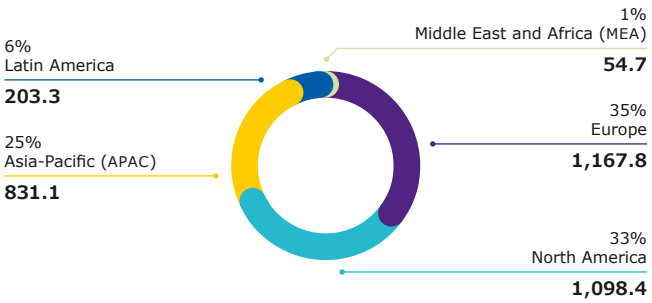


[1] Quarterly breakdown unaudited.

LIFE SCIENCE

Net sales by region – 2015

€ million/% of net sales of the business sector



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

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

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

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

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

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

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

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

LIFE SCIENCE

Net sales components by region – 2015

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

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

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

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

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

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

LIFE SCIENCE

Net sales components by business area – 2015

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

The results of operations developed as follows:

LIFE SCIENCE

Result of operations[2]

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

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

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

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

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

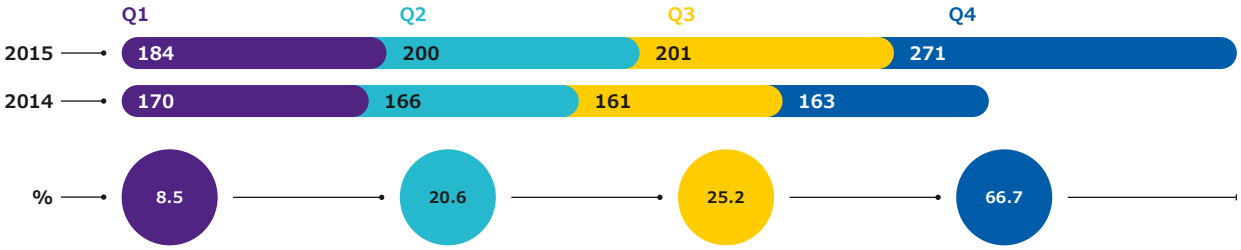
Adjusted for exceptionals, EBITDA pre exceptionals rose by 30.0% to € 856 million, or 25.5% of net sales (2014: € 659 million, 24.6% of net sales). Consequently, the key financial indicator rose more sharply than sales (+25.1%) thanks to the execution of efficiency initiatives, leveraging of Life Science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

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

LIFE SCIENCE

EBITDA pre exceptionals and change by quarter[1]

€ million / change in %



[1] Quarterly breakdown unaudited.

Development of business free cash flow

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

LIFE SCIENCE

Business free cash flow

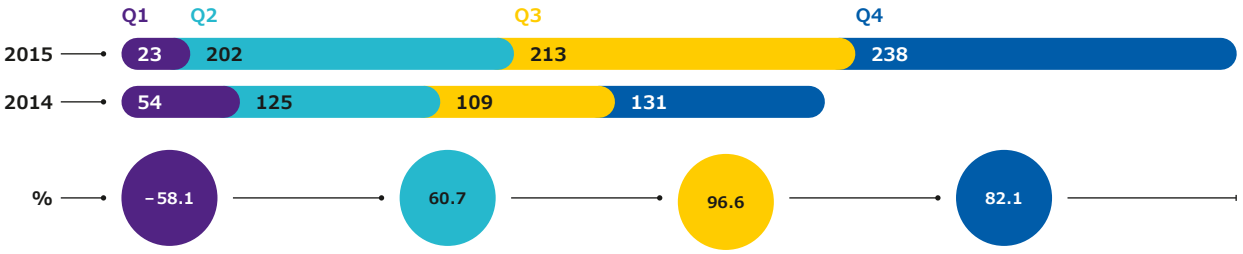
€ million	2015	2014	Change in %
EBITDA pre exceptionals	856.1	658.6	30.0
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–149.9	–141.0	6.3
Changes in inventories	–850.1	–44.2	–
Changes in trade accounts receivables as well as receivables from royalties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

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

LIFE SCIENCE

Business free cash flow and change by quarter[1]

€ million / change in %



[1] Quarterly breakdown unaudited.

