



MEDIZINISCHE  
UNIVERSITÄT

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INNSBRUCK

RESEARCH.TEACHING.HEALING



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## Foreword of the Rector

The year 2015 was an eventful one for the Medical University of Innsbruck. Above all, it was the year in which all of us – my colleagues and I in the Rectorate, University Council and Senate, the Works Council members, our employees and the student representatives – laid solid foundations that enable us to focus our attention on the future. We laid the groundwork for a number of important paths.

The 2016–2021 development plan was also finalised last year. Besides providing an outlook, it forms part of the basis for the performance agreement negotiated last year. Following detailed negotiations with the federal government, we succeeded in safeguarding the university's future in the face of an extremely tense and challenging budget situation. We agreed on a moderate increase of 6.1%, but we still need to pool our energies in order to continue the university's development from a site offering top-quality medical education and research to an internationally attractive, competitive science centre. On a satisfactory note, the extra funding does not include additional clinical expenses, investment in construction or increased salaries for doctors.

With budgets so tight, attracting third-party funds is vital for our success – and thanks to the dedication of our researchers, such funding increased to around 40.4 million euros in 2015. Implementation of the new Doctors' Working Hours Act presented us with another major challenge, and

in spite of the complex requirements we overcame this hurdle in collaboration with the Works Council for Scientific University Staff.

This report presents some of the highlights from our core activities. The wide range of subjects shows that the Medical University of Innsbruck assumes significant responsibilities when performing its three main tasks: research, teaching and healing. We train highly qualified doctors, our university hospitals provide patient care of the highest standards, and our researchers are among the best in the world in their various fields. In addition to our economic, scientific and health-related contribution to the city, the Medical University of Innsbruck also plays a major part in enhancing the region's international reputation.

It is very important to me personally that, it is very important when reading this report, you gain an insight into the obvious success stories which we want to highlight for a wider audience. But I would also like you to spare a thought for the people who make these successes possible – the fact that we can once again look back on a successful year is due to the dedication of our 2,000 or so employees. So I would like to thank all members of the various university bodies, and each and every one of our employees and partners for their outstanding commitment.

**Professor Helga Fritsch**  
Rector

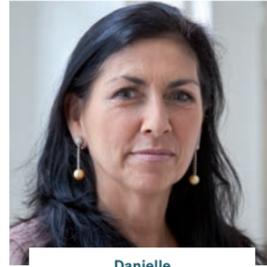
## Members of the University Council since March 2013



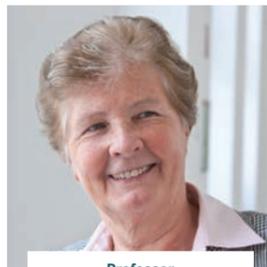
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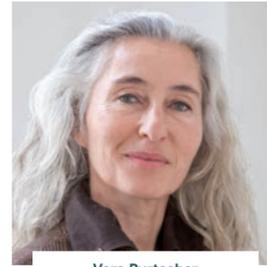
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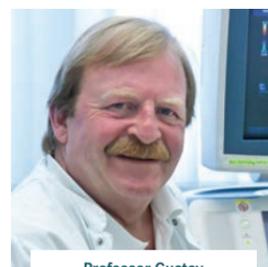
## RESEARCH

*Research at the Medical University of Innsbruck focuses on the fields of neuroscience, oncology, genetics, epigenetics and genomics, as well as infectiology, immunology and transplantation. Close ties between basic research and clinical application are a leading priority.*

## Members of the Rectorate since October 2013



**Professor Helga Fritsch**  
Rector



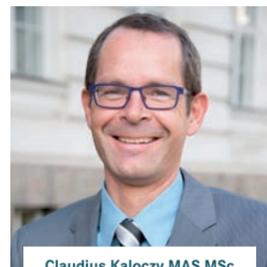
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Vice Rector for  
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**Professor Christine Bandtlow**  
Vice Rector for Research  
and International Relations



**Claudius Kaloczy MAS MSc**  
Vice Rector for Finances and  
Organisational Development

# In demand worldwide

The Medical University of Innsbruck's Institute of Legal Medicine capitalises on synergies between research and providing services. This benefits both areas, and the combination has enabled the institute to build a strong international reputation.

Walther Parson heads the High Throughput DNA Database Unit and is in charge of research into forensic molecular biology at the Institute of Forensic Medicine.

When 43 students disappeared in Mexico City in autumn 2014, more and more evidence suggested they had been murdered. The Mexican authorities succeeded in identifying the suspects and reconstructing the sequence of events. However, establishing the identities of the victims proved difficult, as tiny charred remains and ashes were all that was left of the bodies. In an effort to complete this highly complex task, the authorities turned to the Institute of Legal Medicine at the Medical University of Innsbruck. The experts in Innsbruck achieved the seemingly impossible: they extracted DNA and unambiguously identified two of the victims. This also provided the investigators with valuable evidence.

## A global reputation

"The case of the Mexican students attracted a lot of media coverage," reports Professor Richard Scheithauer, director of the Institute of Legal Medicine. "And it is only one of many international assignments where clients have made use of our services. In our job, though, discretion is the number one concern." This is because the scientists work with highly sensitive data and potential evidence, which requires comprehensive documentation and strict confidentiality. Any breach of confidentiality could ultimately see the institute banned from processing evidence, meaning that scientifically proven evidence would be worthless in court.

## An inquisitive mind

The institute's scientists were entrusted with the assignment in Mexico and a host of others thanks to their strong international reputation, which they have earned above all thanks to their research activities. They are currently working on new methods, such



© Gerichtsmedizin Innsbruck / Lorberg (2)

as next-generation sequencing, which enables a tailored range of tests to be performed simultaneously on a sample. Professor Walther Parson used this technique to identify one of the Mexican students. "We're constantly looking for ways to further enhance the sensitivity of both new and old methods," comments Professor Scheithauer. "Nowadays, you can analyse a drop of blood in virtually every laboratory. But samples that are much smaller or have been compromised by environmental factors

"Nowadays, you can analyse a drop of blood in virtually every laboratory. But samples that are much smaller or have been compromised by environmental factors are a different story. In cases like those, we're able to go beyond existing international standards."

PROFESSOR RICHARD SCHEITHAUER

are a different story. In cases like those, we're able to go beyond existing international standards."

The institute's extensive experience and the outstanding quality of its work are a major benefit for its researchers. As part of their activities in Austria, particularly in Tyrol, and due to geographic factors, the scientists are frequently confronted with bones and other remains that have been exposed to the weather for long periods. They regularly take on new challenges, and are able to develop made-to-measure methods to solve individual real-world problems.

## Symbiosis

This type of work allows for a combination of theory and practical application. The institute provides services in accordance with section 27 of the

"Research feeds into practice and vice versa. That helps to raise our profile, yet also brings new challenges."

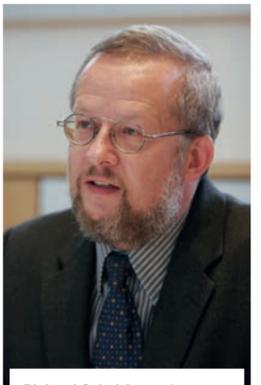
PROFESSOR RICHARD SCHEITHAUER

Universities Act as part of university projects. "We develop new methods and bring them up to the level required for forensic investigations," explains Professor Scheithauer. "So our labs meet the highest standards. Research feeds into practice and vice versa. That helps to raise our profile, yet also brings new challenges."

The Austrian Federal Ministry of the Interior is one of the institute's most important clients and partners. Since 1997 the institute has also housed Austria's Central DNA Database Laboratory, headed by Professor Richard Scheithauer. Entrusting a university facility with this task was a conscious decision. "We work with anonymous samples, mainly cheek swab samples and crime scene evidence," Professor Scheithauer points out. "The results can be identified by means of a bar code and are forwarded to the DNA database at the ministry of the interior. That means we do not gain access to names or other data, which ensures full data protection."

## Beyond forensics

Besides DNA analysis, toxicology is another important part of the institute's work. The institute collaborates closely with the State of Tyrol's drug substitution programme and with the University Hospital for Biological Psychiatry. The Core Facility Metabolomics at the institute serves as an analytical platform for the university's internal and external partnerships. The topic of drug concentration is central to research activities in this regard. "Different people metabolise drugs at different rates. To put it bluntly, each individual patient requires a specific dose in order to achieve the desired concentration," explains Professor Scheithauer. "This phenomenon is particularly significant for the widely discussed idea of personalised medicine. We are involved in efforts to unlock underlying mechanisms – and because genes hold the key, we are ideally positioned to achieve that goal."



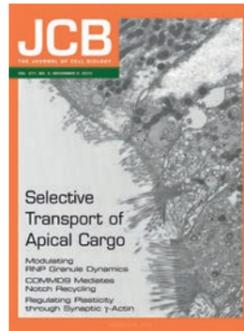
Richard Scheithauer is director of the Institute of Forensic Medicine at the Medical University of Innsbruck.

## Cause of MVID identified

Researchers in Innsbruck created a global sensation with new insights into the cause of an extremely rare and incurable form of diarrhoea.



Their work made it onto the cover of JCB (from left to right): Lukas A. Huber, Michael Hess, Georg-Friedrich Vogel, Katharina Klee, Andreas-Robert Janecke and Thomas Müller.



Journal of Cell Biology (JCB) and were the subject of an editorial.

