MEDICAL UNIVERSITY
OF VIENNA

Shaping the future

Annual Report 2015

The future starts now

2015 was a watershed year for our university in many ways.

After eleven successful and eventful years under the management of the founding rector Wolfgang Schütz, I was given the honour as Rector of taking responsibility for this especially exciting phase in the university's development, together with Michaela Fritz, Anita Rieder, Volkan Talazoglu and Oswald Wagner.

One particularly pleasing development was the provisional end of discussions on university funding and the Doctors' Working Hours Act, which have been ongoing since 2011, with the conclusion of a new works council agreement and the completion of negotiations on the performance agreement for 2016-18. However, we still have to steer a narrow course in terms of financial management – reductions in working time in accordance with the Hospital Working Hours Act, coupled with a 30% increase in basic salaries, as well as staff costs that account for around 95% of the budget, are posing new challenges for all members of the university every single day.

The conclusion just before Christmas of a wide-ranging agreement with the federal government and the City of Vienna regarding our cooperation with Vienna General Hospital was an important milestone for the university. In future, MedUni Vienna will assume extensive rights as well as significant responsibilities for patient care at Vienna General Hospital as part of its collaboration with the City of Vienna. The raft of agreements also includes the renovation of the hospital by 2030 and construction of a new research facility at MedUni's Vienna General Hospital campus. Following relocation of the preclinical centres and departments to the Mariannengasse campus, in the foreseeable future we will be in a position to carry out our work at a single integrated campus.

In view of the major challenges we have faced in recent years, our 58th place in the 2015 Times Higher Education rankings of the world's leading medical schools is testimony to the outstanding overall performance of all of the university's academic and non-academic staff.

I would like to thank each and every one of you for your outstanding commitment to MedUni Vienna, and for placing your trust in the new Rectorate. I hope you enjoy reading the 2015 Annual Report.

Prof. Markus Müller
Rector, Medical University of Vienna

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MEDIZINISCHE
UNIVERSITÄT WIEN

Shaping the future

The dawn of an era, with a new vision and fresh objectives: with Markus Müller and his team now at the helm, MedUni Vienna is looking to build on its success and leverage even greater synergies with Vienna General Hospital as it works to keep step with future challenges.

On 1 October 2015 Markus Müller took up his new position as Rector of MedUni Vienna. Formerly the Vice Rector for Research and Head of the Department of Clinical Pharmacology, Markus Müller is a practising internal medicine specialist and was unanimously appointed by the University Council from a shortlist of three candidates proposed by the Senate. He takes over from Wolfgang Schütz, who as founding rector steered the university through an eventful decade from the time it was granted autonomy. Following a successful tenure, Wolfgang Schütz decided against extending his rectorship. A native of Klagenfurt, Markus Müller graduated from what was then the Medical Faculty of the University of Vienna. After working in Austria, Sweden and the USA he was appointed Professor and Head of the Department of Clinical Pharmacology at MedUni Vienna in 2004.

At the start of July 2015, a few weeks after the identity of the new rector was announced, the University Council unanimously appointed the new team of vice rectors. Michaela Fritz is responsible for overseeing research and innovation, Anita Rieder for education, Volkan Talazoglu for finance and Oswald Wagner for clinical affairs. Previously falling under the remit of the vice rector for education, responsibility for gender and diversity is now assigned to the rector. Anita Rieder and Oswald Wagner both come from leading roles at MedUni Vienna.

Prior to her new role, Anita Rieder was Curriculum Director, Professor for Social Medicine and Head of the Center for Public Health. Oswald Wagner worked as Professor and Head of the Department of Laboratory Medicine from 1998, and was Chair of the Senate until his appointment. He has held the role of Vice Rector for Clinical Affairs before, in 2010/2011. Michaela Fritz comes to us from the Austrian Institute of Technology (AIT), where she had been in charge of the Health and Environment Department since 2010. A practising physician and economist, in 2012 Volkan Talazoglu assumed responsibility for the MedUni Vienna and Vienna General Hospital's joint University Medicine Vienna 2020 project.

Measuring success

According to Rector Markus Müller, MedUni Vienna will continue to align its activities to accepted international parameters in future as it strives for visibility and works to attract the best talent. These include financial clout and infrastructure, international rankings, the number of ERC prize winners, gender quotas and numbers of international students, employees and appointments, the attractiveness of the curriculum, the standard of medical expertise (having the very best doctors) based on transparent outcome parameters, as well as the overall attractiveness of the university's location. Markus Müller explains: "All of MedUni Vienna's efforts must be channelled towards measurable improvements in these categories. If we are all prepared to face up to the challenges and accept the role of pacemaker for Austria, then we will be very competitive internationally."

MedUni Vienna on the right track!
The appointments to the various committees at MedUni Vienna are a success story, as is the fact that we are performing better than ever internationally. A number of initiatives have also been developed to ensure that we are even more competitive in future. The new contract of cooperation with the City of Vienna sets out how we can make the necessary advances step by step, although financing remains the key issue. But hope springs eternal – we have it in us to succeed!

Erhard Busek
Chair of the University Council

After a successful first decade attention now turns to MedUni Vienna 2.0 – the next few years will decide whether we emerge at the European vanguard or whether we stand still in the middle of the pack. Within the university management, the Senate – made up of representatives of the professors, other teaching and research staff, students and general university staff – makes a significant contribution towards achieving our goals.

Michael Gnant
Chair of the Senate

The appointment of the management team by the University Council chaired by Erhard Busek, former Vice Chancellor and Minister of Science of the Republic of Austria, followed the recommendations of Markus Müller, who commented: "I am certain that we are now in a position to overcome the major challenges we are currently facing and elevate our university to the international elite with the support of this team of renowned experts."

CHALLENGES AND SOLUTIONS

The new team faces several challenges, one of the most important of which – the 2016–2018 university budget – was brought to a conclusion at the beginning of December. MedUni Vienna and the Austrian Federal Ministry of Science, Research and Economy agreed on a EUR 145 million increase in funding compared with the 2013-2015 performance agreement period. Satisfactory from MedUni Vienna's perspective, the outcome of the negotiations largely covers value adjustments and the increase in doctors wages introduced in January 2016 as part of the new working time agreement.

The new performance agreement also brought about significant progress in another key area: inauguration of the MedUni Campus Mariannengasse, a development which will concentrate non-clinical departments at a single location, has been scheduled for 2023/24. There will also be construction work in the grounds of Vienna General Hospital. The AKH 2030 framework construction agreement between the federal government and the City of Vienna will see the addition of new research buildings on Lazarettgasse in addition to the refurbishment at Vienna General Hospital. The Center for Translational Medicine – the first development at the new MedUni Campus AKH – has already been contractually agreed.

In mid-December a formal agreement was reached regarding the joint operational management of Vienna General Hospital and MedUni Vienna, as a direct outcome of the University Medicine Vienna 2020 project. This agreement sets the foundation for future collaboration between MedUni Vienna and Vienna General Hospital in patient care. The new ten-year contract upholds the sta-

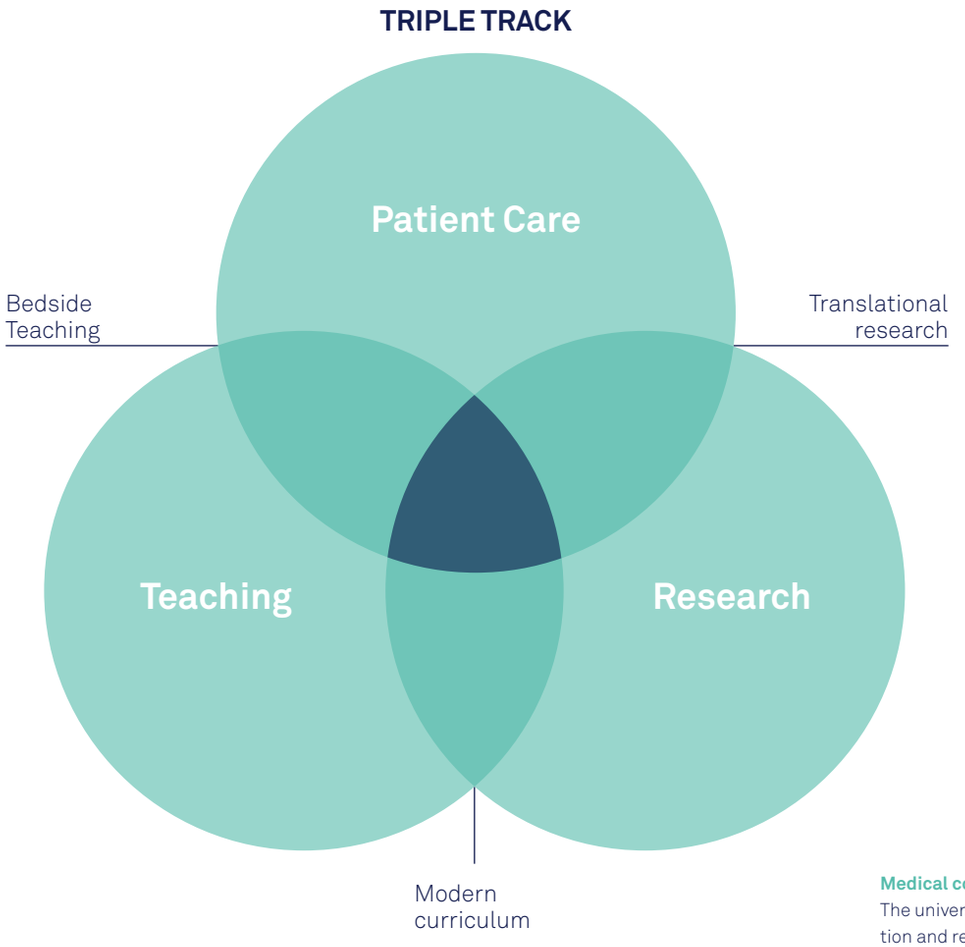
Recently concluded agreements between MedUni Vienna, Vienna General Hospital, the Vienna Hospitals Association, the Federal Republic of Austria and the City of Vienna have set a course for the success of the MedUni Vienna-Vienna General Hospital site as a health and science hub. The three new research buildings and the MedUni Campus Mariannengasse, with non-clinical activities are clustered close to Vienna General Hospital, are a key element.

tus quo for funding streams while safeguarding an acceptable level of new investment in clinical infrastructure.

ON THE RIGHT TRACK

A strong showing in a range of university rankings clearly demonstrates that MedUni Vienna is on the right track. With top marks in the research and international orientation categories in the EU Commission's U-Multirank project, MedUni Vienna now has a place in the European vanguard. It also scored highly when it comes to knowledge transfer. In all, the performance of more than 1,200 universities was looked at and compared in five categories: research, teaching, knowledge transfer, international orientation and regional engagement.

Published in October 2015, the Times Higher Education (THE) rankings also made encouraging reading for MedUni Vienna, which was rated one of the best medical universities in Europe. It took 58th spot in the Clinical, Pre-Clinical & Health category, making it the fifth best performer in the German-speaking world, in this particular area. Although MedUni Vienna slipped out of the top 50 (formerly ranked in 49th place), its overall score improved from 63.4 to 65.0 points. In a worldwide ranking of all universities MedUni Vienna continued to burnish its credentials, finishing in joint 201st-250th place. Last year it finished in the 251–275 bracket, which in turn marked an improvement on the 301–350 placing of 2012. In the respected QS World University Ranking, MedUni Vienna improved its performance in the Life Sciences & Medicine category to finish in the joint 51st to 100th bracket.



Medical competence
The university's status as a leading medical higher education and research institution and as a driver of innovation in the medical sciences is underpinned by the triple track of research, teaching and patient care.

TRIPLE TRACK – DRIVING KNOWLEDGE

The holistic triple track approach to research, teaching and patient care plays a fundamental role in these successful developments. Creating, sharing and applying knowledge are inextricably linked at MedUni Vienna – research, teaching and patient care are in constant dialogue with each other. All three areas contribute equally to medical and scientific quality at the university and enrich one another. The high concentration of scientists, doctors, teachers and students and the immediate proximity to patients facilitates a constant exchange of synergies, ideas, breakthroughs and competences between the individual tracks.

With a total of around 8,000 students and 5,500 employees (full time equivalents), including 3,500 researchers and doctors, MedUni Vienna is one of the largest medical training and research centres in the German-speaking world, and a medical school of international standing.

MedUni Vienna also promotes and practises diversity, an approach that successfully attracts scientists from all over the world. Other key benefits include grants for highly gifted researchers and performance-led career models for physicians.

The scientific output of its 30 clinical departments, 12 medical research centres and departments, and its numerous highly specialised laboratories make MedUni Vienna one of the most important biomedical research institutions in Europe.

The latest results from clinical studies directly benefit the more than 645,000 patients treated every year, since the university closely integrates basic research with clinical application. Due to the considerable medical benefits, this translational approach to research and medical treatment forms a core aspect of the cooperation between MedUni Vienna and Vienna General Hospital.

MedUni Vienna's research clusters in particular facilitate the implementation of translational research. This approach means that exceptional basic research outcomes can quickly be applied for the good of patients. This is precisely the path that we should continue to pursue, building on our strengths and extending our national and international networks.

Michaela Fritz
Vice Rector for Research and Innovation

Over the course of the next few years MedUni Vienna will become an international competence centre for medical education and PhD programmes as well as a best practice reference model for medical curricula.

Anita Rieder
Vice Rector for Education

SCIENTIFIC PROFILING

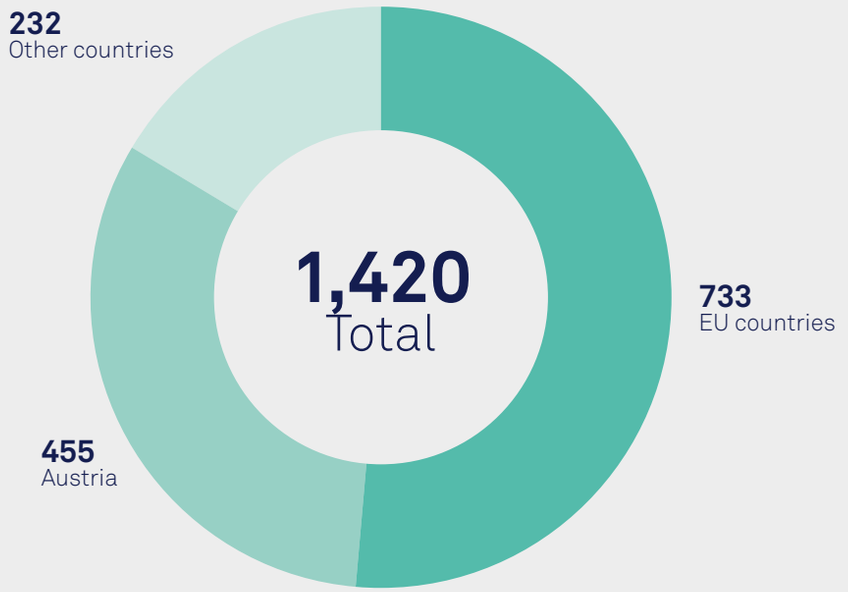
The university's five research clusters have been increasingly successful in bundling competences in interdisciplinary, cross-departmental research. They are focused on cancer research and oncology, medical imaging, cardiovascular medicine, medical neurosciences and immunology – areas in which MedUni Vienna has established particularly extensive international networks and coordinates multinational research consortia and multicentre clinical studies, with projects backed by the European Commission playing a key role. Another step forward includes the proposed formation of clinical centres, as already seen in the field of cancer research with the Comprehensive Cancer Center (CCC). In summary, MedUni Vienna's scientific output is high, as shown by continuing and noticeable upward trends in the relevant indicators: impact factors, citation rates, external funding, knowledge transfer (inventions, inventions put to use, patent applications and patents) and PhDs awarded.

GROUNDBREAKING CURRICULUM

The curricula for the medical and dentistry degree programmes impart integrated specialist knowledge with a focus on small-group teaching and clinical practice. Most students complete their studies within the regulation timeframe and over 86% of those who start courses go on to graduate. The number of individuals participating in international mobility programmes is growing every year.

In addition, since 2014/15, students' final year of study has been a clinical practical year with training in accredited teaching hospitals, preparing them for professional life and postgraduate education. As well as the medicine and dentistry degree programs, physicians and other scientists will find a broad range of PhD and doctoral options on offer at the university – 1,400 young researchers are engaged in these programmes and the number of doctoral candidates with MedUni Vienna appointments rose to 760. Medical informatics specialists are trained in a project-oriented master's programme, and MedUni Vienna also offers academic and practice-oriented postgraduate continuing education programmes and certificate courses covering a broad spectrum of medical, health science and health management focuses.

Networking through partnerships



Cooperation agreements with 1,420 partner institutions are at the heart of a global scientific and research network. MedUni Vienna has key partnerships with Johns Hopkins University in the USA, the Nanyang Technological University in Singapore, Austria's MedAustron cancer therapy and research centre, and its CBmed competence centre, which focuses on developing new biomarkers for individual cancer therapies. MedUni Vienna is also a partner in the Karl Landsteiner University of Health Sciences in Krems. As an internationally-minded institution with an English language curriculum that follows the Bologna model, it integrates study in the fields of medicine, medical technology and health economics.

MedUni Vienna collaborates with the University of Vienna at the Max F. Perutz Laboratories as well as interdisciplinary research clusters. It also operates the Messerli research institute with Vetmeduni Vienna and the University of Vienna, which is dedicated to the study of the relationship between humans and animals. On the national level MedUni Vienna's dense academic network is also reflected in the coordination of a number of Austrian Science Fund special research programmes and in the various Ludwig Boltzmann Institutes and Clusters. Cooperation between research and industry is mainly focused on the Christian Doppler Laboratories (CDLs) where University researchers work closely with private sector partners to develop innovative solutions for commercial use.

Two measures illustrate the success of these collaborative ventures particularly well: around half of all MedUni Vienna publications are based on international collaboration and currently, roughly a fifth of all funding for research and teaching activities comes from sources of independent (external) finance.

FIRST-CLASS PATIENT CARE

In terms of inpatient cases and case severity, the performance of university hospital care in Vienna is impressive both regionally and nationally. More than 20% of all inpatient admissions in Vienna are to Vienna General Hospital, and for severe cases this figure is as much as a quarter. A centre for patient care in east Austria, Vienna's university hospital deserves its reputation for providing comprehensive, high quality tertiary medical care. In addition, Med-Uni Vienna doctors working at Vienna General Hospital are responsible for an above-average proportion of primary (minor inpatient cases) and secondary (outpatient cases) compared with other university hospitals.

Transplantation medicine is a stand-out feature of the university's broad portfolio of outstanding achievements and the hospital is one of the leading centres worldwide for organ transplants. Its 120 lung transplants, for example, make Vienna General Hospital the third largest centre in the field worldwide.

Vienna also has a strong international reputation for heart transplants and implanting and developing heart pumps. It leads the way in the development and introduction of cochlear implants and bionic reconstruction for limbs.

The Medical University of Vienna and Vienna General Hospital approach the cooperation agreement as partners who understand and accept one another as complex systems. Together we want to write a success story for Austrian healthcare. Mutual understanding and faith in each other are the basis for success.

