

# HEALTH

Through our cross-business Access to Health approach, we aim to help improve sustainable access to high-quality health solutions for underserved populations and communities in low- and middle-income countries.





## Fighting schistosomiasis



### THE CHALLENGE

An estimated 249 million people worldwide suffer from the worm disease schistosomiasis, with more than 90% of those affected living in sub-Saharan Africa. This chronic parasitic condition is one of the most devastating neglected tropical diseases in terms of public health burden and economic impact.

**249 million  
people affected**



### HOW WE'RE HELPING

Since 2007, Merck KGaA, Darmstadt, Germany has been partnering with the World Health Organization (WHO) in the fight against schistosomiasis in Africa. We have been donating praziquantel tablets to WHO with the common aim of eliminating the disease in Africa. To date, the company has donated more than 200 million tablets to WHO, and more than 54 million patients have been treated, primarily including children. We have pledged to increase the number of tablets donated to up to 250 million per year. This donation, worth around USD 23 million per annum, will enable 100 million children to be treated annually. At the end of 2014, we called for various NTD constituencies to form the Global Schistosomiasis Alliance in order to help eliminate this disease worldwide.

**54 million  
children treated**

Praziquantel is the only active ingredient with which all forms of schistosomiasis can be treated. In addition to this, praziquantel is also well-tolerated, which is why WHO has included it on its list of essential drugs. Merck KGaA, Darmstadt, Germany developed praziquantel in the 1970s as part of a joint research collaboration.



## Rural Pharmacy



### THE CHALLENGE

According to the World Health Organization (WHO), one-third of the world's population does not have regular access to health care. The majority of those affected live in rural areas of sub-Saharan Africa.



### HOW WE'RE HELPING

As part of its commitment to improving access to health care for these underserved populations, Merck KGaA, Darmstadt, Germany has developed the Rural Pharmacy. This is a 40-foot shipping container that can be transported to rural communities by truck and set up on site with a minimum of effort.

The first of these rural pharmacies has been opened in Ghana and consists of a dispensary, a multipurpose room for vaccinations or medical counseling, and a medicine storeroom with a refrigerator. Solar cells on the roof ensure the constant power supply necessary to continuously refrigerate the medicines. It is also equipped with an atmospheric water generator to produce potable water from the humidity in the air.

**1/3 of the world's population**

lacks access to medicines

**A 40-foot container**

makes pharmacies mobile



## Diabetes prevention



### THE CHALLENGE

According to estimates, around 382 million people suffer from diabetes across the globe, with low- and middle-income countries accounting for a particularly large percentage of patients. In Africa, for instance, approximately 20 million people have diabetes, around one-third of whom remain unaware of their condition. On top of that, very few patients have adequate access to insulin, syringes, or the medical equipment needed to monitor their blood pressure. They often have a life expectancy of less than a year after being diagnosed.

**382 million  
people affected**



### HOW WE'RE HELPING

Merck KGaA, Darmstadt, Germany is committed to improving the quality of diabetes treatment as well as raising awareness of this disease, especially in low- and middle-income countries. To help achieve this, we established the Capacity Advancement Program (CAP) across Africa, India and Indonesia, doing so in collaboration with ministries of health and academic institutions.

**25,000 patients  
screened**

Since launching this program in 2012, we have conducted more than 250 events to boost the profile of diabetes. On top of that, we have provided free diabetes screening and medical check-ups to more than 25,000 people in Kenya, Ghana, Uganda, and India. Additionally, more than 100,000 patient leaflets about diabetes have been distributed at training camps and supermarket chains in Kenya and Uganda. In 2014, around 2,000 pharmacy and medical students in Africa took part in a clinical diabetes management training program that is accredited in Europe. Through the Capacity Advancement Program, we are aiming to reach 15,000 pharmacy undergraduates and medical students in Africa, Asia, the Middle East, and Latin America by 2018.



## Improving health care in rural India



### THE CHALLENGE

Around 70% of the one billion inhabitants of India reside in rural areas and have no access to effective, affordable health care. Medical facilities are concentrated in India's megacities, which account for 80% of India's healthcare professionals as well as 70% of the country's hospital beds.

**1,675 villages reached**



### HOW WE'RE HELPING

Through the Suswastha Project, a socially responsible business model, Merck KGaA, Darmstadt, Germany is seeking to improve health care for rural populations of India. At community-level weekly meetings, healthcare professionals educate patients about everyday health issues such as coughs and childhood ailments, teaching them ways to prevent these conditions. In addition to this, the program also provides patients with free check-ups and offers continuing education to help local physicians advance their medical capacities. Furthermore, we are partnering with the non-governmental organization FHI 360 as well as the Clinton Foundation, supporting amongst others their fight against diarrheal diseases.

