

MAGAZINE

Enriching lives

INTERVIEW WITH DR. SHINTA PRIMASARA

Dr. Shinta Primasara (36) from North Sumatra, Indonesia, is the mother of three children. Muhammad Harits Zaki (10), Amirah Fatimah (4) and Azizah Aisyah (6 months) all suffer from hypothyroidism. Even though Primasara is herself a physician, it took a long time to find a diagnosis for her first child and get proper treatment.



Interview

Dr. Primasara, what made you think that something was wrong with your oldest child Muhammad Harits?

As a baby, my son initially seemed very healthy; up to six months old, his progress was normal for his age. He would occasionally come down with a fever or diarrhea, but nothing that would have worried me. I noticed something was wrong when he was nine months old. Harits could not sit up on his own; but his pediatrician still didn't think anything was seriously wrong. Later, our son's development became regression, and we took him to see a neurologist to figure out the cause. Harits was diagnosed with thyroid hormone deficiency (hypothyroidism). We then consulted an endocrinologist, who prescribed hormone thyroid treatment.

How is your son doing today?

The hormone deficiency caused by hypothyroidism impacts brain development, which is why my son's mental development was delayed. He has severe learning difficulties, cannot do things on his own and his hearing is impaired so that he can only hear low-pitched sounds.

You are a doctor yourself. How did you take the diagnosis?

At first I was shocked when I learned of the diagnosis – it had never even crossed my mind. This disease was rarely heard of when I was in college. I didn't expect it, as Harits's early development was normal. I also didn't know that I suffered from hypothyroidism when I was pregnant. Screening for hypothyroidism is thus essential to diagnosing the disorder in newborns.

Your daughters were also diagnosed with a thyroid disorder, but luckily this happened right after birth.

I have learned a lot about thyroid disease and now understand it. It is quite difficult to identify clinical symptoms in newborns, as they do not appear immediately. In both of my pregnancies with my daughters, I received treatment for hypothyroidism. They were both screened for hypothyroidism four or five days after birth and were subsequently also diagnosed with the disease. Thanks to prompt treatment, they are both developing normally, for which I am very grateful.

Indonesia: Thyroid awareness

Indonesia has one of the highest levels of thyroid disorder in Southeast Asia. Yet only 1% of patients receive proper treatment. Children particularly suffer from the effects of this disease because the hormonal imbalance can impact their development.

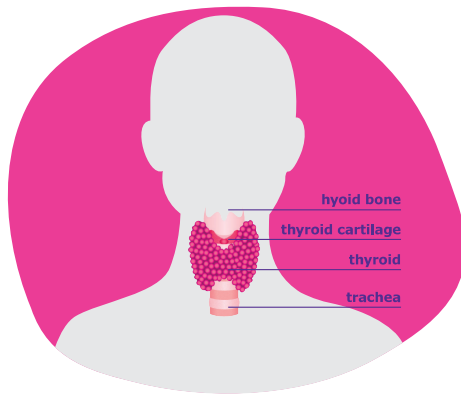
We want to educate the public on thyroid disorders. Since 2014, we've been working with the Indonesian government to accomplish exactly that. Within the "Set yourself free from Thyroid" campaign, we are hosting events such as symposia, lectures and seminars for physicians and the public. Above all, however, we're working to promote hypothyroidism screening of newborns across the country. Although decreed a standard procedure by the Indonesian government in 2014, implementation so far has been slow. Our experts are currently partnering with the Indonesian Pediatric Society to develop a manual on pediatric thyroid disorders that will help pediatricians to diagnose the disease.

20 Million

In 2016, we reached approximately 20 million people through our worldwide thyroid awareness campaigns. More than 14,500 individuals received thyroid checkups.

The control tower of the metabolism

The butterfly-shaped thyroid gland is the primary regulator of the body's metabolism. Its main job is to produce thyroid hormones – messengers that are needed to make sure the tissues and organs of the body work properly and at the right speed. Through its hormones, this gland controls all bodily tissues and organs. A thyroid disorder means that the thyroid gland is either producing and releasing too much (overactivity/hyperthyroidism) or too little (underactivity/hypothyroidism) thyroid hormone into the bloodstream, which can accelerate or slow down one's metabolism. There are many possible symptoms. For example, some people who suffer from thyroid disease may experience excessive sweating or restlessness, while others may be fatigued and depressed.