Herwig Wetzlinger
Director, Vienna General Hospital (a business unit of Vienna Hospitals Association)

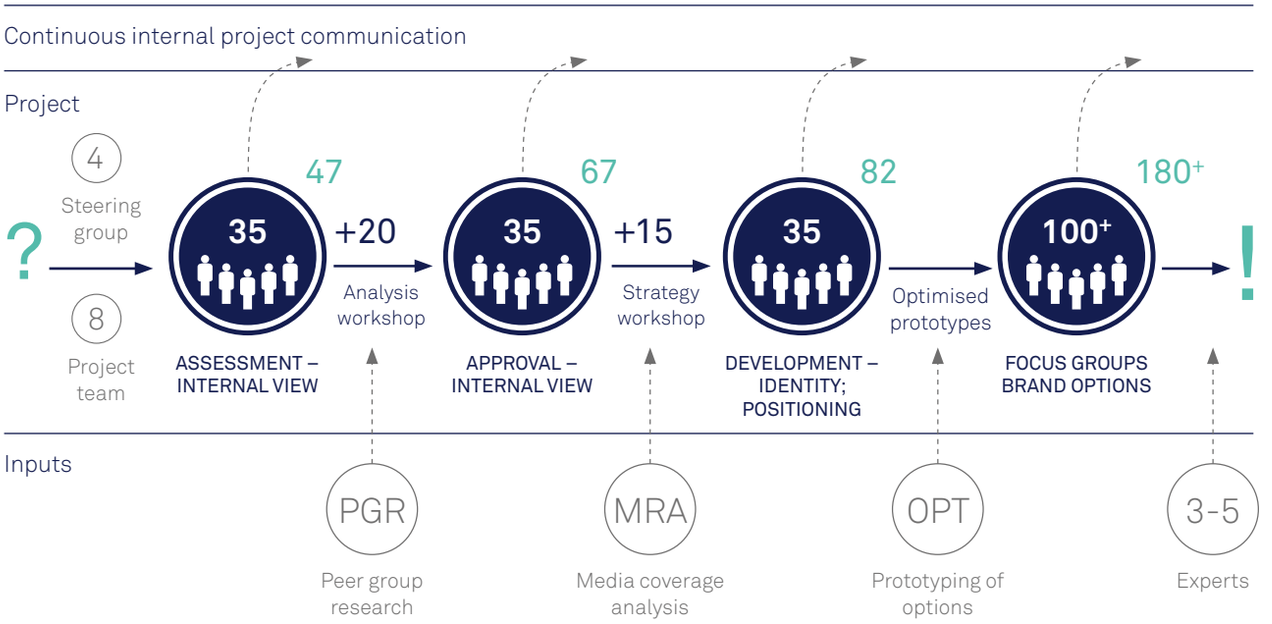
MedUni Vienna's objective is to continue the success story at Vienna General Hospital, confirmed by excellent ratings. In addition to joint management, this will be predicated on the construction of three supplementary research centres at the university's campus on the Vienna General Hospital site – a centre for precision medicine, a centre for translational medicine and a technology transfer centre.

Oswald Wagner
Vice Rector for Clinical Affairs

650 years of experience as a place of learning

The history of the Medical University of Vienna reaches back 650 years. Established when the University of Vienna was founded in 1365, the medical faculty has existed from the university's inception. A clear sign of medical progress came in 1785 with the foundation of the Josephinum, with its world-famous wax anatomical models – available for anyone to view even then. Today the Josephinum is the historic gateway to the Medical University of Vienna and an important centre for knowledge exchange, teaching and research.

**DEVELOPING IDENTITY AND STRATEGY AS A TEAM –
A PARTICIPATIVE PROCESS WITH 180 PARTICIPANTS**



In addition to successful conclusion of the 2016-18 performance agreement, which ensured preservation of the status quo for us, we also secured the ongoing development of infrastructure, allowing us to set a course for the future. We also need to build up a certain degree of financial flexibility to facilitate the active development of our university. This will only be possible through efficient and targeted use of the resources available to us.

Volkan Talazoglu
Vice Rector for Finance

Europe, Austria and our university currently find themselves at a crossroads. Only by focusing on high end research, technology and education will we be in a position to meet the challenges of the future. And it is here that MedUni Vienna must take a pioneering role on the national stage.

Markus Müller
Rector

VISION 2025

The critical mass of knowledge and expertise at MedUni Vienna gives rise to the following vision of the future: "In 2025 MedUni Vienna will be an especially innovative, dynamic and globally respected medical training and research institution. In its role as a leading research institution for physicians in the German-speaking world it will be one of the most attractive European employers in the field of medicine and one of the continent's top ten medical schools, with an established position among the top 50 medical schools worldwide."

A key element of the 2025 Vision is MedUni Vienna's new brand strategy. Developed in close cooperation with 180 employees from all parts of the university, the core value was defined as Knowledge and Innovation. To bring the brand strategy to fruition, during 2015 around 400 employees participated in interdepartmental workshops that delivered almost 200 project ideas. Under one such proposal MedUni Vienna will be more firmly anchored in public perception, in line with the motto Competence and Transparency.

Generating knowledge

Nothing in life is to be feared,
it is only to be understood.
Now is the time to understand more,
so that we may fear less.

Marie Curie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Increased resistance against allergies

Susceptibility to allergies can be reduced by increasing the release of regulatory T cells. This is the principal finding of a study carried out by MedUni Vienna's Institute of Immunology.

The initial results of the study, which examined the reasons behind the development of allergies, were presented at the 4th European Congress of Immunology, held from 6-9 September 2015 at the Austria Center Vienna.

Headed by Winfried F. Pickl, the research team led by Alina Neunkirchner used a new type of animal model to demonstrate that sensitivity to the onset of allergies falls when the activity of regulatory T cells is increased; this was the first time that the model had been used. As Pickl explains: "With the help of the animal model, we were able to simulate for the first time the processes that occur in the body as a result of contact with an allergen that affects humans."

FOCUS ON HIGH-RISK PATIENTS

According to the researchers, the findings could play a part in delivering preventive support to high-risk patients. The people affected produce too few regulatory T cells due to hereditary factors, or alternatively T cells may have been destroyed by viral illnesses. A similar effect of regulatory T cells was also identified in connection with certain autoimmune diseases, including experimental autoimmune encephalomyelitis (EAE).

4TH EUROPEAN CONGRESS OF IMMUNOLOGY

Vienna reaffirmed its status as a leading international science hub by staging the 4th European Congress of Immunology – Winfried Pickl of MedUni Vienna was the conference president and around 4,000 experts attended the event. Organised by the Austrian Society of Allergology and Immunology (ÖGAI) and the European Federation of Immunological Societies (EFIS), the high-level conference focused on basic immunology research as well as immunotherapies.

New hope for psoriasis sufferers

In a study published in top scientific journal Nature, researchers from the Department of Dermatology showed that blocking a messenger in the immune system helps to significantly moderate psoriasis symptoms.

Psoriasis is an inflammatory skin condition that affects 2-3% of the Austrian population and often substantially reduces sufferers' quality of life. The research team, headed by Elisabeth Riedl, Christine Bangert and Tamara Kopp of MedUni Vienna's Department of Dermatology, proved for the first time the clinical effectiveness of selectively blocking the growth factor interleukin-23 (IL-23) in patients with chronic plaque psoriasis.

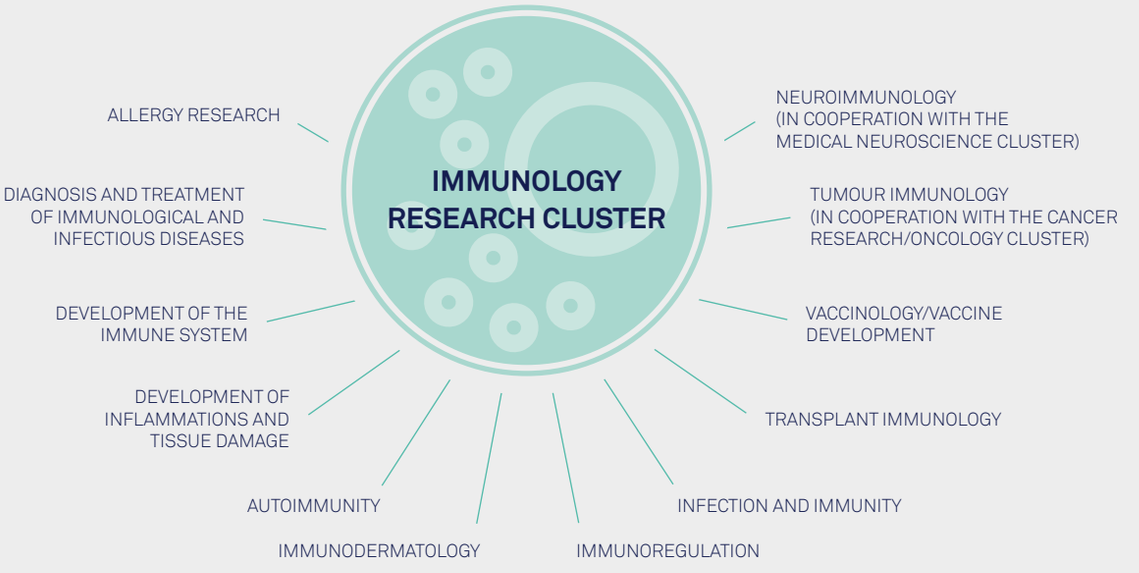
In addition to the subjects at the Department of Dermatology in Vienna, patients at two other study centres in Denmark and the US were treated with tildrakizumab, a new antibody that targets IL-23, in order to examine its clinical impact, safety and pharmacokinetics.

Immunology Research Cluster

Conditions such as rheumatoid arthritis, arteriosclerosis, diabetes mellitus, allergies and inflammatory bowel disease are among the most common results of defective immune system responses. However, infectious diseases are also a growing threat. As the complexity of immunological disorders requires an interdisciplinary approach, the Immunology Research Cluster brings together research into allergies, inflammation and infectious diseases, and develops new concepts for diagnosis and treatment.

The focus is on basic research, as well as translational and clinical research. The cluster also aims to establish structures at various levels and launch initiatives with a view to exploiting synergies between academics more effectively and supporting innovative research activities. Other priorities include supporting up-and-coming academics, and enhancing collaboration with immunology researchers at other universities and at non-university research facilities.

cluster.meduniwien.ac.at/irc



Measles vaccine used in fight against chikungunya virus

A modified version of a common measles vaccine has the potential to combat the chikungunya virus. This was the result of a Department of Clinical Pharmacology study published in leading journal The Lancet Infectious Diseases.

Until now there has been no effective vaccine against the chikungunya virus and the resulting fever. The majority of cases of this potentially lethal infection occur in Latin America and the Caribbean. A group of MedUni Vienna scientists led by Bernd Jilma, working in partnership with the Institut Pasteur in Paris, the Walter Reed Army Institute of Research in the USA and Vienna-based biotech company Themis Bioscience, succeeded in introducing tiny surface particles from the virus into the body using a modified, widely available measles vaccine.

TROJAN HORSE IN THE HUMAN BODY

As Bernd Jilma points out: "The modified measles virus is implanted in humans like a Trojan horse and then produces the corresponding surface particles of the chikungunya virus." The concentration of these particles is so low that none of the symptoms of infection appear. But the chikungunya particles still stimulate the lymphatic system, prompting the production of antibodies that attack the virus. This means the antibodies are present when a person is infected with the chikungunya virus.

EFFECTIVE AGAINST DENGUE AND OTHER VIRUSES?

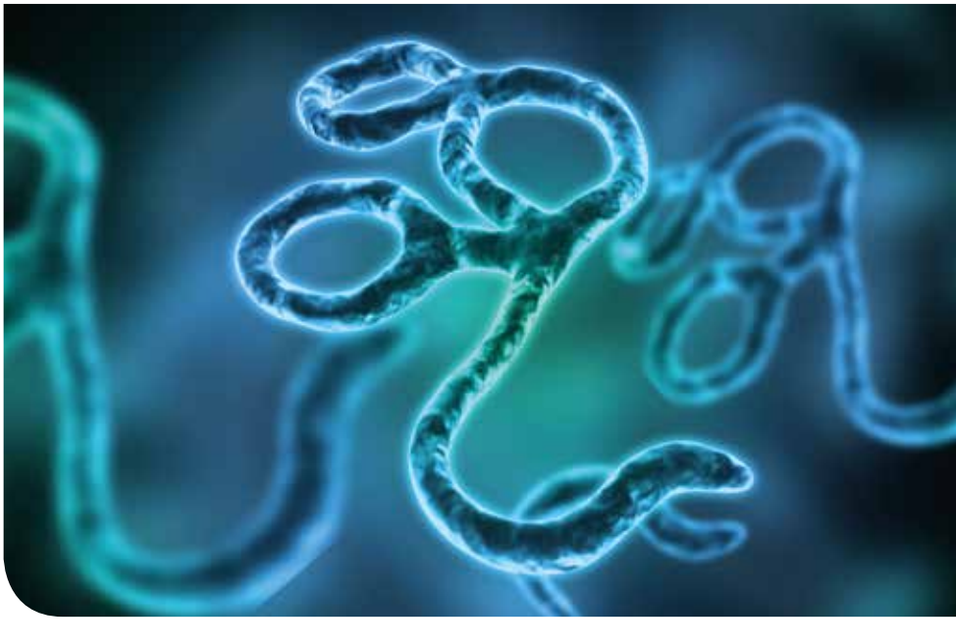
Another positive knock-on effect is that the modified virus boosts immunity against conventional measles. "By changing the vaccine accordingly, it could also be used to target dengue fever and other viruses," says Jilma. Further clinical assessment of the findings in phase II and III studies is necessary, and the scientists believe that the approach could be deployed in the field in three to five years. ●

A single tablet to treat malaria

The initial findings of a multi-centre study, with Michael Ramharter of the Division of Infectious Diseases and Tropical Medicine, part of the Department of Medicine I, as the principal investigator, are very encouraging.

Effective Ebola vaccine

An international study coordinated by the WHO, in which MedUni Vienna played a significant role, has shown that a vaccine based on the vesicular stomatitis virus (VSV) could be a promising weapon in the fight against Ebola.



ENCOURAGING RESULTS

"A glycoprotein from the Ebola strain found in the Democratic Republic of Congo was implanted in the live VSV vaccine," explains Michael Ramharter, co-author of the study, which appeared in the New England Journal of Medicine. "VSV only causes mild symptoms in humans, but the protein acts as an Ebola antigen and induces the immune system to produce antibodies against the disease." 138 healthy adults were vaccinated in the phase I study. The results were promising, and the vaccine will be administered to patients in West Africa in the subsequent phase II studies.

"People often forget to continue taking their medication regularly if their temperature falls the day after the start of malaria treatment. So an effective therapy that only requires a single dose would be a major step forward," Ramharter explains.

SINGLE-DOSE TREATMENT

Initiated by non-profit organisation Medicines for Malaria Venture (MMV) and supported by the Austrian Federal Ministry of Science, Research and Economy, the study concentrated on a new substance that could be used as a single-dose therapy. OZ439, a synthetic substance containing artefenomel, is being evaluated in combination with widely-used drug piperaquine. According to Michael Ramharter: "A water-soluble tablet containing a single dose kills all malaria parasites and even protects the patient against reinfection for several weeks."

IMPROVED MALARIA PREVENTION FOR MOTHERS-TO-BE

As part of another study, sponsored by the EU, in which malaria experts from MedUni Vienna are also heavily involved, scientists are working to develop effective preventive therapies for pregnant women.

Focus on autoimmune disorders

MedUni Vienna coordinates new EU project aimed at developing personalised treatments

RELENT is just one of numerous EU projects in which MedUni Vienna is involved:
80 such EU-funded projects were under way at the university in 2015, including 21 new projects.

Horizon 2020, a new project funded by the EU, is devoted to research into chronic autoimmune diseases and the development of personalised therapies. Renate Kain of MedUni Vienna's Department of Pathology is coordinating the international RELENT (RELapses prevENTion of chronic autoimmune diseases – common mechanisms and co-morbidities) project, which is carrying out research into improved treatments for chronic autoimmune conditions such as rheumatoid arthritis and vasculitis.

A consortium of several European, American and Australian universities and companies plans to examine shared mechanisms that determine the duration and life-threatening progression of these diseases. The aim is to apply the findings in practice as quickly as possible, in order to provide patients with more rapid support. Approved at the start of 2015, the project has received around EUR 6 million in funding from the EU's Horizon 2020 framework programme.

www.relent.eu

Similarities in skin protection in humans and tortoises

A shared history stretching back 310 million years

As part of a genome comparison, a working group headed by molecular biologist Leopold Eckhart of MedUni Vienna's Department of Dermatology found that genes for important skin proteins dated back 310 million years, to a common ancestor of humans and tortoises. The study appeared in Molecular Biology and Evolution, a leading journal.

Inhibiting the protein mTOR

How mTOR inhibitors work in the immune system

mTOR inhibitors such as rapamycin and everolimus are effective tools used in transplantation medicine and cancer therapy, and clinical studies of a number of new mTOR inhibitors are currently in progress. Against this backdrop, Thomas Weichhart, Markus Hengstschläger and Monika Linke of the Institute of Medical Genetics published a widely acclaimed article on the role of mTOR in the innate immune system in the journal Nature Reviews Immunology.

On the trail of the C4d protein

Naturally produced proteins as anti-inflammatory agents

The new Christian Doppler Laboratory for Complement Research opened at MedUni Vienna's Center for Pathophysiology, Infectious Diseases and Immunology in June 2015. Funded by the Austrian Federal Ministry of Science, Research and Economy and Alexion Pharmaceuticals, the research facility will concentrate on the protein C4d, which is credited with playing an important part in inhibiting excessive immune system responses.

New post-doctoral network

Immunology Research Cluster launches platform

A platform for post-doctoral staff, set up by the Immunology Research Cluster at MedUni Vienna, gives young researchers an opportunity to network, as well as promoting their career development. "The aim of the IRC post-doctoral training network is to support fellows at this important stage of their careers," explained Cluster coordinator Wilfried Ellmeier at the unveiling of the new platform.

Breast cancer: MRI far more effective at recognising carcinomas

Magnetic resonance imaging (MRI) correctly identifies 90% of breast carcinomas, compared with only 37.5% using the standard combination of mammography and ultrasound. Breakthroughs in imaging such as these form the backdrop for the opening of two new CDLs at MedUni Vienna.

More than twice as effective at recognising breast carcinomas – this is the groundbreaking result of a study published in the Journal of Clinical Oncology, in which women at higher risk of developing breast cancer were examined by staff from the university's Department of Biomedical Imaging and Image-guided Therapy, in cooperation with the Department of Obstetrics and Gynecology and the Department of Pathology.

DECISIVE FOR HIGH-RISK PATIENTS

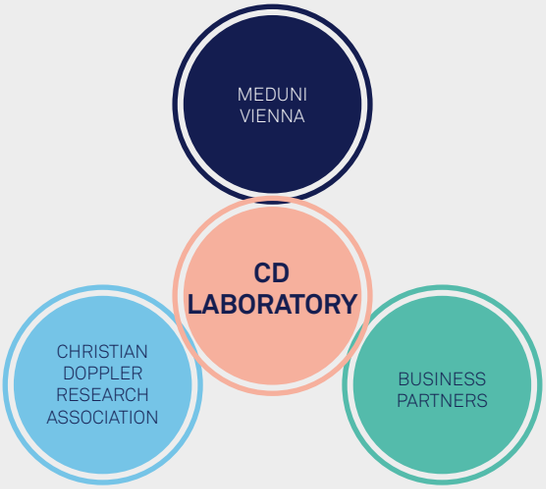
"All the evidence suggests that magnetic resonance imaging is the way to go if there is the tiniest doubt, especially among high-risk patients. Our study clearly shows that MRI is far superior to mammography and breast ultrasounds," comments Thomas Helbich, who led the study together with Christopher Riedl. "MRI's greater effectiveness is totally unrelated to the patient's age, the status of genetic mutations or breast density. Annual MRIs are the only alternative to mastectomy and ovariectomy in high-risk patients whose medical history includes a higher incidence of breast cancer in the family," Helbich adds.

From basic research to industrial application

Christian Doppler Laboratories are jointly funded by the government and the participating companies. The main provider of public funding is the Austrian Federal Ministry of Science, Research and Economy. The following CD laboratories, which are intended to narrow the gap between basic research and industrial application by means of cooperation between government and business, are currently based at MedUni Vienna:

- Clinical Molecular MR Imaging
- Innovative Optical Imaging and its Translation to Medicine
- Complement Research
- Immunomodulation
- Development of Allergen Chips
- Cardiac and Thoracic Diagnosis and Regeneration
- Cardio-Metabolic Immunotherapy
- Recovery of Extremity Function
- Medical Radiation Research for Radiation Oncology
- Ophthalmic Image Analysis
- Ocular Effects of Thiomers

STRUCTURE OF A CHRISTIAN DOPPLER LABORATORY



PUTTING THE CASE FOR INCREASED USE OF MRI

According to the experts from MedUni Vienna, the findings should give added impetus to the increased use of MRI in breast cancer screening programmes. "In view of the results, we have a duty to explain to women that mammography and ultrasound alone will not enable us to identify all carcinomas. MRI really is the method we should be recommending," Helbich believes.