Performance Materials

PERFORMANCE MATERIALS

Key figures

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

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

Development of net sales and results of operations

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

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

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

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

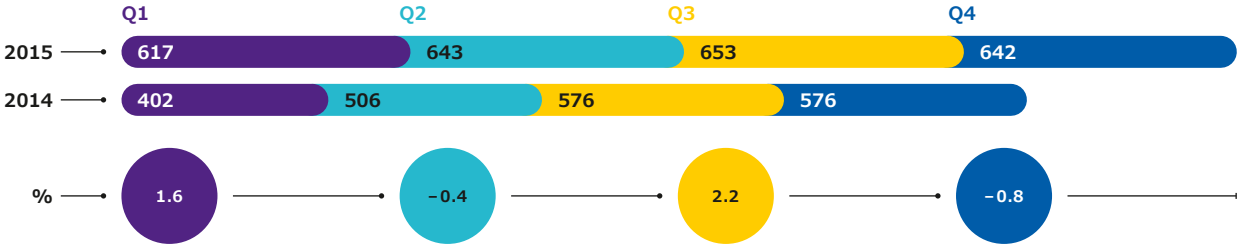
The Advanced Technologies business unit achieved the highest growth rates within our Performance Materials business sector. Special mention should be made of the dynamic development of the OLED materials business.

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

PERFORMANCE MATERIALS

Net sales and organic growth by quarter[1]

€ million / organic growth in %

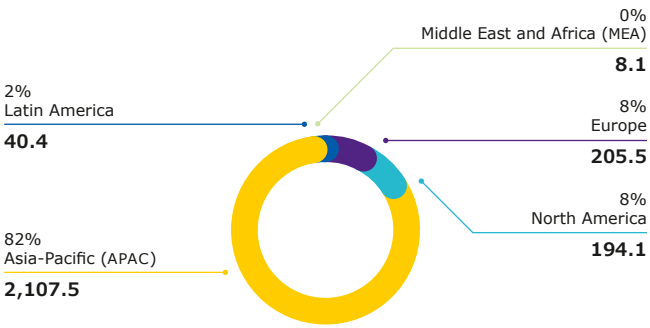


[1] Quarterly breakdown unaudited.

PERFORMANCE MATERIALS

Net sales by region – 2015

€ million / % of net sales of the business sector



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

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

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

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

PERFORMANCE MATERIALS

Net sales components by region – 2015

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

The results of operations developed as follows:

PERFORMANCE MATERIALS

Result of operations[1]

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

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

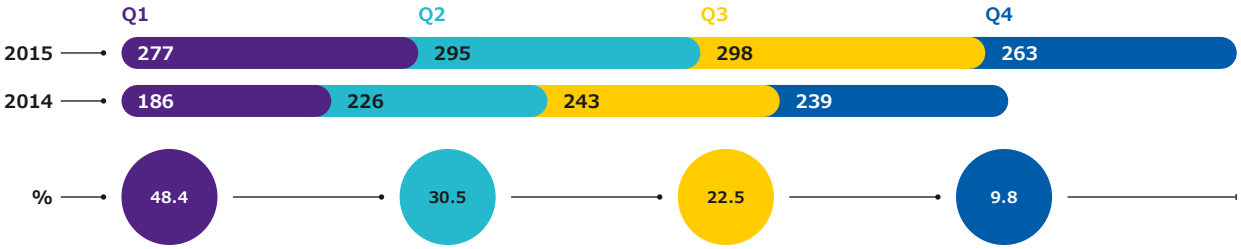
The increase in gross profit was attributable to favorable exchange rate effects and good business performance. In addition, the AZ Electronic Materials business acquired in May 2014 and the SAFC Hitech business from the Sigma-Aldrich acquisition in November 2015 contributed to the improvement in gross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

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

PERFORMANCE MATERIALS

EBITDA pre exceptionals and change by quarter[1]

€ million / change in %



[1] Quarterly breakdown unaudited.

