Title of Course:

Modular advanced practical in the focal point programme "Molecular Medicine",

VZ: 209 806 / 209 852

"Quantification of SARS-CoV-2 Neutralizing Antibodies with Propagation-Defective VSV Pseudotypes"

Type: Advanced practical course within a focal point program			**Workload** 120h	**Intended for Semester** 1	**Duration** 2 weeks
1	**Module:** Elective Practical		**Hours per Week** 5.25	**Self-study** 46,5 h	**Credit Points** 4
2	**Teaching Methods:** a) A two-week all-day practical lab course in a research group				
3	**Group Size:** *1-3 students*				
4	**Learning/Course Objectives:** Severe Acute Respiratory Coronavirus 2 (SARS-CoV-2) has spread globally since its outbreak in 2019, resulting in an ongoing pandemic. In 2021, the first vaccine was approved and since then several other vaccines followed, both mRNA-based and vector-based. All vaccines induce antibodies directed against the Spike protein of SARS-CoV-2. However, in the recent past, various variants of concern (VOC) have occurred, namely Alpha, Beta, Gamma, Delta and Omicron. They differ from the wildtype by several mutations, including mutations in the Spike protein, thus raising concerns about vaccine efficacy against these variants. Studies have already shown a reduced neutralization of the Beta, Gamma and Delta variant by previously infected or vaccinated individuals. The aim of this practical course is to determine neutralizing antibody levels within sera of COVID-19 vaccinated individuals and to teach the participants the performance of the neutralization assay with propagation-defective pseudotypes under BSL2 conditions.				
5	**Contents:** This practical course is dedicated towards working under sterile conditions and to get familiar with the basics of cell culture and the handling of viruses. It covers the cultivation of different cell lines and the production of propagation-defective vesicular stomatitis virus (VSV) pseudotypes. The participants will be able to analyze their own status of neutralizing antibodies, if they wish, against SARS-CoV-2 wildtype and variants of concern. - Working under sterile conditions - Growing and splitting of cells in cell culture flasks - Transfection of cells - Production of propagation-defective vesicular stomatitis virus (VSV) pseudotypes - Performance of neutralization assays to quantify neutralizing antibodies				
6	**Degree Courses:** Master of Science Biochemistry				
7	**Prerequisite(s):** Knowledge of basic methods in molecular biology and protein chemistry.				
8	**Method(s) of Examination:** Assessment of active and successful participation in the practical (60%) and a written project report or scientific presentation (40%)				
9	**Requirements for Acquiring Credit Points:** Achievement of at least the mark "sufficient" regarding the above modes of examination.				
10	**Significance for Overall Grade:** Weighted according to CPs				
11	**Frequency:** Every winter term				

12	**Lecturer(s):** Jun.-Prof. Dr. Stephanie Pfänder, M.Sc. Natalie Heinen, Elena Vidal Blanco
13	**Additional Information:** This lab course is one of four courses in total to be completed in the first term, which have to be fulfilled in different Focal Point Programs