MEDICAL UNIVERSITY OF VIENNA

Medical University of Vienna Development Plan 2022-2027

Status 6 July 2022

5: Medical University of Vienna Development Plan 2022 – 2027

In its meeting of 14 December 2020, pursuant to section 22(1)(1) *Universitätsgesetz* (Universities Act), the University Council of the Medical University of Vienna approved the 2022-27 Development Plan of the Medical University of Vienna, prepared by the Rectorate in accordance with section 22(1)(2) Universities Act and submitted after consultation with the Senate of the university.

The Development Plan for the Medical University of Vienna for 2022-27 enters into force on the day of its publication in the University Gazette. The development plan published in the University Gazette for the 2017/2018 academic year, vol 14, No. 15, will cease to have effect upon publication of this Development Plan.

Chair of the University Council
Dr. Eva Dichand

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Introduction

From the late 18th to the beginning of the 20th century – in the era of the first and second Vienna Schools of Medicine – the Medical Faculty of the University of Vienna set the pace for the expansion of science-based medicine. In the early decades of the 20th century, a number of scientists working in Vienna won the Nobel Prize in Physiology or Medicine. In 1938, academic endeavour collapsed under the Nazi regime, which inflicted lasting damage on the university's international reputation. With the opening of the new Vienna General Hospital building in 1992, the university began to find its place in the international academic vanguard once more, carrying out research in a broad range. Between 1990 and 2010, clinically-focused research in Austria was the fastest-growing branch of science worldwide, although output measured in terms of the relative citation impact was still about 25% lower than in the countries seen as innovation leaders. This positive development was sparked by Vienna's growing importance as a geographical location after 1989, increasing internationalisation, a modern, molecular approach in research, and the establishment of other life sciences institutions with high international profiles, such as the Institute for Molecular Pathology (IMP), in the Austrian capital. Today, the Medical University of Vienna (MedUni Vienna) is one of the leading medical schools and research institutions in Europe, and is rated as one of the best 100 medical schools in the world in the global rankings. Alongside the other public medical universities in Austria, MedUni Vienna forms the academic foundation of the country's health system.

Compiled in accordance with section 13(b) of the Austrian Universitätsgesetz (Universities Act) for the 2022-2024 performance agreement period, this development plan provides a strategic outlook up to 2027, and is based on earlier development plans prepared in accordance with the Universities Act. The measures, aims and plans presented here are subject to corresponding coverage in the budget as part of the performance agreement. In accordance with the Universities Act, this development plan lays the basis for the consecutive plan for the next performance agreement period (2025-2027).

I. Current situation

With a share of 30% of total national scientific output, medical research in Austria is above the average in terms of productivity compared to other disciplines (source: FT report 2011). Established as an autonomous institution in 2004, when it separated from the University of Vienna, MedUni Vienna is the main driver of this strong performance.

Clinical division

MedUni Vienna's academic positioning is inextricably linked with that of Vienna General Hospital, a systemically significant hospital with the most distinctive profile of any in the country, and Austria's biggest medical training institution. Vienna General Hospital is a university hospital providing routine care to around 80,000 inpatients and appointments to 1.2 million outpatients each year. The smooth functioning of the hospital's "hardware" depends directly on its "software": MedUni Vienna's 6,000-plus highly qualified employees. Building on the recommendations of the Austrian National Audit Office's report on 'Cooperation between the federal government and the federal states on healthcare, as illustrated by the example of Vienna General Hospital' (*Zusammenarbeit Bund-Länder im Gesundheitswesen am Beispiel des AKH Wien*), a new basis was established for cooperation with the City of Vienna at Vienna General Hospital in the form of three far-reaching agreements. The agreements (the Finance and Target Control Agreement, Cooperation Agreement, and Construction Framework Agreement) define the long-term framework for joint management of patient care services, provide a contractual basis that underpins investments, additional clinical expense and construction projects, and specify patient care responsibilities in both qualitative and quantitative terms (see section IX). MedUni Vienna's patient care structure consists of 29 clinical departments and two clinical institutes – located at the Vienna General Hospital campus in Vienna's ninth district – and the University Clinic of Dentistry Vienna. 11 of the departments comprise a number of different divisions (in accordance with section 31[4] Universities Act). Departments, clinical institutes and divisions also serve as patient care departments (in accordance with section 7[4] *Krankenanstalten- und Kuranstaltengesetz* [Hospitals Act]).

Medical science division

Medical science operations comprise 12 centres located in Vienna's ninth district. The centres are interdisciplinary and carry out both teaching and research. The Max F. Perutz Laboratories, incorporating the Center for Medical Biochemistry, is jointly run with the University of Vienna and focuses on molecular biology. The facility is based at Vienna Biocenter in the city's third district, together with the Institute for Molecular Pathology, institutes of the Austrian Academy of Sciences and a number spin-off companies.

Organisational units with service functions

As part of the separation of Austrian universities from federal authority, numerous service facilities and specialised service units have been established since 2004 to ensure the provision of service functions and infrastructure.

	All universities	MedUni Vienna
Total FTE	38,220	4,443
FTE admin.	13,918	8893
Proportion admin.	**36.4%**	**20.1%**

Fig. 1 Administrative staff (FTE) in active service, including staff covered by third-party and special funding in accordance with the *Bildungsdokumentationsverordnung* (Education Documentation Order), 31 Dec. 2019

Relative to the number of staff, MedUni Vienna's administrative costs are significantly lower than those of all other public universities in Austria (see **Fig. 1**). The Rectorate has set up integrated task forces, which form a key element in organisational development processes. The organisational structure (**Fig. 2**) includes the management bodies stipulated in the Cooperation Agreement with the Vienna City Council (the Management Board, Supervisory Board, Construction Advisory Board, and Governmental Committee Working Group)

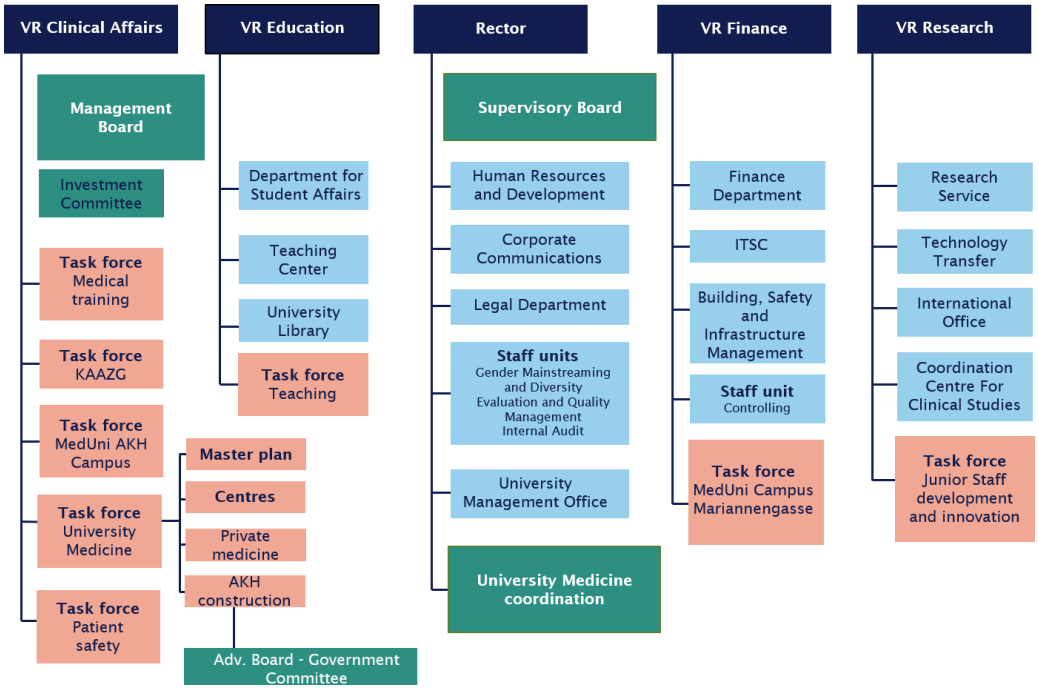


Fig. 2 Organisational chart: Rectorate and general administration

There are also facilities that provide services to other organisational units (the Teaching Center, Center for Medical Statistics, Informatics and Intelligent Systems, Center for Biomedical Research, Comprehensive Cancer Center, and Core Facilities) in addition to carrying out their own research and teaching activities, as well as the following subsidiaries and associates (the university's holdings are shown in brackets): Universitätszahnklinik Wien GmbH (100%); Medical University of Vienna International GmbH (100%); Josephinum-Medizinische Sammlungen GmbH (100%); Forensisches DNA-Zentrallabor Wien GmbH (100%); FSB-GmbH (100%); Karl Landsteiner Privatuniversität GmbH (25%); Max F. Perutz Laboratories Support GmbH (40%); ACOmarket GmbH (16.67%); CBMed GmbH (20%); Alumni Club (100%) (non-profit association).

HR structure

As at 31 December 2019, the medical staff comprised 1,039 qualified medical specialists, 621 doctors in training (FTE), and 49 dentists. There were 1,054 academic staff with a non-medical degree (**Fig. 3**). There were also 893 administrative staff (FTE), and 175 employees with technical responsibilities (FTE). The extensive patient care services provided at Vienna General Hospital have a significant influence on the number of employees and the HR structure. With around 8,000 students, MedUni Vienna is one of the world's largest medical schools, and by far the biggest in Austria. Around 45% of

specialists working in Vienna and 15% of all qualified physicians in Austria are trained here.

	Global budget	Total incl. external funding
Medical specialists	1,032.2	1,038.7
Doctors in specialist training	592.4	621.6
Dentists	49.2	49.4
Ward doctors	28.6	35.0
Academic staff excl. doctors	468.2	1,053.7
Administrative staff	535.5	758.8
Technical staff	132.8	174.5
Nursing staff	222.2	364.2
Laboratory staff	105.2	139.0
Other staff groups	163.8	208.4
Total	**3,330.1**	**4,443.3**

Fig. 3 Staff in active service (FTE), global budget and total, including 3rd party funding (31 Dec. 2019)

As in other areas of academia, the proportion of female staff at the university is inversely proportional to career stage. At present, around a third of all associate professors and lecturers are women, while the proportion of female full professors is 24.1% (**Fig. 4**). There has been a significant increase in the proportion of female staff in all academic positions since MedUni Vienna was established: in 2004, only 8.2% of full professors were female, and the figure published in the 2019 development plan was 20.9%. This shows that the glass ceiling index has fallen significantly in recent years (see section VI). Most notably, the university issued a call for applications from prospective female professors for ten chairs pursuant to section 99(4) of the Universities Act. These appointments will help to significantly narrow the gap between the numbers of female and male professors.

	Female	Male	Proportion of women
Associate professors	113	203	35.76%
Lecturers	163	388	29.58%
Professors	27	85	24.10%

Fig. 4 Proportion of female professors and lecturers (headcount as at 31 May 2020)

Equipment, fixtures and fittings

Equipment, fixtures and fittings for clinical, preclinical and teaching operations are in need of refurbishment, since the unadjusted investment budget for Vienna General Hospital (built in 1992) for 2007-15 did not keep pace with depreciation. Consequently, renovation of the buildings used for patient care, to be completed by 2030 on the basis of a construction master plan, was agreed in the Construction Framework Agreement. Over the next 15 years, about €100m a year (€1.368bn net, including reinvestment projects of €181m until 2024, excl. previously agreed investments) will be invested in the development of the MedUni Vienna General Hospital Campus (see section IX). The university's clinical departments have about 18,000m² of floor space at Vienna General Hospital that is available exclusively for research purposes. Space at the clinical institutes is used for both research and patient care. Additional space is to be built (Anna Spiegel II

– see section VIII) to replace research facilities that will be lost in clinical departments under the construction master plan for the Vienna General Hospital Campus. The research buildings planned on the General Hospital Campus (see section VIII) are vital to MedUni Vienna's ongoing development. The university has net floor space of 57,000m² available for the medical science units located outside the general hospital site – most of this space is rented, mainly from the Bundesimmobiliengesellschaft (Federal Property Company, BIG) – as well as 14,000m² at the renovated Clinic of Dentistry (including the Studies and Examinations Department in the Währinger Strasse Wing/Section 1, where renovation work has been completed). There are considerable differences in the quality of building infrastructure. The majority of spaces are subject to strict legal regulations pursuant to the *Arbeitsinspektionsgesetz* (Labour Inspection Act), the temporary exception stipulated in the Universities Act (workplace permit pursuant to section 112 Universities Act in conjunction with section 143 Universities Act), and the *ArbeitnehmerInnenschutzgesetz* (Employee Protection Act) as well as related liabilities (see also section VIII). With this in mind, in 2013 MedUni Vienna acquired a 10,600m² plot of land near Vienna General Hospital (between Mariannengasse and Spitalgasse) for imminent construction of a new building. In 2015, in cooperation with the Federal Ministry of Science, Research and Economy, the plot was sold to BIG with the aim of receiving planning permission from the federal government that same year. Prompt execution of this project is extremely important to preclinical disciplines and in order to comply with the legal requirements of the Employee Protection Act and the *Bundes-Behindertengleichstellungsgesetz* (Equality of Disabled Persons Act) with regard to protection of students. It is also crucial in order to satisfy the requirements of research and teaching at MedUni Vienna and continue promoting strong performance in both areas. The project was officially approved on 19 September 2017, after 18 months developing the functional layout in consultation with the Ministry of Science, Research and Economy and agreement of the budget with the Ministry of Finance. In total, the federal government will provide €283.9m for construction and €55.5m for the fit-out. The first steps towards executing the Campus Mariannengasse project have already been taken: the constitutive meeting for the tender for implementation took place on 12 October 2017, and the tender was announced on 17 October 2017. The building is scheduled to be fully operational in time for the 2025 winter semester. The tender for planning the project was awarded in an EU-wide, non-open, two-stage competition process (see section VIII). The winning proposal was submitted by Delugan Meissl Associated Architects and Architektur Consult. Other important projects include construction of a new building for animal breeding and care in **Himberg** and the refurbishment of the **Josephinum**. The Campus Mariannengasse project will be financed via the 2017 special economic stimulus programme (see section VIII).

II. Overall strategic aims

Global trends

Positioning in the context of global developments

For the foreseeable future, global developments will be characterised by a period of disruptive change resulting from the new industrial revolution (industry 4.0, postgenomic/digital medicine, and "deep medicine"). The SARS-CoV-2 pandemic has aggravated the situation further, adding another disruptive factor around the globe since 2020. These developments affect medical schools worldwide and are the subject of wide-ranging debate (see also *Wissenschaftsrat* [Germany], 'Perspektiven der Universitätsmedizin'). The change will lead to the loss of entire value chains, but also presents undreamt-of opportunities for knowledge-based services, especially in medicine. The drivers are omics technologies being developed in the wake of the human genome project, and methods for processing large volumes of digital data (deep medicine and big data innovations such as the human brain project and "humans as datasets"). In medicine, there will be major impacts on teaching (virtualisation, virtual/augmented reality and medical simulation), research (precision medicine, renaming of diseases, synthetic biology, gene editing, neurocognitive research, cognitive learning, additive manufacturing) and routine care (robotics, bionics, machine learning and AI, telemedicine).

Despite recent medical advances, common, well-known infectious diseases are still among the most frequent causes of death worldwide. As a result of increased travel, and of climate change leading to the proliferation of disease vectors such as mosquitos, the prevalence of tropical diseases is also increasing in Central Europe. The current SARS-CoV-2 pandemic has brought home the reality of these threats, as it caught many developed countries unawares. In MedUni Vienna's view, there is a need to establish a flagship infectious diseases institute in Austria.

A countermovement to disruptive change can currently be observed with the rejection of enlightened scientific concepts in society – including in relation to SARS-CoV-2 – characterised by buzzwords such as "the post-truth era", "alternative facts", "fake news" and "filter bubbles". Given this state of affairs, MedUni Vienna wishes to fulfil its role as a public ambassador of knowledge and as a leading institution in the assurance of safety and trust in medical innovation. MedUni Vienna's national importance in this context is clear, due among other reasons to its critical mass and the high indirect economic impact of the medical research sector (see 'Medical Research: What's it worth?', Health Economics Research Group, RAND Europe). In spite of Europe's Horizon 2020 offensive, the knowledge axis is increasingly tipping towards the Pacific region. Asia is currently the only continent where R&D spending is growing strongly (with a 44% share of current spending at present; www.rdmag.com; 'Global R&D funding forecast 2020'), followed by the relatively stagnating USA (27%), and the relatively shrinking Europe (20.5%).

Universities therefore need to place greater emphasis on meeting internationally recognised and accepted criteria in order to compete globally for visibility and the best talent. These criteria, or indicators, include in particular (see also the measure to introduce a balanced score card under "quality management", below): 1. financial strength and infrastructure; 2. international rankings and publication output; 3. number

of ERC grant recipients (and Nobel laureates); 4. proportion of female and of international students, staff and professorial appointments; 5. curriculum attractiveness; 6. medical expertise, on the basis of transparent outcome parameters, and 7. general attractiveness of location. All of MedUni Vienna's efforts must be channelled towards measurable improvements in these seven areas. Despite all of the challenges, MedUni Vienna currently has the potential to belong to the "premier league" of medical schools worldwide. However, implementation of solutions regarding the following matters is essential for this vision is to be realised: the MedUni Mariannengasse Campus and MedUni Vienna General Hospital Campus, the budget, and the Hospital Working Hours Act (KA-AZG; see below).

Positioning in the context of national systemic goals

Following evaluations by the Austrian Science Board (ÖWR) of the existing clusters, focuses and activities in clinical research, the resulting recommendations will be implemented – in particular the recommendation to sharpen the focus on core activities. The systemic goals in the Austrian National Development Plan for Public Universities (GUEP), in the strategy for Austria's future as a location for life sciences and pharmaceuticals, in the *Zukunft Hochschule* project (Life Sciences action area) and in the national strategy for research, technology and innovation are principally addressed in the development of: infrastructure (see sections IV, VIII and IX); teaching and research cooperations with other institutions (section VII); new career track models (section III); innovation transfer (section VI); diversity (section VI); internationalisation (section VII), and basic research, personalised medicine and clinical research (section IV). MedUni Vienna's strategy going forward is also informed by the findings of the Austrian National Audit Office, in particular its report on "Cooperation between the federal government and the federal states on healthcare taking the example of Vienna General Hospital"; the Institute of Advanced Studies' paper on monitoring of Vienna and Graz medicine graduates (section V); the Institute of Advanced Studies' Student Social Survey (section V), and the Austrian Public Health Institute's *Ärztebedarfsstudie* (study of the national need for doctors) (section V).

Strategic aims and profile development

- MedUni Vienna's mission statement is "Maintaining and restoring health through expertise and innovation." Driven by technology, the maintenance of health (prevention) based on knowledge and innovation (safety of innovation) will take on an increasingly larger role in relation to treatment.
- MedUni Vienna should be recognised as an entity pursuing the core activities of research, teaching and patient care together, with each of these valued equally.
- MedUni Vienna has an obligation to uphold the principle of equal opportunities, and is committed to recognising and promoting individual achievement.
- MedUni Vienna is an internationally attractive employer of highly qualified staff, and the leading research and training institution for doctors in Austria.
- In its research activities, MedUni Vienna has focus areas with critical mass and the following strategic aims: (i) bench-to-bedside clinical application of translational research; (ii) internationalisation and high staff mobility; (iii) a high proportion of

staff funded by third-party funding, and (iv) research outcomes that can be commercially marketed.

- In teaching, MedUni Vienna offers modern curricula with high-quality outcomes and the following strategic aims: (i) a strong focus on practice and research; (ii) internationally mobile staff and students; (iii) a strong appeal, attracting the best students; (iv) provision of life-long learning through postgraduate courses that reflect labour market requirements, and (v) technological innovation.
- Promotion of medical humanities as a key medical discipline, and more intensive engagement with questions of ethics, anthropology, aesthetics and the philosophy of medicine.
- The university aims to excel in providing the highest quality patient care and preventive medicine, at the same time as maximising individual, personal care. On the basis of the Cooperation Agreement with Vienna General Hospital, the university is charged with providing nationally outstanding top-quality patient care services at the hospital, subject to the maintenance of the range of medical services – or case mix – required for teaching, medical training and research. Patient care and preventive medicine has the following strategic aims: (i) optimised treatment processes; (ii) medical staff with excellent clinical, academic and social competencies; (iii) high-quality medical training; (iv) positioning MedUni Vienna internationally as a place for transfer of medical know-how; (v) a high degree of independence for patient care (Vienna General Hospital) within the Vienna Healthcare Group (WIGEV).
- MedUni Vienna acknowledges its chequered history, in particular during the time of the collapse of academia in the years following 1938.
- MedUni Vienna honours its public responsibility as a leading institution in Austria's health system (see sections V, VI and IX).

Development of the university

The following **measures** form core aspects of the development plan:

- On-schedule construction of the new preclinical building, MedUni Campus Mariannengasse; delays to implementation of this vital infrastructure project due to pending approvals would directly endanger the continuation of medical education, and all preclinical and theoretical research activities, due to the existing legal risks under the *Arbeitsinspektionsgesetz* (Labour Inspection Act) and the *ArbeitnehmerInnenschutzgesetz* (Employee Protection Act) (see also the Federal Ministry of Education, Science and Research's Uni-Med-Impuls 2030 programme).
- Implementation and evaluation of the Cooperation Agreement, the Finance and Target Control Agreement, and the Construction Framework Agreement by 2030 – in particular, construction of the Center for Translational Medicine and Therapies on the MedUni Vienna General Hospital Campus, and planning for the centres for precision medicine and technology transfer (see also the Uni-Med-Impuls 2030 programme).
- Assuring maximum autonomy for patient care provided by MedUni Vienna and Vienna General Hospital, as required by an internationally recognised university

hospital, in the context of the cooperation with the City of Vienna and the intended reorganisation of the Vienna Healthcare Group.

