Title of module	Modular Advanced Practical and Seminar in the Focal Point Programme "Molecular Medicine" VZ: 185780, 185781 **"Characterization of proteins isolated from peroxisomes and peroxisomal membranes of the yeast *Saccharomyces cerevisiae*"**

Credit points	4	***Available in semester(s)***	1
Hours per week	5.3	***Compact course***	☒

Lecturer(s)	Prof. R. Erdmann and teaching assistants
Teaching methods	Two weeks advanced laboratory course with an intergrated seminar
Evaluation of learning progress	Active participation in the laboratory tasks and seminar, feedback during the experiment, participation in laboratory seminars/scientific presentation
Mode of examination	Assessment of active and successful participation in the practical (50%) and a written project report (50%)
Learning objectives	After completion of the course, students will have aquired basic practical skills in biochemical, microbiological and molecular biological methods. The students will be able to isolate protein-complexes by affinity chromatography and to characterize these complexes according to their size (size-exclusion chromatography) and constituents (SDS-PAGE, immuno-blotting). Students will learn how state-of-the-art molecular cell biological methods are used to tackle the structure and function of cellular nanomachines with the peroxisomal protein translocation apparatus as an example.

Soft skills	Communication and collaboration skills will be improved by working in a small team of 2-3 students adviced by members of the research laboratory. Presentation skills will be improved by learning how to present scientific data in talks and scientific discussions.
Contents of module	Topics: Characterization of metabolite transport across the peroxisomal membrane Dissection of the peroxisomal protein import machinery Structure and function of the peroxisomal nano-maschine complex Pex1p/Pex6p, two AAA-ATPases. Methods: • Cultivation of Bakers yeast • Different techniques for cell breakage • Cell fractionation and isolation of cellular membranes • Separation of protein mixtures and protein complexes by SDS polyacrylamid gel electrophoresis • Western blotting and immunodetection • Size-exclusion chromatography