Focus area Evolutionary Medicine II	
Module code	**mlsEvoMedII-01a**
Abbreviated title	EvoMed II
Module components	Lab seminar, lab practical, joint seminar of all focus areas
When	Semester 3
Module coordinator/ Organiser	J. Baines IEM
Lecturers	**J. Baines** (IEM), A. Nebel (IKMB), principal investigators of research groups working on research topics of focus areas (joint seminars)
Contact hours	Practical 9 CH Lab seminar 1 CH Joint seminar 1 CH
Workload Total: 330 h	Lab practical: 240 h Attendance time 100 h, preparation 60 h, revision 80 h Lab seminar: 60 h Attendance time 14 h, preparation 26 h, revision 20 h Joint seminar "Current affairs": Attendance time 14 h, preparation 10 h, revision 6 h
Credit points	11 (practical 8 CP, lab seminar 2 CP, joint seminar 1 CP)
Requirements	*EvoMed I* passed
Expected outcome	Knowledge: Students - are familiar with the theories in evolutionary science important in medical research - have acquired in-depth knowledge on physiological and molecular processes important in evolutionary medicine - are familiar with lab techniques in molecular evolutionary research described in the literature and can explain them - have a thorough understanding of the experiments conducted during the practical. Skills: Students -can formulate testable evolutionary hypotheses pertaining to medical diseases and conditions -can distinguish between proximate (e.g. mechanistic) versus evolutionary explanations for medical diseases and conditions - can conduct the different steps of their lab experiments and explain them - are able to perform quality control measures for the results obtained - can analyse their results and put them into relation to the research area. Competences: Students - can select adequate research techniques from molecular biology, evolutionary biology, human genetics and apply them to scientific questions in evolutionary medicine - can plan experiments, analyse the data obtained and interpret results - can reflect on their own work critically and integrate new results adequately - can familiarize themselves with a topic and develop research approaches

	- are aware of the connections between the topics of the different focus areas, can link and explain them.
Content	Seminar: Preparation of a project by literature research and discussions with fellow students and lecturers. Discussion of current papers including method papers. Practical: Execution of a lab project on topics such as identifying disease-causing candidate mutations using population genetic and/or molecular evolutionary methods, studying the phylogeny and diversification of disease genes, studying the function of a disease gene in model organisms such as mouse, fruit fly or hydra, performing experimental evolution in bacteria and/or viruses to understand principles of the evolution of antibiotic resistance or virulence. Joint seminar: Joint discussion of papers relevant for all focus areas.
Module evaluation/ exam	**Graded** Scientific essay with oral presentation
Media used	PPT presentations, handouts, lab experiments
Literature	Ridley M, Evolution (John Wiley & Sons 2003) [still valid, no new edition available] Gluckman P, Beedle A, Hanson M, Principles of Evolutionary Medicine (OUP 2nd edition, 2016) Stearns S, Medzhitov R, Evolutionary Medicine (Sinauer Associates 2015) Current original publications and reviews