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Handbook for PhD Students

Biomedical Sciences

MASARYK
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Hello PhD student.

MUNI
FACULTY
OF MEDICINE



Congratulations to your admission to the PhD program in Biomedical Sciences at the Faculty of Medicine, Masaryk University!

As a program director, I warmly welcome you to a research environment in which you will have a great opportunity to develop your research skills, expand your knowledge within various biomedical scientific areas, cultivate your curiosity and grow to become an independent scientist.

Our PhD program offers its PhD students access to deep expertise across subject areas and opportunities for multidisciplinary study and research. The program provides an inspiring learning and research environment that lays the foundation for an international academic career. It combines comprehensive training, close supervision, and opportunities to gather and exchange ideas with the faculty members and international scientists. Together, we address cutting edge topics and tackle the challenges in modern biomedical research.

As a PhD program, we give full support to our students by means of close guidance, mentorship and an annual PhD conference that brings together peers from multidisciplinary fields. During your PhD training, you will also attend a wide range of courses, seminars and conferences. We maximize our efforts to create an inspiring, stimulating and friendly environment to make your PhD study a truly unique experience.

This guide was put together to help you navigate your way around the PhD program and settle in to your new life.

We wish you a lot of joy, luck and success on your way!



Prof. RNDr. Ondřej Slabý, PhD
Program Director





1

Program Structure

1.1 Organization of PhD studies

The Faculty

The Faculty of Medicine is one of Masaryk University's ten faculties. There are eleven departments within the faculty. A department is an organizational unit within a faculty that engages in education and research. The faculty also has a number of cross-departmental and inter-faculty scientific collaborations aimed at bringing researchers from different disciplines together.

The Dean and Faculty Management

The Dean and the Faculty Management team are responsible for providing guidelines and making decisions regarding faculty operations. The Dean is the chair of the Faculty Management. The Faculty management team has nine Vice-Deans, including one with special responsibility for PhD studies.

The list of the Faculty Management team members:





The PhD program in Biomedical Sciences

The PhD program is accredited at the Faculty of Medicine, Masaryk University. Several departments from the Faculty of Medicine, together with CEITEC PhD school, have united their efforts to create a stimulating educational and research environment. As such, our PhD students can benefit from deep expertise in three different specializations:

- Biochemistry and Molecular Biology
- Cell and Tissue Morphology
- Molecular Medicine

Each specialization falls under different departments of the Faculty of Medicine, MU or CEITEC, MU. Currently, about 55 % of students are enrolled in the Biochemistry and Molecular Biology specialization, 38 % in Cell and Tissue Morphology and 7 % in Molecular Medicine. These percentages are flexible and evolve over time.

