Faculty of Medicine

BIMM01, Biomedicine: Experimental Design and Scientific Communication, 15 credits

Biomedicin: Experimentell design och vetenskaplig kommunikation, 15 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by The Master's Programmes Board on 2020-03-31 to be valid from 2020-04-01, autumn semester 2020.

General Information

The course is compulsory on the Master's programme in Biomedicine and is included in semester 1. The subject content is mainly immunology in order to create a subject context in which relevant skills are trained and developed.

Language of instruction: English

Main field of studies	*Depth of study relative to the degree requirements*
Biomedicine	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

Knowledge and understanding

On completion of the course, the students shall be able to

- give an account of the basics of empirical and hypothetico-deductive scientific method and give examples of how research questions can be tested
- give an account of the basics of quantitative study design and present arguments concerning the strengths and weaknesses of different study types such as case-control studies, cohort studies and randomised controlled studies
- describe sampling methods and parameter estimation
- describe how the sample size and effect size of the study population affect experiment design, generalisability and conclusions concerning causality

- give an account of current research in the field of immunology related to global health challenges and rare diseases.

Competence and skills

On completion of the course, the students shall be able to

- set up a null hypothesis and an alternative hypothesis and relate to statistical significance and strength
- select and argue for appropriate statistical analyses and calculate, interpret and present the results of them
- plan, carry out and report a scientific experiment with an immunological research question, both orally and in writing
- identify and present relevant information from research texts that cover biomedical issues
- analyse and evaluate study design, methods, results, conclusions and ethical aspects in research articles
- analyse verbal and non-verbal communication and the use of visual aids in oral presentations
- apply research ethics principles.

Judgement and approach

On completion of the course, the students shall be able to

- evaluate their own and the group's contribution to planning and implementation of the project, and reflect on how individual feedback contributed to the development of the project
- reflect on the importance of good research practice and research integrity for sustainable social development
- reflect on the importance of good scientific communication in the research community and outwards towards society in general.

Course content

The subject content of the course is mainly immunology. The course aims to give the students the opportunity to develop their understanding of the hypothetico-deductive scientific method and apply this to how immunological experiments are designed and carried out through hypothesis testing, data collection and evaluation, as well as reporting in writing and orally. Scientific approach is discussed in the course and research ethics principles are related to media reporting in the biomedical research area.

Course design

Different forms of active learning for students are applied, which sets requirements for the students to prepare before the teaching components. Subject knowledge in cell biology and molecular medicine is trained and applied with a considerable focus on cellular immunology and the immune system's role in tissue damage and hypersensitivity.

The reading list consists mainly of relevant published research articles and the course participants evaluate and discuss the content in structured article seminars. A research project is carried out during the course, in which an immunological experiment is

planned and carried out over a five-week period. The project is compiled, evaluated and reported in the form of a short communication and an oral presentation.

Participation is compulsory for all components involving group exercises.

Assessment

The course is assessed through three components. The learning outcomes are assessed during the course with multiple-choice questions that prepare the student for the course's application exercises. Proficiencies and evaluation skills are assessed through a course portfolio containing article seminars, reflections and completed laboratory sessions and through a research project containing an individual short communication report, oral presentation and reflection on the implementation of the project.

Other forms of examination may be used if there are special reasons.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.
To achieve the grade of Pass, the grade on all test components must be Pass. To achieve the grade of Pass with distinction, the grade on the project must be Pass with distinction.

Entry requirements

Admitted to Master's programme in Biomedicine.

Subcourses in BIMM01, Biomedicine: Experimental Design and Scientific Communication

Applies from H20

2001 Project, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction
2002 Course portfolio, 5,0 hp
Grading scale: Fail, Pass
2003 Multiple-choice questions, 2,5 hp
Grading scale: Fail, Pass