

Doctoral Network of Molecular Biosciences (MolBio)

Handbook 2016

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The purpose of MolBio

The Doctoral Network of Molecular Biosciences (MolBio) at Åbo Akademi University (ÅAU) is a doctoral network covering various fields of biomedical research. The purpose of the network is to provide high-impact research and education leading to a PhD degree. The network covers various fields of cellular and molecular research, including cell biology, biochemistry, cell physiology, receptor research, biomedical imaging, physiology, cancer research, and in vitro and in vivo biomedical research.

The objective of the network is to offer multidisciplinary research education in cell and molecular biology to young, talented doctoral candidates with a basic education (MSc) in natural sciences. Doctoral candidates with a degree in medicine, who want to pursue research in groups belonging to the network are also welcome. Doctoral candidates enrolled in the network are expected to graduate with a Ph.D degree after four years of full-time studies. The formal teaching language of the doctoral network and the language of communication in the laboratories is English.

The Goals of the Doctoral Network

1. Creating innovative research and education environments
2. Increasing co-operation between universities, research institutions and industry
3. Promoting internationalization of the doctoral studies
4. Lowering the age of doctoral candidates at dissertation
5. Reducing the duration of doctoral studies
6. Creating more effective supervision practices
7. Supporting systematization of the doctoral studies
8. Advancing interdisciplinarity within bio-sciences and with other natural sciences
9. Advancing activities related to entrepreneurship and technology transfer
10. Promoting professional careers in research

Quality criteria / best practice in the Doctoral Network in Molecular Biosciences

The network offers a broad knowledge in biological sciences, emphasizing knowledge in cell and molecular biology, but also in biochemistry, molecular medicine, bioinformatics, systems biology, genetics, immunology, developmental biology and cancer biology. The network strives at obtaining:

1. High quality publications
2. High quality laboratory courses (national and international)
3. International laboratory visits for training
4. Effective oral and written communication skills
5. Emphasis on the principles of scientific reasoning and logic as well as the importance of ethics (e.g. journal clubs)
6. Career prospects and career development within and beyond academia
7. Intellectual property and technology transfer

THE MOLBIO ORGANIZATION

All PhD student enrolled at ÅAU are part of ÅAU Graduate School, which consists of doctoral programs. The Doctoral Program of Biosciences covers biochemistry, cell biology, environmental biology, marine biology and pharmacy. The purpose of the doctoral programs is to ensure the quality of PhD studies and to arrange for all administrative issues involved in PhD examination. In addition to the doctoral programs, ÅAU Graduate School provides for specialized high profile PhD student training within doctoral networks. MolBio is a doctoral network at ÅAU Graduate School and will hence aim for outstanding PhD student training and has financial support for this purpose from ÅAU.

The network is coordinated by Biosciences at ÅAU. Doctoral candidates enrolled in the program must be registered as PhD students at ÅAU. Doctoral candidates performing research in a research group belonging to the network, but funded by external grants, projects or the Academy of Finland can apply to be part of the network. For these doctoral candidates, the same rights and responsibilities apply as for doctoral candidates funded by ÅAU. Doctoral candidates belonging to the network, but funded by stipends, must apply to Mela (<http://www.mela.fi>) for statutory earnings-related pension and occupational accident insurance according to their rules. All MolBio doctoral candidates have to have an insurance covering possible injuries obtained during working hours.

The network is part of Turku BioNet, and works in close collaboration with BioCity Turku. The network has connections to other networks in the field of Life Sciences through the local Turku BioNet and the national FinBioNet.