### Effective teamwork

The team discovered that a mutation in the MYO5B gene and a genetic defect in the syntax 3 protein can cause the illness. "We managed to create a unique cell culture model that shows the proteins related to the condition in a cellular context," explains lead author Georg-Friedrich Vogel, who earned the Austrian Society of Paediatrics and Adolescent Medicine's 2015 award for the best clinical paper in recognition of the findings. Molecular decoding of MVID has paved the way for new treatment methods. The research project also provides an example of best practice in terms of effective, application-driven cooperation between clinical and basic-science disciplines.

Neonates and young infants suffering from microvillous inclusion disease (MVID) lack the brush border in the intestine, leaving them unable to absorb fluids and nutrients. The resulting loss of fluids is potentially fatal. The Medical University of Innsbruck is home to one of the world's leading centres of research into this rare disorder. Researchers at the university

had previously reported groundbreaking insights into the cause and treatment of the condition. And in 2015, an interdisciplinary team headed by Professor Lukas A. Huber of the Biocenter Innsbruck and Professor Thomas Müller of the University Hospital of Paediatrics I shed new light on the pathology of MVID. The findings were featured on the cover of the renowned

## Innovative tumour treatment

A new treatment platform at the Medical University of Innsbruck is laying the foundations for personalised cancer immunotherapy, which in turn could lead to improved treatment of tumours in the future.

On 1 May 2015, a new platform was set up as part of the EU's APERIM (Advanced bioinformatics platform for personalised cancer immunotherapy) project. The platform aims to process data from individual cancer patients so that they can be used for various purposes, such as treatment recommendations. Bioinformatic methods developed in the course of the Oncotyrol project enable the evaluation and processing of specific details on the molecular basis of individual tumours, which in turn feeds into personalised cancer treatment.

### A unique project

The platform was jointly developed by bioinformatics and immunotherapy experts



Cancer immunotherapy specialist Zlatko Trajanoski, coordinator of the EU's APERIM project.

in Innsbruck. Headed by Professor Zlatko Trajanoski, director of the university's Bioinformatics Division, a group of eight academic partners and three companies are working to make immunotherapy approaches applicable in practice. "We're paving the way for treatment of cancer using state-of-the-art precision medicine," Trajanoski explains. APERIM was the first Horizon 2020 research project on personalising health and care coordinated in Austria. The project received three million euros in EU funding.

## International Parkinson's disease and MSA symposium

There is strong demand worldwide for the results of research carried out in Innsbruck into neurodegenerative diseases. Such findings took centre stage at an international conference from 11–13 February 2015.



Years of expertise (from left to right): Werner Poewe with symposium organisers Nadia Stefanova and Gregor Wenning, who have been involved in MSA research for over 20 years.

Entitled Alpha-Synuclein: the Gateway to Parkinsonism, the international symposium organised by the University Hospital for Neurology put the protein alpha-synuclein under the microscope, so to speak. The focus was on a pathological feature shared by Parkinson's and multi-system atrophy (MSA), which is currently playing a decisive role in research on the causes of and treatments for neurodegenerative conditions. 120 leading Parkinson's and MSA researchers from around the world presented their basic-research findings and compared notes at the three-day event.

### Intensive research

Neurodegenerative illnesses are the subject of detailed research at the University Hospital for Neurology, and one of the key areas of its work. The team led by world-renowned Parkinson's disease expert Professor Werner Poewe (director of the University Hospital for Neurology) is currently taking part in a major study of treatments for immunisation against synuclein. The researchers are also concentrating on promising new imaging procedures – for instance as part of the EU's MultiSyn project, which is aimed at producing molecular images of alpha-synuclein aggregations – and non-motor symptoms that can occur in the early stages of Parkinson's disease and MSA.

Anxiety and its causes are the subject of research carried out by Anna Seewald, Sabine Schönherr, Gabi Schmidt, Francesco Ferraguti and Thomas Rhomberg (from left to right).



## Gaining a better understanding of anxiety disorders

Although anxiety is one of the most common mental disorders, its precise causes are still a mystery. However, various studies conducted by researchers in Innsbruck have helped to answer some key questions.

Anxiety disorders are the most prevalent mental disorders in Europe and cause the highest direct healthcare costs. So far, the exact cause of anxiety disorders is still unknown, but recent studies conducted by researchers in Innsbruck have helped to answer some key questions.

Current hypotheses suggest that anxiety may result from dysfunctional neuronal connections primarily within the amygdala, a key brain structure for the regulation of negative emotions such as fear. Most studies have focused on the regulation of glutamatergic neurotransmission. However, local amygdala inhibitory circuits, using GABA as neurotransmitter, have emerged as critical mediators of anxiety behaviour.

### Tracked down

In three independent studies, the research team headed by Professor Francesco Ferraguti, director of the Department of Pharmacology, in collaboration with researchers from Basel, Tübingen and Oxford, have obtained new insights into the synaptic organisation of the amygdala. They found that a number of inhibitory pathways operate in parallel to regulate emotions. It was also shown that extrasynaptic inhibition mediated by GABA-A receptors plays an important role for the orchestration of a behavioural programme associated with generalised fear and sustained anxiety.

The findings have contributed to a better understanding of the mechanisms underlying anxiety, and could open the door to the development of new treatments. This work has been published in Nature Neuroscience and Neuron, two of the most prestigious scientific magazines.

## New hope for cancer treatment

For a number of years now, immuno-oncology research has been exploring ways to utilise the body's own defences in cancer therapy. Last year, researchers in Innsbruck moved substantially closer to achieving that goal.



Researching new cancer treatments (left to right): Natascha Veronika Kleiter, Victoria Franziska Klepsch and Gottfried Baier.

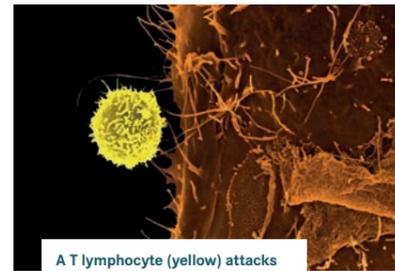
Destroying cancer cells is one of the tasks of the immune system. But as the disease progresses, cancer cells can develop mutations that protect them. To prevent this, Innsbruck cell geneticist Professor Gottfried Baier began pursuing a promising new approach: retraining the immune system by blocking intracellu-

lar immune checkpoints. In a research project published in the online journal Cell Reports, Professor Baier and his team demonstrated in in-vivo and cell cultures that the nuclear receptor NR2F6 plays a crucial role in this regard.

### Opportunity for cancer immunotherapy

"If we genetically suppress NR2F6, the T cells remain active in the tumour microenvironment, keeping the tumour in check," according to lead authors Natascha Kleiter and Victoria Klepsch, who point to the potential the discovery offers for treatment. The next stage will be to collaborate with a pharmaceutical company to find a drug that could block NR2F6. "NR2F6 is an intracellular

checkpoint as well as a transcriptional repressor with a ligand binding domain. This means we have a biological target structure that can be directly influenced pharmacologically using small-molecule drugs," Professor Baier explains. ■



A T lymphocyte (yellow) attacks a melanoma tumour cell (orange).

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Interdisciplinary research group (left to right): Klaus Faserl, Heidelinde Glasner, Nina Clementi, Matthias Erlacher, Thomas Hoernes and Alexander Hüttenhofer.

## Key to gene regulation

Scientists from the Genomics and RNomics Division of the Medical University of Innsbruck's Biocenter have uncovered a previously unknown gene regulation mechanism. The discovery opens up new possibilities for intervening in protein biosynthesis.

The process for generating proteins is the same in all organisms: the genetic code is stored as DNA and genes that need to be expressed are transcribed into messenger RNA (mRNA). These mRNAs are then translated by ribosomes in a tightly orchestrated process. Even tiny deviations during this process can have rather drastic effects. The work to decode the mechanisms of regulation done by the Genomics and RNomics Division of the Medical University of Innsbruck's Biocenter, headed by Professor Alexander Hüttenhofer, is therefore extremely important.

### Promising discovery

A team led by biochemist Matthias Erlacher investigated the effects of mRNA modification on protein synthesis. "Using

RNA ligations, we are in the position to introduce a variety of modifications at specific positions within mRNAs and to investigate their impact on the efficiency and accuracy of translation," Erlacher explains. The researchers conducted in-vitro experiments based on bacterial cell systems to investigate the direct effects of mRNA modification on translation. Their results, published in the scientific journal Nucleic Acids Research, allowed them to uncover a new potential mechanism of gene expression. These findings could provide the basis for a new approach to interfere with protein biosynthesis. Further experiments are planned in eukaryotic organisms to investigate commonalities and differences to the bacterial translation systems. ■

## Advances in cancer research

Last year, Innsbruck-based researchers uncovered techniques for enhancing treatment of certain forms of cancer, finding that programmed cell death can play a crucial role.

A team led by Professor Andreas Villunger, head of the Developmental Immunology Division at Biocenter Innsbruck, showed that combining cancer therapies already in use, such as paclitaxel (Taxol), with newly developed BCL-2 inhibitors improves the effectiveness of treatments for certain cancers. Their work – in the course of which the researchers also uncovered a new sensing method for cancer therapy – was published in the journal Nature Communications.

