

## Genomics and Metabolism (Elective course in MHS / Seminarkursus i Medicinalbiologi)

Title	Genomics and Metabolism (Elective course in MHS / Seminarkursus i Medicinalbiologi)
Semester	E2022
Master programme in	Medicinal biologi / Chemical Biology / Mathematical Bioscience / Molecular Health Science
Type of activity	Course
Teaching language	English
Study regulation	Read about the Master Programme and find the Study Regulations at <a href="http://ruc.dk">ruc.dk</a> Læs mere om uddannelsen og find din studieordning på <a href="http://ruc.dk">ruc.dk</a>

### REGISTRATION AND STUDY ADMINISTRATIVE

Registration	<p>Sign up for study activities at <a href="#">stads selvbetjening</a> within the announced registration period, as you can see on the <a href="#">Studyadministration homepage</a>.</p> <p>When signing up for study activities, please be aware of potential conflicts between study activities or exam dates.</p> <p>The planning of activities at Roskilde University is based on the recommended study programs which do not overlap. However, if you choose optional courses and/or study plans that goes beyond the recommended study programs, an overlap of lectures or exam dates may occur depending on which courses you choose.</p>
Number of participants	The Master Programme/Institute reserves the right to cancel the course if fewer than 8 studentes are registered for the course.
ECTS	5
Responsible for the activity	Jesper Troelsen ( <a href="mailto:troelsen@ruc.dk">troelsen@ruc.dk</a> )
Head of study	Lotte Jelsbak ( <a href="mailto:ljelsbak@ruc.dk">ljelsbak@ruc.dk</a> )
Teachers	
Study administration	INM Studieadministration ( <a href="mailto:inm-studieadministration@ruc.dk">inm-studieadministration@ruc.dk</a> )
Exam code(s)	U60174

## ACADEMIC CONTENT

Overall objective	<p>The course covers molecular, biochemical, medical, physiological and cellular biological responses, mechanisms and adaptations in humane intestine. The main emphasis is on knowledge and understanding, theory and scientific methods and oral presentation. The content of the individual courses appears in the course description on <a href="http://study.ruc.dk">study.ruc.dk</a>.</p>
Detailed description of content	<p>The course consists of a mixture of lectures, presentation of presentations from students, discussion, and can include group work and peer feedback.</p> <p>It is organized around a number of themes within intermediate metabolism and genomic methods.</p> <p>Diabetes epidemiology and genetics, beta cell, its embryonic development and stem cells, mechanisms of beta cell killing in type 1 diabetes, development of insulin resistance, low-grade inflammation and beta cell failure in type 2 diabetes.</p> <p>Research techniques and animal models within intermediate metabolism and diseases of the intestinal system with special focus on, genomics techniques such as: Genome sequencing, SNP analyzes, miRNA sequencing, mRNA profiling by Array and RNAseq analyzes, CAGE analyzes chromatin immunoprecipitation (ChIP-seq), and epigenetic chromatin markers.</p> <p>Passing the course is based on regular and active participation. Regular and active participation means that there is a requirement for attendance in 80% of the teaching, as well as active participation in the teaching (be prepared, participate in discussions, make presentations, etc.). Attendance is registered by name lists and the teacher assesses whether the participation is active.</p>
Course material and Reading list	<p>Research articles for each teaching session.</p>
Overall plan and expected work effort	<ul style="list-style-type: none"><li>• Lectures 4 hours</li><li>• Colloquia 28 hours</li><li>• Preparation 103 hours</li><li>• A total of 135 hours</li></ul>
Format	
Evaluation and feedback	<p>The course includes formative evaluation based on dialogue between the students and the teacher(s).</p> <p>Students are expected to provide constructive critique, feedback and viewpoints during the course if it is needed for the course to have better quality. Every other year at the end of the course, there will also be an evaluation through a questionnaire in SurveyXact. The Study Board will handle all evaluations along with any comments from the course responsible teacher.</p> <p>Furthermore, students can, in accordance with RUCs 'feel free to state your views' strategy through their representatives at the study board, send evaluations, comments or insights from the course to the study board during or after the course.</p>

Programme

- Introduction.
- Genomics:**
- Transcriptome
  - microRNAome
  - Genome
  - Regulatome
  - Microbiome
  - Cell free DNA
- Metabolism**
- Diabetes epidermology
  - Metabolisc syndrome
  - Obesity and Prediabetes
  - Microbiome and diabetes
  - Beta cells
  - Diabetes genetics and management

**ASSESSMENT**

Overall learning outcomes

- After completing the course, the students will be able to:
- describe central physiological processes in human intestines
  - discuss the different physiological and regulatory responses in human intestines to changes in the internal or external environment
  - gather relevant knowledge and understanding from scientific review articles, and critically analyse new and original scientific literature, interpret and evaluate experimental data and hypotheses in molecular biology, health science, physiology or cellular biology
  - make oral presentations of scientific hypotheses, results and interpretations to fellow students
  - reflect upon the latest scientific hypotheses and experiments in the course's subject area
  - formulate a relevant research question and a testable hypothesis as a basis for an experimental thesis project related to health science, biochemistry, physiology or cellular biology.