MolBio was established in 2013 and aims to produce professional experts with wide skills and know-how for the needs of basic research, pharmaceutical companies and new biotechnological industry as well as health and environmental care. Furthermore, the doctoral candidates will obtain skills to become experts and advisers in Government Departments. MolBio is lead by the Board and by the Executive group consisting of the Chair, Vice-chair and Scientific secretary. In addition, ÅAU provides MolBio with a coordinator, Fredrik Karlsson)

Executive group

John Eriksson, Chair, john.eriksson@abo.fi
 Kid Törnqvist, Vice-chair, kid.tornqvist@abo.fi
 Annika Meinander, Scientific secretary, annika.meinander@abo.fi

MolBio Board

John Eriksson (Chair)
 Kid Törnqvist (Vice-Chair)
 Annika Meinander (Scientific secretary)
 Daniel Abankwa
 Eleanor Coffey
 Peter Mattjus
 Pia Roos-Mattjus
 Jessica Rosenholm
 Cecilia Sahlgren
 Lea Sistonen
 Diana Toviola

Åbo Akademi University Graduate School coordinator

Fredrik Karlsson, coordinator, graduateschool@abo.fi

MolBio Information

The MolBio students can find information regarding current activities, courses, administrative rules, administrative documents etc. at the MolBio Moodle notice board (<https://moodle.abo.fi/course/view.php?id=1490>).

PHD STUDIES WITHIN MOLBIO

Study agreement

Information required for being accepted for doctoral studies can be found at the ÅAU web pages. <http://www.abo.fi/forskning/doktorera>. The supervision and study agreement is completed, signed and submitted to the Study office for approval.

Commitments of doctoral candidates accepted to MolBio

- full-time studies towards a PhD-degree to be achieved in 4 years
- either be registered for doctoral studies, or register at Åbo Akademi University within 6 months after the MolBio application is filed. Doctoral candidates must also register as attending at the university every year
- following the recommended curriculum of MolBio in the theoretical and practical studies towards their doctoral degree
- forming an advisory thesis committee and organizing its annual meeting
- report on their progress annually to the MolBio board

The theoretical studies for a PhD degree at ÅAU

In addition to the PhD Thesis (200 ECTS), a total of 40 ECTS theoretical studies are needed for a PhD degree. The 40 ECTS have to consist of at least 25 ECTS in your major subject:

Major subject 25-40 ECTS

1. Scientific postgraduate courses, pedagogical studies, national and international specialized courses (credits based on attendance)
2. Licentiate examination (compulsory for cell biology students), 8 ECTS
3. Seminars and conferences, 5 ECTS
 - Postgraduate seminar attendance
 - Postgraduate seminar presentation
 - FoS seminars
 - International and scientific conferences including at least two poster or oral presentations
4. Teaching and supervision, 1-10 ECTS
5. Scientific work in a national/international university/research institution
6. Writing a scientific publication a published article not included in the thesis work, 2-8 ECTS

Other studies 0-15 ECTS

1. Transferable skills training, 1-15 ECTS
2. University pedagogics, 5-15 ECTS
3. Language courses, 5 ECTS

The theoretical studies must form an entity that fulfills the requirements of the PhD degree. When you have compiled your studies, your supervisor will recommend their acceptance. The Department makes the final decision about the acceptance of the studies.

PhD Thesis and the dissertation

Information about the thesis requirements and the practicalities involved in handing in your thesis, including practical advice for your big day can be found on the ÅAU web pages (<http://www.abo.fi/forskning/en/forskaravhandlingar>). When handing in your thesis, you must be registered as a student at Åbo Akademi University. Always also discuss schedules and procedures with your supervisor.

Obtained transferable skills during PhD training

The MolBio network organizes special seminars and courses on transferrable skills. Furthermore, the MolBio students are encouraged to participate in special courses on business essentials for bioscientists organized under the auspices of the ÅAU tech transfer team. The students also have the possibility to obtain business training and career development through an initiative with the Kellogg School of Business and Management, and skills in intellectual property administration and

technology transfer. Elite graduate students inclined towards entrepreneurship, will be selected for a 3-4 month Kellogg-Northwestern experience, ideally carrying their own specific tech transfer cases to be developed at Kellogg. Transferrable skills that should be obtained during doctoral training includes:

