Course syllabus for

Frontiers in Translational Medicine, 22 credits

Avancerad translationell medicin, 22 hp
This course has been cancelled, for further information see Transitional provisions in the last version of the syllabus.
Please note that the course syllabus is available in the following versions:
Autumn2011 , Autumn2012 , Autumn2013 , Autumn2014 , Autumn2015 , Autumn2016 , Autumn2017 , Autumn2018 , Autumn2019 , Autumn2020

Course code	4BI080
Course name	Frontiers in Translational Medicine
Credits	22 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Biomedicine
Level	AV - Second cycle
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Medicine, Solna
Participating institutions	• Department of Microbiology, Tumor and Cell Biology • Department of Neurobiology, Care Sciences and Society • Department of Clinical Neuroscience
Decided by	Programnämnd 7
Decision date	2011-05-10
Revised by	Programme committee for study programmes in biomedicine
Last revision	2021-04-22
Course syllabus valid from	Autumn 2020

Specific entry requirements

Bachelor's degree or professional qualification worth at least 180 credits in biomedicine, biotechnology, cellular and molecular biology or medicine. English language skills equivalent to English B (with at least the grade of Pass) are required.

Objectives

The aims of the course are that the student should understand the connection between how changes at the molecular level can influence basic functions in individual cells and/or organs in relation to the human body; special focus is placed on changes from healthy to diseased tissue and on the connection between symptoms, diagnosis and treatment of different diseases.

On completion of the course, the student should be able to:

Regarding knowledge and understanding

- explain basic functions and mechanisms at the molecular level in individual cells and in organs and put this in relation to the human body as a whole,
- connect knowledge of basic functions and mechanisms at the molecular level to processes such as disease development, diagnosis and treatment, and to consider these processes from a global health perspective,
- explain pros and cons of the most important methods in molecular medicine.

Regarding competence and skills

- participate actively in project planning (study design) and implementation,
- evaluate and present results from a research project both orally and in writing,
- find relevant original-, review- and other literature regarding issues related to biomedicine, and from these extract information for problem-solving, and experimental design and compilations,
- present and discuss scientific articles,
- give peer feedback to classmates regarding oral presentations and written assignments.

Regarding assessment ability and attitudes

- take responsibility for his/her own learning,
- show an ethical, critically analytical and scholarly attitude towards research data and scientific presentations.

Content

The main theme is translational medicine -"from molecule to patient and from patient to molecule". How cellular and molecular biological knowledge is applied for an understanding of different diseases and for design of new treatments or diagnostics will constitute the basis for all parts of the course, see below. The course particularly focuses on cancer, infectious diseases, inflammatory diseases, cardiovascular diseases and the diseases of the nervous system. Inflammation is brought up as a link regarding all these diseases.Vaccination used for treatment and also in experimental models is discussed. Cell biology-related processes such as cell-cell interactions, intracellular signalling and cell death are covered. Technologies used within advanced translational research, such as relevant cellular and molecular biological technologies, biobanks and the methodology of the -omics are reviewed.

The course is divided into the following parts:

Inflammation and infection and cardiovascular diseases, 7.0 hp

Grading scale: VU

Advanced biomedicine within inflammation/autoimmunity/infection and cardiovascular diseases, including experimental methodology. Integrating theory and practical work during the course.

Neurological and psychiatric diseases and cancer, 7.0 hp

Grading scale: VU

Advanced biomedicine within neurological diseases and cancer, and infectious diseases with a link to neurological disease or cancer, including experimental methodology. Integrating theory and practical work during the course.

Group seminars, 4.0 hp

Grading scale: GU

Group seminars as well as journals clubs and demonstrations. Prepare individually and with peers a task given in advance for the seminar . At the seminar explain, discuss and problematize around the given study question.

Experimental lab work, 4.0 hp

Grading scale: GU

Experimental work in groups in a laboratory. Tissue analysis by microscopy. Present results from lab work and discuss the results, prepare individually or together with peers. At lab seminar present and problematize around the reached results.

This part of the course integrates an ability to prepare oral presentations, and written explanations such as lab reports with participation in analytical discussions in a smaller group.

Teaching methods

The course is at the master's level, where the students are assumed to be familiar with the most common study methods in higher education. The fundamental pedagogical view is based on learning as an active research process. The teaching is given as group tuition, expert lectures, studies
of scientific publications and laboratory sessions. Reading assignments of research articles for journal clubs. In-depth studies in groups with an emphasis on own work and literature studies. Peer-to-peer reviews.

