DEPARTMENT OF MOLECULAR MEDICINE AND SURGERY

K1F6127, Biobanking for Translational Cardiovascular Research, 1.5 credits (hec)

Biobankning för translationell kardiovaskulär forskning, 1,5 högskolepoäng

Third-cycle level / Forskarnivå

Approval

This syllabus was approved by The Committee for Doctoral Education on 2026-08-21, and is valid from spring semester 2027.

Responsible department

Department of Molecular Medicine and Surgery, Faculty of Medicine

Prerequisite courses, or equivalent

No prerequisite courses, or equivalent, demanded for this course.

Purpose & Intended learning outcomes

The purpose of the course is to build up knowledge in the establishment and maintenance of the general biobanking routines and platforms for facilitating translational research approaches, utilizing gold-standard biobanking technologies and expertise, with specific focus on the field of cardiovascular diseases.

An additional purpose of the course is to introduce the students to the concepts of sustainability goals relevant to biobanking.

Knowledge and understanding

At the end of the course, the students are expected to be able to:

- describe the main legal, ethical, infrastructural and organisational framework for biobanking, and discuss the sustainable development goals from the framework of cardiovascular biobanking.

- explain and discuss the potential of these resources in the context of cardiovascular disease research, exemplified by major advancements that the field has made based on such resources.

- critically review and evaluate the various biases and limitations associated with biobanking in general, and cardiovascular biobanking specifically (i.e. clinical, societal, ethnic, genetic, technical, data based, etc), as well as to propose mitigation strategies for these limitations.

Competence and skills

At the end of the course, the students are expected to be able to:

- increase their skills for collaborative networking, scientific presentation and communication.

- discuss and compare state-of-the-art techniques and biobanking frameworks applied for specific questions in this research area.

- make a synthesis of the theoretical and practical knowledge and envision how that knowledge could be applicable in their own research projects.

Judgement and approach

At the end of the course, the students are expected to be able to:

- demonstrate awareness of the ethical and legal perspectives related to the sustainable and equitable biobanking, specifically for cardiovascular disease, which will be incorporated and discussed during the course.

- gain insight into and discuss the possibilities and limitations of biobanking research, its role in the society and the responsibility of the individual for how it is used.

- provide constructive opinions related into the importance of partnerships and large, international collaborations for sharing research data and resources in order to achieve more sustainable scientific and clinical developments for broad societal benefit.

Course content

The course content systematically covers the lifecycle of biobanking in general and specifically cardiovascular biobanking through the following areas: Local KI and Swedish cardiovascular biobank overviews, Legal and ethical frameworks, Technical and operational processes, Large-scale data Integration, Establishing a translational research workflow based on biobanking. The course will also involve specialized topics such as the AI developments in human research, and international biobanking perspectives with guest lectures. Sustainable development goals related to biobanking will be incorporated and discussed throughout the course, both in lectures and in practical moments.

Forms of teaching and learning

Learning will be facilitated through a mix of theoretical and practical methods. Seminars with expert lecturers from KI and externally invited lectures will initiate and enhance the learning process. Site visits and demonstrations will visualise the content and workflow in the biobanks.

The learning methods in this course also include group studies, exemplified through literature reading, group discussions and practical workshops related to the intended learning outcomes.

One practical group-level project will be performed, where the students will:

1) propose design for a cardiovascular biobank in their area of interest, with outlined protocol for patient inclusion, biomaterial and data sampling.

2) draft an ethical permit for this proposed biobank.

Course leaders and staff will serve as facilitators for discussions, to promote networking and collaboration skills during this group-work. This project is part of the compulsory course elements and examination.

Language of instruction

The course is given in English

Grading scale

Pass (G) /Fail (U)

Compulsory components & forms of assessment

Compulsory components

The course is work-intensive. Presence is strongly recommended during the whole course, but is compulsory during group work, practical tasks and examination. Leave of absence will be evaluated on a case-to-case basis and will have to be compensated with a written assignment in agreement with the course leader.

Forms of assessment

All learning outcomes of the course must be reached to pass the course. Every participant will be individually assessed and examination will be based on several formats:

i) oral presentations of assigned research group work. Time for group work will be designated during the whole course, where teams prepare a presentation based on the biobank they have designed, supervised by the course leaders.

ii) individual contribution during workshops and group work that will encompass e.g. critical evaluation of the course literature, writing short protocols and a prototype ethical application for a biobank study, etc. including discussion among the peers facilitated by the seminar leaders.

Course literature

1. https://biobanksverige.se/en/research/research-guide/

2. Harati MD, Williams RR, Movassaghi M, Hojat A, Lucey GM, Yong WH. An Introduction to Starting a Biobank. Methods Mol Biol. 2019;1897:7-16. doi: 10.1007/978-1-4939-8935-5_2.

3. Annaratone, L., De Palma, G., Bonizzi, G. et al. Basic principles of biobanking: from

biological samples to precision medicine for patients. Virchows Arch 479, 233–246 (2021).