- Implementation of the Hospital Working Hours Act, with provision for improved protected time arrangements for research and teaching by means of a statutory opt-out option for university clinical departments (see also the Uni-Med-Impuls 2030 programme).
- Enhancement of the infrastructure for digital medicine and precision medicine through investment, building work and fundraising (projects: development of the MedUni Vienna General Hospital Campus, the Center for Precision medicine, and the Center for Technology Transfer) (see also the Uni-Med-Impuls 2030 programme).
- Further development and implementation of the medical masterplan (see section IX). Besides its focus on tertiary care and areas of excellence, the range of care provided by the central university hospital (Vienna General Hospital) must comprise the case mix required for medical training and maintaining clinical and academic quality in accordance with the Finance and Target Control Agreement.
- Establishment of a centre-based structure at Vienna General Hospital that can be represented in the organisational structure, in order to bundle resources and exploit synergies (see section IX).
- Promotion of high-quality patient care as an international hallmark of the university hospital (enhancing the reputation of the university hospital).
- Contributing to enhancing Vienna's position as a location for medical research by expanding the existing research clusters (see section IV), establishing the Ignaz Semmelweis Center for Infectious Diseases (see section VIII) and through existing local cooperations in Vienna, in particular with the University of Vienna (Max Perutz Labs) and the Austrian Academy of Sciences (CeMM).
- Expansion of the Medical Education Environment; ongoing development of the MedAT admissions exam (see also the Uni-Med-Impuls 2030 programme).
- MSc/PhD curricula: expansion of programmes and cooperations with partner universities.
- Recruitment of potential ERC/START award winners.
- Establishment of attractive career models (see section III) as a key tool for supporting the development of young academics; increasing the proportion of female full professors to over 25%, and the proportion of female associate and extraordinary professors to over 40%.
- Development of intellectual property (IP) activities as part of Knowledge Transfer Centre East; space for start-ups and industry at a new Center for Technology Transfer to be built on the MedUni Vienna General Hospital Campus.
- Participation in quality assurance for medical specialist training in light of the medical education regulation.
- Securing a higher position for the university in global rankings (top ten in the EU, top 50 worldwide).
- Strengthening the Medical University of Vienna brand, and the reputation of the university and the university hospital.

Corporate governance and quality management

Anti-corruption and compliance

MedUni Vienna's existing Anti-corruption and Compliance Guidelines set out the principles of separation of duties, transparency, adequate documentation and general appropriateness. They highlight potential dangers, outline recommended procedures and contain compulsory documentation and approval processes. All employees are contractually bound to observe these rules. The Guidelines define the action to be taken in cases of suspected corruption, including the duty to report and who to report to. Adherence to the guidelines is verified by Internal Audit. Disciplinary measures are prescribed for cases of non-compliance. **Plans:** The existing compliance guidelines will be harmonised, augmented by a fundraising code of conduct, and evaluated by the end of 2023.

Transparency; disclosure of conflicts of interest

MedUni Vienna recognises article 9 of the Pharmig Code of Conduct at the institutional level. Business and contractual relationships between employees of MedUni Vienna and customers or suppliers in which employees have an interest, or with which they have a close relationship are forbidden. Clinical investigators (as well as researchers and auditors) are required to declare any potential conflicts of interest to the Ethics Committee when submitting proposed research projects for assessment. Clinical investigators, researchers and auditors are required to declare any conflicts of interest to the Ethics Committee when submitting or assessing proposed research projects. In addition, the University's Good Scientific Practice (GSP) guidelines, which form part of its statutes, bind researchers to adhere to current regulations, provide for consequences in case of academic misconduct, and govern cooperation with industry, and conflicts of interest.

Secondary employment

Staff with secondary employment must disclose such employment to the university. Secondary employment may not infringe upon an employee's duties or the university's interests. MedUni Vienna's *Rahmenbedingungen für Nebenbeschäftigungen in Privatordinationen und Privatkrankenanstalten* (General Conditions for Secondary Employment in Private Surgeries and Private Hospitals) specify in detail the medical activities that are not compatible with employment by the university, and set out conditions for secondary employment. These conditions form part of every contract with a qualified doctor. Compliance is verified by an employee's line manager, the Human Resources and Human Resources Development Department, and Internal Audit. Non-compliance can result in disciplinary measures.

Controlling of subsidiaries and associates

In accordance with section 10 Universities Act, MedUni Vienna is entitled to establish companies, foundations and associations, to invest in them and to be a member of associations, provided that such actions serve to support the university's performance of its tasks. The university's rights to information and control are assured in the memoranda of association of subsidiaries and associates. The Rectorate is responsible for representing the university's interests as an owner of these organisations (e.g. by setting strategic goals, participating in shareholder meetings, appointing members of

governing bodies, and exercising shareholder rights). In all companies in which the university has a majority stake, the General Assembly, including the Rector as the representative of MedUni Vienna, is the most senior legal governing body (there is no supervisory board). Based on sections 1 and 2 Universities Act, the university has non-economic objectives and core activities, and management must be based on the principles of efficiency, economy and expediency. The Vice Rector for Finance – with the Finance Department – and the Controlling unit are responsible for reporting. Reports containing the following information on the status of subsidiaries and associates are submitted to the University Council: 1) budgeted and actual statement of profit or loss; 2) statement of financial position; 3) employees at reporting date; 4) qualitative forecast of results. Budget and investment planning takes place in meetings of the finance committee. Events that may have significant effect on the management of the university or its accounts are also reported to the University Council without delay. In the future, standards for handling and controlling subsidiaries and associates will be defined in a manual.

Internal control system (ICS); crisis and risk management

A comprehensive internal control system (ICS) is in place at MedUni Vienna. The ICS manual provides a consistent set of guidelines. The Rectorate is responsible for ensuring that appropriate risk management is in place to allow early identification of developments that pose a risk to the University, so that countermeasures can be taken. This includes identifying, in risk reports, potential risks related to employee protection and IT in particular. MedUni Vienna has implemented institution-wide risk management. The goals are continuous identification of the biggest potential risks, implementation of adequate risk monitoring and control of measures taken. Internal Audit applies risk and process-orientated audit techniques in evaluating the effectiveness of risk management, as well as providing advice and support for optimisation of business processes. Internal and external evaluations of the Internal Audit department's work are to be carried out for quality assurance purposes. An Emergency and Crisis Management System has been established to deal with such events should they occur.

Quality management

Wide-ranging quality assurance processes and process management have been adopted at MedUni Vienna. These are detailed in a quality management manual. The university's teaching, research and patient care activities, and administrative operations are internally audited, and certified by external bodies according to various standards (e.g. ISO 9001:2015, AQ Austria, ACQUIN), as well as being subject to continuous monitoring processes (e.g. by scientific/advisory boards). Research projects are evaluated by the Ethics Committee and the Animal Ethics Committee. Additional quality management measures include peer review in connection with research grants and publications, research documentation in accordance with good scientific practice and good clinical practice, establishment of advisory boards, establishment of performance criteria for teaching and research, online learning evaluation, evaluations of clinical training and performance (A-IQI), and of management processes in the context of joint operational management of Vienna General Hospital and MedUni Vienna. In addition, processes will be defined for appointments procedures, including a definition of conflicts of interest and how they are to be handled. **Measures:** Certification of the Teaching Center to ISO standards; continued application of the quality management measures outlined above

at the current high level. Aims and strategies will be represented in a balanced score card.

Digitalisation strategy

The university will move forward with integration of the digital transformation in teaching (virtual/augmented reality, medical simulation, hybrid learning), research (precision medicine, renaming of diseases, artificial intelligence, deep medicine, cognitive learning, additive manufacturing/3D printing, machine learning, complexity research), patient care (robotics, bionics, holomedicine, telemedicine), university administration (computer-aided facility management), construction projects (CPM) and appointments (digital/computational medicine). In the medium term, MedUni Vienna will become a hub for digital medicine. The detailed definition and implementation of a digitalisation strategy will be overseen by a taskforce.

Corporate communications

MedUni Vienna's communication activities are strategically planned and centrally managed. Content management, stakeholder-oriented activities and the integration of all available communication channels help to ensure that communications objectives are achieved as efficiently as possible. Public awareness of the MedUni Vienna brand will be strengthened by ongoing active media relations, corporate publishing, social media activities, internal communications, events and fundraising campaigns. Future **measures** comprise: (1) Continued implementation of the established brand strategy, concentrated on brand engagement (focus on leadership and reputation; brand video on the history of the Viennese School of Medicine). (2) Increasing the visibility of the brand on the MedUni Vienna General Hospital Campus and at all other sites. (3) Coordination of communication activities with Vienna General Hospital and the Vienna Healthcare Group. (4) Updating the internal communication guidelines. (5) Regular media coverage analyses for the purpose of evaluation and adjustment of the communication strategy. (6) Coordination and communication of fundraising activities, in particular for the Center for Precision Medicine. (7) Creation of a media room to enable interviews, virtual meetings and multimedia presentations to be conducted efficiently and professionally. (8) Further development of the MedUni shop in the Vienna General Hospital entrance hall, for target-group focused merchandising.

Financial management

Financial stability and strength, alongside adequate physical infrastructure, are essential in order to be able to compete on the global stage for the best talent as staff mobility increases (see section II). MedUni Vienna faces both historically rooted challenges (in terms of the university's assets) and structural challenges (in terms of revenue) with regard to putting this essential basis in place, in order to underpin its positive development over the long term.

Assets

The opening balance of MedUni Vienna's equity was in the red, at a negative value of €8.3 million (m) on 1 January 2004. At the same time, this opening balance included

accumulated third-party capital reserves from the time of partial autonomy, amounting to €6m; this meant that as at 1 January 2004, the global budget for the university was separated from federal administration with negative equity of €14.3m.

There were various reasons behind the negative balance of capital and reserves at the time of the separation from federal administration: (i) all equipment in Vienna General Hospital acquired up to the end of 2003, for which the Federal Government had borne a 40% share of the cost of acquisition, was wholly transferred to ownership of the City of Vienna, so that MedUni Vienna was unable to recognise any assets in this regard; (ii) prior to the separation of the universities from federal administration, the federal government had incurred numerous financial obligations that were transferred to MedUni Vienna in the course of separation; (iii) the total assets of the Altes AKH (old general hospital) remained assets of the University of Vienna; (iv) in the implementation of separation from federal administration, due to a lack of accounting planning no start-up funds were budgeted.

Despite the adverse initial circumstances, in its 2019 financial statements MedUni Vienna was able to recognise a positive equity figure for the first time since it became autonomous, with equity amounting to EUR 0.3m including retained earnings. This was the result of consistent growth in the university's output, and consistently reporting an annual profit. Taking into account investment grants pursuant to section 16 of the *Univ. Rechnungsabschluss VO* (University Financial Statements Order), MedUni Vienna's 2019 financial statements showed an equity ratio of 8.13%, reaching the 8% target value stipulated in the order for the first time.

Revenue

In accordance with section 55 *Krankenanstalten- und Kuranstaltengesetz* (Hospitals Act) and the political agreement between the federal government and the City of Vienna, in addition to the global budget MedUni Vienna receives necessary funds for additional clinical expense (KMA). The amount received comprises MedUni Vienna's share of the capital expenditure budget at Vienna General Hospital (Invest-KMA, €20m annually) and a cash subsidy for additional clinical expense (Bar-KMA, €40m annually). Despite these funds being recognised in MedUni Vienna's revenue, they are not available for use for day-to-day operations. In addition, the main portion of current additional clinical expense is paid for out of the global budget, in staff costs (Staff-KMA) and the cost of on-call services provided by all of the doctors working in Vienna General Hospital's clinical departments. This means that at present about 90% of the budget provided by the federal government to MedUni Vienna is used to cover staff costs. The aim of future performance agreement periods must be a corresponding increase in the global budget funds provided, in order to improve the university's position in global competition. In respect of staff costs, the number of staff (doctors) in the clinical division is capped at 1,500 full-time equivalents (see section IX), but due to the development of the regional healthcare system it is not possible to comply with this limit, and a reduction in medical staff is all but impossible to implement.

Budget planning and controlling

(1) Global budget: The contractual responsibility of joint management of Vienna General Hospital, combined with implementation of the Hospital Working Hours Act and the increase in salaries for medical staff in the clinical division from 1 January 2019, forms the basis for future performance agreements.

The minimum requirement for future performance agreements is maintenance of the status quo, and a balanced budget. The status quo relates explicitly to current performance and not to the university being internationally competitive. It can be assumed that due to the challenges it faces with regard to financial strength, MedUni Vienna will not be able compete globally as an innovation leader. A commitment to improving the university's position internationally can only be made given adequate funding in the global budget.

MedUni Vienna continues to pursue the efficiency and cost control projects initiated under the 2016-18 performance agreement. Cumulative efficiency gains of €36.3m were agreed in the 2016-18 performance agreement, and of €70m to 2024 in the Finance and Target Control Agreement. Funds made available as a result of efficiency gains provide support for balancing the budget as well as finance for strategic initiatives.

(2) Third-party funding: Thanks to a range of internal initiatives, third-party funding receipts have consistently grown from a level that was already high (from EUR 89.7m in 2016 to EUR 114.1m in 2019). Further increases will depend on ensuring a stable financial basis in the future, as well as on the availability of funding for basic research. Third-party funding revenue plays a significant role in ensuring liquidity, and makes an important contribution to covering staff costs. The contribution to liquidity is due to the fact that prepayments have almost continuously exceeded current expenses for externally funded projects in recent years. A risk to liquidity, and to the university's annual profit or loss, arises from the relationship between the global budget and third-party funding, and could potentially result in the development of a negative spiral (inadequate global budget ►decline in scientific capability ►decline in third-party funding receipts ►cycle-related negative third-party funding total ►negative instead of positive effect on overall profit/loss ►liquidity issues, early warning report/reorganisation required). In order for MedUni Vienna to develop positively and consistently over the long term in the discharge of its sovereign duties, financial coverage for risks is a key duty and aim of financial management.

All of the projects, aims and measures contained in development plans that have budgetary effects are therefore conditional upon corresponding coverage in the global budget related to the performance agreement in question.

Finance and liquidity management

Building on the finance and controlling systems successfully introduced at MedUni Vienna, additional improvements have been made to management accounting by means of quarterly reporting. Reports include liquidity overviews and interim results as well as brief information on subsidiaries and associates. During the financial year, quarterly financial statements are prepared showing the projected results for the year for MedUni Vienna and all subsidiaries and associates. The Vice Rector for Finance and the Finance Department are responsible for quarterly reporting. The quarterly reports (including a management summary) are submitted to the Rectorate and the University Council. MedUni Vienna's annual financial statements, as well as those of the subsidiaries it controls, are audited by an independent auditor. After they are submitted, the Vice Rector for Finance submits a report to the University Council. Should the university's liquidity reserves be significantly reduced, detailed liquidity planning will be implemented.

Finance and Target Control Agreement

In addition to the performance agreement, MedUni Vienna is bound to implement its contractual obligations arising from the Finance and Target Control Agreement agreed between the Ministry of Finance and the Ministry of Science, Research and Economy, which provides for efficiency gains of €70m to be made up to 2024. In implementation of the Finance and Target Control Agreement, employment of staff and the expense for medical staff in the clinical division are monitored constantly.

Measures

(1) Implementation of cost-benefit analysis: MedUni Vienna will continue to take an operational role in the implementation project group, and in project management within Universities Austria (uniko). (2) Computer-aided facility management (CAFM): Following an internal project to optimise facility management processes, the extension of the CAFM project will be based on new technology. Continuous digitalisation of technical installations (in the course of new builds) and ongoing surveys of existing equipment will contribute to optimisation of technical operations (monitoring, maintenance and repairs). Additionally, it is planned that research spaces on the Vienna General Hospital site will be mapped and managed in the MedUni Vienna system. (3) Contract database: This database contains copies of general contracts and research contracts. The system is maintained and expanded on a continuous basis – most recently, electronic HR files were integrated into the same software platform. The next step is digitalisation of HR processes and of "old" HR files. (4) Investment process: The process for signing off on investments will be accelerated by further digitalisation (removing the time it takes for files to be transported), and harmonised so that it is the same for investments under the global budget and under third-party funding. Both the CAFM system and the contract database have the potential to support implementation; the aim is to define and carry out implementation in the 2022-24 performance agreement period. (5) Fundraising: see section IV. (6) Manual for projects with third-party funding: This manual presents legal bases, framework, responsibilities and processes for management of third-party funding, and is updated on an ongoing basis. (7) Continuous expansion and development of central IT infrastructure: Implementation of the Infrastructure as a Service project has begun and will be expanded to enable efficient use of IT Systems and Communications (ITSC) infrastructure resources. A parallel computing centre has been installed to ensure adequate capacity for the increasing demand for storage space and computing power, and in order to make new teaching and learning platforms available while maintaining data protection, data security and operational security. The next major project will evaluate and make recommendations for a data repository for the purpose of research data management.

III. Human resources (HR)

MedUni Vienna's academic and non-academic staff represent Austria's most important intellectual capital in the field of medicine. MedUni Vienna is currently Vienna's 16th-largest employer, and is rated as one of the best employers in Austria (Trend Premium magazine, Issue 13/2020).

HR strategy

The university employs 1,213 academic staff on indefinite employee contracts, and 1,557 academic staff on fixed-term contracts (**see figs. 6 and 7**). Supporting people with high potential for research and teaching as early as possible, and offering them long-term opportunities at the university, plays a decisive role in MedUni Vienna's long-term prospects. Therefore, MedUni Vienna's HR strategy is aimed at recruiting the best talent to work in Vienna/Austria as a location for science and medicine.

Indefinite term employment contracts	Global budget	Total incl. external funding
Full professors (civil servant contracts)	27.0	27.0
Full professors (collective agreement)	77.6	77.6
Associate professors	295.15	298.25
Assistant professors (collective agreement)	3.25	3.25
Assistants with teaching qualification (collective agreement) without qualification agreement	45.8	47.63
Qualified medical specialists and other academic staff (collective agreement) without teaching qualification	199.4	229.67
Staff physicians	60.3	60.3
University lecturers, assistant professors, contract lecturers (civil servant contracts)/contract staff	469.5	469.5
Total	**1,178**	**1,213.2**

Fig. 6 Breakdown of academic staff with indefinite employment contracts in active service (31 Dec. 2019; FTE).

Fixed-term employment contracts	Global budget	Total incl. external funding
Qualified medical specialists, pre-doctoral and post-doctoral researchers	367.35	931.22
Assistant professors with qualification agreement	4	4
Doctors in specialist training	592.4	621.6
Total	**963.75**	**1556.82**

Fig. 7 Breakdown of academic staff with fixed-term employment contracts in active service (31 Dec. 2019; FTE).

This objective is pursued by means of internationally competitive appointment procedures (section 98 Universities Act), advancement of internationalisation and attractive career track models for young academics (see below).

HR planning

With current annual staff turnover at about 16% (excl. parental leave) and 20% of staff either on civil servant contracts or contractors, the following indicators are used in ongoing HR and budget control: (1) Number of new collective agreement career positions compared with the number of staff retiring or otherwise leaving the organisation within the same period (81 full and associate professors will retire in the period 1 Jan. 2022-31 Dec. 2024); (2) ratio of fixed term to indefinite term contracts for academic staff (incl. full professors); (3) in recent years, efforts have intensified to recruit staff with potential to make ERC submissions – attractive, long-term academic career paths offered (at present there are 358 "old" qualification agreements with staff in active service); (4) assignments abroad and evaluated teaching – according to the Austrian National Development Plan for Public Universities (GUEP) key criteria for careers at a university (internal career model as well as sections 98 and 99 Universities Act) (5) equal opportunities and measures to enhance the professional status of women (see section VI); (6) employee satisfaction (surveys), and (7) supporting young academics (see below).

Supporting young academics and career development

In order to offer attractive career opportunities to young academics, outside the career progressions set out in the Universities Act and the collective agreement, an *internal career model* has been developed, taking into account the HR structure at MedUni Vienna. This performance-based model is designed to help researchers at the start of their careers to acquire their academic qualifications and incorporates aspects of gender mainstreaming and women's advancement. A major component of the internal career model is its integration with the existing doctorate programme. After award of a doctorate degree, an *internal career agreement (ICA)*, including career phases abroad, can be offered, based on a needs-orientated announcement of a position. The development goals set out in the agreement should be reached within three years. On fulfilment of the ICA, the employee gains the right to take up an indefinite term position associated with the honorary title of extraordinary professor. The prerequisites for being offered such an agreement are a defined number of publications, relevant acquisition of third-party funding, experience in a foreign country, and defined teaching criteria. The aim is to promote the international competitiveness required to obtain a professorship. In addition, academic staff already employed at the university may be awarded a *"new qualification agreement" (section 99[5-6] Universities Act)* or a professor position under section 98 or section 99(1) Universities Act within the tenure track framework. The prerequisites for being offered a qualification agreement are international recognition, a doctorate degree, a defined number of publications, relevant acquisition of third-party funding with peer review, experience of working at an external research institution, and teaching criteria defined according to international standards. Further, for a number of associate and extraordinary professors that is yet to be defined, there will be the opportunity to take up a full professorship by way of a *simplified procedure on the basis of defined criteria (section 99[4] Universities Act, see annex).* The development goal is to become a full professor that is ranked equally to the international competition. Efforts will be made to minimise salary disparities among academic staff.

Measures

Evaluation of the various career options and the processes behind them. See section VI for measures regarding mentoring and women's advancement as well as conducting a call for professors (section 99[4] Universities Act). The major career development opportunities for administrative staff comprise being awarded expert status, the measures outlined under "HR development" (below), and the option to move to a higher remuneration grade when they take on management responsibility. Recruitment of ERC high-potentials under section 99(5-7) Universities Act: this proposal involves active recruitment of outstanding academics with the potential to receive ERC or START funding. An ERC or START application will be expected within two to three years of recruitment at the latest. The objective is greater internationalisation of the faculty and the strengthening of MedUni Vienna's research clusters and centres.

Subject allocations of chairs in accordance with section 98(1) Universities Act

In the course of the 2022-24 performance agreement period, 17 professors will retire or receive emeritus status. They will be replaced by the 16 professorships (some new and some being continued) described below. The actual budget situation for 2022-24 (in particular salary increases due to the Hospital Working Hours Act) will be a decisive factor in determining which and whether all of the listed chairs can be filled (see the section on financial management, and the Medimpuls 2030 programme). In the period up to and including 2027, it is expected that a further 14 professors will retire or be granted emeritus status. Irrespective of this, all of the professorships stated in the Development Plan (University Gazette for the 2014/15 academic year, vol. 13, no. 15 and the Development Plan (2019-2024) University Gazette for the 2017/18 academic year, vol. 14, no. 15) which have not been advertised before this Development Plan comes into force shall also remain applicable.

