



**Karolinska  
Institutet**



## ***COURSE PM 5MT014 / BL9065 / CB295X***

**Degree Project in Molecular Life science, Second Cycle, 30.0 credits  
Examensarbete inom molekylära livsvetenskaper, avancerad nivå, 30,0 hp**

**Please read this entire document! It contains important information about specific dates for events with mandatory on-site presence, and it also lists the specific intended learning outcomes for the class, which is what your grade will be based on.**

### **Objectives**

The aim of this course is to stimulate further development of the students' skills in solving complex and challenging tasks within the area of molecular life sciences. The student should show independence and apply professional project planning and demonstrate skills in oral presentation, and scientific writing. In addition, awareness concerning sustainability, economic, societal and ethical aspects of the project should be shown.

### **Intended learning outcomes**

After completion of the degree project, the student should be able to:

1. Demonstrate knowledge of the chosen topic's scientific foundation and applications, in-depth insight into current research and development, as well as in-depth knowledge of methodology.
2. Demonstrate ability to holistically, critically and systematically search, collect and integrate knowledge, and identify one's need for further knowledge.
3. Demonstrate ability to identify, analyze, assess, and handle complex phenomena, issues and situations, even with limited information.
4. Demonstrate ability to plan and with adequate methods carry out advanced tasks within given time frames, and evaluate this work.
5. Demonstrate ability to clearly present and discuss conclusions and the underlying arguments with other groups both orally and in writing.
6. Demonstrate ability to make judgments considering relevant scientific, social, and ethical aspects.
7. Demonstrate the skills required to participate in research and development work, or to work independently in other advanced activities.

### **Course syllabus**

<https://education.ki.se/course-syllabus/5MT014>

[https://sisu.it.su.se/search/archive\\_info/BL9065](https://sisu.it.su.se/search/archive_info/BL9065)

<https://www.kth.se/student/kurser/kurs/CB205X>

The course is provided in collaboration between Karolinska Institutet (KI), KTH Royal Institute of Technology, and Stockholm University (SU), for students at the joint master's programme Molecular techniques in life science. There is only one course PM, which is valid regardless of which course (5MT014 at KI, BL9065 at SU, CB205X at KTH) the student is registered at.

### **Course coordinators and contact details**

SU: Marc Friedländer and Ylva Engström

KTH: Anniina Vihervaara

KI: Peter Svensson

### **Examination**

To pass the course, all of the following must be graded at least "pass":

1. Project plan
2. Written thesis report
3. Oral presentation
4. Public opposition on another student's written thesis report in molecular life sciences, including written summary of opposition.
5. Popular science summary (press release)

While the thesis project provides you with a great opportunity to participate in an active research project, the grading of this *class* is not related to the outcome of the science, but the extent to which you reach the intended learning outcomes.

If submission of the written thesis report occurs later than the set deadline the student loses the opportunity to obtain the grade of pass with distinction for the course.

### **Eligibility**

At least 60 credits of total 120 credits at the master's programme Molecular Techniques in Life Science (TMTLM) should be completed.

### **Course communication**

All communication will be handled through messages and announcements in Canvas (presently at KI).

### **Course duration**

The extent of the work should correspond to 20 weeks of full-time effort. The course runs once a year during spring semester.

### **Literature**

Each student will search for relevant literature for the specific project. No formal requirements.

### **Roles**

The following people are involved:

- **Student:** The Student performs the project as outlined in this document. The Student is also opponent at one other presented degree project.
- **Supervisor:** One main supervisor must be assigned. The main supervisor is responsible for providing adequate resources for performing the project and evaluates the Student performance. A PhD student cannot be main supervisor. Co-supervisors may be assigned. At least one supervisor should be affiliated with either of the three universities (KTH, SU, KI).

