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Research

Caring for the rare cases

by Hubert Filser

"I want to be able to give my patients answers," says Christoph Klein, LMU pediatrician and clinical researcher. He studies rare diseases, seeking to determine their causes and find experimental therapies. This takes time, but many of his patients have little to spare.

For the complete article, see www.en.lmu.de/news/insightlmu/2013/02_01.pdf



Felix was one of the first patients to be treated with stem cells by Christoph Klein (then in Hannover). The little boy is now judged to be in good health.

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by Kerstin Meierhöfer

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by Elizabeth Willoughby

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Setting course(s) for the future

by Kerstin Meierhöfer

The first MOOC (Massive Open Online Course) from LMU went live on July 1, 2013, and three more will follow. Over 140.000 people worldwide have opted to take part in this new form of collaborative learning offered by LMU.

The advent of Massive Open Online Courses (MOOCs) is one of the hottest topics in the sphere of higher education at the moment. Many of the world's best universities, from Harvard to Tsinghua, already have their own MOOCs on the market. This month LMU is releasing four such courses in collaboration with Coursera, one of the leading MOOC platforms worldwide.

A new form of learning

Among the 70,000 participants who have registered for the MOOC on Competitive Strategy, given by Tobias Kretschmer (Professor of Management at LMU), is Shrikant P. from India. In a contribution to the discussion forum linked to the course, he calls on his fellow-students to form a collaborative International Study Group, in which each member can help the others to understand and digest the course content. Within a few hours, he receives more than 100 positive responses from participants in Vietnam, Mexico, Italy, China, Nigeria, Cambodia and Peru. Only three days after the first week's material was posted on the Coursera platform, some students feel confident enough to venture on the first online quiz. Then the pace of exchanges in the discussion forum picks up considerably. Several students who plumped for the wrong answer to a question related to the Prisoner's Dilemma, which Kretschmer introduced and explained in his video lecture, remain convinced that they

chose the correct alternative. Is there, perhaps, something wrong with how the test was framed? Together the study group works out why the solution offered by Kretschmer is in fact the right one.

For Professor Kretschmer, this kind of controversy leading to clarification represents valuable feedback. "For example, if there are specific questions that come up repeatedly and to which the collective can find no agreed answer, I can produce a supplementary video that clarifies the problem," he says. "And I also learn how to restructure the material so that the group has less difficulty understanding it." This is also the kind of learning effect that LMU President Professor Bernd Huber was hoping that online courses would catalyze: "These first LMU MOOCs are an experiment for us too," he says. "With them, we are now directly involved in, and can make an individual contribution to, a widely discussed educational and technological innovation. And we ourselves can learn how the tools provided by social media can be optimally utilized in our study programs."

Experimentation and its rewards

Together with Professor Kretschmer, four other LMU professors have taken on the role of trailblazers in this unfamiliar territory, and have produced MOOCs designed to interest a new audience in the challenges and rewards of their own particular areas of expertise. Professor

What are MOOCs?

MOOCs are videotaped lecture courses, divided into short program slots, and supplemented by recommendations for further reading and online tests to assess comprehension of the course material. Anyone who has access to the internet can take part in such a course and in the online discussion groups that provide for the indispensable interaction between learners. And all of this comes without an entrance exam, and there are no tuition fees.

Donald Dingwell, geologist and current President of the European Research Council, is pleased that he can now reach an audience of over 7,000 with his course on Volcanology, which is normally restricted to a class of no more than 30. Stephan Hartmann and Hannes Leitgeb, each of whom holds one of the internationally renowned Alexander von Humboldt Professorships, were already exploring ways of bringing their subject, Mathematical Philosophy, to the attention of a wider public, when MOOCs appeared on the horizon. "When LMU decided to cooperate with Coursera, we jumped at the opportunity. In our course, we want to demonstrate, without assuming much prior knowledge, how mathematical methods can be applied to traditional philosophical questions. We discuss the tools we use in our own research, but with the simplifications necessary for an audience that is unfamiliar with the technicalities," says Hannes Leitgeb. And he mentions one other important motivation: "We are delighted to be able to make our course available to inquiring minds in different parts of the world – especially those in places where people would otherwise have no opportunity, for political or economic reasons, to study anything remotely like it."

Translation: Paul Hardy

LMU MOOCs on Coursera:

www.coursera.org/lmu

FAQs:

www.en.lmu.de/students/moocs/about



What medical students take for a mind altering experience

by Elizabeth Willoughby

With the goal of producing physicians capable of handling challenges posed by globalization, social change and scientific development, MeCuM (Medical Curriculum Munich) and its LMUexchange Brazil program is immersing German medical students into Brazilian classrooms and hospitals.