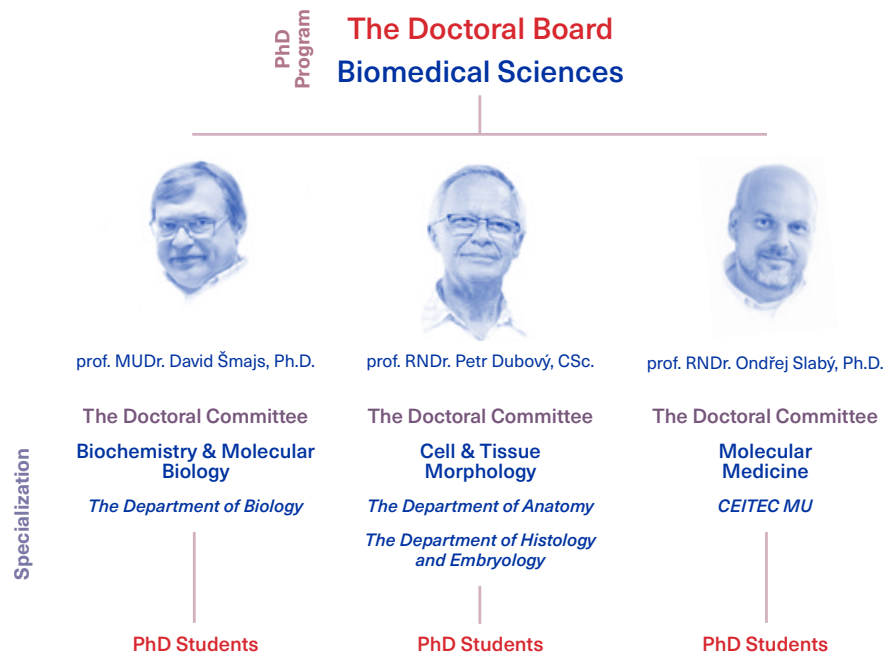
The Doctoral Board and Committee

The PhD program as a whole is presided over by the Doctoral Board, while each specialization is headed by the Doctoral Committee. Each entity consists of the Chair and has several permanent members, including external members outside of the university. Their task is to oversee and assess the program's development and to maintain its quality. From a student's perspective, the Doctoral Board/Committee approves the individual study plans, monitors the study progression of each PhD student, and evaluates the doctoral state exams as well as the thesis defense.

The list of the Doctoral Board and Committee members:



The organizational structure of Biomedical Sciences PhD program



Coordinator for PhD studies

The Chair of the Doctoral Board is assisted by a PhD Program Coordinator who coordinates PhD studies, communicates with students and assures the program's quality and development.

PhD Studies Office

PhD Studies Office, also called *Office for Qualifying Development* (Czech program) or *Office for Quality* (English program), handles the administration of the PhD program. The office administers admissions, thesis defenses, travel grants, doctoral scholarships, etc. The office is also responsible for disseminating information, consultation responses and issues concerning PhD studies.

1.2 Time frame

A doctoral education is a once-in-a-life time investment that requires a full-time commitment. The standard length of studies is 4 years, although some students may finish earlier or later. Even though there are various reasons for extended studies, the long-term goal of Masaryk University is to increase the number of students that successfully defend their thesis within the standard period. The maximum length of study is 8 years.

During the study, a PhD student must meet several key milestones, such as establishing an Individual Study Plan and semester content, participating at the annual PhD conference, and passing the doctoral state exam and thesis defense.

An overview of the study progression



1.3 Internationalization

For researchers looking for new discoveries, a collaborative spirit is vital. Our program warmly welcomes young researchers from across the world. Currently, more than 25 % of our students are international, and we wish to increase this number over time.

2

Program Details

2.1 Individual Study Plan

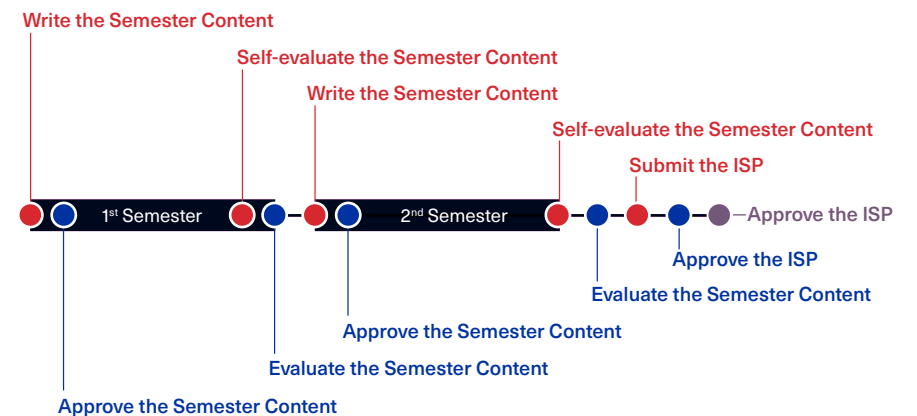
A PhD student should draw up an Individual Study Plan (ISP) within the first year of his or her PhD study. This plan serves as a broad overview of the key milestones of the research project as well as the study progression. An example of an ISP is shown in the guide on PhD studies at the Faculty of Medicine, MU (pp. 24–25).



Once submitted, the ISP is approved for the entire period of study by the supervisor and the Doctoral Board.

