

# **Evaluation report Master's Programme in Medical Research, Uppsala University, 2021**

**Date: 8 December 2021**

## **Mission and work process**

The assessment panel was appointed on February 4, 2021 and we received information about the evaluation process on May 7. The assessment is based primarily on the programme self-evaluation report (received on June 30), interviews (management, teachers, students, and alumni) and a tour in the localities at Uppsala Biomedical Centre (BMC) conducted during a site visit in Uppsala (September 27–29, 2021). We also had access to several additional documents, *e.g.*, programme syllabus, course leader evaluations, summary of goal compliance, course evaluations, course reports, employer questionnaire, programme build-up, and course syllabi.

The assessment panel thanks for being entrusted with the task of carrying out this review and we hereby submit our report.

### **Members of the assessment panel**

*Brita Svensson*, ordförande, Uppsala universitet

*Claudia Wladdimiro Quevedo*, studentrepresentant, Uppsala universitet

*Daniel Öberg-Arendt*, arbetslivsrepresentant, Mercodia

*Erik Fries*, Uppsala universitet

*Kajsa Weslien*, studentrepresentant, Uppsala universitet

*Maria Jenmalm*, Linköpings universitet

*Maria Norlin*, Uppsala universitet

*Michael Lindberg*, Linnéuniversitetet, Kalmar

*Roger Karlsson*, Stockholms universitet

### **Overall comments**

The assessment group concludes that the Master's Programme in Medical Research has achieved a high level of recognition among the students due to dedicated programme coordinator and teachers, and that there is unity among those regarding the programme goals. A programme committee, common for all programmes at the Medical Faculty, meets once a month which gives a good opportunity to share experiences and to introduce common activities with the other programmes. The approach to teaching is student-centred. Students get support from their programme coordinator whenever needed and drop-outs are very few.

We commend the ambitions of a high-quality study programme with strongly motivated and qualified students. Clearly this has a positive impact on both teaching and students' learning process as demonstrated by the fact that most of the students continue with doctoral studies after finishing their masters.

Some areas for improvement have been detected. The most urgent one concerns the programme organisation itself, namely the fact that the function as programme director and coordinator is now combined, resulting in a major workload for this person. We therefore suggest that a senior scientist is appointed director of the programme with expertise in an area complementing that of the present coordinator, together with increased administrative support. This arrangement would also make the programme less sensitive to an unplanned loss of the coordinator.

Additionally, the programme director/coordinator has a weak mandate to act if course related problems occur which, combined with a poor

influence on the budget, makes a closer cooperation with the head (Prefekt) of Department of Medical Biochemistry and Microbiology crucial. Unfortunately, we never got the chance to meet this person, nor the head of the Programme Committee, to hear their views in these matters.

A concern is that the programme is currently run with 50% vacancies and therefore may become too costly in the long run despite its successful implementation. Consequently, the course organization needs to work on reaching a larger number of students. We recommend a more intense international marketing of the programme, taking advantage of recommendations and statements from the alumni that have passed the programme. Informing that not only academic research, but also more applied research in medical and pharmaceutical industry, is a career possibility. A small but important adjustment in that direction could be to organize site visits to various companies both as study visits and for networking purposes.

**Summary of the most important quality-enhancing measures. We recommend that:**

- a programme director is appointed, as well as one or more study counsellor (s), and that appropriate administrative support is provided,
- more time is allocated for the programme coordinator and the programme director,
- the head of the Dept. of Medical Biochemistry and Microbiology becomes more involved in the programme regarding, *e.g.*, support and future strategic planning, and that
- the international marketing of the program is intensified.

## Specific comments related to the eleven aspects

Some comments may recur for several aspects, as it is sometimes difficult to draw clear boundaries between them. We have chosen to structure our comments under the headings **Strengths** and **Development opportunities**.