Preclinical chairs that will become vacant (2022-24):

(1) **Neurophysiology**: from 1 Oct. 2022 at the Center for Brain Research

(2) **Medical Biotechnology:** from 1 Oct. 2024, at the Center for Pathophysiology, Infectiology and Immunology

(3) **Biochemistry**: from 1 Oct. 2024 at the Center for Medical Biochemistry (Max Perutz Labs)

Clinical chairs that will become vacant (2022-24):

(4) **Gynaecology:** from 1 Oct. 2022 at the Department of Gynaecology

(5) **Clinical Pharmacology**: from 1 Oct. 2022 at the Department of Clinical Pharmacology

(6) **Otorhinolaryngology**: from 1 Oct. 2023 at the Department of Otorhinolaryngology

(7) **Radiology**: from 1 Oct. 2023 at the Department of Radiology and Nuclear Medicine

(8) **Angiology**: from 1 Oct. 2023 at the Department of Medicine II

(9) **Cardiac Surgery**: from 1 Oct. 2023 at the Department of Cardiac Surgery

(10) **Social Psychiatry:** from 1 Oct. 2023 at the University Department of Psychiatry and Psychotherapy

(11) **Magnetic Resonance Imaging**: from 1 Oct. 2024 at the Department of Radiology and Nuclear Medicine

New chairs (2022-24):

(12) **Uropathology:** from 1 Sep. 2022 at the Department of Pathology

(13) **Interventional Pulmonology**: from 1 Sep. 2022 at the Department of Medicine II

(14) **Infection Control and Hospital Epidemiology**: from 1 Jan. 2023 at the Department of Medicine I

(15) **Primary Care Medicine**: from 1 Jan. 2023 at the Center for Public Health

(16) **Molecular Pathogenesis**: (jointly with the University of Vienna) from 1 Jan. 2022 at Max Perutz Labs

(17) **Infectious Diseases**: from October 2022 at the Ignaz Semmelweis Center

Chairs that are scheduled to become vacant (2025-27):

Pharmacology, Oral and Maxillofacial Surgery, Ophthalmology, Comparative Medicine, Pediatric Cardiology, Forensic Medicine, Orthopaedics, Endocrinology and Metabolism, Laboratory Medicine, Pathology, Cardiology, Radiotherapy, Vascular Biology

Opportunity hiring

The Statutes of the Medical University provide for the possibility of appointing chairs in accordance with section 99a Universities Act. This enables highly-qualified researchers to be brought to Vienna as a life sciences location, in a process known as opportunity hiring. The number of positions without specific subject dedication within the meaning of section 99a Universities Act is limited to a maximum of 5% of the positions for university professors according to section 98 Universities Act, the number of which is specified in the annex to the Development Plan.

Hospital Working Hours Act, working hours agreement and employee protection

Implementation of the Hospital Working Hours Act represents a major challenge for all Austrian hospitals. MedUni Vienna has taken a leading role by developing specific new shift models. Unfortunately, other care providers are increasingly employing a strategy of shuffling services in order to make savings and “cherry picking”. MedUni Vienna and its departments in Vienna General Hospital make a major contribution to care for seriously ill patients from all over Austria, and for this purpose the university is maintaining structures that are increasingly being reduced by other providees. Meeting these responsibilities is currently possible due to a high degree of willingness to make use of the “opt-out” solution. Flexibility can be maintained due to a provision – expiring on 31 December 2021 – for an opt-out option for individuals (see section IX).

Working hours exceeding the average working week of 48 hours must be spent on research and teaching duties. If no permanent opt-out option is enacted, the care services that Vienna General Hospital is able to provide will be drastically limited from 1 January 2022. University management is committed to supporting the establishment of

a permanent opt-out option. The aim of internal management is to achieve a fair balance between the share of the burden borne by preclinical departments, clinical departments with the "48 hours model" and clinical departments with the "48+ hours model." Under the existing working hours agreement, a further 10% salary increase was applied on 1 January 2019 for all doctors working in clinical departments on the basis of the collective agreement and the Salaries Act and Contract Staff Act. Employee protection is implemented according to legal responsibility: (1) for the preclinical departments and the Clinic of Dentistry, in cooperation with external preventive staff and occupational physicians; (2) in Vienna General Hospital departments, the responsibility for all employees working in patient care lies with the Vienna General Hospital Business Unit.

Medical training

(See also section IX). A taskforce for medical training set up by the Rectorate has already begun developing structural and organisational standards for training doctors, in collaboration with Vienna General Hospital. Step-by-step implementation is being carried out on an ongoing basis, supervised by three working groups (for operational implementation of the new statutory framework, evaluation, and strategy). The Medical Training Taskforce and the Evaluation and Quality Management Unit evaluated clinical training at Vienna General Hospital again in 2019. The initial survey was conducted in 2017. All doctors in specialist training were asked to take part in the evaluation.

The response rate of 45% meant that almost every second doctor in specialist training participated, an even greater proportion than in 2017. The evaluation reached the following conclusions: a greater proportion of men (a good three quarters vs. approx. two thirds) have signed the Hospital Working Hours opt-out; more than twice as many female staff (approx. 15%) than male employees view the requirements of the training as "too high". It was found that ratings for evaluation criteria relating to specialist medical training were consistently higher in the 2019 survey than they were in the 2017 version. While "Opportunities for research and teaching during regular working hours", "Time for training" for teaching staff and "Training as a central topic in daily routines" continue to be rated critically, here too there were significant improvements compared to the 2017 survey. On the basis of the evaluation results, discussions are held and internal training audits are carried out with departments that return comparatively worse average scores.

In the coming years, further ***measures*** for implementation of new medical training (e.g. templates for training schedules, SOP for specialisation training, rotation management), as well as regular evaluation of training for doctors (surveys, staff appraisals, internal audits) and deriving measures for improving the quality of training will be the priority. MedUni Vienna will be positioned as an internationally attractive location for the best up-and-coming scientists and doctors. Supplementary measures include cooperations with international fellowship programmes, and optimised integration of the existing doctorate/PhD programmes with training, resulting in transparent training paths. The Physician Researcher Pathway offers improved scientific education during clinical specialist training, based on the integration of research and clinical activity by creating and structuring funded "protected time". This instrument will enable high potentials to achieve the qualifications needed to take up competitively funded research posts at an early stage in their career, and open up possibilities for them in terms of international career mobility and the ICA.

HR development

Based on an AQA Focus Audit, in 2011 MedUni Vienna received HR development and HR management certification (see the 2016-18 Development Plan). Since then, measures have been introduced in order to actively facilitate improvements in work-life balance and make career re-entry easier: the families service; groups for family caregivers and fathers taking parental leave; Family Day; individual coaching. MedUni Vienna has been continuously certified by family-friendly university audits since 2001. The audit is a management instrument that supports family-friendly configuration of working and studying conditions. MedUni Vienna has also signed the *Familie in der Hochschule* (family in the university) charter. The following focus areas and **plans** are to be pursued:
(1) For staff with leadership responsibilities: head of department curriculum; leadership curriculum; management and leadership seminar programme. Welcome@MedUni Vienna programme for newly-appointed professors with management responsibilities. (2) For academic staff: career mentoring; career advice; career service for PhD students and post-doctoral researchers; academic work seminar programme; languages; personal skills; teaching development opportunities at the Teaching Center (see section V); programmes run by the Gender Mainstreaming Unit. (3) For general staff: office management curriculum; personal skills; languages; MS Office; TYPO3; continuous programme of training. (4) For all: moderated health roundtables on "Working Together Healthily"; counselling for work issues; seminars on the topic of burnout prevention to help improve work-life balance; conflict management and conflict counselling; welcome service for new staff members; Dual Career Service; regular appraisals; multiple health promotion measures, in particular burnout prevention, prevention of workplace bullying and harassment, and exercise programmes in cooperation with the University Department of Physical Medicine, Rehabilitation and Occupational Medicine. To promote continuing education and training, support options for assignments abroad will be put in place (mobility grants, programmes offered by the International Office). (5) Remote working guidelines: The existing guidelines were adapted in consultation with the Works Council committees while taking into account experiences of working from home during the Covid-19 pandemic, as well as data protection considerations.

Internationalisation plans

(See also section VII). Further development of the International Office as a resource for international career development, expansion of the Dual Career Service, adjunct professorships (each organisational unit can, following the American model, nominate up to ten international adjunct professors not employed at MedUni Vienna), undergraduate Erasmus Programme, "free movers", a grants programme to promote mobility in qualification agreements and the ICA, observer and fellowship programmes.

Recruitment management

(1) Non-academic recruitment: Publication of the vacancy notice on the internal jobs noticeboard and/or in external print media, on the website and in the University Gazette. For management roles, cooperation with a recruitment agency as necessary.

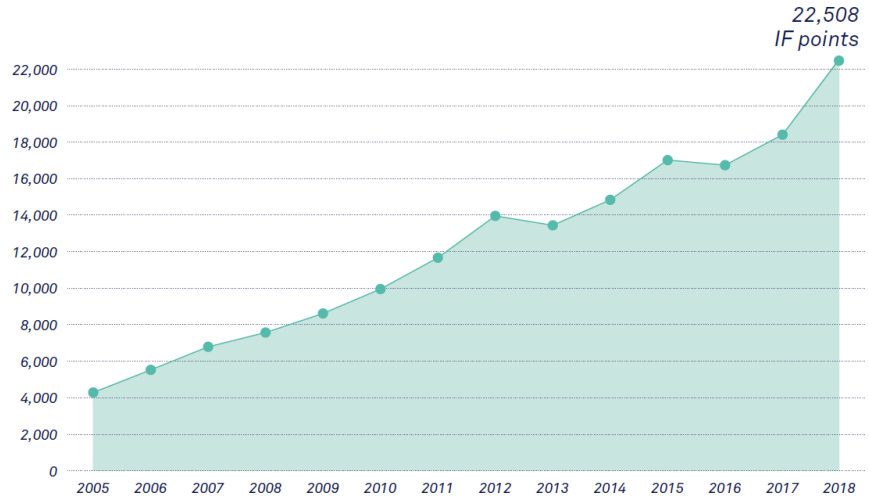
(2) Academic recruitment: Publication of the vacancy notice on the website and in the University Gazette; publication in daily newspapers (e.g. Die Zeit) and specialist publications (e.g. Nature, Science) as required; for highly qualified positions, publication in EURAXESS. Alignment of the PhD programme with international standards, which

include a joint recruitment process for PhD candidates. All existing PhD programmes with specific research themes are to be given the opportunity to participate in a joint recruitment process with an international call for proposals.

IV. Research

Current situation

MedUni Vienna is Austria's largest research institution in the field of life sciences – one of the strong points of the country's university and business landscape. The university's research activities have expanded continuously since it became an autonomous legal entity (see **Fig. 8**). This is clearly reflected in the evolution of bibliometric indicators (e.g. citations, h-indices and impact factor), the acquisition of third-party funding, and participation in programmes of excellence.



Year	Total	Average IF per pub.
2015	3,264	4.45
2016	3,224	4.39
2017	3,571	4.88
2018	3,945	4.89
2019	4,087	5.64

Fig. 8 MedUni Vienna – publications (cumulative impact factor and number of publications included in the intellectual capital report)

Potential, international benchmarking and profile-building

Austria is a European leader in terms of research and development (R&D) spending as a proportion of gross domestic product (GDP), with a ratio of 3.19%. The business sector accounts for 70% of this spending, and around half of the total is spent on experimental development (Austrian Technology Report 2019). By contrast, when it comes to R&D expenditure per researcher or per capita on basic research, Austria comes in last place compared with Switzerland, the Netherlands, Germany and the UK (J. Janger et al., 2019, International differences in basic research grant funding – a systematic comparison). A

comparison of MedUni Vienna with high-ranking international institutions, such as Karolinska Institutet, shows that these have more generous budgets and also generate more output. However, when it comes to the proportion of top publications, MedUni Vienna is able to keep pace with selected benchmark institutions (Karolinska Institutet, Heidelberg University and the University of Zurich). Overall, based on its current research performance, the university's position in research-focused university rankings is acceptable, but below potential due to budgetary constraints, although there has been a general upward trend since 2004. This positive development, despite being at a financial disadvantage compared with other institutions worldwide, is due to strategic profile-building in recent years and underlines MedUni Vienna's status as one of Austria's top universities. MedUni Vienna scored 90 out of 100 points in the Citations category of the 2019/2020 Times Higher Education (THE) rankings. **Fig. 9** shows results from the QS World University Rankings for the subject of medicine. The weightings used are 40% for academic reputation, 10% for employer reputation (employability), 25% for citations and 25% for H-index. This again shows that scientific output is keeping pace with top institutions. Employer Reputation, measured by means of a survey, is the only weak area. This metric is highly dependent on location and budget, and is difficult for MedUni Vienna to influence on its own.

University	Ranking	Academic reputation	Employer reputation	Citations per paper	H-index citations
MedUni Vienna	51-100	68.9	53.8	92.8	88.6
Harvard	1	100	100	96.5	100
Oxford	2	96.6	94.8	97.0	97.6
Cambridge	3	96.5	95.5	95.9	94.4
Karolinska	5	97.6	75.1	93.2	95
Heidelberg	31	79	72.8	92.7	90.6
Charité	41	88.6	79	84.3	78.5
Zurich	51-100	71.6	76.6	91.3	89.7

Fig. 9: Comparison of MedUni Vienna with selected benchmark institutions (QS World University Rankings 2020)

In line with its strategy of targeting specific fields of research, MedUni Vienna has five research focuses, which form the basis for five corresponding research clusters. These are not independent organisational units, but rather platforms for academic integration. Clinical centres (known as Comprehensive Centers – see section IX) are internal hospital organisational units, where patients receive interdisciplinary care (see section IX). The five established research clusters are: Immunology/Allergies/Infectious Diseases/Inflammation; Cancer Research/Oncology; Medical Imaging; Medical Neuroscience; and Cardiovascular Medicine. Publication output confirms the academic critical mass of these five clusters (see **Fig. 10** for analysis). The university's first research platform, Transplantation, was set up to promote interdisciplinary collaboration.

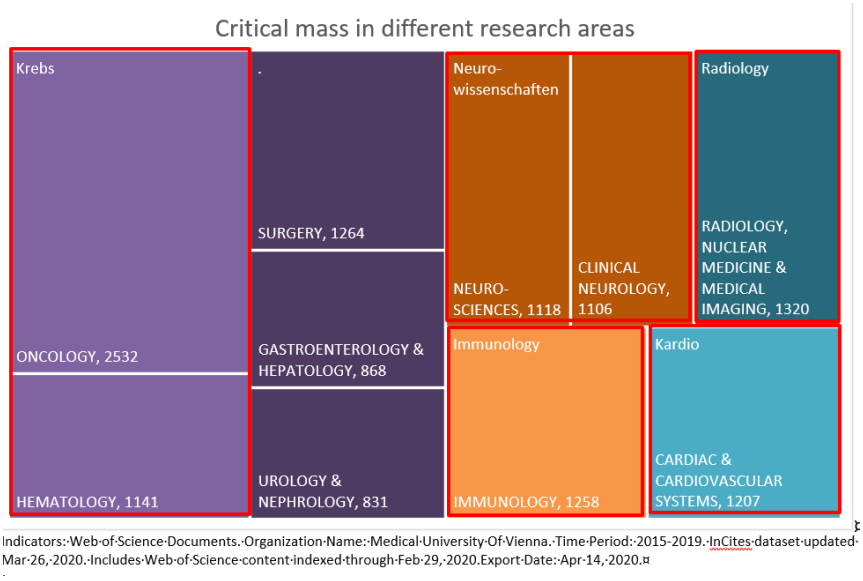


Fig. 10: Key academic focuses at MedUni Vienna

Another means of enhancing Vienna's profile as a research location is participation in domestic research networks. This takes place within the scope of the following projects: (i) the Correlated Multimodal Imaging Node (Austrian Bioimaging Node); (ii) the Platform for Personalised Medicine; (iii) projects with MedUni Graz including the Cbmed COMET Centre for Biomarker Research in Medicine; (iv) VRVis centre for virtual reality and visualisation; (v) Complexity Science Hub Vienna; (vi) projects with the Austrian Academy of Sciences (ÖAW): Center for Molecular Medicine (CeMM; cooperation agreement relating to education, infrastructure etc.) and the Institute of Molecular Biotechnology (e.g. stem cell bank); (vii) projects with the University of Vienna: Max F. Perutz Laboratories (MFPL) and part-ownership of Campus Science Support Facilities GmbH; the Institute for Ethics and Law in Medicine; joint cluster projects; (viii) projects with Vetmeduni Vienna: the Messerli Research Institute focusing on human-animal interactions, and a joint virtual cancer research platform (the LBI integration institute); (ix) project with TU Wien: the VICEM medical engineering platform; (x) cooperation agreement with the Research Institute of Molecular Pathology (IMP); (xi) projects with the Medical University of Graz and Medical University of Innsbruck: biobanks (BBMRI), Clinical Trials Coordination Centre, higher education area structural funds (HRSM) contract formulation.

Large-scale research infrastructure

Shared infrastructure plays a key role in the life sciences. MedUni Vienna participates in the Austrian Federal Ministry of Science, Research and Economy's infrastructure database, shares large devices with the University of Vienna and the ÖAW, and invested in setting up the following shared infrastructure and core facilities at an early stage: Genomics (with CeMM), Flow Cytometry, Imaging, Proteomics, the 7 Tesla MRI Centre, and the Preclinical Imaging Lab (PIL). Development milestones will include (i) start of the comprehensive renovation of animal breeding facilities in line with the latest quality standards (primarily the Himberg site, which has a €24m special construction budget), including the construction of a germ-free mouse breeding facility and gnotobiotics laboratory; (ii) further development of MedUni Campus Mariannengasse and MedUni Vienna General Hospital Campus (see sections VIII and IX); (iii) construction of the hybrid

operating theatre for large animals (HRSM 2016); (iv) continued participation in the MedAustron cancer therapy centre; and (v) participation in the Vienna Scientific Cluster (VSC) high-performance computing centre coordinated by TU Wien. Data storage and data processing remain central to the university's large-scale investment plans, especially given the massive amounts of data produced in connection with imaging and genome analysis. Involvement in European infrastructure programmes such as Biobanking and BioMolecular resources Research Infrastructur (BBMRI), EuroBioImaging, the European Molecular Biology Laboratory (EMBL) and the European Synchrotron Radiation Facility (ESRF) opens up networks for participation in European programmes and access to research infrastructure which is not available in Austria.

Research services

Researchers at MedUni Vienna receive comprehensive support from: the Ethics Committee, the Center for Medical Statistics, Informatics and Intelligent Systems (CEMSIIS), the Clinical Trials Coordination Centre (CTCC), the Center for Biomedical Research, the Center for Medical Physics and Biomedical Engineering, the University Library, biobanks, the Research Service unit including the Europe Office, the Technology Transfer Office (TTO), the International Office, the IT Systems and Communications (ITSC) and IT4Science units, as well as other organisational units with service functions. Building on the results of the HSRM project aimed at harmonising clinical research contracts, the goal is to achieve efficiency gains in contract performance and conclude master agreements with industrial and other partners (e.g. GPMed).

Management of third-party funding

Total third-party funding acquired by MedUni Vienna is relatively high and has increased steadily in recent years. However, the conditions for clinical research in Austria are expected to become tougher, and approval rates for peer-reviewed grants from the Austrian Science Fund and the EU will continue to fall. **Measures** (e.g. expansion of the Research Service unit and Europe Office) are therefore necessary to maintain levels of participation in domestic programmes and Horizon Europe, and to increase European Research Council (ERC) programme applications. Fundraising will be a key focus. Campaigns and structures will be developed to continue the professionalisation of fundraising for the Center for Precision Medicine.

Participation in programmes of excellence

At €114.1m (2019), MedUni Vienna has one of the highest third-party funding budgets of any university in Austria. The university attracts 10% of the FWF's budget (2018) – a disproportionately high amount. MedUni Vienna's participation in European programmes in the fields of research (particularly framework programmes such as Horizon 2020 and the ERC) and teaching (Erasmus) in accordance with the Austrian National Development Plan for Public Universities (GUEP) is particularly important. According to the Austrian Research Promotion Agency (FFG), as presented in the course of the strategic ERA Dialogue consultation meetings with the ERC, MedUni Vienna is the most successful Austrian life sciences/health organisation participating in Horizon 2020. By the middle of 2020 – the final year of Horizon 2020 – the university had acquired total funding of over €61m (including Innovative Medicines Initiative [IMI] projects). Despite stiffer competition within the Horizon 2020 programme, MedUni Vienna ranks third among Austrian universities in this regard. Participation in programmes of excellence has increased as a result of raising the profiles of the research

clusters, which were involved in the following programmes in 2019: (i) Immunology: five FWF Doctoral Programmes (DKs), four FWF Special Research Programmes (SFBs), one FWF doc.funds programme, two Ludwig Boltzmann Institutes (LBIs), one ERC Consolidator grant; (ii) Cancer Research: two ERC Advanced Grants, one FWF SFB, one FWF doc.funds programme, one LBI; (iii) Medical Imaging: LBI for Applied Diagnostics (lbi:ad), one ERC Starting grant; (iv) Medical Neuroscience: one Consolidator and one Advanced ERC grant, one FWF DK, one FWF doc.funds programme; (v) Cardiovascular Medicine: one LBI.

The university intends to continue supporting participation in the following excellence programmes:

FWF special programmes: In 2019, MedUni Vienna headed five DKs, six FSBs and three doc.funds programmes. *Doctoral Programmes (DKs):* DK W1258 Integrative Structural Biology: Timothy Skern; DK W1248 Molecular, Cellular and Clinical Allergology (MCCA): Winfried Pickl; DK W1205 Cell Communication in Health and Disease (CCHD): Stefan Böhm; DK W1207 RNA Biology: Andrea Barta; DK W1212 Inflammation and Immunity (IAI): Maria Sibilia; *Special Research Programmes (SFBs):* SFB 70 Histone Deacetylases as Regulators of T-cell-mediated Immunity: Wilfried Ellmeier; SFB 54 Inflammation and Thrombosis: Johannes Schmid; SFB 47 Myeloproliferative Neoplasms: Peter Valent; SFB 46 Towards Prevention and Therapy of Allergy: Rudolf Valenta; SFB 43 RNA Regulation of the Transscriptome: Michael F. Jantsch; *doc.funds programmes*: Medical Neuroscience: Johannes Berger; Molecular and Cellular Control of Tissue Homeostasis in Health and Disease – TissueHome: Karl Kuchler; Malignant Diseases: Gergely Szakacs.

