

**Section of Medicine
Faculty of Science and Medicine
University of Fribourg**

**Specialized Master of Science
in
Experimental Biomedical Research**

TARGET STUDENTS AND OBJECTIVES

Very international program with students coming from all around the world

Broad topics:

Neuroscience, Tissue Degeneration and Regeneration, Infection Inflammation and Cancer

Who can apply?

Students with an undergraduate degree in Life Sciences or a related subject area, who wish to deepen their knowledges and acquire practical skills and experience in the area of biomedical research.

TARGET STUDENTS AND OBJECTIVES

Objectives

Acquisition of advanced competences:

- Theoretical background: Advanced structure and function of biological systems.
Mechanisms underlying normal function and dysfunction of the human body at molecular, cellular and systems levels.
State of the art methods in biomedical research.
Scientific thinking, formulation of scientific hypotheses, research project design, data analysis and interpretation.
- Practical experience: Practical research skills necessary for scientific investigations in the medical field. Master thesis of 18 months in a research group from the section of Medicine.

Perspectives

- Fundamental research
- Clinical research
- Biotechnology
- Pharmaceutical industry
- Medical technology
- Health care sector
- Other connected domains (economy, journalism, consulting, patent law, marketing).

GENERAL STRUCTURE

Program: 120 ECTS in total, distributed on 5 modules:

- ① Compulsory common courses (27 ECTS)**
- ② Elective courses (6 ECTS)**
- ③ Compulsory courses in one of the three options (12 ECTS):**
 - Neuroscience**
 - Infection, Inflammation and Cancer**
 - Tissue Degeneration and Regeneration**
- ④ Master thesis related activities (15 ECTS)**
- ⑤ Master thesis (60 ECTS)**

Duration: 4 semesters.

From 2nd Semester: Begin of practical work in the laboratory
of your choice for your master thesis.

1st Semester exclusively courses.

Compulsory Course Units

Code	Title of UE	Semester	tot. h.	ECTS
SME.07010	Basic knowledge upgrading	AS	6-9	1
SME.07100	Models for human diseases	AS	28	3
SME.07200	Infection, inflammation and cancer	AS	28	3
SME.07300	Central nervous system regeneration and repair	AS	28	3
SME.07400	Microscopy in life sciences	AS	28	3
SME.07501	Scientific communication	AS	28	3
SME.07502	Advanced scientific writing	SS	28	3
SME.07700	Data analysis and statistics with the R programming language	AS	28	3
SME.07701	Introduction to modern instrumentation	SS	28	3
SBL.00427	Visual communication of data	SS	8	1
SBL.10004	Ethics in stem cell research	SS	8	1
Total				27

SME.07800	Master thesis			60
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Elective Course Units

Code	Title of UE	Semester	tot. h.	ECTS
SBL.00420 ^{a#}	Career profiling in life sciences	SS	8	1
-	<i>English for Master Students of Science I</i>	AS	-	3
-	<i>English for Master Students of Science II</i>	SS	-	3
SBL.00115 [#]	The RNA world	AS	12	1.5
SBL.00419 [#]	Advanced imaging	SS	8	1
SBL.00451 ^{b#}	Introduction to mass spectrometry and proteomics	AS	8	1
SBL.00452 ^{b#}	Advanced quantitative proteomics	SS	12	1
SBL.00119 ^{c#}	Molecular genetics of model organism development	AS	28	3
SBL.10001 ^{c#}	Modelling human diseases in experimental genetic systems	SS	20	2
SBL.10002 ^{c#}	From bench to bedside	SS	5	0.5
SBL.00428 ^{a#}	Optogenetics and <u>photopharmacology</u>	SS	8	1
SCH.05123	Innovation and Entrepreneurship	AS	48	4.5
Minimum ECTS credits required from elective Course Units				6

Compulsory course Units in the Neuroscience option

Code	Title of UE	Semester	tot. h.	ECTS
SME.07301	Behavioural methods in neuroscience	AS	28	3
SME.07305	From neurons to culture and back	AS	28	3
L25.00721*	Sleep and visual neuroscience [L071.0821]	AS	28	3
L25.00644*	Introduction to <u>Matlab I</u> [L071.0743]	SS	14	3
Total				12

* Offered by the Dept. of Psychology, Faculty of Humanities
Subject to change. See the up to date list under moodle.

