Science
and Technology

University of
Applied Sciences

MASTER

Medical and Pharmaceutical Biotechnology

Looking for an internationally respected master programme that will open up exciting career opportunities in the pharmaceutical industry and research? Potential employers hold our Medical and Pharmaceutical Biotechnology programme in high regard thanks to its broad curriculum.

www.imc.ac.at

The master programme Medical and Pharmaceutical Biotechnology represents one of the broadest biotechnology programmes in Europe and is very well embedded in the Vienna Biotech Region. Graduates of the programme have excellent opportunities to gain a foothold in the global biotechnology industry or in international PhD programmes. About 40 lecturers from research and industry teach basic and applied topics and how to take advanced therapies from research to application.

We prepare you for the upcoming trends

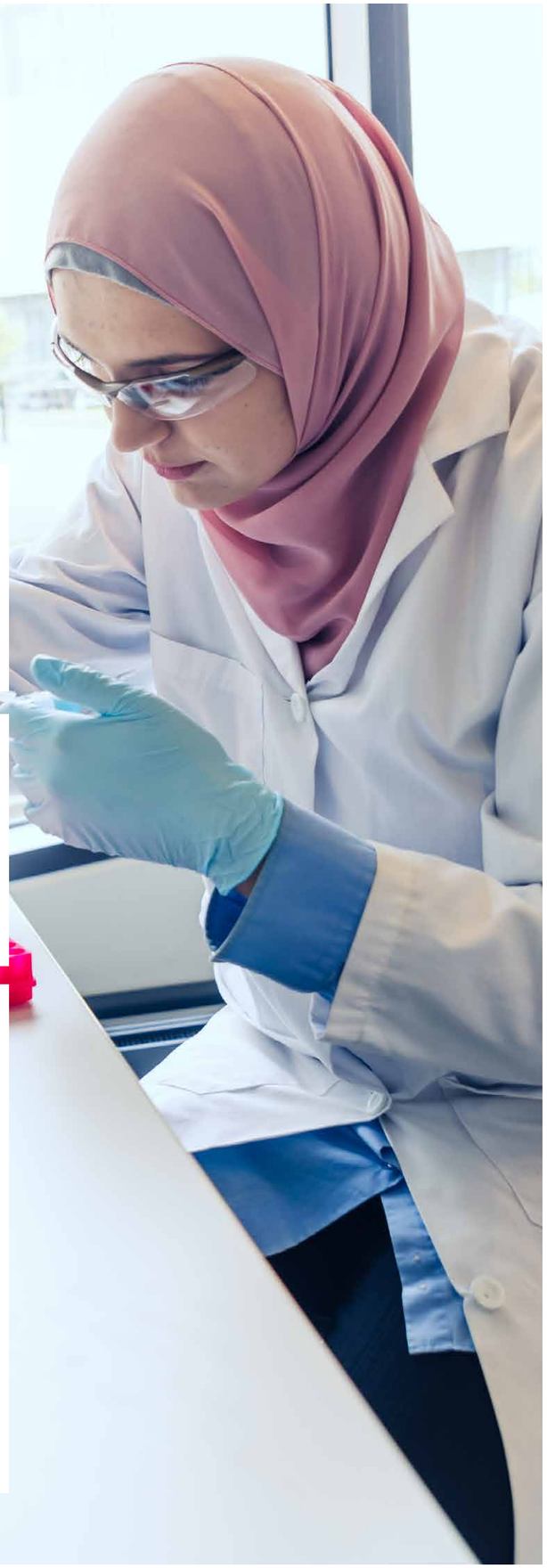
Developing high-level expertise in identifying, characterising and manufacturing biopharmaceuticals is an essential aspect of this master programme. Manufacturing biopharmaceuticals also requires extensive knowledge of the applicable legal framework and the quality assurance procedures which play a vital part in an interdisciplinary setting. In order to prepare our students for the upcoming trends, we also offer complementary training in development, application and production methods for quality-assured tissue and organ replacements.

The research semester and master thesis

The research phase is a core element of the master programme. You can start the research work for the master thesis already after the 2nd semester as the lectures of the 3rd and 4th semesters are online lectures. With that, you can spend up to one year at a respected biotechnology company or research facility in Austria or abroad working on a project, which often forms the basis for your master thesis. After your research semesters, you only have to return to university to take your final master examination. So, if you're offered a permanent job or a Ph.D. position by your internship provider, there'll be nothing standing in your way.