1. Working with others/team working
2. Communication/presentation skills, both written and oral.
3. Communication/dialogue with non-technical audiences (public engagement).
4. Project and time management skills
5. Problem solving
6. Research management - research leadership
7. Creativity and the ability for abstract thought
8. Knowledge of research methods and technologies beyond the Doctoral project
9. Teaching skills
10. Research ethics
11. Enterprise skills (entrepreneurship, innovation, patenting, and general tech transfer know-how)
12. Use of science in policy-making

Salary

MolBio students can be accepted with or without promise of salary from ÅAU. If you are on the payroll of MolBio, you will receive an Employment Contract form stating the dates of your employment and the level of your salary. The maximum period of time you can receive salary from ÅAU as a PhD candidate is 4 years. If funding is obtained from external sources, the contract can be written for a shorter period of time. For finalizing the Thesis, the Doctoral candidate may apply for funding from the Rector of Åbo Akademi University. This stipend usually covers 3 months.

If you want to make any changes to the period of time you are hired by MolBio due military service, maternity leave or other legally accepted reasons, fill in a relevant form (see <http://www.abo.fi/personal/blanketter>) and hand it in to the Department secretary. If you want to make any changes to the period of time you are hired by MolBio due to other scholarships or other reasons, you shall do this in discussion with your supervisor and the executive board.

Seminars and meetings

The *MolBio Seminars* are organized once a month by the network scientific secretary. The purpose of the seminars is to ensure that all MolBio students have knowledge of all the current techniques used in molecular biological research and that novel methods are presented and made available for the students. The speakers on the seminars are both external experts and researchers from the MolBio groups. The MolBio students are also participating in the high standard campus-wide Frontiers of Science (FoS) seminar series and the other activities going on in BioCity (<http://www.biocity.turku.fi/scientific-events/>).

MolBio Winter School is arranged annually by an organizing committee formed by the students themselves has also been a successful concept. This event gathers all MolBio students and supervisors for a one-day seminar, when the students present their projects followed by a discussion with the whole audience. In addition, the organizing committee can freely invite one special speaker talking about a topic chosen by the students.

The *BioCity Symposium* is another example of the importance of collaboration within biosciences in the Turku region is the (<http://www.biocity.turku.fi/biocity-symposium/>). This high-quality symposium gathers the whole campus for two days annually to take part of the forefront of scientific research.

An important part of the training to become an independent researcher is participation in lab meetings and Journal clubs organized in individual labs or jointly within the Network.

Travel grants and financial support for courses

MolBio doctoral candidates are encouraged to work abroad in another laboratory or in a scientific collaboration project in order to learn new techniques. The doctoral candidates are also encouraged to participate in international meetings and conferences abroad. In addition, the MolBio students are encouraged to participate in courses organized by the other doctoral networks in Finland. To cover expenses for travelling and for course fees, MolBio students can apply for funding from MolBio (from January 2016). Doctoral candidates also are encouraged to apply for travel grants from ÅAU and from several national foundations.

ÅAU usually funds 60% of travel and accommodation costs. In order to apply for a travel grant from ÅAU, you must fill an application form (<http://www.abo.fi/forskning/media/27158/forskblankett.pdf>) and write an informal application. The application should include the dates of your travel and the reason for it (name of the meeting/congress or laboratory) as well as an estimation of your travel expenses. You should include a short statement explaining the reason for why you will visit a foreign laboratory. If you plan to go to a scientific meeting, you should always include an abstract of your poster or presentation. Before you travel, you must also fill out a travel itinerary in the program TRAVEL (found on the home pages of Åbo Akademi University). After your trip, you should write a travel report, including the name of the meeting/congress you attended or the site of the laboratory you visited as well as the dates of your travel. The travel report should also include the main advantages you feel you gained from your trip.