The ISP and the Semester Content

• Student • Supervisor • Doctoral Board





2.2 Semester Content

The semester content is established by the PhD student in the beginning of each semester. It provides a detailed description of the student's commitments for the upcoming semester, such as planned research work, teaching activity, seminars and courses, conferences, internships, etc. An example of semester content is shown in the guide on PhD studies at the Faculty of Medicine, MU (pp. 26–27).

Unlike the ISP, the semester content has to be planned by the student and evaluated by both the student and the supervisor for each semester of study. Together with evaluation of the semester content, the supervisor also approves student's progression to the next semester.

2.3 Supervision

The program supports an open-door approach that encourages dialogue between the PhD student and the supervisor. Supervisors are asked to continuously encourage the students to fulfill the tasks related to the studies and closely guide PhD student towards a successful doctoral defense.

The supervisor should closely assist to the PhD student with planning of both the ISP and the semester content. This means that the supervisor should advise and thoroughly discuss with the student how to plan the research work, which courses to take, which conferences to attend and how to participate in teaching.

2.4 Thesis Advisory Committee

The program in Biomedical Sciences uses the concept of the Thesis Advisory Committee (TAC) as a mentorship program. TAC aims to help PhD students in their career and enhance the overall quality of their work. It is a tool that students have to discuss different aspects of the PhD study progress with experts that can provide an unbiased point of view. Therefore, the Doctoral Board strongly recommends that each PhD student takes advantage of this mentorship program. It is important to

note, that the TAC mentorship for the PhD students of the specialization of Molecular Medicine follows its own rules that can be found on the CEITEC PhD School website.

The establishment of TAC

Shortly after the student's admission into the PhD program (within the first semester of the study), the TAC should be established. Setting up the TAC is a responsibility of each PhD student, and it should be done in a cooperation with the supervisor. Once the TAC is set up, the PhD program coordinator should be informed about it using the document called TAC Members Proposal. All necessary documents, such as the TAC Members Proposal and the TAC Assessment Report are available on the PhD program's website.

It is highly recommended that the TAC consists of at least three members: the supervisor and two additional members (ideally one of them is external from another institution, or at least another faculty of MU). An advisor from abroad is beneficial. Each committee member must hold a doctorate. The committee should be maintained throughout the whole studies, but if needed, new members can be assigned later on during the studies.

The organization of the TAC meeting(s)

Each PhD student should pass at least one TAC meeting within the first year of the study. PhD student is responsible to invite the TAC members, arrange the TAC meeting, and provide the PhD program coordinator with the signed TAC Assessment Report.

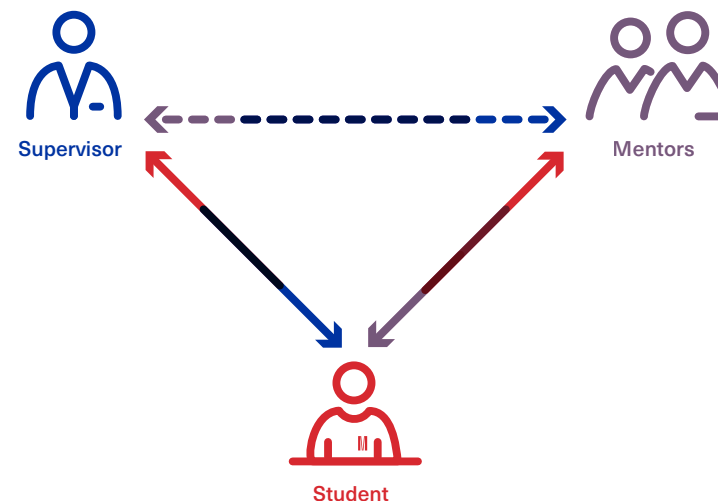
The TAC meeting is meant to evaluate not only the student's progress but also (and crucially) the quality of the supervision and the student-supervisor relationship. The thesis ADVISORY committee is there to give helpful advice, and as such, the student is encouraged to use the TAC whenever he/she feels the need of an external advice.

Two weeks before the TAC meeting, the student should submit a written progress report on the thesis project to all committee members. The report should be a brief summary of 2–4 pages describing the basic outline of the project and initial results. The report can have the following structure: project summary, introduction/background, research aims, experimental approaches, preliminary results, perspectives, technical hurdles and alternatives.

