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HELMHOLTZ PERSPEKTIVEN

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Dr Self-Employed

When Scientists Turn Into Entrepreneurs

HELMHOLTZ GEMEINSCHAFT

→ HELMHOLTZ extreme

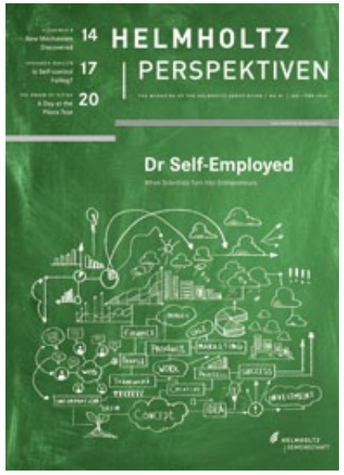
This Time: The Intelligent Plant Surface

When certain aquatic plants are submerged, they simply take their air for breathing along with them. They are thus able to survive under water for many months. "It is quite spectacular what nature comes up with," says Thomas Schimmel. At the Karlsruhe Institute of Technology (KIT), physics professor Schimmel is working on a new project that focuses specifically on this retained layer of air. Soon he and his team intend to artificially construct surfaces resembling those of the aquatic plants. These may allow ships to glide through the water as if carried by air, resulting in fuel economies.

The plant model used is the aquatic fern *Salvinia molesta*. Recently, the physicists at the KIT and the team around botanist Wilhelm Barthlott (University of Bonn) have discovered the Salvinia effect, named after this plant. They demonstrated the trick by which the nanostructure plant surface can permanently retain air under water. The Salvinia effect is based on the fine surface hairs. These are water-repellent; only their very tips are hydrophilic and maintain a firm hold on the water film above the air stored below. They thus ensure a stable mantle of air. If the Karlsruhe team is successful in replicating this, they soon will attach samples to the hulls of seagoing vessels. Fluid dynamics researchers will then put these surfaces into an artificial canal and pull them through the water to test whether the air layer remains stable. The chances are good: the Karlsruhe researchers have already created coated surfaces based on the Salvinia effect that have been submerged in their laboratory for three years. They have continued to retain their air layer without any problems.

Angela Bittner

Natural cushion of air Fine hairs retain an air layer between the leaf and the water. Photo: Forest&Kim Starr@wikimedia.org / T. Schimmel (KIT)



Dear Readers,

Germany is making unprecedented investments in research and development. With an allocation of about 3 per cent of its gross domestic product, Germany ranks directly behind the Scandinavian countries within Europe and also holds a top rank on a global scale. However, it does not perform quite as well when it comes to science-triggered start-ups. Here the Germans occupy only a mediocre middle rank in international comparison. So far, that is, for slowly, very slowly, the picture is beginning to change in this field as well. To speak of a spirit of optimism amongst the research community would surely still be an exaggeration, but more and more scientists are risking the uncertainty of self-employment. In our cover story we present two such courageous scientists and we have captured the points of view of promoters and critics.

With its new framework research programme “Horizon 2020”, which went into effect at the turn of the year, the European Union is also putting increased emphasis on innovations. We have researched who profits from the millions handed out by Brussels and who is likely to come up empty-handed. Moreover, we have spoken with two researchers, a married couple, who have been investigating the basics of nerve cell diseases for over 20 years. A PhD candidate from their joint laboratory has now found a new mechanism involved in Alzheimer’s disease.

I hope you enjoy the read!

Andreas Fischer
Editor-in-chief

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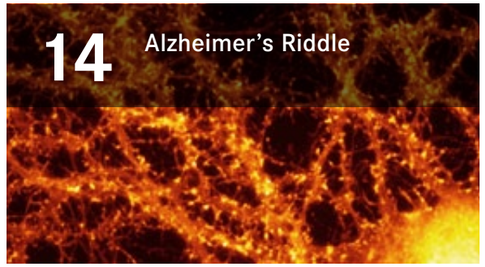

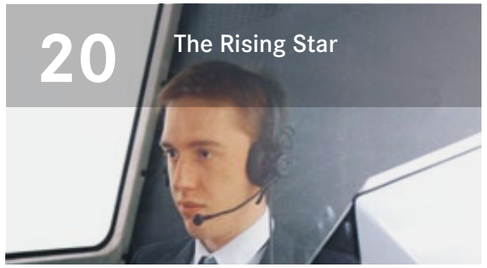

Dr Self-Employed

Every year thousands of researchers become company founders. Decision makers in politics and science wish there were even more of them

The garage on the arterial road in Leipzig was the ideal place to go to for Jonathan Velleuer: the mechanics there do all kinds of welding jobs without asking too many questions. For example, why somebody like Velleuer would need a bespoke metal table with special gadgets. “Why, to measure magnetic fields,” says the physicist, as if this was the most ordinary thing ever. And then he heaves a sigh. That’s how it is when you’re suddenly self-employed: “Whether you’re searching for personnel or dealing with patent law, product development or simply workshop jobs – suddenly you have to do everything yourself.”

Jonathan Velleuer has changed sides. After completing his PhD thesis at Bristol University and a short intermezzo of working for a business consultancy, the 32-year-old is now co-founder of the company MD-5. Such enterprises launched as a result of research are called spin-offs or spin-outs. With their company, Velleuer and his colleagues intend to develop a technology that uses magnetic fields for medical treatment purposes. For instance, they plan to influence the blood flow in the brains of stroke patients in a targeted manner without the need for invasive treatment. The goal of the company founders is to equip every ambulance with such a device for intelligent magnetic stimulation.

Enterprises deriving from science are part of a growing trend: in Germany in 2012 alone, more than 1,000 companies were spun off from universities or extramural research institutions, and that number is rising. Policy makers are supporting this trend. For example, the funding programme EXIST provides academic entrepreneurs with a total of 15 million euros per year. The research institutions are also lending a hand: for instance, the Helmholtz Association financially supports ambitious start-ups through its Helmholtz Enterprise programme.

The basic aim is obvious: scientific innovation is to be utilised for society. “We want to create jobs,” says Volker Hofmann from the company start-up service of the Humboldt University of Berlin. After all, jobs are the currency in which all the public funds expended for science and research can be repaid to the general public.

> **“The scientific world does not lack ideas and patents, but rather a culture of entrepreneurship”**

Researchers and politicians in Germany have long dreamed not only of new Nobel Prize laureates, but also of entrepreneurs such as Sergey Brin (Google) and Jerry Yang (Yahoo), who first launched their careers as entrepreneurs out of university. In order to give creativity a leg up, Germany’s federal government and federal states not only allocate substantial sums to the spin-offs themselves, but also invest in the environment in which they germinate. One example is Leipzig: a state-of-the-art laboratory and office building were erected on the old trade fair grounds and now six professors and their teams as well as more than 20 biotech companies are working under the same roof. It is only a quick walk of a few hundred metres to the Fraunhofer Institute for Cell Therapy and Immunology (IZI). “Funding as well as the close proximity to the IZI and other biotech companies were our reasons for choosing Leipzig,” says Jonathan Velleuer.

Meticulous work Jonathan Velleuer and his colleagues intend to use magnetic fields to treat cerebrovascular accidents. Photo: André Künzelmann

Even though adventure and insecurity surely are not the very first things scientists are likely to associate with the question of their ideal place of employment, many will know about these issues because of their experiences prior to founding a company, as sociologists Klaus Dörre and Matthias Neis from the University of Jena have found out in a study. Often the company founders previously held only temporary jobs or worked only part-time. “For a postdoc on a fixed-term contract, the founding of a company is a career move,” says Volker Hofmann from the Humboldt University of Berlin. With a team of now seven colleagues, he provides support for potential spin-off founders; each year they supervise a growing number of cases.

Yet the scientific start-up boom does not meet with unanimous enthusiasm. For instance, sociologist Reinhard Münch from Bamberg speaks of “academic capitalism” in his book of the same title and bemoans the fact that funding is granted only to projects that promise short-term success. Andreas Keller, head of the University and Research Department at the Education and Science Workers’ Union agrees, emphasising: “Research must not be considered and assessed too much on the basis of application-related aspects.” Critics say that innovation cannot be forced: it is above all free and non-targeted thought and research that are decisive factors in achieving breakthroughs – not a business plan.