*1. that the study programmes achieve the objectives of the Higher Education Act and Higher Education Ordinance (Qualifications Ordinance) and programme-specific objectives, i.e., that actual learning outcomes correspond to expected learning outcomes*

### Strengths

In each course, the learning outcomes are examined in various ways, *e.g.*, through written reports, laboratory practicals, seminars, and written exams. Many of the goals in the Higher Education Act are already covered in earlier courses, suggesting that efforts have been made to hold the courses at an advanced level already from the beginning.

Work has started to use criterion-based examination throughout the programme, an initiative that we encourage. Teachers are engaged, ensuring that Higher Education Ordinance as well as learning course objectives are met.

### Development opportunities

Learning outcomes in the programme syllabus are sometimes absent in the course syllabi. Also, some learning outcomes specific for the programme overlap with the general learning outcomes in Higher Education Ordinance. Therefore, we recommend a revision of the programme syllabus and the course syllabi, where appropriate. Furthermore, a review of the syllabi of the individual courses would be beneficial. Some of the learning outcomes are unclear, for instance as to whether and how they are assessable. Also, there should be more learning outcomes at a higher level of cognition, *e.g.*, requiring the students to be able to “analyse” or “evaluate” instead of “describing”, considering that these courses are taught at an advanced level. It is important to give the more junior course leaders support in the process of writing syllabi and learning outcomes. It might be advantageous to organize a workshop on syllabus construction with an experienced invited speaker.

To meet some of the course goals, students need experience of giving and receiving feedback on their presentations (both oral and written). To

reduce the resulting workload for the teachers, these exercises could be done through peer-to-peer review among students, especially in the later courses since the students by then have been given feedback from teachers in the past.

*2. that the content and teaching activities are founded on a scientific basis and proven experience*

**Strengths**

This master's programme has a strong focus on research, with several aspects of critical training such as paper reading, high-quality research-centred journal clubs, projects and, not the least, wet labs. Lectures are given by highly qualified specialists, and this is true also for the other teaching activities. The students are allowed full flexibility to find host laboratories for their projects; it can be research laboratories at the department or at other laboratories at Uppsala University, or even at other institutes not necessarily located in Uppsala, as long as the supervision and project is found to be appropriate.

Altogether, this is strongly commendable; it certifies that the students will be able to critically digest facts from the frontiers of current research and put their knowledge into perspective of present and future activities, thereby forming a solid platform for continued studies in the area of medical biochemistry and molecular cell biology.

**Development opportunities**

The research-focused strategy taken by this programme is strongly appreciated. However, with its focus on academic research, biomedical research performed outside academia in the pharmaceutical and medical industry is less well illustrated. To balance this and to some extent also boost an interest for a career related to applied research, we suggest that site visits to such laboratories are organized. Furthermore, contacts can be made to establish possibilities for interested students to do their projects at company-run research labs.

*3. that teaching focuses on the learning of students/doctoral students*

**Strengths**

We commend that teachers and course administration are most helpful in guiding the students, and course leaders are willing to improve the courses. There are projects, wet labs, and journal clubs in most courses. The courses are structured in a way that makes the student think and reflect: why? and how? In the bioinformatics course a new appreciated teaching format has been introduced: while watching a pre-recorded lecture, the students can shift between viewing to testing described programme commands on their own computers.

**Development opportunities**

Students having different background knowledge and experiences is a challenge typically encountered by most programmes at this level, making it difficult balancing the curriculum. We recommend introducing quizzes early in the programme to provide feedback to the teachers on the students' level of knowledge. Subjects for assignments and lecture contents should be chosen to fit students with different previous knowledge and current interests.

We consider the current number of admitted students (about 15) to be too low for economic sustainability. In addition to other actions suggested to increase the number of students (see #8), we suggest the possibility to cooperate with other master's programmes in certain aspects. For example, such a cooperation could enable students to join single courses in order to broaden their knowledge in specific areas and thereby increase flexibility with respect to their future careers. Additionally, it could involve establishing new courses or renewal to minor or larger extent of already existing ones. We are of the opinion that such a strategy could be of mutual benefit to all the programmes involved. A larger student group is also better for the students for several reasons, as it increases cooperation and sharing of experiences, and allows the students to build larger networks for future benefit.