The TAC meeting begins with a short (15-20 min) presentation by the student, followed by a discussion with the TAC members. Student then leaves the room and the committee discusses student's progress with the supervisor. Next, the supervisor leaves the room and the student can discuss freely with the committee about how he/she feels the PhD study is going. Finally, the chairperson of the committee (any member apart from the supervisor) summarizes the meeting and finalizes the TAC Assessment Report. A signed version should be sent to the PhD program coordinator.

Finally, note that the main goal of the first TAC meeting is NOT to evaluate the amount of data you have produced since the start of the thesis. It is more important to show that the student has a solid grasp of the literature surrounding the topic and that he/she has a clear idea of what the objectives of the project are, how the project will evolve, and what the student will do in case something does not work out the way that was predicted. Importantly, TAC should also evaluate the quality of the supervision and address if the PhD student is facing any obstacles (on both professional or personal level).

Thesis Advisory Committee



2.5 Funding

The PhD program in Biomedical Sciences requires that all students have financial support of at least 22 000 CZK per month during the standard length of studies (4 years).

The Faculty of Medicine, MU provides a scholarship to support doctoral students, but importantly, different rules apply when assigning a scholarship depending on whether the PhD student is enrolled in the Czech or English PhD program.

1. The Czech PhD program in Biomedical Sciences

The Czech PhD program provides a monthly scholarship of 12 000 CZK during the standard length of studies to all students enrolled in the program. The supervisor is then responsible to provide the rest of the finances in order to reach the guaranteed amount of 22 000 CZK per month.

2. The English PhD program in Biomedical Sciences

The English program provides a monthly scholarship of 12 000 CZK, but unlike the Czech program, the scholarship is limited to 10 international PhD students per academic year for all English PhD programs at the Faculty of Medicine. If the number of applicants for the scholarship exceeds the limit, the scholarship committee will individually evaluate each applicant. In case the scholarship is not assigned to a PhD student, the supervisor is fully responsible to cover the monthly financial support of 22 000 CZK.

3. Scholarships from external providers

Additionally, students may apply for several scholarships provided from external providers. Student can find more information on the PhD program's website or contact the *Office for Quality* for more information.

If the PhD studies advance well, it is recommended that the monthly income should be progressively increased. An example of the minimum financial support during the PhD studies: 22 000 CZK for 1st year students, 23 000 CZK for 2nd year students, 24 000 CZK for 3rd year students and 25 000 CZK for 4th year students. These are suggested minimum PhD salaries; the program encourages the supervisors to reward their PhD students according to their work and outcomes.

2.6 Annual PhD Conference

Annual PhD Conference in Biomedical Sciences brings together PhD students from different fields, offering a chance to present their research in front of their peers, and members of the Doctoral Board/Committee.

The conference usually lasts three days, and all PhD students should actively participate (participation in the PhD conference is one of the degree requirements).

During the PhD conference, all PhD students present a poster. In addition to the poster, 3rd year students have to pass the doctoral state exam, while 2nd, 4th and 5th year students (or higher) present their progress report.

Poster - all students

Posters are commonly used in the academic community, and during the academic carrier scientists come across poster sessions at most conferences. A research poster should summarize research concisely and attractively to help publicize it and generate discussion. The poster usually provides a big picture of the research project including background information, results, methods and importantly future research directions. First-year students can briefly sum up their research project/proposal as discussed with the supervisor.

Progress report - 2nd, 4th, 5th (or higher) year students

Students are asked to prepare a brief (15 min) presentation of their PhD research project that will be followed by a short discussion.

Doctoral state exam

The doctoral state exam is described in the next chapter - degree requirements.