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However, it is also undeniable that compared to other countries Germany and its spin-offs are nowhere near making the top ranks. “The scientific world does not lack ideas and patents, but rather a culture of entrepreneurship, such as is prevalent in the United States or also in Israel,” says Barbara Grave from Stifterverband, the business community’s innovation agency for the German science community. She is responsible for the annually published *Gründungsradar*, which surveys the spin-off culture at German universities. “Somebody failing with their first self-founded company is considered experienced in a positive sense in the United States. In Germany, they are more likely to be seen as a failure,” says Grave. Often there is also simply a lack of enterprising individuals, people with the courage and persistence to turn a good idea into a successful business.

Philip Wahl is one such enterprising individual. “I have always known I wanted to create my own business one day,” he says. His parents are entrepreneurs and as a student he would sit with friends and think about potential business concepts. Even before completing his studies, the 24-year-old mechanical engineer established his own business: the company e-Motion-Line, a spin-off from the Karlsruhe Institute of Technology (KIT), which is a member centre of the Helmholtz Association. Together with colleagues, Philip Wahl intends to develop and implement concepts for electromobility. “Just look at the slow-moving evening traffic,” he says, pointing out the window of his hotel on Friedrichstrasse in Berlin. His company’s first electric car is parked outside. “This is the ideal field of application for electric vehicles.”

The Karlsruhe founders have identified a few conditions under which their electric cars can display their full range of advantages: for instance, high daily mileage and frequent braking and accelerating. Based on these criteria, they have now developed their business model: The electric car in front of the hotel is steered by an elegantly dressed chauffeur, who is to drive predominantly business customers through the heavy Berlin city traffic. “When the driver drives in an anticipatory manner, a lot of energy can be reclaimed by the recuperation process,” says Wahl. Soon the young entrepreneur intends to operate seven vehicles, provided the pilot test with the first e-City Cab proves profitable. On his road to success, he can rely on academic support: “The environment combining a strong university, strong companies in the vicinity and professors providing active support is unique in Karlsruhe,” Wahl says in praise. His old colleagues at the KIT serve as sparring partners. In return for a fee, he can also use the university’s technical equipment.

The feeling of not being on one’s own is particularly important for potential company founders: this is what Volker Hofmann from Humboldt University’s company founder support service hears again and again. He and his colleagues address professors from all departments in a targeted manner regarding potential business ideas. “It is astounding what such discussions may reveal. Spin-offs have come from almost all our departments.”

What is essential here for company founders is that the university administration should display a positive attitude towards its spin-offs. “On the one hand, this is about the actual structural support; on the other, it is simply a matter of a positive basic attitude,” says Barbara Grave from Stifterverband. This is by no means to be taken for granted; some universities fear that they might lose capable employees or even entire research sections. This, too, is why universities often get involved in spin-offs. Participation ensures their insight into the research and they retain the right to have a say.

For Jonathan Velleuer, the physicist from Leipzig, the most exciting phase has now started: the idea of using magnetic fields to treat stroke patients is increasingly becoming a reality. “The path to the finished product is nearly completed,” he says. “If all goes well, we can begin production as early as this year.”

Martin Trinkaus

Entrepreneurial spirit Philip Wahl plans to market electric taxis. Photo: Kathrin Schüler

On the path to self-employment? Students at the Gründerwerkstatt of the Bauhaus-Universität Weimar. Photo: Candy Welz

START-UP FUNDING AT HELMHOLTZ

The Helmholtz Association supports this knowledge and technology transfer through funding programmes: for instance, Helmholtz Enterprise provides company founders with funds for additional personnel in the spin-off phase and with external management support. The Helmholtz Validation Fund is intended to close the gaps between scientific insights and marketable applications even before establishment of a spin-off.

More information can be found at → www.helmholtz.de/technologietransfer

For facts and figures regarding research spin-offs, please visit
→ www.helmholtz.de/spin-offs

Enemy identified The tiny warty comb jelly *Mnemiopsis leidyi* grows to a maximum size of only two centimetres. Photo: J. Jamileh/GEOMAR

Telegram

Research +++ Research Policy +++ Events

A Walnut Capable of Learning

The warty comb jelly *Mnemiopsis leidyi*, also commonly called the sea walnut, has an immune system that can recognise and remember various groups of bacteria. This is the result of a study that involved scientists from the GEOMAR Helmholtz Centre for Ocean Research Kiel. “It is remarkable what the immune system of such primitive organisms can do,” says Sören Bolte, main author of the study. The scientists injected the jellyfish twice with bacteria: some sample jellyfish were given the same kind of bacteria both times, others received two different kinds. The immune system of the jellyfish reacted more intensively when the jellyfish received the same bacterium a second time. Bolte and his colleagues were able to show that the expression of certain immune genes was dependent on whether or not the jellyfish had previous contact with the injected bacterium. The ability to fend off enemies with a flexibly reacting immune system probably facilitates the migration to an unfamiliar environment: actually a native of the North and South American Atlantic coast, this jellyfish species found its way to the North Sea and Baltic Sea some years ago. Whilst the sea walnut poses no threat to humans, its distribution could negatively affect the fish population in our seas, since the jellyfish feed on fish eggs and larvae, amongst other things.

Genetic Risk Factors for Alzheimer’s Discovered

Eleven hitherto unknown genetic risk factors for developing Alzheimer’s disease were identified by an international research project in which the German Center for Neurodegenerative Diseases participated. These changes in the genetic material increase the probability of developing the so-called sporadic form of Alzheimer’s disease, which affects 90 per cent of Alzheimer’s patients. However, the increased risk does not necessarily result in the onset of the disease. In a next step, the scientists plan to investigate which biological role the affected genes play. The study analysed and compared the genetic material of more than 25,000 Alzheimer’s patients and more than 48,000 healthy persons in the control group.

Straw Underestimated as Source of Energy

Straw from agriculture could provide several million households with energy. This is the result of a study in which the Helmholtz Centre for Environmental Research – UFZ collaborated. Of all forms of biological waste, straw is so far the least used material in energy generation. According to the study, part of the straw should remain on the fields because it improves humus formation. Yet of the approximately 30 million metric tons of straw produced in Germany each year, up to 43 per cent could be used for biofuel and electricity generation. Combined heat and power plants that are fuelled by straw are particularly eco-friendly.

Previously overlooked Straw could provide up to 4.5 million households with electricity and heat. Photo: S. Michalski/UFZ

Researchers Identify Important Enzyme Structure

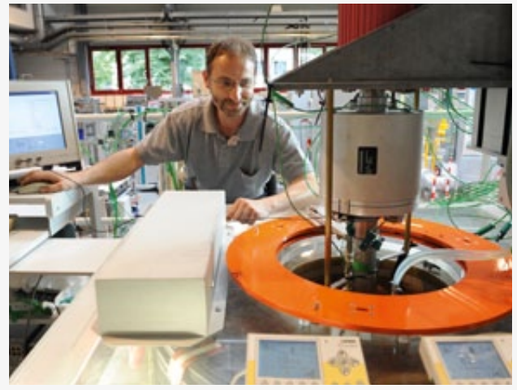
Researchers from the Helmholtz Zentrum Berlin and their colleagues from Finland have identified the structure of the enzyme Thiolase, which is essential for the survival of a certain family of parasites. The scientists have thus created a new basis for the development of medication to treat diseases such as African sleeping sickness and Indian leishmaniasis, which are transmitted by parasites. Their research has provided a very detailed image of the structure and function of the so-called active site of Thiolase. The active site is a pocket on the surface of the enzyme where certain substances are triggered into chemical reaction. If it were possible to develop substances that bind to the active site, this could block the metabolism of the pathogenic agents and therefore be used as a starting point in the development of new pharmaceuticals.

The Role of the Ocean in the Climate System

A standard reference work on marine and climate research has been revised: *Ocean Circulation and Climate – A 21st Century Perspective* is the title of the second edition. One of the editors is oceanographer Gerold Siedler, emeritus at the GEOMAR Helmholtz Centre for Ocean Research Kiel. The publication summarises current scientific knowledge regarding the influence of the oceans on climatic fluctuations and the latest insights into ocean currents. It is not only addressed at experts, but also contains synopses in lay terms for readers with an interest in the natural sciences.