**500,000 patients have participated**

Since the program's start in January 2013, more than 1,675 rural villages in India have benefited from the project, which has now reached half a million patients in total.

# ENVIRONMENT

A number of our innovative chemical and life science products contribute to environmental protection. We strive to continuously enhance the sustainability footprint of our products while helping our customers achieve their own sustainability goals.





## Energy efficient displays



### THE CHALLENGE

The danger of serious climate damage has increased in recent years, and many natural resources are growing scarcer. As a result, people are becoming increasingly environmentally conscious, and more and more consumers are taking a product's power rating into account when deciding what to buy.



### HOW WE'RE HELPING

Merck KGaA, Darmstadt, Germany develops and markets products that help our customers save energy. Our liquid crystals for PS-VA technology (polymer-stabilized vertical alignment) provide television screens with high contrast while also consuming little energy. They also increase light transmittance, which helps to significantly reduce the amount of backlighting needed - the largest power consumer in a display. In comparison to VA technology, screens with our PS-VA materials consume up to 20% less energy. Furthermore, liquid crystals for PS-VA technology considerably improve image quality. In general, the faster the switching time, the better the image. The polymer-stabilized vertical alignment orients the liquid crystal molecules in a particular direction. The crystals can then tilt faster when they switch directions.

The new UB-FFS technology (ultra-brightness fringe field switching) provides displays with up to 15% more light transmittance than its forerunner, FFS. In combination with other technological developments, UB-FFS lowers end device power consumption by as much as 30%. Furthermore, this new technology also provides superior image resolution and reduces battery size, thereby opening up new design possibilities for product designers.

### Displays consume 20% less energy

thanks to liquid crystals for PS-VA technology

### UB-FFS technology

provides displays with 15% more light transmittance



## Smart windows



### THE CHALLENGE

Climate change and its consequences are already impacting life on Earth today. In the West, 40% of total energy consumption is attributable to buildings, a large portion of which goes to lighting (20%) and air conditioning (15%). With resources becoming ever scarcer and energy prices rising ever higher, companies and private individuals are seeking to boost the energy efficiency of both new as well as existing buildings.

**40% of total energy consumption** is attributable to buildings



### HOW WE'RE HELPING

Under the Ilicivision™ brand, Merck KGaA, Darmstadt, Germany is developing liquid crystal mixtures for new applications. For instance, we are working with architects, glass makers and facade manufacturers to create the windows of tomorrow. Our ambitious goal is to use smart windows to make buildings more energy-efficient, thus conserving resources and cutting costs. To this end, we have developed the Liquid Crystal Window Technology. How does this work? At the push of a button, these windows can be darkened within seconds - tinted in whatever color desired. Smart windows thus help regulate the temperature indoors while also setting interior design accents. This technology is made possible thanks to the special properties of our liquid crystals (LCs), which in this case are combined with customized dyes. When a low voltage is applied to the windows, the LCs allow electromagnetic waves, i.e. light, to either pass through, thus making the window transparent, or to be absorbed and blocked, thus darkening the window. In this way, smart windows help regulate the temperature indoors while also setting interior design accents and lowering HVAC costs.

**Liquid crystals make windows smarter**

In the Netherlands, we are currently operating a pilot plant for the manufacture of such smart windows, some of which are to be installed in the new Innovation Center under construction in Darmstadt, Germany.



## Recycling and waste reduction



### THE CHALLENGE

Biopharmaceutical production requires many single-use products such as filter cartridges and tubing. However, a lack of disposal options – along with the material properties of the product itself and stringent regulatory requirements – often make it difficult to recycle these items.

**54,000 kg of plastic recycled**



### HOW WE'RE HELPING

Through environmentally sound recycling programs, including disposal of used products and packaging, the life science business is working together with its customers to help reduce the environmental impacts of its products and services.

**189 metric tons**  
of product waste diverted

In 2012, Life Science partnered with a waste disposal company and five customers in the United States to jointly pilot a recycling program for biopharmaceutical single-use products. During the ten-month pilot phase, we recycled more than 54,000 kilograms of plastic, which was reprocessed and repurposed into items such as paint buckets and plastic pallets. Non-recyclable components were sent to a cement kiln and used as an alternative fuel source. In 2013, we expanded this program to include two additional customers. Overall, we diverted 189 metric tons of product waste in 2013 and 2014, 91 metric tons of which was plastic that was recycled.



## Reducing our customers' impacts



### THE CHALLENGE

Just like us, our customers are also striving to conserve resources and protect the environment, which means they expect products from Merck KGaA, Darmstadt, Germany that help them minimize their own environmental impacts.