### Combining established anti-cancer drugs

Using cell cultures and live-cell imaging, Villunger's team identified the protein Noxa as

playing a major role in triggering cell death by means of the mitotic inhibitor paclitaxel and related substances that influence cell division. They also shed light on the protein MCL1, which inhibits cell death and can be blocked by Noxa. "This interplay could hold the key to opening up novel therapies," says Professor Villunger. Mitotic or cell division inhibitors are primarily used to treat breast and lung cancer, while another class of cancer drugs, BH3 mimetics, are mainly administered in chemotherapy for leukaemia. The researchers found that combining both therapies in cell cultures resulted in even greater efficacy. Combination drugs have not yet been approved, but are already being trialled in clinical studies. ■



Zeroing in on programmed cell death (left to right): Luca Fava, Andreas Villunger and Manuel Haschka.

## Lipidology researcher receives award

Stefan Coassin from the Division of Genetic Epidemiology (headed by Professor Florian Kronenberg) received the inaugural Lipidology Research Prize in St. Gilgen, Salzburg.

Coassin studied molecular biology and gained his doctorate in genetics and genomics before joining the Medical University of Innsbruck's Division of Genetic Epidemiology. He specialises in the genetics of complex diseases, focusing on lipoprotein metabolism, lipoprotein(a) genetics and new sequencing technologies. In autumn 2015, the 34-year-old was awarded the Lipidology Research Prize, worth 10,000 euros, by the DACH-Gesellschaft Prävention von Herz-Kreislauf-Erkrankungen e.V. (the German, Austrian and Swiss Association for the Prevention of Cardiovascular Disease) for his plan for the analysis of a specific section of the apolipoprotein(a) gene, which until then had not been possible.



Prizewinner Stefan Coassin with Ulrich Laufs (left) and Eberhard Windler (right) of the DACH-Gesellschaft.

### Pioneering work from Innsbruck

The Division of Genetic Epidemiology has a long and illustrious tradition of research into the human lipoprotein Lp(a). The former head of the division of Human Genetics and Medical Biology, Professor Gerd Utermann, carried out pioneering work in this line of research. Discoveries made in Innsbruck have contributed to our understanding of the mechanisms of diseases and to new approaches to developing therapies. The Lipidology Research Prize is funded by the Christine Katharina Schmitz Foundation, part of the German Stifterverband. It is aimed at young scientists conducting clinical and experimental research into lipid metabolism and metabolic disorders. Coassin shared the prize with Christian Schlein of the University Medical Center Hamburg-Eppendorf. ■

## New findings, new treatments

Researchers in Innsbruck have succeeded in uncovering the role that proteins perform in the immune control of bacteria. It is hoped their findings will pave the way for innovative new treatments for infections.

As the number of multi-resistant pathogens increases, scientists all over the world are investigating new approaches to the treatment of infection. In collaboration with the European Molecular Biology Laboratory in Heidelberg, the team working under Professor Günter Weiss and Manfred Nairz of the University Hospital for Internal Medicine VI have discovered a mechanism that is essential to how the body protects itself against infection.



**Important discovery:** Günter Weiss (left) and Manfred Nairz shed light on immune response mechanisms.

### Understand and improve

The researchers discovered that the iron regulatory proteins IRP 1 and 2, which are normally vital for iron metabolism and

other forms of metabolism, also play a crucial role in immune response. Iron is one of the requirements for the pathogenicity

and multiplication of bacteria and other microbes. A mouse model showed that salmonella-infected mice lacking IRP 1 and 2 were unable to effectively control the infection. This is because the IRPs hamper the bacteria's access to iron and stimulate the immune response mechanisms of macrophages, which contribute to the elimination of salmonella. "These insights into immune response mechanisms against microbes and their more detailed molecular analysis mean that new therapies can be developed for the effective treatment of infections," explained Nairz and Professor Weiss in a statement. The findings were published in the respected journal *Cell Host & Microbe*.

## A deeper understanding of kidney damage mechanisms

Innsbruck researchers have shown that in-vitro models are suitable for the discovery of new clinical biomarkers.

Due to species differences in the transport and metabolism of chemicals, animal models are not always suitable for predicting the effects of chemicals in humans. To overcome this species gap, Assistant Professor Paul Jennings's team at the Physiology Division – headed by Professor Michaela Kress – uses human cell models to uncover the molecular mechanisms of chemical-induced kidney damage. For instance, RPTEC/TERT1 cells from Evercyte Vienna GmbH closely resemble renal proximal tubule cells and allow the study of chemical-related cell stress in vitro. These investigations have yielded a comprehensive dataset of stress response signatures and biomarkers. One such biomarker, IL-19, inversely correlated with renal function in the urine of patients

with chronic kidney disease, thus nicely demonstrating that part of human biology can be captured in vitro to discover new clinical biomarkers.

### Interdisciplinary approach

In the EU FP7 project Predict-IV, Jennings' team collaborated with other groups on the integration of transcriptomics, proteomics and metabolomics with kinetics (the measurement of chemical uptake in cells) to collate a large amount of mechanistic biology into systems toxicology and physiologically-based pharmacokinetic models for chemical risk assessment. In the IMI/EFPIA project StemBANCC, Jennings' group is now developing renal models from human-induced Pluripotent Stem Cells (iPSC) with an aim to generate

models tailored to specific patient genetic backgrounds.



**Successful teamwork (left to right):** Alice Limonciel, Giada Carta, Paul Jennings and Anja Wilmes.

## Sanofi Award for exceptional talent

Three outstanding researchers from the university's Biocenter received the Sanofi Award at a ceremony in Innsbruck on 9 November 2015.



**At the award ceremony (left to right):** Rector Helga Fritsch with Markus Keller, Manuel Haschka, Sabine Radl and Christine Bandtlow.

Julia Scheffler of the Cell Biology Division, headed by Professor Lukas A. Huber, was recognised for her insights into a signal transduction mechanism in cells which contributes to the development of aggressive myeloproliferative neoplasm bone marrow diseases.

Manuel Haschka from the Developmental Immunology Division, headed by Professor Andreas Villunger, received the prize for identifying the pro-apoptotic protein Noxa as a sensor for personalised or combination therapy for specific forms of cancer. Markus A. Keller of the Bio-

logical Chemistry Division, headed by Professor Klaus Scheffzek, received the award for his research into the functioning of the lipo metabolism enzyme FALDH, which is central to the development of the rare disease Sjögren-Larsson syndrome.



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**Collecting their prizes:** Rector Helga Fritsch with Rector Tilmann Märk, Arnold Kind, Harald Stadler, Cornelia Lass-Flörl, Thomas Lörting and the award winners.

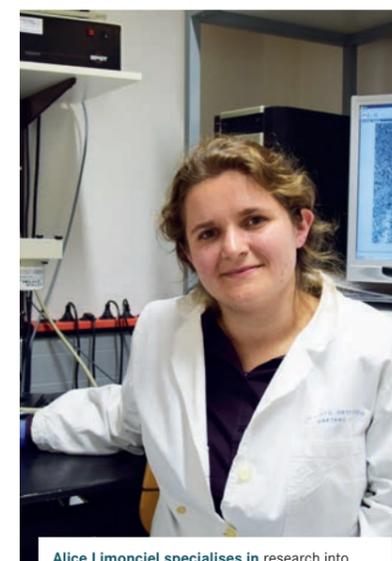
Three young researchers were presented with the prize at a ceremony in Innsbruck. Wilfried Posch

received the accolade for his research into dendritic cells and the effect of antibody-bound HIV-1 with respect to the killer T cell immune response, which was published in *The Journal of Allergy and Clinical Immunology*. He showed that HIV-1 antibody opsonisation (surface marking with antibodies) on dendritic cells triggered significantly

weaker T cell responses than with a complement-bound virus. In conjunction with preliminary work, these new findings demonstrate the importance of considering the surface marking of pathogens. Physicist Katrin Amann-Winkel and archaeologist Birgit Öhlinger from the University of Innsbruck also received the prize.

## Innsbruck researcher scoops top award

Alice Limonciel won the Long-Range Research Initiative (LRI) Innovative Science Award in recognition of her experimental research approach for quantifying the reaction of kidney cells to stress.



**Alice Limonciel specialises in** research into kidney cells and their reaction to stress.

Using an in-vitro model fine-tuned in Innsbruck, Alice Limonciel proposed a strategy to quickly and cost-effectively test the effect of drugs and chemicals on kidney cells. The jury for the LRI Innovative Science Award were impressed with the toxicologist's research approach and she was rewarded with one of Europe's most substantial grants for young re-

searchers. Limonciel is a post-doctoral researcher in Assistant Professor Paul Jennings's working group at the Physiology Division, headed by Professor Michaela Kress. The toxicologist's innovative proposal aims to fill an important gap, as there still is no in-vitro nephrotoxicity test that has been accepted by the regulatory authorities.

## New Christian Doppler Laboratory

The new Christian Doppler Laboratory for Insulin Resistance was officially launched in January 2015.



The formal opening of the Christian Doppler Laboratory (left to right): Lorenz Sigl, Susanne Kaser, Rector Helga Fritsch and Karl Bögl.

Associate Professor Susanne Kaser of the University Hospital for Internal Medicine I is the director of the new Christian Doppler Laboratory (CDL) for Insulin Resistance. In collaboration with pharmaceutical companies Merck, Sharp and Dohme, the internist and metabolism expert is researching treatment-related mechanisms that induce a metabolic disorder in glucose and insulin production in cells. "This focus means that the CDL dovetails perfectly with Tyrol's existing medical research environment, as well as the Medical University of Innsbruck's immunology research – one of its key topics," emphasised Rector Professor Helga Fritsch. Half of the funding is provided by the Austrian Federal Ministry of Science, Research and Economy, with the remainder coming from participating partners of the Christian Doppler Research Association. ■

## Taking aim at invasive fungal infections

A second new Christian Doppler Laboratory in Innsbruck began work in May 2015.