"Catching butterflies" – across the globe!

Merck KGaA, Darmstadt, Germany is working to raise global awareness of the thyroid gland and possible disorders. Hand in hand with Thyroid Federation International (TFI), we've been supporting International Thyroid Awareness Week for the last nine years. Held in May every year, the 2016 campaign was called "Catching Butterflies: Spotting the Symptoms of Thyroid Disorders in Children". A survey we commissioned in 2016 revealed that 84% of mothers worldwide could not correctly identify typical symptoms of thyroid disorders in their children.

In response, we collaborated with TFI to develop a film, a children's book and an informational brochure for parents. These tools feature two butterfly cartoon characters called "Hypo" and "Hyper", who explain the symptoms of hyperthyroidism and hypothyroidism. Worldwide, 34 of our sites supported this campaign through initiatives such as social media activities, drawing contests, info fairs, and free checkups for children.



"Millions of people around the world suffer from some form of thyroid disease. Most of them, however, are unaware of their condition. They grapple with health limitations that could easily be alleviated with the right treatment. Thyroid Federation International aims to change this and is working to raise awareness of thyroid disorders."

Ashok Bhaseen

President of Thyroid Federation International

Greater awareness

Initially, many diseases go undetected. People often know too little about diseases such as diabetes, multiple sclerosis (MS) and cancer. Our company has in-depth knowledge and expertise regarding these diseases. We therefore run global awareness campaigns in which we work closely with various partners such as patient advocacy groups. Many of our employees get involved in these initiatives as well. In addition to external campaigns, we also regularly organize awareness campaigns within our own company.

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In 2015 and 2016, we organized 17 awareness campaigns around the world on diseases such as cancer, diabetes, multiple sclerosis, and thyroid disorders.

Dispelling the stigma of infertility

Since launching our More than a Mother campaign in 2015, we have been working in partnership with ministries of health and social welfare, academia, parliaments, and fertility societies to raise awareness about infertility prevention and break the stigma around infertile women in Africa. This initiative originally launched in Kenya, was expanded in 2016 to Uganda, Nigeria, Tanzania, Ghana, Central African Republic, and Ivory Coast, where we are providing practical training for embryologists and fertility specialists in an effort to build fertility care capacity on the continent. We are also helping governments define policies to improve access to safe and effective fertility care. In 2016, we furthermore helped more than 1,000 affected women to set up their own business and thus achieve financial independence. The More than a Mother campaign is championed by the first ladies of Nigeria, Central African Republic and Sierra Leone. It is publicized through social media to spread awareness of the stigmatization endured by these women and share their stories.



"Advocating for better health creates a ripple effect, uplifting entire families, communities and future generations. We are proud to support disease awareness campaigns around the world in order to take medical education in developing countries to the next level. By promoting global access to health services, we are taking a significant step toward achieving the United Nations Sustainable Development Goals."

Belén Garijo

Executive Board member and CEO Healthcare

Educating the public in rural India

With our Su-Swastha project, we are working to improve the quality of healthcare in rural India. We educate both the public and physicians in these regions on commonplace health problems and how to treat them. For instance, experts provide information on coughs and childhood illnesses, explaining ways to prevent them. In addition, we offer free check-ups for patients and continuing education for physicians.

MAGAZINE

Exploring the future

INTERVIEW WITH JOHANNES CANISIUS

Johannes Canisius, who holds a PhD in Chemistry, is one of the minds behind our latest vision for liquid crystal technology. Since 2012, the 49-year old Merck KGaA, Darmstadt, Germany employee has been working with his team on the development of liquid crystal windows (LCWs). Head of the LCW business field within our Performance Materials business sector, Canisius explains the benefits of this innovative application.



Interview

You and your team have developed a new way to shade windows from the sun. What inspired you?