Second Chance for Silicon Powder

Silicon is an elementary component of most kinds of solar cells. In current production processes, more than half of the metal is lost as powder when it is sawed into ultra thin slices. In the EU project SIKELOR, co-ordinated by the Helmholtz-Zentrum Dresden-Rossendorf (HZDR), the participating researchers are working on an industrial process to recycle the silicon powder. The HZDR scientists intend to separate the silicon grains from other waste using an electromagnetic stirrer. To this end, they are testing the effect of differently calibrated magnetic fields on molten metal. They are planning to develop a demonstrator device to study the individual process steps.



Magnetised Josef Pal tests the effect of magnetic fields on liquid metals. Photo: F. Bierstedt/HZDR

Warm Climate Diminishes Siberian Coast

The cliff coast in East Siberia is losing ground at an increasingly fast rate. This is the conclusion drawn by scientists from the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI). They have evaluated data and aerial photographs of a stretch of coast from the past 40 years. Their study reveals that the loss of land has been caused by the rising summer temperatures in the Russian permafrost regions. As a result, the uppermost ground layer thaws and steep slopes slip. Moreover, the rising temperatures cause the sea ice to further recede, thus giving wave activity more time to undermine the coast and promote the cliffs' collapsing. In the past 40 years, the investigated coastline has receded by about 2.2 metres per year. This coastal erosion also has an effect on the ocean: carbon-rich material which previously was enclosed in the permafrost is introduced into the water and contributes to ocean acidification.

At risk of collapsing Waves have deeply eroded this section of the coast. Photo: M. N. Grigoriev/AWI

EU-Russia Year of Science has Begun

Helmholtz Office Moscow: The EU-Russia Year of Science was launched on 25 November 2013. As part of this initiative, numerous workshops, conferences and forums will take place both in Russia and the European Union with the aim of establishing new collaborations and strengthening existing ones. Moreover, important political milestones are on the agenda for both the European Union and Russia, such as the beginning of the new EU framework programme for research and innovation "Horizon 2020", the renewal of the scientific-technical agreement between the EU and Russia and the launch of the new governmental target programmes for research and development in Russia. Together with the Russian Foundation for Basic Research, the Helmholtz Association is organising a concluding seminar for the Helmholtz-Russia Joint Research Groups programme. On 3 March 2014, after five calls for applications, 32 German and 32 Russian project partners will present the research results from their three years of collaboration. The topics range from genetic disposition for tuberculosis and Arctic research to particle physics and the analysis of climate change based on the example of Lake Baikal.

China Promotes Collaborations With the EU

Helmholtz Office Beijing: Last November the EU embassy in China organised several tours to Chinese cities to promote collaborations between the EU and China within the new framework research programme "Horizon 2020". Representatives from EU member states and other countries took part in those tours, which visited the cities of Chengdu, Chongqing, Shanghai, Nanjing, Hangzhou, Chanchun and Beijing. During the tours, EU representatives praised the active involvement of Chinese researchers in projects that were carried out within the framework of the past two research programmes.

Saskia Blank

Events

28 January 2014

Ideas 2020 – A Tour of Tomorrow's World

The travelling exhibition opens at 6 pm in the Rathausfestsaal, Rathaus St. Johann, Saarbrücken
→ www.ideen2020.de/en

Next stops:
4 March 2014, Freiburg,
21 March 2014, Stuttgart
23 April 2014, Koblenz,
12 May 2014, Munich
2 June 2014, Berlin

Ideas 2020 – A Tour of Tomorrow's World. Photo: Helmholtz Association / Michalke

No escape Safety laboratories keep dangerous pathogenic agents effectively locked up. Photos: HZI

Question & Answer

This Time: Can Viruses Escape From a Safety Laboratory?

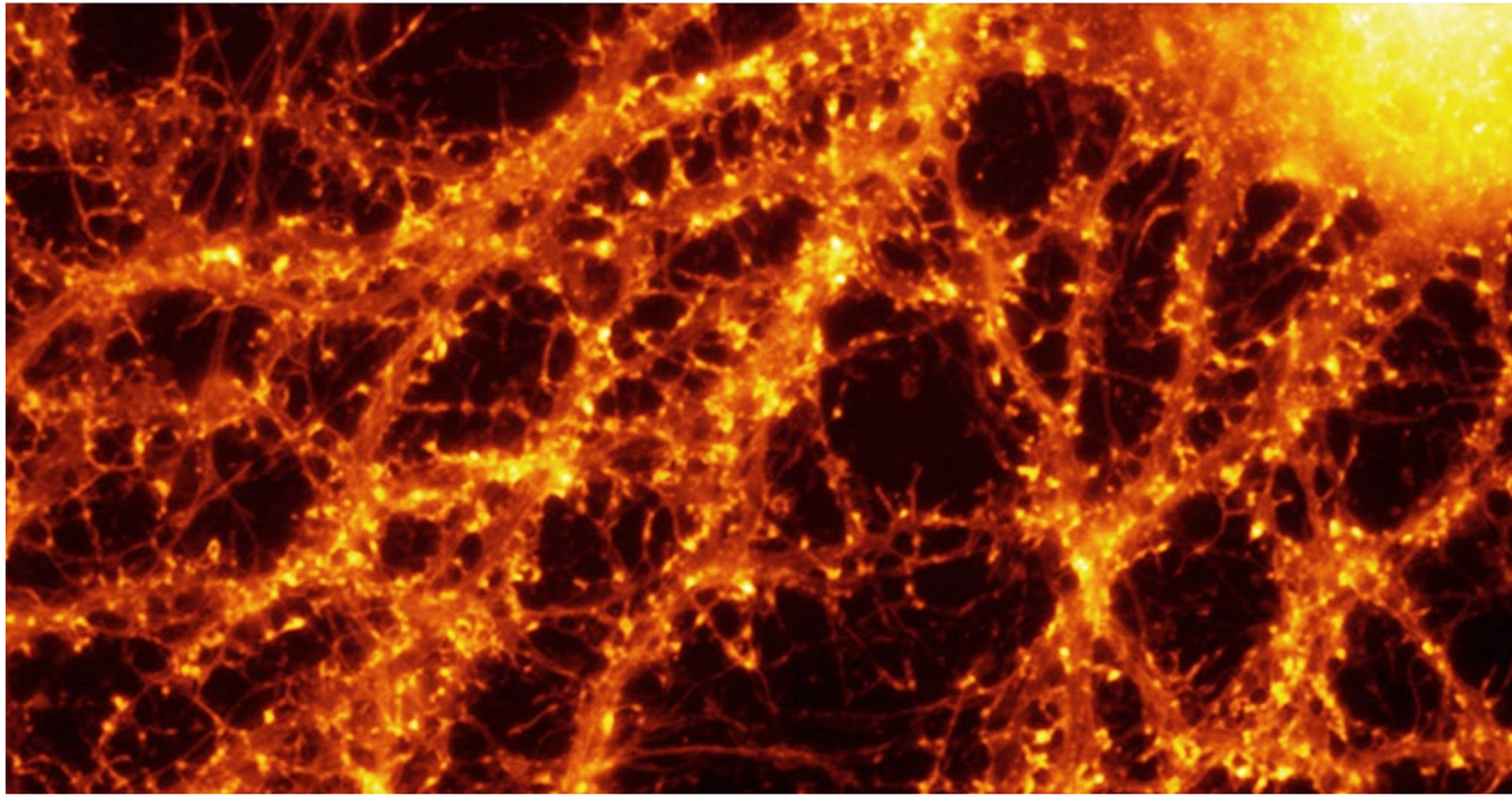
Scientists investigate dangerous pathogenic agents in rigorously isolated laboratories. These labs are classified according to different biological safety levels; biosafety level 4 (S4) provides the highest degree of safety. Susanne Talay is supervisor of two S3 laboratories at the Helmholtz Centre for Infection Research in Braunschweig and explains why pathogenic agents cannot escape from these laboratories:

"We work with pathogenic agents that constitute a certain risk for scientists and the environment – for example, the dengue virus, bird flu viruses and the EHEC bacterium. These are stored at minus 80 degrees Celsius in tubes that are marked only with a bar code. This prevents targeted misuse. Yet the most important factor is this: everything contained in an S3 laboratory remains there. This applies to all materials, even to the air. From the glove box to the pipette, everything is sterilised for 30 minutes in steam heated to 120 degrees Celsius. After this procedure, any organism clinging to any surface is dead. Air exchange with the exterior world is also strictly controlled: the windows cannot be opened and ventilation systems filter the used air. The laboratory atmosphere is kept at low pressure. The scientists access the security area via an airlock that has a higher air pressure than the laboratory itself, but a lower air pressure than the environment. These differences in air pressure allow air to flow into the laboratory, but prevent it from escaping to the outside. All research staff carry an emergency mobile phone on their full-body suit. This sends an alarm when it is in a horizontal position – for example, when the person in the suit loses consciousness and falls down. When scientists leave the laboratory, their clothing remains in the airlock. In the event of a blackout, diesel generators provide the laboratory with electricity. And in the event of fire, the facility does its own extinguishing. In extreme cases, the flames could blaze for 90 minutes without risk of anything escaping to the outside world. After that, the shield may be breached, but any pathogenic agent would be dead as well."

Kristine August

“This is Like Railway Traffic”

In Alzheimer’s patients, a protein that is otherwise useful can wreak havoc, as the neuroscientists Eva-Maria and Eckhard Mandelkow have discovered. An interview about supply pathways, nerve cells and new hope for Alzheimer’s patients



Well connected In a healthy brain, many fine projections maintain contact between the nerve cells. Photo: Hans Zempel/DZNE

You are researching a protein called Tau. What does this have to do with Alzheimer’s?

Eckhard Mandelkow (EM): The Tau protein plays a role in various diseases of the nerve cells, including Alzheimer’s disease. It stabilises the supply pathways of the cells, the so-called microtubules. They provide platforms for intracellular transport of important substances or even entire cell components to where these are required. For the cells it is of vital importance that the microtubules are healthy.

And in Alzheimer’s they’re not?

Eva-Maria Mandelkow (EMM): That’s right, in Alzheimer’s the number of microtubules declines and less transport takes place. This can, for instance, lead to an energy shortage in the nerve cells and many of them die as a result. However, the actual triggers for this are only partly known. We know for sure that in brains affected by Alzheimer’s two proteins form plaques: the Tau protein within the nerve cells and the Aß (Amyloid-beta) outside of them. Both contribute to the death of nerve cells.

EM: Yet there are more factors playing a role in Alzheimer’s disease. In our investigation of Tau, we have encountered a protein that so far has been known as the trigger for an entirely different disease, spastic paraplegia. This protein is called Spastin. If it mutates, it damages the nerve cells in the spinal cord, which then leads to paralysis of the legs. Hans Zempel, a doctoral candidate in our laboratory, has discovered that Spastin is also connected to Alzheimer’s. However, the mechanism is entirely different: here the healthy Spastin causes the damage if it is wrongly regulated. It severs the supply pathways in those parts of nerve cells that receive signals – and this occurs, of all places, in the region of the brain that is responsible for memory.

But why does healthy Spastin cause damage in the first place?

EM: In healthy cells, these connections can be compared to railway traffic: the possible speed of a train depends not only on the engine, but also on the tracks themselves. We observe this every time we travel from Bonn to Hamburg on the ICE. In fact, the ICE could travel much faster, but the tracks are not up to it. A similar mechanism applies to the cell. Here the microtubules are the tracks on which the transport takes place. And under normal circumstances, Spastin fulfils an important function in this system: it breaks down old tracks and thus enables the creation of new tracks.

EMM: In this metaphor Tau proteins would then be the railway sleepers that support the new tracks.

EM: Together with other proteins, Spastin and Tau ensure that the transport network remains in good condition. Yet when Tau cannot protect the microtubules and Spastin is overactive on top of that – as we have discovered in the signal receptors of nerve cells – then the transport network breaks down and the cells die.

How did you hit on Spastin of all things?

EMM: When we treated nerve cells with Aß, Tau suddenly accumulated in the signal receptors even though it normally does not occur there. Actually, it should stabilise the supply pathways, but within one hour, 80 per cent of the Tau proteins were gone. So these pathways are not protected when Aß is present. Hans Zempel has investigated

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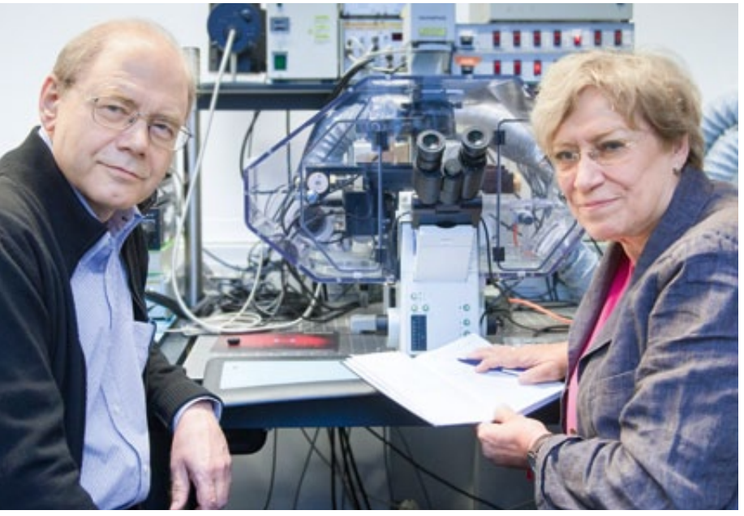

Strong together Neuroscientists Eva-Maria and Eckhard Mandelkow. Photo: V. Lannert

several factors that could damage the microtubules, including Spastin. He simply switched it off by way of testing.

And what happened then?

EMM: Nothing. Without Spastin, the microtubules remain intact, even when Aß is applied to the cells. We thus identified a hitherto unknown connection between Tau and Aß: the Aß destabilises the microtubules. The unprotected microtubules are then severed by Spastin.

Can something be done to prevent this self-destruction?

EMM: One idea for treatment would be to intervene in the regulation of Spastin in order to improve stabilisation of the microtubules. Yet one has to pay careful attention to where in the body this intervention occurs. There are now various potential treatments of Alzheimer's disease that are being developed internationally and here at the DZNE. Examples include vaccinations against Aß or Tau that neutralise the damaging plaques. We are concentrating on active agents that can check the plaque formation of Tau. To this end, we have tested 200,000 substances and identified some that basically work. But unfortunately, because of the blood-brain barrier, many substances cannot make it to the brain, where the Tau plaques form. A lot remains to be done to overcome this obstacle.

EM: Other approaches aim to capture the protein plaques with antibodies or to influence regulation of the microtubules. Still others use the body's own messenger substances as a basis.

Do you believe that some day *the* Alzheimer's medication will be found?

EMM: Regarding this question, we have different opinions. I am very optimistic, my husband is more cautious.

EM: The big problem with Alzheimer's is that the disease is already far advanced by the time the first symptoms occur. Admittedly, there already are drugs that can delay Alzheimer's ...

EMM: For one to two years.

EM: Right, they only slow down the disease. In animal models, the treatment of Alzheimer's disease is now successful. This now has to be translated into humans and that is not easy. We shouldn't be discouraged by the fact that development is taking so long. For example, the possibility of a vaccination was discovered only around 15 years ago; today, large-scale tests are being conducted in this area. At present, a whole range of procedures to treat Alzheimer's are being tested, amongst them combating inflammations in the brain. Another important development is the fact that today it is possible to discover accumulations of Tau or Aß by brain imaging. The combination of early detection and the testing of new procedures will surely lead to success, but not overnight.

Interview: **Andreas Fischer**

The married couple Eva-Maria and Eckhard Mandelkow have been jointly researching the basic structures of nerve diseases connected with the Tau protein and microtubules for more than 20 years. They head working groups at both the German Center for Neurodegenerative Diseases (DZNE), a member of the Helmholtz Association, and at the center of advanced european studies and research (caesar), an Institute of the Max Planck Society.