The CDL gets to work (left to right): Lorenz Sigl, Christine Bandtlow, Cornelia Lass-Flörl, Rector Helga Fritsch, Michael Egger Jr. and Martin Dittmer.

The CDL for Invasive Fungal Infections, headed by director of the university's Hygiene and Medical Microbiology Division, Professor Cornelia Lass-Flörl, focuses on developing innovative strategies for the diagnosis and treatment of infections. Every year millions of people succumb to infections in European hospitals, with bacteria, viruses and fungi among the major pathogens. There has been a sharp

increase in fungal infections in seriously ill patients over recent years. One of the reasons for this is the increasing number of immune-deficient and seriously ill patients; also, treatment options are extremely limited due to a lack of effective drugs. With this in mind, the objective of the new CDL is to stop the spread of hospital infections by means of multidimensional prevention approaches. ■

## Hot on the heels of cardiovascular conditions

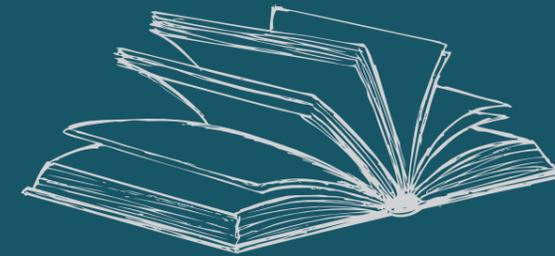
Researchers from the university have produced new findings on the functioning of HDL cholesterol, shedding new light on the development of cardiovascular disorders.

Epidemiological studies show that plasma levels of high-density lipoprotein (HDL) – known as "good" cholesterol – are inversely correlated with the development of coronary heart diseases. This implies that a high HDL plasma level reduces the risk of atherosclerosis. The Innsbruck-based team of researchers, led by Professor Andreas Ritsch of the University Hospital for Internal Medicine I, discovered that it may be the quality of HDL, rather than its concentration, that is the crucial factor. "These results could pave the way for the development of new treatment strategies for the prevention of atherosclerosis in patients with high cardiovascular risk, especially personalised therapy," said Professor Ritsch. ■

The research was published in The New England Journal of Medicine. ■



Tackling atherosclerosis: Andreas Ritsch from the University Hospital for Internal Medicine I.



## TEACHING

*The Medical University of Innsbruck offers degree programmes in medicine and dentistry, new bachelor's and master's programmes in molecular medicine, a range of part-time Clinical PhD programmes, nine full-time PhD programmes and a wide choice of professional training courses.*



**Laboratory-based health care:** the behind-the-scenes work of molecular scientists is aimed at enhancing patient well-being.

## First-rate education

The new Molecular Medicine master's programme kicked off in 2015 with a curriculum designed to be perfectly in step with the university's main research areas. It also enables students to specialise in a particular subject.

**M**olecular scientists working in healthcare operate behind the scenes. It is their job to figure out the molecular principles behind health and disease, and to use these findings to develop new methods of diagnosis and treatment. The Molecular Medicine master's programme is therefore aimed at a very specific target group: young people with a talent for life sciences, such as biochemistry and molecular or cell biology, who

also feel attracted to medicine, but not in a role requiring direct patient contact. "Basically it's molecular biology with a focus on people," explains Professor Peter Loidl, Vice Rector for Academic Affairs and Director of the Molecular Biology Division at Biocenter Innsbruck. It is a field that is becoming increasingly important worldwide, and there is increasing demand for qualified specialists. This is why the Medical University of Innsbruck introduced its

Molecular Medicine bachelor's programme in 2011 – the first and still the only programme of its kind in Austria. The students from the initial class graduated in 2014, and 16 students began their studies on the new master's programme in the 2014/15 winter semester.

### Individual supervision

"To start with, we deliberately limited the number of places on the master's

"We encourage our students to spend time abroad. International experience is definitely an advantage, given the globalisation of science."

PROFESSOR PETER LOIDL



university or research institution. "We encourage our students to spend time abroad. International experience is definitely an advantage, given the globalisation of science," says Professor Loidl. There is a strong emphasis on maintaining the highest academic quality standards. External experts are involved in the assessment of theses with an experimental focus. "Master's theses are assessed by both internal and external referees because we want to guarantee high standards," continues Professor Loidl. The final mark is awarded following an oral defence.

### Attractive career prospects

Graduates of the Molecular Medicine master's programme will have a range of career options thanks to their sound theoretical knowledge and practical know-how. It opens the door to a PhD, while there is also strong demand for specialists among clinics, in the pharmaceutical industry and at research institutes. "Every state-of-the-

programme. It's very resource-intensive because of the practical focus, which relies on significant time commitment from staff," says programme director Professor Bernhard Redl. Small-group teaching facilitates a close two-way exchange between staff and students, an approach which has already paid dividends on the bachelor's programme. "It's a very valuable way of studying, as the lecturers and students can get to know each other," Professor Loidl sums up. As with the bachelor's programme, there is a two-stage application process for the master's. The first step is a written examination of the applicants' medical knowledge. If they pass this, they are then invited to a selection interview designed to assess their reasons for choosing the course, motivation, resilience and their view of their own abilities. To be accepted on the course, applicants must have successfully completed or be close to completing the university's bachelor's degree in molecular medicine or have a degree in a related subject. 16 of the 20 places for the 2014/15 winter semester were filled. Two of these places went to students with first degrees from other universities.

### International quality standards

The university's four main research areas are oncology; neuroscience; infectiology, immunology and organ and tissue transplantation; and genetics, epigenetics and genomics. Thanks to its design, the Molecular Medicine master's programme functions as a bridge between the university's teaching and research activities, says Professor Loidl. "The curriculum has been planned very cleverly. It's one of the few degrees in Austria that is aligned perfectly with the main research areas set out in the university's development plan." Oncology, neuroscience and infectiology modules are all compulsory elements of the programme, and students must also complete the genetics, epigenetics and genomics elective. The four-semester course has a strong practical focus, with 65–70% of courses taking place in the laboratory. The combination of compulsory and elective modules means that students can specialise according to their scientific interests and talents, further enhancing their competitive capacity on the job market. Semester four is dedicated to the master's thesis – as with other modules, this can be taken at a foreign

"Basically, it's molecular biology with a focus on people."

PROFESSOR PETER LOIDL

art hospital will soon be employing molecular scientists," predicts Professor Loidl. The university plans to gradually expand the range of elective modules and increase the number of places to 30. "The introduction of a Bologna-compliant Molecular Medicine degree programme has helped the Medical University of Innsbruck raise its international profile in life sciences," says Loidl. ■

## First Clinical PhD graduations

The university's current range of clinical medical science PhD programmes (Clinical PhDs) was introduced in 2011/12, and the first three students graduated in 2015.

Their graduations mark an important milestone for the Clinical PhDs, a range of part-time studies that are unique in Austria. Alois Schiefecker (University Hospital for Neurology, CNS programme), Andreas Seeber and Normann Steiner (both University Hospital for Internal Medicine V Haematology and Oncology, CCR programme) passed their Clinical PhDs with flying colours. The marks awarded by the referees and the examination board resulted in overall grades of distinction or merit for the candidates, who expertly defended their theses in mid-November 2015.



Celebrating their graduations were Normann Steiner, Alois Schiefecker and Andreas Seeber.

### Academic careers for doctors

The Clinical PhDs at the Medical University of Innsbruck are part-time doctorates that can be completed in parallel with a specialist registrar position. "This is a longer-term approach adopted by the university, and its clinical departments in particular, to foster the next generation of academics with a clinical focus," emphasises programme director Professor Thomas Berger. The detailed and specialised PhD programmes currently offer graduates of the Medicine and Dentistry degree programmes training in six interdisciplinary areas: Applied Morphology and Regeneration (AMR), Cardiovascular Medicine (CVM), Clinical Cancer Research (CCR), Clinical Imaging Sciences (CIS), Clinical Neurosciences (CNS) and Intensive Care and Emergency Medicine (ICE).

Medicine degree programme student Peter Schwendinger (right) receives energetic support from Michael Nogler.



© Experimentelle Orthopädie

## Medical student doubles up

After picking up an award from the Center for Academic Spin-offs Tyrol (CAST), Peter Schwendinger went on to take second place in Tyrol's adventure-X start-up competition for his improved hip replacement technique.

Schwendinger, who is also employed in the Division of Experimental Orthopaedics, headed by Professor Michael Nogler, has developed a new method for filling the acetabulum in hip replacement operations. His innovation reduces bone loss and improves healing after hip revision surgery. Replacing a hip with an implant involves bone loss and after some time the implant often needs to be replaced, resulting in further loss. This can be extremely significant, especially for younger patients, who are very likely to require further operations.