*4. that the achievement of intended learning outcomes is assessed using appropriate methods, and complying to rule of law, and that progression is ensured*

### **Strengths**

We perceive a strong focus on strategic communication and contact between the programme coordinator and the course leaders within the programme, which appears to successfully provide efficiency and smooth transitions between courses. This is a good ground for ensuring progression. Also – perhaps as a result of this efficient communication – the different courses in the programme seem very well coordinated with each other. We also commend the different assessment methods used in the courses.

The way in which the journal clubs (present in every course) are organized seems to provide very good progress in critical thinking, clearly helping the students to develop their ability in this regard.

### **Development opportunities**

We support the idea expressed in the self-evaluation, that the progression of the students' knowledge could be strengthened by connecting the programme courses through a "red thread" mini-project or topic. In addition, more independent and analysing tasks should be progressively included. Also, we recommend a continued evaluation of what could be learnt from going on-line, with the focus on providing some variation and adaptability to the new student cohorts and the changing situation in the world. The grading of master's theses has so far been done by the programme director/coordinator alone which is not sufficiently secure. We therefore recommend that this task is also done by another teacher or expert in respective field. For the grading a template containing various aspects of the thesis, not forgetting the important ethical considerations, should be used.

*5. that staff involved in the study programme possess relevant and up-to-date expertise in the subject matter, that they have pedagogical and/or subject didactic expertise, and that there is sufficient teaching capacity*

The recruitment of university staff involved in teaching activities may not always be based on the identification of teaching needs, considering that

many of those employed have duties in both research and teaching and in some cases more so the former than the latter. This seems especially true for many of the teachers in this programme, who are also active researchers (which is quite natural considering the type of programme). This means that there are inherent challenges for the department to have a teaching staff with adequate subject and higher education pedagogical and subject didactic competence.

### **Strengths**

We commend that, in principle, all teaching is done by professors, university lecturers, post-docs, or PhD students, who are also active researchers. To a large extent this ensures subject competence at a basic level as well as a scientific approach.

Moreover, in general the teaching personnel seem to attend pedagogical workshops and days with pedagogical themes arranged by the department. There are also courses and initiatives by the Pedagogical Council at the Disciplinary Domain of Medicine and Pharmacy (PR&M), and it seems that at least some teachers are active in these contexts. We detected a wish towards making an extra effort in informing teaching staff of opportunities for pedagogical development.

### **Development opportunities**

The workload for the programme director/coordinator is very high; the time allocated for programme coordination is not enough. We therefore suggest that a senior scientist is appointed director of the programme, with expertise in an area complementing that of the present coordinator. This arrangement would also make the programme less sensitive to an unplanned loss of the coordinator. This would free time for the present programme director/coordinator to focus on the development of the programme. At the same time the different roles and responsibilities between programme director and programme coordinator should be clarified. The low mandate for the programme director/coordinator to act together with the fact that the programme director/coordinator has little to say when it comes to budget questions calls for a closer cooperation with the Department of Medical Biochemistry and Microbiology, in particular with the head (Prefekt).

The programme is currently vulnerable as only one or a few teachers are involved in teaching (for different reasons). This imposes a threat toward the present teachers, whose workload may become excessive.



There is some concern and frustration that it is not possible to recruit teachers with specific skills in relation to teaching. There is a great concern that year-to-year consistency is not achieved, especially as some teaching is done by PhD students who may leave the department when they finish.

We detected a lack of support for junior course leaders and PhD students regarding their pedagogical development. Also, there seems to be a need for support for aiding teachers to apply for becoming "excellent teachers".

We recommend a review to explore whether it could be possible to recruit additional university lecturers. We also recommend that junior course leaders are given time for pedagogical development.