Self-Checking Processes are not Working

A commentary by Lothar Kuhn about the fatal trend to only rarely control research results

This is good news in more ways than one: recently, an international team of psychologists announced the repetition of 13 partially classical experiments. In ten cases, the researchers were able to confirm the results. One positive aspect is the fact that most of these experiments could be replicated. Especially in psychology, this is far from being taken for granted. However, it is even more positive that the scientists have taken this initiative in the first place, for it is far too rare an occurrence that researchers check their colleagues' results.

This is far from being a permissible omission. There has long been talk of a replication crisis and even the British business magazine The Economist thought the topic was important enough for a cover story. It was prompted by a few samples that revealed a shocking picture. For instance, researchers at Bayer failed to verify results from other scientists in two-thirds of the cases investigated by them. For the most part, these were attempts at combating cancer. Their colleagues at the American pharmaceutical company Amgen were able to replicate the results of only 6 of 53 investigated papers. And a representative of the American National Institutes of Health (NIH) estimates that scientists have difficulty replicating the results of three-quarters of all biomedical research.

This is fatal for the science system, which is in grave danger of losing trust. And this is equally fatal for pharmaceutical enterprises that intend to develop new drugs, yet cannot rely on the preliminary work conducted at universities and research institutes. Observers say that one of the explanations of the high failure rate of clinical studies, where new active agents are tested for the first time in the human model, could be the faulty results from basic research.

Why has it come this far? It is not particularly sexy to repeat the work of others. The only scientists who can hope for a career are those that report new findings. In addition, scientific journals dislike printing the fact that replication of an older paper has failed.

Of course, a hypothesis is not automatically wrong just because somebody else cannot replicate the experiments this hypothesis is based on. It may well be that these experiments require a lot of experience and implicit knowledge. For instance, many cultures of human cancer cells that researchers use in their studies are highly sensitive and react to even the slightest changes in the nutrient solution. Yet those taking the principle of repeatability seriously will think about such influencing factors and will enter into an intensive exchange with colleagues wanting to repeat the experiments. This, too, serves the purpose of scientific progress and transparency. What to do? Money is all-important. Currently, foundations such as the Laura and John Arnold Foundation in the United States step in. It has provided 1.3 million dollars to support the validation of 50 important cancer studies carried out in the past few years. In 2012 the Reproducibility Initiative was launched with the intention of connecting researchers with suitable partners if they want to have their work replicated. And high-ranking representatives of the NIH are currently discussing the option of granting research funds in some disciplines only on the condition that the results are routinely reproduced. The German Research Foundation (DFG) could make similar stipulations. After all, this form of self-review is no luxury, but rather a basic mechanism in the creation of reliable knowledge.

Lothar Kuhn (47) was editor-in-chief at the German *New Scientist* edition and now heads the technology and knowledge desk at the magazine *WirtschaftsWoche*. Drawing: Jindrich Novotny

How Should Science Deal With Esoterics?

Two Opinions: Julia Offe and Reinhold Leinfelder

Medical practitioners, in particular, should dissociate themselves far more decisively from pseudo healers,

says biologist Julia Offe, member of the board of the Society for the scientific investigation of parasciences (GWUP)

These days, when patients search the internet for potential treatments, they find not only the recommendations of evidence-based medicine but also a myriad of other therapies that are often advertised with plenty of marketing expertise. For instance, the providers of esoteric pseudo-treatments often use scientific sounding terms to endow their remedies and methods with respectability and legitimacy. They are apparently successful, too: many people trust pseudo-scientific concepts such as homoeopathy, quantum therapy and energy healing.

In this context the scientific approach seems arbitrary: many patients have the impression that scientific, evidence-based medicine is only one of several approaches and that the advice of a good physician is nothing more than his or her personal opinion.

Scientists themselves reinforce this impression when they ignore esotericism and fail to identify the errors in pseudo-scientific argumentation – and when they fail to explain to their students and the public why scientific insights ought to be rated higher than the embellished phrases of esoterics, namely, because they do not bear up to critical review.

And worse still: now the pseudo-sciences have reached the universities. These days, for instance, medical faculties teach homoeopathy as a form of treatment largely without any degree of criticism and are thus making an esoteric theory without scientific proof socially acceptable. They are also making themselves the handmaiden of esotericism.

Yet universities and research institutions have the duty to highlight the difference between real science and pseudo-scientific mumbo-jumbo. For if they adopt or propagate pseudo-scientific theories, they call into question the fundamental value of the scientific method per se – and this in their capacity as a scientific institution!

In order to uphold the value of these methods, scientists should clearly identify the deficiencies of pseudo-scientific theories: no, geologists have as yet not been able to measure terrestrial radiation. No, vaccinations do not cause autism. And no, highly diluted belladonna C30 does not carry spirit-like information, but contains nothing but sugar.

And that is precisely what students at the universities should learn.

Science must not marginalise its sceptics out of arrogance,

says Reinhold Leinfelder, professor of geobiology at the Freie Universität Berlin

The challenges are huge, from climate change to global justice. Many will surely agree that society will be able to make the necessary changes only with the help of science. But unfortunately, there remain always the unenlightened ones, those eternally stuck in yesteryear – as can be heard again and again amongst the ranks of researchers – the scaredy cats who counter wide swathes of science with suspicion or rejection: climate change deniers, evolution sceptics, opponents of genetic technology, people anxious about nanotechnology, vaccination objectors and so forth. Is this the end of the knowledge society? Do we have to outlaw homoeopathy, astrology and suchlike? In other words, should we put all those who distrust science into a corner and point our fingers at them? This would surely backfire.

Science must not be arrogant. It must be aware of its potential and limitations. Quite rightly some find themselves disenchanted with science, for, indeed, the promises made in the 1950s and 1960s were huge, often too huge: cancer, AIDS, hunger, nuclear waste and the environmental crisis persist even though everyone hoped that science and technology would provide almost instant help. Even today, many mistakes are made when research insights from various disciplines are translated into technological applications, because correlations often are not sufficiently investigated. A current example is the matter of biofuels, where, for instance, the food versus fuel debate was not given sufficient thought, that is, the question of whether plants should not be processed to make comestibles instead of fuel. Likewise, science and society still have many open questions regarding many other new technologies such as fracking, carbon storage and genetic engineering. The debate should not be fully relinquished to other parties or carried out in an authoritative manner by science alone.

However, it is particularly important to understand that a knowledge society cannot be defined solely by science. The personal knowledge of a human being is the combined mixture of science-based insights, experiences and insights guided by values and beliefs. One has to accept this, however, with one major limitation: tolerance comes to an end whenever there is threat of personal danger, for instance, when important treatment is rejected. The denial of necessary medical treatment, particularly in the case of children, is tantamount to physical violence and must be prevented.

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The Rising Star

Bastian Schneider wants to be a Lufthansa pilot – and for this, he has to take only one more hurdle: the selection process at the German Aerospace Center. A report

He has come so far. Only two more small steps. Of course he will not make it, he thinks, too much speaks against it. On the other hand, much spoke against the fact that he would ever be here in the first place, on a December morning, on the fifth floor of the German Aerospace Center (DLR) in Hamburg. Bastian Schneider waits. He is wearing a black suit; he had the hole in the sleeve mended only yesterday. Schneider paces the waiting room floor. Any time now. 10:30 hours. Step one. Simulator test.

It was an unlikely idea to become a pilot. And then with Lufthansa, an airline that each year chooses only the very best from out of 5,000 applicants. Those graduating from school with A grades. Those who know that a Beechcraft Bonanza has a Boxer engine. Those who fly a straight line in the simulator, as is the jargon here. Most applicants are 19 or 20 years of age, sometimes there is a female applicant, but mostly they are young men. Many have been dreaming of flying since kindergarten. And then there is Bastian Schneider. At 27, he is older than any other applicant on this day. When he was 16, he founded an information technology company, which he has been managing ever since. He has a customer file containing 500 entries and an annual income compared to which the 60,000 euro entry salary as a Lufthansa pilot would be a significant step back.