Christian Doppler Laboratories (CDLs): MedUni Vienna participated in a total of nine CDLs in 2019: CDL for Applied Metabolomics, Alexander Haug, Lukas Kenner, Siemens Medical Solutions USA, Inc.; CDL for Arginine Metabolism in Rheumatoid Arthritis and Multiple Sclerosis, Gernot Schabbauer, Bio-Cancer Treatment International Limited; CDL for Molecular Stress Research in Peritoneal Dialysis, Klaus Kratochwill, Zytoprotec GmbH; CDL for Clinical Molecular MR Imaging, Siegfried Trattnig, Siemens AG Österreich; CDL for Innovative Optical Imaging and its Translation to Medicine, Rainer Leitgeb, Carl Zeiss Meditec Inc., Exalos AG; CDL for Recovery of Extremity Function, Oskar Aszmann, Otto Bock Healthcare Products GmbH; CDL for Medical Radiation Research for Radiation Oncology, Dietmar Georg, EBG MedAustron GmbH, PEG MedAustron GmbH, Siemens AG Österreich/Sector Healthcare, Elekta GmbH; CDL for Ophthalmic Image Analysis, Ursula Schmidt-Erfurth, Novartis Pharma AG; CDL for Ocular and Dermatological Effects of Thiomers, René Werkmeister, Croma-Pharma Gesellschaft m.b.H.

ERC grants: 16 MedUni Vienna employees have been awarded ERC grants. Starting Grants (5): Thomas Klausberger (Hippochronocircuity), Alwin Köhler (NPC Genexpress), Bernhard Baumann (Optimalz), Stephane Ciocchi (ventralHippocampus), Kaan Boztug (Immunocore).

Consolidator Grants (3): Igor Adameyko (Stemming from nerve), Alwin Köhler (NPC-BUILD), Kaan Boztug (iDysChart).

Advanced Grants (5): Maria Sibilia (TNT-Tumors), Tibor Harkany (Secret-Cells), Giulio Superti-Furga (i-Five and GameofGates). Erwin Wagner joined MedUni Vienna after receiving his Advanced Grant (for the CSI-Fun project).

Synergy Grants (3): Oskar Aszmann (Natural BionicS), Igor Adameyko (coordinator of KILL-OR-DIFFERENTIATE), Joanna Loizou (DDREAMM).

Ludwig Boltzmann Institutes: LBI for Digital Health and Patient Safety (coordinators: Harald Willschke and Maria Kletecka-Pulker), LBI for Cardiovascular Research (coordinator: Johann Wojta), LBI for Applied Diagnostics (coordinator: Markus Mitterhauser), LBI for Arthritis and Rehabilitation (coordinator: Günter Steiner); LBI for Hemotology and Oncology (coordinator: Peter Valent), LBI for Rare and Undiagnosed Diseases (coordinator: Kaan Boztug)

Vienna Science and Technology Fund (WWTF): In 2019, three MedUni Vienna projects were awarded funding under the WWTF's Multimodal Imaging Life Sciences Call. A total of five projects headed by MedUni Vienna which received funding as part of the 2018 Life Sciences Call, titled Linking Research and Patients' Needs, have been in progress since 2019; the university is participating in two further projects.

European Reference Networks (ERNs) for rare diseases: MedUni Vienna is an associate member of 15 ERNs (out of a total of 24), where it is represented by a total of 18 centres. The university's application for full membership of two more ERNs is currently being assessed under the European approval procedure. The aim is to become a full member of relevant ERNs as quickly as possible, in order to reap the maximum possible benefits for research and patient care from the European networks. The university is also supporting moves to accelerate and remove bureaucracy in the Austrian ERN designation process.

Strategies, objectives and development measures

The focus is on development and differentiation of the five research clusters, a research platform and the integrative interdisciplinary areas of translational medicine and precision medicine, within the overarching topic of "high-tech preventive medicine" (**Fig. 11**). Future research strengths have been identified and are regularly assessed. Continued improvements to put in place high-performance, modern infrastructure are vital for the university to be able to exploit this potential. The foundations required to realise potential are the continued development of infrastructure for research based on genome discoveries, and of data storage and computing power, imaging (high-field MRI, the Preclinical Imaging Lab/radiopharmacology) and biobanks (BBMRI); access to large-scale research infrastructure in Austria and abroad through initiatives and facilities such as EuroBioImaging, EMBL, ESRF, CERN via MedAustron, and Elixir (for big data in life sciences research), Vienna Scientific Computing (VSC) and Vienna Life-Science-Instruments (VLSI); as well as the planned Center for Translational Medicine and Therapies and Center for Precision Medicine at MedUni Vienna's General Hospital Campus. **Plans: (i)** expanded digital medicine research activities (data mining, bioinformatics, integrated genomics, radiomics, machine learning); **(ii)** stronger links within the research clusters and initiation of translational projects; **(iii)** establishment of research platforms and regular potential analyses of new topics and evaluation of research focuses; **(iv)** expansion of existing core facilities and large-scale infrastructure – continued high investment is required, especially in the areas of genomics and imaging; **(v)** establishment of data storage and computing power for the digital medicine focus (hardware and as a service); **(vi)** expansion of the data advice unit for questions relating to the reuse of clinical data, EU data protection, open access, etc.; **(vii)** enhanced

data-protection expertise; **(viii)** continued financing of existing networks and platforms, expansion and enhancement of networks to exploit potential synergies; **(ix)** expansion of animal breeding and care facilities, and optimisation of processes and infrastructure in Vienna and at the Himberg site, incl. internal and external communications measures; (x) expansion of existing services provided by IT, biobanks and the CTCC (including implementation of the EU Clinical Trial Regulation); (x.1) establishment of a service unit specialising in medical products and regulatory requirements (implementation of the Medical Device Regulation [Regulation (EU) 2017/745; MDR] and the In Vitro Diagnostic Medical Devices Regulation [Regulation (EU) 2017/746; IVDR]; **(xi)** provision of support to help researchers attract competitive funding from excellence and EU programmes, and to incentivise success (e.g. proportional additional financing for contributions to core facilities and animal breeding and care facilities); **(xii)** enhancements to structured doctorate programmes in relation to recruitment, training and networking; **(xiii)** bundling of research services; **(xiv)** acquisition of the European HR logo; **(xv)** new research documentation system to support preparation of the intellectual capital report, documentation for the performance-related allocation of funding, and various reports (replacement and adaptation); **(xvi)** over 100 Covid-19-related research projects (see https://www.meduniwien.ac.at/web/forschung/forschung-zu-covid-19/ – German only) aimed at helping to contain the SARS-CoV2 pandemic.

There will be a special focus on the career development of **young researchers** within the scope of doctorate programmes (see sections III and V). The PhD Programme (N094) and the N790 programme encourage the continued development of independent academic research skills and provide development and support for young researchers. All PhD students are categorised as early-stage researchers and are employed by the university. They follow structured programmes throughout their studies. There will be an increased emphasis on joint, transparent invitations for applications, selection procedures and related educational measures (international PhD recruitment). The university will take steps to obtain the European human resources logo and establish corresponding structures and programmes. See section III for information on career support measures for young researchers.

Development of key research focuses

MedUni Vienna's strengths, which are built on its existing research clusters, lie in translational and clinical research in combination with basic biomedical research. The future trends of personalised and digital medicine are clearly visible as interdisciplinary topics running through all of the clusters. All activities fall within the scope of high-tech precision medicine as a strategic objective, in accordance with the university's mission (see section II and **Fig. 11**). The construction projects at MedUni Campus Mariannengasse and MedUni Vienna General Hospital Campus (see sections VIII and IX) are essential for the continued enhancement of scientific excellence and the application of research findings.

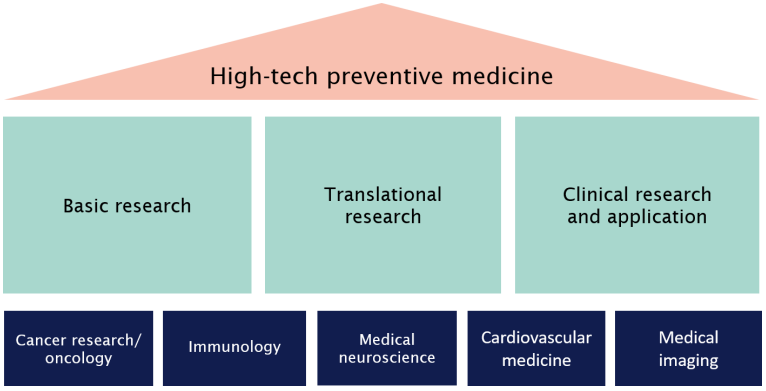


Fig. 11: Organisation of key research focuses in relation to the overriding theme of high-tech preventive medicine at MedUni Vienna

The university's additional key strengths and horizontally integrated focuses, which are fostered and supported in various ways, are: (i) patient safety; (ii) microbiome research (in collaboration with the University of Vienna); (iii) orphan and rare diseases; (iv) gender medicine, and (v) metabolism and endocrinology. Other technological fields which will be enhanced across the university include regenerative medicine, RNA biology and epigenetics.

V. Teaching

The Austrian Universities Act describes the link between research and teaching as the defining feature of a university. Correspondingly, the objectives of teaching at MedUni Vienna are (1) providing education based on actively acquired scientific knowledge and therefore also laying the foundations for lifelong learning (LLL), and (2) teaching practical clinical skills for the purpose of training students to enter the medical profession (see also *Perspektiven der Universitätsmedizin* [Perspectives in University Medicine] for the position of the German Council of Science and Humanities). As a result of disruptive global changes (see section II), professional attitudes, mindsets and LLL will play increasingly significant roles as opposed to purely technical skills determined by current trends. MedUni Vienna has a wide range of undergraduate degree and continuing education programmes which fit the profile of a medical university, comprising degrees in medicine and dentistry, a medical informatics master's programme, relevant PhD and doctoral programmes, postgraduate continuing education courses and certificate courses. Following the major higher education reform in 2002/03 and the transition from the "old" doctoral programme in human medicine (N201), over the last 15 years the Medicine degree programme (N202) at MedUni Vienna has evolved into a modern, highly effective, internationally recognised course. The curriculum was last accredited in 2016, with accreditation valid until 30 September 2023. A **Teaching White Paper** has been produced as part of the work of the teaching taskforce (https://intranet.meduniwien.ac.at/allgemeines/news/news-detail/white-paper-lehre-praesentiert-zukunft-der-lehre-an-der-meduni-wien/ [German only]). The document presents (1) the current organisational structure for teaching; (2) the current framework for the Medicine degree programme; (3) positions developed by the teaching taskforce, and (4) specific proposals.

Medicine and Dentistry degree programmes

The way in which healthcare is currently structured in Austria requires, as a result of a shortage of nursing and administrative staff, an uncommonly high number of qualified doctors (by international comparison) to be deployed in positions which are inappropriate in terms of their level of training. The statistic that in Austria only about 4% of doctors were trained abroad, compared to the OECD average of 17%, highlights the relatively unattractive working conditions in the country. Comprehensive structural and quality measures would need to be taken in the healthcare system to address this situation (Institute for Advanced Studies [IHS] medical graduate monitoring for Vienna/Graz, and study into the demand for doctors by Österreichische Bundesinstitut für Gesundheitswesen [ÖBIG]/Gesundheit Oesterreich GmbH). Before the introduction of a selective admissions procedure in 2006, the university had up to 16,000 students, about 30 times the number of people studying medicine at Harvard Medical School, but graduation rates were low, at between 30% and 60%. Austria had two to three times as many doctors and medical graduates in proportion to its population than comparable countries. In 2005, the Austrian media was still reporting a glut of doctors, the Austrian Medical Chamber ran a media campaign to try to deter people from studying medicine and the ÖBIG Austrian health institute was predicting that there would be 20,000 unemployed doctors in 2010. The decades-long surplus of poorly paid and inefficiently deployed physicians had a problematic effect: healthcare institutions were established

based on local labour market policy rather than purely on the basis of medical necessity. Students still want to study medicine in large numbers – about nine times as many candidates take the Med-AT entrance exam at MedUni Vienna than there are places available (740). It cannot be argued that the frequently mentioned shortage of doctors in Austria is the result of insufficient training places or graduates. In comparison with other EU and OECD countries, the number of doctors and medical graduates per capita is still very high in Austria. It is the care provision structure that is flawed – vertically (hospital doctors versus general practitioners) and horizontally (urban centres versus rural areas), as well as in terms of opportunities after doctors qualify (according to a survey of graduates, over 30% of a medical degree year group currently wanted to work abroad due to the unattractive working conditions in Austria). In view of the already high number of graduates, answering the frequent calls to increase training places at existing universities would be an ineffective approach. The uncoordinated establishment of partially-private, research-free medical education centres located outside the established university locations being pursued by some of Austria's federal provinces (especially in their function as hospital providers) could lead to a further weakening of Austria as a location for medical science and education. What would have a decisive impact would be restructuring healthcare provision to make it future-capable and more attractive to young doctors.

Domestic demand for graduates – EU quota system

The demand for medicine and dentistry graduates is influenced by health policy and the higher education environment. The current number of graduates differs only slightly in comparison to the number before the introduction of a selective admissions procedure. An annual intake of 660 students on to the university's undergraduate medicine programme is at the top end in international rankings. Since 2019, the quota procedure has no longer applied to the admissions process for dental studies, as it was dropped at EU level. The 2012 study into demand for doctors in Austria (*Ärztebedarfsstudie*) by the Austrian Medical Chamber, the Federal Ministry of Health and the Federal Ministry of Science, Research and Economy predicts a shortage of doctors from 2025, on the basis of various scenarios, despite Europe's highest number of doctors per capita and a record number of practising physicians. The decisive factors, given the current structure of healthcare provision, are regional distribution, choice of specialism, mass retirement, the efficacy of care provided by "doctors of choice" without direct contracts with insurers, and the emigration of doctors. In Austria, the international mobility of graduates is strongly linked with country of origin, in contrast with other OECD countries. According to a 2015 IHS study, only a small proportion of graduates from Germany remain in Austria, compared to 80% of Austrian graduates. By retaining the quota system designed in consultation with the EU Commission for admission to the Medicine programme, and maintaining high graduation rates, MedUni Vienna will continue to make an important contribution to the provision of medical care in Austria. The removal of the quota system for admissions to the Dentistry programme will have a significant impact on the development of dental care provision. Trends in applicants' countries of origin – especially in the numbers applying from Germany – and the resulting likely emigration patterns following graduation will play a decisive role. After two years (2019, 2020) the number of applicants has barely changed, but in 2019 the proportion of applicants receiving a study place for the first semester with an Austrian university entrance qualification (*Matura*) was significantly below the former quota. An evaluation of this

development is essential, in order to support a continued push for the reintroduction of quotas for the Dentistry degree programme given these circumstances.

The principle of research-led teaching

In order to closely link teaching with research – a defining feature of a university – courses reflect the current state of research and teach the latest findings. To adequately embed the aspect of research-led teaching in undergraduate programmes, all students must complete an academic paper (dissertation). As preparation for this, the fundamental principles of academic research form a key element of curricula, and are covered in special study modules (SSM), forming a sub-curriculum running in parallel with the main curriculum. In the SSM, students learn the fundamentals of the scientific method, as well as planning, conducting and evaluating investigative studies. They are also introduced to specific methods of scientific research. Students receive dissertation supervision from staff with post-doctoral teaching qualifications (or other suitably qualified university teaching staff). Dissertations are presented and defended as part of the second element of the third final examination. Evidence-based medicine is a fundamental principle, underpinning the entire curriculum *(Medicine degree programme self-documentation report, 1 April 2016, accreditation process)*.

Impact of the selective admissions procedure

The admissions process was audited by the National Audit Office in 2019/20. The audit took account of the effect of the admissions process on three key indicators for the Medicine and Dentistry degree programmes: the proportion of students taking part in exams, the proportion of students graduating within the standard number of semesters (incl. "tolerance" semesters), and the average duration of study. The National Audit Office "saw these indicators as comparatively the most suitable for monitoring over the long term to enable a direct analysis of the impact." Within ten years, at Austria's medical universities the proportion of students taking part in exams increased to 85%, in comparison with just 57% at other universities. The proportion of students graduating within the standard number of semesters (incl. "tolerance" semesters) number of semesters also increased, to 69%, while at other universities this figure stands at just 30%. The average duration of study is approximately 12 semesters. The chart below shows MedUni Vienna admissions and graduations over time.

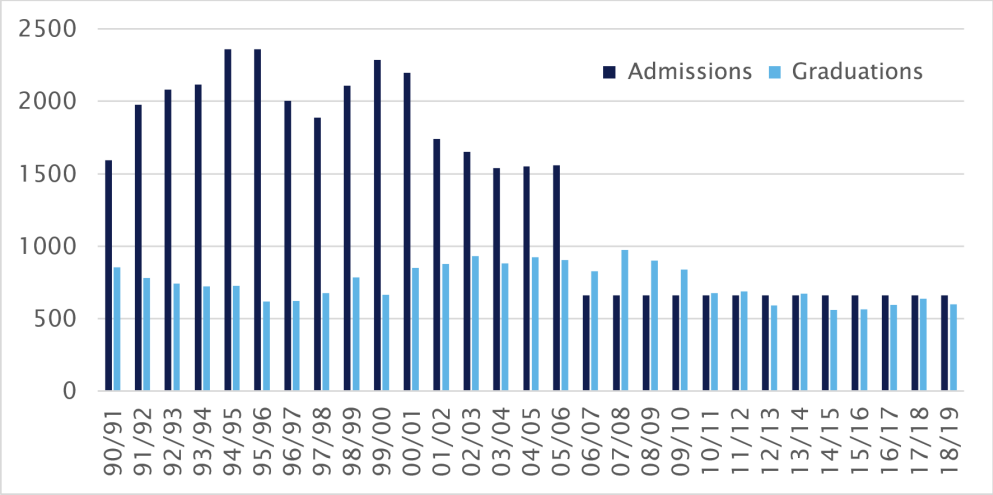


Fig. 12 MedUni Vienna Medicine degree programme: new admissions and graduations since 1995.

The trend is a result of the introduction of the selective admissions procedure as well as the organisation of the curriculum in both degree programmes. All students are guaranteed internship placements and seminar places – in both pre-clinical and clinical care, as well as with respect to academic mobility – and sufficient examination dates. Lengthening of the duration of study due to increased student numbers, and the resulting teaching capacity shortages would heighten the risk that degrees are not completed – particularly in the case of socially disadvantaged students – and lead to an increase in the drop-out rate. The National Audit Office stated "...that key performance indicators for evaluating the impact of the selective admissions process on the Medicine and Dentistry degree programmes have improved over recent years. The potential influence of other factors (e.g. changes to the curricula) to the change over time must not be underestimated. Nevertheless, it is plausible that students selected based on aptitude in the admissions process are more suitable for the programmes and therefore may make a significant contribution to improving these key performance indicators."

Accreditation and quality of the Medicine degree programme

The Medicine degree programme conforms to the recommendations made by the German Council of Science and Humanities in 2014, and in 2016 was unconditionally re-accredited until 30 September 2023 by the Accreditation, Certification and Quality Assurance Institute (ACQUIN). According to ACQUIN, the Medicine degree programme provides training which meets the requirements of professional practice and incorporates the standards for quality improvement in basic medical education. The re-accreditation encompassed major reviews of the Medicine programme following its introduction in 2002 and the introduction of the Clinical Practical Year (CPY) in 2013/14. In future accreditation processes, consideration of social responsibility aspects will be more firmly embedded in the evaluation. Accreditation will be conducted in accordance with the WFME Global Standards and the ESG criteria. Both standards ensure that social responsibility is included as an object of accreditation, and reaccreditation will be sought for the Medicine degree programme before 2023. One indicator of the high quality of education is the success students have enjoyed in domestic and international competitions. MedUni Vienna students perform well in the Paul Ehrlich Contest for medical universities/faculties in the German-speaking countries, which tests students' expertise in the categories of practice, theory and diagnosis. Students have also received

the Federal Ministry of Education, Science and Research's prize for the best dissertation by a student at an Austrian university. The university intends to increase its support for student involvement in competitions, as well as entries by teaching staff/tutors for the Ars Docendi and Ars Legendi prizes (Austria and Germany). Teaching staff at MedUni Vienna have received awards for three years running (starting in 2018), including the Ars Docendi state prize for excellent teaching, and the university is represented in the ministry of education's atlas of good teaching by numerous best-practice examples. The Teaching White Paper, produced as part of the work of the teaching taskforce in 2019, sets out measures which are to be realised in the coming years. Additionally, in 2018 the Medicine Curriculum Committee established by the MedUni Vienna Senate initiated a process with the objective of analysing the Medicine degree programme curriculum in terms of quality, and linking together the content of different courses to an even greater extent. This process will be carried out by the Curriculum Directorate in coordination with the Vice Rectorate for Teaching. Entries to the Ministry of Education, Science and Research's Digitalisation and Social Transformation programme will result in funding for teaching projects on this theme. These projects will be implemented in the next three years.

Measures: (i) Reaccreditation of the Medicine degree programme by 2023.
(ii) Continued implementation of the recommendations from the 2016 reaccreditation.
(iii) Implementation of white paper topics: development of teaching culture, the position held by teaching in the medical career path, development of clinical teaching, medical simulations, digitalisation of teaching and a digitalisation focus in curriculum development, hybrid education; assessment including enhancing completion of the Medicine degree programme with an internationally comparable final examination; development of competence-based evaluation and introduction of new evaluation software (evasys); evaluation by means of graduate surveys. Harmonisation of assessments in medical education core areas, including in particular development of an internationally comparable final examination for the Medicine degree programme.
(iv) Planning and implementation of teaching requirements on Campus Mariannengasse, including simulation centre and VR lab; further development of the Clinical Practical Year (CPY), in particular (a) quality assurance measures for teaching departments with site visits, (b) rationalisation of use of progress documentation (logbook) for teachers and students, and (c) greater flexibility for individual planning of the CPY. **(v)** Ongoing graduate monitoring, and application of the results of the graduate and student monitoring HRSM project launched in 2017, will provide the basis for analysis of the profile of graduates when they enter the Austrian labour market; the aim is to collect data relating to different degree subjects at 12 universities on graduates' entry into the workplace and their first five years of work (for social aspects see section VI).
(vi) Digitalisation (see also the Federal Ministry of Education, Science and Research's Uni-Med-Impuls 2030 programme): implementation of all content required in the Medicine degree programme to provide optimal training for future doctors in the areas of digital skills, knowledge and communication (DSKC), and patient safety. DSKC includes not only operation of computers and computer-operated devices per se – which future generations of students will have acquired competence in as part of their general education – but also knowledge about and a deeper understanding of the basic premises and the processes of digitalisation in medicine. Skills for using digital media and day-to-day application of such instruments in the medical environment will also be taught. Acquisition of the knowledge and skills that accompany the process of digitalisation in

medicine must be combined with acquisition of related communication skills and digital expertise, in order for physicians to be able to communicate effectively with patients. Execution of the project over the next three years (Ministry of Education, Science and Research call for digital and social transformation initiatives, lead MedUni Vienna), followed by continued implementation based on the results. **(vii)** Hybrid learning, distance learning and teaching: Hybrid learning describes the interweaving of face-to-face teaching with digital media and platforms. It incorporates aspects of e-learning and takes the form of blended learning for the purposes of these measures (see white paper). Innovations such as virtual and augmented reality will also be used, as well as 3D-printed models for individualised training.

