

Curriculum for the award of the Degree of

Master of Science in Molecular Life and Health Sciences

options:

- **Developmental Biology and
Regeneration**
- **Neurobiology**
- **Biochemistry and Cell Biology**
- **Marine Biology**
- **Teaching**

Provisional

Appendix: teaching units proposed in the MLHS Master

The teaching units are shown as O (obligatory), R (recommended), E (elective), - not possible, A: Obligatory, but alternating every year (see Teaching option).

AS, Autumn semester; SS, Spring semester.

Options are:

- Developmental Biology and Regeneration (DBR); • Neurobiology (NEU);
- Biochemistry and Cell Biology (BCB); • Marine Biology (MAR); • Teaching (TE)

Teaching units from the MSc in Environmental Biology or the Master of Bioinformatics and Computational Biology can replace recommended teaching units if prerequisites are met.

Some teaching units are given every two years:

biennial A: given for the 1st time during the academic year 2021/2022 and then every two years

biennial B: given for the 1st time during the academic year 2022/2023 and then every two years

Code	Title	DBR	NEU	BCB	MAR	TE	Occurrence	Prerequisite / Comments
SBL.10001	Modelling human disease in experimental genetic systems	O	O	O	E	O	Annual; SS	SBL.00119
SBL.10002	From bench to bedside	O	O	O	E	O	Annual; SS	SBL.10001
SBL.10003	Health-related topics in developmental biology	O	R	E	E	R	Annual; SS	SBL.00119
SBL.10004	Ethics in stem cell research	O	R	R	E	O	Annual; SS	
SBL.10006	Developmental biology of marine animal species	E	R	E	O	A	Biennial A; AS	Alternates with SBL.10008
SBL.10007	Polar biology	R	E	E	O	A	Biennial B; SS	Alternates with SBL.00421
SBL.10008	Omics approaches in marine sciences	R	R	E	O	A	Biennial B; AS	Alternates with SBL.10006
SBL.10009	Advanced marine biology practical course	R	E	E	O	E	AS	
SBL.10010	Altered carbohydrate metabolism in disease	E	E	O	E	E	Annual; SS	SBC.00119; SBC.00114
SBL.10011	Structure, function and diseases of lipid metabolism	E	E	R	R	E	Biennial A; SS	SBC.00119; SBC.00114
SBL.10012	Systems biology	E	E	R	E	E		SBL.30001
SBL.10100	Journal club in molecular life sciences (3 sem.)	O	O	O	O	-	All semesters	
SBL.10102	Journal club in molecular life sciences (2 sem.)	-	-	-	-	O	All semesters	
SBL.10103	Research group meetings (3 sem.)	O	O	O	O	-	All semesters	
SBL.10104	Research group meetings (2 sem.)	-	-	-	-	O	All semesters	
SBL.10105	Research seminars in molecular life and health sciences	O	O	O	O	O	All semesters	
SBL.20001	Biostatistics I – generalized linear models and mixed effects models	E	E	R	O	E	Biennial A; AS	
SBL.20004	Introduction to metabolomics: data acquisition and processing	E	E	O	E	E	Annual; AS	
SBL.20032	Population ecology and evolutionary dynamics	E	E	E	R	E	Biennial B; SS	
SBL.20036	Global change	E	E	E	R	E	Biennial A; AS	
SBL.30001	Introduction to R	O	O	O	O	O	Annual; AS	
SBL.30004	Organization and annotation of eukaryote genomes	E	E	E	E	E		
SBC.04202	Eucaryotic cell growth control	R	R	O	E	E	Annual; AS	
SBC.04203	Genotyping	R	R	O	E	E	Annual; AS	
SBC.07104	Intro. Protein structure and homology modelling	E	R	O	E	E	SS	SBL.00412
SBC.07105	Intro. Docking of small molecules, molecular graphics	E	R	O	E	E	SS	SBC.07104

