Nodule Name Metabolic Reprogramming in Health and Diseases (Trifunovic)					
Identification Number	**Workload**	**Credit Point**	**Term**	**Offered Every**	**Duration**
MN-BC-BSM04	360 Hours	12 CP	1st or 2nd term	Winter, 2nd half	7 weeks

1	**Course Types**	**Contact Times**	**Self-Study Times**	**Group Size**
	a) Lecture	20 h	80 h	max. 10
	b) Practical/Lab	150 h	50 h	max 1
	c) Seminar	12 h	48 h	max 10

2 Module Objectives and Skills to be Acquired

Students who successfully completed this module

- have acquired detailed knowledge on important metabolic concepts in a variety of health and diseases states.
- have acquired experimental skills in state-of-the art methodologies in cell biology, biochemistry and molecular biology and can independently carry out small scientific projects related to the topic of the module.
- have the ability to process, quantify and evaluate their experimental results.
- 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

In this course we will gain insight into the fundamental principles of metabolic concepts in different health and diseases states and especially emphasize how these processes can be studied using biochemical and molecular biological techniques.
The specific areas that will be covered are:

- Introduction into Metabolism
- Proteostasis mediated metabolic rewiring during differentiation and aging
- Role of mitochondria in control of metabolism in different cell types
- Metabolic reprogramming of the heart in physiology and pathological states
- Metabolic reprogramming and control of cancer
- Reprogramming in starvation and metabolic syndrome (diabetes)
- Compartmentalisation and plasticity of metabolism in the brain
- Metabolic reprogramming of adaptive immunity during infection (T cells)
- Metabolic reprogramming in stem cells

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)

Enrolment in the Master´s degree course “Biochemistry and Molecular Medicine”

6 Type of Examination

	The final examination consists of three parts (Type BC5): One hour written examination about topics of the lectures (50% of the total module mark), seminar talk (25% of the total module mark) and Written report (25% 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** -
9	**Proportion of Final Grade** 10%
10	**Module Coordinator** Prof. Dr. Aleksandra Trifunovic, phone 478-84291, e-mail: aleksandra.trifunovic@uk-koeln.de Dr. Alexandra Kukat, phone 478-84293, e-mail: akukat@uni-koeln.de
11	**Further Information** Focus of research: (M) Molecular Biology: Molecular mechanisms of metabolic reprograming. **Participating faculty**: Dr. M. Corrado, Dr Ina Huppertz, Dr. A. Kukat, Dr. P. Kreuzaler, Dr. E. Motori, Prof. Dr. E. Rugarli, Prof. Dr. A. Trifunovic, Prof. Dr. D. Vilchez **Literature:** A list of literature that should be used for preparation to the module can be obtained from http://www.genetik.uni-koeln.de/Teaching.html under "Advanced undergraduate courses". **Note:** The module contains hand-on laboratory work conducted individually and is taught in research laboratories. The module does not contain computer-based practicals/research as a main component. **General time schedule:** Week 1-6 (Mon.-Fri.): Lectures, practical/lab and preparation for the oral presentation (held in week 6); Week 7(Mon.-Fri): Preparation for the written examination **Introduction to the module:** 02.12.2024; 9:00; CECAD Seminar room 39/40 (further information/link will be sent to your Smail-Account) **Examination:** 31.01.25 13:00 - 14:00 CECAD Seminar room 1 st floor, 2nd examination: 28.02.25 13:00 - 14:00 CECAD Seminar room 1st floor

* 6 students from the Master's degree course "Biochemistry and Molecular Medicine".