Schneider was 24 when he sat in an aeroplane for the first time. From Frankfurt to New York. Since then, he has flown a few more times. Fuerteventura, London, Edinburgh and now from Cologne to Hamburg for the selection process. That's it. The act put on by some pilots amongst his Facebook friends annoys him. Every week a new picture. Sunglasses. Uniforms. Flight attendants (female) at the pool. Caracas. Rio. Vancouver. Is that necessary? He never had the chance to visit the cockpit during a flight. His father works at a brewery. His mother is afraid of flying.

"Please loosen your tie and take a seat," says Uschi Topp, a strict Hanseatic type. Bastian Schneider takes his place inside the small cabin of the flight simulator. To the left, the long thrust lever, in front of him, the control stick. Schneider sits upright. He inspects the instruments before him. Eight round displays: altimeter, compass, revolution counter, attitude indicator. Schneider seems calm. But the control stick is moist. Schneider's hands are sweaty.

"Did you prepare for the simulator?" Uschi Topp asks. "If so, with which software?" "No, I had no time for that," says Bastian Schneider. He had promised himself to be honest. "Hmm," says Uschi Topp, making a brief note. For more than an hour, Bastian Schneider flies the given tasks, patterns that look as if a small child has drawn them. Wild curves, ascents in blue, descents in green. Schneider has to calculate courses, master 80/260 procedure turns, find the right pitch. Whatever all this means, he seems to know it. He must have prepared a little after all.

Schneider's flying leaves traces on Uschi Topp's screen. In the beginning, they look like cardiac arrhythmia, wild jerks around a straight line, which marks the perfect altitude, the ideal speed. This much is quickly clear: Bastian Schneider does not fly a straight line. Uschi Topp jots down the word "inaccurate" several times. After the first task, Bastian Schneider asks for a glass of water. Uschi Topp says no. Sixty seconds to the next task, initial course 030, flight altitude 6,000 feet, then 180 degrees to the right ...

Steady hand during the flight simulator test, Bastian Schneider has to fly "a straight line", as it is called in pilot jargon

Full concentration The flight simulator is only one part of the admissions examination for pilot training

Bastian Schneider's first flight, the trip to the United States, was on a Boeing 767, he recalls. A seat in the middle. He was excited. During take-off in Frankfurt, the acceleration pressed him into his seat. Next to him, by the window, sat a Japanese man sleeping. But on Schneider's face a smile formed, no, a laugh. And it did not fade. For several minutes. He was euphoric. A flight attendant asked him whether he was feeling well. Later, she gave him a tour of the aircraft, allowed him to peek into the crew's resting area. After touchdown, she took him into the cockpit. "The flight was the highlight of the entire holiday," says Schneider today.

The second task is more difficult. Schneider continues to sit in the simulator stiff as a statue. Only his arms move, smoothly, millimetre by millimetre. The eyes are fixed on the screen. This time he maintains altitude and speed. But he takes one curve too steeply and has to correct the course. Uschi Topp coughs.

During the third task, he calculates one course wrongly, but notices in time. He flies rather well. The curves on Uschi Topp's screen have stabilised. She makes some notes and sends Schneider out.

Inside Topp says: "If he really did not practice, this was quite good. A very calm pilot." Outside, Schneider tells his fellow applicants: "Could have been better. She coughed at every mistake. Nearly drove me insane. But I tried to be calm."

After his holiday in the United States, Bastian Schneider cannot let go of the idea of becoming a professional pilot. He thinks about working part-time as a flight attendant; after all, he can flexibly organise his time at his company. But he is not the type for half measures. At some point a friend asks him in jest: "Why not become a pilot?"

Yes, why not, actually? He gathers information and realises that not only super athletes can become a pilot. That his short-sightedness is not a problem. That most notions about pilot training are in fact myths. Yes, it is difficult, but it is not impossible, Schneider thinks. He ponders the issue for one year; he polishes his letter of motivation for three months. He sets up the blog "Bastian wants to fly an A380". Initially only friends have access to it. He intends to make it publicly accessible only when he starts his training. He prepares his employees for the eventuality that he might soon leave the company. In October 2012, he sends off the application.

15:25 hours. Bastian Schneider looks out the window. The storm Xaver is raging over Hamburg. The Hamburg airport, only one kilometre away, has closed down. Bastian Schneider waits. His interview is due to start in five minutes. The last step. He says: "My heart is beating so hard I'm afraid my tie will come undone." On his smartphone he quickly reviews once more the engines in the different aircraft.

Only around 12 to 15 per cent of applicants make it to the interview. Up to this point, all have proved that they can do arithmetic, can rotate bodies in space, can speak English well. They have displayed technical sensitivity on the control stick, passed a verbal dispute with a psychologist, solved a problem in role play with other applicants and revealed leadership qualities. And if they did not fly a straight line on the simulator, they were not far from it. Like Bastian Schneider. But to be accepted into the pilot training programme they must convince the panel in the interview. The programme runs two and a half years, with theory in Bremen and flight lessons in Phoenix, Arizona. The participants train aboard an Airbus A320 in Frankfurt. In the end, the pilots will have mastered the difficult approach into Bogotá and will know how to defuse quarrels amongst passengers. They will know when they will have to disagree with a captain and take over control in the cockpit. They will fly for one of the best airlines in the world, promises Lufthansa.

Shortly after 4 pm, Bastian Schneider is invited in for the interview. He sits face to face with a Lufthansa captain and two DLR psychologists. Schneider kneads his fingers. "Why is it that you became interested in flying so late?" the captain asks. The question was expected. Schneider tells the panel about his flight to the United States. About the non-stop smile. So far, so good.

"Can you explain how an aircraft behaves when I increase the propulsion? Which forces are at work there?" "I don't understand the question. It is too abstract." "How does an electric motor work?" Schneider talks about coils, magnets and alternating voltage. The captain says: "If I were a child, I would not be able to imagine it." Schneider feels at a loss.

He is then given half an hour to explain how important this job is for him, why he would immediately give up his company for it. He is then asked to step outside. He has a fairly good feeling, Schneider says. Five minutes later, they ask him back in. The captain says: "We have good news for you!" "Seriously?" "We do not make jokes in such matters. Congratulations!"

Bastian Schneider has made it. At some point in the near future he will start his pilot training. Perhaps he will be the oldest flight student with the least number of flights. He leaves the room with a broad grin. This is roughly what he must have looked like on the aeroplane to New York City, he says. Outside, he turns on his mobile. A few curious friends have written to him. And he has received an email from Lufthansa. His flight back tomorrow morning was cancelled because of the storm.

"What a way to start," he says and laughs. Will he now take the train back to Cologne? "I'd rather wait for the next flight," says Schneider and steps out into the stormy evening.

Bastian Berbner

The German Aerospace Center (DLR), a member of the Helmholtz Association, operates the Cockpit Test Centre in Hamburg. Here DLR experts test applicants for responsible jobs in aviation. Prospective pilots of several airlines and future flight controllers have to pass these tests. With their research, the scientists are thus making a direct contribution to ensuring the safety of the air space.

With flying colours Bastian Schneider has been accepted for pilot training. Photos: Bastian Berbner

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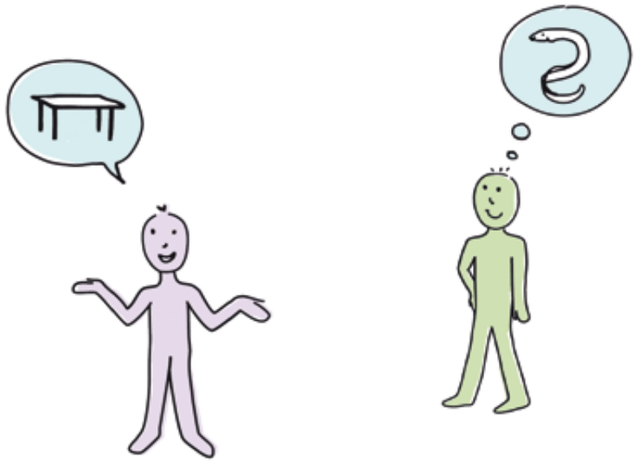


Of Eels and Tables

In fact, the study by the two Munich-based linguists was expected to produce entirely different results. But what they discovered instead proved to be by far more interesting. Their findings have been published in the *Journal of Unsolved Questions (JUnQ)*

How similar are an eel and a table on a scale of one to ten? Clearly dissimilar, one should think. But Fabian Bross and Philip Pfaller, linguists from Ludwig Maximilian University of Munich, assumed that some individuals in their Asian subject group would assess this matter differently. In many Asian languages, nouns are divided into certain categories depending on their properties or visual appearance, similar to grammatical gender in the German language. These categories are named together with the noun when it comes to counting. “Grammatical categories in our language have a significant influence on how we think and perceive the world around us,” says Bross. “This is the case even if we do not use language, but only have to assess images of objects with respect to their similarity.”