Development of business free cash flow

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

PERFORMANCE MATERIALS

Business free cash flow

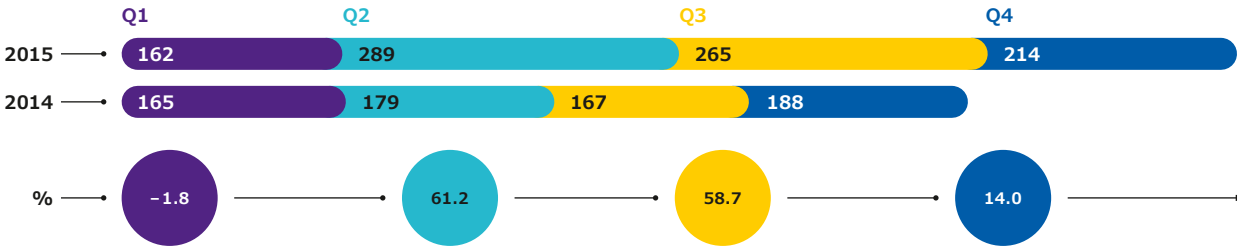
€ million	2015	2014	Change in %
EBITDA pre exceptionals	1,132.1	894.8	26.5
Investments in property, plant and equipment, software as well as advance payments for intangible assets	–109.4	–97.6	12.1
Changes in inventories	–83.2	–98.8	–15.8
Changes in trade accounts receivable and receivables from royalties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

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

PERFORMANCE MATERIALS

Business free cash flow and change by quarter[1]

€ million / change in %



[1] Quarterly breakdown unaudited.

Corporate and Other

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

CORPORATE AND OTHER

Key figures

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

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

REPORT ON RISKS AND OPPORTUNITIES

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

Risk and opportunity management

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

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

Risk management process

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

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

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

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

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

Opportunity management process

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

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

Risk and opportunity assessment

Risks

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

The underlying scales for measuring these factors are shown below:

PROBABILITY OF OCCURRENCE

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

DEGREE OF IMPACT

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

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

RISK MATRIX

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

Opportunities

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

Internal control system for the Group accounting process

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

Key tools

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

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

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

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

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

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

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

Business-related risks and opportunities

Political and regulatory risks and opportunities

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

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

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

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

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

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

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

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

Market risks and opportunities

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

Opportunities due to the further development of the Biosimilars business

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

Opportunities due to new technologies in the manufacture of displays

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

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

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

Opportunities due to new application possibilities for liquid crystals

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

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

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

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

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

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

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

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

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

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

Risks and opportunities of product quality and availability

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

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

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

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

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

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

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

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

Financial risks and opportunities

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

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

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

Liquidity risks

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

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

Counterparty risks

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

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

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

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

Financial market opportunities and risks

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

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

Risks of impairment of balance sheet items

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

Risks and opportunities from pension obligations

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

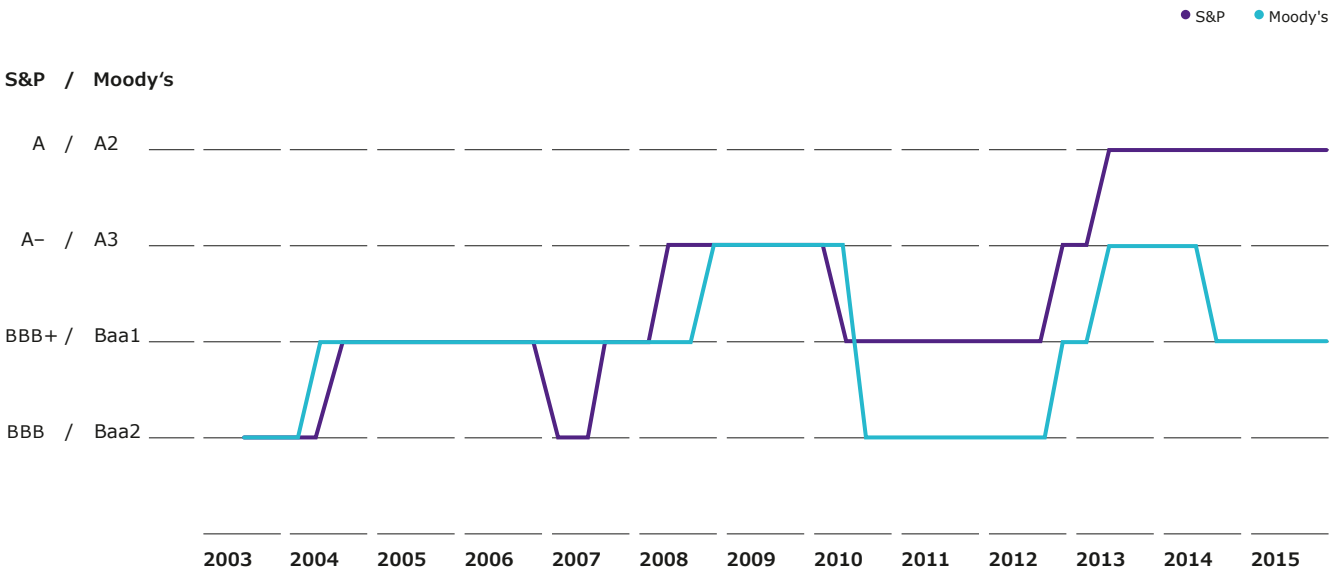
covered by the pension provisions reported in the balance sheet, while other obligations are funded by plan assets (further information can be found under "Provisions for pensions and other post-employment benefits" in the Notes to the Group accounts). To the extent that pension obligations are covered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