Hybrid learning environments can be integrated into all degree programmes. This involves identifying relevant curriculum elements and developing suitable teaching concepts. A strategy for implementing hybrid learning is required, which can be based on experiences from the transition to distance teaching and learning necessitated by the Covid-19 crisis. The concepts and tools that have been developed will be evaluated for future use. In this connection, digital exams will also be further developed. The resources required need to be defined, and corresponding structural support should be established. The HR development offering will be expanded in this regard, and adapted to needs and requirements (see white paper). Digital Microscopy, an extensive national project resulting from the ministry's Digital and Social Transformation call with MedUni Graz as the project lead, will be implemented over the next three years, including at MedUni Vienna. A new strand of teaching and research will be established – Cognitive Learning, Medical Simulation and Mixed Reality – focused on digital learning, educational technology, digital medicine and digital skills. The joint projects between the medical universities of Graz, Innsbruck and Vienna, and Johannes Kepler University Linz with the highest priority over the next three years are further development of the joint admissions process, the Digital Knowledge and Skills project, and the Digital Microscopy project.

Dentistry degree programme

80 new students are accepted on to the Dentistry degree programme via the MedAT-Z admissions process every year. Several major reviews of the curriculum have previously been completed to develop it into one of the most up-to-date dentistry degree programmes offered anywhere in the world, thanks to innovative teaching approaches and a strong practical focus. A process analogous to that being carried out for the Medicine degree programme will be conducted for the Dentistry programme in 2020/21: in accreditation procedures, consideration of social responsibility aspects will be incorporated into evaluation by means of indicators. This was included when commissioning the accreditation agency for initial accreditation of the Dentistry degree in 2020. Accreditation will be conducted in accordance with the WFME Global Standards and the ESG criteria. Both standards ensure that social responsibility is included as an object of accreditation.

Measures:

For the purposes of quality control and continuous improvement, the Dentistry programme will undergo accreditation for the first time, including its 72-week practice placement. The programme will then be further developed in line with the accreditation report produced in 2021, which will also have a bearing on organisational matters. The Dentistry programme is an exception, in that graduates are immediately permitted to

practice as independent practitioners. The impact of removal of quota rules for the Dentistry programme admissions process from 2019, as a result of the decision by the EU Commission, will be monitored over the next few years. Long-term effects may include too few Austrian students being admitted to the programme, resulting in a declining number of licensed and practising dentists in Austria. Evaluation will be conducted jointly with the Austrian Dental Chamber, and by means of surveys of graduates. In the case that such effects materialise, the falling numbers of Austrian students that have already been observed can be used as an indicator, and corresponding initiatives at the level of EU policy will need to be put in place.

Doctorate programmes

In the 2018/19 academic year, 1,320 doctoral candidates were under supervision in the structured doctorate programmes. There are 28 thematic programmes, and confirmation of supervision by an accredited supervisor and of a thesis project are required for admission. The university's career development strategy reflects the view that doctorate programmes provide the foundation for an academic career. Two postgraduate doctorate degrees are currently offered at MedUni Vienna: the Doctoral Programme in Applied Medical Science (UN790) and the PhD Programme (UN094). Both are taught in English. The PhD programme encourages the further development of independent academic research skills as well as providing development and support for the next generation of scientists. The university regards PhD students as early stage researchers, who receive an education geared towards a career in scientific research. The Applied Medical Science programme encourages the further development of independent academic research skills for medical careers. The research element of the course is equivalent to a PhD, culminating in an original thesis with accompanying publication in respected journals. The Doctoral Programme in Applied Medical Science is intended to support the diffusion, development and management of professional clinical practice. In 2009, the MD/PhD programme of excellence was established. It allows undergraduate medical students to participate in a doctorate programme. In 2018/19, 16 students were admitted by decision of a committee following an application process.

Progress was made on establishing joint PhD programmes during the 2018-21 performance agreement period. To enhance cooperation between the University of Vienna and MedUni Vienna, an internationally visible, English-language joint PhD programme has been created. Identical curricula are to be approved at the two institutions, within which different fields of doctoral research (University of Vienna) or thematic programmes (MedUni Vienna) will be offered. The PhD programme is based on identical curricula to be approved at the two universities with effect from the **2021/22 winter semester**, and further joint PhD programmes will be planned. A combined recruitment process for the two doctorate programmes will be developed, to be launched in 2021, in order to boost international competitiveness and attractiveness as a location for biomedical research. Further development of the PhD programmes can be expected as a result. As in 2019, MedUni Vienna will continue to focus on doctorate scholarships. In 2019/20, the university successfully participated in the PromoLi initiative for the first time, and was able to award doctorate programme places to outstanding applicants with disability or chronic illness.

Plans and measures: (i) Evaluation of the MD/PhD programme running since 2009 and, on the basis of the results, further development of the programme, taking into account compatibility with the CPY and the Physician Scientist programme. **(ii)** Support for the Young Scientists Association (YSA), including a symposium (15 symposia held to date). **(iii)** Expansion of the mentoring programme for doctoral candidates. **(iv)** Expansion of supervisor seminars. **(v)** Reduction of average period to complete thesis (currently 4.3 years) – evaluation of PhD programmes including analysis of time taken to complete theses, and formulation of measures. **(vi)** Establishment of a thesis database (see section on the University Library). **(vii)** Recognition of curriculum elements between doctorate programmes. **(viii)** Employment contracts for all doctoral candidates at MedUni Vienna, if they are not already employed or receiving a scholarship. **(ix)** Expansion of structured PhD programmes (see section IV) – on the UN094 programme, employment in a position with at least 30 hours per week is planned, on the UN790 programme at least 20 hours per week. PhD positions will be advertised and applied for via international calls for applicants; alignment of the PhD programme with the harmonised recruitment process will contribute to additional quality assurance for the programme, greater attractiveness of the university as an international centre and increased international visibility. **(x)** Implementation and expansion of joint PhD programmes with other universities. **(xi)** A physician-researcher mobility programme. **(xii)** Further development of a joint recruitment process for all doctorate programmes. **(xiii)** Evaluation of the Physician Researcher Pathway scholarship.

Master's degree programmes

Medical informatics: The successful Medical Informatics master's programme was launched in 2006, and now makes even greater use of MedUni Vienna's standout features (intimate links with Austria's largest teaching and research hospital, project-based study opportunities, and the wide range of specialisations). Nevertheless, the programme is not yet achieving its potential in terms of the number of students it attracts given the significance of the subject. More informatics content on digital medicine topics is to be included in the medical curriculum, and advanced courses on such topics are also being generally considered for inclusion in continuing education and training programmes for life sciences occupations (including medicine). With a view to these developments, the goal is to expand the master's curriculum by implementing a closely integrated dual track model for medical informatics, which augments the current track with another aimed at students with life sciences and bioscience backgrounds. The majority of courses will be designed as joint courses for both tracks, and there will be additional introductory courses for each of the student groups. Course requirements will be based on the students' backgrounds (informatics or life sciences). The objective of joint teaching is to develop the skills required for effective communication between the two occupational groups. The existing cooperation with TU Wien and the University of Vienna will be carried forward and even closer collaboration will be sought as appropriate. The intention is to establish a formal partnership with the University of Vienna to replace the current informal arrangements.

Medical Biotechnology: This cooperation with the University of Natural Resources and Life Sciences, Vienna (BOKU) will continue. MedUni Vienna's teaching contribution (including the chair for Biotechnology) is balanced by doctoral programme participants at MedUni Vienna and graduates of the master's programme at BOKU.

Master's programmes offered in partnership with universities of applied sciences: It is currently difficult to implement joint master's programmes with universities of applied sciences, such as the Translational Biomedical Science programme with FH Campus Wien, due to the difference in the frameworks within which Austrian universities and universities of applied sciences operate. If this situation changes, the plans for joint master's programmes with universities of applied sciences will take higher priority, especially with respect to existing projects which have yet to be implemented. The introduction of master's programmes for healthcare professions (e.g. nursing) is a potential area for future cooperation. The university is looking into cooperation agreements for this purpose and will pursue such partnerships in the coming years.

Health sciences master's programme: In 2016 Karl Landsteiner University of Health Sciences, which is partly owned by MedUni Vienna, launched a medicine master's programme with a complementary health sciences bachelor's programme.

Molecular precision medicine: In conjunction with the University of Vienna, MedUni Vienna is introducing a master's programme in molecular precision medicine in line with other leading medical universities internationally. Students will develop the skills to analyse large data sets and genomic information using bioinformatics and data mining techniques, and critically evaluate them according to ethical and health economics criteria. With advanced molecular and mechanistic understanding of human disease, graduates of this postgraduate programme will be well placed to pursue careers in basic, clinical or biomedical research in science or industry (e.g. the biotechnology or

pharmaceutical industries). It is a joint programme with the University of Vienna, which has until now been offering a similar master's degree that required supplementing with essential basic medical content. The degree will be coordinated by Max Perutz Labs. Existing research projects in this area and the experience gained through coordinating the Molecular Biology master's programme, which is based at the University of Vienna, makes the Max Perutz Labs the ideal coordination platform for the planned degree programme.

Postgraduate teaching – lifelong learning

Lifelong learning, practical general background knowledge and attitudes to change, as opposed to tangible technical knowledge, are becoming more and more significant in today's world of disruptive change brought about by advances in biotechnology and information technology, particularly with respect to academic staff in the early stages of their careers. The significance of continuing education at the university as one of its core activities – alongside research, teaching and patient care – is therefore growing. Synergies exist with the Alumni Club, existing internationalisation activities, and networking activities such as membership of AUCEN (workgroup comprising staff responsible for continuing education and staff development at Austrian universities) and the European Universities Continuing Education Network (EUCEN). Continuing education programmes at MedUni Vienna are not only aimed at university graduates, but also at people with university entrance qualifications and relevant work experience. Planned future developments at MedUni Vienna include new continuing education and certificate course programmes, as well as stand-alone education and training (see *Grundsätzen und Empfehlungen universitärer Weiterbildung [Continuing education at public universities: guidelines and recommendations],* Universities Austria, 2014). The university offered a total of 33 postgraduate continuing education courses and four certificate courses in the 2018/19 academic year. The following programmes have been recently introduced or are in development: Occupational Medicine, Occupational Health and Occupational Health Consulting, Endodontology, Health Care Facilities, Intensive Care, and Professional Interaction and Counselling. New courses in dementia management, sleep coaching (three stage), sexual medicine and substance use disorder are in planning, as well as two psychotherapy continuing education courses. The curricula of nine continuing education courses are currently being redesigned. The changes relate to revision of the organisational plan for continuing education curricula, and adjustments with regard to the range of programmes offered. Cooperation with domestic and international partners will be intensified to enable the addition of programmes in further important fields of healthcare such as in critical care nursing and other nursing specialisms. Psychotherapy training will be expanded with a range of new courses, notably for medical professionals, and a palliative medicine course will be added to the curriculum. MedUni Vienna's postgraduate programmes will also result in greater access to the tertiary education sector and be offered in formats compatible with part-time study. The expansion of modular formats and certificate courses will enable this. Collaborations with other institutions and partners will be expanded to involve continuing education programmes for other groups of healthcare workers. There will be

an increased focus on interprofessional training for different groups of healthcare workers, which will be reflected in curricula. In parallel, enhanced quality assurance measures will be implemented, including an internal audit and an internal audit report.

Measures: A focus of the coming years in the area of continuing education and training will be the continuation of quality assurance efforts and measures. A postgraduate unit has been set up in the Teaching Center, two working groups have been created, the quality assurance processes have been comprehensively defined, and a handbook for continuing education courses is being produced. The curriculum is also being expanded with the addition of continuing education courses for healthcare professions.

Other teaching-related plans, measures and objectives

Avoiding drop-outs

Because an introductory and orientation period (STEOP) in the meaning of section 66(1) Universities Act is not compulsory for degree programmes with selective admissions procedures (in the meaning of section 71c and 7d Universities Act), the current introductory phase in the curricula of the undergraduate Medicine and Dentistry degree programmes will remain as is (see order of the Rectorate 2016). There has been a drop-out rate of around 5.5% since the introduction of the selective admissions procedure in 2006. (*Drop-out study, Kirnbauer, 2015*). **Measures:** Moderators are available to help students with organisational matters in the first semester of the Dentistry and Medicine degree programmes. In 2009 a comprehensive mentoring programme was introduced from the third semester *(Senior- Mentoring für Studierende an der MedUni Wien: Konzeption und Evaluation eines Pilotprojekts [Senior mentoring for students at MedUni Vienna: planning and evaluation of a pilot project], Hofhansl et al., 2010).* MedUni Vienna is expanding the curriculum with additional specific general practice content. During their Clinical Practical Year (CPY), students can complete placements lasting a total of four months in general practice at over 75 accredited providers.

Promotion of general practice

The general practice programme was launched in cooperation with the City of Vienna and social insurance carriers in 2018. An evaluation was carried out in 2019, and the programme has succeeded in making general practice a more attractive option for students. Measures: Expansion of the general practice programme to other provinces of Austria and further evaluations.

Student and teacher mobility

The promotion of international student mobility is an important strategic element of teaching in tertiary education (see also the Federal Ministry of Science, Research and Economy's tertiary education mobility strategy). MedUni Vienna is one of the most active higher education institutions in Austria when it comes to participation in the Erasmus+ programme, ranking third in the category of work experience placements (*OeAD, Sep. 2016; MedUni Vienna has set up its own free mover programme*). International mobility rates among Medicine degree students in their fifth and sixth years of study are high. During the 2018/19 academic year, over 500 students took part in international mobility programmes, and the university hosted 375 incoming students. Mobility activity is particularly concentrated in the fifth and sixth years of the Medicine degree programme.

440 of the students who graduated in 2017 had completed a placement abroad as part of their degree. Before the outbreak of the COVID-19 pandemic, work had been taking place to develop the mobility strategy, and a mobility atlas had already been created.

Measures: International mobility programmes had to be completely suspended due to the COVID-19 pandemic, and severe restrictions will remain in place for the 2020/21 winter semester. Mobility-related measures will continue to be implemented with the resumption of mobility activities (which cannot be guaranteed at the current time). The objective will be to support student mobility by means of funded programmes and Erasmus+, as well as increasing the number of partnerships with other institutions.

If restrictions on international mobility continue, the university will reassess mobility activities within Austria, particularly for fifth-year students, and place a stronger focus on domestic mobility opportunities. Mobility for sixth-year students can be guaranteed thanks to the large number of teaching hospitals and general practice training providers in the university's Austrian network. Participation in clinical placements within mobility programmes has been limited significantly as a result of COVID-19, and the degree of participation will depend largely on how the pandemic develops. The importance of domestic mobility programmes for clinical placements as well as academic mobility programmes for students will increase. Mobility activities will have to be reassessed, and promotion of cooperation with teaching hospitals covering a range of levels of care, and cooperation with the primary care sector including mobile services will take on greater significance, as will gaining experiences in new environments, and student mobility between these different areas of healthcare, even if such activities will not be able to replicate an international experience.

The university plans to design a mobility programme evaluation system, which will have a wider focus than purely participation in programmes and mobility figures. MedUni Vienna is a member of Eurasia Pacific Uninet and ASEA-UNINET, and uses its full allocation with respect to both of these networks. An increase in Erasmus+ teaching mobility at MedUni Vienna will be achieved as a result of the introduction of the new career track models and by collaborating with partners. Arrangements for domestic and international mobility will be established and developed for the Dentistry degree programme over the coming years. Students will also have the opportunity to complete placements in primary dental care settings as part of their 72 weeks of practice, provided that the quality of training can be assured.

University Library

The university is executing the following **plans**: Open access (OA) activities: Austrian Transition to Open Access Two (AT2OA2) digitalisation project. Participation in the joint AT2OA2 project (2021-24) will advance and expand the successful implementation of open access by means of transformative contracts, which were facilitated by the AT2OA HRSM project from 2017-20 and concluded for Austrian universities within the scope of the Kooperation E-Medien Österreich (KEMÖ) partnership. Development of the institutional repository (visual library): This server is MedUni Vienna's institutional repository. It came into operation in 2016 and already contains over 4,000 electronic documents. The service will be developed with a focus on electronic journal articles as well as dissertations and theses. Processing of historical inventory of books and journals: As part of the preparations for the general refurbishment of the Josephinum (2019-

2021), the university's inventory of valuable historical books and journals from the period of the Vienna Schools of Medicine were relocated. The key points of the outline plan for the university's historical inventory devised in 2019 are to return especially valuable items to the Josephinum after refurbishment, to permanently store other items elsewhere in a suitably adapted facility, and to identify, and sell or dispose of items which fall outside the University Library's area of interest. The return of items to the Josephinum and the commencement of library operations for the historical inventory at the site are scheduled for 2021/22. Building work: A plan which will enable the library to operate as a modern information centre is being implemented within the scope of the construction masterplan.

Teaching quality improvement

Measures: End of degree programme survey: All Medicine programme graduates have been surveyed annually since 2011. Questions relating to the social demographics of the student cohort were added to the survey in the 2017/18 academic year. A teaching staff survey was conducted for the first time in 2016, and again in 2019: teaching staff will complete comprehensive surveys at regular intervals. The results of these surveys will be used to continue to improve teaching and enhance its value. Promoting scientific education is an issue which is receiving a great deal of attention internationally with respect to the quality of medicine and dentistry curricula. MedUni Vienna took corresponding measures by introducing the integrated curriculum for its Medicine and Dentistry degree programmes (see above). The remaining measures are related to student dissertations, e.g. creating the conditions to make it easier for students to complete their dissertations within the regular timeframe, setting up a dissertation database and developing an electronic submission system. Professionalisation of teaching (teacher training): MedUni Vienna runs a comprehensive HR development programme for teaching. The university is in the process of designing and implementing a new teacher training programme. The aim is to further strengthen professionalisation of teaching across all programmes. Lecturers will receive training in teaching skills tailored to the requirements of curricula, and in accordance with international standards. A special emphasis will be placed on medical context and the corresponding practical situations and specific requirements. Acquiring verified teaching skills within the scope of career track models (e.g. qualification agreements and post-doctoral lecturing qualifications) is becoming increasingly significant at universities from an international perspective. MedUni Vienna's innovative medical teacher training programme, previously named the Teaching Staff Development Program/MLW, will be expanded and offered at three levels: (i) training/preparation of teaching staff for specific courses; (ii) certificate course in teaching for medical subjects (supporting career development with respect to development agreements and post-doctoral lecturing qualifications), and (iii) medical teaching leadership programme. Master's in medical education (MME): The university awards funding to teaching staff for MME programmes on a case-by-case basis. MME programmes are currently offered at Heidelberg University and the Institute of Medical Education in Bern. Teaching Center*:* A large educational institution such as MedUni Vienna requires a comprehensive teaching services centre. The Department of Medical Education was therefore relaunched as the new Teacher Center in 2016. It serves all undergraduate programmes and postgraduate programmes, as a service, administration, organisational and examination coordination centre. It also functions as

a hub for curriculum development research and a centre for medical education research. In collaboration with other units, the Teaching Center works on the development of teaching projects, such as e-learning methods, and their integration into the curriculum, e.g. for the CPY e-portfolio. The Teaching Center was also responsible for central coordination of the transition to distance learning in response to the COVID-19 pandemic for both students and teaching staff, and takes care of the organisation of examinations and work placements in compliance with the COVID-19 legislation introduced in Austria. Strategic development within the Teaching Center's functional units is on the agenda for the next few years, as is the evaluation of COVID-19 measures to improve teaching administration. Expanding the university's distance teaching and learning capacity requires a strengthening of the respective areas in the Teaching Center and corresponding capacity building, including with respect to facilities. The programme of HR development activities for teaching staff (incl. tutors) is anchored within the Teaching Center and is being expanded to include more distance-learning focused activities. Administration of the MedAT admissions exam is integrated into the Teaching Center, and it is closely involved in the development of the exam. Developments, requirements and plans for the MedUni Campus Mariannengasse are also an important part of the Teaching Center's remit, and it has already fully assumed its responsibilities in this area. The next steps in the MedUni Campus Mariannengasse construction project will require the Teaching Center to play an important role in implementation planning.

Good teaching practice and careers

Teaching and participation in teacher training play important roles in fulfilling the criteria for MedUni Vienna's current and previous career track models, and achievements must be demonstrated on the basis of evaluation results. The criteria encompass the teaching of evaluated courses, the teaching of courses for promoting students' scientific skills, mentoring duties, dissertation/thesis supervision, examination duties, teacher training, participation in HR development programmes for teaching staff, preparing best practice examples for teaching, teaching coordination duties and continuing education programme management duties. The internal career path will be enhanced to include the option of teaching as a focus area, with the ultimate aim of introducing a corresponding professorship or professorships. The intention is to increase opportunities and acceptance in relation to teaching responsibilities across the university. Opportunities for teaching will also be increased within the academic career path.

Measures: Academic staff will in future be able to follow individualised career paths with a teaching focus. More emphasis will be placed on teaching focuses with respect to career development, going beyond quantification and evaluation. Qualitative evaluation criteria for teaching focuses are being drawn up for career paths with a teaching focus.

Course evaluation system

MedUni Vienna uses a standard evaluation tool – acquired from Graz University of Technology – for evaluating its courses, which is integrated into the MedCampus administration system. By the end of 2024 the university will no longer be able to use the CAMPUSonline (MedCampus) system for managing evaluations and courses, as the current QT_QUEST application has not kept pace with the increasing requirements of universities. An interface to enable the use of Electric Paper's evasys system is therefore

currently being developed. One of the objectives is to allow evaluations to be completed both in paper-and-pencil and online formats. As part of this project, in 2018 Graz University of Technology set up a special interest group and a focus group in conjunction with participating Austrian and German universities to jointly design the evaluation process. As well as a project participant, MedUni Vienna is also one of the Austrian pilot universities together with the University of Natural Resources and Applied Life Sciences Vienna (BOKU). It is expected that MedUni Vienna will be able to start using EvaSys for course evaluations during 2021. The implementation date for module evaluations (evaluation of block-timetabled courses), which are more important from MedUni Vienna's perspective, has not yet been fixed.