Thesis-related activities in the Neuroscience option

Code	Title of UE	Semester	tot. h.	ECTS
SME.07002	Fribourg day of cognition	AS	8	0.5
SME.06001 [§]	Neurobiology (seminar)	AS	5	0.5
SME.07001 [§]	Neurobiology (seminar)	SS	5	0.5
SME.07302	Frontiers in neuroscience BENEFRI (workshop)	block	6	0.5
SME.07304	Neuroscience journal club [2 semesters x 18h]	AS/SS	36	4
SME.07601	Research group meetings in Neuroscience [3 semesters x 18h]	AS/SS	54	4.5
SME.07602	Project design in Neuroscience	SS	42	4.5
Total				15

Compulsory Course Units in the Infection, Inflammation and Cancer option

Code	Title of UE	Semester	tot. h.	ECTS
SME.07201	Cellular immunology: theory and practice	AS	28	3
SME.07215	Hot topics in Cancer research, Metabolic health and Regenerative biomedicine	SS	28	3
SME.07203	Principles and methods in investigating and treating age-associated heart and vascular diseases	SS	28	3
SME.07209	Concepts and approaches in metabolic phenotyping, anti-obesity targeting and hypoxia research	SS	28	3
Total				12

Thesis-related activities in the Infection, Inflammation and Cancer option

Code	Title of UE	Semester	tot. h.	ECTS
SME.07210 [§]	Section of medicine research (seminar)	AS	6	0.5
SME.07211 [§]	Section of medicine research (seminar)	SS	6	0.5
SME.07213	Joint research group meetings of Dept OMI (Oncology, Microbiology and Immunology)	AS/SS	6	0.5
SME.07212	Research Day in Medicine	SS	8	0.5
SME.07214	Cancer/inflammation research journal club [2 semesters x 18h]	AS/SS	36	4
SME.07603	Research group meetings in cancer/inflammation [3 semesters x 18h]	AS/SS	54	4.5
SME.07604	Project design in cancer/inflammation	SS	42	4.5
Total				15

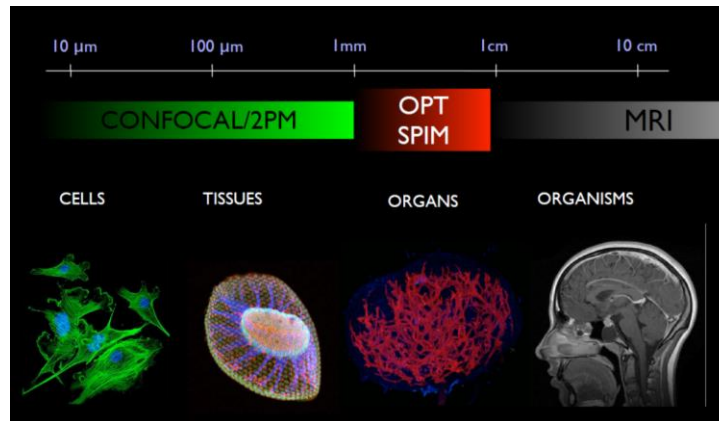
Compulsory Course Units in the Tissue Degeneration and Regeneration option

Code	Title of UE	Semester	tot. h.	ECTS
SME.07203	Principles and methods in investigating and treating age-associated heart and vascular diseases	SS	28	3
SME.07209	Concepts and approaches in metabolic phenotyping, anti-obesity targeting and hypoxia research	SS	28	3
SME.07201	Cellular immunology: theory and practice	AS	28	3
SME.07215	Hot topics in Cancer research, Metabolic health and Regenerative biomedicine	SS	28	3
Total				12

Thesis-related activities in the Tissue Degeneration and Regeneration option

Code	Title of UE	Semester	tot. h.	ECTS
SME.07104 [§]	Joint research group meetings of Dept EMC (Endocrinology, Metabolism and Cardiovascular System)	AS/SS	12	1
SME.07212	Research Day in Medicine	SS	8	0.5
SME.07102	Research symposium	AS or SS	8	0.5
SME.07105	Tissue Degeneration and Regeneration journal club [2 semesters x18h]	AS/SS	36	4
SME.07607	Research group meetings in Tissue Degeneration and Regeneration [3 semesters x 18h]	AS/SS	54	4.5
SME.07608	Project design in Tissue Degeneration and Regeneration	SS	42	4.5
Total				15