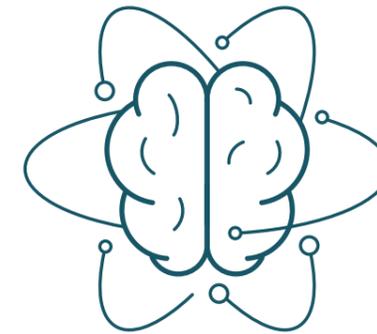
### Pre-cup seeking development partner

The adventure-X jury panel awarded Pre-cup – Vorarlberg-born Schwendinger's

team name – second place for the business model they have designed to implement his innovation. Just a few months before, he won CAST's award for best idea. The development project enabled the qualified mechanical engineer and technical college graduate to put his know-how into practice. He is also writing his dissertation at the Division of Experimental Orthopaedics under the supervision of David Putzer. There are still a few hurdles to be overcome before his innovation can be used in operations, such as finding development partners who can support him in the process of implementation into clinical procedures. Schwendinger plans to start building a career as a doctor.

## A LIFE OF LEARNING

The university is constantly expanding its range of continuing education courses for people seeking high-quality scientific training and professional development programmes.



## First continuing education course for psychiatry and psychology professionals

Last year, around 20 psychiatrists and psychologists began their studies on the new Consultation-Liaison Psychiatry and Consultation-Liaison Psychology continuing education course, which comprises a foundation component and advanced modules. The programme focuses on the concept of integrated treatment of somatic and mental comorbidity. Somatic and psy-

chiatry-related topics are complemented by psychological and psychotherapy treatment strategies that specifically target general hospital patient groups. The intention is now to extend the course by covering certain areas of the curriculum in more depth. The course was set up by the lifelong-learning team of the Vice Rector for Academic Affairs' office.

## New course for doctors with training responsibilities

In collaboration with the Tiroler Gesellschaft für Allgemeinmedizin, a professional association for general practitioners, the university has launched the new Academic Teaching Practice continuing education course. The high-quality training and development course is aimed at general practitioners and junior doctors who are or would like to be involved in the training of students. On successful completion of the 19-week programme, participants are awarded Medical University of Innsbruck Academic Teaching Practice status for a period of three years. This can be extended for another three years by attending a refresher course. Around 30 people have already signed up for the course.

## Clinical and Health Psychology continuing education course

In response to the 2013 Austrian Psychologists Act, the university introduced a Clinical and Health Psychology continuing education course in collaboration with the Lochnau-based Schloss Hofen school of postgraduate studies, part of the University of

Applied Sciences Vorarlberg. The new act stipulates that only clinical and health psychologists are permitted to practise independently. This has had an impact on postgraduate training, which is now organised in a general foundation qualification and advanced specialist

components in clinical psychology and/or health psychology. The programme is part-time and teaching takes place at Schloss Hofen and in Innsbruck. It is approved by the Federal Ministry of Health and qualifies participants to practise in their respective profession.

## Gender-specific research in the spotlight

The Gender Medicine lecture series is centred on the latest research findings from the fields of genetics and genomics, as well as infectious diseases, immunology and transplants.

Professor of Gender Medicine Margarethe Hochleitner has driven the increased focus on gender-specific research and teaching at the Medical University of Innsbruck. Against this backdrop, the spotlight was turned on genetics and genomics during the 2015 summer semester. The topics addressed in the lectures ranged from prenatal diagnostics through to personalised cancer therapies and the genetic backgrounds of diseases. In the winter semester, attention shifted to infectious diseases, immunology and transplants, with sessions on gender-specific aspects of cancer immunotherapy and organ transplants.



## Pupils don white coats for Open Lab Days

On 2 and 3 February 2015, 170 school pupils gained fascinating insights into the world of cells and molecules, as well as finding out about the Molecular Medicine degree programme.

During the Open Lab Days the youngsters attended short lectures and conducted some experiments in the modern teaching laboratories at the Center for Chemistry and Biomedicine. Eight stations were set up where the pupils discovered how human DNA is prepared for analysis, among other things. The objective was to introduce pupils to the university's Molecular Medicine degree programme, which

began in 2011 and is still the only course of its kind in Austria. "For school pupils with an interest in science, the programme has become an attractive alternative to traditional medicine, dentistry or biology degrees," says Professor Peter Loidl, Vice Rector for Academic Affairs, commenting on the visitors' enthusiastic response. Once again, the third annual Open Lab Days event was a roaring success.

## Cross-border research and education

Innsbruck and Bolzano agree on partnership on the joint education of doctoral candidates.

Signed on 4 February 2015, the agreement between the European Academy of Bozen/Bolzano (EURAC) and the Medical University of Innsbruck paves the way for four new three-year PhD positions that will be jointly set up, financed and academically supervised.

The goal of the Bolzano-Innsbruck Doctoral programme (BI-DOC) is to provide outstanding education and research as well as strengthen cross-border ties. "We had already collaborated very successfully in the past. With this new agreement we can now offer young researchers supervision

from both institutions," explained Medical University of Innsbruck Rector Professor Helga Fritsch and EURAC President Werner Stuflesser in a joint statement. The doctoral positions will form part of the Infectious Diseases: Molecular Mechanisms PhD programme in Innsbruck.



## HEALING

*Providing high-quality patient care – in collaboration with the tirol kliniken hospital association – is one of the three core responsibilities of the Medical University of Innsbruck.*

# New cancer centre

Innsbruck is the site of a new high-performance facility for modern cancer treatment: the Comprehensive Cancer Center Innsbruck (CCCI). Bundling oncological expertise at a single location has opened up new diagnosis and treatment options.

In order to quickly put cancer research findings to work in the diagnosis and treatment of tumours, a range of clinical and research units need to collaborate closely. This is one of the reasons why tirol kliniken and the Medical University of Innsbruck have established the CCCI. “The CCCI will make a valuable contribution to the implementation of highly effective personalised cancer therapies in the future,” explains Professor Günther Gastl, director of the University Hospital for Internal Medicine V

“The CCCI will make a valuable contribution to the implementation of highly effective personalised cancer therapies in the future.”

PROFESSOR GÜNTHER GASTL

(Haematology and Oncology). The agreement establishing the facility was signed at the end of December 2015.

## Under one roof

Patient care, research and teaching staff in Innsbruck will have access to the best possible evidence-based knowledge. “The CCCI promotes interdisciplinary collaboration, as well as providing a structure for cross-departmental cooperation,” comments Professor Gustav Fraedrich, Vice Rector for Clinical Affairs at the Medical University of Innsbruck. Professor Wolfgang Buchberger, Medical

The CCCI will use tried-and-tested as well as innovative research techniques.



“Patient care, research and teaching staff in Innsbruck will have access to the best possible evidence-based knowledge. The CCCI promotes interdisciplinary collaboration, as well as providing a structure for cross-departmental cooperation.”

PROFESSOR GUSTAV FRAEDRICH

Director at tirol kliniken, adds, “Innsbruck provincial hospital treats 21,000 cancer inpatients each year. Uniform, interdisciplinary treatment standards, tumour boards, an interdisciplinary outpatient and day clinic, and a study coordination office are important components of a modern approach to oncology, like the one adopted at the CCCI. After completion of the new building for Internal Medicine in 2017, all of these facilities will be located under one roof.”

## Advances in cancer treatment

In many cases, the latest research findings allow for earlier diagnosis and more targeted treatment of cancer. Tumours could soon be identified using blood analysis thanks to the new liquid biopsy method.

“Tumours always release material that circulates in the blood. The aim is find conclusive proof of the presence of these markers in a blood sample,” Professor Gastl explains. Liquid biopsies could also simplify monitoring in the course of treatment, and clinical testing of their effectiveness in cases of lung cancer is now under way. In Austria, lung cancer is the second most common form of cancer among men; a total of around 4,500 people develop lung tumours each year. Thanks to molecular profiling for such tumours, made-to-measure treatments including anti-tumour drugs can now be used instead of chemotherapy. Patients with lung and other tumours will soon feel the benefits of recent research findings. “However, finding a tumour’s Achilles heel and targeting this weakness to provide effective treatment requires painstaking molecular diagnosis,” according to Professor Gastl.

## Turning point in oncology

In Gastl’s view, “Oncology is on the verge of a

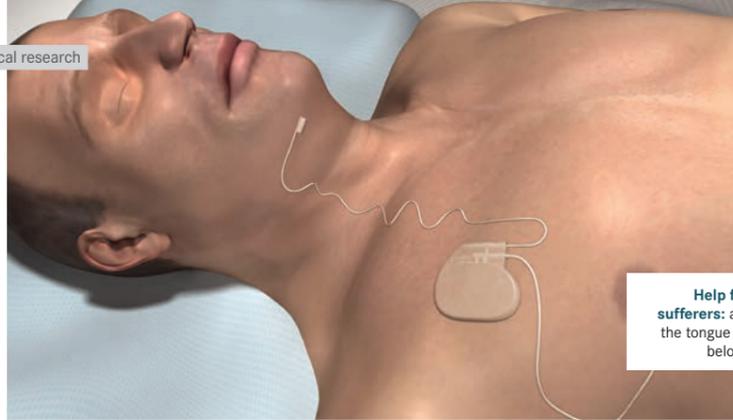
paradigm shift. Until now, we’ve classified types of cancer according to the organs in which they develop. But in future, tumours could be labelled on the basis of their molecular profile, which is the reason why they develop.” The molecular features of a tumour – its profile – will also influence the choice of treatment. “If we can identify the mutation in the genetic code, we can use drugs that target the tumour’s molecular make-up,” Gastl adds.