**91% reduction**  
in autoclave-associated  
carbon emissions



### HOW WE'RE HELPING

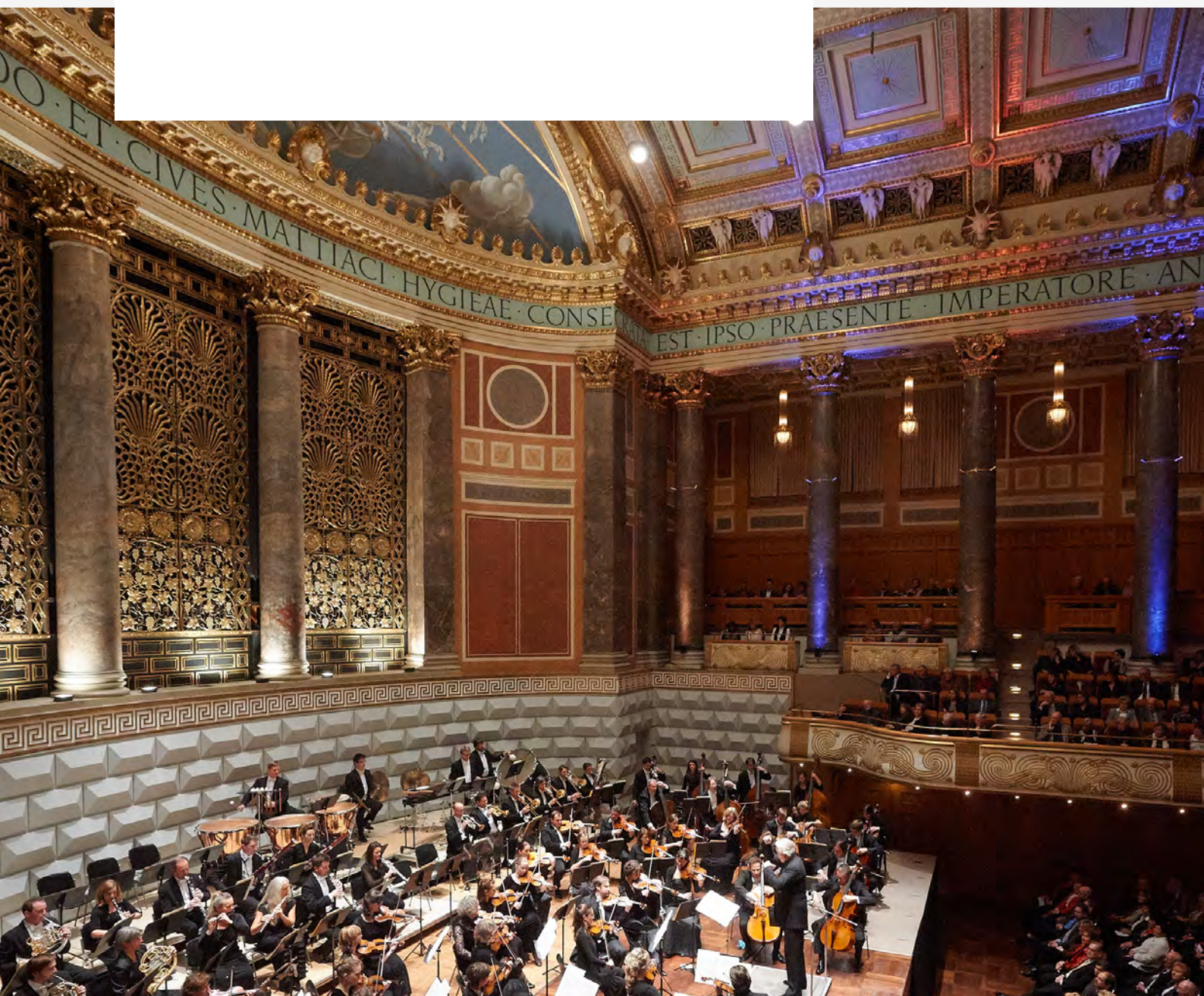
The life science business has developed the Design for Sustainability (DfS) program, which aims to reduce the environmental impacts of our products across their entire life cycle, from manufacture to end of life. We furthermore work to maximize product performance and ease of use for our customers. Beginning with the concept definition phase, we identify potential environmental impacts, along with opportunities to make improvements.