Responsibilities of PhD students during the annual PhD conference



3

Degree Requirements

3.1 Coursework

During the standard 4-year PhD study, the student should take a total of 240 credits. If the length of the studies is shorter or longer, it is recommended to obtain an average of 30 credits per semester. According to MU study and examination regulations, in order to enroll in the next semester, a student must:

- a) **Gain a minimum of 20 credits for courses enrolled in a given semester of studies**
- or b) **Gain a minimum of 45 credits for courses enrolled in a given semester and an immediately preceding semester of studies**

To meet the degree requirements, students should take credits from:

1. **Core courses**
2. **Common faculty-wide courses**
3. **Field-specific courses**

The credits from the core credits should meet the requirements of the ISP/semester content. This covers several areas – thesis preparation, professional training (e.g. conference attendance), publication activity, teaching assistance or internship abroad. Each of these activities is assigned to a course for a specific amount of credits. When registering for a course in the beginning of each semester, students should specify the number of credits they wish to receive for the above-mentioned activities. Each course/activity has an upper limit of credits per semester (e.g. 15 credits/semester for thesis preparation; this information is listed in the course description). If the requirements are fulfilled, the supervisor will give the credits to the student by the end of the semester.

In addition to the core courses, students need to complete at least 4 common faculty-wide courses + an English language course and 4 field-specific courses. Common faculty-wide courses cover various areas of general scientific skills. These courses are not specialized for a specific research field, but rather target a broader scientific audience, hence they are shared between all three specializations of the Biomedical Sciences PhD program.

Field-specific courses deepen the knowledge and expertise within your research field. Each specialization has one or more mandatory courses:

Biochemistry and Molecular Biology

- **Advances in Molecular Biology and Genetics** (DSMBz01)

Cell and Tissue Morphology

(mandatory only for students who did not graduate at the Faculty of Medicine)

- **Anatomy I** (VLAN0121p/aVLAN0121p) and **Anatomy II** (VLAN0222p/aVLAN0222p)
- **Histology I** theory + practice (VLHE0221p/aVLHE0221p + VLHE0221c/aVLHE0221c)
- **Histology II** theory + practice (VLHE0322p/aVLHE0322p + VLHE0322c/aVLHE0322c)

Molecular Medicine

- **Molecular Medicine** (DSMoIM01)

Mandatory courses have open registration; therefore, students of e.g. the Cell and Tissue Morphology specialization can also register for the Advances in Molecular Biology and Genetics course.

In addition to the mandatory courses, students are free to choose from the optional courses based on their interests. Mandatory as well as suggested optional courses are listed on the PhD program's website. The list of optional courses serves only as a suggestion and students are encouraged to look for other courses offered by MU using the course catalogue.

240 Credits / 8 Semesters

Core Courses

Thesis Preparation I-VIII (DSDP...)

Professional Training I-VIII (DSOP...)

Teaching Assistance (DSVY01)

Publication Activity (DSPAZ01)

Internship (VLZS001)

Common-Faculty Wide Courses

At least 4 Common-Faculty Wide Courses

+ **English Language Course** (DSAJz01)

Mandatory courses:

English language (DSAJz01)

MUNI Life Science Seminars

(DSCB060, DSCC060)

- mandatory for students enrolled in Biochemistry and Molecular Biology and Cell and Tissue Morphology specializations

Optional courses (examples):

Acquisition of scientific information (DSAS01)

Academic writing (VLAW051)

Freshers:

Skills for Research Career

Mendel Centre Seminars in the Bio-omics (S2009)

Law, ethics and philosophy of science (S4002)

Present Your Research Result with Confidence (S4010)

International Performance (S4001)

Publish or Perish - practicals (6040)

Acquisition of Scientific information (DSVlz01; in czech only)

Clinical Data Analysis (DSAK051, in czech only)

Ethics in Biomedical Research (DSETz01)

Computer Network User (DSUP031)

Field-Specific Courses

At least 4 Specific Courses

Mandatory courses for each specialization:

Biochemistry and Molecular Biology
Advances in Molecular Biology and Genetics (DSMBz01)

Cell and Tissue Morphology

Anatomy I (VLAN0121p/aVLAN0121p)

Anatomy II (VLAN0222p/aVLAN0222p)

Histology I

- theory + practice

(VLHE0221p/aVLHE0221p

+ VLHE0221c/aVLHE0221c)

Histology II

- theory + practice

(VLHE0322p/aVLHE0322p

+ VLHE0322c/aVLHE0322c)

Molecular Medicine

Molecular Medicine

(DSMoIM01)

Optional courses (examples):

Advanced Molecular Medicine (DSAMoIM)

Introduction to Bioinformatics (DSIB01)

Genomics (CG920)

Modern Genomic Technologies (DSMGT01)

Proteomics (CG910)

Methods in Proteomics (CG990)

Synthetic Biology (BI9690en)

Molecular Mechanisms of Cell Aging (C3901)

3.2 Research

Although coursework is important, the main goal of the PhD studies is to impart independent research skills and to train creative and successful researchers. Therefore, the main activity of each PhD student is to systematically work on the doctoral thesis project.