- **Expert evaluator:** The Expert evaluator should be an expert in the thesis subject area, an active researcher within a field related to the thesis subject area, and affiliated to one of the three universities. The Expert evaluates the written report (format, structure, language, scientific content, discussion and implication) and must not be the same person as the Examiner or Supervisor. The expert evaluator may be the expert evaluator on maximum 2 degree projects per course offering. The expert evaluator is appointed by the course coordinator.
- **Examiner:** The Examiner evaluates the Student performance, including all written documents and the oral presentation, and performs the grading. The Examiner is responsible that each Student that is given a pass or pass with distinction has reached a sufficient level at all 7 intended learning outcomes. The Examiner must have a teacher position at at least one of the three universities.
- **Course coordinator(s):** The Course coordinator is responsible for planning and operating the degree project course. May be the same person as the Examiner. The Course coordinator(s) formally appoints the Supervisor, the Examiner, and the Expert evaluator.

## Scheduled course activities

### Start-up meeting (1<sup>st</sup> week of class) [Tuesday January 21, 10-12, SciLifeLab Air/Fire]

The Course coordinator invites all Students and Examiners to a start-up meeting at the course start. Supervisors are also welcome. The Course coordinator presents the course PM, including the intended learning outcomes, schedule, student documentation and evaluation process. Each Student introduces her/his project during 3 minutes with one (1) slide (powerpoint or similar).

### Half-time seminar (9<sup>th</sup> week of class) [Tuesday March 12, 13-16, SciLifeLab Air/Fire]

A half-time seminar with the Students and the Course coordinator is held in course week 9. The seminar consists of (1) peer discussion in groups, 3-4 students/group; (2) each group should choose one or two of the discussed topics/issues and present to the others; (3) information and discussion about plagiarism and copyright; (4) a discussion on sustainable development goals.

Before the half-time seminar, the Supervisor should submit a half-time evaluation of the Student performance so far, using the set evaluation criteria.

### Oral presentation & opposition (20<sup>th</sup> week) [Mon May 26-Wed May 28, 9-17, ScilifeLab Air/Fire]

The oral presentations are scheduled as seminars with several students presenting at the same occasion. Physical attendance of presenter and opponent are required, unless previously agreed by the Course coordinator. Other occasions for oral presentations may occur, if decided by the Course coordinator and urged by particular circumstances.

Each oral presentation should consist of 30 minutes project presentation followed by 15 minutes of discussions between the Student and student opponent. The Examiner must be present and ensure fulfillment of learning process and learning outcomes. Supervisors and Expert evaluators are welcome.

Each student should be the opponent on (at least) one other presentation. The opponent should critically assess another student's report in writing (see Written summary of opposition) and orally following the same criteria as the Expert evaluator.

## **Documents to be authored and submitted by the Student**

Documents that will be graded are marked with an asterisk (\*). All documents should be submitted through Canvas before the deadline (in red), unless application for extension has been filed and extension granted. The written thesis report should also be submitted to the Expert evaluator and the Student opponent.

### **Project synopsis** (2 weeks before course start): **Tuesday January 7, 2025**

*Content:* Name and contact details of Supervisor; project title; project goal; brief time plan.

*Optional contents:* Tools to be used; Ladok extract to verify eligibility.

### **Student – supervisor agreement** (2 weeks before course start): **Tuesday January 7, 2025**

### **Project plan\*** (2 weeks into course): **Monday Feb 3rd, 2025**

*Content:*

1. Student's name and e-mail
2. Supervisor's name, e-mail and address
3. Co-supervisor's name, e-mail and address
4. Starting date
5. Project title
  - 5.1 Short background
  - 5.2 Aims and objectives
  - 5.3 Main approach and methods
6. Working plan and time plan

### **Written thesis report\*** (course week 18): **Monday May 19, 2025**

A written thesis report should be uploaded to Canvas and also emailed to Opponent and the Expert evaluator before the deadline. Contact information will be provided in advance.