EARLY DIAGNOSIS OF DISEASES USING MRI

Opened in June 2015 at the MedUni Vienna Department of Biomedical Imaging and Image-guided Therapy, the new Christian Doppler Laboratory (CDL) for Clinical Molecular MR Imaging (MOLIMA) should help to achieve a broad improvement in prognoses for the progression of diseases. At present, many conditions are only diagnosed once morphological changes emerge. However, improving prognoses for patients who develop an illness requires earlier recognition of molecular changes. The new research facility – part of the High Field Magnetic Resonance Centre of Excellence at MedUni Vienna's Department of Biomedical Imaging and Image-guided Therapy – develops high-definition, quantitative imaging processes that can identify diseases at an earlier stage.

NEW LIGHTING TECHNOLOGIES SUPPORT EARLY DIAGNOSIS

Another CDL opened at the university's Center for Medical Physics and Biomedical Engineering in September 2015. The CDL for Innovative Optical Imaging and its Translation to Medicine (OPTRAMED) aims to facilitate the diagnosis of conditions, for instance in the human retina, using new lighting technologies, and to make such methods suitable for clinical practice much more quickly than was previously the case.

The effect of hormones in the brain

For the first time, researchers at MedUni Vienna have shown with the help of positron emission tomography (PET) that testosterone helps to bind mood-enhancing anti-depressants in the brain. PET scans have also paved the way for major advances in connection with the serotonergic neurotransmitter system.

Depression and anxiety disorders are the most common psychiatric conditions. In recent years, molecular brain imaging using positron emission tomography has helped to uncover key mechanisms in the development and treatment of such conditions, especially in relation to the serotonergic neurotransmitter system. Selective serotonin reuptake inhibitors (SSRIs), the drugs used to treat depression, were developed 30 years ago. To mark this anniversary, a team of MedUni Vienna experts led by Siegfried Kasper, head of the Department of Psychiatry and Psychotherapy, published a summary of the current status of global research in The Lancet Psychiatry.

INTERNATIONAL AND INTERDISCIPLINARY COLLABORATION

The study was carried out in partnership with the Copenhagen University Hospital's Neurobiology Research Unit. Headed by Siegfried Kasper, the researchers under Rupert Lanzenberger of the Department of Psychiatry and Psychotherapy are among the world leaders in research into PET brain imaging for psychiatric illnesses. The underlying mechanisms were examined in Vienna in collaboration with the Department of Biomedical Imaging and Image-guided Therapy.

TESTOSTERONE BINDS ANTI-DEPRESSANTS

A study funded by the Austrian Science Fund (FWF) and the Oesterreichische Nationalbank Anniversary Fund, and published in leading journal Biological Psychiatry, was the first in the world to show that testosterone increases the number of serotonin transporters in the brain. This was done using the PET imaging technique. The head of the research team, Rupert Lanzenberger of the Department of Psychiatry and Psychotherapy, carried out the study in cooperation with the Division of Nuclear Medicine and the Department of Obstetrics and Gynecology. As Siegfried Kasper explains: "The study showed that testosterone increases the number of binding points in the brain for commonly prescribed anti-depressants such as SSRIs, which allows for significant insights into the effect of sex hormones on the human brain, as well as differences between the sexes in cases of psychiatric illness."

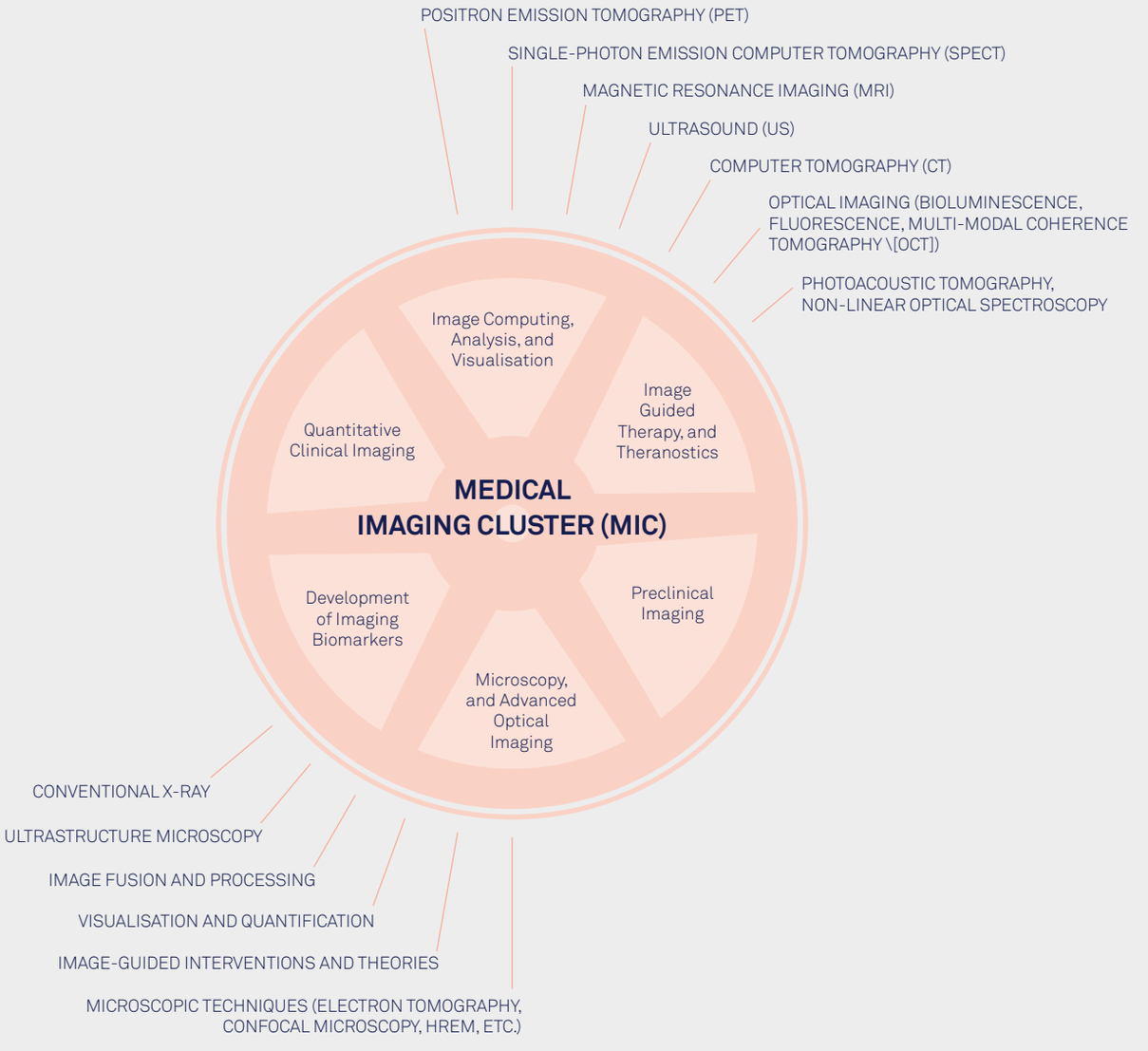
BRAIN REFLECTS GENDER IDENTITY

A mismatch between gender identity and physical gender is known as transidentity or transsexuality. In a study funded by the FWF, Georg S. Kranz of the Department of Psychiatry and Psychotherapy proved that an individual's gender identity is reflected in the links between different sections of the brain, and is also verifiable. This involved examining transgender, female and male control subjects using magnetic resonance imaging (MRI). The findings showed significant differences in the microstructure of brain connections between male and female control subjects. The results for transgender individuals were in between those for males and females. In addition, a strong correlation was identified with the level of testosterone in the blood.

Medical Imaging
Research Cluster

Medical Imaging brings together the MedUni Vienna institutes and research facilities involved in imaging. The cluster is organised into six areas of specialist research, or nodes: Image Computing, Analysis, and Visualisation; Image Guided Therapy, and Theranostics; Preclinical Imaging; Microscopy, and Advanced Optical Imaging; Development of Imaging Biomarkers; and Quantitative Clinical Imaging. The focus is on carrying out research into and achieving advances in morphological, functional and molecular imaging, so as to be able to diagnose and treat diseases at the earliest possible stage.

cluster.meduniwien.ac.at/mic



Multiple sclerosis: new insights into progression of the disease

An international research team led by MedUni Vienna has documented the pathological processes behind the disease for the first time, a discovery that could open the door to new treatment options.

Medical Neuroscience Research Cluster

MedUni Vienna researchers focusing on Alzheimer's, depression, multiple sclerosis and pain have an outstanding international reputation. The Medical Neuroscience Research Cluster carries out extensive research into neuroscience and psychosocial sciences.

The findings generated help to provide a better understanding of the pathophysiology of nervous system disorders, and to ensure better diagnosis and treatment of patients. There is also a strong focus on training – doctoral students and other young researchers receive high-quality, internationally recognised academic education at the participating departments and institutes.

The Center for Brain Research at MedUni Vienna is a world leader in research on the mechanisms behind multiple sclerosis (MS). In a summary published in Lancet Neurology, a team of researchers from universities in Edinburgh, Cleveland and Vienna, under the leadership of Hans Lassmann, head of the Division of Neuroimmunology at MedUni Vienna, showed the pathological progression of the condition – from early to late stage – for the first time. They also identified the role played by inflammatory and neurodegenerative processes.

TWO DOES GO INTO ONE

Until now, two approaches have been used to categorise the condition. The first treats MS as an inflammatory disease of the nervous system and regards these inflammations as being responsible for the subsequent neurodegenerative damage. The second approach is based on the premise that MS ultimately transforms from an inflammatory condition into a neurodegenerative one. In the Lancet Neurology paper, however, the researchers proved for the first time that both factors play a part in multiple sclerosis.

NEW TREATMENTS ...

The findings could give rise to new therapeutic approaches. "There are two ways we could go," Lassmann explains. "The first is to develop pharmaceuticals that not only stifle immune responses in the blood and the lymphatic organs, but also have an anti-inflammatory effect in the brain. The second option is developing neuroprotective therapies that block amplification mechanisms, thereby preventing mitochondria damage and the resulting complications."

THE CLUSTER'S NEUROSCIENCE DISCIPLINES

... AND NEW DRUGS

Clinical studies of potential medications based on the findings are already under way. As Lassmann points out: "I'm convinced that in the foreseeable future, say in the next five to ten years, we'll succeed in countering amplification mechanisms and as a result further delaying the progredient phase." These amplification cycles are also part of other neurodegenerative conditions such as Alzheimer's and Parkinson's disease, and of normal brain aging. Damage is multiplied or amplified by a cycle that repeats over and over within itself.

STUDY OF SIBLINGS OF MS SUFFERERS

As part of an international study in which Simon Hametner of the MedUni Vienna Center for Brain Research participated, the brains of healthy brothers and sisters of MS patients, and the brains of healthy individuals unrelated to MS sufferers were examined. The study highlighted differences between the two groups, which may be attributable to the fact that siblings of people with MS are more likely to develop the condition themselves.

TOP STORIES IN 2015

Gaining a better understanding of the brain

Our brains are highly complex organs that make us the people we are: they act as the control centre for the body and are the source of each individual's personality. Researchers at MedUni Vienna are playing an important part in uncovering how this fascinating organ actually works.

A "map" of all brain cells

New technology renders the 100 billion cells in the human brain visible

Many brain cells and their functions are still unresearched. But this is about to change thanks to a new combined technology implemented for the first time by MedUni Vienna's Center for Brain Research and the Karolinska Institutet in Stockholm. A combination of conventional cell-identification methods that use microscopes and single-cell RNA sequencing means that each individual component of the cells can be identified. "We're making good progress towards creating a map of all brain cells and their function," explains Tibor Harkany, head of the Division of Molecular Neurosciences at MedUni Vienna, who is in charge of the study.

The groundbreaking technology, which is described in an article published in leading journal Nature, opens up new perspectives for research and clinical practice. Starting points for new drugs could be identified more quickly, thereby speeding up the development of new medications. In addition, the new method can be used for cell identification and analysis in connection with pancreatic and heart disorders, and with brain tumours.

The place where fear dwindles away

The brain's "fear centre" does not play a part in allaying anxiety

Scientists from MedUni Vienna's Center for Brain Research are finding out more about how we process anxiety, and more generally about information flows in the brain. In a study published in the journal Science, a team from the Division of Cognitive Neurobiology, headed by Stephane Ciocchi and Thomas Klausberger, describe how anxiety is encoded by nerve cells in the hippocampus; this information is not passed on directly to the "fear centre" of the brain, but instead to the prefrontal cortex – the brain's control centre – for further processing and decision-making. As Klausberger explains: "This answers a very general neurobiological question, namely how feelings of anxiety are represented and processed in the brain."

The brain does the thinking, the spinal cord does the steering

Key control mechanisms for walking identified

A team from the university's Center for Medical Physics and Biomedical Engineering, working in cooperation with an international group of researchers, described the control mechanisms by which the spinal cord regulates muscle activity. This is the first time that the activation patterns through which the spinal cord enables walking have been deciphered.

4-MEC and 4-MEPP

Explaining the mode of action of two new synthetic drugs

New substances such as 4-MEC and 4-MEPP are strong stimulants and highly euphorigenic, like the synthetic drug mephedrone, which has been banned in Austria for several years. Until recently, the modes of action of these two substances were unknown. But researchers from the Institute of Pharmacology at MedUni Vienna have unlocked these mechanisms as part of an international partnership.

The body's very own "cannabis"

Impact on foetal development

In the course of an international research collaboration, a team led by Tibor Harkany of the MedUni Vienna Center for Brain Research showed that endocannabinoids – cannabis-like substances produced by the body – have a direct impact on pancreas development in unborn children.

Eight-year-olds who look 80

Progeria, the Scyl1 genetic mutation and many other illnesses are classified as "rare diseases" – they are less common but in total affect a large number of people. MedUni Vienna has underlined its commitment to this important field of research with the opening of a new Ludwig Boltzmann Institute.

Small children trapped in old bodies – this is a simple description of progeria. Between the ages of one and two, sufferers begin to age prematurely. Most patients die before their 20th birthday, usually from a stroke or heart attack.

THE CULPRIT: A PROTEIN

Many of the symptoms are caused by a protein called progerin. Roland Foisner and his team at the Max F. Perutz Laboratories – a joint venture between the University of Vienna and MedUni Vienna – showed how the protein's effects unfold. The findings will open up new approaches for the treatment of progeria, and enable researchers to draw conclusions about cellular processes that occur during the normal aging process.

GENETIC MUTATION IDENTIFIED

A group of researchers from the neuromuscular research division at the Center for Anatomy and Cell Biology discovered the genetic causes of another rare disease. Patients suffer from life-threatening hepatic crises in early childhood and develop serious neurological symptoms at school age. In 2007, the same researchers identified a mutation in the Scyl1 gene that caused similar symptoms in mice. Thanks to modern DNA sequencing methods, for the first time mutations in the human Scyl1 gene were found in patients with comparable symptoms – an important step towards developing an effective treatment.

NATIONAL ACTION PLAN

To mark Rare Disease Day on 28 February 2015, Austrian Health Minister Sabine Oberhauser unveiled a national action plan for such diseases. Experts from MedUni Vienna were instrumental in preparing the plan, which should help to ensure better treatment for sufferers.

CeRUD: Center for Rare and Undiagnosed Diseases

Opened in 2014, the idea behind MedUni Vienna's Center for Rare and Undiagnosed Diseases is to offer patients the best possible interdisciplinary support in terms of diagnosis and treatment by bundling resources and expertise. CeRUD also takes part in numerous international research projects aimed at developing new diagnosis and treatment strategies for rare diseases. This is important because around 5%-8% of the population suffer from some form of rare disease. Estimates put the number of rare and undiagnosed diseases at 6,000-8,000. In total, about 27 million people in Europe and over 400,000 in Austria are afflicted.

www.meduniwien.ac.at/cerud

Two new Ludwig Boltzmann Institutes

Two new Ludwig Boltzmann Institutes (LBIs) have been set up at MedUni Vienna: for Rare and Undiagnosed Diseases (LBI RUD) at the Center for Molecular Medicine (CeMM), and for Applied Diagnostics (LBI AD). Research at the LBI AD will concentrate on developing innovative and improved diagnostics for cancer, while the LBI RUD is aiming to decipher rare disorders that affect blood formation or haematosis, as well as the immune and nervous systems. MedUni Vienna is also involved in the LBI for Cancer Research and the LBI for Electrical Stimulation and Physical Rehabilitation. The Ludwig Boltzmann Gesellschaft provides MedUni Vienna with funding for research carried out at the Ludwig Boltzmann Clusters for Cardiovascular Research, Oncology, and Translational Oncology.

One degree rise in temperatures, up to 6% more fatalities

Climate change is a fact – and so are the heatwaves it will bring – but there are countermeasures that we can take and ways of protecting ourselves against the health risks, say the experts of the Institute of Environmental Hygiene at MedUni Vienna's Center for Public Health.

In 2015 Austria experienced a record heatwave. Environmental medicine specialist Hans-Peter Hutter from the Institute of Environmental Hygiene warns that higher temperatures and longer phases of hot weather are likely to become the norm: "In 30 years' time we can expect an average of at least 45 days with temperatures of over 30 degrees every year."

HIGHER TEMPERATURES MEAN MORE FATALITIES

The effects are life-threatening, says Hutter: an average temperature rise of just one degree Celsius could result in an increase in the fatality rate of up to 6%. "Heat affects everyone – even young, healthy adults – but especially young children, older people and individuals who are in poor health," explains the MedUni Vienna expert. At highest risk are elderly people who live alone and are socially isolated.

BEHAVIOUR CHANGES AND INTELLIGENT SOLUTIONS

There must be changes in behaviour if we want to halt climate change and protect future generations. At the same time, society has to prepare more thoroughly for the challenges posed by a significant rise in the number of heatwaves, and give more thought to the architectural and town-planning implications. Hutter also thinks we need to pay more attention to the design and organisation of workplace environments, where higher temperatures are already problematic.

MIGRANTS AT GREATER RISK

Socially disadvantaged groups such as migrants are particularly vulnerable, according to research carried out by Franz Kolland of the University of Vienna's Department of Sociology with colleagues at MedUni Vienna and the

University of Natural Resources and Applied Life Sciences Vienna. Their work shows that people who are already susceptible to environmental risk factors, and endure cramped family living conditions in substandard housing where the air quality is poor, are also more vulnerable to the dangers of heat. An effective countermeasure would be to increase the number of green spaces in urban areas and make sure there are enough of them in all parts of a city.

