Clinical manifestations of diseases and cell biology for clinical research	
Module code	**mlsIntroMed-01a**
Abbreviated title	IntroMed
Module components	Lectures, diagnostics lab tutorial, seminar
When	Semester 1
Module coordinator Organiser	E. Hütten A. Klettner (Ophthalmology) | K. Reiß (Dermatology)
Lecturers	Clinical manifestations of diseases: **A. Klettner** (Ophthalmology), F. Tran (Med. Department I), A. Remes (Cardiology) Clinical Cell Biology: **K. Reiß** (Dermatology), H. Schäfer (IET), S. Fuchs (Trauma Surgery), J. Harder (Dermatology), A. Klettner (Ophthalmology)
Contact hours	Lecture Clinical manifestations 2 CH Diagnostics lab tutorial 1 CH Lecture Clinical cell biology 2 CH Seminar Clinical cell biology 1 CH
Workload Total: 180 h	Lecture Clinical manifestations of diseases: 60 h Attendance time 26 h, preparation 10 h, revision 24 h Tutorial Clinical manifestations of diseases: 30 h Attendance time 14 h, preparation 6 h, revision 10 h Lecture Clinical cell biology: 60 h Attendance time 26 h, preparation 10 h, revision 24 h Seminar Clinical cell biology: 30 h Attendance time 14 h, preparation 10 h, revision 6 h
Credit points	6 (lecture Clinical manifestations 2 CP, tutorial 1 CP; lecture Clinical cell Biology 2 CP, seminar 1 CP)
Requirements	-
Expected outcome	Knowledge: Students - can apply and explain the most important medical terms correctly - have an overview knowledge of factors and clinical manifestations of non-contagious diseases (including civilization diseases) and epidemiologically significant infectious diseases of temperate latitudes - are familiar with the basics of molecular and cell biological processes and their relevance for disease-related alterations - understand the pathomechanisms of chronic inflammatory and degenerative diseases, - have an overview of model systems for basic and translational research. Skills: Students -have acquired skills in applying basic techniques in dedicated research labs in cardiology, ophthalmology and dermatology, e.g. cell isolation, microscope techniques to detect aberrations in tissue thin sections, staining cells, live cell imaging techniques, assessment of mitochondria function in hypoxic conditions. Competences: Students - understand the significance of clinical aspects of their studies and are aware of the interaction between and interdependence of research and treatment of diseases - understand molecular and cell biological processes in disease development conceptually -can transfer the acquired conceptual knowledge.
Content	Lecture Clinical manifestations of diseases: Typical disease manifestations and epidemiology of non-infectious diseases (including civilization diseases), basic medical terminology, theoretical introduction to clinical problems (e.g. allergies, physiology of the skin, skin diseases, cardiovascular system, anatomy and

	physiology of the eye and ophthalmological diseases). Introduction to cellular and molecular processes in disease development and progression, introduction into experimental model systems, introduction to molecular research in non-contagious diseases, understanding of molecular mechanisms behind pharmacological treatments for cardiovascular disease. Basics behind various *in vitro* and *in vivo* modeling strategies for cardiovascular disease and importance of bench to bedside transfer of knowledge. Diagnostics lab tutorial: Laboratory aspects of molecular research in ophthalmology, cardiology and dermatology for degenerative and chronic inflammatory diseases, practical exercises. Lecture Clinical cell biology: Carbohydrate/Lipid and energy metabolism, liver metabolism, cell communication, basics of signal transduction, regulation/ deregulation of ligand-receptor interactions, Ubiqitin-Proteasome System, oxidative and genotoxic stress, proteolysis as regulative mechanism in cell biology and pathophysiology: classes of proteases, ectodomain proteolysis, intra-membrane proteolysis, regulation of signal transduction by proteolysis; transcription factor NFκB, phospholiophase A2 family, signal transduction in antigen presentation and co-stimulation, compartmentalisation of signalling pathways, cytoskeleton and motor proteins, cell organelles function and associated diseases. Seminar Clinical cell biology: Knowledge consolidation via current publications
Module evaluation/ exam	**Graded** Clinical cell biology: oral exam [individual exam] Clinical manifestations of diseases: written exam [individual exam] Weight of each exam part for final grade: 50%
Media used	PPT presentations, clinical case studies, handouts, textbooks.
Literature	**Clinical manifestations of diseases** Current scientific publications **Clinical cell biology** Alberts B, Johnson A, Lewis J, Raff M, Roberts K, Walter P, Molecular Biology of the Cell (Garland Science 6th edition 2014) Deans K, Murphy M, Srivastava R, Clinical biochemistry – an illustrated colour text (Elsevier 6th edition, 2018) Nelson DL, Cox MM, Lehninger - Principles of Biochemistry: International Edition (Macmillan Education 8th edition, 2021) Current scientific publications