

MSc Program in Biology, Concentration in Immunology Final Exams (BIO520/BIO515)

Burkhard Becher & Christian Münz, MSc coordinator (last update Nov. 2015)

BIO 520 "Integrated Knowledge in Biology / Themenübergreifende Fachkompetenz"

General instructions

Description

This module, common to all Master concentrations in Biology, is designed as a self-study period of the Master program, comprising a total of 300 study hours (corresponding to approximately 2 months). It allows students to consolidate and demonstrate a comprehensive understanding primarily of the area of their chosen MSc concentration - here "Immunology" - but also of general fundamental biological concepts. In general, it is expected that the student uses the opportunity to acquire a broad and solid overview in Immunology (for instance by working through an actual immunology textbook like the Janeway, Kuby, Parham, Locksley or Abbas), but also reviewing all scientific information acquired via published articles and relevant seminars attended during the Master program. At the end of the self-study period, the examination of the learning outcomes takes the form of a three-hour written and a 30- minute oral examination. For each student, the Master coordinators Burkhard Becher or Christian Münz and the supervisor of the Master thesis discuss, design and evaluate the content of the BIO520 exam.

Learning Outcomes

By the end of this module students should be able to

- demonstrate their understanding and command of relevant biological facts, methods and concepts in Immunology
- identify and explain relationships between the various facts, methods and concepts in Immunology
- summarize and review - critically and effectively - scientific literature in Immunology

Format of the exams

The three-hour written and the oral examination should take place either on the same day or on two consecutive days. While an approximate date is already determined in the Learning Agreement at the start of the MSc Program, the precise date for the exam have to be arranged on an individual basis between the MSc coordinator, the thesis supervisor and the student. In general, it will be scheduled about 8 weeks after completion of the Master thesis. Thus the MSc Supervisor will contact all in time to finalize the dates. The final grade will be the arithmetic mean (rounded to half grades) of the grades obtained in the two parts.

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Part 1: Oral examination

For practical reasons, the BIO520 oral exam will usually follow the public presentation and discussion of the Master thesis (BIO515, see below) and thus takes place at a seminar room **booked by the student prior to the exam at the Irchel campus at the UZH**. The public presentation shall include a 20 minute seminar and 10 minutes of questions by members of the audience. Important: the seminar should be accessible for an informed lay public and must introduce the general topic, the hypothesis and question of the thesis work.

This is immediately followed by a closed examination session with the thesis supervisor and one of the two coordinators of the Immunology MSc program, which lasts a minimum of 30 and a maximum of 60min. It is not meant to further discuss the master thesis, but rather to assess the general knowledge in Immunology, the ability to integrate fundamental concepts and methods in biology, and the awareness of the student of new, groundbreaking discoveries that were published in the wide area of Immunology during attendance of the Master program.

Part 2: Written examination

4 weeks prior to the exam, the student will receive 3 original articles available in the public domain and **not immediately in the research area of the Master Thesis**. The student has then 4 weeks to study the papers as well as the relevant literature to familiarize with the topic.

Unless otherwise agreed, the exam takes place at the Institute of Experimental Immunology (the room needs to be determined individually). The written examination lasts up to 3 hours. The candidate brings copies of the three papers mentioned below. Unless otherwise agreed, the student is **not** permitted to bring or to undertake: other documents, devices such as laptop, calculator, cell phone or other communication forms, unannounced/unaccompanied visits to the bathroom.

There are **three formats, one of which will be chosen** by the supervisor/MSc coordinator and revealed to the student at the beginning of the written exam.

- 1) a grant proposal (subdivided into state of the art, research plan based on at least three main aims, and significance of the proposed project) regarding open questions resulting from the work discussed in 1 or more of the three articles.
- 2) Specific questions to 1 or more of the three articles.
- 3) A review/essay of the topic discussed in 1 or more of the three articles.