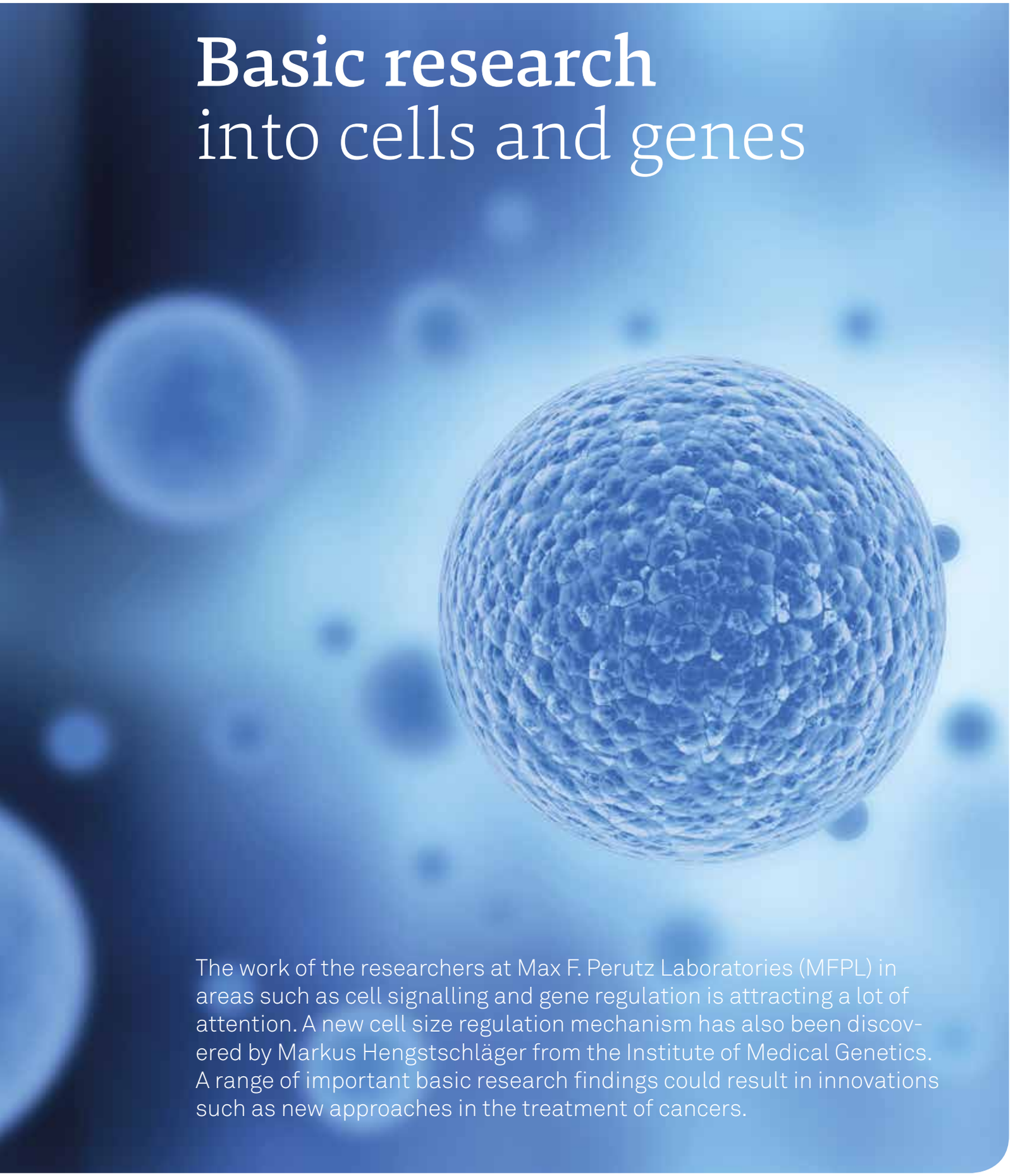
WOODLAND COOLS AND PROMOTES HEALTH

When temperatures are soaring, the woods are an excellent place to cool down. Wooded spaces can also stimulate other health benefits: "Just 10 minutes spent in woodland has a positive effect on health," says Daniela Haluza from the Institute of Environmental Hygiene at the university's Center for Public Health. She is a member of a research team who, in conjunction with the University of Natural Resources and Applied Life Sciences Vienna, have compiled scientific findings on the topic. The research indicates that regular trips to the woods contribute to better physical recovery and regeneration, a healthy immune system, quality of sleep and harmonisation of the central nervous system.

Assistance from staff, students and the university

In 2015 hundreds of thousands of people fled their homes to escape war and persecution – and many came to Austria. MedUni Vienna took various forms of action to do what it could to help these refugees and minimise human suffering. These included medical support and initiatives by the students' union, ÖH Med Wien, who provided assistance at the refugee camp at Röszke in Hungary. The university also put in place processes to recognise medical qualifications as swiftly as possible, and courses specially tailored for asylum seekers. Along with 15 other universities in Austria, MedUni Vienna is also participating in Universities Austria's MORE project to facilitate educational opportunities and career perspectives for people from a refugee background.

Basic research into cells and genes



The work of the researchers at Max F. Perutz Laboratories (MFPL) in areas such as cell signalling and gene regulation is attracting a lot of attention. A new cell size regulation mechanism has also been discovered by Markus Hengstschläger from the Institute of Medical Genetics. A range of important basic research findings could result in innovations such as new approaches in the treatment of cancers.

UNLOCKING THE SECRETS OF CELL GROWTH REGULATION

Every cell in the human body must have a very specific size if it is to function correctly. A working group, led by Markus Hengstschläger from the university's Institute of Medical Genetics, has discovered a new mechanism that regulates cell size. As the body needs a way of constantly and carefully controlling the number and size of all its different types of cells, the mechanism is integral to the functioning of the body as a whole and the individual organs.

The precise quantities of particular cells are regulated by cell division, and their size by regulation of cell growth. When cell growth regulation fails, it may mean that individual cell types can no longer carry out their functions, which in the majority of cases results in tumours. "These findings represent an important step forward in our understanding of the molecular regulation of cell growth and could be of relevance in the development of future cancer treatments," explains Hengstschläger.

NEW ASPECT OF GENE REGULATION

A joint MFPL and University of Natural Resources and Applied Life Sciences Vienna research group, headed by Andrea Barta, have uncovered a whole new aspect of gene regulation, which they call exitron splicing. Their findings are important to our understanding of the complexity of gene regulation and how genes respond to developmental signals and the environment. The discovery also paves the way for new therapeutic targets and methods of diagnosis such as the development of biomarkers and drug targets in the fight against cancer.

GENES AND NUCLEAR PORES NEED THE HELP OF "TRANSLATORS"

As well as controlling the transport of molecules in and out of the cell nucleus, nuclear pores in the nuclear membrane play an important role in the reading of genetic information – or gene expression. MFPL researchers have discovered a mechanism by which nuclear pores directly influence gene expression with the help of "translators". The findings were published in the respected journal Cell and are the result of collaboration with The Research Institute of Molecular Pathology (IMP) in Vienna and Pennsylvania State University.

"If we really want to understand the blueprint of a cell, understanding transcription mechanisms is vital. It's the key to being able to one day treat a range of diseases including cancers, which are often ultimately the result of communication errors in the reading of genetic information," says Alwin Köhler, a group leader at MFPL.

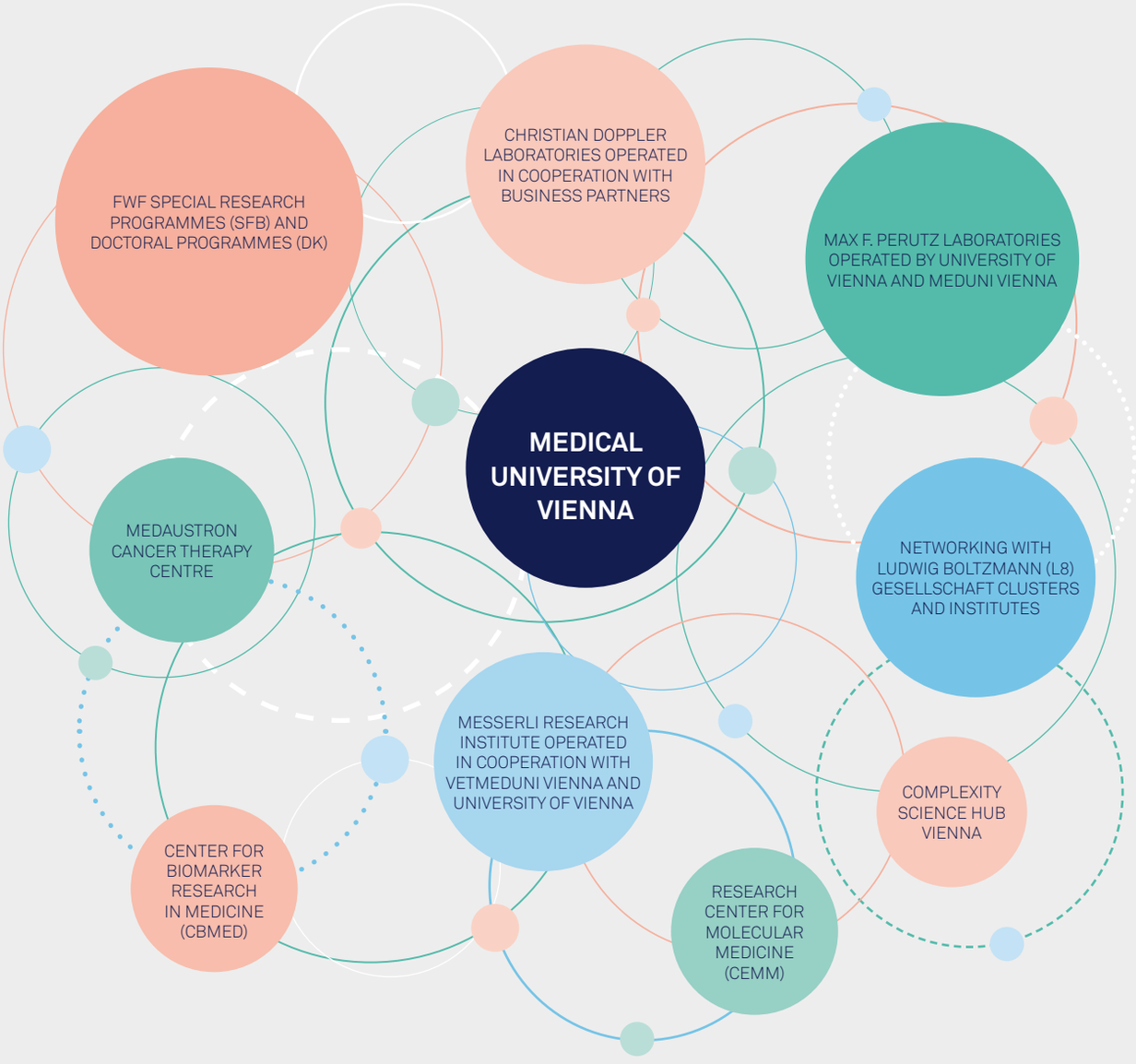
CELL SIGNAL TRANSMISSION

In a separate study, Thomas Leonard and his MFPL research group showed that the activity of the ROCK enzyme is regulated by a molecular ruler. ROCK is a protein kinase that transmits signals and regulates complex cell processes. Their research describes a whole new model of kinase regulation in cells and was published in Nature Communications. ●

Basic research funding

The major funding bodies in Austrian basic medical research are the Austrian Science Fund (FWF), the Vienna Science and Technology Fund (WWTF) and the EU Commission.

Fostering partnerships



MedUni Vienna plays a central role in life sciences research in Austria. Various research consortiums have links to the university, or are headed or managed by MedUni Vienna experts.

Mass spectrometry is becoming increasingly important for the characterisation and identification of biomolecules. It is currently the most common method for this kind of analysis, but is an elaborate and expensive technique – unlike matrix-assisted laser desorption/ionisation (MALDI), the subject of a range of MedUni Vienna joint projects.

The Department of Biomedical Imaging and Image-guided Therapy and the Department of Surgery at MedUni Vienna are developing MALDI technology in conjunction with industrial partners. The project, with the objective of enabling analysis of tiny amounts of substances from tissue samples and body fluids, is integrated into CBmed, a new Austrian competence centre, which is partly owned by the university. It is hoped that biomarkers identified using MALDI mass spectrometry will subsequently be used in the development of personalised medical treatments.

Results so far are promising, according to Rudolf Oehler (Department of Surgery) and Gerald Stübiger (Department of Biomedical Imaging and Image-guided Therapy), who says: "When compared to the method that is most commonly employed today, liquid chromatography-electrospray ionisation, MALDI is more reliable and crucially more cost effective. So we think this technology will help to bring about a revolution in molecular diagnostics and therapy."

CBMED – APPLICATION-ORIENTATED RESEARCH

As well as MedUni Vienna and Graz's three universities, CBmed's shareholders include the Austrian Institute of Technology (AIT) and Johanneum Research. CBmed was founded in 2015, with 34 industrial and 23 research partners joining its consortium in the first year. The network has helped to strengthen the financing and resourcing of the MALDI project.

COMPLEXITY SCIENCE HUB VIENNA

"Gaining meaningful insights from big data" is the stated goal of Complexity Science Hub Vienna, which was founded in 2015 and focuses its efforts on basic research activities. The research centre was established by the Vienna University of Technology, Graz Technical University, MedUni Vienna and AIT. The first president of the new Complexity Science Hub is Stefan Thurner, who was appointed Professor of the Science of Complex Systems at MedUni Vienna when the post was created in 2009.

MESSERLI RESEARCH INSTITUTE

Another of the university's important collaborations is the Messerli Research Institute, a cooperation with Vetmeduni Vienna and the University of Vienna, which carries out research into the relationship between humans and animals and the underlying issues of ethics, comparative medicine and animal cognition and behaviour. A broad interdisciplinary approach brings together academics from the fields of biology, medicine, veterinary medicine, philosophy, psychology and law. The Institute puts a strong emphasis on its international orientation. ●

A joint strategy for life sciences in Vienna

In 2015 MedUni Vienna, the University of Vienna and the Austrian Academy of Sciences (ÖAW) agreed to develop a joint life sciences strategy with the objective of strengthening Vienna's position as a centre of life sciences.

Each of the three partners brings something different to the table in terms of specialisms and expertise. MedUni Vienna will be able to harness its standing as a leader in oncology, immunology, medical neuroscience, cardiovascular disease and molecular imaging. The aim of developing a joint strategy is to optimise content coordination and planning for this and future collaborations, as well as injecting new and sustained impetus into science policy.

The three strategic partners have already been working together for some time. MedUni Vienna and the University of Vienna have been jointly operating the Max F. Perutz Laboratories at Vienna Biocenter for ten years now, with which the Institute of Molecular Biotechnology and the ÖAW's Gregor Mendel Institute of Molecular Plant Biology have very close ties. MedUni Vienna and the ÖAW's Research Center for Molecular Medicine have also been working together at the university's Vienna General Hospital site since 2005.

Tissue engineering for dental pulp, periodontal ligament and bone

A team of researchers at the University Clinic of Dentistry are working on cutting-edge technologies for the regeneration of oral tissues. The aim is to improve treatment options for specific groups of patients, such as diabetics.

Hermann Agis and his interdisciplinary team of dentists, biologists and biotechnologists at the University Clinic of Dentistry's Competence Center for Tissue Engineering and Cell-based Therapies are developing innovative strategies for the regeneration of dental pulp, periodontal ligament and bone. The three key elements of tissue engineering – cells, biomaterials and active molecules – play a central role in their work. Important fields of application for the method are endodontics, periodontology and oral surgery.

IMPROVED TISSUE HEALING IN DIABETICS

The team's current projects include innovative treatment strategies for improved healing in patients with specific health conditions, with diabetes as a potential field of application. Studies show that thrombocytes and cellular oxygen sensors play a major role in healing. The researchers are investigating how these active molecules can be used to promote regeneration of oral tissues in patients with diabetes.

DENTAL PULP REGENERATION

Another important focus of the competence centre's current projects is the development of cutting edge approaches in regenerative endodontics. They are researching the cellular processes of dental pulp regeneration to establish the groundwork for new regenerative strategies, which involves evaluating molecules that may promote blood vessel formation and the testing of new scaffold materials.

BONE REGENERATION AND BIOMATERIALS

One approach to promoting bone regeneration is pharmacological simulation of hypoxia and the researchers are investigating how hypoxia-mimetic agents can be most effectively used for this in the treatment of patients. They are also working on the functionalisation of clinical biomaterials such as collagen membranes and bone substitute materials.

NEW IN VITRO METHODS

Developing these new therapy strategies requires experimentation using both in vitro and in vivo techniques. One of the competence centre's research specialisms is the development of new in vitro testing methods as potential alternatives to animal testing. Thanks to their work, innovations such as 3D wound healing models, spheroid cultures and tooth slice organ cultures have all been established at the University Clinic of Dentistry Vienna. In 2015 the centre published studies into tooth slice organ cultures in the Journal of Endodontics and the International Endodontic Journal, attracting considerable international attention among experts.

The journey from basic research to the bedside

In 2015 the Anna Spiegel Building, which is home to the Center of Translational Research, celebrated its five-year anniversary with an expert symposium. As well as providing sophisticated core research facilities and know-how that are at the disposal of all research groups, certain groups who benefit from particularly close communication with each other are located at the service-focused centre.

This type of exchange between issues facing clinical practitioners and research into them, and the flow of new findings back into medical care and treatments, is called translational research. The approach ensures that the patients of Vienna General Hospital receive state-of-the-art treatment and that the results of new research are implemented into clinical practice as quickly as possible.

Diabetes: cough remedy improves blood sugar levels

The drug dextromethorphan can be found in many over-the-counter cough remedies. A study published in Nature Medicine has now shown that it can also be used to improve blood sugar levels in type 2 diabetes sufferers.

The research group behind the paper, based at the Center for Physiology and Pharmacology and led by Marjan Slak Rupnik, described how dextromethorphan can extend the periods of electrical activity in beta cells. It is during these periods that the cells secrete insulin. According to the researchers, the drug is able to stimulate increased beta cell insulin production in the pancreas via NMDA receptors when blood sugar levels are high. It therefore regulates blood sugar levels and reduces peaks.

Inventor of the Year

Christian Gruber, a group leader at the Center for Physiology and Pharmacology, was voted MedUni Vienna Inventor of the Year 2015. As a result of the development work on circular synthetic peptides carried out by Gruber and his team, MedUni Vienna was able to file patents in several countries, and in May 2015 signed a licence agreement with Swedish investment group Accequa AB for the development and use of these cyclotides for the prevention and treatment of autoimmune diseases. The project received financing from the Austrian Science Fund, and was also recognised with the Austria Wirtschaftsservice's PRIZE 2013 prototype development award.

Conveying knowledge

> *We are who we are because of what we learn and what we remember.*
>
> Eric Kandel

Positive feedback on the new Clinical Practical Year

The Clinical Practical Year (CPY) was introduced for the first time in the 2014/15 academic year. After completing 48-week placements at accredited hospital departments, sixth-year students came back to university and presented their newly acquired competencies during Return Week.

The medical students in their sixth year of study gained practical clinical experience working in teams at accredited teaching hospitals and university departments. Over the 48-week programme, they completed two CPY components (internal medicine and perioperative care and surgery) and either one or two electives.

SKILL ACQUISITION

The budding doctors were assigned mentors to guide them through this period of intensive clinical training. The year presented an opportunity for them to apply the knowledge and skills they had acquired over the previous five years of study, and to develop their competence in professional medical conduct. The primary goals were the acquisition of skills meeting European requirements and those of the Austrian Competence Level Catalogue for Medical Skills, as well as competencies in applying academic reasoning to clinical issues, and evidence-based medical practice.

RETURN WEEK

When the students returned to university after finishing the demanding clinical training programme, they completed study units focusing on case studies and clinical decision-making skills as part of the new Return Week.

In a ceremony on 26 November 2015 at the Wiener Konzerthaus, some 357 graduates took their academic oath to the thunderous applause of their families and friends. The degree certificates were presented by Rector Markus Müller and Vice Rector Anita Rieder.

In small groups moderated by experienced clinicians, students presented and discussed real cases that had been recorded in their portfolios, and were asked to provide feedback on the supervision they had received during their CPY.

POSITIVE FEEDBACK

90% of students reported that they had been able to apply their medical knowledge when treating patients. 88% said they would recommend the department they had worked in, 86% felt they had been integrated well into their teams, and 86% said they had been able to broaden their knowledge. 84% rated their mentor's supervision as "good", and 71% thought the exit interview was "useful".

WELL OVER A THOUSAND PLACEMENTS IN AUSTRIA AND ABROAD

A total of 215 placements were made available for students at Vienna General Hospital in the 24 divisions of the university departments, five clinical institutes, two institutes and one clinical centre. A further 1,332 placements

were offered at 84 training hospitals around the country. Organised into components lasting a third of a year, there were a total of 404 places for internal medicine, 500 for perioperative care and surgery, and 643 for electives. Accredited training hospitals abroad, as well as the 20 general practices that are currently accredited to provide training, also offered placements.

THIRD YEAR OF MEDAT

For the third year in a row standard entrance tests were used in the admissions processes for medical degrees (MedAT-H) and dentistry degrees (MedAT-Z) at all Austrian medical universities – the result of a joint initiative to develop centralised processes. A total of 11,409 applicants sat the MedAT tests at the medical universities in Vienna, Innsbruck and Graz and the Faculty of Medicine at Johannes Kepler University Linz on 3 July 2015.

741 STUDY PLACES IN VIENNA

The 1,561 study places in Austria were offered to 789 women and 772 men. 4,861 applicants took the entrance test at MedUni Vienna; 1,989 men and 2,872 women. In Vienna 397 of the 741 places were awarded to women, and 344 to men. Originally only 740 places were planned – however, following application of a rule governing procedures in the event of level scores, an additional place was made available. In Innsbruck 202 of the 400 places were offered to women, and 198 to men. In Graz the split was 163 women and 197 men (360 in total), and in Linz 27 places were awarded to women, and 33 to men (60 in total).