VI. Social responsibility

MedUni Vienna is committed to meeting its social responsibility (third mission, or, in the field of medicine in fact its fourth mission), to promoting diversity and to the principle of equal opportunities. People with a range of different competencies and perspectives work in cooperation at MedUni Vienna, with equal status. For the university to be successful, it is essential that we view this diversity as a resource, providing potential for the development of individual Med Uni Vienna staff and society as a whole.

Strengthening the professional status of women

The plan for women's advancement and equal opportunities outlined in the Statutes of MedUni Vienna sets an objective of achieving a proportion of 50% female staff, as specified in the Universities Act and the *Bundes-Gleichbehandlungsgesetz* (Equal Treatment Act), at all levels of the university's hierarchy. MedUni Vienna is making consistent progress towards this goal (see **fig. 4**). A range of instruments are being applied in order to reach these aims (mentoring programme for women, promotion measures for highly qualified young female academics, seminars specifically aimed at women). Women remain underrepresented at the top levels of MedUni Vienna's organisational hierarchy. It can be seen that the typical "leaky pipeline" exists at MedUni Vienna (**fig. 13 and 14**). The glass ceiling index has fallen significantly in recent years. Most notably, the university issued a call for applications from prospective female professors for ten chairs pursuant to section 99(4) of the Universities Act. These appointments will help to significantly narrow the gap between the numbers of female and male professors.

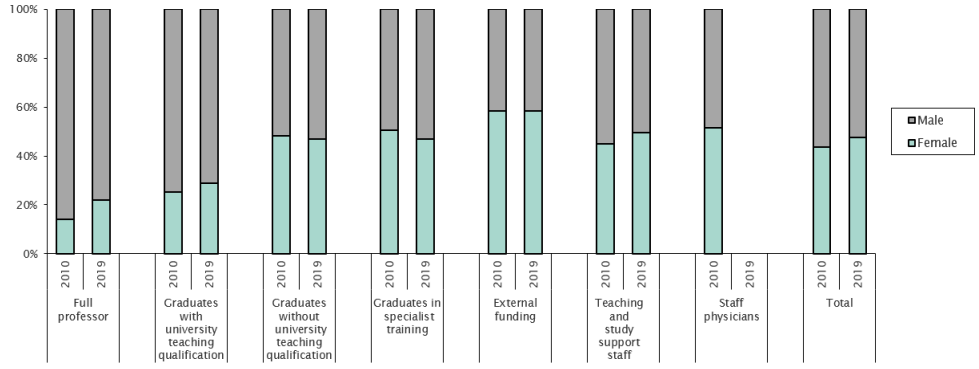
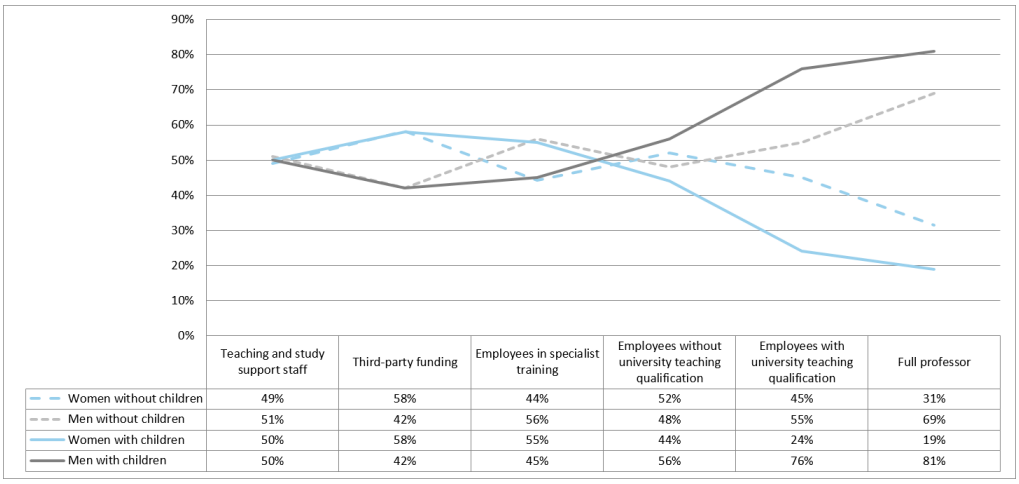


Fig. 13: Proportions of women and men in the different career stages at MedUni Vienna (2019 Equal Opportunities Report, figures as at 31 Dec. 2018).

The issue of the compatibility of work with having a family remains especially relevant. Parenthood has a different impact on the careers of men compared with women. While 75% of male professors at MedUni Vienna have children, among female professors the proportion is just 60% (figures as at 31 Dec. 2018). **Figure 14** shows that women with children are still underrepresented, especially in senior career stages.



	Teaching and study support staff	Third-party funding	Employees in specialist training	Employees without university teaching qualification	Employees with university teaching qualification	Full professor
Women without children	49%	58%	44%	52%	45%	31%
Men without children	51%	42%	56%	48%	55%	69%
Women with children	50%	58%	55%	44%	24%	19%
Men with children	50%	42%	45%	56%	76%	81%

Fig. 14: The leaky pipeline – comparison of men and women, with and without children (2019 Equal Opportunities Report, figures as at 31 Dec. 2018).

The university's equal opportunities strategy follows a three-level approach to achieving gender parity: **(1)** At the level of the individual, MedUni Vienna applies individual HR development measures tailored to women. These include the Frauen netz.werk Medizin mentoring programme for women in advanced stages of their careers, and Schrittweise, a programme for early-stage researchers. In addition, MedUni Vienna offers individual career coaching. **(2)** At the level of internal structures and processes, the Frauenbericht (report on women at the university) will be continually developed to become a wide-ranging equal opportunities report. Continuous monitoring is required in order to achieve equal opportunities. Gender competence is also incorporated into internal structures and processes at the university. **(3)** At the level of the gender dimension in research and teaching, gender medicine has been established as a distinct discipline with its own chair at the university. There is also an ongoing process of integrating gender and diversity across the spectrum of research and teaching at MedUni Vienna. A continuous series of lectures on gender topics is organised for this purpose. Teaching staff and researchers are supported by a resources pool when it comes to integrating gender aspects in their work. **(4)** Implementation of an initial call for female professors for ten section 99(4) professorships will help to make an effective contribution towards significantly narrowing the gap between the numbers of female and male professors.

Diversity strategy

The strategy adopted by MedUni Vienna comprises approaching the topic of diversity on many levels that are perceived by individuals as defining identity, at the same time as being structurally embedded causes of unequal treatment. The university sees it as its duty to create a framework that fosters a working environment defined by respect and tolerance. The following ***measures*** are intended to help establish diversity as part of the university's culture and promote social mobility: (1) at the level of equal opportunities measures (see above); (2) at the structural level – expansion of diversity monitoring, linkage with internal control measures, increasing the visibility of role models, networking events, the Veronika Fialka-Moser Diversity Award; (3) research and teaching – integration of gender and diversity themes across the curriculum and research; (4) Diversity management: workshops and seminars to promote analysis of structures

and individual attitudes and build individual diversity competence, creation of a pool of e-resources, networking and participation formats for diversity expertise and specific focus areas, outreach activities to e.g. parents and children with migration backgrounds. A further aim is make a contribution to social diversity at all levels of the institution. MedUni Vienna has established an **Office of Disability Services** and an advisory board to support and integrate employees and students with disabilities. The Statutes of the Medical University of Vienna stipulate how the advisory board is to be formed and what its duties are. The board must be made up of disabled and fully abled members, in equal numbers, all of whom are active within the University. The duties of the advisory board are to advance the integration of disabled people studying or working at the university into all aspects of university life. This includes step-free building adaptation, appropriate fit-outs in research and teaching facilities, and disability-friendly design of courses and the MedAT admissions tests. MedUni Vienna acknowledges it has an obligation to give due consideration to family caregiving responsibilities when structuring professional duties and programmes of study. Frameworks to support the improvement of compatibility between work (or study) and family caregiving responsibilities are being developed (see also HR development). A compatibility officer will be appointed to implement and develop such measures. As a shared priority, diversity management measures will also be pursued within joint management of Vienna General Hospital.

Social distribution of graduates

Parents' educational background has a major influence on the educational choices made by their children (Austrian Integration Fund research report 2016). To a large extent, by the time children are in primary school, social inclusion and educational choices have already been determined. 8,600 people registered for the MedAT admissions tests in 2020. In the education index, 30% of applicants to the medical degree programme (in 2019) were shown to have a low educational background, with the same applying to 27% of those allocated study places; the proportions were slightly higher for the dentistry programme. The survey of parents' educational backgrounds (conducted using the UStat 1 form) takes place at MedUni Vienna. The results are also checked as part of the audit process. The psychometric analysis conducted as part of the MedAT admission tests in 2019, and those on fairness (incl. social status) in particular, are presented in a report each year. An excerpt from the draft report by the Austrian National Audit Office is included in the annexes to this report. Additionally, MedUni Vienna was involved in the evaluation of access regulations in accordance with sections 71b, 71c and 71d Universities Act 2002, which was conducted by the Institute of Advanced Studies on behalf of the Federal Ministry of Education, Science and Research. Further analysis will be required before the social dimension can be fully described in relation to social structures and their effects, as well as the extent to which they can be influenced. A self-assessment by applicants will support the process.

Social dimension mainstreaming strategies and measures

Each year MedUni Vienna collects and analyses data on the social background of applicants and students. MedUni Vienna expects the results of a survey conducted by the Institute of Advanced Studies on the social background of applicants which was conducted at MedUni Vienna in 2020. **Measures**: (i) graduate surveys to be conducted

annually; (ii) fair admissions process and regular evaluation of the fairness of the MedAT tests; (iii) diversity: individual advice for disabled applicants, provision of preparation materials free of charge, greater distribution of information on medical studies and the admissions process to schools and parents without a high level of education, collaboration with federal states' school authorities; (iv) consideration of social context in curriculum accreditations; (v) compensation for clinical internship year expenses by the hospital provider in accordance with the Universities Act; (vi) regional distribution of clinical internship placements to allow placements near students' place of residence (approx. 1,600 places in Austria); (vii) grants programme for periods of study abroad; (viii) low student/teacher ratio; (ix) mentoring programme, participation in the MORE project, guaranteed share for MedUni Vienna from the social fund for low-income students and students with caregiver responsibilities, work opportunities for students as tutors; (x) support for applicants for recognition of foreign qualifications who have refugee status, cooperation with Vienna Social Fund; (xi) projects aimed at removing social barriers – Junior Scientist Programme, Children's University, equal opportunities measures and students' needs integrated into family-friendly university audit; (xii) applications for PromoLi grants for PhD students with disabilities or chronic illnesses. Further development of the joint admissions process in terms of social diversity: an area which the medical universities of Graz, Innsbruck and Vienna, and medical faculty at the Johannes Kepler University Linz are working on together. For this purpose, the regional statistics prepared by Eurostat will be used at NUTS 3 level. Measures: initial pilot evaluations have already been carried out by the medical universities of Graz and Innsbruck. A joint strategy for evaluation will be drawn up and another strategy based on the evaluation.

Technology and knowledge transfer

With an average of 16 licences issued a year over the past ten years, MedUni Vienna is among the Austrian leaders in IP commercialisation. Over 860 invention and technology registrations have been processed by the Technology Transfer Office (TTO), and over 70 patent applications are submitted each year (average for the last ten years, including renewals). Cooperation agreements with 34 partner institutes in Austria and abroad (excluding cooperations with industry) result in joint inventions. The breadth of its commercialisation activities is one of MedUni Vienna's particular strengths. Alongside inventions in the fields of medical technology and pharmaceuticals, there will also be an increased focus on commercialisation of know-how, scientific discoveries, software and biological materials (technologies without patent rights). MedUni Vienna's successfully established technology transfer activities will be expanded more intensively in the area of non-patentable knowledge (know-how), so that conventional technology transfer is extended to encompass broader knowledge transfer. In order for an idea to be exploited commercially, it is important that researchers are equipped with the related competencies. The university organises courses on intellectual property rights and project management, as well as other training and networking opportunities (e.g. Knowledge Transfer Centre East, the Fellowship Programme, the Entrepreneurship Center Network [ECN], INiTS). The TTO also offers support for establishing spin-off companies, as do external partners such as INiTS, ECN, aws, and the wings4innovation project to develop a translational research centre. As the lead partner in the Knowledge Transfer Center East consortium, MedUni Vienna is playing a pivotal role in implementing the Federal Ministry of Science, Research and Economy's *Young Innovators Austria* support programme (running from 2017-21).

The following **aims and measures** are planned: **(1)** expansion of the TTO's range of commercialisation activities (to incorporate knowledge transfer); **(2)** training and awareness events on the topic of IP rights; **(3)** integration of IP rights topics and the commercialisation of research findings in teaching; **(4)** awards for inventors and outstanding achievements; **(5)** expansion of Austrian and international technology and knowledge transfer networks; **(6)** active role in Knowledge Transfer Center East; **(7)** active role in wings4innovation; **(8)** continuous improvement of commercialisation processes; **(9)** regular development opportunities for technology transfer managers; **(10)** use of professional technology transfer infrastructure (Inteum software, market databases, technology platforms); **(11)** planning and construction of a Center for Technology Transfer on MedUni Vienna General Hospital Campus; **(12)** partnership with INiTS.

Keeping in touch with graduates

The Alumni Club is a knowledge, dialogue and career platform for all students and graduates of MedUni Vienna as well as current and former employees. The Alumni Club has 662 paying members (as at 1 Feb. 2020). A broad-based programme including podium discussions on current topics, interdisciplinary symposia and scientific seminars, coaching programmes, interesting cooperation partners and exclusive cultural events help to promote networking between members. Club members have the opportunity to link professional practice with academic dialogue, while maintaining ties with one another and 'their' university. The Alumni Club is an important network available to students from the start of their studies.

Responsible science

Responsible science comprises a range of aspects of the dialogue between science, business and society. Based on the categories referenced by European programmes and in the Federal Ministry of Science, Research and Economy's document on responsible science, as well as the indicators developed in the MoRRI project, the following areas of activity were defined: public engagement, science literacy and education, gender equality, ethics, and open access. **(i)** In the areas of public engagement and science literacy and education there are a range of focuses (the Long Night of Research, when MedUni Vienna attracts the most visitors of any institution in Vienna; the teddy bear hospital; the Children's Medical University; Cancer School; Mini Med events; media cooperations; Mini Med Junior; talks at adult education colleges; participation in various health fairs and a publication series with advice on topics such as allergies, high blood pressure, diabetes and immunisations). Many of MedUni Vienna's experts are frequently requested for interviews by the media. Further initiatives include the cancer research run with more than 3,000 runners and supporters each year, the pollen warning app – a citizen science initiative that has won numerous awards, and CeRud, a centre for rare undiagnosed diseases, in which patient and parent organisations play a central role. **(ii)** The university ensures that it meets the ethical responsibilities of conducting medical research, having established an Ethics Committee and an Animal Ethics Committee, through its involvement with the Federal Chancellory's Bioethics Committee, and through its mandatory Good Scientific Practice and Compliance guidelines. **(iii)** Open access and open data are complex topics in medicine. Scientific discoveries should certainly be published, including in studies in cooperation with industry, but it is especially important to protect patient data. There are other challenges too, related to IT investments (terabytes of data are generated at MedUni Vienna daily), and the financial

burdens of open access, which have not been solved. Implementation of open data initiatives is currently possible only at considerable expense in view of the investments required in IT infrastructure and a data clearing centre (to ensure compliance with statutory restrictions). **(iv)** On gender equality see below. The following ***measures*** will be pursued: **(1)** public engagement, science literacy and education: the wide range of activities described above will be continued; **(2)** gender equality: implementation of the women's advancement/equal opportunities plan; **(3)** ethics: implementation of the European Trial Regulation by the Ethics Committee, active communication on animal testing, review of Compliance Guidelines; **(4)** open access and open data – taking an active role in designing the corresponding Ministry of Science, Research and Education digitalisation projects; **(5)** sustainable development goals – MedUni Vienna is fully aware of its responsibilities to society as a whole to help combat climate change and is taking active steps in research, teaching and administration in a clear demonstration of its commitment to them. Similarly to a health-in-all-policies strategy, sustainability goals are to be developed, implemented and evaluated.

Data protection

In the course of implementation of the General Data Protection Regulation (GDPR), numerous measures were implemented to further improve data protection at the Medical University of Vienna. Digitalisation in research and medicine presents special challenges, particularly in connection with personalised medicine. The data protection officer, the internal university Data Protection Committee and the newly established data clearing centre have important duties here in cooperation with IT Systems and Communications (ITSC). Training courses and information events, as well as the creation of FAQs, are intended to provide employees with the knowledge they need to ensure they handle data correctly. Data security also involves the establishment of data management plans and data security measures when exporting personal data. IT and data protection guidelines and the related processes are evaluated on an ongoing basis and updated as required.

Medical humanities

The term medical humanities applies to a whole host of topics that have a bearing on medicine and how to deal with advances in technology, the majority of which relate to the social sciences and the humanities, as well as artistic and aesthetic fields. Deeper engagement with ethics, patient safety, the importance of self-reflection, exploration of the history and philosophy of medicine, as well as cultural and medical anthropology are among the subjects covered by the discipline. An example is structured communication training for students on the medical degree programme, which continues over the course of several semesters with the support of patient actors. Ultimately a question of engaging with social and cultural contexts in all medical disciplines, medical humanities is currently covered in around 600 hours of compulsory and elective modules.

COVID-19

Identified for the first time on 8 January 2020, the SARS-CoV2 coronavirus was found to have been responsible for "at least 163" doctors' deaths in Italy in the first half of 2020 according to the BBC, revealing to the world just how exposed and vulnerable care workers were. But thanks to the tireless efforts of the experts at MedUni Vienna and the guidance and support provided by them to the federal government, the prevalence of

SARS2 has been minimised in Austria. COVID-19 PCR testing was established in Austria at MedUni Vienna's Institute for Virology as early as 20 January, an achievement that provided the foundation for all of the steps that would follow. In addition to the outstanding achievements in virology and infectious medicine, numerous MedUni Vienna researchers are currently working on more than 100 COVID-19-related research projects (https://www.meduniwien.ac.at/web/forschung/forschung-zu-covid-19 German only) into solutions to bring the coronavirus pandemic under control and improve understanding of the disease caused by the SARS-CoV-2 virus. Like the threats presented by other microorganisms, the ongoing pandemic, which caught many developed countries off guard, represents a chance to think about sufficient and harmonised organisational structures in Austria. MedUni Vienna is calling for the construction of a university Ignaz Semmelweis Center for Infectious Diseases that would also act as a central point of contact for politicians and members of the general public.

Smoke-free MedUni Vienna

MedUni Vienna and Vienna General Hospital, including all ancillary buildings and outdoor spaces, were declared a smoke-free zone in 2020. In line with its responsibilities as a leading healthcare institution, MedUni Vienna initiated the move and supported it with necessary accompanying measures. Experts from the Center for Public Health offer smoking cessation support. A new guide entitled *Risiko Rauchen* (Smoking risks – how nicotine works, why it makes you addicted and how you can beat addiction to it) by MANZ Verlag in cooperation with MedUni Vienna was published to share advice on how to break nicotine addiction.

Forensic Medicine

MedUni Vienna plays a significant role in the performance of court-ordered autopsies in Austria. As the funds provided for fulfilling this public duty do not by any means cover the costs, these activities are supported by significant cross-financing from the global budget. Above all, staff costs (including as a result of aspects such as the establishment of night shifts) are not fully met by the fees charged, and in recent years investments in existing buildings and systems have been financed from third-party funds and global budget funds, which were not compensated for. The aim is to ensure that the costs of the court-ordered autopsies are covered and the funds used for cross-financing can be put to use again for the sovereign duties of MedUni Vienna.

VII. Internationality and partnerships

MedUni Vienna sees itself as a systemically important institution for Austria in the knowledge-based society and in tackling the global challenges of the 21st century. Internationality and interdisciplinary exchange are therefore core assets in the university's profile. Mobility experiences and assignments abroad offer all employees the opportunity to network internationally and are necessary for building a successful academic career. The goal of partnerships with other institutions is to strengthen core activities in research, teaching and patient care. In terms of the extent of cooperation, partnerships range from a letter of intent through to the formation of a legal entity. MedUni Vienna has strong international ties – at the institutional, organisational unit and individual employee level (**see fig. 15**).

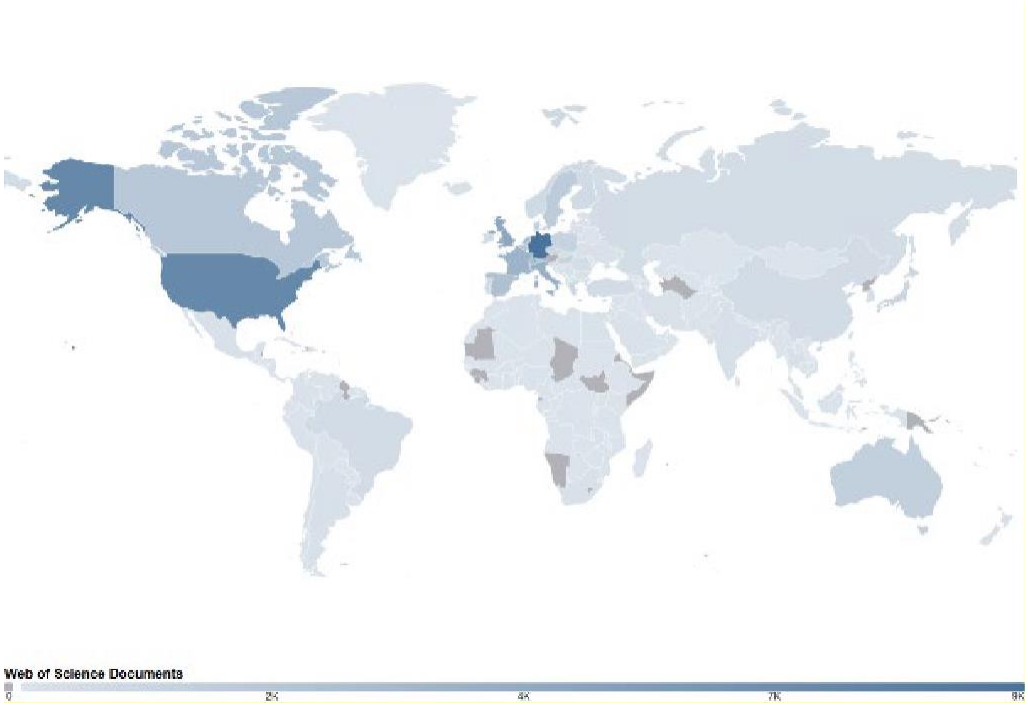


Fig. 15: MedUni Vienna's global partnerships: darker colour indicates greater cooperation density (InCities 2020)

Below is an overview of the domestic and international partnerships which serve to enhance the visibility of Austria as a life sciences location and fully exploit the resources and synergies of the respective organisations. MedUni Vienna has substantially increased its international activities since it became an autonomous legal entity. Additional student and employee mobility measures form part of the university's internationalisation strategy. These are coordinated, reviewed and continuously developed by the International Office.