MASTER'S PRACTICAL WORK: VARIOUS RESEARCH FIELDS



© Dr. Spierer's research lab

© Dr. Stein's research lab

MASTER'S PRACTICAL WORK: VARIOUS RESEARCH LABS

🏠 > Math.-Nat. und Med. Fakultät > Abteilung Medizin

FR | DE

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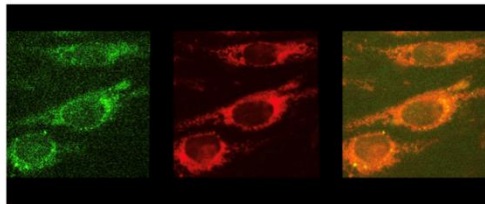
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Abteilung Medizin

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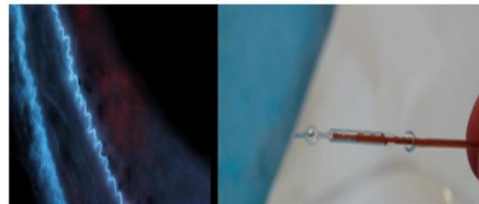
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Research Groups



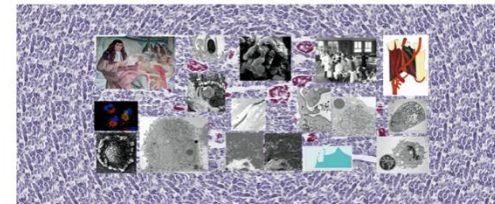
Biological Roles of Labile, Diffusible Molecules

Csaba Szabo



Cardiology

Stéphane Cook, Mario Togni



Clinical Anatomy and Cell Biology

Luis Filgueira



<https://www.unifr.ch/med/de/research/researchgroups/>

WHAT IS LEARNED AND EXPECTED FROM THE MASTER THESIS?

- A. Writing a proposal together with your supervisor**
- B. Perform experiments in the laboratory**
- C. Written thesis (report on your work)**
- D. At the end, a 15 minutes oral presentation**

WHY TO CHOOSE FRIBOURG? TESTIMONIALS

Mr. Reto Cola, former EBR student:

<https://www.unifr.ch/med/de/studium/master/mscebr/testimonials.html>

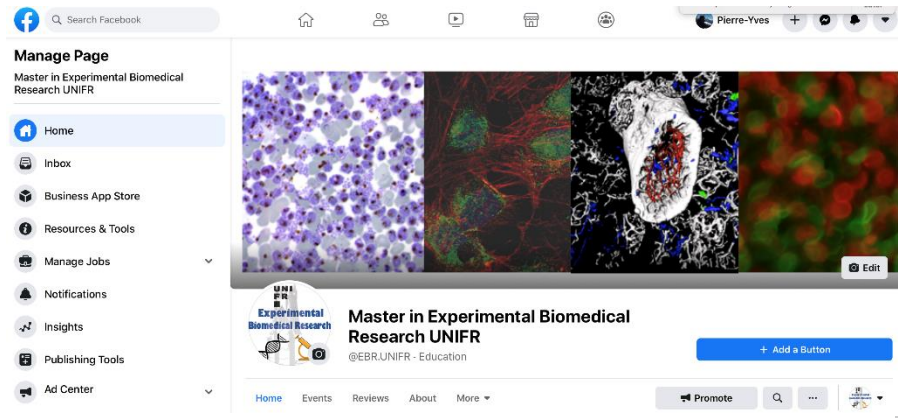
Dr. Jun Abe, researcher at Unifr:

<https://www.unifr.ch/med/de/research/groups/stein/members/people/234016/09d6c>

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WEBSITE:

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Deadline for application

*Applications for 2022/2024 have started in February 2022 and last until **June 30, 2022***

<https://www.unifr.ch/med/de/studium/master/mscebr/admission.html>