In Thai, eel and table fall belong to the same linguistic category; in Chinese, they do not. The researchers therefore assumed that speakers of Thai would rate the respective pictures of an eel and of a table as more similar than speakers of Chinese would. However, when they had the results of their study in front of them, the two linguists were confused: no differences whatsoever between Chinese and Thai people. Yet elsewhere, fellow scientists had reported on such differences. So what accounts for this strange divergence? Bross and Pfaller found a surprising answer: their study participants were native speakers, but had recently moved to Germany. The longer the speakers of Thai had been subjected to the German language, the weaker was the influence of their mother tongue. “Obviously, the way we think about things changes rapidly when we are subjected to another language,” says Bross. “Our mother tongue influences our thinking – but apparently not as strongly as is often assumed.”

Nicole Silbermann

→ **http://junq.info**

Soaring hopes “Horizon 2020” is intended to lend wings to science. Photo: © Jorisvo/istockphoto

Financial Windfall From Brussels

Over the next seven years, research in Europe will be allocated additional funds. But who will actually benefit from this?

How does one really measure “impact”? Markus Rex is at a loss. Even after a discussion with an EU employee he found himself no wiser. The man from Brussels told him that “impact” is now the new criterion when research funds are allocated. Research needs to be reflected in new equipment, technologies and improvements. The researchers who fail to describe the significance of their project for society have the deck stacked against them when applying for funds. “But we want not only to forecast how high dams need to be built, but also to improve our understanding of the climate system,” says Rex, a climate researcher from the Alfred Wegener Institute, Helmholtz Centre for

More than half of his third-party funding comes from Brussels: climate researcher Markus Rex. Photo: AWI

Polar and Marine Research (AWI). For such endeavours, he says, the new EU programme allocates less money. “Curiosity-driven research is becoming less important.”

The new programme that the European Commission has set up for the next seven years is called “Horizon 2020”. This is the first time that a fine-sounding name has been given to what is usually called the “Framework Programme for Research”. In the period up to 2020, keeping its eye on the future “horizons”, the EU will spend a total of 70.2 billion euros for Europe-wide research (after seven years, this sum will have increased to nearly 80 billion euros due to inflation). The previous programme was significantly leaner with 54 billion euros, but “Horizon 2020” is required to co-finance other programmes as well. In the end, this still is an increase. “The largest research programme in the world!” rejoiced the president of the European Research Council (ERC) in November. So it is good news for the world of science?

Actually, yes. After all, funds for the European Research Council, which supports individual scientists and focuses on basic research, have been doubled. And at least the formalities have now been simplified, elaborate audits have been partly abolished and grants are to be awarded faster. “But a certain polarisation can be observed within the Commission,” says Uwe Möller from the German Aerospace Center (DLR) in Brussels. “Some are calling for basic research, while others want to concentrate on innovation.” With “Horizon 2020”, the champions of innovation have gained influence: while the ERC is still busy rejoicing over the doubling of its funds to 13 billion euros, an entirely new programme section called “Industrial Leadership” has been created that will cost nearly 18 billion euros. This new section is intended to promote co-operation projects with industrial enterprises and to support application-oriented research. The programme section “Societal Challenges”, endowed with the hefty sum of nearly 32 billion euros, also focuses on the search for concrete solutions to urgent problems such as air pollution, the management of natural resources and the avoidance of waste. “The Commission seems to be taking the IT sector as a role model, where the lead time between idea and project is two years at most,” says Uwe Möller. “But in our field, development periods of ten years are more likely to be the rule.” Actually, DLR has little reason to complain: the field of aerospace research will also receive significantly more funds from “Horizon 2020”. This translates into more prestigious large-scale projects and increased access to pan-European co-operation projects, know-how and potential customers. “This is probably more important to us than the money,” says Möller. The EU funding accounts for merely 2 per cent of DLR’s budget.

Lone fighters without contacts will have a harder time in future

The groups that do not benefit from this focus on innovation are likely to be found in the social sciences. Universities such as the University of Freiburg have an inkling of what lies ahead: “In the new proposals, the applicability and societal benefit must be clearly stated right away,” says Klaus Düformantel from the EU advisory office at the University of Freiburg. “Naturally, basic research and research in the social sciences have a harder time doing this.” That said, to some degree he can even understand the fact that results now should become more visible. “In the past there was criticism that too many project results ended up in closed drawers,” he explains. In addition, nobody can disagree with the notion that current environmental and climate problems are being tackled. Yet he hopes that social science projects will still be given a chance. So far, says Düformantel, EU funding accounts for about 20 per cent of the third-party funds in Freiburg. “We cannot do without it.”

Between 2007 and 2013, German research received EU funds totalling 6.4 billion euros; about a third of this sum went to non-university research institutes. In the Helmholtz Association, these incentives account for about 10 per cent of third-party funding. Climate researcher Markus Rex is one of the old hands in this business. More than half of his third-party funds come from Brussels. At present, he is co-ordinating a project for improved climate forecasting that involves 28 partners from 11 countries. When asked how this can be managed, he answers with a single word – “networking”. First, networking with European colleagues helps to develop ideas. Second, in the event of a call for proposals, networking helps him put together a group of experts to make a submission. Third, networking with Commission employees helps to introduce ideas for calls for applications before these calls are even formulated. “So far it has not been very promising to simply apply in response to a call for proposals,” says Rex. Basically, in his research field, the routine so far was more or less as follows: people in Brussels ask what urgently needs to be researched. Well-connected scientists suggest a topic and start contacting potential partners in order to form a consortium. When the call for proposals is finally issued, it is virtually tailored to suit this consortium. “This is often how it goes when acquiring third-party funding,” says Rex. Whether this system remains in place in the new programme cannot be said. After all, many topics are now tendered with a significantly broader scope. Yet lone fighters without contacts will continue to have a hard time in the future. According to Markus Rex, only one thing will remedy this: excellent work. “After all,” he adds, “this work will capture the attention of existing consortiums.”

The Trailblazer

He determines what will be researched in the EU tomorrow: a brief interview with Hans-Jörg Lutzeyer, Research Programme Officer at the European Commission

Mr Lutzeyer, why can it be useful for a scientist to be acquainted with you?

In my role as research programme officer, I draft calls for future EU research projects. Applicants who are familiar with the procedure have an advantage.

What is the procedure in detail?

In our department, we enquire with industry and research once a year about what their strategic agendas are – in other words, what is planned with regards to technological developments. For this, we use technology platforms where businesses, science and civil society come together. On this basis, we then develop calls for proposals.

So researchers cannot simply call you in order to gain attention for their subject matter?

No. Instead, they should give input on platforms, workshops and working groups where the topics are discussed. After all, this is where the key issues are developed, which then make it to the agendas.

What should I keep in mind when submitting a proposal for a Horizon 2020 call?

Put into words the impact, that is, the effect that your research will have already in your application. Ideally, the users and producers should already be part of the research consortium. And make sure to include various European points of view.

With great staying power Martina Pötschke-Langer heads the Division of Cancer Prevention at the German Cancer Research Center (DKFZ). Photo: Tobias Schwerdt

Her Weapon is the Truth

For 30 years, Martina Pötschke-Langer has been fighting against cigarette advertisements downplaying the threat

The cigarette packets on the conference table are elaborately decorated. The elegant packages bear names such as Merilyn and Vogue and come from Bulgaria, Norway and Spain. Still in her coat, Martina Pötschke-Langer picks up one pack in her hand: “The packaging is tempting indeed: who would not want to be as beautiful as Marilyn Monroe,” she reflects. Pötschke-Langer heads the Division of Cancer Prevention at the German Cancer Research Center (DKFZ) in Heidelberg. She is currently collaborating on an international study in which she is studying how women are seduced through the packaging. She has just returned from a lecture in Austria. Her days dedicated to combating smoking are busy: more than 40 business trips in this year alone, meaning more than 80 days spent on travelling.