When the sun shines into an office, the bright light warms up the room and makes it hard to see – so you put down the blinds. But the problem is that these darken the room, meaning you then have to turn on a light. And people often use air conditioning to cool the room down. We asked ourselves whether there might not be a better, more sustainable solution. We have essentially put sunglasses on the windows. Our liquid crystal technology allows the level of incoming light to be adjusted at the touch of a button. If the sun is shining, the room can be immediately darkened, which means it is less prone to heating up. This technology reduces the amount of energy consumed by air conditioning and lighting. Blinds can be done away with altogether, boosting the general feel good factor – with an uninterrupted view of the great outdoors, people become more creative and productive!

Saving energy

Our liquid crystal windows can help save energy. Since they absorb a portion of the sunlight and therefore the heat, the room does not grow as warm, reducing the need to use air conditioning. Light still enters the building, just not so bright that it's blinding. People no longer need to draw the curtains or drop the blinds, nor do they need to turn on the lights. All in all, liquid crystal windows can thus save up to 40% of the energy that would normally be used for air conditioning or lighting.

Seems like a brilliant idea – how did it come about?

Our company is the world market leader in liquid crystal technology. For a long time, we focused our efforts on reducing the energy consumed by the liquid crystal displays of smartphones, tablets and TVs. But then in 2012 we realized that we could use our liquid crystals for so much more. We heard about the Dutch start-up Peer+, a small team that was experimenting with liquid crystals in windows. We partnered with them for two years before acquiring the company. With our ideas and expertise, we complement each other perfectly.

What role does sustainability play in your work?

Fortunately, it plays a major role. Every day, I have the chance to work on new, sustainable ideas. In developing our liquid crystal window technology, we received a lot of support from the Executive Board, even during challenging stages. The drive to blaze new trails requires top-down buy-in, which we definitely have at our company!

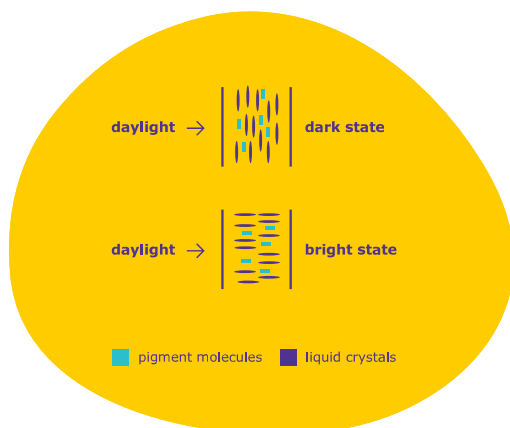
Up to

40 %

Buildings outfitted with liquid crystal windows consume up to 40% less energy otherwise required for air conditioning or lighting.

Liquid crystal windows as a sunshade – how it works

A mixture of liquid crystals and pigment molecules is placed between two panes of glass. The alignment of these crystals changes when an electrical current is applied. When users push the button to alter the current, the liquid crystals arrange the pigment molecules so that they absorb more or less light, depending on their positioning. This controls how much light the window transmits. If it's set to "bright", light penetrates the window. If darkened, light and heat are absorbed – but it's still possible to see out.



100 %

Our liquid crystal windows are 100% recyclable after the end of their useful life.



Producing their own electricity

Liquid crystal windows could be made to generate their own electricity. The liquid crystal mixture can be designed so that it functions as an optical waveguide. Incoming light would be conducted to the inner frame of the window, which contains small solar cells. These would then produce enough electricity to enable the windows to operate.

Conserving resources

Buildings with giant window façades have one major problem: it takes a lot of time, effort and money to block the sun. Electric blinds require repairs - and it is expensive as well as time-consuming to install a new motor. As a result, large office buildings often have all the motors changed at once, even the ones that still work, thereby wasting a lot of materials. With our liquid crystal windows, however, blinds are no longer needed. These windows require practically no maintenance and are 100% recyclable.

"Our people have creative ideas and develop innovative and sustainable solutions with the full backing of our company. Johannes Canisius' team is a quintessential example: Their liquid crystal windows have taken our liquid crystal technology in a completely new direction and will soon be an integral component of state-of-the-art architecture and sustainable building management."

Walter Galinat

Executive Board member and CEO Performance Materials

Cool to the touch

At our global headquarters in Darmstadt, we have already installed our liquid crystal windows in our modular Innovation Center as well as our OLED materials production building. "During the summer, you can immediately feel the room cool down when the windows are darkened and the sunlight is blocked out," says Johannes Canisius, reporting on the successful test phase.