Assessments by independent rating agencies

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

REPORT ON RISKS AND OPPORTUNITIES

Overview of rating development



Legal risks

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

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

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

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

Risks from product-related and patent law disputes

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

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

Risks due to antitrust and other government proceedings

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

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

Risks from drug pricing by the divested Generics Group

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

Human resources risks

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

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

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

Information technology risks

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

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

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

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

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

Environmental and safety risks

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

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

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

Overall view of the risk and opportunity situation and management assessment

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

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

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

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

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

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

REPORT ON EXPECTED DEVELOPMENTS

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

Forecast for the Group

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

Net sales

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

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

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

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

EBITDA pre exceptionals

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

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

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

Business free cash flow

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

Forecast for our Healthcare business sector

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

Net sales

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

EBITDA pre exceptionals

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

Business free cash flow

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

Forecast for our Life Science business sector

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

Net sales

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

EBITDA pre exceptionals

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

Business free cash flow

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

Forecast for our Performance Materials business sector

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

Net sales

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

EBITDA pre exceptionals

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

Business free cash flow

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

Summary

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

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

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

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

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

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

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

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

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

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

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

The company is not authorized to acquire its own shares.

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

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

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

Statement on Corporate Governance

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

Business Development

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

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

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

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

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

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

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

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

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

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

Results of operations

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

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

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

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

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

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

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

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

Net assets and financial position

ASSETS

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

EQUITY AND LIABILITIES

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

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

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

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

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

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

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

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

Research and Development

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

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

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

Dividend

For 2015, we will propose to the General Meeting a dividend of € 1.05 per share. Based on our earnings expectations, the family of owners and shareholders of our company can continue to expect to receive an earnings-oriented dividend.

Personnel

As of December 31, 2015, Merck KGaA, Darmstadt, Germany, had 9,537 employees, a slight increase over the previous year (2014: 9,407).

Average number of employees by functional area:

Average number of employees during the year	**2015**	2014
Production	3,114	3,024
Administration	2,254	2,174
Research	2,186	2,160
Logistics	583	542
Engineering	555	538
Sales and marketing	409	389
Other	348	551
Total	**9,449**	**9,378**

Risks and opportunities

Merck KGaA, Darmstadt, Germany, is largely subject to the same opportunities and risks as the Group. More detailed information on risks and opportunities is provided in the consolidated financial statements of Merck KGaA, Darmstadt, Germany.

Forecast for Merck KGaA, Darmstadt, Germany

Deviations of actual business developments in 2015 from previously reported guidance:

In the 2014 Annual Financial Statements of Merck KGaA, Darmstadt, Germany, we expected sales to increase slightly in 2015.

In our sales forecast, we anticipated a slight sales decrease for our Healthcare business sector as a result of lower sales of Erbitux®. The expected decline in sales of the Oncology franchise, however, was more than compensated for by the sales increases in the Cardiovascular and Thyroid franchises, leading to overall sales growth of 6.0%.

In our Performance Materials business sector, sales were expected to decrease due to the persisting high competitive pressure in the context of liquid crystals. This development did not materialize. The business units Display Materials (+27.9%), Advanced Technologies (+84.1%) and Pigments & Functional Materials (+7.9%) achieved sales growth, resulting in an overall sales increase in our Performance Materials business sector of 26.4%.

As expected, our Life Science business sector increased its sales (+8.4%) in 2015.

As stated in the Annual Financial Statements for 2014, we expected a decrease in profit from ordinary activities and thus also of financial resources.