AUSTRIA'S MOST SUCCESSFUL STUDENTS

A study commissioned by Johannes Kepler University Linz and conducted by the economist Friedrich Schneider showed that MedUni Vienna had the lowest dropout rate and the highest graduation rate of any Austrian university, based on data from the 2012/13 academic year. The figures have also continued to improve and in 2014/15 the graduation rate for medical and dentistry students was 86.4% (85.0% for women and 87.6% for men). ●

MedUni Vienna's Young Scientist Association (YSA) held the inaugural Science | Art Contest, which presents academic papers using illustrations and visualisations, as part of the university's 11th YSA PhD Symposium. The symposium – the largest of its kind in Europe – enables young researchers to network and compare notes. Doctoral students present their theses and international experts share their experience in keynote lectures. At the symposium, Karin Schelch from the university's Institute for Cancer Research received the YSA Publication Award for her article 'Spatio-temporally precise activation of engineered receptor-tyrosine kinases by light'.

Specialisation at the highest level

International collaborations prepare the ground for a drug development educational programme and the new Medical Technology PhD.

A new project has been set up to help prepare young researchers for careers in the biomedical sciences industry. In collaboration with Karolinska Institutet in Sweden, the Helmholtz Centre for Infection Research in Germany and other European partners, Michael Wolzt's team at MedUni Vienna's Department of Clinical Pharmacology is working on an education programme that is specifically tailored to the requirements of the pharmaceutical industry, with the goal of accelerating research into new drugs.

The Erasmus+-financed project, named the Competency-based Course on Translational Research and Medicines Development for PhDs and Postdocs (C-COMEND), is scheduled to last two years and aims to strengthen the European Union as a location for innovative biomedical research.

DRUG DEVELOPMENT TRAINING NETWORK

14 researchers have been given the opportunity to improve their medical statistics skills thanks to the Improving Design, Evaluation and Analysis of early drug development Studies (IDEAS) project. The competencies acquired will help them to identify ineffective and unsafe drugs more effectively and confidently at earlier stages of the drug development process. The central theme of this innovative training network, which is funded by the EU under a Marie Skłodowska-Curie grant agreement, is statistical methods for the design, evaluation and analysis of clinical studies.

MENTORING PROGRAMME FOR YOUNG RESEARCHERS

In order for young researchers to get a foot in the door, international experience is essential. With this in mind, since 2010 MedUni Vienna's Alumni Club has been cooperating with Austrian Scientists and Scholars in North America (ASciNA), a mentoring network of over 1,000 Austrian scientists and researchers in the US, Canada and Mexico. The current round of the programme started in 2015, and the Alumni Club is sponsoring three mentoring pairs, working on research in North America, for one year.

PhD programmes, doctoral programmes and doctorate placements

More than 1,400 early stage researchers are currently engaged in PhD or other postgraduate doctoral studies at MedUni Vienna, with an international contingent of around 30%. The vast majority of doctoral candidates have fixed-term employment contracts with the university for their thesis project work. They receive professional support from their supervisors, who have been trained on two-day train-the-trainer workshops introduced in 2013.

PhD students are fully integrated into research groups, and their studies lay the foundations for their subsequent research specialisation. On receiving their PhD they already have numerous publications to their name, in many cases in leading journals. Admissions to the doctoral research programmes funded by the Austrian Science Fund (FWF) are subject to a two-stage selection process that incorporates international review. The applied medical sciences doctoral programmes provide in-depth training in applied biomedical research.

PHD PROGRAMMES

- Molecular Signal Transduction
- Molecular Mechanisms of Cell Biology
- Medical Physics
- Neuroscience
- Malignant Diseases
- Endocrinology and Metabolism
- Vascular Biology
- Immunology
- Medical Informatics, Biostatistics and Complex Systems
- Inflammation and Immunity (IAI)
- Cell Communication in Health and Disease (CCHD)
- Molecular Mechanisms of Cell Signaling
- RNA Biology
- Molecular Drug Targets (MolTag)
- Molecular, Cellular and Clinical Allergology
- Integrative Structural Biology

APPLIED MEDICAL SCIENCES DOCTORAL PROGRAMMES

- Clinical Endocrinology, Metabolism and Nutrition
- Biomedical Engineering
- Clinical Neurosciences (CLINS)
- POeT – Program for Organ Failure, Replacement and Transplantation
- Clinical Experimental Oncology
- Preclinical and Clinical Research for Drug Development
- Regeneration of Bones and Joints
- Cardiovascular and Pulmonary Disease
- Mental Health and Behavioural Medicine
- Public Health

Transcultural Medicine and Diversity Care

In October 2015 MedUni Vienna introduced a new postgraduate continuing education course that addresses the increasing challenges presented by greater international mobility – an important addition to the university's curriculum.

Greater international mobility means that the socio-cultural diversity in Europe's healthcare facilities is broader than ever. As a result, healthcare professionals have to face the new and complex challenges posed by a multiplicity of languages and lifestyles.

INTERDISCIPLINARY CURRICULUM

Students on the new, solutions-orientated interdisciplinary master's course gain in-depth, practice-based expertise in the fields of medical anthropology, transcultural psychiatry, and gender and migration research. As well as doctors, the two-and-a-half-year part-time programme is aimed at people working in a wide range of other disciplines, from psychologists, nursing and nutritional science specialists, pharmacists, sociologists and anthropologists to high-level healthcare, nursing care and medical technology service professionals.

INCLUSION A PRIMARY OBJECTIVE

The first master's course of its kind in Europe, the programme offers students practical expertise related to

Medical Informatics master's programme

As an alternative to the standard third-semester curriculum, students on the Medical Informatics master's programme can opt to take the practical and engaging project-based study elective – a combination of hands-on project work, lectures and self-study. Academic support is provided by supervisors, who are responsible for determining the basic parameters for the project work. As well as acquiring the competencies set out in the curriculum, students who take this option can focus on their own specific areas of interest and apply the theoretical knowledge they have gained in practice.

the impact of socio-cultural conditioning on health and illness behaviour, attitudes towards the body, psychosocial stress and specific health problems in patients with a migration background, and expectations and attitudes with regard to treatment. The goal is to ensure that all patients have the same access to and standards of care, irrespective of their social and cultural backgrounds or language competence.

SUCCESSFUL START IN AUTUMN 2015

The first intake of 19 students from a variety of professional backgrounds began their studies in October 2015. The programme coordinators are Türkan Akkaya-Kalayci of the University Department of Child and Adolescent Psychiatry and Christine Binder-Fritz from the Center for Public Health.

Continuing education courses and master's programmes

With master's programmes resulting in an MSc, MAS or MBA, as well as certificate courses, and continuing education courses providing certification to practise in a particular field, the part-time postgraduate courses offered by MedUni Vienna cover a wide range of disciplines. But there is one thing that all of the continuing education programmes have in common: teaching staff from Austria and abroad and cooperations with other leading universities and educational institutions – guaranteeing postgraduate training of the highest quality.

MSC MASTER'S PROGRAMMES

- Ergonomics and Fitness for Work
- Clinical Research
- Forensic Sciences
- Gender Medicine
- Interdisciplinary Pain Medicine (ISMED)
- Periodontology
- Patient Safety and Health Care Quality
- Prosthodontics
- Psychotherapy Research
- Public Health
- Traditional Chinese Medicine (TCM)
- Toxicology
- Transcultural Medicine and Diversity Care

MBA MASTER'S PROGRAMMES

- Health Care Management (HCM)

MAS MASTER'S PROGRAMMES

- Insurance Medicine

CONTINUING EDUCATION COURSES WITH CERTIFICATION

- Clinical Trials Assistant
- Medical Hypnosis
- Medical Physics
- Medical Hypnosis for Dental Care

CERTIFICATE COURSES

- Ethical and Legal Aspects of Clinical Research
- Sleep Coaching

www.meduniwien.ac.at/postgraduate/

TOP STORIES IN 2015

Science affects us all

The university's know-how reaches out much further than the scientific community – and not just through patient care. A range of MedUni Vienna initiatives are designed to communicate the knowledge generated at the largest medical university in the German-speaking world to the public in coherent and practical formats.

Getting excited about research

Four Young Science Ambassadors have been tasked with sparking interest in science

The university's Young Science Ambassadors are Christian Gruber (Institute of Pharmacology), Thomas Grunt (Department of Medicine I), Christian Kollmann (Center for Medical Physics and Biomedical Engineering) and Tim Skern (Max F. Perutz Laboratories). On a voluntary basis, since autumn 2015 the researchers have been making visits to Austrian schools to tell pupils about their academic careers and day-to-day work.

New series of guides

MedUni Vienna series kicks off with books on high blood pressure and pollen and allergy

Published in April 2015, Pollen und Allergie was the first in a new series of guides based on medical research that are being jointly published by MedUni Vienna and Manz Verlag. It was followed in the autumn by Bluthochdruck, a title focusing on high blood pressure, a condition which affects the lives of many people. The authors of both books are leading experts from MedUni Vienna. All the titles in the series will be written for a general audience and address prominent diseases, outline the latest research and give useful tips on prevention and treatment. Two or three will be published every year.

Food allergies in focus

An Austrian Science Fund (FWF) project is making scientific findings accessible to all

The public had the opportunity to learn about many aspects of food allergies thanks to the FWF-funded project Food Allergies – A Hard Nut to Crack. The initiative included a walk-in model of the gastrointestinal tract displayed as part of an awareness-raising day at a Viennese shopping centre, workshops held in schools, information leaflets and a dedicated website containing useful information. The immune systems of food allergy sufferers react to otherwise harmless substances in food, and the gut plays a significant role in this.

Free and open to all

MedUni Vienna know-how direct from the experts

University experts shared useful knowledge on a wide variety of health-related themes at over 50 free MedUni Vienna public events in 2015. An excellent example is the Mini Med lecture series that presents the very latest research to anyone with an interest in health and medicine and has become somewhat of an institution. Other events that have enjoyed great popularity for years are the Health Talks, the Cancer School Vienna and Brain Awareness Week – the Center for Brain Research's sizeable annual schools initiative.

KinderuniMedizin

Over 2,000 children enrolled in MedUni Vienna's kids uni

In 2015 knowledge-hungry youngsters once again had the chance to take part in exciting events as part of MedUni Vienna's KinderuniMedizin. The children who attended From Spectacles to Artificial Hearts – Technology for Life were let into some medical secrets and learnt amazing things about the human body, diseases, therapies and prevention. KinderuniMedizin was packed to the rafters, with a total of 2,000 kids taking up the 4,924 places at the 91 lectures held at MedUni Vienna.

Putting knowledge to use

> *Most people say that it is the intellect which makes a great scientist. They are wrong: it is character.*
>
> Albert Einstein

Miniature heart pump: first implantation in the world

MedUni Vienna has pulled off a world first with the implantation of a brand new type of heart pump, the Miniaturised Ventricular Assist Device (MVAD). The university was heavily involved in the development of this innovation, and of a new material for artificial blood vessels.

"We consider this miniaturised pump to be another big step forward in heart treatment which has the potential to change the way advanced stage heart failure is treated," explained Günther Laufer, head of the Division of Heart Surgery at MedUni Vienna, where the patient received the new MVAD heart pump. The implantation marks the beginning of an international study with the objective of CE marking and approval of the pump.

LESS STRAIN ON PATIENTS

The new MVAD pump is half the size of the smallest currently available full support implant (HVAD), and is implanted using a less invasive operative procedure, reducing strain on the patient. It weighs just 78 grams and has a volume displacement of 22ml. "The MVAD pump therefore has an extremely minimal space requirement in the thorax. This makes it ideal for minimally invasive implantation procedures, which is our preferred approach for the current generation of HVAD pumps," said Daniel Zimpfer, head of the Mechanical Circulation Support programme at MedUni Vienna and Vienna General Hospital.

LEADING THE WAY IN DEVELOPMENT

In recent years the Division of Heart Surgery has taken a pioneering role in the development of methods for the implantation of ventricular assist systems via small incisions in the skin. MedUni Vienna has also been instrumental in the development of the new generation of MVAD pumps, in no small part due to the efforts of Heinrich Schima's working group at the Center for Medical Physics and Biomedical Engineering.

NEW MATERIALS FOR ARTIFICIAL BLOOD VESSELS

A joint development project between MedUni Vienna and Vienna University of Technology is focusing on a related area. A blocked blood vessel can rapidly become life threatening and bypass surgery is often the only option.

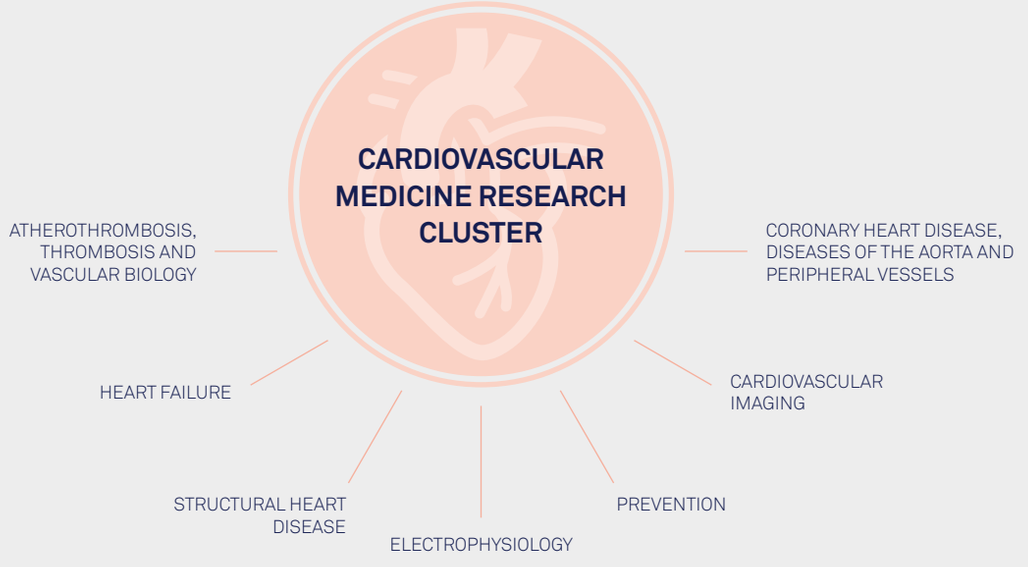
Blood vessels from other parts of the body are normally used in these operations, but the use of artificial blood vessels is now set to become more widespread thanks to new man-made alternatives that have been developed in a collaboration between the two universities. The project was entered into the Austria Wirtschaftsservice (AWS) PRIZE competition, and as one of the winners has received funding for the development of a prototype.

CLINICAL APPLICATIONS ON THE HORIZON?

Artificial materials that have been used up to now have one major drawback: they are not fully compatible with the body's tissues, meaning the blood vessels can easily block. This is not the case with the newly developed polymer-based blood vessels, which are slowly replaced by the body's own tissue. The result of this transformation is a natural, fully functioning blood vessel. "The walls of these artificial blood vessels are very similar to the wall of a natural blood vessel," according to Heinz Schima. Further pre-clinical trials are needed before the artificial blood vessels can be used in the operating theatre, but based on the results so far the research team are confident that the new technology will prove successful for applications inside the human body in a few years' time.

Cardiovascular medicine research cluster

Numerous factors play a part in the development of cardiovascular conditions, which affect all of the body's organ systems. In addition to cardiovascular disease, the principal objects of the Cardiovascular Medicine Research Cluster's research are imaging and non-imaging diagnosis, as well as epidemiology and genetic research. The cluster is also known for its basic research into vascular biology and thrombosis, and interdisciplinary activities ranging from biomechanics to gene and stem cell therapy.



Leading the way globally in cancer research

Austria's largest breast cancer research trial, ABCSG 18, showed that it is possible to reduce the chances of developing osteoporosis as a long-term consequence of cancer therapy. The results, produced by experts from the university, have given fresh impetus to cancer research around the world – as have two further studies and two high-profile oncology congresses.

With a major contribution from MedUni Vienna's Comprehensive Cancer Center Vienna (CCC), Austria's largest ever cancer study, conducted by the highly respected Austrian Breast & Colorectal Cancer Study Group (ABCSG), showed that patients who have had endocrine cancer treatment can be protected from osteoporosis. The study, entitled ABCSG 18, was a placebo-controlled adjuvant trial involving 3,425 post-menopausal breast cancer patients. Based on the data collected, researchers concluded that the occurrence of osteoporosis and bone fractures induced by therapy – as a side effect of endocrine adjuvant treatment – can be easily reduced using aromatase inhibitors, without additional toxicity. Administering the standard therapy denosumab (an antibody injected twice a year) was shown to reduce the rate of osteoporosis-induced fractures by 50%. Furthermore, bone density increased and the number of vertebral fractures was halved.

FRACTURES A BIGGER PROBLEM THAN PREVIOUSLY THOUGHT

"As well as fracture prevention – the unexpected clear main effect – our data also shows that therapy-induced fractures may be a much bigger problem than we had suspected," reports Michael Gnant, director of the Department of Surgery, deputy director of the CCC and president of the ABCSG, who headed the study. The ABCSG is Austria's largest study group and has enjoyed great success over its 30-year history. With this study, it has once again underlined its leading position in international cancer research.

HEALTHY BONES IN SPITE OF BREAST CANCER

Gnant believes that the study, published in the prestigious journal The Lancet, will bring about an international practice change in breast cancer treatment: "With just two injections a year, we can prevent a serious negative

Medical congresses make Vienna an international conference hotspot

Many leading international medical congresses take place in Vienna – a key factor for Vienna's status as a research and business hub. They are vital to the Viennese exhibition and conference industry and are responsible for about 5% of overnight stays in the Austrian capital. One of the high-profile professional get-togethers that took place in Vienna in 2015 was the 14th St. Gallen Breast Cancer Conference in March. It is Europe's largest breast cancer congress and attracted around 5,000 delegates. This was followed in September by the European Society of Medical Oncology's European Cancer Congress 2015 (ECC 2015) – a massive event with 20,000 participants and a very big deal in the world of research. This time around the conference focused on targeted therapy and immunotherapy.

Roughly 3,000 runners took part in the 9th Cancer Research Run. The charity event, organised by MedUni Vienna's Cancer Research Initiative, raised over EUR 130,000 for cancer research projects.

effect of cancer treatment. I think this benefit means that it has to become the standard treatment in Austria in the very near future." ABCSG expert, deputy director of MedUni Vienna's Breast Health Center, a member of the CCC, Christian Singer adds: "In this dosage denosumab is virtually side effect free. It's not often that you discover a beneficial effect profile – or side effect profile – like this in cancer research."

18 % FALL IN RECURRENCE RATE WITH DENOSUMAB

A further important effect observed by the study team was that administering denosumab to post-menopausal, hormone-receptor positive breast cancer patients receiving adjuvant treatment with aromatase inhibitors reduced the recurrence rate by 18%. "This is a very positive finding as it shows that, as well as halving bone fractures, the adjuvant denosumab also reduces the breast cancer recurrence rate," explains Gnant.

NEW STANDARD FOR BREAST CANCER TREATMENT

Two further studies published in The Lancet showed that anti-hormone and bisphosphonate treatments can reduce both the recurrence and fatality rates in post-menopausal patients with hormone-dependent breast cancer. Michael Gnant's team of researchers at the CCC played a major role in compiling these two meta-analyses. The university contributed more than just study data, with Gnant taking up a place on the writing committee of both studies and Peter Dubsk on one. According to the two experts, the two sets of results are highly significant because they will set new standards in breast cancer treatment.

NEW BREAST PRESERVATION TECHNIQUES FOLLOWING TUMOUR REMOVAL

One third of all patients undergoing a breast cancer tumour operation face the risk of losing the affected breast. At MedUni Vienna, medical staff are already able to save the breast and achieve a good cosmetic outcome for up to 20% of all patients. Innovative new techniques have been crucial in achieving this. Michael Gnant and the university's Florian Fitzal, who is a member of the CCC and director of the breast health centre at the Krankenhaus der Barmherzigen Schwestern hospital in Linz, are among the first in their field to practise these techniques and have also trained many other doctors in their application. ●

Cancer research and care: the Comprehensive Cancer Center

The Comprehensive Cancer Center Vienna (CCC) is a joint facility of MedUni Vienna and Vienna General Hospital (AKH). Building on the establishment of the university's Cancer Research and Oncology Research Cluster, it combines expert interdisciplinary cancer care with clinical and basic research, and world-class academic teaching.

Patients benefit from the innovative procedures and technologies – both in diagnosis and therapy – available to the experts working at the CCC thanks to the close links between care and scientific research. Patients also have the opportunity to take part in the latest Austrian and international research programmes.