**47% less raw  
material needed**

For instance, the life science business employed DfS principles in the design of its new EZ-Fit™ Manifold, which is used for microbiological water testing in the food and beverage industry. In comparison to the previous model, the EZ-Fit™ Manifold is easier to clean, which significantly reduces our customers' environmental impacts. This device uses 47% less raw material and its packaging consists of 100% recyclable corrugated board. In addition, the filtration heads can be easily removed and autoclaved on their own, unlike the previous model, which had to be completely sterilized. This feature results in an estimated 91% reduction in autoclave-associated carbon emissions.

# CULTURE

Culture inspires people and opens up their minds to new possibilities. As a high-tech, research-based company, we therefore promote cultural projects worldwide and are engaged in educational projects – especially since education is key to making culture accessible.





## Getting children excited about classical music



### THE CHALLENGE

For children and adolescents, playing music together teaches them teamwork and builds their self-confidence. Yet many of them first come into contact with classical music only later in life – or never at all.



### HOW WE'RE HELPING

Our musical ambassador, the Deutsche Philharmonie Merck sponsored by Merck KGaA, Darmstadt, Germany, seeks to get children and adolescents excited about classical music and to nurture young talent. With this in mind, the Philharmonie thus held its first ever orchestra workshop in 2010. At this music camp, young musicians practice together with the Philharmonie members, gaining initial experience in a professional orchestra. The event concludes with a joint concert. In both 2013 and 2014, around 50 children and adolescents participated in our annual orchestra workshop. In addition to this, the Deutsche Philharmonie Merck sponsored by Merck KGaA, Darmstadt, Germany has also given four "cushion concerts" over the past two years, thereby reaching around 800 children.

**Cushion concerts  
for 800 children**

**50 children**  
played music with  
professional musicians



## Promoting literature and building bridges



### THE CHALLENGE

In certain parts of society, we as a research-based, high-tech company often encounter a growing sense of skepticism toward innovation and science, particularly in industrialized countries.



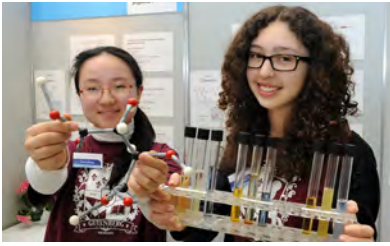
### HOW WE'RE HELPING

Literature can inspire creativity, raise critical questions, and lead to innovation. Literature can also address scientific issues, thus furthering a deeper understanding of science and research. Merck KGaA, Darmstadt, Germany therefore grants and promotes four literary prizes worldwide.

For 12 years, we have been sponsoring the Premio Letterario of Merck KGaA, Darmstadt, Germany in Italy, which recognizes authors who build bridges between literature and science, thereby making them accessible to a wide audience. Building bridges between cultures is the focus of two literary awards that we grant in partnership with the Goethe Institut: the Kakehashi Prize of Merck Ltd. Japan, a subsidiary of Merck KGaA, Darmstadt, Germany in Japan and the Merck Tagore Award of Merck Ltd., a subsidiary of Merck KGaA, Darmstadt, Germany in India. Since 1964, we have also been sponsoring the renowned Johann Heinrich Merck Award of Merck KGaA, Darmstadt, Germany for Literary Critique and Essay of Merck KGaA, Darmstadt, Germany, which is presented by the German Academy for Language and Poetry. Through this prize, we are helping build bridges between literature and literary criticism.

**4 literary prizes  
worldwide**

**77 authors  
recognized since  
1964**



## Fostering young scientists



### THE CHALLENGE

Germany is experiencing a shortage of skilled, trained personnel - especially in the areas of mathematics, IT, science, and technology. This is partially due to the fact that too few children and adolescents are taking an interest in science.



### HOW WE'RE HELPING

With the aim of promoting young scientists, for more than 30 years Merck KGaA, Darmstadt, Germany has been a partner in "Jugend forscht", the largest and most successful young scientist competition in Germany. The company has been hosting this competition in the German Federal State of Hesse since 1996. In addition to "Jugend forscht", for many years we have also been supporting more than 60 schools in the region surrounding Darmstadt and Gernsheim in order to spark students' interest in science. For instance, our company not only provides materials for science classes - we also hold continuing education courses for teachers and offer classes field trips to our headquarters in Darmstadt, Germany. We are furthermore partnering with select schools to give teachers extensive support for science classes.

On top of this, since 2008 Merck KGaA, Darmstadt, Germany has also been running the Junior Laboratory in collaboration with the Technical University of Darmstadt. In more than 200 square meters of space, elementary and high school pupils of all ages can work on their own experiments and discover the world of chemistry, receiving guidance from university staff as well as university chemistry students. In 2014, around 3,500 pupils took advantage of the lab.

**3,500 students**  
conducted experiments in  
the Junior Lab

**For more than  
30 years,**  
we have been a partner in  
"Jugend forscht"