Title of module	Advanced Practical in the Focal Point Program: "Molecular Medicine" VZ: 185881 **"The role of protein misfolding in neurodegenerative diseases"**

Credit points	7.5 (of 15)	***Available in semester(s)***	1
Hours per week	9	***Compact course***	☒

Lecturer(s)	Prof. J. Tatzelt and teaching assistants
Teaching methods	A five-week all-day practical lab course with a compulsory seminar presentation. **Please note:** A second Advanced Practical will have to be performed in the same semester to earn the full complement of 15 credits
Evaluation of learning progress	Active participation, feedback during independently performed experiments, project discussions with the supervisor
Mode of examination	Assessment of experimental skills during the practical (50%), a written project report (40%), and a seminar presentation of experimental results (10%).
Learning objectives	A hallmark of several neurodegenerative diseases, such as Alzheimer's disease and prion diseases is the formation and accumulation of aberrant protein conformers. Cellular quality control pathways monitor correct folding and ensure rapid elimination of misfolded proteins. Employing different techniques the students will learn how to analyze protein targeting, folding and maturation in neuronal cells and to investigate the impact of pathogenic protein conformeres on cell viability.

Soft skills	Team work and time management. Professional presentation and interpretation of data. Improvement of communication skills and scientific writing.
Contents of module	**Topics:** Protein targeting ER and mitochondrial unfolded protein response Heat shock response Ubiquitin-proteasome system Lysosomal degradation Posttranslational modifications of secretory proteins **Methods:** Cultivation and transfection of mammalian cells Cell death and viability assays Real time PCR Western Blotting Reporter gene assays Immunofluorescence Confocal microscopy