PhD opportunities and international opportunities

- The Transformation of Pre-Clinics into Clinics by Organoids (TOPICO) project is a novel PhD programme, which is embedded in the Malignant Disease programme of the Medical University of Vienna, but also synergistically extends important contents of the Medical and Pharmaceutical Biotechnology master programme of IMC University of Applied Sciences Krems. This creates a unique environment for PhD students to develop their individual PhD projects in a well-founded network of students and faculty, thereby promoting their later careers in international cancer research in industrial or academic settings.
- A collaboration with the University for Continuing Education in Krems has been in place for several years in the PhD programme Regenerative Medicine. For graduates of the master programme Medical and Pharmaceutical Biotechnology, this is another opportunity to start a PhD in this innovative field.
- Within this ERASMUS Plus Project, a joint module covering the main aspects of drug development is being developed. The partner institutions Université Paris XII Val De Marne (UPEC), Turku University of Applied Sciences (TUAS) and IMC Krems University of Applied Sciences (IMC) bring in their research focus, which will be presented to the students. The theory courses will be held as interactive courses in the virtual classroom in the autumn, whereas the laboratory courses will take place on site at the partner institutions in spring.



At a glance

Full-time

Courses usually take place from Monday to Friday.

English

The language of instruction is English. This prepares you for a career in a multi-cultural environment.

Four semesters

The degree programme lasts two years, with a total workload of 120 ECTS. Graduates receive the academic degree of Master of Science in Engineering (MSc).

Admission

Undergraduate degree in a relevant natural sciences or engineering discipline (bachelor's degree or equivalent, minimum 180 ECTS). Amongst others, the following disciplines are accepted: Biotechnology or Biomedical Studies, Biochemistry, Molecular Biology or Pharmacology, Biomedical Analytics, Chemical Engineering, Nanotechnology, Bioinformatics, Biology, Chemistry, Physics

Study fee

EU/EEA citizens pay a study fee of EUR 363.36 per semester, plus the student union fee.

Electives

On the master programme, you will enhance your methods-based and problem-solving competencies, putting you in a position to overcome the challenges associated with developing and producing innovative treatments for cancer, autoimmune conditions and neurodegenerative diseases. You will use cutting-edge and interdisciplinary methods, such as culturing "mini tumours" to help predict the effects of cancer treatments.

1. Bioprocess Engineering

If you take this elective, you will gain detailed insights into bioprocess engineering, process automation, and especially fermentation. This expertise will give you the skills required to take on positions at all types of biotech companies – large pharmaceutical businesses as well as small start-ups specialising in innovative products such as nutraceuticals. You'll be able to contribute in a wide range of areas encompassing the development, testing and large-scale manufacturing of brand-new substances.
In the bioprocess engineering lectures and practicals, you'll use cutting-edge analytical techniques, ranging from simple online methods – which you'll also evaluate – through to liquid LC-MS for proteomics work.

2. Advanced Therapeutics Development

Medical biotechnology has seen some major breakthroughs in recent years, such as immune checkpoint inhibitors (PD-1) for the treatment of advanced melanomas. Small interfering RNA (siRNA) molecules are currently being tested for use in potential treatments for cancers and viral diseases, which are expected to come on to the market in the next few years.
High-throughput technologies in areas such as next-generation sequencing (NGS), mass spectrometry and imaging are becoming increasingly important in the development of new treatments. This means there is going to be an ever greater focus on linking together large data sets, and integrating the clinical results of treatment.

Tip

Double Degree Option: A particularly attractive option is the double degree we offer in cooperation with Linköping University in Sweden. Besides obtaining a Master of Science at IMC Krems, you will also be accredited with completing the "Experimental and Medical Biosciences" programme at our esteemed partner institution.

Curriculum

FULL-TIME

Semester I	CH	ECTS
HEALTH, DISEASE AND THERAPEUTICAL STRATEGIES		
Immunology	2	3
Hallmarks of Cancer	1	1
Molecular Mechanisms of Ageing	1	1
Developmental Biology	1	1
BIOETHICS		
Bioethics	1	1
PROCESS DESIGN		
Equipment and Production Design	2	3
Standardisation	1	2
BIOMEDICAL REGULATIONS		
Legislation for Drugs and Medical Devices	2	3
BIOPROCESS TECHNOLOGY		
UPSTREAM AND DOWNSTREAM PROCESSING		
Upstream Processing	1	2
Downstream Processing	1	2
Recombinant Protein Production – Theory	2	3
Recombinant Protein Production – Laboratory	4	4
RESEARCH PROJECT IN INDUSTRY AND MASTER THESIS		
Research Project – Preparation	1	1
FOCAL SUBJECT – ELECTIVE 1: BIOPROCESS ENGINEERING		
ELECTIVE 1: BIOPROCESS ENGINEERING		
Process Control and Process Online Monitoring	2	3
FOCAL SUBJECT – ELECTIVE 2: ADVANCED THERAPEUTICS DEVELOPMENT		
Elective 2: Advanced Therapeutics Development		
Drug Discovery Systems	2	3

