



## DEPARTMENT OF MOLECULAR MEDICINE AND SURGERY

### **K1F1790, Exercise in the Management and Prevention of Metabolic Diseases, 3 credits (hec)**

Träning som ett medel att förebygga och behandla metabola sjukdomar, 3 högskolepoäng

*Third-cycle level / Forskarnivå*

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#### **Approval**

This syllabus was approved by the The Committee for Doctoral Education on 2023-11-01, and is valid from spring semester 2024.

#### *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**

##### **Purpose**

This course will enable doctoral students to acquire the necessary knowledge to integrate clinical and basic research knowledge and understanding, competence and skills, judgement and approach in the field of exercise physiology to prevent and treat metabolic disease.

##### **Intended learning outcomes**

Participants will be able:

to explain the health-related benefits of exercise from a physiological perspective,  
to integrate basic knowledge of exercise with current research topics, and  
to design a research proposal to evaluate the efficacy of a specific exercise program to combat metabolic disease.

#### **Course content**

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The aim of this course is to address the role of exercise in the prevention and treatment of diseases associated with an ever-growing sedentary population. Interactive lectures will focus on the metabolic, physiological and molecular responses to exercise in health and disease. A current understanding of the underlying molecular and cellular events that govern the acute and chronic exercise response will be provided. Topics include strategies for exercise prescription in various clinical situations including diabetes, obesity, musculoskeletal disorders and aging.

## Forms of teaching and learning

This course will be composed of interactive seminars, lectures, laboratory practicals, group work, group presentations, discussion, and reflection.

### *Language of instruction*

The course is given in English

## Grading scale

Pass (G) /Fail (U)

## Compulsory components & forms of assessment

### Compulsory components

Laboratory practicals and group work are compulsory. Students that are not able to attend a part of the course must do a self-study and write an essay on the topic(s) that was missed.

### Forms of assessment

Students will be assessed on the following:

an oral group presentation (10 min) and contribution to the discussions in connection to this, an individual written summary of the specific project researched by the group, and contribution to a course ""Abstract Book"".

## Course literature

Suggested text:

""Molecular Exercise Physiology: An Introduction 1st Edition"", Henning Wackerhage, Stromme. Routledge; 1 edition (April 27, 2014)

Egan, B. & Zierath, J. R. Exercise metabolism and the molecular regulation of skeletal muscle adaptation. *Cell Metab* 17, 162-184, 2013.

Gabriel, B. M. & Zierath, J. R. The Limits of Exercise Physiology: From Performance to Health. *Cell Metab* 25, 1000-1011, 2017.

Bishop, D. J., Granata, C. & Eynon, N. Can we optimise the exercise training prescription to maximise improvements in mitochondria function and content? *Biochim Biophys Acta* 1840, 1266-1275, 2014.

FYSS 2017 <http://www.fyss.se/in-english> - Chapters related to metabolic diseases.

Recent related review articles and handouts will be available before each lecture.