Methods such as DNA profiling and gene sequencing, which are common in areas including forensic medicine, will enable doctors to track down tumours



A strong partnership for cancer therapy (left to right): Günther Gastl, Wolfgang Buchberger and Gustav Fraedrich.

and pinpoint their molecular basis. In spite of the progress that cancer therapy researchers are currently making, Professor Gastl does not get carried away when it comes to curing advanced forms of the disease. “As is the case now, we won’t be able to cure every single cancer patient, but in future we will be in a position to treat cancer and even metastasis effectively over the long term, giving sufferers the chance to live a satisfying life.” ■



Help for sleep apnoea sufferers: a "pacemaker" for the tongue can be implanted below the collarbone.

## First tongue pacemaker implanted

In a first for Austria, three patients suffering from a type of sleep apnoea (snoring and cessation of breathing) were given a tongue pacemaker at the University Hospital for Otorhinolaryngology (ENT). This novel treatment was also the subject of an international conference held in the Tyrolean capital.

The implants were performed in collaboration with the University Hospital for Neurology's renowned sleep laboratory. "We can only treat a small number of patients using such implants, but otherwise their life expectancy would be lower owing to the sharply increased risk of stroke and heart attack. They also feel drowsy during the day, which translates into an increased risk of falling asleep at the wheel of a car," explains Professor Herbert Riechelmann, director of the University Hospital for Otorhinolaryngology. "A breathing mask is still the gold standard when treating obstructive sleep apnoea. But if patients cannot use one for medical

reasons and they meet the necessary criteria, a tongue pacemaker could be a remedy," says Professor Birgit Högl, who heads the sleep laboratory at the University Hospital for Neurology.

### Background

The tongue pacemaker, also known as an airway stimulation device, is similar to a heart pacemaker and can be implanted below the collarbone. The device senses breathing and stops the tongue from falling back into the throat by stimulating the nerve responsible for tongue movement. Around five per cent of the Austrian population suffer from obstructive sleep apnoea. An examination in the sleep laboratory can determine the type and severity of the condition. The method of treatment depends on the individual's body mass index (BMI) as well as any accompanying illnesses and other symptoms.

### International ENT meeting

This cutting-edge treatment method was presented by Professor Herbert Riechelmann at the annual conference of the Austrian Society of Otorhinolaryngology, Head and Neck Surgery, which took place in Innsbruck from 16–20 September 2015. The conference was entitled "Science and Innovation for our Patients", and was a major success, attracting around 850 participants from Austria and abroad, including a number of high-profile scientists. ■

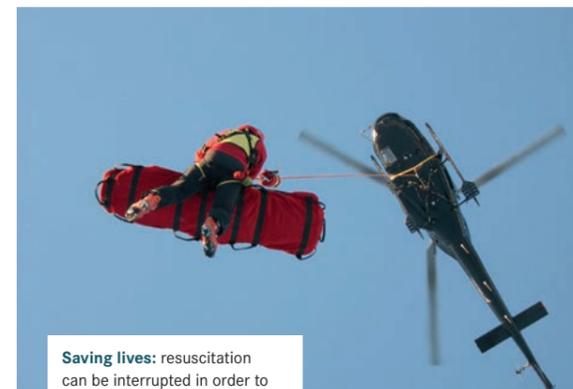


Birgit Högl and Herbert Riechelmann present the innovative treatment method at the international ENT meeting.

## Study revolutionises emergency rescue procedures

If core body temperature falls below 28°C, patients can be resuscitated intermittently to enable them to be transported. This discovery by researchers in Innsbruck and Bolzano resulted in a fundamental change in emergency rescue procedures.

The rule when treating accident victims who suffer cardiac arrest is that resuscitation measures must not be interrupted. But during rescue operations in mountainous areas, this is not always possible, due to the need to move the patient. A study carried out by medical experts at the EURAC research centre in Bolzano and the Medical University of Innsbruck in cooperation with fellow specialists in the UK and the US showed that in the case of severely hypothermic casualties, cardiac massage can be repeatedly interrupted for short spans of time in order to move the patient without endangering his or her chances of survival. The study was published in the specialist journal Resuscitation.



Saving lives: resuscitation can be interrupted in order to move patients.

### Learning from others

The researchers borrowed the idea from heart and vascular surgery, where many patients' body temperatures are reduced significantly in order to perform treatment. They also carried out comprehensive case analysis. "In practice, this means that when we need to evacuate severely hypothermic cardiac arrest patients with a core body temperature of below 28°C from rough terrain, they can be resuscitated for five minutes, then moved for five minutes alternately until continuous cardiac massage is possible," explains Peter Paal of the Medical University of Innsbruck, who collaborated with Professor Hermann Brugger of EURAC. The results have been incorporated into the guidelines of the International Commission for Mountain Emergency Medicine (ICAR MEDCOM) and those of the European Resuscitation Council (ERC). ■



Causing a sensation (left to right): Bernhard Haubner, Jörg-Ingolf Stein and Johanna Schneider reported on the medical miracle.

## Newborn born again

The case of a baby who fully recovered from a heart attack has raised hopes of finding a cure for cardiovascular conditions, as researchers from Vienna and Innsbruck reported.

Shortly after birth, the infant suffered a massive heart attack due to the occlusion of a key coronary vessel. "The baby's heart was severely damaged. Astonishingly, the baby recovered extremely quickly," as Innsbruck-based cardiologists Bernhard Haubner and Johanna Schneider described in the journal *Circulation Research*. A month and a half after this serious illness, the baby was released from hospital with a properly functioning heart. The case illustrates that the human heart can make a full recovery from massive damage.

### High-potential discovery

Cardiovascular disease is the most common form of death in the West. The regeneration of damaged hearts has become a holy grail for the medical profes-

sion, but until now complete regeneration has only been observed in animals.

"Together with a group from Texas we were the first researchers to describe full heart regeneration following a clinically significant heart attack in mice. But this is only possible if the mice are less than one week old," explains Bernhard Haubner, who in addition to his work as a doctor carries out research at the Austrian Academy of Sciences' Institute of Molecular Biotechnology (IMBA) in Vienna. "So if we can fully explain the mechanisms behind heart regeneration in mice and then in humans, we can take specific steps to activate or promote the regeneration of heart muscle cells. This could potentially enable adult hearts to recover completely from a heart attack," he concludes. ■

## Lab-2-Go puts device through its paces

The university has launched a study of the practical application of a measuring device developed by four European companies that enhances the chances of recovery for cardiovascular patients.



© Emanuel Kaser  
**Researchers (left to right):** Katrin Wegscheidler, Gerhard Laschober, Bernadette Wille, Johannes Mair, Daniel Basic and Christina Mayerl are studying the device.

However, four companies – Philips, Conworx Technology, Micro Systems Limited and Scienion AG – have come up with a handy biophotonic point-of-care measuring device called Minicare. The instrument should enable identification of cardiac troponin I in minutes, allowing doctors to diagnose myocardial damage.

**Successful CE Approval for Minicare**  
 As part of the EU's Lab-2-Go project, in mid-January 2015 a team headed by Professor Johannes Mair of the University Hospital for Internal Medicine III (Cardiology and Angiology) began a clinical study of the Minicare's application in practice, with a view to driving forward technical improvements in the system. A further six European cardiology centres, based

in France, Germany, the Netherlands and the UK, are participating in the multi-centre study. The results enabled fine-tuning of the device, which was recently even followed by CE approval for Minicare diagnosis system in Europe.



In suspected cases of acute myocardial infarction (AMI), rapid and reliable diagnosis improves the chances of survival, as well as minimising complications later on. Cardiac troponin I is a reliable indicator of heart muscle damage. This protein is normally identified in hospital laboratories, a process that takes at least an hour.

## New technique for ENT procedures

Implemented in November 2015 by the University Hospital for Otorhinolaryngology (ENT), the CI Guide BRIDGE project is aimed at improving computer-aided navigation during operations on heads.

The utmost precision is required in ENT procedures – various anatomical structures are contained in a minute space, and injuries to these can lead to facial paralysis, deafness or life-threatening bleeding. As part of the CI Guide initiative, Professor Wolfgang Freysinger of the University Hospital for Otorhinolaryngology (ENT) and his team joined forces with Tyrol-based medical technology start-up iSYS to create a new computer-aided navigation tool for head surgery. This should provide surgeons with additional guidance in locating target areas or identifying the best means of approaching such areas based on the patient's anatomy.

**Application-driven research**  
 "In microscopic operations, we try to place laser points precisely at the target of a surgical procedure. This additional navigational support should provide assistance where it is required, namely in situ," explains Professor Freysinger.

The research project will receive funding for three posts for the next three years under the highly competitive BRIDGE programme initiated by the Austrian Research Promotion Agency (FFG) and the Austrian Science Fund (FWF). BRIDGE projects are aimed at promoting knowledge transfer between science and industry.



**Optimising head operations** is the goal of CI Guide, a BRIDGE project headed by Wolfgang Freysinger.



## Meeting on personality disorders in adolescents

The first child and adolescent psychiatry conference, held in Innsbruck on 30 and 31 January 2015, was extremely well received by the experts in attendance.



**In Professor Kathrin Sevecke's view,** early diagnosis of personality disorders represents the best opportunity of recovery for sufferers.