The CCC carries out basic research into the development, growth and spread of tumours and applies the results directly in the clinic. This is possible as a result of the close ties it has with other parts of the university and cooperation with research groups, as well as collaborative work with other institutions involved in international cancer research.

www.ccc.ac.at

The CCC's three pillars of research

The mission of the CCC is to carry out research into the mechanisms underlying the development of cancer and directly and efficiently implement findings in patient care via new strategies for prevention, diagnosis and treatment. The organisational structure of the CCC is based on three pillars: units (clinical research), platforms (technologies) and clusters (basic and translational research).

UNITS

- CCC-BGZ Breast Cancer Unit
- CCC-CNS Central Nervous System Tumor Unit
- CCC-CRC Colorectal Cancer Unit
- CCC-GCU Gynecologic Cancer Unit
- CCC-GET Gastroesophageal Tumors Unit
- CCC-MST Musculosceletal Tumors Unit
- CCC-NET Neuroendocrine Tumors Unit
- CCC-UOU Urologie Cancers Unit
- CCC-PCU Pancreatic Cancer Unit

PLATFORMS

- Molecular Diagnosis and Treatment in Oncology
- DTS Drug & Target Screening
- TE Taskforce Extravasation
- Side effects – Management, Supportive Care & Rehabilitation
- SHCP Sexual Health in Cancer Patients

CLUSTERS

- CCC Cluster I Genetics & Epigenetics
- CCC Cluster II Immunology & Inflammation
- CCC Cluster III Toxicology, adverse drug effects, and cancer prevention
- CCC Cluster IV Experimental Therapy & Drug Resistance
- CCC Cluster V Microenvironment, Vasculature & Metastasis
- CCC Cluster VI Cell Signaling and Metabolism
- CCC Cluster VII Diagnostic and therapeutic Developments

New approaches in the fight against prostate cancer

An international research group including researchers at MedUni Vienna has developed a new prostate cancer combination therapy for the treatment of large tumours. A “cancer gene” that reduces metastasis has also been identified.

4,700 men are diagnosed with prostate cancer in Austria every year. Globally it is the third leading cause of cancer-related death in men. Chemotherapy treatment is very effective in the case of small prostate tumours. However, with large tumours the body’s immune response is suppressed by an increase in B-cells (B-lymphocytes), which contributes to further growth of the cancer in spite of treatment.

CLOSE TO FULL RECOVERY WITH CHEMOIMMUNOTHERAPY

An international research team with involvement from MedUni Vienna's Department of Pathology, the University Department of Urology, the Ludwig Boltzmann Institute for Cancer Research (LBI-CR) and the Unit of Pathology of Laboratory Animals at Vetmeduni Vienna has been able to show that a new combination therapy can successfully fight large prostate tumours. The treatment pairs a standard chemotherapy substance called oxaliplatin with immunotherapy and is effective in the treatment of otherwise therapy-resistant advanced prostate cancer. It works by first blocking the activity and functioning of B-cells. When the new chemoimmunotherapy was tested on mice with advanced prostate cancer, the result was almost full recovery.

EASING THE STRAIN ON PATIENTS

"What's more, the treatment is effective with low doses of chemotherapy, resulting in less strain on the patient," explained Lukas Kenner of the university's Department of Pathology. "We also think that similar immune-supressing B-cells play a role in other forms of cancer." This could lead to new treatment options for a range of cancers. The research was published in top journal Nature and stemmed from a collaboration between MedUni Vienna, the University of California, UC San Diego School of Medicine and the Charité medical university in Berlin.

"CANCER GENE" REDUCES METASTASIS IN PROSTATE CANCER

Another research group that Lukas Kenner is heavily involved in, with Jan Pencik as lead author, has established that a gene responsible for tumour growth plays a totally different role in prostate cancer than was previously thought. The STAT3 gene is controlled by the immune modulator interleukin 6 and normally promotes cancer cell growth. But in the case of prostate cancer the exact opposite is true because STAT3 activates the p14ARF gene, suppressing cell growth in prostate tumours.

BASIS FOR A NEW NON-INVASIVE TECHNIQUE

"The predictive capacity of these proteins when used as biomarkers is twice as good as the existing gold standard," is how Kenner explains the significance of the finding. Unnecessary surgery that can result in serious side effects such as incontinence and impotence can therefore be avoided. A new nuclear medicine examination technique based on the outcomes of the research could soon replace painful biopsy procedures. ●

TOP STORIES IN 2015

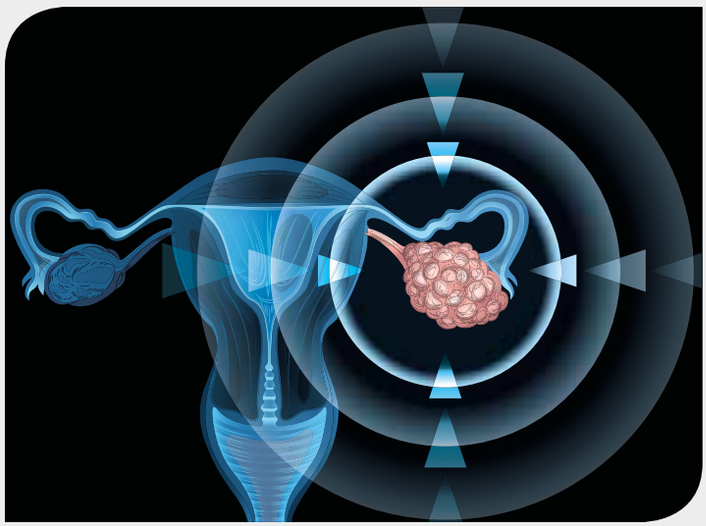
Treatment and early detection

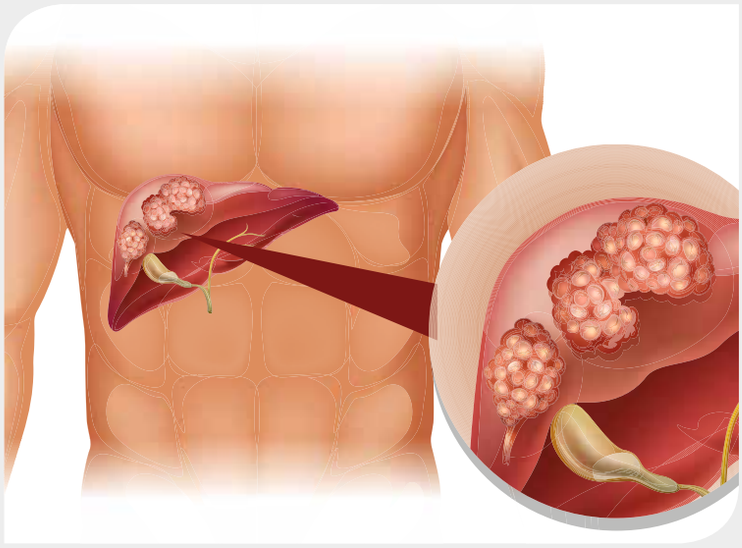
Cancerous tumours are among the most common diseases and can result in death in many cases. The university's oncologists work day in, day out on identifying the causes of cancer, how it can be detected as early as possible and the most effective treatments.

New early detection methods for ovarian cancer

Innovative catheter could hold the key

Ovarian cancer is a particularly aggressive form of cancer, and about 1,000 women are diagnosed with the disease in Austria every year. There is currently no method of early detection. This may soon change thanks to a new three-way catheter, developed by the molecular oncology working group and Paul Speiser from the Department of Obstetrics and Gynecology, and presented in the prestigious Journal of Clinical Oncology.





Potential new treatment for hepatocellular carcinoma

A positive step forward in the treatment of the most common form of liver cancer

Scientists at Institute of Cancer Research in the Department of Medicine I have published a study in respected journal Hepatology showing that the FGFR3 receptor boosts the growth and aggressiveness of hepatocellular carcinoma – regarded internationally as one of the most aggressive cancers. The research opens the door to a new, more effective method of treatment that inhibits this receptor.

Patients receive new skin cancer immunotherapy

Antibodies form one of the core components of the treatment

The two new anti-PD-1 antibodies nivolumab and pembrolizumab are now routine treatment options at Vienna General Hospital. Their introduction comes after studies by MedUni Vienna involving trials that took place over a three-year period. Roughly 1,500 people develop malignant melanoma in Austria every year. It is a form of cancer that has been very difficult to treat in the past, but with the introduction of this immunotherapy at the Department of Dermatology, that is set to change.

Effective therapy for lung and gastrointestinal tract tumours

New treatment options with mTOR inhibitor

An international multicentre phase III study entitled RADIANT-4 has firmly established the efficacy of the drug everolimus in the treatment of non-functional neuroendocrine tumours originating in the lungs and the gastrointestinal tract. Everolimus inhibits the mTOR enzyme inside the cell and has already been approved for the treatment of advanced neuroendocrine tumours in the pancreas. Markus Raderer from the University Department of Medicine I led the Comprehensive Cancer Center's involvement in the study.

Brain tumour networks potentially responsible for therapy resistance

Breaking up networks the way ahead

Astrocytomas, a type of brain tumour, do not respond well to standard therapies and are therefore difficult to treat. A reason for this resistance could be their ability to establish a communication network, a finding made by an international study with contributions from the Comprehensive Cancer Center. The paper was published in Nature and was received as an important milestone within the cancer research community.

World-class medicine made in Vienna

Top quality neonatal care resulting in outstanding survival statistics, an exceptional lung transplantation programme with a distinguished 25-year history, high-tech bionic prosthetic hands and further improvement in patient safety.

Outstanding treatment of the youngest of the young by MedUni Vienna: the latest statistics show that the survival chances of very premature babies are better than ever. The 23rd week of pregnancy is currently considered to be the border of survivability for premature babies, yet 70% of babies born at this stage survive at Vienna General Hospital's neonatal unit. "Globally, the statistic is 35%, which means twice as many of these tiny babies survive at our hospital," explained Angelika Berger, director of the Division of Neonatology, Critical Care Medicine and Pediatric Neurology. 161 of the 171 premature babies with birth weights of less than 1.5kg survived at Vienna General Hospital in 2014, a 94.2% survival rate. These successes are the result of a neonatal care strategy which has been in place since 2009. The consolidation of all obstetrics and neonatology departments into a perinatal centre is expected to bring about further improvements for high-risk patients and their families.

Transplants carried out by the university departments at Vienna General Hospital in 2015

Kidney	158
Liver	51
Heart	49
Lung	116
Pancreas	4
Bone marrow	387
Cochlear	86
Total number of operations	53.174

A LEADING CENTRE FOR LUNG TRANSPLANTATION

The university carried out its first lung transplant back in November 1989, when it was still a faculty of the University of Vienna. 25 years later Vienna is ranked as one of four global centres for lung transplantation, along with Hanover, Toronto and Cleveland. 120 patients are given new lungs in the Austrian capital every year. The University Department of Surgery serves as an international transplantation centre for donor lungs from Croatia, Cyprus, Estonia, Greece, Hungary, Romania, Slovakia, and Slovenia, countries which do not have their own transplant facilities.

"This is a win-win situation because we receive more donations than we require. The programme benefits patients in Austria, those in other countries and the Eurotransplant network, and is the envy of the world," said Walter Klepetko of the Division of Thoracic Surgery, who has been director of MedUni Vienna's lung transplantation programme from its inception. The large number of lung donations gives researchers at the university the opportunity to conduct high-quality studies and develop and implement new surgical techniques. This is the foundation of Vienna's position as a leader in the field.

OUTSTANDING EXPERTISE IN BIONIC RECONSTRUCTION

Oskar Aszmann, director of the Christian Doppler Laboratory for Recovery of Extremity Functions at MedUni Vienna's Division of Plastic and Reconstructive Surgery has published a transplantation-related study in the renowned medical journal The Lancet. In it he describes the bionic reconstruction technique he has developed, using complex neuromuscular surgery to establish an interactive biotechnological interface between man and machine. The outcome is a functioning hand for patients who have often suffered serious damage to the brachial plexus network of nerves. Because the patient's brains have forgotten how to manipulate their hand, which in many cases has been functionless for many years, they are first required to practise controlling the prosthesis they will receive via an electronic interface. When the high-tech neurorehabilitation is complete, the hand is amputated and replaced by a brain-signal controlled functioning prosthetic hand.

RAISING THE BAR FOR PATIENT SAFETY

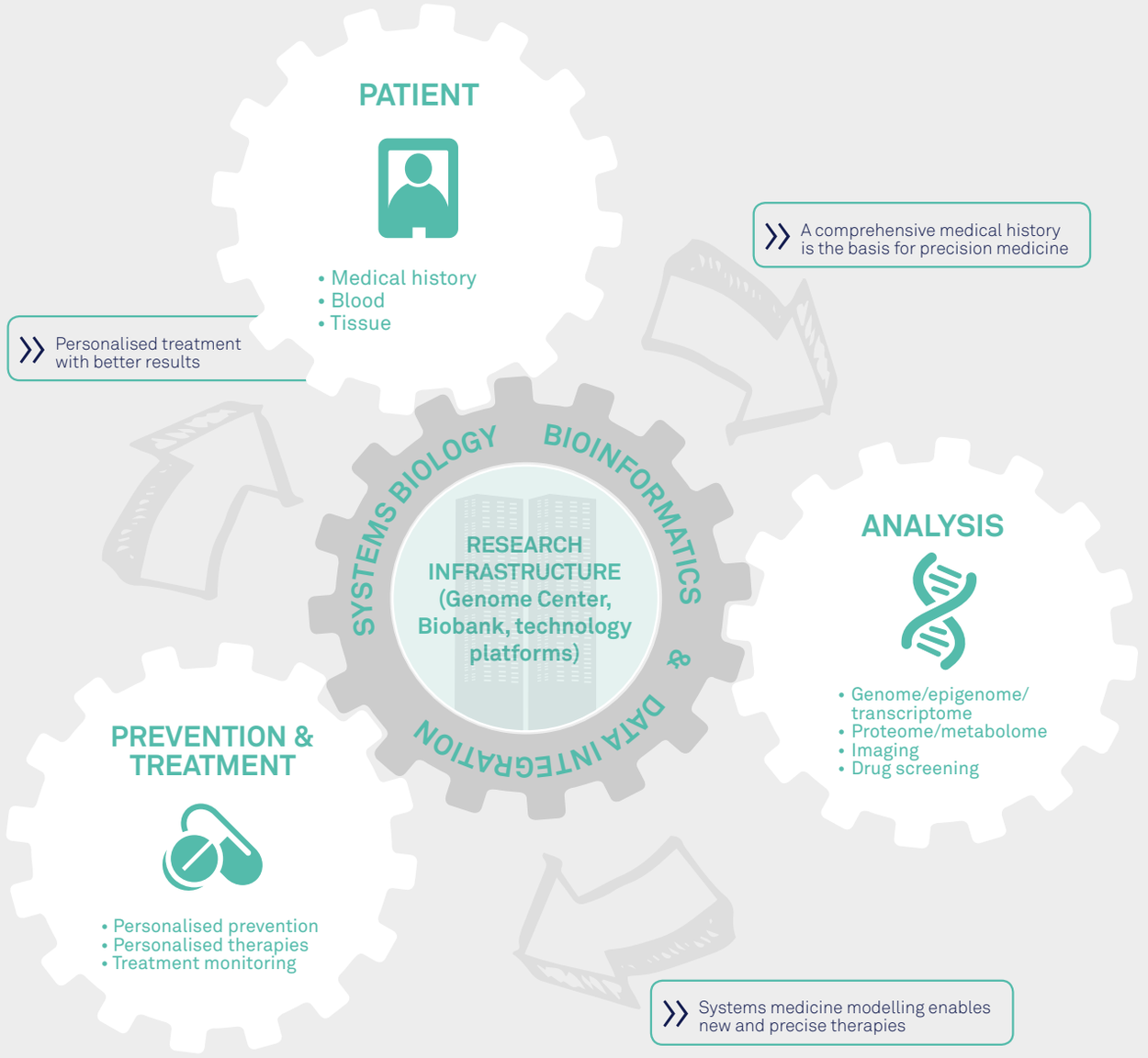
Impressive scientific and clinical advancements in recent decades have resulted in continuous improvements to patient safety in the areas of anaesthesiology, intensive care and surgery. The goal is now to further enhance safety throughout perioperative care – the care of patients before, during and after an operation. To achieve this, the Center for Perioperative Medicine was established, which is the first interdisciplinary centre set up under the University Medicine Vienna 2020 programme. Patients requiring particularly close monitoring while being prepared for surgery, during treatment or during follow-up care will be overseen by the centre for the full duration of their stay, from admission right through to discharge. The plans include interdisciplinary monitoring teams to carry out regular rounds of the hospital wards.

Precision medicine – healthcare for the 21st century

Precision medicine, also referred to as personalised medicine, seeks to identify the best treatment options for individual patients using analytical techniques that work at the molecular level. It is the most efficient strategy in fighting a range of previously and as yet incurable diseases such as various cancers and congenital rare diseases. Based on cutting-edge diagnostic methods including genome sequencing and molecular imaging.

Precision medicine is perhaps the most important medical development of the 21st century. It will lead to targeted prevention – by better identifying risk factors – and optimised treatment in a multitude of areas, including:

- Cancer
- Cardiovascular disease
- Mental health
- Sight and hearing loss
- Respiratory diseases
- Musculoskeletal diseases
- Metabolic disorders and obesity
- Genetic diseases
- Infectious diseases
- Autoimmune diseases



E-learning for dentistry

Greater practical focus in the Dentistry degree programme thanks to new digital tools.

In 2015 a comprehensive new e-learning platform was introduced for the Dentistry degree programme, incorporating digital tools for teaching activities that are based on realistic clinical situations. The project drew on considerable experience and expertise in this area from the Medicine degree programme. One example of how the platform is being used is for case study tasks, where the cases are introduced in lectures and then worked on over a defined period of time individually and in groups. It also gives students access to study materials, discussion forums and a range of tools – including one for peer reviewing each other. Assessment of the various tasks makes up part of the students' overall grade.

Healthy teeth for kids

Children's dental health needs are different to those of adults, which means different approaches – to examinations and treatment for instance – are necessary. MedUni Vienna has decided to make this an area of special focus, creating a new professorship in paediatric dentistry.

Despite a reduction in the incidence of tooth decay in the general population, early childhood caries (ECC) is still a major problem. ECC frequently appears shortly after the milk teeth have come through and then develops rapidly. It is the most common form of chronic disease in pre-school children. "This represents a big challenge in the field of paediatric dentistry," says Katrin Bekes, who took up the new post of Professor of Pediatric Dentistry in April 2015. "So we have to redouble our efforts towards improving healthcare expertise with respect to this risk group, and implement preventive measures across the board."

DEDICATED CHILDREN'S CLINIC

As well as the new professorship, part of the University Clinic of Dentistry is now devoted entirely to the treatment of children. Its child-friendly design creates a pleasant, unthreatening environment which puts the young patients at ease. Treatment is also very child-focused, and the dentists have all received additional training in relevant aspects of education and psychology. Communicating with the children as equals and nurturing trust are especially important facets of their work. From a purely medical perspective, the main difference to an adult facility lies in the treatment approaches employed. They have been specially developed for children, as general dentistry methods are not always directly transferable to the treatment of milk teeth, and appropriate treatment may depend on other factors such as the developmental stage of the child.