Form of examination

The course is passed through active, regular attendance and satisfactory participation.

Active participation is defined as:  
The student must participate in course related activities (e.g. workshops, seminars, field excursions, process study groups, working conferences, supervision groups, feedback sessions).

Regular attendance is defined as:  
- The student must be present for minimum 80 percent of the lessons.

Satisfactory participation is defined as:  
- e.g. oral presentations (individually or in a group), peer reviews, mini projects, test, planning of a course session .

Assessment: Pass/Fail.

Form of Re-examination

Individual written take-home assignment

The character limit of the assignment is: 12,000-28,800 characters, including spaces.

The character limit includes the cover, table of contents, bibliography, figures and other illustrations, but exclude any appendices.

The duration of the take-home assignment is 7 days and may include weekends and public holidays.

Assessment: Pass/Fail.

Type of examination in special cases

Examination and assessment criteria

Active participation is defined as: the above and more specific the students are expected to take active part in the discussions following the presentations.

Satisfactory participation is defined as: one presentation in genomics and one presentation in metabolomics.

Assessment criteria: - make oral presentations of scientific hypotheses, results and interpretations to fellow students

- reflect upon the latest scientific hypotheses and experiments in the course's subject area

Exam code(s) Exam code(s) : U60174

Course days:

Hold: 1

## Genomics and Metabolism (MHS)

time 08-09-2022 12:15 til  
08-09-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Louise Torp Dalgaard ( ltd@ruc.dk )  
Jesper Troelsen ( troelsen@ruc.dk )

## Genomics and Metabolism (MHS)

time 15-09-2022 12:15 til  
15-09-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Jesper Troelsen ( troelsen@ruc.dk)

## Genomics and Metabolism (MHS)

time 22-09-2022 12:15 til  
22-09-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Jesper Troelsen ( troelsen@ruc.dk)

## Genomics and Metabolism (MHS)

time 29-09-2022 12:15 til  
29-09-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Louise Torp Dalgaard ( ltd@ruc.dk)

## Genomics and Metabolism (MHS)

time 07-10-2022 08:15 til  
07-10-2022 10:00

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forberedelsesnorm D-VIP ikke valgt

location 28b.0-01 - store teorirum (30)

Teacher Louise Torp Dalgaard ( ltd@ruc.dk)

## Genomics and Metabolism (MHS)

time 13-10-2022 12:15 til  
13-10-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Jesper Troelsen ( troelsen@ruc.dk)

## Genomics and Metabolism (MHS)

time 20-10-2022 12:15 til  
20-10-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Jesper Troelsen ( troelsen@ruc.dk )

## Genomics and Metabolism (MHS)

time 27-10-2022 12:15 til  
27-10-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Louise Torp Dalgaard ( ltd@ruc.dk )

## Genomics and Metabolism (MHS)

time 03-11-2022 12:15 til  
03-11-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Pia Nyeng ( pnyeng@ruc.dk )

## Genomics and Metabolism (MHS)

time 10-11-2022 12:15 til  
10-11-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Louise Torp Dalgaard ( ltd@ruc.dk )

## Genomics and Metabolism (MHS)

time 17-11-2022 12:15 til  
17-11-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Louise Torp Dalgaard ( ltd@ruc.dk )

## Genomics and Metabolism (MHS)

time 24-11-2022 12:15 til  
24-11-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Jesper Troelsen ( troelsen@ruc.dk )

## Genomics and Metabolism (MHS)

time 01-12-2022 12:15 til  
01-12-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Jesper Troelsen ( troelsen@ruc.dk )

## Genomics and Metabolism (MHS)

time 08-12-2022 12:15 til  
08-12-2022 14:00

location 28b.0-01 - store teorirum (30)

Teacher Louise Torp Dalgaard ( ltd@ruc.dk )

## Genomics and Metabolism (MHS)

time 15-12-2022 12:15 til  
15-12-2022 14:00

location 28b.0-01 - store teorirum (30)

## Genomics and Metabolism - Take-home assignment (reexam) (MHS)

time 17-02-2023 10:00 til  
24-02-2023 10:00

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