Challenged by both language and culture, students have found the exchange to be one of their best life experiences, and thus far in their education deem it the most effective way of opening one's mind to the other and to developing tolerance within the self.

Katharina Grandl arrived in Curitiba, Brazil last August for two months of practical training, an opportunity available to 10 final-year medical students each year. Despite having only a basic level of Portuguese, she says, "From the beginning the doctors and fellow students on our ward were welcoming and open-minded. Their supportive attitude impressed me deeply, as well as their pragmatic way of dealing with stressful and demanding situations. There was a relaxed and positive climate among the people in the hospital, based on appreciation among patients, students and doctors."

A long term investment

Milena Auhagen, in her fifth year at LMU, returned this spring from a 13-month long exchange in João Pessoa in the north-east of Brazil and says she found her year attending Universidade Federal de Paraíba inspirational both academically and personally. Her enthusiasm is palpable.

"My exchange with the UFPB was without a doubt a huge enrichment for me in many respects," says Milena. "I was surprised at how quickly I settled in and integrated at university. Coming from a

school with 880 students suddenly to a much smaller, more personal setting, I got to know people quickly and they were like old friends whenever I needed a hand. The professors were also very helpful since they were aware of my initial linguistic deficit and didn't want me to be disadvantaged in the first exams."

Science without borders

Being in a developing country provides other things that can challenge one's sensibilities as well. Part of Milena's exchange was a 30-day internship at a maternity hospital. "Seeing the patients' meagre existence did make me despair," says Milena. "I was forced to reflect on these women and to realize that although the university I lived in was beautiful, it was only one piece of Brazil. I had to learn how to deal with these two realities. But at the same time, the smile of simplicity prevails in all classes of Brazilian society."

Through the Ciências sem Fronteiras program, just launched this year, MeCuM also brings recipients of Brazilian government scholarships to LMU for a year of study and research. These visiting students participate in Oncology Winter School preparatory courses, are each assigned a study buddy at the Faculty of Medicine, and take German language along with medical classes.



Bem-vindo ao Brasil: Final-year students of the 2012 practical training program.

Mário Leite Vasconcelos arrived from Brasília in January for his year of study at LMU. He's learned to fend for himself even down to daily tasks such as meal preparation, a job for which he says even middle-class families in Brazil hire help. Most interesting to compare, however, are Brazil and Germany's healthcare systems, particularly in regards to fund allocation and the resulting quality of care and resources. Embracing the language and cultural challenges, Mário recommends the exchange to anyone with an open mind. Only half way through his year in Munich, he says, "I see the world differently now."

"A doctor should learn about different realities of medicine," says Milena. "In one of the poorest states of Brazil our Western European medical luxuries will not be found, but there is other rich and equally effective knowledge. The core of this exchange is the perfect combination of a well-structured but still different academic life and the incredibly diverse private life you can have there. As a future doctor it has brought me way further than if I'd spent the year in my own familiar system in Munich."

www.med.uni-muenchen.de/intercambio-brasil



Philosophy of science



The Networker

Interview: Maximilian G. Burkhardt and Thomas Morawetz

Stephan Hartmann dissects thorny philosophical problems by using mathematical tools to construct and analyze sets of interconnected statements. But his work is firmly grounded in the empirical and the practical.

For the complete article, see www.en.lmu.de/news/insightlmu/2013/02_02.pdf

Neurodegenerative diseases

Putting the brakes on Parkinson's

Research groups led by Armin Giese of LMU Munich and Christian Griesinger at the Max Planck Institute for Biophysical Chemistry in Göttingen have developed a chemical compound that slows down the onset and progression of Parkinson's disease in mice. "The results look very promising. We hope that this approach will give us a way to treat the cause of Parkinson's and so arrest its progress," says Giese. The disease usually becomes manifest between the ages of 50 and 60, and results from the loss of dopamine-producing nerve cells in the substantia nigra, which is part of the midbrain. Under the microscope, the affected cells are seen to contain insoluble precipitates made up of a protein called alpha-synuclein. As an early step in the pathological cascade, this protein forms so-called oligomers, tiny aggregates consisting of small numbers of alpha-synuclein molecules, which are

apparently highly neurotoxic. By the time the first overt symptoms appear in humans, more than half of the vulnerable cells have already been lost. Together, Armin Giese and Christian Griesinger have developed a substance which, in mouse models of the disease, reduces the rate of growth of the protein deposits and delays nerve cell degeneration to a yet unprecedented degree. As a consequence, mice treated with this agent remain disease-free for longer than non-medicated controls. The discovery is the result of years of hard work. Giese and his colleagues systematically tested 20,000 candidate substances for the ability to block formation of protein deposits. In these experiments, one chemical lead structure proved to be particularly active. Andrei Leonov, a chemist in Griesinger's team, finally succeeded in synthesizing a pharmaceutically promising derivative. The two teams have already applied for a patent on the compound, which they called Anle138b – an abbreviation of Andrei Leonov's first name and surname.