PhD students present their research progress every year at the Annual PhD conference in Biomedical Sciences, where they can get valuable feedback from their peers as well as supervisors and the Doctoral Board and Committee.

Before the thesis defense, the PhD student must have at least one first author publication in an international research journal with an impact factor above the median IF in the field or have two first author publications with the IF in Q3. Importantly, the affiliation of the Faculty of Medicine, Masaryk University must be listed.

3.3 Teaching

Teaching is a valuable experience that is especially important if a PhD student decides to pursue a career in academia. Many departments pay attention to an applicant's teaching strength, both for postdoc and tenure-track positions.

PhD students are asked to take an active part in teaching within the maximum range of 150 hours during their studies. If students wish to teach above this limit, they shall be financially rewarded for it (however, teaching should not limit the student's research activity).

3.4 Internship

A PhD internship gives the student the opportunity to apply his/her research expertise to a short project within their research field, gaining practical experience and building a professional network.

PhD students have to complete an internship abroad for at least one month during their PhD studies. Alternatively, they may actively participate

in an international project with results published or presented abroad or may collaborate with international partners; this is evaluated individually by the vice-dean based on an official student's application.

Ideally, students (supported by their supervisors) choose a foreign institution themselves. Supervisor's personal and professional contacts can be of great help. Alternatively, students can use various mobility programs offered by the *MU Centre for International Cooperation*. When planning the internship, students can contact the *Office for Quality* which will advise the student about options and other related paper work.

In addition to valuable experience, students will also obtain credits for the internship once it is completed (the number of credits reflects the type and length of the internship, usually, the amount is 5 credits per month abroad).

3.5 Conference

Students are asked to present their research outcomes (a talk or a poster) at the international conference of their choice at least once during their studies. Active participation at the conference is awarded by credits that the supervisor gives to the student within the course called Professional Training I-VIII (DSOP...).

3.6 Doctoral State Exam

The doctoral state exam takes place at the Annual PhD Conference in Biomedical Sciences and is compulsory during the 3rd year of studies. Students should summarize their research project and place it in the context of Biomedical Science in a 20 min presentation. The presentation is then followed by a 20 min discussion that includes questions specific to the research project (hypothesis, methodology, planned outcomes) as well as general and theoretical questions related to the specialization and the focus of PhD project.

3.7 Doctoral Thesis

The doctoral thesis defense can only take place after a PhD student meets all degree requirements.

Degree requirements in a nutshell

- Have at least one first author publication in an international research journal with an impact factor above the median IF in the field or have two first author publications with the IF in Q3. Importantly, the affiliation to the Faculty of Medicine, Masaryk University must be listed.
- Gain a set of minimum credits (240 ECTS in 4 years of study), pass 4 faculty-wide courses + an English language course and 4 field-specific courses.
- Pass the doctoral state exam.
- Take active part in teaching.
- Participate in the Annual PhD Conference.
- Present research outcomes at least once at an international conference (poster, presentation).
- Spend at least one month abroad on an internship.

If the student meets all degree requirements and plans to defend in the upcoming months, there are several steps to follow:

Before Defense

- Write thesis.
- Contact the program coordinator and let him/her know a list of publication(s) that will be included in the thesis.
- The Doctoral Board approves the thesis defense and establishes two reviewers.
- Register for the defense at the *Office for Qualifying Development (Czech program)* or *Office for Quality (English program)*. When registering, the student needs to provide several documents listed in the registration form. Importantly, the students can register only once the thesis is ready, as the printed version of the thesis has to be enclosed together with the registration form. Before going to the Office, student should inform the Office with the title of the thesis (in Czech and English) and the contact on the reviewers (e-mail, phone). Additionally, student should upload the thesis into the Archive in IS MU.
- The *Office for Qualifying Development /Office for Quality* sends the thesis to the reviewers.
- The Doctoral Board establishes a thesis defense committee and set a date and place of the defense.