Recommended Laboratory Courses and Meetings

Cold Spring Harbor Laboratory Meetings and Courses <http://meetings.cshl.org/>

EMBO Conferences and Courses <http://www.embo.org/>

FEBS Conferences and Courses <http://www.febs.org/>

EMBL Conferences and Courses <http://www.embl-heidelberg.de/>

ASCB Conferences and Activities <http://www.ascb.org/>

Keystone Symposia <http://www.keystonesymposia.org>

TMR Network - Scientific Meetings http://cordis.europa.eu/home_en.html

FASEB Conferences and Courses <http://www.faseb.org>

Gordon Research Conferences <http://www.grc.org>

Other Funds for Researcher Training and Education. The Åbo Akademi University has access to a research funding database (<http://www.aurora-tietokanta.fi>), which includes Finnish funds and foundations, the Finnish Academy, Tekes and other public and private funding sources as well as Nordic, European and other international funding sources. This database is constantly updated and has links to relevant home pages.

BioCity Young Scientist' Forum. The students of MolBio have formed a student body for discussion and support. The student body, BYoSF (BioCity Young Scientist' Forum), has further developed to a platform for young scientists (PhD students, advanced undergraduate students and post-docs) to interact and get to know each other. The MolBio students organize meetings monthly after each MolBio Seminar, on which they either discuss current matters with the supervisors or to which they invite guests to discuss with them.

Other useful www-sites

BioCity Turku <http://www.biocity.turku.fi/>

National Research Training Courses, FinBioNet www.biocenter.helsinki.fi/finbionet/

Turku BioImaging www.bioimaging.fi

Biocenter Finland <http://www.biocenter.fi/>

Turku Science Park, www.turkusciencepark.com

SUPERVISION WITHIN MOLBIO

The MolBio strategy for excellent PhD quality lies within student supervision. Supervision within MolBio is granted via the supervisor and the thesis advisory committee. Research supervisors are responsible for their doctoral candidates. They are the main influence on the direction of their research and their day-to-day research education and training. It is desirable that the supervisors should plan for their doctoral candidates to complete their PhD thesis within 4 years. They must also ensure that their doctoral candidates follow the guidelines of the Doctoral Network. It is essential that research supervisors take an active role in the Doctoral Network and participate in the MolBio meetings and events. Supervisors interested to join the program can apply at any time by submitting an application along with a CV to the Board of the Network. The Board will decide whether an interview will take place. The MolBio supervisors 2015 are John Eriksson, Eleanor Coffey, Peter Mattjus, Pia Roos-Mattjus, Annika Meinander, Cecilia Sahlgren, Lea Sistonen, Diana Toviola and Kid Törnquist.

Thesis Advisory Committees

The Thesis Advisory Committees evaluate the quality and progress of the MolBio doctoral candidates' research projects. Each MolBio doctoral candidate must have a Thesis Advisory Committee that follows the progress of the thesis project and provides the doctoral candidate with guidance, advice and constructive criticism on the project. The members of the Advisory Committee should have substantial knowledge of the field of the project to be able to give critical comments and to estimate the potential of the ongoing project to result in thesis defense. All interactions within the Thesis Committee are to be considered confidential. The tasks of the Thesis Advisory Committee include:

1. Following the progress of the doctoral candidate
2. Advising and assisting the doctoral candidate in achieving research and study goals (thesis committee members can also be collaborators in a part of the research if so agreed)
3. Giving an annual statement on the progress of the doctoral candidate to the Board of MolBio
4. Determining the time when the doctoral candidate is ready to proceed to the writing and the public defense of the final thesis.
5. Helping the student in case of conflict with the supervisor.

The Thesis Advisory Committee must have at least 3 members (the supervisor + 2 other researchers), each with a doctoral degree. At least one of the members should be from another research group or department, preferably from another university. The thesis committee should be assembled within three months after being accepted to the Doctoral Network. The doctoral candidate selects the committee in consultation with their supervisor. The Board of MolBio approves the composition of the thesis committee as well as any changes in it.

The thesis Advisory Committee should be selected with care. The members of the committee should have substantial knowledge on the field of research in order to be able to give the doctoral candidate valuable insights on the subject and evaluate the progress of the project. As the annual thesis committee meetings are compulsory, please do not select members who are not likely to be able to participate.