Child development

Five-year-olds insist on fairness

Five-year-olds are already sensitive to violations of distributive justice. A research team led by LMU psychologist Markus Paulus, has reported that, when it comes to sharing resources, 5-year-olds can identify who has been hard done by and who has received too much – and they demand redress. "Our study shows, for the first time, that pre-school children will not only take a third party into account when they share with someone else, they also take care that each in the group gets a fair share. Thus the notion of fairness is already very strongly developed at that age," says Paulus. The study, done in collaboration with Chris Moore from Dalhousie University in Halifax, Canada, investigated the actions and reactions of 3- or 5-year-old children in an experimental situation involving three players: The child was given some toys, the second player received lots more, and the third got none at all. The empty-handed player then asked the child for some toys. 3-year-olds promptly parted without taking any notice of the third, rich, member of the group. The 5-year-olds also willingly shared some of their riches. However they also demanded of the second player, who had more toys than they did, that he should give the third player a share of his bounty. A further experiment confirmed that this response was motivated by considerations of fairness: When the child was given the largest share, the 5-year-olds were willing to give up more of their bounty, without explicitly involving the third player at all. Markus Paulus sees in this result an important developmental step on the way to prosocial behavior and morality. The study is part of a long-term project designed to investigate the emergence of prosocial behaviors and the development of learning skills in young children at LMU's Institute of Developmental Psychology.

The perfect wave

by David Lohmann

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The Eisbach, Munich's „Alpine Coast“ resort: taking a quick time-out from working in the library.

Marco Smolla stands in a neoprene suit in the car-park of the *Haus der Kunst* in Munich and calls to his friends nearby: “How cold is the *Eisbach* today?” He might have guessed: “Ice-cold,” comes the bland reply. Nevertheless, he dispenses with his headgear, waxes his surfboard, and sprints off to the *Eisbach* and its famous wave in Munich's *Englischer Garten*. The overcast sky is not exactly inviting, but he still finds eight other surfers waiting on the banks of this artificial side-arm of the Isar.

When his turn comes, Marco sets off at a run, while some of his colleagues try to distract him by shouting out his name. He repays the compliment by showering them with icy river water. It is at once relaxing and absorbing to watch him – from a safe distance – ride the rapids. But this meditative mood is abruptly interrupted when the 23-year-old tries a 180° turn and loses his balance. But after a couple of determined strokes he clammers up the slippery bank, with a huge grin on his face.

Marco discovered surfing as a byproduct of his love of snowboarding. Talent scouts for the Red Bull team recognized his exceptional snowboarding ability early on, and the firm agreed to sponsor him. He now heads their “Wings Academy” in Oberstdorf, coaching up-and-coming juniors, and giving them tips for a future professional career.

The most problematic aspect of the standing wave on the *Eisbach* is the water level in the stream. The tallest rocks lie only 80

cm below the surface. “The most difficult part is learning how to fall,” explains Smolla, a Munich native. “Otherwise one risks injury to the head or the legs.” So anyone interested should be prepared for a tough time in the beginning. So far, Marco has needed only a couple of stitches – in a toe.

Objections to surfing the Eisbach

But it is hardly surprising that safety on this stretch of the stream soon became a political issue. After years of wrangling between the local authorities over legal liabilities, and protests by 17,000 fans against a proposal to deny access to the famous wave, the city fathers simply decided to post signs informing surfers that they themselves would be held liable for any accidents. “Meanwhile, even the police sometimes come to watch us,” Marco chuckles.

Given Marco's interest in the balance of forces, it is quite appropriate that he is now writing his Bachelor's thesis in Physics, a task which he obviously takes seriously. “I haven't been near the water for the last 10 days,” he avers. During the summer he normally surfs for 2 hours a day, 6 days a week – anticipating how the onrushing “breaker” will behave rather than laboriously calculating the solution to a problem in wave mechanics. Ocean waves may be higher, but surfing in the middle of a busy city is very special and every ride is

different from the last. No wonder he keeps his surfboard at a friend's house nearby, so that he can always take a quick time-out from working in the library and head for the *Eisbach*.