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Code	Title	DBR	NEU	BCB	MAR	TE	Occurrence	Prerequisite / Comments
SBC.07107	Bioinformatics	E	E	R	R	E	AS	SBC.07110
SBC.07110	Introduction to UNIX and BASH	R	E	O	R	R	AS	
SBL.00114	Experimental genetics	O	O	R	R	O	Annual; AS	
SBL.00115	The RNA world	O	O	O	E	O	Annual; AS	
SBL.00117	Neurogenetics	O	O	R	R	R	Annual; AS	
SBL.00118	BeNeFri workshop "Frontiers in neurosciences"	E	O	E	E	E	Annual; AS	
SBL.00119	Molecular genetics of model organism development	O	O	R	R	O	Annual; AS	
SBL.00123	Cellular and genetic networks	R	O	R	R	R	Annual; SS	
SBL.00125	Light and fluorescence microscopy for life sciences	O	O	O	O	R	Annual; AS	
SBL.00126	Established and emerging organisms for marine science	R	R	E	O	E	Annual; SS	
SBL.00127	BeFri research colloquium in cell and developmental biology I	O	O	R	R	R	Annual; SS	
SBL.00128	BeFri research colloquium in cell and developmental biology II	R	O	R	R	R	Annual; SS	
SBL.00129	BeFri research retreat in cell and developmental biology	O	O	R	R	R	Annual; SS	
SBL.00130	Nuclear organization and chromosome dynamics	O	R	R	E	R	Annual; AS	
SBL.00411	Signalling and transport	R	R	R	E	R		
SBL.00412	Introduction to protein structure and function	E	R	R	E	E	Annual; AS	SBC.07003
SBL.00414	Cell fate and tissue regeneration	O	R	R	E	O	Annual; AS	
SBL.00415	Cell proliferation	O	R	O	E	O	Annual; SS	
SBL.00416	Biological rhythms	R	O	O	R	O	Annual; SS	
SBL.00417	Evolution on the bench	R	E	R	E	R	Annual; SS	
SBL.00418	Microbial metabolism and genetics	R	E	O	R	R	Annual; SS	
SBL.00419	Advanced imaging	R	R	R	R	E	Annual; SS	
SBL.00420	Career profiling in life sciences	R	R	R	R	R	Biennial B; SS	
SBL.00421	Oceanography and marine ecosystems	R	E	E	O	A	Biennial A; SS	Alternates with SBL.10007
SBL.00425	Metagenomics data analysis	E	E	R	E	E	SS	
SBL.00427	Visual communication of data	O	O	O	O	O	Annual; SS	
SBL.00428	Optogenetics and photopharmacology	R	O	O	R	R	Biennial A; SS	
SBL.00429	Animal models of regeneration	O	R	E	E	R	Annual; SS	
SBL.00431	Biology seminars 4 sem	O	O	O	O	-	All semesters	
SBL.00432	Biology seminars 3 sem	-	-	-	-	O	All semesters	
SBL.00451	Introduction to mass spectrometry and proteomics	R	R	O	R	R	Annual; AS	
SBL.00452	Advanced quantitative proteomics	R	R	O	R	R	Annual; SS	
SBL.00453	Protein homeostasis: translation, quality control and degradation	R	R	O	E	O	Annual; AS	
SBL.00501	Introduction to data analysis	O	O	O	O	O	Annual; AS	SBL.30001
SBL.05001	Master thesis (3 sem.)	O	O	O	O	-	All semesters	
SBL.05002	Master thesis (2 sem.)	-	-	-	-	O	All semesters	
SME.05001	Neurobiology seminars	E	O	E	E	E	All semesters	
SME.06001	Neurobiology seminars	E	O	E	E	E	All semesters	

Curriculum of the Master of Science in Molecular Life and Health Sciences

Code	Title	DBR	NEU	BCB	MAR	TE	Occurrence	Prerequisite / Comments
SME.07100	Models for human diseases*	E	E	E	-	-	Annual; AS	SPY.00110; SPY.00111; SMO.00004
SME.07200	Infection, inflammation and cancer*	E	E	E	-	-	Annual; AS	
SME.07300	Central nervous system regeneration and repair*	E	E	E	-	-	Annual; AS	
SME.07202	Hot topics in cancer research*	E	E	E	-	-	Annual; AS	
-	English for Masters Students of Science I	R	E	R	O	E	Annual; AS	Check your English level online
-	English for Masters Students of Science II	R	E	R	O	E	Annual; SS	Check your English level online
UniL	Introductory course in laboratory animal science	R	E	R	E	R	Annual	

Elective courses shared with the Master Environmental Biology and the Master in Bioinformatics and Computational Biology

<https://www3.unifr.ch/scimed/fr/plans/master>

** Courses from the specialized EBR Master are accessible only if space allows and if prerequisites are met. Evaluation modalities are found in the corresponding annex of the EBR study plan in biomedical sciences.*