Domestic institutional partnerships

The university's most important research partners in terms of publication output are the University of Vienna, the Ludwig Boltzmann institutes, the Medical University of Graz, the Medical University of Innsbruck and Vetmeduni Vienna (InCites analysis). MedUni Vienna also has ties with all of these institutions as a result of strategic partnership projects, interacts with a wide range of partner organisations and plays an active role in numerous networks (alphabetical order):

- Austrian Platform for Personalised Medicine: MedUni Vienna is the host organisation of this association for building networks in the field of personalised medicine; funded by the Austrian Federal Ministry of Science, Research and Economy.
- Center for Biomarker Research in Medicine (CBmed): K1 Competence Center specialising in systemic biomarker research in personalised medicine.
- Clinical Trials Coordination Centre network: partnership to facilitate knowledge exchange between the Clinical Trials Coordination Centres of Austria's medical universities.
- Cognitive Neuroscience: virtual cluster with the University of Vienna and the University of Veterinary Medicine, Vienna.
- Complexity Science Hub Vienna with AIT, the International Institute for Applied Systems Analysis (IIASA), TU Wien, Graz University of Technology and the Vienna University of Economics and Business: centre of complexity science research led by MedUni Vienna.
- Core Facility Net: platform for sharing various life sciences core facilities (www.corefacilitynet.org). The platform is used for making services and equipment clearly visible and facilitates knowledge exchange.
- Correlated Multimodal Imaging Node: partnership for collaborative imaging initiatives involving the University of Vienna, TU Wien, the Austrian Institute of Technology (AIT) and other institutions based in Vienna.
- Dual Career Service: this established service is currently a partnership between universities in Vienna, Lower Austria and Upper Austria.
- Ethics Committee: provides services to other institutions on a contractual and statutory basis within the scope of "one single opinion".
- Institute for Ethics and Law in Medicine interdisciplinary research platform with the University of Vienna: as well as the Patient Safety postgraduate programme, which has been running since 2012, the institute is involved in a clinical forensic victim protection clinic at MedUni Vienna's Department of Paediatrics and Adolescent Medicine.
- Institute of Molecular Biotechnology GmbH (IMBA): stem-cell biobanking collaboration.
- Knowledge Transfer Centre East (with the Vienna universities and Johannes Kepler University Linz): Founded in 2014, the objective of the centre is to promote

accessibility to know-how generated at universities for society at large, in the form of new products and services.

- Life Science Region Austria (LISA) and LISA Vienna: joint events and wide-ranging collaboration with the Austrian and Vienna Life Science Cluster.
- Max F. Perutz Laboratories: a joint research and teaching centre set up by MedUni Vienna and the University of Vienna, based at the Vienna Biocenter.
- MedAustron: Advanced centre for ion beam therapy and ion beam research based in Wiener Neustadt. An agreement is in place with MedUni Vienna for cooperation on radiotherapy and radiobiology.
- Messerli Research Institute with Vetmeduni Vienna and the University of Vienna: established in 2010, principally funded by Switzerland's Messerli Foundation.
- Platform for comparative pathology with Vetmeduni Vienna: a means of continuing the successful cooperation within the scope of the Ludwig Boltzmann Institute (LBI) for Cancer Research.
- Research Center for Molecular Medicine (CeMM): cooperation agreement serving as the basis for full integration of CeMM into MedUni Vienna and the University of Vienna in the medium term.
- Research cluster projects with the University of Vienna: continuation of internationally peer-reviewed projects as seed financing for scientific partnerships in areas of strength.
- Research Institute of Molecular Pathology (IMP): cooperation agreement.
- Universitäres Gründerservice Wien GmbH (INiTS): university spin-offs cooperation agreement.
- Vienna Center for Engineering in Medicine (ViCEM): medical technology platform with TU Wien to promote cooperation in the field of medical technology.
- Vienna Cancer Center: with the Vienna Healthcare Group, for the harmonisation of oncology-related activities.
- Vienna Life Science Instruments, VLSI (with the University of Vienna and the institutes of the Austrian Academy of the Sciences active in the life sciences): cooperation for sharing large devices.
- Zentrum für Virtual Reality und Visualisierung Forschungs-GmbH (VRVis): K1 Competence Center for visualisation and imaging.

International partnerships

MedUni Vienna's participation in international cooperations has been steadily increasing. Around 55% of all publications are currently the product of international collaborations. One of the most significant countries for the university in terms of academic partnerships is the USA, with over 800 partner institutions located there. Harvard University is the most important of these (around 1,300 co-publications between 2009 and 2019), followed by the University of California. In Europe, the most significant

countries are Germany (8,753), the UK (4,643), Italy (3,949), France (3,602) and Spain (2,629), where most co-publications are also the result of collaboration with leading universities such as the Charité Berlin (over 1,000 co-publications between 2009 and 2019), the University of London (over 1,300), Karolinska Institutet (over 1,000) and Inserm (over 1,000). The university has well-established global research partnerships with top universities and hospitals, especially in the USA and Western Europe. It also pursues strategic institutional partnerships, especially with institutions in Eastern European countries (focusing on knowledge transfer) and in Asian countries (focusing on mobility and research, principally in Singapore, Japan and China). The International Network of Medical Universities and Departments of Postgraduate Medical Education in the Field of Molecular Allergology and Immunology (INUNIMAI) was founded in 2013 to promote collaboration in teaching and research with Eastern European as well as North and Central Asian countries. The joint PhD Programme with the Nanyang Technical University in Singapore was established in May 2014 following the signing of an implementation agreement. MedUni Vienna is also a founding member of Africa UniNet, a network to promote academic cooperation between Austria and Africa. Initiated in 2020, these activities will be supported by the chair of tropical medicine based in Lamberene, in Gabon which is jointly supported by the University of Tübingen in Germany, as well as our active role in the European and Developing Countries Clinical Trial Partnership (EDCTP). The activities of Medical University of Vienna International GmbH (MUVI) promote the university's international visibility. Knowledge transfer and international partnerships are among the core tasks of an internationally-aligned research institution. As a subsidiary of MedUni Vienna, MUVI implements healthcare management projects, principally in the Arab world and East Asia. The main focus is knowledge transfer in the areas of hospital management, training and education, and patient care.

Academic and professional mobility

In line with the Federal Ministry of Science, Research and Economy's higher education mobility strategy, international mobility is an important aspect of university management. Measures (see also section V): (i) Undergraduate outgoing activity is increasing. The number of partner institutions for Erasmus programmes has risen. The number of incoming students, primarily via Erasmus programmes, remains at a constant level. The trend towards places occupied by non-Erasmus "free movers" is continuing. **(ii)** For early-stage researchers, an assignment abroad is fundamental to building an academic career. Placements at foreign research institutions are valuable, formative experiences. The career track models provide for at least six months of mobility experience. The university intends to further enhance mobility opportunities for teaching staff. MedUni Vienna is a member of the ASEAN European Academic University Network and Eurasia Pacific UNINET. It also runs programmes with Slovakia, the Czech Republic and as part of the Central European Exchange Program for University Studies (CEEPUS) and the Trans-European Mobility for University Studies (TEMPUS) scheme. **(iii)** Observerships and fellowships (incoming): observers build on their expertise in a specific discipline without receiving hands-on training. Anyone with a degree in medicine can apply for an observer programme. The focus of an observership is gaining clinical experience and insights into Austrian tertiary healthcare. An average of 200 observers are accepted every year, who are integrated into organisational units for up to six months. Fellows are not given duties as part of a healthcare team, but are able to acquire hands-on experience under supervision. On average 50 fellows complete a clinical or

research fellowship each year. **(iv)** Guest and adjunct professorships: currently 20 guest professorships are awarded each year. Guest professors are appointed for a period of two to 12 months and are authorised to use the title of Guest Professor. This does not bring about an employment relationship or result in classification as a Professor pursuant to section 94(2)(1) Universities Act. The honorary title of Adjunct Professor is awarded to distinguished personalities who have close ties with MedUni Vienna. Nominees should have an excellent reputation and academic track record. The award of the title strengthens the university's scientific network and enhances the visibility of partnerships. It is bestowed for a period of three years and does not give rise to a legal relationship or financial commitment by MedUni Vienna. Around 90 adjunct professorships have been awarded to date. For related measures, see section III.

VIII. Real estate management

MedUni Vienna is working towards establishing an integrated campus which will create a comprehensive combined research and teaching complex of closely-located sites in Vienna's ninth district. This complex comprises three real estate projects representing major investments, for which budgets have already been partially approved: (1) MedUni Campus Mariannengasse; (2) expansion of MedUni Vienna General Hospital Campus (MedUni Campus AKH) comprising the Center for Translational Medicine and Therapies, Center for Precision Medicine, and Center for Technology Transfer; (3) renovation of the MedUni Campus AKH main building ("construction masterplan") (**fig. 16**).

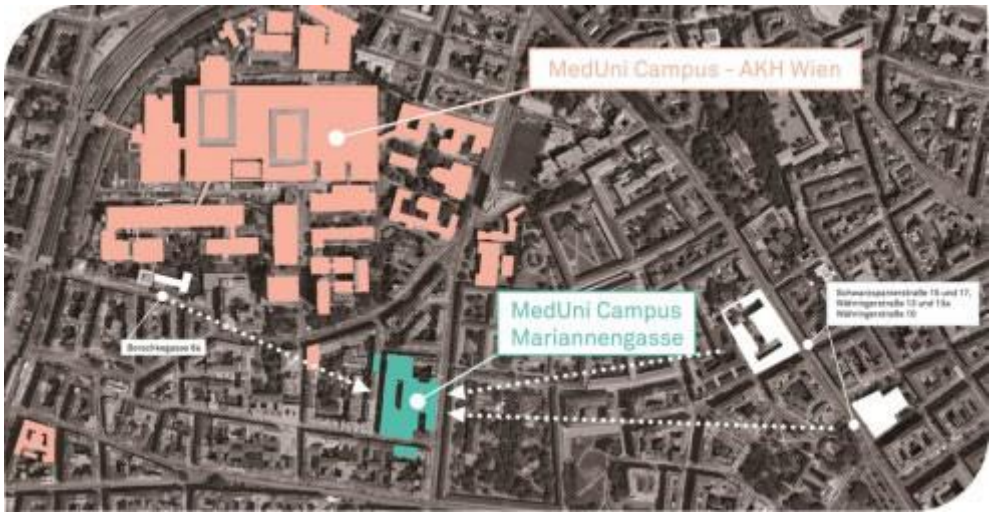


Fig. 16: The MedUni Vienna Campus in the ninth district: preclinical site (MedUni Campus Mariannengasse); hospital and Center for Translational Medicine and Therapies, Center for Precision Medicine, and Center for Technology Transfer (MedUni Vienna General Hospital Campus).

MedUni Campus Mariannengasse

MedUni Campus Mariannengasse (*https://www.medunicampus-mariannengasse.at*) (approx. 35,000m² floor space – currently 25,000m²; implemented in collaboration with BIG, financing by means of additional rental income) is an essential project (see also the Uni-Med-Impuls 2030 programme) from both an operational and a strategic perspective. (i) Operational goal: Alleviating the acute shortage of space and addressing the urgent need for renovation work on the existing building to improve fire protection and employee protection, as well as to comply with the requirements of the Equality of Disabled Persons Act with regard to the protection of students. The project therefore provides the basis for fulfilling crucial legal requirements. (ii) Strategic goal: bringing together scattered preclinical sites at a location in close proximity to MedUni Vienna General Hospital Campus, with planned translational research facilities which will operate between the preclinical and clinical units. The result will be a comprehensive research and teaching complex (the MedUni Campus) that brings the full scope of research activities together physically – from preclinical through translational to clinical research (**fig. 16**). The following research units will be relocated from various sites and integrated at MedUni Campus Mariannengasse: Center for Physiology and Pharmacology, Center for Anatomy and Cell Biology, Center for Pathobiochemistry and Genetics, Center for Medical Physics and Biomedical Engineering, Division of Cancer Research. There will

also be office space for the facility management group that will be created for operations at MedUni Campus Mariannengasse, as well as for the teaching management team for the relevant organisational units and the Austrian student union (ÖH). MedUni Campus Mariannengasse will also feature new facilities that are currently unavailable. These include self-study areas in line with contemporary requirements, various communication and common-room areas for interaction between members of research and functional units, and a modern cafeteria on the ground floor.

Locating core medical science activities at MedUni Campus Mariannengasse and the resulting synergy effects will promote the efficient use of available resources, and interdisciplinary research – especially thanks to the structure and design of the building, which will facilitate interdisciplinary communication. A task force involving representatives of the centres (including the Teaching Center) at MedUni Campus Mariannengasse and ancillary bodies (incl. student organisations) has been set up for this purpose. Creating flexible structures allows for adaptation to future developments with respect to technological and space considerations. The plans that are being made will therefore lay the foundations for long-term use. Offering up-to-date working, teaching and study spaces, which comply with fire protection and workplace health and safety requirements, the building will provide an environment for MedUni Vienna staff and students that enables continued excellence in teaching and research. In summary, MedUni Vienna's new MedUni Campus Mariannengasse will address the following objectives and challenges (see room and functional plan for further details): (i) more efficient use of space through optimisation and concentration on functional focus areas; (ii) ensuring that spaces meet the requirements of users for the long term by increasing spatial flexibility (via standardisation of room profiles) and implementing design approaches that will accommodate changes to technical facilities; (iii) centralisation of selected functions and related infrastructure from organisational units with a view to efficient use of available financial resources.

Plans/schedule: The time required for assessing the plausibility of the room and functional plan, and ensuring compliance with the requirements for formal processing of the project by the Austrian Federal Ministry of Science, Research and Economy (relating to incorporation into the Bauleitplan Ost [Eastern Area Development Plan]) – as well as setting the budget in conjunction with the Federal Ministry of Finance – has made it necessary for the schedule to be revised. Contrary to the objective of commencing full operations in the winter semester of 2023/24, as set out in the performance agreement formulated between 2016 and 2018, the new campus is now expected to be fully operational in the winter semester of 2025. Following approval for the project and its financing in September 2017 (see section I), the call for submissions for an EU-wide, non-open, two-stage competition for implementation, with subsequent negotiations for the award of overall planning services, was launched in October 2017. The planning phase and approval of the architectural plans will be followed by the drawing up and signing of the tenancy agreement, and then the construction of MedUni Campus Mariannengasse. When construction is completed and the project is handed over (2024/25), the fit-out and relocation to the new campus can begin, and it should enter full operation in the 2025 winter semester.

MedUni Campus AKH

About 20,000m² of building land on the Vienna General Hospital (AKH) site will become free in the next few years. This will enable the future development of research-driven medicine in Vienna, despite the site's location in a heavily built-up area. The building plots will be used to expand the MedUni Vienna General Hospital site, by extending the biomedical research landscape in close collaboration with Vienna General Hospital. The following construction projects for expanding the research facilities at the MedUni Vienna site are planned as part of the *MedUni Vienna General Hospital Campus Development* project: (1) Center for Translational Medicine and Therapies; (2) Center for Precision Medicine; (3) Center for Technology Transfer.

Center for Translational Medicine and Therapies

Center for Translational Medicine and Therapies (CTMT), approx. 13,600m² (financed through the Construction Framework Agreement): MedUni Vienna's internationally competitive translational research landscape is one of its most prominent strengths (see also the Uni-Med-Impuls 2030 programme). However, a number of infrastructural requirements for the effective implementation of new research findings in treatment are lacking if the university is to remain internationally competitive. The university requires a central building as a hub for the synergistic activities of various basic science disciplines and clinics. The CTMT will therefore bundle various centralised activities of the research clusters and facilitate rapid translation by means of an integrated phase I and II centre. To acquire large international phase II and III trials in future, it will be necessary to place even greater emphasis on phase I trials in particular. The following units and facilities will be integrated into the CTMT: project-focused research laboratories, screening platforms, a preclinical research facility including GLP toxicology, GMP units, a clinical phase I and II trial centre, bioinformatics, office space, meeting, seminar and teaching rooms, store rooms, common rooms, and spaces for communication and interaction. Currently under way, the tendering process is scheduled for completion in 2024.

Center for Precision Medicine

Center for Precision Medicine (CPM) *https://www.zpm.at/de/*:, approx. 11,500m²: Precision – or personalised – medicine, a term used to describe individually tailored treatments using cutting-edge technologies such as genome sequencing, is probably going to be the most significant trend in 21st-century medicine. Large-scale precision medicine initiatives are being launched all over the world – see President Obama's 2015 State of the Union address, EU initiatives (http://tinyurl.com/EU-pers-medicine, https://eatris.eu/) as well as UK (www.genomicsengland.co.uk), Dutch and Scandinavian (www.scilifelab.se, www.fimm.fi) initiatives. In Austria, precision medicine opens up opportunities for improving healthcare, greater cost efficiency and strengthening the knowledge economy. MedUni Vienna is ideally placed to occupy a leading position in the development and application of precision medicine. Several initiatives are currently under way on a project basis, notably in the field of oncology and in collaboration with the Center for Molecular Medicine (CeMM), which is playing an internationally pioneering role in molecular medicine. The upgrading of precision medicine infrastructure is therefore an important large-scale research infrastructure project in the context of the European Research Area (see also the Uni-Med-Impuls 2030 programme). Building the CPM will bring about a concentration of precision medicine technologies at MedUni

Vienna. The CPM will have a genome centre for cost-effective sequencing of the genomes of all patients taking part in clinical trials, a well-equipped biobank and facilities for processing the large amounts of data which are generated in the field of precision medicine. Supported by the central pillars of advanced technologies and data science, the CPM will lead and take part in international and domestic precision medicine initiatives. Bundling the four components of the CPM at a single site will generate synergies and enable the university to establish a position as an international innovation leader in the rapidly expanding field of precision medicine, while at the same time ensuring that scientific advances can be quickly implemented in clinical practice. The following physical sub-units and facilities are planned: genome centre, biobank, core facilities, high-performance computer centre link, bioinformatics, project-specific research laboratories, office space and meeting rooms, store rooms and common rooms.

Center for Technology Transfer

Technology Transfer Center (TTC), industry and start-up centre for collaborative projects based on a rental model at MedUni Vienna General Hospital Campus; approx. 13,500m² (see section IX).

MedUni Campus AKH (renovation of the main building)

The 2015 construction masterplan forms the basis of the Construction Framework Agreement entered into by the federal government and the City of Vienna, which was signed in 2016. The projects which are to be implemented as part of this agreement, and the phasing plan, are essential for MedUni Vienna's clinical division. The construction masterplan sets out clear objectives, which form the basis for planning and implementation: **(i)** Floor space reduction: the Vienna General Hospital's net floor spaces will be altered, taking into account the structural and service adaptations, in order to optimise the use of space. **(ii)** Centralisation: the use of peripheral buildings will be reduced. Assessment of whether functions can be relocated to the central building will therefore be carried out. **(iii)** Operational cost minimisation: the processes at Vienna General Hospital will be standardised and aligned where technical considerations permit. Operational cost savings will be achieved in order to part-finance the necessary investments in modernisation.

Himberg building and Josephinum

As part of the 2017 special economic stimulus programme, and unconnected with the Eastern Area Development Plan, MedUni Vienna has obtained funding for the construction of a new building for animal breeding and care in Himberg (scheduled for completion in 2022), as well as for the renovation of the Josephinum (scheduled for completion in 2021). The contract which forms the basis for these projects was finalised in June 2017. Both projects are now under way, and the room and functional plan as well as the layout plan are in place. For both projects, the call for tenders for planning services and entries for the architectural competition as well as construction work has begun.

Ignaz Semmelweis Center for Infectious Diseases

Thanks to advances in modern medicine, the belief that infectious diseases had been brought under control in the western world has become increasingly widespread in recent years. The current SARS-CoV-2 pandemic has now painfully exposed this fallacy and brought home the reality of these threats, as it caught many developed countries off guard. As a result of increased travel, and of climate change leading to the proliferation of disease vectors such as mosquitoes, the prevalence of tropical diseases is also increasing in Central Europe. In addition, the alarming evolution of antibiotic-resistant bacterial strains has left the Austrian health care system facing a serious problem. And equally worryingly, existing and genetically modified micro-organisms could be used as biological weapons by terrorists which represents a particularly dangerous scenario. In MedUni Vienna's view, there is a need to establish a flagship infectious diseases institute in Austria, which would address existing organisational shortcomings, act as a central point of contact for government and the public, and also pursue the top-class basic and clinical research into infectious diseases (see also the **Uni-Med-Impuls 2030 programme**).

IX. Patient care

MedUni Vienna is committed to fulfilling its public responsibility as a leading institution in Austria's health system (see also sections V, VI and IX), and to excellence in clinical medicine as the foundation for outstanding clinical and translational research. The university plays an active role and takes clear public positions in relation to debates on (i) the national demand for doctors, density of physicians, specialisations with shortages; (ii) care services performed by inpatient institutions and the primary care segment; (iii) care services performed in the public and in the private sectors; (iv) medical education and (v) research-free/research-limited medical education; (vi) cooperation between different groups of healthcare workers in the health system, and (vii) global and regional migration of doctors. Through its cooperation with the City of Vienna, MedUni Vienna is also involved in complex questions concerning Versorgungsregion Ost (the Eastern Provision Region) in the Austrian Health Care Structure Plan (ÖSG) and the Regional Health Care Structure Plan (RSG). Notably, in relation to the exceptional circumstances brought about by the COVID-19 pandemic, the expertise and authoritative input of MedUni Vienna's medical and non-medical academic staff have strengthened the university's position as an institution of systemic importance to Austrian healthcare.