The Thesis committees should meet at least once a year. The doctoral candidates who are in an early phase of their work may find it useful to arrange meetings more often. The doctoral candidate organizes the thesis committee meeting and takes notes of it and writes a memo, which is then approved by the thesis committee. The memo of the meeting is to be attached to the progress report.

The Thesis Advisory Committee is responsible of ensuring that during the PhD studies the doctoral candidate gains detailed knowledge of his/her research field as well as adequate understanding of related biomedical fields. In the first Thesis Advisory Committee meeting the personal study plan is discussed and revised (if judged necessary).

Annual follow-up of doctoral studies

A Thesis Advisory Committee meeting is held once a year until the Thesis defence. The nature of thesis advisory committee work changes according to the maturation of the doctoral candidate. In addition to the general follow-up on the progress of the project, each meeting has some specific aims:

- Meeting 1:** Discussing the personal study plan and research project with the doctoral candidate
- Meeting 2:** Following-up on the personal study plan and on the progress of the research
- Meeting 3:** Following-up on the personal study plan, thorough check of research results, manuscripts, and articles. First preliminary future career plans are discussed (labs and funding).
- Meeting 4:** Accepting the PhD project for faculty evaluation, discussing future career plans.

Additional meetings may be required, especially if the research project takes more than the stipulated four years. Furthermore, the doctoral candidate can at any time ask for the Committee to assemble, if difficulties arise regarding the research project or matters that may affect the progress of the training.

Arranging the Thesis Advisory Committee meeting

1. Prior to the meeting

The doctoral candidate prepares and sends the progress report to the Thesis Advisory Committee members. Thesis Advisory Committee members are expected to familiarize themselves with the report in advance. The meetings also provide an important tool for the Doctoral Network to keep updated on the current status of the PhD project.

2. During the meeting

- a. The doctoral candidate presents the current status and future plans of the PhD project
- b. Thesis Advisory Committee members evaluate the project and make suggestions for the continuation of the project. The doctoral candidate should carefully take notes and prepare a report of the meeting, which is approved by the members of the committee
- c. The doctoral candidate and the members of the Thesis Advisory Committee check the courses taken by the doctoral candidate and plan the studies to guarantee adequate knowledge and expertise in the field
- d. The Thesis Advisory Committee meeting is approved by all members by signing the memo of the meeting written by the doctoral candidate

3. After the meeting

Based on the feedback at the meeting, the doctoral candidate revises the report and sends the revised progress report to the Thesis Advisory Committee members and to the MolBio Doctoral Network along with the minutes of the Advisory Committee Meeting.

Progress report

The report is an important document for the follow-up of a doctoral candidate's progress. The progress report should include:

- 1) Updated version of your research plan
- 2) Progress report appendix
- 3) Updated study plan
- 4) Memo of a thesis committee meeting.

The maximum length of the progress report is 10 pages, including references. It should be written under the guidance of the supervisor and thesis committee, who should also approve the progress report.

Progress Report Appendix

The progress report appendix contains information about your scientific activities (posters, presentation, courses, grants etc.) and should be attached to your annual report.

Name:

Degree:

Supervisor and thesis committee:

1. Publications of your thesis work:

1. Published and accepted for publication:
2. Submitted for publication:
3. Manuscripts under preparation:

2. Other publications:

3. Oral presentations and seminars:

1. International meetings:
2. National meetings:
3. Local meetings:

4. Poster presentations:

5. Working abroad:

6. Research training courses:

1. International method courses: 2. National research training courses: 3. Other courses:

7. Local seminar series:

8. Summer schools:

9. Journal clubs:

10. Teaching experience:

Undergraduate/research education/other

11. Grant applications

1. Have you personally applied for a research grant/scholarship?
2. Have you received a grant?

12. Estimate how many % of your thesis project is completed:

13. Estimate of the month and year of completion of your thesis project:

Situations of conflicts or bullying and harassment

MolBio does not accept any type of bullying or harassment, including any type of discrimination. If a student is exposed to any kind of harassment from the supervisor or any other colleagues or staff at the university, the student can contact anyone listed below.