Thesis Defense

After the opening words by the Chair of the Defense Committee, the floor is given to the candidate for a 15 minute presentation. The presentation is followed by a summary of the reviews and students are asked to comment on the reviewer's questions. After the presentation and reviews, a general discussion starts followed by the evaluation of the candidate by the committee.

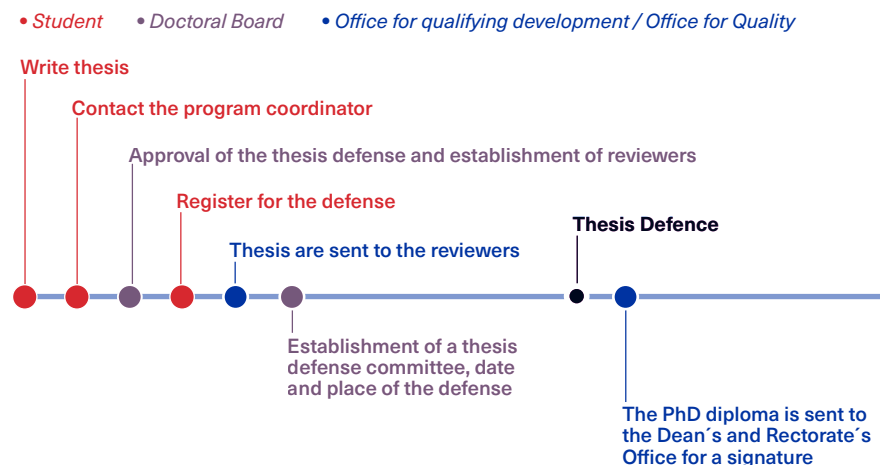
Viva voce

Viva voce is an alternative to regular thesis defense rarely allowed by the Doctoral Board in case a PhD student does not have a first author publication, but the research outcomes are of exceptionally high quality (e.g. the paper is under review or being submitted). Contact the program coordinator for more details.

After the Thesis Defense

The *Studies Office* prepares the PhD diploma and sends it for a signature to the *Dean's Office* and the *Rectorate's Office*. The *Rectorate's Office* contacts the student once the Diploma is ready and inform about the graduation ceremony.

Thesis Timeline





Contact Information

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Resources

PhD program website

The PhD program in Biomedical Sciences has its own website where students can find useful information about the program itself as well as the latest news such as calls for student grants or invitations for upcoming trainings and conferences.

WWW.BIOLOGY.MED.MUNI.CZ/PHD-PROGRAM



PhD brochure, Faculty of Medicine, MU

General information on the PhD studies at the Faculty of Medicine are summarized in an extensive guide that provides information on the study progression as well as practical information such as Health Insurance, University Sport Facilities, Transportation, ISIC card etc.

WWW.MED.MUNI.CZ/EN/RESEARCH-AND-DEVELOPMENT/PHD-STUDIES



Information System (IS MU)

All the agenda related to the studies will take place in the Information System of the Masaryk University. Student will use it to define the Individual Study Plan and semester contents, register for the next semester, search and register for new courses, assess the amount of collected credits etc. Upon enrollment into the study, student will receive login details for the IS MU as well as the Faculty e-mail.

WWW.IS.MUNI.CZ



Centre for International Cooperation

When planning an internship abroad, students can find important information about grants, applications and selection processes on the website of the Masaryk University Centre for International Cooperation.

WWW.CZS.MUNI.CZ/EN/MU-STUDENT

If students have any questions or need help with the paperwork related to their stay abroad, they can ask for help the Office for Quality.



Faculty of Medicine website

To get to know the Faculty of Medicine better and stay updated about the latest news, students can visit the official website of the Faculty of Medicine, MU.

