

DEPARTMENT OF MEDICINE, SOLNA

K2F3113, Endothelial Cell Function and its Relevance in Cardiovascular Disease, 1.5 credits (hec)

Endotelets funktion och dess relevans för kardiovaskulär sjukdom, 1,5

högskolepoäng

Third-cycle level / Forskarnivå

Approval

This syllabus was approved by the The Committee for Doctoral Education on 2023-11-27, and was last revised on 2024-02-19. The revised course syllabus is valid from autumn semester 2024.

Responsible department

Department of Medicine, Solna, Faculty of Medicine

Contributing department/s

Department of Molecular Medicine and Surgery

Prerequisite courses, or equivalent

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

Purpose & Intended learning outcomes

Purpose

This course is specially planned to give the participants in the area of cardiovascular research a global perspective on endothelium pathophysiology as well as advanced cutting-edge approaches used by researchers.

This course will enable the participants to obtain the required knowledge to understand and study endothelial cell function in cardiovascular disease.

Intended learning outcomes

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

1. show an in depth knowledge of endothelial cell function and related molecular basis;

2. evaluate endothelial cell dysfunction and its relevance to cardiovascular disease (e.g.

atherosclerotic lesion, diabetes, ischemia and infection);

3. show an insight into the application of state of the art models and technologies (in vitro, in vivo, from animal model to clinic study) for studying endothelial cell function in cardiovascular disease.

Course content

Endothelial cells and endothelial cell function under various physiological and pathological conditions will be discussed from molecular, cellular, organ and clinical perspectives. Topics to be covered include the roles of endothelial cells in atherosclerosis, ischemic heart disease, inflammation, hypertension and diabetes/insulin resistance, and in mechanisms of current and future treatment. The course will include examples of in vitro and animal models for evaluation of endothelial cell function as well as examples of clinical studies.

Forms of teaching and learning

The course activities include daily interactive lectures and seminars given by invited scholars in the respective fields, lab demonstrations, group learning (literature review and research planning), and a group project presentation and review on the last day of the course.

Language of instruction

The course is given in English

Grading scale

Pass (G) /Fail (U)

Compulsory components & forms of assessment

Compulsory components

Students need to participate in all learning activities and to complete self learning assignments. Absence maybe compensated for by an extra task in agreement with the course organizer. The final examination must be passed in order to pass the course.

Forms of assessment

The final assessment will be held in two parts:

1) a literature review and discussion in groups;

2) an oral presentation of a research project in the field of endothelial cell function, which should be designed at least partially using the knowledge from the course lectures and experimental methods from the lab demonstration.

In order to pass the course, each student needs to show that he or she reached all the learning outcomes of the course.

Course literature

Recommended literature:

The importance of endothelin-1 for vascular dysfunction in cardiovascular disease.

Böhm F, Pernow J. Cardiovasc Res. 2007 Oct 1;76(1):8-18. Review.

Arginase as a potential target in the treatment of cardiovascular disease: reversal of arginine steal? Pernow J, Jung C. Cardiovasc Res. 2013 Jun 1;98(3):334-43. Review.

Therapeutic targets for endothelial dysfunction in vascular diseases. Huynh DTN, Heo KS. Arch Pharm Res. 2019 Oct;42(10):848-86. Review