Profit from ordinary activities in 2015 mainly declined compared with 2014 due to a lower investment result and the associated increase in financing costs in connection with the Sigma-Aldrich acquisition. The financial resources for this acquisition were provided through borrowings from Merck Financial Services GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany.

Forecast for 2016

A slight decline in sales is assumed for 2016 for our Healthcare and Performance Materials business sectors. This decline is expected to be nearly fully offset by sales growth in our Life Science business sector.

The financing costs of the Sigma-Aldrich acquisition will have a negative impact on earnings. Accordingly, we expect net income to decline. Net income will also be influenced significantly by investment results and dividend payments of subsidiaries. The provision of a sufficient amount of financial resources is ensured by Merck Financial Services GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany.

Currently no risks can be identified that could jeopardize the continued existence of Merck KGaA, Darmstadt, Germany.

The internal control system for the accounting process according to section 289 (5) HGB

The annual financial statements of Merck KGaA, Darmstadt, Germany, are prepared by Merck Accounting Solutions & Services Europe GmbH, Darmstadt, Germany, a subsidiary of Merck KGaA, Darmstadt, Germany, and an independent legal entity within the Group. The financial statement process of Merck KGaA, Darmstadt, Germany, is based on the accounting provisions of the German Commercial Code with due consideration of key processes and uniform deadlines. The objective of the internal control system for accounting is to implement controls that will provide the security needed to ensure that financial statements are prepared in compliance with the relevant accounting laws and standards. It covers measures designed to ensure the complete, correct and timely conveyance and presentation of information that is relevant for the preparation of the financial statements. The financial reporting processes are monitored via a stringent internal control system that ensures the accuracy of financial reporting as well as compliance with the relevant legal regulations.

The main rules and tools used are as follows:

- Accounting guidelines based on Group-wide guidelines. These Group-wide accounting guidelines are the responsibility of Group Accounting and are available to all employees of the relevant units via the company's intranet. Detailed account allocation instructions are provided here for all major transactions. These guidelines include, for example, clear requirements for the inventory valuation process and transfer pricing within intragroup supply relationships.
- Clearly defined segregation of tasks and assignment of responsibilities to the units involved in the financial reporting process. Through corresponding organizational measures, the company ensures that in the accounting system duties are segregated between the booking of transactions and the review and approval of transactions. These measures include the power of disposition approved by the Executive Board in relation to authorizing contracts and credit notes, as well as consistently implementing a dual-control principle.
- Involvement of external experts as needed, for example for the valuation of pension obligations
- Use of suitable, largely uniform IT finance systems and the application of detailed authorization concepts to limit user rights on a need-to-have basis, taking into account principles concerning the segregation of duties.
- System-based IT controls as well as manual, process-integrated controls, particularly within the scope of the financial reporting process
- Consideration of risks recorded and assessed by the risk management system in the annual financial statements insofar as this is required by existing accounting rules.

The management of the respective department is responsible for the implementation of these rules and utilization of the tools.

The annual financial statements of the company are the responsibility of the Chief Financial Officer, who is a member of the Executive Board of Merck KGaA, Darmstadt, Germany. This responsibility is laid down in the rules of procedure of the Executive Board.

All the structures and processes described are subject to constant review by Group Internal Auditing. The Executive Board determines the structures and processes that are to be audited in an annual audit plan.

The results of these audits are dealt with regularly in meetings of the Executive Board, the Supervisory Board and the Finance Committee of E. Merck KG, Darmstadt, Germany.

SUBSEQUENT EVENTS

At the beginning of January 2016, two contracts entered into with BioMarin Pharmaceutical Inc., USA (BioMarin), became effective. Firstly, the sale of the rights to Kuvan®, a drug used to treat the metabolic disorder known as phenylketonuria (PKU), was agreed. And secondly, our company returned its option to develop and commercialize Peg-Pal to BioMarin. Based on these two agreements, in January 2016 our company received an upfront payment of € 340 million for the sale of the rights to Kuvan® as well as an entitlement to milestone payments of up to € 185 million. The financial statements of Merck KGaA, Darmstadt, Germany, prepared in accordance with the German Commercial Code are only affected by this via future dividend payments from subsidiaries. More information can be found in Note [4] “Acquisitions, assets held for sale and disposal groups” in the Notes to the Group accounts.

Subsequent to the balance sheet date, no further events of special importance occurred that could have a material impact on the net assets, financial position or results of operations.