Module Name
Mitochondrial Proteins: Biogenesis, Networks and Functional Decline

Type of Module	**Module Code**
o Advanced Module	Mitochondrial Proteins

Identification Number	**Workload**	**Credit Points**	**Term**	**Offered Every**	**Start**	**Duration**
MN-B-SM (G 5)	360 h	12 CP	2nd term of studying	Summer term	summer term only	7 weeks

1	**Course Types**	**Contact Time**	**Private Study**	**Planned Group Size***
	a) Lectures	24 h	48 h	max. 8
	b) Practical/Lab	154 h	102 h	max. 2
	c) Seminar	8 h	24 h	max. 2

2 Module Objectives and Skills to be Acquired

Students who successfully completed this module

- have acquired detailed knowledge on biogenesis of different cellular organelles especially mitochondria.
- have acquired detailed knowledge on general protein synthesis, folding, homeostasis and degradation with an emphasis on mitochondrial proteins.
- can independently develop strategies for characterization of proteins, and responsible folding, translocation, and surveillance machineries.
- are able to analyze enzymes/pathways on different levels, such as primary sequence, domain structure, oligomerization, three-dimensional structure, evolutionary conservation, genetic interactions with other pathways.
- can independently carry out small scientific projects related to the topic of the module.
- have learned how to present research results in oral and written form and to critically discuss scientific publications related to the topic of the module on a professional level.
- are able to transfer skills acquired in this module to other fields of biochemistry.

3 Module Content

- Mammalian cell culture, Isolation of mitochondria
- Purification of recombinant proteins and their biophysical, biochemical and structural analysis
- Techniques to analyse mitochondrial protein synthesis, import, and folding

4 Teaching Methods

Lectures; Practical/Lab (Project work); Seminar; Guidance to independent research; Training on presentation techniques in oral and written form

5 Prerequisites (for the Module)

Enrollment in the Master´s degree course “Biological Sciences” or in the Master’s degree course “Biochemistry”

Additional academic requirements

Previous attendance of the lecture module “Principles of Molecular Genetics, Development and Aging (A/D/G)”.

6	**Type of Examination** The final examination consists of two parts: oral examination on topics of lectures, seminars and the practical/lab part (20-30 min; 50 % of the total module mark) written report (50 % of the total module mark)
7	**Credits Awarded** Regular and active participation; Each examination part at least "sufficient" (see appendix of the examination regulations for details)
8	**Compatibility with other Curricula*** Biochemical subject module in the Master´s degree course "Biochemistry"
9	**Proportion of Final Grade** In the Master´s degree course "Biological Sciences": 15 % of the overall grade (see also appendix of the examination regulations)
10	**Module Coordinator** Prof. Dr. Jan Riemer, phone 470-7306, e-mail: jan.riemer@uni-koeln.de
11	**Further Information** **Subject module** of the Master´s degree course "Biological Sciences", **Specialization:** (G) Molecular and Developmental Genetics **Participating faculty**: Prof. Dr. J. Riemer **Literature:** Information about textbooks and other reading material will be given on the ILIAS representation of the course (https://www.ilias.uni-koeln.de/ilias/goto_uk_cat_2815610.html) **General time schedule:** Week 1 (Mon.-Fri.): Lectures, preparations for practical work and practical work; Week 2-5 (Mon.-Fri.): Lectures, Seminars and practical/lab; Week 6 (Mon.-Fri.): Preparing chalk talk and posters, and chalk talk and poster presentation about the content of the practical; Week 7 (Mon.-Fri.): Preparation for the written examination **Introduction to the module:** May, 23rd, 2022 at 8:30 a.m. (this date is also the start of the module = week 1), Center for Molecular Biosciences (COMB), room 0.01 (ground floor) or online (in this case, further information/link will be sent to your Smail-Account); for preparation to the module before this introduction see ILIAS link under literature. **Oral examination:** July 15, 2022, second/supplementary examination August 26, 2022; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.

* 4 students from the Master´s degree course "Biological Sciences" and 4 students from the Master's degree course "Biochemistry".