Examination

Inflammation and infection and cardiovascular diseases (7 credits). The examination consists of a written exam. Graded Fail/Pass/Pass with distinction.

Neurological and psychiatric diseases and cancer (7 credits). The examination consists of a written exam. Graded Fail/Pass/Pass with distinction.

Group seminars (4 credits). The examination consists of active participation in the seminars, oral or written analysis of scientific articles, work shops or demonstrations. Graded Fail/Pass.

Experimental lab work (4 credits). The examination consists of active participation in the laboratory work and related discussions, and written analysis of experimental results in lab reports. Graded Fail/Pass.

The course grade is a combination of the grades for "Inflammation and infection and cardiovascular diseases" and "Neurological and psychiatric diseases and cancer" . To pass the whole course the grade pass must have been obtained for all parts of the course.

Compulsory participation
The introduction to the course, seminars, group assignments and demonstrations as well as presentations and lectures linked to these parts are compulsory. The course director assesses if and, in that case, how absence can be compensated. Before the student has participated in all compulsory parts or compensated absence in accordance with the course director's instructions, the student's results for respective part will not be registered in LADOK.

Limitations of the number of examinations or practical training sessions
Students who have not passed the regular examination are entitled to participate in five more examinations. If the student has failed six examinations/tests, no additional examination or new admission is provided.

The number of times that the student has participated in one and the same examination is regarded as an examination session. Submission of a blank examination is regarded as an examination. An examination for which the student registered but not participated in, will not be counted as an examination.

If there are special grounds, or a need for adaptation for a student with a disability, the examiner may decide to deviate from the syllabus's regulations on the examination form, the number of examination opportunities, the possibility of supplementation or exemptions from the compulsory section/s of the course etc. Content and learning outcomes as well as the level of expected skills, knowledge and abilities may not be changed, removed or reduced.

Transitional provisions

The course has been cancelled and was given for the last time in autumn 2020. According to the syllabus, the final semester when examination will be offered to students who have not completed the course is autumn 2022. Six occasions to take the examination will be offered during the transitional period.

Other directives

The course language is English.

Course evaluation will be carried out in accordance with the guidelines established by the Board of Higher Education.

Oral evaluation in the form of course council meetings will be carried out during the course.

Literature and other teaching aids

Barker, Kathy

At the bench : a laboratory navigator

Updated ed. : Cold Spring Harbor, N.Y. : Cold Spring Harbor Laboratory Press, cop. 2005 - 465 p. .
ISBN:0879697083 LIBRIS-ID:9594916
Library search

In addition to this book the student is expected to have education that equals literature used during Karolinska Institutet's BSc in Biomedicine. Other text books with equal information to the literature listed below can be used. Specific study material will be handed out during the course and provides the basis for the examination questions. The student will also retrieve web-based information.

Medical physiology : principles for clinical medicine

Rhoades, Rodney; Bell, David R.

3. ed. : Philadelphia : Lippincott Williams & Wilkins, cop. 2009 - 816 s.
ISBN:978-0-7817-6852-8 LIBRIS-ID:10702457
Library search

Murray, Patrick R.; Rosenthal, Kenneth S.0 319233; Pfaller, Michael A.

Medical microbiology

6. ed. : Philadelphia : Mosby/Elsevier, cop. 2009 - x, 947 s.
ISBN:0-323-05470-6 LIBRIS-ID:11179944
Library search

Neuroscience

Purves, Dale

4th ed. : Sunderland, Mass. : Sinauer, cop. 2008 - 857 s. + (52 s.)
ISBN:978-0-87893-697-7 LIBRIS-ID:10531974
Library search

Weinberg, Robert A.

The biology of cancer

New York ;a London : Taylor & Francis, cop. 2007 - xix, 796, 4, 20, 24 s.
ISBN:0-8153-4076-1 LIBRIS-ID:10202722
Library search

Vander's Human Physiology : the mechanisms of body function
Widmaier, Eric P.; Raff, Hershel; Strang, Kevin T.; Vander, Arthur J.

11. ed. : Boston : McGraw-Hill Education, c2008 - xxviii, 770 p.
ISBN:978-0-07-128366-3 LIBRIS-ID:10637341
Library search

Abbas, Abul K.
Basic Immunology
Lichtman, Andrew H.

3rd ed. : Saunders, 2009
ISBN:978-1-4160-4688-2
Library search