NEW RESEARCH AND TEACHING FOCUS

So that all children may be able benefit from the specialised approaches to treatment, a process of integrating paediatric dentistry more closely into the curriculum and clinical training of student dentists has begun. In future, as part of their 72-week internships dentistry students will be able to gain experience treating children at the children's clinic. They will also attend specialised seminars and lectures culminating in an examination. These paediatric dentistry components will cover effective communication with child patients, disease prevention and oral hygiene as well as minor restorative measures and designing treatment plans. ●

Template-guided dental implants

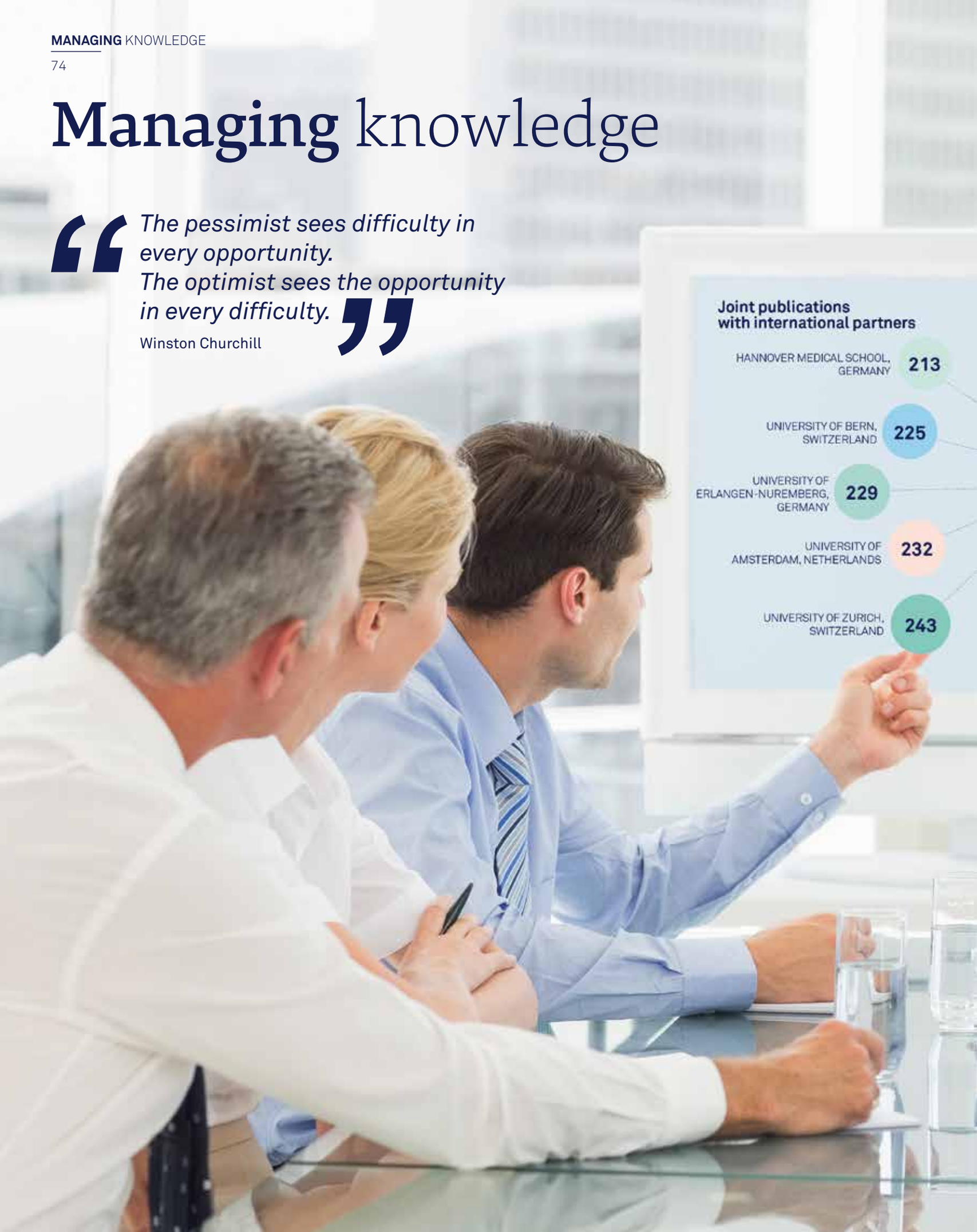
Computer-aided oral implant surgery at the University Clinic of Dentistry.

The template-guided implantation methods employed in the Clinic of Dentistry are already offering many patient benefits, in particular enabling precise execution of surgical interventions following preparation, which involves a "virtual treatment", taking into account the procedure and prosthetics to be employed.

The expansion of the treatment approach has facilitated a continuous digital workflow for the care of patients with missing teeth over an extended period of time. Christoph Vasak and Werner Zechner, dental technology experts at the Clinic of Dentistry, see this as an important step forward for dental implant treatment offered at the clinic.

Managing knowledge

> *The pessimist sees difficulty in every opportunity.*
> *The optimist sees the opportunity in every difficulty.*
>
> Winston Churchill




MEDICAL UNIVERSITY OF VIENNA
362
UNIVERSITY OF MUNICH, GERMANY
354
HARVARD UNIVERSITY, USA
332
CHARITÉ UNIVERSITY HOSPITAL BERLIN, GERMANY
321
KAROLINSKA INSTITUET, SWEDEN
263
HEIDELBERG UNIVERSITY, GERMANY
data: 2009-2014

Facts and figures

General

Employees

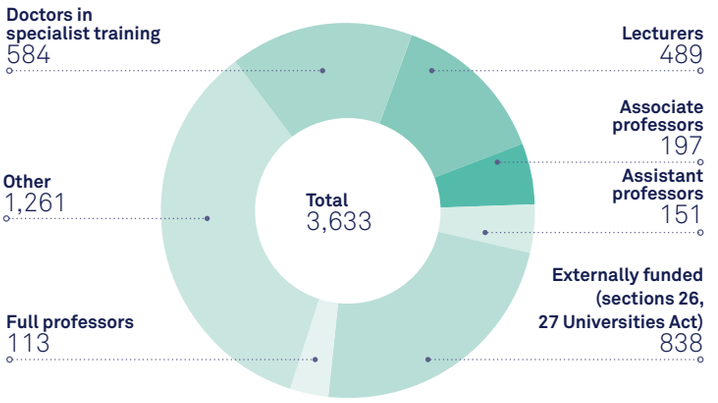
With 5,499 employees in 2015, MedUni Vienna is one of the largest centres of medical education and research in the German-speaking world. The number of administrative staff as a proportion of total employees remained low at 19.8 %.

WOMEN
3,037

MEN
2,462

Academic staff

3,633 academic staff (1,638 women and 1,995 men) work as researchers, lecturers and doctors at MedUni Vienna. Nine professors (four women and five men) were appointed in 2015, and 58 post-doctoral lecturing qualifications were awarded (to 23 women and 35 men).



Research

Research focuses (clusters)

- Immunology (Immunology Research Cluster)
- Cancer Research/Oncology (Comprehensive Cancer Center)
- Medical Neuroscience
- Cardiovascular Medicine (Cardiovascular Cluster)
- Medical Imaging (Medical Imaging Cluster)

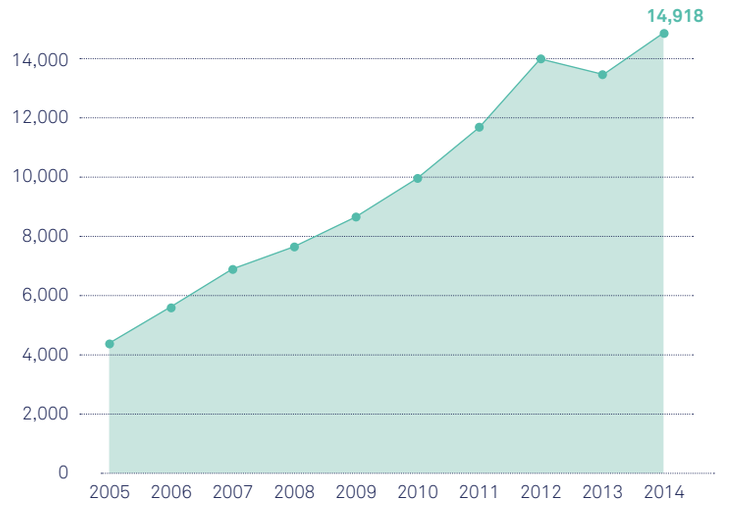
Research infrastructure

MedUni Vienna offers a full range of support facilities for the research groups active at the university.

- Flow Cytometry Core Facility
- Genomics Core Facility
- Imaging Core Facility
- Proteomics Core Facility
- Institute of Medical Genetics
- Center for Medical Statistics, Informatics and Intelligent Systems
- Clinical Trials Coordination Centre
- Medical Imaging Platform
- MedUni Vienna Biobank
- Department of Biomedical Research
- University Library
- Center for Medical Physics and Biomedical Engineering

Impact factor

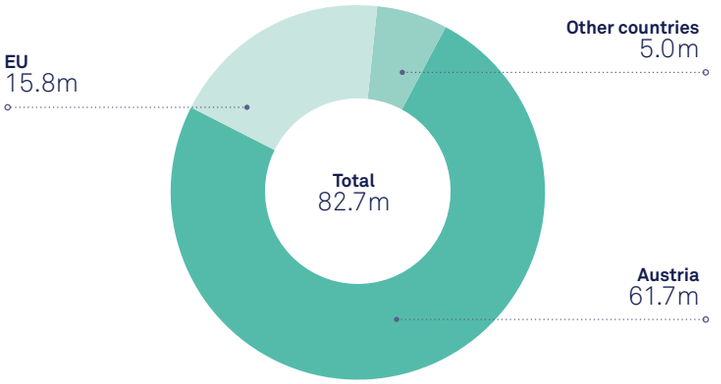
Impact factor of scientific publications, 2005-2014. Scientific output and the quality of research at MedUni Vienna have risen steadily.



Research

External funding
Revenue from R&D projects

External funding raised by MedUni Vienna pursuant to sections 26 and 27 Universities Act 2002, together with donations, amounted to EUR 82.7 million in 2015. After plateauing, revenue from research grants and donations increased again.



Research project proposals submitted to the Ethics Committee

186	Assessments for compliance with Pharmaceuticals Act
99	Assessments for compliance with Medical Products Act
891	Other studies
1,176	Clinical research study proposals

Patient care

Patient care at Vienna General Hospital

- 106,869 inpatient cases
- 539,611 outpatient cases
- 53,174 operations
- 1,603 doctors

University Clinic of Dentistry Vienna

- 121,567 treatment sessions
- 32,226 patients
- 95.4 weekend patients (average)
- 73.6 dentists (FTE)

Education

Courses offered at MedUni Vienna

- Medicine degree programme
- Dentistry degree programme
- Medical Informatics master's programme
- PhD programmes (16 research themes)
- Doctoral Programme in Applied Medical Science (ten research themes)
- Medical Sciences doctoral programme (being phased out)
- 18 postgraduate continuing education courses

90 teaching hospitals and 30 medical practices are accredited for clinical practice training.

Students by nationality	Women	Men	Total
Austria	2,794	2,718	5,512
EU	787	777	1,564
Other countries	472	366	838
Total	4,053	3,861	7,914

Students in mobility programmes (outgoing/incoming)	Women	Men	Total
Host/home country in EU	143/125	120/61	263/186
Host/home country outside EU	73/32	69/32	142/64
Total	216/157	189/93	405/250

Students in doctoral programmes	Women	Men	Total
Austria	479	480	959
EU	134	94	228
Other countries	118	120	238
Total	731	694	1,425

Organisational structure

As at 31 December 2015

SENATE
26 MEMBERS

RECTORATE
RECTOR AND
4 VICE RECTORS

UNIVERSITY COUNCIL
5 MEMBERS

SCIENTIFIC ADVISORY BOARD

Committees

- Working Group on Equal Opportunities
- Ethics Committee
- Arbitration Committee
- Works Council for General University Staff
- Works Council for Academic Staff
- Students Union (ÖH)
- Advisory Board for People with Disabilities
- Data Protection Commission

Curriculum Directors

- Medicine
- Dentistry
- PhD programmes
- Continuing education courses

Medical science division

8 centres

- Anatomy and Cell Biology
- Physiology and Pharmacology
- Public Health
- Brain Research
- Pathobiochemistry and Genetics
- Pathophysiology, Infectiology and Immunology
- Medical Physics and Biomedical Engineering
- Medical Statistics, Informatics and Intelligent Systems

5 departments

- Medical Biochemistry
- Virology
- Forensic Medicine
- Biomedical Research
- Medical Education

Clinical division

27 university departments

- Medicine I
- Medicine II
- Medicine III
- Surgery
- Obstetrics and Gynecology
- Ear, Nose and Throat Diseases
- Anesthesia, Critical Care and Pain Medicine
- Psychiatry and Psychotherapy
- Pediatrics and Adolescent Medicine
- Dermatology
- Biomedical Imaging and Image-guided Therapy
- Radiotherapy
- Trauma Surgery
- Orthopedics
- Urology
- Neurosurgery
- Oral, Maxillary and Facial Surgery
- Emergency Medicine
- Neurology
- Physical Medicine and Rehabilitation
- Child and Adolescent Psychiatry
- Psychoanalysis and Psychotherapy
- Ophthalmology and Optometrics
- Blood Group Serology and Transfusion Medicine
- Hospital Epidemiology and Infection Control
- Clinical Pharmacology
- University Clinic of Dentistry

3 clinical institutes

- Laboratory Medicine
- Pathology
- Neurology

Organisational units with special service functions

- Comprehensive Cancer Center
- Core Facilities
- University Library
- History of Medicine and Historical Collections

Organisational units with university management responsibilities

10 service departments

- University Management Office
- Human Resources
- Legal Department
- Corporate Communications
- Studies and Examinations Department
- Research Service
- Clinical Trials Coordination Centre
- Finance Department
- Facility Management
- IT Systems and Communications

6 staff units

- Internal Audit
- Evaluation and Quality Management
- Gender Mainstreaming
- Process Management and Project Development
- Controlling
- Human Resources Development

Spin-offs

- Alumni Club
- Medical University of Vienna International
- Universitätszahnklinik Wien GmbH
- Max F. Perutz Laboratories
- Forensisches DNA-Zentrallabor Wien GmbH
- CBmed GmbH
- Privatuniversität f. Gesundheitswissenschaften Errichtungsges.m.b.H.
- Josephinum – Collections of the Medical University of Vienna

UNIVERSITY MANAGEMENT

• Rectorate

The Rectorate is the university's executive management body.

Rectorate until 30 September 2015
Prof. Wolfgang Schütz, Rector
Prof. Karin Gutiérrez-Lobos, Vice Rector for Education, Gender and Diversity
Dr. Christiane Druml, Vice Rector for Clinical Affairs
Prof. Markus Müller, Vice Rector for Research
Dr. Franz Wurm, Vice Rector for Finance

Rectorate from 1 October 2015
Prof. Markus Müller, Rector
Dr. Michaela Fritz, Vice Rector for Research and Innovation
Prof. Anita Rieder, Vice Rector for Education
Dr. Volkan Talazoglu, Vice Rector for Finance
Prof. Oswald Wagner, Vice Rector for Clinical Affairs
www.meduniwien.ac.at/rectorate

• University Council

The University Council is one of the University's three most senior management bodies, alongside the Rectorate and the Senate. Two of the Council's members are appointed by the Senate of the Medical University of Vienna, and two by the federal government. A fifth member is elected by these four members.

Dr. Erhard Busek (Chair)
Dr. Elisabeth Hagen
Prof. Veronika Sexl
Dr. Walter Dorner
Prof. Robert Schwarcz
www.meduniwien.ac.at/university-council

• Senate

The Senate is made up of 13 representatives from among the university's full professors, six representatives of teaching and research staff, one representative of the general university staff and six student representatives, appointed by election or, in the case of student representatives, by delegation in accordance with section 25 Universities Act 2002.

PROFESSORS:

Prof. Oswald Wagner (Chair until 24 June 2015, Member until 30 Sep. 2015)
Prof. Michael Gnant (Chair from 24 June 2015)
Prof. Wolfgang Gstöttner
Prof. Alexandra Kautzky-Willer (from 16 Oct. 2015)
Prof. Sylvia Knapp
Prof. Renate Koppensteiner
Prof. Hubert Pehamberger
Prof. Eva Piehslinger
Prof. Elisabeth Presterl
Prof. Ursula Schmidt-Erfurth
Prof. Harald Sitte
Prof. Siegfried Trattnig
Prof. Rudolf Valenta
Prof. Ursula Wiedermann-Schmidt

TEACHING AND RESEARCH STAFF:

Prof. Ivo Volf
(First Deputy)
Dr. Martin Andreas
Prof. Diana Bonderman
Dr. Martin Frossard
Dr. Dietrich Haubenberger
(until 23 Jan. 2015)
Dr. Regina Patricia Schukro
Prof. Rotraud Wieser (from 23 Jan. 2015)

STUDENTS:

Frédéric P.R. Tömböl (until 4 Dec. 2015)
Johanna Zechmeister
Sarah Schober (Second Deputy)
Abelina Zimba (until 4 Dec. 2015)
Martin Schauperl (until 4 Dec. 2015)
Lukas Wedrich (until 4 Dec. 2015)
Florian Berndl (from 4 Dec. 2015)
Eren Eryilmaz (from 4 Dec. 2015)
Carina Borst (from 4 Dec. 2015)
Florian Pinterits (from 4 Dec. 2015)

GENERAL UNIVERSITY STAFF:

Gerda Bernhard

CO-OPTED MEMBER – WORKING GROUP ON EQUAL OPPORTUNITIES:

Prof. Alexandra Kautzky-Willer (until 16 Oct. 2015)
Prof. Ulrike Willinger (from 16 Oct. 2015)
www.meduniwien.ac.at/senate

Christoph Aufricht, Deputy Head of the Division of Pediatric Nephrology and Gastroenterology, was appointed Professor of Pediatrics and Adolescent Medicine with a focus on nephrology and gastroenterology as of 1 August 2015.

COMMITTEES

• Arbitration Committee
Chair: Prof. Herbert Watzke
Deputy Chair: Dr. Anna Sporrer
www.meduniwien.ac.at//arbitration-committee

• Ethics Committee
Chair: Prof. Ernst Singer
Deputy Chair: Prof. Jürgen Zezula
Deputy Chair: Dr. Martin Brunner
www.meduniwien.ac.at/ethics

• Works Council for General University Staff
Chair: Gabriele Waidringer
First Deputy Chair: Gerda Bernhard
Second Deputy Chair: Helga Kalser
www.meduniwien.ac.at/wc-gus

• Works Council for Academic Staff
Chair: Dr. Martin Andreas
Deputy: Prof. Peter Birner
Deputy: Prof. Anita Holzinger
Deputy: Dr. Ingwald Strasser
www.meduniwien.ac.at/wc-sus

• Working Group on Equal Opportunities
Chair: Prof. Alexandra Kautzky-Willer
First Deputy Chair: Prof. Ulrike Willinger
Second Deputy Chair: Irene Bednar
www.meduniwien.ac.at/equalopportunities

• Student Union (ÖH Med Wien)
Until 30 June 2015:
Chair: Sarah Schober
First Deputy: Falk Preissing
(until 21 Jan. 2015)
First Deputy: Johanna Zechmeister
(from 22 Jan. 2015)
Second Deputy: Lukas Wedrich

(from 1 Jul. 2015)
Chair: Johanna Zechmeister
First Deputy: Eren Eryilmaz
Second Deputy: Lukas Wedrich
www.oehmedwien.at (German only)

• Advisory Board for People with Disabilities
Chair: Prof. Richard Crevenna
Deputy Chair: Prof. Johannes Wancata
www.meduniwien.ac.at/disabilities

• Intra-university Data Protection Commission
Chair: Dr. Markus Grimm
Deputy Chair Ernst Eigenbauer
www.meduniwien.ac.at/dbc

• Medicine Curriculum Director
Prof. Anita Rieder
(until 30 Sep. 2015)
Prof. Gerhard-Johann Zlabinger (from 1 Oct. 2015, previously Deputy Curriculum Director)
Deputy: Prof. Franz Kainberger
Deputy: Prof. Werner Horn
Deputy: Prof. Anahit Anvari-Pirsch (from 1 Oct. 2015)

• Dentistry Curriculum Director
Prof. Anita Holzinger
Deputy: Prof. Andrea Nell

• PhD Programmes Curriculum Director
Prof. Stefan Böhm
Deputy: Prof. Irene Lang
Deputy: Prof. Harald Trost

• Continuing Education Curriculum Director
Prof. Michael Hiesmayr

Katrin Bekes took up the post of Professor of Pediatric Dentistry on 1 April 2015. The expert in dental care for children moved from Martin Luther University Halle-Wittenberg to the University Clinic of Dentistry in Vienna.

Wolfgang Dörr became Professor of Applied and Translational Radiobiology on 1 June 2015. The professorship is endowed by MedAustron. Previously Dörr was head of the radiobiology laboratory in the Department of Radiotherapy and Radiation Oncology at Carl Gustav Carus Medical School, Technische Universität Dresden.

SCIENTIFIC ADVISORY BOARD

This external body advises the MedUni Vienna Rectorate on all matters related to research, with the aim of safeguarding the University's strategic positioning for the long term.

