

Experimental Biomedical Research

Degree conferred

Specialised Master of Science in Experimental Biomedical Research

Options

Three options available:

- Neuroscience
- Infection, Inflammation and Cancer
- Tissue Degeneration and Regeneration

Languages of study

Study in English

Commencement of studies

Commencement of studies only in the Autumn Semester (September)

Special features for admission

Students, who fulfil the admission requirements of the University of Fribourg, will be further selected on the basis of an individual interview and their curriculum dossier.

Access to further studies

Ph.D.

The master programme in Experimental Biomedical Research provides opportunities for a broad learning experience in the area of biomedicine. It emphasises research training and acquisition of practical skills that will enhance students' capacity to continue learning in their future employment and/or develop a research career in their chosen option. Three options are available: «Neuroscience», «Infection, Inflammation and Cancer», «Tissue Degeneration and Regeneration».

Profile of the study programme

The master programme in Experimental Biomedical Research provides opportunities for a broad learning experience in the area of biomedicine. It emphasises research training and acquisition of practical skills that will enhance students' capacity to continue learning in their future employment and/or develop a research career in their chosen option. Three options are available:

- **Neuroscience:** The focus of this option lies mainly on understanding the functioning of neural circuits and systems in health and disease in both humans as well as relevant

animal models including rodents, tree shrews and macaques. State-of-the-art approaches for diagnosing and repairing central nervous system dysfunctions will be presented and critically evaluated. Students will have the opportunity to acquire in-depth expertise in areas including structural and functional brain imaging, multi-channel electrical recordings, deep-brain and trans-cranial magnetic stimulation, pharmacological interventions, quantitative neuroanatomical reconstruction, data analysis and interpretation as well as developing and conducting behavioral assays.

- **Infection, Inflammation and Cancer:** This option will provide a comprehensive theoretical and practical basis to understand novel paradigms and emerging areas of research in the field of infection, inflammation and cancer. Students will gain insight into topics at the forefront of medical research such as the role of inflammation in cancer and metastasis, tissue-specific immune responses, the immune response to pathogens (bacteria, viruses and parasites), cancer and the development of antibiotic resistance in infectious diseases. Emphasis will be placed on translational aspects and clinical relevance. Students will acquire practical expertise in state-of-the-art molecular and cellular research techniques, including multicolour flow cytometry, biochemical analyses, a wide range of immunological assays, high-end live imaging techniques, and pharmacological strategies as well as the role of various mouse models for cancer and inflammation.

- **Tissue Degeneration and Regeneration:** Chronic diseases such as obesity, diabetes, cardiovascular pathologies and hepatic diseases are major health burdens. Boosted by population ageing, the urgent need for solutions has challenged the scientific community. Increased understanding of the pathophysiology of chronic diseases and ageing is paramount and essential for developing innovative treatments, since many mechanisms such as inflammation, oxidative stress, mitochondrial dysfunction, tissue fibrosis, decreased cell/tissue regeneration, etc., are shared by the ageing process and chronic diseases. The option will offer advanced training in scientific principles and clinical aspects of the prevention, pathology and treatment of non-communicable diseases. It will focus on a comprehensive foundation in practical research skills, including research models, analysis of the above-mentioned mechanisms, cell therapy and drug delivery techniques to promote tissue repair and prevent tissue degeneration.

What will I learn?

Students will develop an advanced comprehension of the structure and function of biological systems, together with an understanding of the mechanisms underlying normal function and dysfunction at molecular, cellular and systems levels. They will develop proficiency in scientific thinking, formulation of scientific hypotheses, research project design as well as data analysis and interpretation. They will also acquire and apply research skills necessary for scientific investigations and develop specific knowledge in this field.

Who can apply?

The programme is addressed to students with an undergraduate degree in Life Sciences or a related subject area.

What are we looking for?

When assessing your application we would like to know:

- Why you want to study Experimental Biomedical Research?
- Why you want to study at the University of Fribourg?
- What particularly attracts you to this programme compared to other ones?
- How your personal and professional background meets the demands of this rigorous programme?
- What are your expectations from this programme?
- What your career plans are following the award of your degree?

Together with essential academic requirements, the personal statement is your opportunity to illustrate whether your reasons for applying to this programme match what the programme delivers.

Academic and professional openings

Graduates will find employment opportunities in the biotechnology, pharmaceutical or medical device industry as well as in the health care sector. The master's degree also provides a solid foundation for doctoral studies, where students can capitalise upon the acquired knowledge and skills. A doctorate and subsequent postdoctoral experience then provide potential access to academic and management positions within Switzerland or abroad.

Studies organisation

Structure of studies

120 ECTS credits, 4 semesters

Curriculum

<http://studies.unifr.ch/go/vBvMa>

Comments

The number of places is limited to the formation capacities of the Medicine Section.

Admission

The admission to the master follows the conditions of admission of the University of Fribourg. Holders of a bachelor's degree in Life Sciences awarded from a Swiss University can be admitted to the master's degree course. The same applies to holders of a bachelor's degree awarded by a foreign university, provided that the bachelor's degree is recognised and considered equivalent by the University of Fribourg. For details, please, refer to the study plan.

Contact

Faculty of Science and Medicine
Medicine Section
Prof. Gregor Rainer
mscebr@unifr.ch
<http://studies.unifr.ch/go/fr-medicine> (French)
<http://studies.unifr.ch/go/de-medicine> (German)