The two-day event, entitled "Aspects of personality development – opportunities and risks", focused on the development of personality and the diagnosis and treatment of personality disorders in adolescents. According to Professor Sevecke, initial symptoms can appear before the age of 16, so early recognition can prevent them from developing into chronic conditions. The director of the University Hospital for Child and Adolescent Psychiatry at the Medical University of Innsbruck believes this offers new hope for sufferers. The risk of stigmatisation can primarily be countered by means of social acceptance. As a result, precise diagnosis and a specific course of treatment are essential. The 200 available places at the meeting were fully booked in next to no time.

## Pioneering metagenome study

A study carried out in Innsbruck, Salzburg and the Chinese city of Shenzhen has shed new light on intestinal flora, paving the way for a cure for intestinal cancer.



**Taking the lead:** Herbert Tilg played a central role in the study.

The metagenome-wide association study, in which the director of the University Hospital of Internal Medicine I, Professor Herbert Tilg, participated, showed that the composition of germs in the intestines (the microbiota) plays an important role in the development of intestinal cancer. The subjects – intestinal cancer sufferers – had too few of certain key germs, but a proliferation of other, aggressive ones. A total of twelve species

of bacteria with a connection to intestinal cancer were discovered. Risk factors, such as an unbalanced diet, were also assessed. Published in the journal Nature Communications, the findings could support new methods for early diagnosis of intestinal cancer as well as innovative treatments. 138 patients took part in the study, making it the largest metagenome-wide association study ever carried out.

## University hospital director admitted to ÖAW

Each year, the Austrian Academy of Sciences (ÖAW) nominates outstanding figures as members. In 2015, this honour fell to distinguished medical expert Professor Günter Weiss.

At the electoral session on 17 April 2015, Professor Weiss, director of the University Hospital for Internal Medicine VI, became a Corresponding Member of the ÖAW's Division of Mathematics and the Natural Sciences in Austria. Membership comes in recognition of his outstanding scientific achievements. Born in Innsbruck, he is a well-known and widely respected expert in internal medicine, infectiology and immunology. Last year, Professor Weiss and his team published a number of findings in connection with the immunological processes involved in fighting infections. This work led to a

series of advances, such as the development of new treatment concepts, and attracted international attention.



**A great honour** for renowned researcher Günter Weiss.

# ALUMN-I-MED puts hot topics up for debate

The ALUMN-I-MED university alumni association has offered a varied programme of events for many years, with a fixed calendar forming the backbone.



Discussing future cooperation (left to right): Martha Stocker, Andreas Falger, Walter Obwexer, Helga Fritsch, Artur Wechselberger, Markus Schwab, Christoph Brezinka and Raimund Margreiter.

wise choice of topics, and showing that ALUMN-I-MED has established a strong reputation for high-quality events.

### A good year all round

The ALUMN-I-MED team comprises a part-time (50%) secretarial position, a part-time (25%) managing director and its president, a voluntary position currently held by Professor Margreiter, as well as a management board. Altogether, they initiated and organised ten events during the year, including the PhD and applications seminars. The association also helped to organise other events, such as the job application seminar, a seminar for doctors looking to set up their own practice, as well as the graduation ceremonies for medical students, at which each new graduate received a book as a gift. A large part of the team's work involves maintaining the member database and keeping up with correspondence. There were about 250 ordinary members at the end of 2015. Graduates and students enjoy free membership until two years after they graduate. Since it was set up, the association has received financial and organisational support, as well as support for its activities from Hypo Tirol Bank. ■

Following the traditional New Year reception in January, podium discussions are organised in the spring and autumn, with a focus on topical and controversial subjects. Last year, the chosen themes centred on future generations, with one debate looking at egg freezing and family planning, and the other at training tomorrow's doctors.

### High-profile speakers

The discussion in March on egg freezing, or oocyte cryopreservation, was addressed by a high-calibre expert working in Vienna, Professor Matthias Beck, who as a physician, pharmacist, moral theologian and philosopher provided valuable insights from a variety of perspectives. Emotions sometimes ran high as participants debated the extent to which medicine may be permitted to interfere in the creation of new life, as well of when this might be medically

indicated versus when it may fall under the category of a lifestyle choice.

ALUMN-I-MED wanted to open up the debate on future generations of doctors, and in May, invited its president, Professor Raimund Margreiter, to an information event on the reform of education for physicians. Stefan Kastner from the Medical Chamber of Tyrol gave an expert talk – as always – on the legal framework, the implementation of which presents major challenges for the institutions concerned in day-to-day hospital operations.

The autumn programme was dedicated to an equally important topic concerning a specific local area, namely the education of doctors from South Tyrol, with the aim of highlighting the roles played by the Medical University of Innsbruck, the tirol kliniken hospital association and institutions in South Tyrol. All three events were extremely well attended, confirming the



ALUMN-I-MED

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### OFFICE-HOURS

Mon-Fri, 9am-1pm

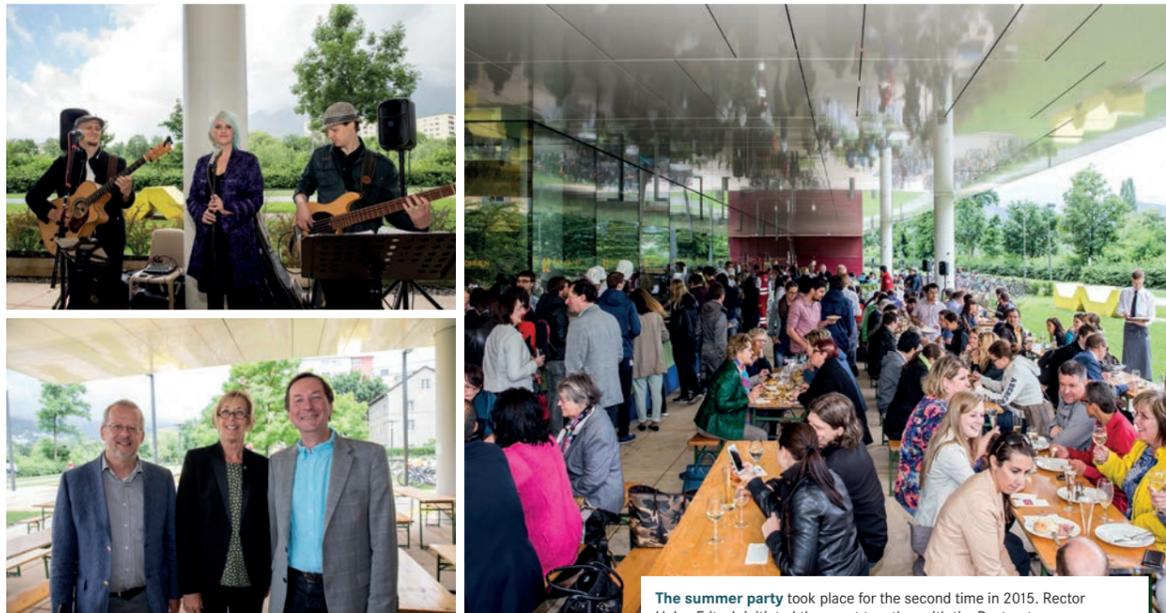


## University life

*Last year, the Medical University of Innsbruck staged a series of ceremonies and events.*

# Special events

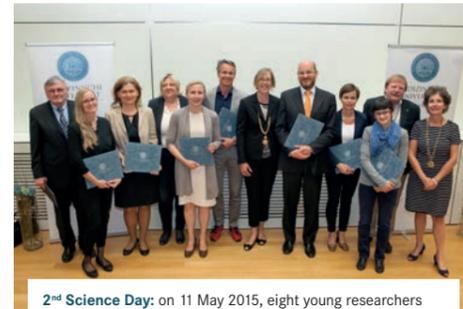
The Medical University of Innsbruck organised a variety of entertaining events for staff and young researchers.



**The summer party** took place for the second time in 2015. Rector Helga Fritsch initiated the event together with the Rectorate as a way of expressing the university's gratitude for its employees' dedication and hard work.



**Tyrol universities day:** on 22 October 2015 numerous school pupils took the opportunity to find out more about the Medical University of Innsbruck's degree programmes, as part of the Tyrol universities day organised by the Tiroler Hochschulkonferenz, the province's universities association. Lectures, guided tours and information booths provided visitors with everything they needed to know.



**2<sup>nd</sup> Science Day:** on 11 May 2015, eight young researchers were welcomed onto the university team at the Science Day, an academic ceremony in which authorisation to teach (venia docendi) is awarded. The postdoctoral students accepted their authorisations and presented the subjects of their postdoctoral theses and their research topics.

# New appointment in 2015: Dietmar Öfner-Velano

On 1 March 2015 Professor Dietmar Öfner-Velano assumed responsibility for the University Hospital for Visceral, Transplant and Thoracic Surgery, returning to the place where his academic career began.



Öfner-Velano is an expert in surgical oncology.