Frederica Salusto
Institute for Research in Biomedicine
Bellinzona, Switzerland

Hedvig Hricak
Chair, Department of Radiology
Memorial Sloan Kettering Cancer Center
New York City, USA

Joseph Thomas Coyle
Professor of Psychiatry and Neuroscience
Harvard Medical School

Fortunato Ciardiello
Professor of Medical Oncology
Second University of Naples

UNIVERSITY DEPARTMENTS

MedUni Vienna's clinical division consists of 30 departments, including three clinical institutes. 12 of these comprise a number of different divisions (in accordance with section 31(4) Universities Act). Departments, institutes and divisions also serve as patient care departments (pursuant to section 7(4) Hospitals Act).

Department of Medicine I

Head: Prof. Christoph Zielinski
- Division of Oncology
- Division of Hematology and Hemostaseology
- Division of Palliative Medicine
- Division of Infectious Diseases and Tropical Medicine
- Institute of Cancer Research (not a patient care department pursuant to section 7(4) Hospitals Act)

Department of Medicine II

Head: Prof. Gerald Maurer
- Division of Cardiology
- Division of Angiology
- Division of Pulmonology

Department of Medicine III

Head: Prof. Josef Smolen
- Division of Endocrinology and Metabolism
- Division of Nephrology and Dialysis
- Division of Rheumatology
- Division of Gastroenterology and Hepatology

Franz Michael Jantsch was appointed Professor of Cell and Development Biology on 1 August 2015 and heads the Center for Anatomy and Cell Biology at MedUni Vienna.

Department of Surgery

Head: Prof. Michael Gnant
- Division of General Surgery
- Division of Cardiac Surgery
- Division of Thoracic Surgery
- Division of Vascular Surgery
- Division of Transplantation
- Division of Plastic and Reconstructive Surgery
- Division of Pediatric Surgery

Department of Obstetrics and Gynecology

Head: Prof. Peter Wolf Husslein
- Division of Obstetrics and Feto-Maternal Medicine
- Division of General Gynecology and Gynecologic Oncology
- Division of Gynecological Endocrinology and Reproductive Medicine

ERC Starting Grant for Bernhard Baumann

Bernhard Baumann, a researcher at the university's Center for Medical Physics and Biomedical Engineering, was awarded a Starting Grant by the European Research Council (ERC) at the beginning of 2015. He was provided with a total budget of EUR 1.5 million over five years to establish a research group. His project, Optical Imaging of Ocular Pathology in Alzheimer's Disease (OPTIMALZ), will investigate the development and application of non-invasive optical imaging techniques for examining Alzheimer's-related changes in the eye.

Department of Ear, Nose and Throat Diseases

Head: Prof. Wolfgang Gstöttner

- Division of General Ear, Nose and Throat Diseases
- Division of Speech and Language Therapy

Department of Anesthesia, Critical Care and Pain Medicine

Head: Prof. Klaus Markstaller

- Division of General Anesthesia and Intensive Care Medicine
- Division of Specialist Anesthesia and Pain Medicine
- Division of Cardiothoracic and Vascular Anesthesia and Intensive Care Medicine

On 1 January 2015 Luise Poustka became Professor of Child and Adolescent Psychiatry and Head of the department of that name.

Department of Psychiatry and Psychotherapy

Head: Prof. Siegfried Kasper

- Division of Biological Psychiatry
- Division of Social Psychiatry

Department of Pediatrics and Adolescent Medicine

Head: Prof. Susanne Greber-Platzer

- Division of Neonatalogy, Intensive Care Medicine and Neuropediatrics
- Division of Pediatric Cardiology
- Division of Pediatric Pulmonology, Allergology and Endocrinology
- Division of Pediatric Nephrology and Gastroenterology
- Division of Pediatrics with special focus on Pediatric Hemotology-Oncology (St. Anna Children's Hospital)

Department of Dermatology

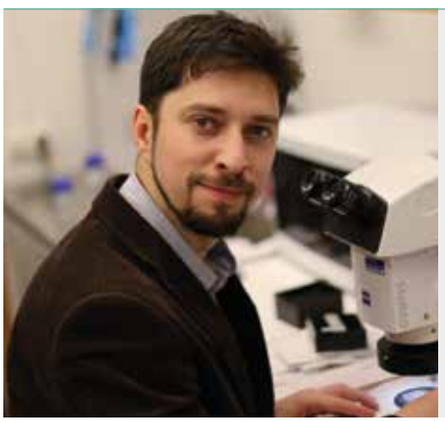
Head: Prof. Hubert Pehamberger

- Division of General Dermatology and Dermato-Oncology
- Division of Immunodermatology and Infectious Diseases of the Skin

Department of Biomedical Imaging and Image-guided Therapy

Head: Prof. Christian Herold

- Division of General and Pediatric Radiology
- Division of Cardiovascular and Interventional Radiology
- Division of Neuroradiology and Musculoskeletal Radiology
- Division of Nuclear Medicine



ERC Consolidator Grant for Igor Adameyko

Developmental biologist Igor Adameyko moved from the Karolinska Institutet in Sweden to the Center for Brain Research at MedUni Vienna in 2015. The researcher will carry out stem cell research in the Division of Molecular Neurosciences (headed by Tibor Harkany) with the support of an ERC Consolidator Grant. The ERC promotes basic research by offering large research grants. It awards Starting Grants and Consolidating Grants to young researchers and Advanced Grants to established principal investigators.

Department of Radiotherapy
Head: Prof. Richard Pötter

Department of Trauma Surgery
Head: Prof. Stefan Hajdu

Department of Orthopedics
Head: Prof. Reinhard Windhager

Department of Urology
Head: Prof. Shahrokh Shariat

Department of Neurosurgery
Head: Prof. Engelbert Knosp

Department of Oral, Maxillary and Facial Surgery
Head: Prof. Emeka Nkenke

Department of Emergency Medicine
Head: Prof. Anton Laggner

Department of Neurology
Head: Prof. Eduard Auff

Department of Physical Medicine and Rehabilitation
Interim Head: Prof. Richard Crevenna

Department of Child and Adolescent Psychiatry
Head: Prof. Luise Poustka

Department of Psychoanalysis and Psychotherapy
Head: Prof. Stephan Doering

Department of Ophthalmology and Optometrics
Head: Prof. Ursula Schmidt-Erfurth

Department of Blood Group Serology and Transfusion Medicine
Interim Head: Prof. Simon Panzer

Department of Clinical Pharmacology
Head: Prof. Markus Müller
(until 30 Sep. 2015)
Interim Head: Prof. Markus Zeitlinger
(from 1 Oct. 2015)

University Clinic of Dentistry Vienna
(Hospital in the meaning of section 2(1) (7) Hospitals Act)
Head: Prof. Andreas Moritz

Department of Hospital Epidemiology and Infection Control
Head: Prof. Elisabeth Presterl

Department of Laboratory Medicine
Head: Prof. Oswald Wagner
- Division of Medical-Chemical Laboratory Diagnostics
- Division of Clinical Microbiology
- Division of Clinical Virology

Institute of Neurology
Interim Head Prof. Johann Hainfellner

Department of Pathology
Head: Prof. Dontscho Kerjaschki
(until 30 Sep. 2015)
Head: Prof. Peter Birner (from 1 Oct. 2015)

Eva Schernhammer, a faculty member of Harvard Medical School since 2003, has been Professor of Epidemiology at MedUni Vienna since 1 September 2015. The role includes heading the Division of Epidemiology at MedUni Vienna's Center for Public Health.

Tanja Stamm was appointed Professor of Outcomes Research at MedUni Vienna as of 1 December 2015, and leads the Outcomes Research group at the Department of Medicine III at Vienna General Hospital.

CENTRES OF MEDICAL SCIENCE

The medical science division is organised into centres and departments. While the departments – like university clinical departments – generally cover a single scientific discipline, the centres are tasked with efficiently combining the priorities of research and teaching, with various disciplines clustered in accordance with international practice.

Center for Anatomy and Cell Biology

Head: Prof. Franz-Michael Jantsch
- General Division of the Center for Anatomy and Cell Biology
- Division of Applied Anatomy
- Division of Systematic Anatomy
- Division of Cell and Developmental Biology
- Division of Cell Biology and Ultrastructure Research

Center for Physiology and Pharmacology

Head: Prof. Michael Freissmuth
- Institute of Vascular Biology and Thrombosis Research
- Institute of Pharmacology
- Institute of Physiology
- Division of Neurophysiology and Neuropharmacology

Giulio Superti-Furga became MedUni Vienna's Professor of Medical Systems Biology on 1 February 2015, and is also Scientific Director of the CeMM Research Center for Molecular Medicine.

Center for Public Health

Head: Prof. Anita Rieder
- Division of General and Family Medicine
- Institute of Social Medicine
- Institute of Environmental Hygiene
- Division of Epidemiology
- Institute of Medical Psychology
- Ethics in Medical Research
- Division of Health Economics

Center for Brain Research

Head: Prof. Jürgen Sandkühler
- Division of Neuroimmunology
- Division of Neurophysiology
- Division of Molecular Neurosciences
- Division of Neuronal Cell Biology
- Division of Cognitive Neurobiology
- Division of Pathobiology of the Nervous System

Center for Pathobiochemistry and Genetics

Head: Prof. Markus Hengstschläger
- Medical Genetics
- Institute of Medical Chemistry and Pathobiochemistry

Center for Pathophysiology, Infectiology and Immunology

Head: Prof. Hannes Stockinger
- Institute of Pathophysiology and Allergy Research
- Institute of Immunology
- Institute of Specific Prophylaxis and Tropical Medicine
- Institute of Hygiene and Applied Immunology

Center for Medical Physics and Biomedical Engineering

Head: Prof. Wolfgang Drexler

Center for Medical Statistics, Informatics and Intelligent Systems

Head: Prof. Michael Schemper
(until 30 Nov. 2015)
Head: Prof. Martin Posch
(from 1 Dec. 2015)
- General Division of the Center for Medical Statistics, Informatics and Intelligent Systems
- Institute of Medical Statistics
- Institute of Clinical Biometrics
- Institute of Biosimulation and Bioinformatics
- Institute of Medical Information Management and Imaging
- Institute of Medical Expert and Knowledge-based Systems
- Institute of the Science of Complex Systems
- Institute of Artificial Intelligence

Department of Medical Biochemistry

Part of Max F. Perutz Laboratories, a joint venture of MedUni Vienna and the University of Vienna for research in the field of molecular biosciences.

Head: Prof. Graham Warren
- Division of Molecular Cell Biology
- Division of Molecular Genetics

Department of Medical Education

Head: Prof. Anita Holzinger
- General Division of Medical Training
- Administration
- Curriculum Coordination
- Unified Patient Division
- Methods and Development
- Science and International Relations

Department of Virology

Head: Prof. Franz Xaver Heinz
(until 30 Sep. 2015)
Deputy Head: Prof. Elisabeth Puchhammer
- Division of Applied Medical Virology

Department of Forensic Medicine

Head: Prof. Daniele Risser

Department of Biomedical Research

Head: Prof. Bruno Podesser
- Division of Laboratory Animal Science and Genetics
- Division of Decentralized Biomedical Facilities
- Division of Biomedical Research

ORGANISATIONAL UNITS WITH SPECIAL SERVICE FUNCTIONS

Comprehensive Cancer Center
Head: Prof. Christoph Zielinski

Core Facilities
Head: Prof. Johann Wojta
- Genomics: DNA analysis
- Genomics: genome analysis
- Imaging
- Proteomics
- Cell Sorting

Library
Head: Bruno Bauer

History of Medicine and Historical Collections
Head: Dr. Christiane Druml

CENTRAL SERVICES

Administrative support
- University Management Office
- Human Resources
- Legal Department
- Corporate Communications
- Studies and Examinations Department
- Research Service
- Clinical Trials Coordination Centre
- Finance Department
- Facility management
- IT Systems and Communications

Staff units
- Internal Audit
- Evaluation and Quality Management
- Gender Mainstreaming
- Process Management and Project Development
- Controlling
- Human Resource Development

SPIN-OFFS

Alumni Club

Medical University of Vienna International GmbH (MUVI)

Universitätszahnklinik Wien GmbH

Max F. Perutz Laboratories GmbH (MFPL)

FDZ – Forensisches DNA-Zentrallabor Wien GmbH

CB Med GmbH – Center for Biomarker Research in Medicine

Privatuniversität für Gesundheitswissenschaften Errichtungs-Ges.m.b.H.

Josephinum – Medizinische Sammlungen GmbH

Gergely Szakacs has been Professor of Chemical Safety and Cancer Prevention since 1 January 2015. Professor Szakacs specialises in research into ABC transporters and the role of these proteins in health and disease.

Researcher of the Month

Each month, MedUni Vienna highlights the work of one or more young scientists who have conducted outstanding research, by nominating its Researchers of the Month. The researchers who received this recognition in 2015 were honoured at an event on 25 November 2015.

Prizewinners
January 2015: Josef Singer, Judit Fazekas, Katja Pinker-Domenig; February 2015: Anastasia Meshcheryakova, Claudio Spick; March 2015: Karin Pfisterer, Martin Bauer; April 2015: Nicole Boucheron, Daniela Haluza; May 2015: Ljubomir Petricevic, Thomas Steinkellner; June 2015: Gregor Gryglewski; July 2015: Elisa Einwallner; September 2015: Georg Kranz; October 2015: Richard Lass; November 2015: Anna Sophie Berghoff; December 2015: Andreas Kammerlander

Financial statements

I. Statement of financial position as at 31 December 2015

ASSETS

	31 December 2015 EUR				31 December 2014 EUR '000			
A. Fixed assets								
I. Intangible assets								
1. Concessions and similar rights, and licences thereto		1,054,522,56.				1,051		
of which acquired by purchase	*1,054,522.56*				*1,051*			
2. Rights of use		20,000,000.00	21,154,522.56			20,000	21,051	
II. Property, plant and equipment								
1. Land, leasehold rights and buildings including buildings on third-party land		14,307,125.07				58,866		
a) of which land value	*587,155.00*				*47,546*			
b) of which building value	*1,015,389.95*				*1,071*			
c) of which investments in third-party buildings and land	*12,704,580.12*				*10,249*			
2. Plant and machinery		10,594,952.51				10,825		
3. Scientific literature and other scientific data media		6,851,039.55				6,893		
4. Other fixtures and fittings, operating and business equipment		3,078,675.36				2,737		
5. Advance payments and assets under construction		3,138,540.87	37,970,333.36			3,733	83,053	
III. Financial assets								
1. Investments in subsidiaries and associates		2,883,650.18				2,849		
2. Loans to subsidiaries and associates		1,722,28.46				1,301		
3. Securities and similar instruments held as fixed assets		50,000,000.00	54,605,778.64	113,730,634.56		0	4,150	108,254
B. Current assets								
I. Inventories								
1. Inventories		403,755.87				404		
2. Services rendered to third parties not yet invoiced		84,197,528.03	84,601,283.90			82,027	82,431	
II. Receivables and other assets								
1. Trade receivables		7,912,254.20				8,554		
2. Receivables from associates		1,105,391.13				790		
3. Other receivables and other assets		18,717,613.04	27,735,258.37			7,708	17,052	
III. Securities and equity interests			6,291,619.14				6,241	
IV. Cash and cash equivalents			104,421,840.07	223,050,001.48			103,079	208,803
C. Prepaid expenses and deferred charges				1,422,102.55				1,226
Total Assets				**338,202,738.59**				**318,283**

The 2015 financial statements were given an unqualified audit certificate by auditors Moore Stephens City Treuhand GmbH, Wirtschaftsprüfungs- und Steuerberatungsgesellschaft.

LIABILITIES

	31 December 2015 EUR				31 December 2014 EUR '000		
A. Negative equity							
1. Equity			-8,334,166.31			-8,334	
2. Net loss			-8,565,474.01	-16,899,640.32		-10,732	-19,066
of which loss/profit brought forward	*-10,732,459.08*				*-13,448*		
B. Investment grants				32,037,334.52			32,108
C. Provisions							
1. Provisions for severance payments			14,132,690.38			12,206	
2. Other provisions			136,327,563.58	150,460,253.96		117,417	129,623
D. Liabilities							
1. Advances received			129,109,268.26			124,547	
of which deductible from inventories	*81,512,019.93*				*82,027*		
2. Trade payables			7,198,158.30			15,209	
3. Payables to associates			1,860,334.13			645	
4. Other liabilities			17,867,170.96	156,034,931.65		17,042	157,443
E. Deferred income				16,569,858.78			18,179
Total liabilities				**338,202,738.59**			**318,284**

Note regarding equity:
The university's negative equity figure results from the separation of the Medical University of Vienna from the University of Vienna on 1 January 2004 in accordance with the Universities Act 2002. In respect of Austria's constitutional guarantee for institutions and its incorporation into the Universities Act 2002, the federal government's resulting obligations to guarantee the continued existence of universities and to finance MedUni Vienna mean that, in all events, a positive going concern forecast may be given for the Medical University of Vienna. Equity including investment grants was positive as at 31 December 2015.

II. 2014 Statement of profit or loss

		2015 EUR		2014 EUR '000
1. Revenue				
a) Revenue from Federal Goverment global budget allocation		384,942,376.16		373,863
b) Revenue from tuition fees		845,655.07		812
c) Revenue from tuition fee compensation by Federal Government		4,773,231.45		4,763
d) Revenue from postgraduate training programmes		1,266,005.91		1,136
e) Revenue pursuant to section 27 Universities Act		73,259,429.84		76,963
f) Reimbursements of costs pursuant section 26 Universities Act		15,459,292.33		14,914
g) Other revenue and reimbursements		15,810,827.95		14,377
		496.356,818.71		**486,828**
2. Change in services rendered to third parties not yet invoiced		**2,170,552.57**		**-6,734**
3. Other operating income				
a) Income from disposal and revaluation of fixed assets		541,910.28		16
b) Income from reversal of provisions		6,066,377.98		3,038
c) Other		12,787,377.94		12,528
of which from reversal of investment grants	*10,311,744.95*		*10,297*	
		19,395,666.20		**15,582**
4. Expenditure for materials, consumables and purchased services				
a) Expenditure for materials and consumables		-11,737,219.92		-17,319
b) Expenditure for purchased services		-3,911,290.68		-4,703
		-15,648,510.60		**-22,022**
5. Staff costs				
a) Salaries and wages		-280,659,471.27		-268,097
of which refunds to the Federal Government for officials assigned to the university	*71,208,081.55*		*70,114*	
b) Expenditure for external teaching staff		-123,375.87		-101
c) Cost of severance payments and payments to employee benefits funds		-5,770,443.02		-3,711
of which refunds to the Federal Government for officials assigned to the university	*97,835.25*		*15*	
d) Cost of pensions		-7,853,064.31		-7,436
of which refunds to the Federal Government for officials assigned to the university	*404,108.32*		*404*	
e) Social security contributions and other pay-related contributions		-64,215,668.48		-62,044
of which refunds to the Federal Government for officials assigned to the university	*17,597,627.38*		*17,883*	
f) Other employee benefits		-11,684,245.15		-2,489
		-370,306,268.10		**-343,878**

		2015 EUR		2014 EUR '000
6. Depreciation and amortisation			**-19,067,209.90**	**-18,611**
7. Other operating expenses				
a) Taxes other than those under item 13			-658,882.1	-570
b) Reimbursements to hospital operator pursuant section 33 Universities Act			-51,526,535.72	-52,888
c) Other			-43,675,969.76	-39,472
			-95,861,387.59	**-92,930**
8. Subtotal items 1 to 7			**17,039,661.29**	**18,236**
9. Income from financial resources and investments			**769,525.55**	**831**
a) of which from write-ups	*136,181.26*		*58*	
10. Expenditure arising from financial resources and equity holdings			**-15,523,452.67**	**-16,226**
a) of which from write-downs	*86,021.64*		*80*	
b) of which expenditure arising from subsidiaries and associates	*15,437,441.11*		*16,145*	
11. Subtotal items 9 to 10			**-14,753,927.12**	**-15,395**
12. Result from ordinary university activity			**2,285,734.17**	**2,841**
13. Taxes on income and profit			**-118,749.10**	**-126**
14. Loss/profit after tax			**2,166,985.07**	**2,715**
15. Loss/profit brought forward			**-10,732,459.08**	**-13,448**
16. Net loss			**-8,565,474.01**	**-10,733**

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