

Wahlfachtitel	Deciphering cardiovascular disease - RNA therapeutics & single cell technologies
Lehrperson(en)	Prof. Dr. Wesley Abplanalp
Empfohlen ab klinischem Semester	ab 1. Klin. Semester
Kursort	Cardio-Pulmonary Institute (CPI), Haus 25B, Theodor-Stern-Kai 7, 60590 FFM und online
Gruppengröße	12 Teilnehmer
Eingangsvoraussetzungen	This elective course is aimed at students who wish to pursue an experimental doctoral thesis. The language of the course is English.
Lernziele	This elective course is aimed at students who wish to pursue an experimental doctoral thesis. By providing distinct experimental procedures, the course will provide knowledge on endothelial cell culture and function in response to pro-inflammatory and pro-angiogenic stimuli as well as confocal imaging, immunofluorescence and RNA biology. Students may choose any subcategory of interest.
Veranstaltungsinhalte	<p>RNA Biology: The students will gain exposure to the intricate network of mechanisms that regulate RNA expression levels. Adding to the courses depth will be discussion of the divergent RNA classes with respect to their form and function. Finally, students will have hands on experience by isolating total RNA from endothelial cells and performing reverse transcription for cDNA synthesis. Subsequently, they will perform quantitative real time PCR studies to evaluate the expression pattern of marker genes and housekeeping transcripts. The students will also learn to summarize and analyse the data using appropriate software.</p> <p>Cardiovascular Single Cell Technologies: Maintenance of the cardiovascular system involves carefully orchestrated actions of the component cells of the heart (e.g. cardiomyocytes, endothelial cells, fibroblasts, pericytes, etc.). The increasing disorder of the cardiac resident cells inherently lead to pathology.</p> <p>The students will learn about developing technologies in the field, how to apply them to specific questions, and develop opportunities for in silico development and testing of hypotheses. Each student will perform a basic bioinformatic analysis and learn to use cutting edge analytical tools.</p> <p>RNA Therapeutics: The students will learn about developments in RNA-based therapeutics. This will span methods for discovery, to testing, and establishment in the field. An overview of the current therapies in clinical pipelines will also be provided. From RNAs predicted to be important for therapeutic ends, the students will get hands-on experience in the handling of human endothelial cells and their responses to interference of these RNAs. Each student will perform an experiment where human endothelial cells respond to stimulus with and without RNA interference for insights into therapeutic applications.</p>

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Art der Prüfung	At the end of the elective course, each student will write an experimental protocol (max 3 pages) and will present (max 10 min/ student) at an online joined event. Grades will be cumulatively based on protocol and presentation. No missing hours are allowed.
Weitere Hinweise	
Literaturhinweise	