Semester II	CH	ECTS
INTEGRATIVE METHODS IN BIOTECHNOLOGY		
Biostatistics and Trend Analysis	1	2
Systems Biology	1	1
Structural Bioinformatics and Drug Design	2	2
ANALYTICAL METHODS IN LIFE SCIENCE		
Bioanalytics Laboratory	2	3
Personalised Medicine Laboratory	2	3
Analytical Methods in Biomedicine	2	3
FUNDAMENTALS IN PHARMACEUTICAL SCIENCES		
Pharmacokinetics and Pharmacodynamics	2	3
QUALITY MANAGEMENT AND REGULATIONS IN BIOTECHNOLOGY		
GLP, GMP AND RISK ASSESSMENT		
GLP and GMP Regulations	1	1
Risk Assessment	1	1
Quality Management Systems	1	1
PHARMACEUTICAL PROJECT MANAGEMENT		
Project and Portfolio Management	1	1
Clinical Studies and GCP	1	1
Entrepreneurship in Life Sciences	2	2
FOCAL SUBJECT – ELECTIVE 1: BIOPROCESS ENGINEERING		
ELECTIVE 1: BIOPROCESS ENGINEERING		
FERMENTATION AND SCALE UP - SCALE DOWN TECHNIQUES		
Fermentation of Complex Host Systems	1	1
Scale Up – Scale Down Techniques	1	2
Fermentation Technology – Laboratory I	2	3
FOCAL SUBJECT – ELECTIVE 2: ADVANCED THERAPEUTICS DEVELOPMENT		
ELECTIVE 2: ADVANCED THERAPEUTICS DEVELOPMENT		
Advanced Therapeutic Developement Laboratory I	2	3
Pathophysiology and Molecular Therapies	2	3

Semester III	CH	ECTS
FOCAL SUBJECT – ELECTIVE 1: BIOPROCESS ENGINEERING		
ELECTIVE 1: BIOPROCESS ENGINEERING		
Equipment Test and Process Validation	2	4
Fermentation Technology – Laboratory II	5	11
FOCAL SUBJECT – ELECTIVE 2: ADVANCED THERAPEUTICS DEVELOPMENT		
ELECTIVE 2: ADVANCED THERAPEUTICS DEVELOPMENT		
Stem Cells, Gene Therapy and Regenerative Medicine	1	3
Immunology Based Therapies	1	1
Advanced Therapeutic Developement Laboratory II	5	11
RESEARCH PROJECT IN INDUSTRY AND MASTER THESIS		
Master Thesis – Part I	1	4
Master Thesis – Coaching Seminar I	1	1
Research Project	1	10

Semester IV	CH	ECTS
FOCAL SUBJECT – ELECTIVE 1: BIOPROCESS ENGINEERING		
ELECTIVE 1: BIOPROCESS ENGINEERING		
Current Issues in Bioprocess Engineering	1	2
FOCAL SUBJECT – ELECTIVE 2: ADVANCED THERAPEUTICS DEVELOPMENT		
ELECTIVE 2: ADVANCED THERAPEUTICS DEVELOPMENT		
Current Issues in Advanced Therapeutic Developement	1	2
RESEARCH PROJECT IN INDUSTRY AND MASTER THESIS		
Master Thesis – Part II	1	18
Master Thesis – Coaching Seminar II	1	6
Master Exam	0	4

CH: Contact Hours
* Students choose one elective.
Subject to possible alterations.

A very personal story

RAPHAELA WAGNER STUDIED FOR A MASTER DEGREE IN MEDICAL AND PHARMACEUTICAL BIOTECHNOLOGY AFTER COMPLETING HER BACHELOR DEGREE AT IMC KREMS.

Top job prospects

My keen interest in science and medical research as well as a stay in the US reassured me that the English-language study programme Medical and Pharmaceutical Biotechnology at IMC Krems was the perfect solution for me. The ideal conditions for my professional life also made the master degree attractive.

Unmatched team spirit

The enthusiasm of students and teachers were a real highlight for me. We even met with professors during our free time to chat about the latest findings in cancer research. The programme also organises the annual Life Science Meeting, which brings together international research projects from academia and industry. The team spirit at IMC Krems is incomparable.

Practical laboratory courses

I have benefited most from the applied laboratory courses, which make it possible to apply the theory in practice. In small groups we learned, for example, how to genetically modify bacteria and yeast species, to breed human 3D tumours or to work with a mass spectrometer.

Insights into processes

For me, the quality and quantity of the processes that are necessary to develop, produce and market a drug are surprising. Probably only few people know that it takes at least 13 years and costs around 2.5 billion euros to develop an innovative idea into a safe drug.

Diverse future prospects

I would like to specialise in the development of drugs in the field of neurodegenerative diseases. No matter if you study for a doctorate or a career in a pharmaceutical company – you are in good hands with this education.

Career options

After your studies, you have the choice of either enrolling for a related PhD programme or starting your career. You'll have excellent career prospects in: R&D responsibilities in research and industry; clinical trials and drug approval; planning and management of biotechnological processes (fermentation); biomedical and analytical testing procedures; coordination responsibilities in production, quality control, quality assurance and approval; marketing and sales; medical engineering; food technology and food safety; industrial and environmental biotechnology

IMC. It’s all in me.

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Accreditations

Memberships

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