From 2004 to 2009 the qualified surgeon was deputy director and senior consultant at the same department. He returned to Innsbruck after serving as head of the University Hospital of Surgery at Paracelsus Medical University in Salzburg. "Coming back to Innsbruck is an important step for me, both professionally and emotionally. I was born in Innsbruck, and it's the place where I completed my medical degree and specialist training, and obtained my postdoctoral teaching qualification. Being back home is a hugely motivating," says the newly appointed professor. In addition to his medical experi-

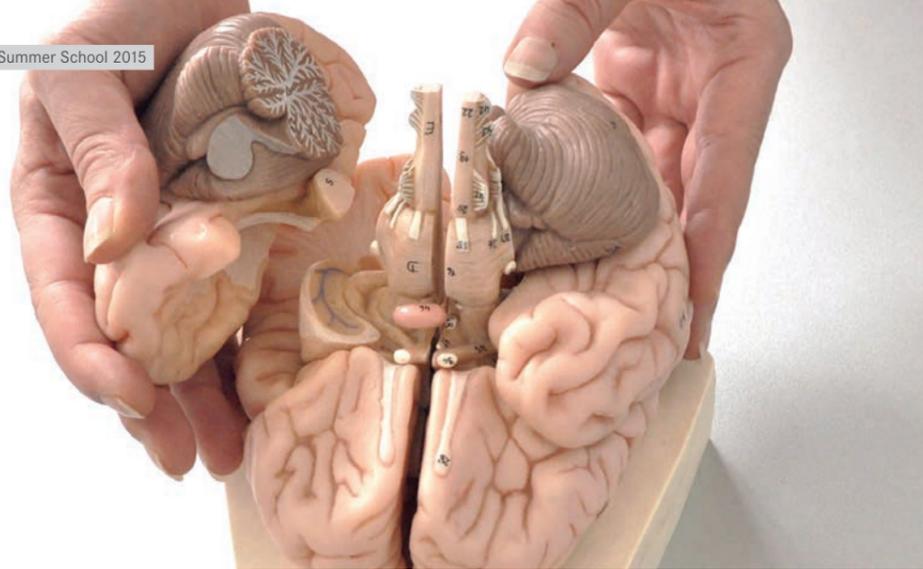
ence, Professor Öfner-Velano has degrees in health and hospital management and public health to his name, as well as various supplementary qualifications.

### Driving force

"Professor Öfner-Velano is a true expert, who also stands out for his experience of managing a department and his dedication to teaching and research. Under his leadership, the University Hospital for Visceral, Transplant and Thoracic Surgery will continue to provide top-quality medical care and further improve on its high standards," comments Rector Professor Helga Fritsch.

Professor Öfner-Velano aims to take standards of transplant surgery and surgical oncology to new levels with the help of the latest quality assurance processes, with a view to ensuring the best possible patient safety, even in complex and resource-intensive operations.

His dedication also stands out when it comes to research and teaching, and surgical oncology is one of his main research topics. He has previously been involved in teaching, making a significant contribution to the development and design of the new study regulations for surgical disciplines.



## Why do we get anxious?

The university's first Summer School, themed Emotions in Motion, took place from 15–17 September 2015. 20 postgraduate students from six countries joined experts from Innsbruck and abroad to address topics connected with emotions and the related processes in the brain.

Innsbruck's academic credentials made it the ideal location for the first Summer School, since research teams at both of the city's universities are focusing on anxiety disorders," explains Professor Christine Bandtlow, head of the Neurobiochemistry Division and Vice Rector for Research and International Relations at the Medical University of Innsbruck. Anxiety disorders are among the most common complaints in Europe. There is demand for new insights and therapy approaches – such as those being developed in Innsbruck – all over the world.

### Processes in the brain

Understanding processes in the brain is key to discovering potential new treatments, meaning that neuroscience – a research focus at the Medical University of Innsbruck – is highly important.

At the university's Institute of Pharmacology, a team led by Professor Francesco Ferraguti is investigating neuronal mechanisms that are important regarding anxiety and fear. Brain cells that are responsible for feelings of anxiety have already been identified.

### Unlearning anxiety

Neuropharmacologist Professor Nicolas Singewald and his team at the University of Innsbruck's Institute of Pharmacy are working on ways to improve

extinction-based behavioural therapy. Anxiety is frequently a learned response that can be "unlearned" in psychotherapy. However, in some cases, anxiety disorders return. Certain neuroenhancement drugs can support memory, significantly strengthening extinction learning.

### International experts

The most common anxiety disorder is generalised anxiety disorder. Some patients suffer from an especially debilitating panic disorder. "The first port of call for sufferers is usually their family doctor, since a variety of physical symptoms are the most apparent signs of an anxiety disorder – a racing heart, sweating, breathlessness and shaking, as well as indigestion, sleep disorders or pain can all occur," according to Professor Barbara Sperner-Unterweger, head of the University Hospital for Psychosomatic Medicine. The programme also included a guest lecture by renowned anxiety researcher Professor Katharina Domschke from the University Hospital of Würzburg.



**Christine Bandtlow** organised the first Summer School.



**Barbara Sperner-Unterweger** is familiar with the typical symptoms of anxiety.

## Prizes and awards

Every year, researchers from the Medical University of Innsbruck receive numerous accolades in recognition of their scientific achievements.

- **Barbieri, Fabian:** Young Investigator Award, 17<sup>th</sup> Cardiology Congress, Innsbruck
- **Böckle, Barbara:** MEDA Non-Melanoma Skin Cancer Research Award, Austrian Society of Dermatology and Venereology (ÖGDV)
- **Coassin, Stefan:** Lipidology Research Prize, Christine Katharina Schmitz Foundation, (German, Austrian and Swiss Association for the Prevention of Cardiovascular Disease)
- **Demetz, Egon:** MSD Best Publication 2015, Austrian Atherosclerosis Society (AAS)
- **Fanciulli, Alessandra:** Science Award, Austrian Society of Neurology (ÖGN)
- **Ferlic, Peter:** ISAKOS Patellofemoral Research Excellence Award Sponsored by The Patellofemoral Foundation, Inc.
- **Frauscher, Birgit:** 2015 Ernst Niedermeyer Prize for Epileptology
- **Gruber-Sgonc, Roswitha:** 2015 Austrian Society of Rheumatology and Rehabilitation (ÖGR) Publication Award sponsored by Roche
- **Hofer, Alex:** Austrian Society of Neuropsychopharmacology and Biological Psychiatry (ÖGPB) Schizophrenia Award
- **Holfeld, Johannes:** Best of Biotech Award, Austria Wirtschaftsservice (aws); finalist, Phase II, International Biotech and Medtech Business Plan Competition; finalist, Science 2 Business Award, Rudolf Sallinger Fund; winner, Life Science Cluster Award, Standortagentur Tirol; AdventureX Award – Start-Up Competition, Tyrol Economic Chamber
- **Jesacher, Alexander:** SAOT Young Researcher Award (YRA) in Advanced Optical Technologies, Friedrich-Alexander University Erlangen-Nürnberg
- **Kathrein, Susanne:** Young Scientists Award for the Best PhD Thesis, Medical University of Innsbruck
- **Keller, Markus Andreas Robert:** Sanofi-Aventis Foundation Award
- **Liebensteiner, Michael Christian:** ISAKOS Patellofemoral Research Excellence Award
- **Limociel, Alice:** Long-Range Research Initiative (LRI) Innovative Science Award
- **Lobenwein, Daniela Antonia:** Young Investigator Award of the Acute Cardiovascular Care Association (ACCA)
- **Nairz, Manfred:** City of Innsbruck Research Award
- **Oberhuber, Rupert:** Biotest Young Investigator Award, Austrotransplant; Hank Shippers Award, Eurotransplant
- **Pechlaner, Raimund:** Award of Excellence, Federal Ministry of Science, Research and Economy
- **Pichler, Renate:** City of Innsbruck Research Award
- **Pierer, Gerhard:** President of the Austrian Society of Plastic, Cosmetic and Reconstructive Surgery (ÖGPÄRC)
- **Poewe, Werner:** Science Award, Innsbruck Association of University Professors (UPVI)
- **Puelacher, Wolfgang:** admitted into the European Academy of Sciences and Arts
- **Rantner, Barbara:** Science Award, Austrian Stroke Society (ÖGSF)
- **Sampson, Natalie:** Otto Kraupp Award for Best Postdoctoral Thesis (2<sup>nd</sup> place)
- **Saria, Alois:** Executive Chair, ISN-JNC Flagship School, International Society of Neurochemistry (ISN) and the Journal of Neurochemistry (JNC)
- **Scherfler, Christoph:** CAST Technology Award
- **Schiefecker, Alois Josef:** Austrian Society of Neurology (ÖGN) Award
- **Schmutzhard, Erich:** Honorary Member of the Neurological Society of Thailand; Science Award, Austrian Society of Infectious Diseases and Tropical Medicine (ÖGIT)
- **Schwendinger, Peter:** 1<sup>st</sup> place, CAST Award
- **Stefani, Ambra:** Young Investigator Award, Sleep Research in Neurodegeneration, World Association of Sleep Medicine (WASM); Young Investigator Award RLS/WED Science Summit, International RLS Study Group (IRLSSG) and European RLS Study Group (EU-RLSSG)
- **Steinmaßl, Patricia-Anca:** Austrian Dental Association (ODV) Science Award, Austrian Dentists Association (ZIV)
- **Tancevski, Ivan:** Paracelsus Award, Austrian Society of Internal Medicine (ÖGIM); City of Innsbruck Research Award; Austrian Infection Award, Austrian Society of Infectious Diseases and Tropical Medicine (ÖGIT)
- **Watschinger, Katrin:** City of Innsbruck Research Award
- **Weiss, Günter:** admitted to the Austrian Academy of Sciences (ÖAW)
- **Zehetner, Claus:** Otto Seibert Award for Research into Socially Disadvantaged Groups

Source: Medical University of Innsbruck Intellectual Capital Report 2015 <https://www.i-med.ac.at/mitteilungsblatt/2015/43.pdf> (German only)

## Imprint

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