The feel-good factor

Displays? No problem! But windows? With our new technology, we were faced with the major challenge of breaking into the market of the construction industry, a sector that is relatively conservative when it comes to innovations. However, modern architecture is increasingly catering to the feel-good factor, which played right to our strengths. Over the last several years, the percentage of glass used in both private homes and large office complexes has increased exponentially. This is the perfect time for our liquid crystal windows.



"Modern buildings are becoming more and more like living organisms, where the façade works like our skin in keeping the interior comfortable. Like in a human body, all parts of a building must function in harmony. Our liquid crystal windows fit the bill perfectly because they can be seamlessly integrated with other lighting and climate controls in a building, optimally making use of available daylight and all working together to make the building a pleasant place to be."

Caspar van Oosten

CEO Merck Window Technologies, Eindhoven, Netherlands a subsidiary of Merck KGaA, Darmstadt, Germany, co-developer of the LCW technology, founder and joint owner of the start-up Peer+

Commercializing liquid crystal windows

Our windows are on the verge of market launch, and our first production facility in Veldhoven (Netherlands) is scheduled for completion some time in 2017. Our initial target group will be the premium architecture segment, where large window façades envelop high rises and corporate headquarters, and the task of regulating the incident sunlight is complicated and expensive. Once these windows have established a firm foothold in this sector, we will turn our attention to the mass market. We believe that liquid crystal windows will soon become the window of choice.

5 years

It took 40 people – among them engineers, scientists, and quality managers – five years to develop our liquid crystal windows, from the initial idea in 2012 to market maturity in 2017.



MAGAZINE

Fostering talent

INTERVIEW WITH BHAVYA VIJAY VAKIL

Bhavya Vijay Vakil, a medical professional from Mumbai, India, knew early on that he wanted to be a doctor. Yet his family could not afford to send him to university. Thanks to financial support from the Merck KGaA, Darmstadt, Germany Scholarship Program, Bhavya has made his dream come true. Now 26 years old, he works as an anesthesiology resident in Mumbai.



Interview

Why did you want to become a doctor?

I come from a humble background. My father was an engineer but worked as a teacher – that was his passion. My mother is a housewife. Until the eighth grade, I'd never really considered what I wanted to be when I grew up. But then my father died of a heart attack – that day, I knew that I wanted to become a doctor and help people.

How did you achieve your goal?

It was very difficult at first. After my father's death, we had little money and I needed tutoring at school. My mother had no idea how she would pay for it. When I was in tenth grade, my uncle happened to read about Merck KGaA, Darmstadt, Germany's scholarship program in the newspaper. That was my window of opportunity – I applied immediately.

... and you were accepted. Do you still remember the moment you heard the good news?

When the company called to tell me I'd won a scholarship, it was one of the most pivotal moments of my life. I'd never dreamed it would actually happen! I was sure I'd messed up the application. Far from it – I'd been accepted! I was unbelievably grateful.

What form of support has Merck KGaA, Darmstadt, Germany provided?

Starting in 2006, the company covered 90% of my tuition at the Maharashtra University of Health Sciences. This support lasted for about seven years. There are many local scholarships available in India, but the company's is one of the most extensive. However, Merck KGaA, Darmstadt, Germany also expects good performance and continually checks on the progress of scholarship recipients. I had to get good grades in my classes to keep the scholarship, which kept me really motivated. And ultimately, I succeeded!

You are now a medical resident. Do you have new goals?

I am currently working as an anesthesiology resident at a hospital in Mumbai. This comes with a great deal of responsibility, and I have to maintain high levels of concentration at work. I enjoy it a lot and would like to continue in this field of medicine. After finishing my residency, I would like to go to London and apply for the fellowship offered by the Royal College of Anaesthetists. For anesthesiologists, successful completion of this fellowship comes with a lot of cachet. Afterwards, however, I would like to return to Mumbai. It's my home; it's where my friends and family live. I want to be with them and serve my nation.

A springboard ...

