Course syllabus for

# Frontiers in Translational Medicine, 13 credits

Kunskapsfronten inom translationell medicin, 13 hp
This course syllabus is valid from autumn 2024.
Please note that the course syllabus is available in the following versions:
Autumn2023 , Autumn2024

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| Course code | 5MT012 |
| Course name | Frontiers in Translational Medicine |
| Credits | 13 credits |
| Form of Education | Higher Education, study regulation 2007 |
| Main field of study | Molecular Life Science |
| Level | AV - Second cycle |
| Grading scale | Pass with distinction, Pass, Fail |
| Department | Department of Medicine, Solna |
| Decided by | Programme committee for study programmes in biomedicine |
| Decision date | 2023-03-07 |
| Revised by | Programme committee for study programmes in biomedicine |
| Last revision | 2024-03-06 |
| Course syllabus valid from | Autumn 2024 |

## Specific entry requirements

A Bachelor's degree or a professional degree worth at least 180 credits. At least 10 credits should be in mathematics and at least 20 credits in life sciences (such as cell biology, biochemistry, microbiology, gene technology, or molecular biology). Proficiency in English equivalent to English B/English 6.

## Objectives

The course provides an overview of modern molecular techniques and how they accelerate the understanding of human biology/disease, thereby improving global health. Students will acquire knowledge of human biology, disease aetiology and pathogenesis, as well as the molecular techniques that contribute to current understanding. The course also considers the implications of these interdisciplinary approaches for the discovery of novel diagnostic tools and pharmaceuticals.

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

Regarding knowledge and understanding

- understand human disease mechanisms, from the molecular level to the whole-body perspective,
- understand the fundamental principles and work-flow of molecular techniques,

- integrate understanding of molecular techniques with molecular biology in studying human diseases,
- comprehend the systems biology approach to studying human diseases and its clinical relevance,

Regarding competence and skills

- evaluate, interpret, and discuss biomedical data in speech and writing,
- design a research project (formulate a research question and plan relevant experiments/analyses),
- critically analyse and assess specific topics covered within the course,
- demonstrate knowledge of and ability to work cooperatively with people of diverse backgrounds and perspectives, for example managing differences/conflict when working in a multicultural team,

Regarding judgement and approach

- identify their individual need for further knowledge and development,
- reflect on the impact of different cultures on values, assumptions, perceptions, expectations, and behaviour,
- reflect on the societal impact of biomedical research, including the perspectives of planetary health (e.g. climate change and global health), sustainability, equality and gender dimension.

# Content

The course focuses on common human diseases such as metabolic diseases (e.g. obesity, diabetes and cardiovascular diseases), cancer and inflammation/immunological disorders. The societal perspectives are discussed. Molecular techniques used within the field of advanced translational research are reviewed.

The main themes are common human diseases and modern molecular techniques in translational medicine. A central concept is to appreciate how advances in modern molecular techniques could improve knowledge of human diseases, through examples from different biomedical fields.

The course is divided into the following parts:

### Disease mechanisms and translational medicine, 7.0 hp

Grading scale: VU

An overview of advanced biomedical knowledge of different human diseases and fundamental knowledge of current molecular techniques in translational medicine. Learning activities include lectures, seminars, workshops, study visits, journal clubs, and practical laboratory sessions.

### Applications of molecular techniques in biomedical research, 6.0 hp

Grading scale: VU

Integration of theoretical knowledge of selected molecular techniques with knowledge of selected human diseases. Learning activities include student-driven, in depth, self-directed studies.

# Teaching methods

Structured learning activities include expert lectures, seminars, workshops, journal clubs and practical sessions. Particular emphasis is placed on peer-learning and self-studies (both theoretical and practical) in groups and at the individual level. Students are mentored to facilitate self-initiated learning activities.

# Examination

Disease mechanisms and translational medicine (7 credits).
The examination consists of continuous assessments through written assignments and oral presentations, as well as active participation in laboratory work with evaluation of the student's practical performance. Graded Fail/Pass/Pass with distinction.

Application of molecular techniques in biomedical research (6 credits).
The examination consists of oral presentations, written reports, and self-reflections. Graded Fail/Pass/Pass with distinction.

To attain the grade "Pass with distinction" for the whole course, a grade of "Pass with distinction" must be obtained for both "Disease mechanisms and translational medicine" and "Application of molecular techniques in biomedical research".

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 sections 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.

Compulsory participation
The course's introductory activities, journal clubs, study visits, laboratory sessions and group presentations are compulsory, as are lectures, seminars and workshops linked to these activities. 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 will not be registered in LADOK. Absence from a compulsory activity may result in that the student cannot compensate the absence until the next time the course is given.

Limited 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 is not approved after four examinations, he/she is recommended to retake the course at the next regular course date, and may, after that, participate in two 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.

# Other directives

The course language is English.

# Literature and other teaching aids

Specific study material and reference articles will be provided during the course.