Current situation

Cooperation with the hospital provider

Long-term structural and financial frameworks for MedUni Vienna and Vienna General Hospital's clinical operations ("University Medicine Vienna") were defined with the signing of the Cooperation Agreement between MedUni Vienna and the City of Vienna/Wiener Gesundheitsverbund (Vienna Healthcare Group), the Finance and Target Control Agreement, and the Construction Framework Agreement on 27 January 2016.

The *Cooperation Agreement* contains the operational model developed in the University Medicine Vienna 2020 project, and provides a formal framework for the cooperation between MedUni Vienna and Vienna General Hospital as a business unit of the Vienna Healthcare Group, and fulfilment of responsibilities in research, teaching and patient care. It provides the foundation for joint strategic and operational decisions to be made by the partners. Under the Cooperation Agreement, a dual management structure was implemented for the purpose of effective, efficient joint management of Vienna General Hospital and MedUni Vienna's patient care segment, without impinging on the partners' respective areas of authority and responsibilities. The structure consists of a Supervisory Board (with four members) as a strategic supervisory and management committee, and a Management Board (with two members) as the operational management committee, both of which have an equal number of appointees from each of the two partners. This structure has proved itself successful in the first few years of joint management. Measures and plans have been implemented on the basis of consensus, in close consultation between the partners, notwithstanding their different interests.

Due to its national patient-care remit and international orientation, and the need for an innovation and research-friendly environment, it is clearly a priority for Vienna General Hospital to have a decision-making structure that is as flexible and decentralised as possible, in accordance with the needs of an international university hospital, and that

provides maximum autonomy for the university hospital within the Vienna Healthcare Group. A discussion process to this end has been initiated with the relevant parties within the City of Vienna administration and the federal government.

The *Finance and Target Control Agreement* provides for the establishment of a partnership-focused system for the control of structures, administration and the use of resources in MedUni Vienna's patient care segment and Vienna General Hospital, and assures funding for MedUni Vienna's patient care. This is intended to create the basis for the very best research, teaching and patient care at the hospital and in MedUni Vienna's patient care segment, through expanding and underpinning the principles of cooperation and coordination while ensuring efficiency and effectiveness throughout the system. The term of the agreement ends on 31 December 2024. It was agreed that the federal government, in addition to providing staff for medical services, would pay an annual compensation amount of €40m to the City of Vienna as a cash subsidy for additional clinical expense. The number of doctors to be provided by MedUni Vienna was capped at 1,500 full-time equivalents (FTE). MedUni Vienna is currently exceeding the contractual requirements (1,600 FTE), while in nursing care there is currently a shortfall of over 300 FTE in provision from the City of Vienna. For agreed investments (purchasing and renewing equipment, IT, and related construction measures), funds amounting to €495.8m were provided by both parties to the contract. 33% of this funding is borne by the federal government and 67% by the City of Vienna. In the Finance and Target Control Agreement, the parties defined economic and innovation policy targets, organisational policy targets, care provision policy targets, research and teaching policy targets, and staff policy targets.

The *Construction Framework Agreement* (see section VIII) concluded between the federal government and the City of Vienna assures financing for adaptation, extension and new building works at Vienna General Hospital. The term of the agreement ends on 31 December 2030. Total costs of the construction projects amount to €1,368m. The federal government is covering various portions of the cost of each project, ranging between 50% and 33%. A project list provides the basis for implementation of construction works. It includes projects for the parent and child centre, operating theatres, accident and emergency, nursing care and outpatient clinics and outpatient procedures, as well as research facilities at a cost of €132.9m. Around €100m of this sum is for a new research centre for translational medicine and therapies.

The investment management process for agreed investments is governed in detail in the Cooperation Agreement. The Management Board has established an Investment Committee to reach decisions in this regard, composed of an equal number of representatives of each of the parties, and supported by jointly provided administration services. In the medium term, the existing AKIM system will need to be adapted in connection with digital precision medicine projects. Implementation of joint targets and the monitoring and control of adherence to the Finance and Target Control Agreement is the responsibility of the Supervisory Board and Management Board. A monitoring system will be introduced for this purpose. A key management process in joint operational management are the target agreement meetings between the Management Board and the individual clinical departments. The Management Board has also agreed rules for a joint corporate identity for MedUni Vienna and Vienna General Hospital, and developed a composite logo. The shared identity is to be expanded step by step and supplemented by a shared communications concept, with the aim of raising the visibility of MedUni Vienna and Vienna General Hospital as part of joint operational management.

In view of the expiry of the Finance and Target Control Agreement on 31 December 2024, the implementation and effectiveness of joint management as set out in the Cooperation Agreement should be evaluated, and preparations should be made for negotiations for the extension and/or new arrangements in good time.

Human resources in the patient care segment

The Cooperation Agreement stipulates that at least 30% (on average) of the normal working hours of MedUni Vienna doctors working in patient care are used for university teaching and research, in accordance with section 29(5) Universities Act. In order to boost the time available for research and teaching, in the works agreement of 16 September 2015 (pursuant to the Hospital Working Hours Act) it was agreed that from 1 January 2017, average weekly working hours for patient care activities may not exceed 48 hours. The "opt out" clause (an option for individual staff to agree to an average of up to 60 working hours per week, in accordance with the Hospital Working Hours Act) is based on the stipulation that the working time exceeding an average of 48 hours a week is exclusively dedicated to duties related to research and teaching (including administrative tasks for the university). This supports the performance of research and teaching duties within legal working hours, in implementation of section 29(5) Universities Act. The applicability of this rule will be extended to 31 December 2021, due to the special provision regarding the Hospital Working Hours Act for university clinics in section 110 Universities Act. To enable implementation, the electronic shift management tool has been adapted so that research and teaching hours can be recorded. More detailed aspects of implementation have been defined by a working group with participation of the Works Council. In all cases, ensuring protected time for research and teaching will require the opt-out rule to be extended beyond 31 December 2021.

Other healthcare responsibilities

In addition to its involvement in patient care at Vienna General Hospital, MedUni Vienna provides other healthcare services, principally the following:

- The Austrian Newborn Screening Program for Inherited Metabolic and Endocrine Disorders: all newborns have been screened for rare hereditary disorders since the mid-1960s owing to initiatives of the Federal Ministry of Health. This prevention programme is carried out centrally for the whole of Austria by the Department of Paediatrics and Adolescent Medicine. Early detection within the first few days of a baby's life is critical for successful treatment.
- Dental, oral and maxillofacial medical care provided by a wholly-owned subsidiary (Universitätszahnklinik Wien GmbH).
- Integration of telemedicine applications into patient care.
- Diagnosis-related laboratory testing (in particular in the Center for Virology, Center for Pathophysiology, Infectiology and Immunology, Center for Anatomy and Cell Biology, Center for Physiology and Pharmacology and Center of Pathobiochemistry and Genetics), the results of which are used for research and teaching purposes (research data collection).
- An out-patient clinic for vaccination and another out-patient clinic at the Center for Pathophysiology, Infectiology and Immunology.

- Autopsies ordered by state prosecutors and courts at the Center for Forensic Medicine; this requires corresponding amendment of the *Gebührenanspruchsgesetz* (Austrian Fees Entitlement Act), in consultation with the Federal Ministry of Science, Research and Economy and the Federal Ministry of Justice.
- Forensic DNA analysis provided by a wholly-owned subsidiary (Forensisches DNA-Zentrallabor Wien GmbH).
- A clinical forensic victim protection clinic at the Department of Pediatrics and Adolescent Medicine, to be expanded into an abuse prevention centre with the addition of further facilities under the national abuse prevention action plan.
- Operation of Spenderdatei Wien (Vienna donor register) within the scope of the Austrian Stem Cell Transplantation Registry on behalf of Gesundheit Österreich GmbH, by the Department of Blood Group Serology and Transfusion Medicine.
- Taking up functions on committees for public health provision and management.

Integration of basic and clinical research

Research and development at medical universities can be divided into experimental, translational and clinical medicine, all three of which are well established (see section IV). Due to the growing personalised/precision approach to diagnosis and treatment, the area of translational medicine is to be expanded. Consonant with this trend, MedUni Vienna is establishing a Center for Translational Medicine and Therapies (see sections II and VIII), where work will centre on the development of therapies derived from experimental research. The Center for Translational Medicine and Therapies, which will be based in a new building on the MedUni Vienna Campus AKH as agreed in the Construction Framework Agreement, will drive the integration of basic and clinical research forward. The scientific community at the MedUni Vienna General Hospital Campus – including neighbouring institutions such as CeMM, St. Anna Kinderkrebsforschung, private laboratories and start-ups – employs in the region of 20-30,000 experts. The university aims to promote partnerships with the basic research institutions at Vienna Biocenter (e.g. IMP and IMBA) in the city's third district, as well as translation into clinical applications in cooperation with established businesses and start-ups.

Central development measures

Development measures principally relate to the contents of the agreements between the federal government, the City of Vienna and MedUni Vienna.

Medical Masterplan: In the University Medicine Vienna 2020 project, MedUni Vienna and Vienna General Hospital drew up a Medical Masterplan (MMP), finalised on 15 September 2015, based on the agreements between the federal government, the City of Vienna and MedUni Vienna. The MMP forms the basis of the flagship concept which positions MedUni Vienna and Vienna General Hospital at the top of a structured chain of provision, coordinated with the hospitals included in the Vienna Hospitals Concept (hospitals that receive funding from the Vienna Health Fund), for Vienna and (eastern) Austria. The MMP provides strategic service planning, taking account of research and teaching as well as projected demographic changes. It includes the expansion of intensive care with a corresponding reduction in standard care. The MMP serves as the basis for further planning for the strategic orientation of patient care and clinical research, medium and long-term focus areas, the future organisational structure, provision of human resources and facilities, and investment decisions. It is intended to be adapted to changing conditions on an ongoing basis. An evaluation of the MMP was carried out in 2019, though its findings have not been implemented (see section III).

The project to **optimise planning of staff requirements and deployment** for all occupational groups in the patient care segment, as provided for in the Finance and Target Control Agreement, has been completed. The main objective is to ensure efficient and demand-driven deployment of human resources for patient care, research, and teaching, which are inextricably linked. The staff requirement for the actual provision in 2016/17 and for the implementation of the 2020 MMP were calculated: the medical-services target requirement to meet the actual services provided in 2016/17 while maintaining the opt-out arrangements amounts to 1,378 FTE (excl. research and teaching). A 10% research and teaching quota can be achieved at current staffing levels. It would require approximately 400 FTE of additional medical staffing to be able to achieve a 30% teaching and research quota. Implementation of the 2020 MMP would require approximately 600 FTE of additional medical staffing for a 30% teaching and research quota, and approximately 160 FTE for a 10% quota. It is therefore not possible to implement either the 2020 MMP or the agreed amount of teaching and research at current staffing levels.

Monitoring of service provision: Section C (care provision policy targets) of the Finance and Target Control Agreement between the federal government and the City of Vienna (27 Jan. 2016) defines upper limits for Vienna General Hospital's proportion of care provision in comparison with the other KAV hospitals, for inpatient services (25%; currently 25%) and for outpatient services (28%; currently 36%). According to the intentions of the Finance and Target Control Agreement, Vienna General Hospital/MedUni Vienna's patient care segment ("University Medicine Vienna") must be a leading university hospital with growth potential in the provision of healthcare for the population of Vienna, as well as an internationally recognised research and teaching institution with high potential for innovation. However, the findings of the 2019 monitoring report, the report on optimising staff requirement planning and staff deployment at Vienna General Hospital and the report on the results of evaluation of the 2020 MMP show that, over the long-term, it is not possible to secure and develop the provision of high-quality, patient-focused, modern medical and nursing care which satisfies demand on the basis of current service levels, and simultaneously expand university research and teaching, as well as strengthen the greater Vienna region's position as a centre of science and healthcare, under the current conditions, while at the same time achieving the target values contained in the Finance and Target Control

Agreement (upper limits for Vienna General Hospital's proportion of care provision within the Vienna Healthcare Group, limits on staffing levels, minimum research and teaching quota). Trends at MedUni Vienna and Vienna General Hospital show stability in the proportion of care provided by Vienna General Hospital within the Vienna Healthcare Group and strict adherence to the prescribed limit of 25%. There is a requirement for a change in the case mix in some specialisms because patients who do not necessarily require treatment at a tertiary centre are displacing patients with highly complex needs. This acts as a hindrance to areas of excellence in patient care.

The proportion of outpatient services provided by Vienna General Hospital within the Vienna Healthcare Group is currently 37%, rather than the 28% of the proportion agreed for the City of Vienna. This shows that MedUni Vienna is providing significantly more than originally contractually agreed for outpatient care. An improvement (over the long term) in this situation as a result of the commencement of operations at Vienna's Krankenhaus Nord is not foreseeable, as many areas of provision have been transferred without the creation of additional services/resources. The 2019 monitoring report categorically states that it is not possible to implement either the 2020 MMP or the agreed amount of teaching and research at current staffing levels.

Despite the increased effectiveness and efficiency of clinical operations at Vienna General Hospital/MedUni Vienna (University Medicine Vienna), and the increased focus on effectiveness in research and teaching as well as healthcare, the federal government and the City of Vienna – as the contractual partners – must therefore make a fundamental decision on the way forward if these goals are still to be pursued as a priority. The joint operational management committees have brought this issue to the attention of the relevant bodies of the federal government and the City of Vienna with a view to arriving at a solution.

(i) **Cooperations**: Cooperations play an especially important role in managing inpatient service provision, whereby the central focus is on active management of patient streams. Examples include the Vienna Cancer Center (VCC) pilot project as well as cooperations with the Pflegewohnhaus Baumgarten care home, the Kuratorium Wiener Pensionisten (KWP) care home provider, collaboration with the Austrian Workers' Compensation Board (AUVA) in trauma surgery, participation in the preclinical emergency doctor system, and the transfer of patients from Accident and Emergency to the hospitals of the Vinzenzgruppe. This approach is consistent with the Finance and Target Control Agreement, which provides that the regional structure for medical care provision is to be streamlined so that overcapacities can be reduced and synergies exploited. The services that are to be provided in coordination and cooperation with hospitals funded by Vienna Health Fund should be identified.

(ii) Upstream **healthcare centre**: In collaboration with Vienna General Hospital, MedUni Vienna is setting up a healthcare centre which will integrate the current acute general medical care clinics with the aim of partially transferring general medical and specialist services. The plan has been accepted by the Landes-Zielsteuerungskommission (provincial target oversight committee) and the implementation project is under way.

(iii) Detailed planning and implementation of the **parts of the construction masterplan relevant to academic activities**:

- Relocation of some research spaces from the main Vienna General Hospital building: This process must take account of the importance of the proximity of clinical departments to research spaces and staff rooms for MedUni Vienna's success as a

research institution. Only research space that is not located in direct proximity to patient care operations should be relocated, and research facilities that require a connection with patient care operations must remain in the main building. New space (the **Anna Spiegel 2** building) on the Vienna General Hospital campus is planned for all of the research areas to be relocated, in phase 6 of the Construction Framework Agreement. The reorganisation of research space will make an additional, lasting contribution to enhancing the quality of clinical research.

- Staff rooms: The construction masterplan provides for staff rooms in Vienna General Hospital to be allocated, first and foremost, according to their function. Further, when implementing the construction masterplan, the value and importance of the individual work spaces currently available adjacent to clinics needs to be taken into account: the short distances are extremely beneficial to joint academic and clinical operations.

- Research buildings (see section VIII): The MedUni Vienna General Hospital Campus concept comprises the following research buildings (1) **CTMT**: Funding will be provided via the Construction Framework Agreement. (2) **CPM**: Funding is being provided by means of a fundraising project and externally funded projects managed by MedUni Vienna. Talks are also taking place with the federal and provincial governments. Space for the building will be made available on the Vienna General Hospital campus. (3) TTC: This centre, an office and laboratory building, is to be built by a private investor and/or public investors and will house space rented to start-ups, SMEs and multinational pharmaceutical companies. The Center for Translational Medicine and Therapies and the proximity to Vienna General Hospital will make the MedUni Vienna General Hospital Campus especially attractive to businesses.

- Formation of centres: The university is forming interdisciplinary clinical centres (Comprehensive Centers) in a step-by-step process, ensuring that patient care, research and teaching are at the leading edge of scientific practice. The following centres have already been established: the Comprehensive Cancer Center (CCC), the Comprehensive Center for Pediatrics (CCP), and the Center for Cardiovascular Medicine (CCVM), which was established on 1 Jan 2020. The Center for Neuroscience and a perioperative medical centre are now at the implementation stage. Plans are being developed for further Comprehensive Centers, such as a diagnostic centre and an infectiology centre. To support the implementation and further development of the centre-based structure, including the development of evaluation criteria and the evaluation of suggestions for new centres, a working group for the centre-based structure was established by the University Medicine taskforce, and a joint steering committee has been established by the Management Board. Detailed arrangements regarding management structure, the integration of the facilities involved, and the representation of different professional groups will be set out in rules of procedure. All centres of this type will undergo assessments of their success as part of target agreement reviews involving their management committee, the Management Board and the Rector. For this purpose, key indicators of clinical performance, scientific development and teaching performance must be defined and evaluated.

(iv) **Medical training** (see section III, HR)

(v) **Patient safety**: Patient safety is to be established and expanded as a focus area. MedUni Wien will take a leading role in Europe and gain international recognition with regard to this topic. A taskforce is being set up for this purpose, as well as a joint steering group with Vienna General Hospital, which will define interdisciplinary projects

in patient care, research and teaching and assess the degree to which they can be implemented. Existing projects (patient simulations, wet labs) will be integrated into this new focus area. Further measures will address communication of the patient safety strategy, the development of a patient safety learning objectives catalogue for medical students, design and ongoing development of training and development programmes in the field of patient safety (e.g. a patient safety continuing education course), and the integration of staff safety in the context of the legal framework. In addition, indicators to measure success in the area of patient safety will be defined and established.

(vi) **Private medical care**: Together with Vienna General Hospital, MedUni Vienna aims to continuously improve infrastructure for private care by allocating 12% of the hospital to privately paid care. In addition, use of facilities for consultations with private patients has been made available to department and division heads, for which clearly defined regulations in respect of transparency and compliance rules have been developed. The aim is to increase the head physicians' loyalty to the hospital and the university, at the same time as strengthening the MedUni Vienna brand.

(vii) **Quality management**: A central aspect of joint operational management is the continuous development of the holistic quality management system, which comprises full documentation of diagnoses and treatment.

(viii) **Joint management work packages**: In implementation of the Cooperation Agreement between MedUni Vienna and the City of Vienna/Vienna General Hospital, the Management Board has produced a work programme which further develops areas for collaboration, and defines projects for optimisation and the exploitation of potential synergies. Working groups have been set up, composed of equal numbers of representatives of MedUni Vienna and Vienna General Hospital, to execute the 11 work packages that are explicitly listed in the Cooperation Agreement (administration of clinical trials, HR management, IT, buildings management, employee protection [the City of Vienna bears responsibility for staff in Vienna General Hospital's clinical segment] and safety plans, controlling, communications and public relations, legal, quality management, risk management and external submissions). The implementation of the approaches devised by the working groups has begun and will continue step by step over the coming years, in accordance with the action and implementation plan, and expanded to encompass additional areas in order to achieve improved efficiency throughout operational management.

X. Annex

Table 1: Professorial chairs in accordance with section 98(1) Universities Act (indefinite term lasting more than three years)

Subject		Number of positions		
		Phase 1 (2019-21)	**Phase 2** (2022-24)	**Phase 3** (2025-27)
1	Medicine	100-120	100-120	100-120

Table 2: Number of career positions in accordance with section 13b(3) Universities Act

Subject		**Phase 1** (2019-21)	**Phase 2** (2022-24)	**Phase 3** (2025-27)
1	Medicine	-10	-10	-10

Table 3: Overview of changes in professor positions

Category	**Phase 1** (2019-21)	**Phase 2** (2022-24)	**Phase 3** (2025-27)
Section 98:			
Section 98, fixed-term or indefinite appointments lasting more than three years	100-120	100-120	100-120
Section 99(1) more than three years up to a maximum of five years fixed-term	0	-3	-3
Section 99(3)	-	-	-
Section 99(4):			
Associate professors	20	10	10
Lecturers	20	10	5
Section 99(5)	-10	-10	-10
Section 99a	-5	-5	-5
Total	140-165	170-210	185-240

Table 4: Current degree programmes

1. List of established full-time degree programmes

ISCED	ISCED field code	Programme title	SKZ1	Type of degree	Notes
	481	Medical Informatics	936	Master's	
	721	Medicine	202	Undergraduate	
	724	Dentistry	203	Undergraduate	

2. Full-time degree programmes established in cooperation with other educational institutions

ISCED	ISCED field code	Programme title	SKZ	Type of degree	Notes
		None			

3. Established doctorate/PhD programmes

Programme title	SKZ1	SKZ2	Type of degree	Notes
Doctorate in applied medical science	790	202	Doctorate degree	
Doctorate in medical science	090	202	Doctorate degree	
Medicine	201		Doctorate degree	
PhD	094	202	Doctorate degree	
Joint PhD programme with NTU Singapore			Doctorate degree	Until end of 2017

Table 5: Planned changes to degree programmes[1]

4. Programmes scheduled to be introduced, or introduced in revised form

Programme title	Scheduled implementation	Relation to research	Resources required Notes[1]
MSc Molecular Precision Medicine	From 2021-22 winter semester	No new programmes apart from the Molecular Precision Medicine master's programme are planned at present. The 2017 amendment to the Universities Act may open up new options for cooperations with other higher education establishments. Intended to enhance biomedical research. Preparation for doctorate programmes in molecular precision medicine and related areas.	In cooperation with the University of Vienna.

1 *Studienkennzahl* [programme code] (without head codes).

1 In particular, innovations and changes in the range of programmes offered.

3 Information on programmes that are relevant to internationalisation.

5. Programmes scheduled to be discontinued

Programme title	Scheduled implementation	Relation to research	Resources to be released
Medicine 201	Feb. 2021 - END COVID Order	No relation to research	No resources will be released since only examinations are offered at this stage.
Doctoral Programme in Medical Science N090	Enrolment not possible since WS 2007; 20 doctorands currently enrolled		No resources to be expected.

All numbers, ranges and targets stated in the tables are subject to corresponding coverage in the budget under the performance agreement.