“Cancer is no. 1 amongst tobacco-induced causes of death”

Pötschke-Langer takes off her coat and sits down at her crowded desk. Her fight against smoking started 30 years ago: as a medical student, her first surgery required her to hold down a leg that had to be amputated – the patient being a smoker. Later, when writing her doctoral thesis at the University of Heidelberg, she sat at the bedside of a cancer patient, also a heavy smoker. “This was the first time I witnessed how desperate patients can be. And how angry that at the time nobody had informed them about the consequences of smoking.” These impressions were so intense that she started thinking about how to change from a medicine of repair to a medicine of prevention. Thus, in the mid-1980s, Martina Pötschke-Langer and colleagues developed the first National Hypertension Programme. And she entered into the unequal fight against the trivialising tobacco advertisements; at the time, she was a pioneer in this field.

The decisive year in the battle against smoking was 1994: at the 9th World Conference on Tobacco and Health in Paris, researchers for the first time provided evidence that every second smoker loses an average of ten years of life. Smoking kills more people than traffic accidents, AIDS, alcohol, illegal drugs, murder and suicide combined. “Cancer is no. 1 amongst tobacco-induced causes of death,” Pötschke-Langer quickly realised. “Amongst other things, this is how we communicated it and drew a lot of attention.”

A trained physician, she knows only too well how tempting cigarettes can be: during her exams she smoked to reduce stress. The phase lasted some weeks; since that time she has never touched a cigarette again.

When the DKFZ, a member of the Helmholtz Association, established a new division for cancer prevention, Martina Pötschke-Langer became divisional head and continued her endeavours in the matter of smoking in this post. For instance, in the early years, the World Health Organisation searched for a German representative for an international training course on tobacco control. Nobody really wanted to take the job, for tobacco abuse was an unpopular topic. Then Pötschke-Langer was asked – and immediately accepted. “That was the best continuing training course I have taken part in. Since that time I know: tobacco prevention is a community task that has to be fulfilled on an ongoing basis. This is the decisive factor for the success of our work,” she says in hindsight.

Learning from that experience, she developed an information series that she calls “From Science – for Politics”. Recently in this series, she and her team summarised on two pages current studies that looked into the effects of the scare pictures that are intended to be printed on cigarette packs in the EU in future. The information in this concise format is well received. “To produce it, our team spends some weeks working its way through all international studies,” says Pötschke-Langer. “Prior to publication I ask them: please check and recheck all facts. This is how we have earned the reputation for exactitude; we are trained to seek the truth. This is essential for maintaining our credibility.”

Martina Pötschke-Langer has contributed to putting smoking on the social agenda: smoking bans are in effect in many places, the number of juvenile smokers has dropped by 50 per cent, members of parliament and ministries are turning to the scientific community for advice, advertising is being monitored and the media are reporting on developments. What is her most important goal? The physician does not have to think about this long: the end of the tobacco industry. When once, riding together in a lift, the boss of a tobacco corporation asked her whether they could not get talking, she pleasantly replied: “Only if you change your product.”

Angela Bittner

Internal Affairs

Appointments | Awards | Miscellaneous

New Administrative Director at HZI

Franziska Broer. Photo: David Ausserhofer

Franziska Broer is the new administrative director of the Helmholtz Centre for Infection Research in Braunschweig, succeeding Ulf Richter, who accepted the position of chancellor at the University of Siegen last October. Broer studied economy and law at the Wildau University of Applied Sciences and consumer health care at the Charité in Berlin. She later worked as personal assistant to the administrative director at the Max Delbrück Center for Molecular Medicine (MDC) Berlin-Buch. Soon she assumed additional responsibility as head of the controlling division. Since 2007, she has worked as head of controlling at the head office of the Helmholtz Association and, in early 2011, she accepted the additional post of head of administration.

Rainer Waser Receives Leibniz Prize

The Jülich researcher Rainer Waser has been awarded the 2014 Leibniz Prize. Amongst other things, he is working to develop nano-electric components which in future could contribute to drastically reducing energy consumption in computers, sensors and energy converters. Rainer Waser is director of the Peter Grünberg Institute at the Forschungszentrum Jülich research centre, a member of the Helmholtz Association, and also holds a chair at the Faculty of Electrical Engineering and Information Technology at the RWTH Aachen University. The Gottfried Wilhelm Leibniz Prize is the most important German research sponsorship award. The prize is awarded annually by the German Research Foundation (DFG) and endowed with up to 2.5 million euros.

Magdalena Götz Wins Ernst Schering Prize

The Ernst Schering Prize 2014 has gone to Magdalena Götz for her work researching the basic molecular structures of brain development. Götz is director of the Institute of Stem Cell Research at the Helmholtz Zentrum München and holds the Chair for Physiological Genomics at the Ludwig Maximilian University of Munich (LMU). Her discovery that glial cells from the brain work as stem cells and that nerve cells can derive from glial cells led to a paradigm shift in the field of neuroscience and is of fundamental significance to the development of new treatments for brain injuries and diseases of the brain. The award is endowed with 50,000 euros.

Award for UFZ Photographer André Künzelmann

André Künzelmann, photographer at the Helmholtz Centre for Environmental Research – UFZ, has won second prize at the Deutscher Preis für Wissenschaftsfotografie (German Awards for Science Photography). His photo “Forest in 3D” was created at the UFZ’s visualization centre and depicts various species of trees in a computer model. The software helps researchers in their investigation of the role of forests in climate change. First prize went to Menno Aden for his photograph of a bio-laboratory.

The award-winning photograph “Forest in 3D”. Photo: André Künzelmann

Memorial Award for Cancer Researcher Sandrine Sander

Cancer researcher Sandrine Sander from the Max Delbrück Center for Molecular Medicine (MDC) Berlin-Buch has received the Curt Meyer Memorial Prize for her new insights into the development of Burkitt’s lymphoma, a malignant, rapidly growing tumour that frequently occurs in childhood. The award is endowed with 10,000 euros.

HZB Chemist Sebastian Seiffert Honoured

Chemist Sebastian Seiffert has received the Reimund Stadler Award 2013 for his work in the field of polymer science. Seiffert researches switchable micro gel particles at the Helmholtz-Zentrum Berlin and the Free University of Berlin. The jury commended the interdisciplinary synergy between the university and the Helmholtz centre. The award is endowed with 2,500 euros.

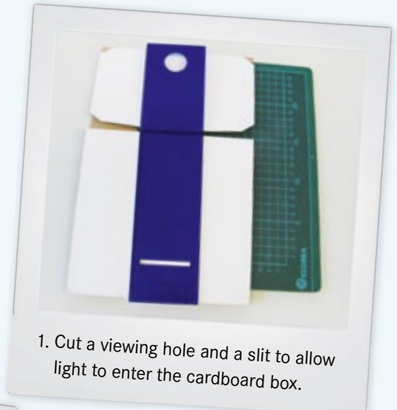
Bianca Berlin

Breaking up Light With a Spectroscope

What you need:

- One cardboard box, about half the size of a shoe box
- One CD “shard” (cut it out carefully)
- Glue
- Adhesive tape
- scissors

Your spectroscope works like rain in the sun: the very fine bit structure of the CD breaks up white light into coloured light. Use your spectroscope to investigate not only sunlight, but also light from a light bulb, an energy-saving light bulb or an LED and observe the differences.



1. Cut a viewing hole and a slit to allow light to enter the cardboard box.

2. Use the glue to stick in a CD shard.

3. Close and seal the box so no other light can enter.

4. Look at various light sources.

The school labs “Blick in die Materie” (Looking at Matter) of the Helmholtz-Zentrum Berlin für Materialien und Energie (HZB) invite students from grades 4 to 12 to join the experimentation. The focus is on physics topics.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