Module title	**Physiology and Immunotherapies**
Code	BP5
Degree Programme	Master of Science in Life Sciences
Group	Bio/Pharma
Workload	3 ECTS (90 student working hours: 42 lessons contact = 32 h; 58 h self-study)
Module Coordinator	**Name**: Dr. Bruno Schnyder **Phone**: +41 (0)58 606 86 59 **Email**: bruno.schnyder@hevs.ch **Address**: HES-SO, Institut für Life Technologies, Rte du Rawyl 64, 1950 Sitten / Sion
Lecturers	• Dr. Bruno Schnyder, HES-SO Vs • Dr. William Pralong, EPFL • Dr. Gerrit Hagens, HES-SO Vs • Dr. Eric Kübler, FHNW-HLS
Entry requirements	Bachelor Degree in Life Sciences (Biotechnology, Bioanalytics, Pharmatechnology) including the basics described by the following keywords: • properties of the biomolecules proteins, lipids, carbohydrates (sugars), genes, vitamins, small chemical molecules • analytical methods of proteins and cells • structure and function of living cells, physiological transport of nutrition across cell membranes These basics are summarized by the indicated literature (Silverthorn 2015) provided on moodle, including a self-test.
Learning outcomes and competences	After completing the module, students will be able to: • list the key physiological aspects of organs, cell systems, and molecular systems • master cell-based therapy and gene therapy • identify obstacles in recipients of a therapy e.g. adverse immune reaction • understand the fascinating complexity of the brain, and respective therapies
Module contents	"Physiology and Immunotherapies" introduces and goes beyond the medical aspects of classical "Physiology". Physiology is the science of functioning of an organism, an organ, or a cell. Eventual dysfunctions can be repaired by newly adopted cells. Other dysfunctions are being targeted by molecular and gene therapies. The module's training includes illustrative examples thereof. The tissues, cells, molecules, and genes under *in natura* conditions will be compared with those in engineering facilities. Novel and next generation therapies (e.g. CART cell-therapy) will be based on this. <u>Key aspects of Physiology:</u> Brain science discoveries, Immune system defense (e.g. against infectious disease, including antibiotics resistances), Intestinal and Urinary tracts, whole organism models (e.g. gene-ko mice)

	Key aspects of Immunotherapies: Cell-based and antibody-based Immunotherapy, furthermore Gene-Therapy, Microbiota "our home pharmacy"
Teaching / learning methods	lectures in oral and written form • exercise trainings individually and in groups • literature study of selected research publications • self-study, both prior to and following the lectures • Overview of teaching hours (12 lectures by B.Schnyder, 12 lectures by G.Hagens, 12 lectures by W.Pralong, 6 lectures by E.Kübler)
Assessment of learning outcome	1. Final written exam, closed book (100%)
Format	7-weeks
Timing of the module	Spring semester, CW 8-14
Venue	Mix of online and on-site lectures (in Berne)
Bibliography	pre-course work: Silverthorn D.Unglaub "Human Physiology" Edit. Benjamin Cummings, Pearson ISBN-13: 978-0-321-75000-6: Summaries and a self-test (both are available on moodle) Course material (moodle): Manuscripts and a selection of scientific papers
Language	English
Links to other modules	BP6 "Tissue Engineering for Drug Discovery"
Comments	
Last Update	23.09.2021