Fears of commercialization

The prehistory of surfing on the *Eisbach* goes back to the so-called *Brettlrutschn* of the 1960s, in which enthusiasts rode the wave on a log attached to the river-bank by a rubber cable. The real surfers discovered the *Eisbach* in 1978, but it took time for this “Alpine Coast” resort to become internationally known.

Meantime, its fame has reached Australia. In 2009, the film “Keep Surfing” was made here. Since then, competitions have been held, and a well-known North German brewery now uses the odd combination of urban waterway and surfing to advertise its alcohol-free beers. This in turn has raised fears of the wholesale commercialization of the stream. As long as the sport doesn't suffer, Marco doesn't mind. – On the contrary! “If I had charged a euro for every photo tourists have taken of me, I would have a tidy sum put away by now,” he says.

Translation: Paul Hardy

An English version of the “Keep surfing” trailer is available at: <https://www.facebook.com/video/video.php?v=1753284026866>



Prime Minister Seehofer gives the go-ahead for Philologicum

In the course of an official visit to LMU in April Bavarian Prime Minister Horst Seehofer gave the go-ahead for the construction of the new Philologicum: "You have the green light; planning work for the Philologicum can begin immediately," he said. The Philologicum will serve as a centralized repository for the holdings of several specialist libraries, and will also provide extra office space. Sited in a prominent location on Ludwigstrasse, within easy reach of the Bavarian State Library, the Historicum, the Central Library for Theology and Philosophy and the largest University Library in Germany, the planned new Center for the Humanities is set to become an institution of national stature.

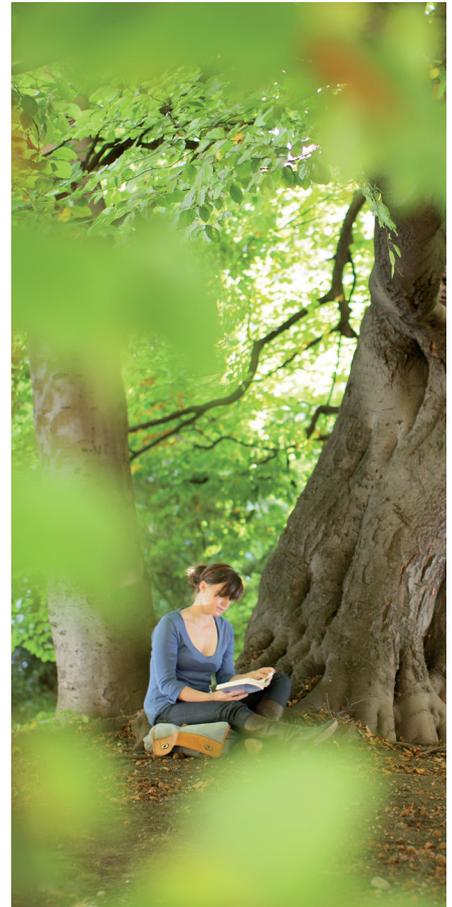
Bavarian State Collection for Botany at 200

The Bavarian State Collection for Botany in Munich is celebrating its 200th birthday. The institution traces its origins to the amalgamation, in the early 19th century, of the herbaria accumulated by LMU and the Bavarian Academy of Sciences. It now comprises almost 3 million dried plants, fungi and lichens, and is ranked 21st among the 3,400 herbaria worldwide. Its holdings continue to increase and, in their composition and significance, they constitute a unique resource. All parts of the world are represented – from Brazil and Chile to Japan, Southwestern Asia and Africa. Of course, the flora of Munich itself, and of Bavaria as a whole, also finds its place in the collection.

"Circulating Natures": A Conference on Environmental History at the Rachel Carson Center

On 20-24 August 2013 LMU's Rachel Carson Center for Environment and Society plays host to the world's largest gathering of specialists in the field of Environmental History. The European Society for Environmental History's Conference will focus on highly topical issues such as dwindling resources, food security, energy supplies, climate change, nature conservation and water scarcity. As the 21st century progresses, the clearer it becomes that our planet's supplies of arable land and other vital resources are limited, and that the human race is in the process of destroying the natural environment on which it depends. The motto of this year's Conference, *Circulating Natures*, refers to its focus on the global movement of natural resources and its repercussions. Some 600 participants from all over the world are expected to attend. In addition to hundreds of talks and panel discussions, the centerpiece of the plenary session on 23 August will be the lecture to be given by Marion Nestle (Professor of Nutrition and Public Health at New York University). The supporting program includes book presentations, award ceremonies and excursions. Those interested in attending should register at:

<http://eseh2013.org/>



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