... for great dreams: Our Merck India (Mumbai) a subsidiary of Merck KGaA, Darmstadt, Germany Charitable Trust (MICT) has been providing scholarships to underprivileged students since 2005. These scholarships cover a five- to seven-year period, generally enough for recipients to pay for their tuition fees and study materials. Since the scholarship's launch, 54 recipients have successfully completed their degrees and found good jobs, primarily in the fields of IT and medicine.



"With this scholarship, Merck KGaA, Darmstadt, Germany is nurturing the future of the nation. We believe that a lack of financial resources should not be a barrier to young talent reaching their full potential and achieving a respectable life. That is why we have made a long-term commitment of financial support to these talented students who are starting a new phase in their education."

Anand Nambiar

Managing Director of Merck KGaA, Darmstadt, Germany in India

275 students

We are currently funding university degrees for 275 students in Mumbai and Goa, India.

Finally going to school – Other projects in India

We procure mica used in the production of effect pigments for the cosmetics industry from Jharkhand, India. Many children and adolescents in this region do not attend school. We are collaborating with the IGEP Foundation to remedy this situation. In Jharkhand, we operate three schools with adjacent nursery schools along with a vocational training center for tailoring and carpentry, which provide services to 500 children and teenagers. At a fourth school, we provide scholarships that enable 200 children access to a basic school education.



China and Ghana: Supporting the health experts of tomorrow

Because young, skilled individuals are key to the future success of entire regions, we are committed to facilitating education in other developing and emerging countries as well. Since 2011, for instance, we've been awarding two-year scholarships to talented students in China who come from an economically disadvantaged background. We are focusing our support particularly on medical and pharmacology students at Fudan University in Shanghai. Fudan University is one of the most renowned academic institutions in China and ranks among the top 100 universities worldwide. To date, 600 students have benefited from our scholarships, with 120 in 2016 alone. Recipients have included PhD fellows and graduates working towards an advanced degree.

Furthermore, in 2016 our Healthcare business in China launched a scholarship program for MBA students enrolled in the National School of Development (NSD) of Beijing University. In Ghana, Nigeria and Kenya, we award prizes to outstanding students on an annual basis.

Progress through curiosity



"With the constantly changing kaleidoscope of new issues we encounter and completely new forms of collaboration, we are always searching for inquisitive, capable young people who share our passion for science and technology. We are therefore committed to inspiring children and teenagers to explore the sciences. To this end, we promote a number of educational projects – particularly in the communities near our sites across the globe."

Kai Beckmann

Executive Board member and Chief Administration Officer

Jugend forscht: Three decades of pioneering spirit

"Jugend forscht" is Europe's largest youth science and technology competition. We have been supporting this initiative for more than 30 years. Since 1996, we have also been hosting the state-level competition held in the German Federal State of Hesse, and have hosted the nationals twice. We have been selected to host the nationals again in 2018 and are already looking forward to it. Furthermore, 80% of the Hessian Jugend forscht competitors came from schools with which we partner.



Having fun in the lab

Gilding copper coins, removing rust from iron, isolating pigments from carrots: young students are curious and love to experiment. They have ample opportunity to explore their curiosity in our top-notch Junior Lab, a facility that is perfectly equipped for school classes. In October 2016, we launched a similar learning laboratory for biology known as the "livfe BioLab". This is an initiative that links classroom lessons with trending topics and modern methods of biological research. We partner with the Technical University (TU) of Darmstadt in the operation of both laboratories.

More than

20,000

Since 2008, more than 20,000 students have paid a visit to the Merck KGaA, Darmstadt, Germany-TU Darmstadt student chemistry lab, where they've tinkered about and conducted experiments.

Inspiring teachers

Teachers also need inspiration. For many years, we have been supporting more than 60 schools in Darmstadt and Gernsheim by providing class materials and continuing education for teachers. Our efforts here focus on subjects in which we're experts, such as chromatography, spectroscopy and lab safety.

When science makes sparks fly

Launched in 2016, our SPARK volunteering program works to bring science to life. It motivates employees across the Life Science business sector to volunteer to share their scientific knowledge with students at schools in 192 cities around the world. To date, around 4,500 employees have provided exciting insights into the world of science in classrooms and at company sites in 36 countries. More than 60,000 pupils have put on lab coats and had fun conducting hands-on experiments.