*Content:* The report shall include: Cover page, Table of contents, Abstract, Introduction, Materials and Methods, Results, Discussion, Future work, Ethical reflection, Acknowledgements, References; Tables and Figures within these sections; and, if applicable, Appendices with raw data or computer program code. The maximum number of words is 10,000 (excluding Figure and table legends, Acknowledgements and References) and the report should be written in English.

The written thesis report must be written only by the Student and should adhere to the standards of scientific reports within molecular life sciences (see Contents).

If submission of the written thesis report occurs later than the set deadline the student loses the opportunity to obtain the grade of pass with distinction for the course.

### **Popular science summary (press release)\*** (course week 18): **Monday May 19, 2025**

*Content:* A popular science summary of half a page (A4) size aimed at the general public without advanced knowledge in biomedicine. The text should have a title, be brief, convey the main message of the research in popular science terms. It should be included as part of the written thesis report, after the Abstract.

### **Written opposition report\*** (before course week 20): **Sunday May 25, 2025**

*Content:* The Student opponent writes an opposition report of another student's (the respondent) written project report. This document should be maximum 1,000 words and must contain the following 4 sections: (i) The author and the title of the project to which the opposition report pertains; (ii) A summary of the project in the opponent's own words; (iii) The questions

the opponent intends to ask; (iv) The opponent's own assessment and reflections on the strengths and weaknesses of the work. The criteria to use are the same as those used by the Expert evaluator (rubric found on Canvas).

Please note: each Student should hand in the opposition report that she/he wrote, *not* the opposition report that someone else wrote about his/her project. The opposition report may be shared with the respondent.

**Updated written thesis report\*** (end of course week 20): **Sunday June 8, 2025**

*Content:* Identical to the Written thesis report (see above), but updated based on feedback provided.

The updated written thesis report must be written only by the student and should adhere to the standards of scientific reports within molecular life sciences (see Contents).

## **Evaluations to be authored and submitted by the Supervisor**

**Half-time evaluation** (course week 8): **Tuesday March 11, 2025**

*Content:* An evaluation of the Student performance so far, using the set evaluation criteria. The evaluation should be discussed between the supervisor and the student.

*Instructions for submission:* The main Supervisor and the Student are jointly responsible to email the half-time evaluation to the Course coordinator at the latest at the beginning of the half-time seminar.

**Final evaluation** (course week 20): **Wednesday May 28, 2025**

*Content:* The Supervisor should submit an evaluation of the Student performance, using the evaluation criteria (same form as used for half-time evaluation).

*Instructions for submission:* The Supervisor should email this form to the Course coordinator at the latest after 20 weeks of full-time work.

## **General course requirements**

The project has to be conducted on-site in a research group.

### **Extension of time**

Duration of the project work can be extended under special circumstances if approved by the Course coordinator. If the project progress is delayed due to periods of illness, parental leave, or similar the course coordinator should immediately be notified and duration of the project adjusted if needed.

### **Language**

The final project report should be written and presented orally in English.

### **Plagiarism**

Written reports and presentations submitted by the Student must be original and the updated written thesis report will be checked for plagiarism.

### **Project documentation**

The work should be documented in accordance with the agreement between Student, Supervisor(s) and Examiner at the Start-up meeting and detailed in the final project plan. The

project documentation should adhere to the standards of project documentation within molecular life science; e.g., lab book, blog, wiki.

### Evaluation

Evaluation of the work will follow the grading criteria and is performed by the main Supervisor, the Expert evaluator, and the Examiner. Evaluation will be based on Student's work, the project plan, the working process, the final report, the opposition, the oral presentation and the popular science summary.

### Grading

Pass with distinction/Pass/Fail (PwD/P/F)

Grading is done by the Examiner and based on evaluation of the project plan, the written thesis report, the oral presentation, the opposition, the press release (popular science summary), and the Student's progress towards the learning outcomes throughout the project.

### Evaluation criteria

Are provided separately in Canvas.