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BIO 515 "Master Thesis"

The written Master thesis has to comply formally with the standards applied to scientific publications. The student has to hand in the final version of his Master thesis to the Studienkoordination (Y 13-J-01) on the date fixed in the Learning Agreement. Additional copies will have to be given to the Master thesis supervisor and to the MSc coordinator for evaluation. Before the BIO515 oral presentation, the supervisor must forward to the MSc coordinator a brief evaluation report (1-2 paragraphs), together with a suggestion for an appropriate grade for BIO515 (quarter grades are permitted). The coordinator has the right to ask for revisions of Master theses that do not fulfil formal standards, as well as modify the suggested grade. In general, the following six criteria (A.1-3, B.1-3) are most important for grading BIO515:

A. Thesis: Overall style, presentation, logic, language and completeness

A.1 Introduction:

- Concise overview of the research field relevant to the Master thesis focused on an explanation of the significance of the Master thesis research within this field
- Clear description of the problem addressed in the thesis, and clear statement of the project goals

A.2 Results and Methods:

- Clear description of the logic and hypotheses underlying the choice of performed experiments
- Clear presentation and correct interpretation of the experimental results
- Clear description of the methods used such that all experiments can be reproduced by others

A.3 Discussion and Conclusions:

- Concise discussion of the obtained results with respect to the original goals
- Discussion of the results into a more general context within the research field
- Formulation of new hypotheses, outlook for future work

B. Practical work in the laboratory: Overall attitude, aptitude, motivation, input, independence

B.1 Lab work:

- Quality and conclusiveness of experimental work
- Independent organization of experimental procedures
- Understanding of the theory behind experimental techniques
- Detailed and traceable documentation of the experimental work in the lab book

B.2 Experimental design:

- Independent interpretation and design of experiments

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- Understanding of the purpose, possibilities and limitations of the applied experimental techniques

B.3 Communication:

- Communicative attitude in the laboratory

- Ability to ask for and make constructive use of advice

- Initiation of and contribution to scientific discussions

- Clear presentation of the project and the results in group meetings and during a contingent Master thesis defense

Application for the final degree (MSc in Biology)

After handing in the Master thesis, the student completes the form "Application for final degree MSc" and hands this in to the Studienkoordination (Y13-J-01). After taking the BIO520 exam, and after all courses listed on the Learning Agreement have been completed, the degree needs to be validated by the Faculty of Science (MNF). Students can obtain a provisional confirmation from the Study Dean's Office (Studiendekanat MNF).

The degree will be awarded at the next Graduation Ceremony (dates are listed on the MNF homepage).

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Practical Instructions for Master thesis supervisor

1. Who selects the publications for the BIO520 written exam?

The publications will be selected by the Master thesis supervisor, but selection by the MSc coordinator is not excluded. 6 weeks before the BIO520 written exam, the Master thesis supervisor presents three papers as suggestions to the coordinator (pdfs by e-mail), who either accepts them or replaces one or all of them. The final papers are send **exactly 4 weeks before the exam** via e-mail to the student by the MSc Supervisor and a cc is send to the respective MSc coordinator (either Prof. Becher or Münz)

2. How close to the topic of the Master thesis should the selected papers be?

The papers should generally address matters of the chosen MSc specialization (i.e. Immunobiology). They should not be too close to the topic of the Master thesis, but they can be from the wider area of the Master thesis research.

3. Who formulates the questions concerning the selected publications for the written exam?

The MSc coordinator and supervisor agree on one of the three formats for the written exam. Dependent on the decision, the Master thesis supervisor will formulate the exam questions/topic and discuss them with the MSc coordinator ahead of the exam who either accepts them or modifies/replaces one or all of them. **The Master thesis supervisor is responsible that the papers and questions are communicated in time to the respective MSc coordinator.**

5. Who organizes the time/room for the BIO520 written exam and for the BIO520/BIO515 oral presentation/examination?

Once a date is found, the student and the Master thesis supervisor are responsible to book a room at the Irchel campus, where the Thesis oral presentation/discussion (BIO515) and the BIO520 oral exam can take place (max. 90 min in total). They are also responsible to advertise the public thesis presentation, in order to secure sufficient attendance.

6. Who corrects and grades the BIO520 written and oral exams?

The Master thesis supervisor corrects the written BIO520 exam. He/she will get from the MSc coordinator the original solutions written by the candidate and, by the day of the BIO520 oral exam, should formulate a suggestion for an appropriate grade for the written exam. The MSc coordinator will also read the written exam and has the right to modify the suggested grade. The grade for the BIO520 oral exam is agreed between MSc coordinator and Master thesis supervisor.

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The final grade for BIO520 is the average of written and oral exams, approximated to the closest half point.

7. Who grades the BIO515 Master thesis?

At the end of the BIO520 oral exam, MSc coordinator and Master thesis supervisor evaluate the public discussion of the Master thesis, and discuss the mark suggested by the thesis supervisor based on all points described above (A.1-3, B.1-3). A final mark for the Master thesis (BIO515) is thereby agreed between the Master thesis supervisor and the MSc coordinator.