- a. The supervisor
- b. The Thesis advisory committee (without the supervisor present if the student wish)
- c. Any member of the MolBio executive board as well as any other supervisor in MolBio
- d. Employed students can contact occupational health
- e. All members of the student union can contact the Ombudsman for harassment (<http://www.studentkaren.fi/english/advice-for-students/>)
- f. The Head of Personnel at ÅAU

The same persons can be contacted in a case of conflict with the supervisor.

HOW TO APPLY TO MOLBIO

Students interested to join a topic/laboratory that belongs to the program can contact a responsible MolBio-affiliated PI at any time to request a position in the lab. If approved by the PI, a project will be set up for the student. There are annual entrance calls to the network at a time decided by the Board of the Network. The PI has to support the student's application to the Network. The application procedure includes:

- Submission of a research plan
- Submission of CV and relevant diplomas
- Personal interview with the review panel (including a short presentation of the project)
- Entrance examination (testing knowledge in cell and molecular biology) or other selection test

Example of contents of the research plan

A well-composed research plan is a substantial and necessary part of graduate studies. A research plan should include the information required for the evaluation of the project. It should be specific, informative and without redundancies. The research plan must to cover the whole project. A recommended structure is outlined below. However, please notice that when applying to the doctoral network, the proposal should comply with the general rules of the call (length, layout, font etc.):

1. Summary (approximately 300 words)

A clear and concise summary of the project. This is the most important part of a research plan.

2. Specific aims

The broad, long-term objectives of the proposal. State the hypotheses to be tested. The recommended length is one page. The aims should be clearly defined and presented. The subprojects must to be linked to one another.

Questions to answer: Are the aims original and innovative? Does the project challenge existing paradigms or develop new methodologies or technologies?

3. Background and significance

This section is intended to introduce the reader to the field of research, including the main problems as they are presented in the literature. Briefly sketch the background leading to the present plan, critically evaluate existing knowledge, and specifically identify the gaps, which the project is intended to fill. State concisely the scientific importance of your research and also evaluate its possible relevance for applied aspects (e.g. advancing human health, health of the environment, industrial production etc.).

Details to consider: The review has to be clear and sufficiently detailed. Identify the problems and questions that are still unanswered in your field of research. The review should not be a list of previous research but a synthesis and interpretation of the knowledge accumulated to the present date

Questions to answer: Does your study address an important problem? If the aims of your proposed study are achieved, how will the scientific knowledge be advanced? What will be the effect of these studies on the concepts or methods that drive the field? Does the project employ novel concepts, approaches or methods? Is the work proposed appropriate to the experience level of the research group or other researchers? Will the scientific environment in which the work is going to be done contribute to the probability of the success?

4. Current state of the project

Summarize your previous results, describe and show examples of the ongoing studies including preliminary results and delineate forthcoming studies. Discuss in detail the experimental design, procedures and protocols to be used as well as the means by which the data will be analysed and interpreted. Describe any new methodology and its advantage over existing methodologies. Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the aims. Discuss the criteria that will be used to determine if feasibility has been demonstrated.

Questions to be answered: Have you achieved any of the goals listed in the original aims? Are the conceptual framework, design, methods and analyses adequately developed, well integrated and appropriate to the aims of the study? Have you identified potential problem areas and considered possible alternative strategies? Do the performed, ongoing and planned experiments take advantage of unique features of the scientific environment or employ useful collaborative arrangements?

5. Timetable

Estimated finishing time of each specific aim and the suggested date for your thesis defense.

Question to be answered: Is the timetable realistic?

6. References

Each reference must include the title, names of all authors, book or journal, volume number, page numbers, and year of publication. The references do not need to be exhaustive; they should be limited to the current relevant literature.