Furthermore, we suggest that the teachers work towards increasing the possibilities for PRÅM to arrange, *e.g.*, workshops, seminars, and literature discussions, to increase teachers' options for pedagogic development.

#### *6. that internationalization, international perspectives and sustainability are promoted*

##### **Strengths**

The programme is appreciated by the students because of its flexibility and the support that they get from teachers, programme coordinator and study counsellors. We were informed that students are welcomed through a kick-off event that is appreciated. The students seem well informed regarding contacts with, *e.g.*, the language workshop.

##### **Development opportunities**

During their thesis work, the students do not have any arranged meetings with the other students of the programme. We recommend arranging meetings where students can talk about their work and socialize, since this could help avoid isolation during this period.

In the self-evaluation it is mentioned that students are trained in the concepts of sustainability and internationalization. However, these issues are not found as learning goals in the course syllabi (there is one lecture on sustainability in the Professional Training Seminar). We recommend that topics around these themes are included in the course syllabi (at least in some) as learning goals, to make this clearer to the students and so that they can be examined. We also recommend making clear use of the experiences that international students and teachers bring, to achieve

Internationalization at Home. This could be done by expanding aspects of Cultural Intelligence into the programme, since understanding and awareness of different cultures can help students from different backgrounds to interact more effectively.

We commend the suggestion in the self-evaluation to increase the kick-off from one to three days. Since there is a lot of information to take in as a new student, we recommend having a follow-up day at a later occasion, with some repetition of information given during the kick-off days and where students can ask questions. Furthermore, we recommend that the programme coordinator has a personal interview with each student, to learn about their main interests, and to establish a personal relationship.

#### *7. that a gender equality perspective is integrated into the study programme*

##### **Strengths**

Gender equality perspectives are treated in the programme on certain occasions, including a lecture in the Professional Training Seminar series in the beginning of the programme. The programme contains an appreciated course in bioinformatics, which provides opportunities for women to establish themselves in a male-dominated field.

##### **Development opportunities**

Gender equality perspectives could be more integrated in the programme, rather than being addressed only on certain occasions (such as the Professional Training Seminar in the beginning of the program). We recommend having specific activities where this issue is brought up and discussed in the form of seminars and/or journal clubs.

One suggestion is having a seminar on equal opportunities in science, where students themselves get to gather information through research articles *etc.* and design a study with the aim to investigate how gender/cultural background determines the degree of academic success. This could be done in collaboration with other programs.

We also recommend having journal clubs focusing on these issues, where students get to develop their knowledge and critical thinking by independently reviewing and evaluating scientific reports and articles on the subject.

A third suggestion is having workshops where different gender and

equality scenarios are discussed, including how to behave if you are being discriminated against at the workplace.

There is a gender bias (85% female students) in the programme. We recommend that when promoting the programme, recruitment efforts could be more directed towards men. One way is to analyse any gender bias in texts (and illustrations) describing the programme. Also, information towards third-year bachelor students could be made inviting both male and female master or PhD students.

In the self-evaluation, possible efforts to be made are mentioned but not specified. We recommend that these efforts are again taken up for discussions among the teachers, in particular the course heads.

*8. that the study programme meets individuals' and society's needs for learning and professional knowledge and prepares students for future careers*

### **Strengths**

We commend the programme for its great success in preparing the students for future employment. The number of alumni accepted as PhD students is impressive. We support the efforts allowing students to get in contact with the local life-science industry.

We commend the efforts to provide networking possibilities, especially on the platform LinkedIn, which presents a way for the programme and connected students to follow alumni through their professional development, highlighting career possibilities and potential mentors, *etc.* It is also a good marketing tool.

### **Development opportunities**

We recommend introducing the students to an entrepreneurial way of thinking early in the programme. Academics, on all levels, are seldom knowledgeable about what it takes to secure intellectual property. "Publish or perish" is felt as an insurmountable hurdle. Trying to patent discoveries does not actually hinder labs to publish, it just delays the process to some degree, and the cost and effort involved can often be covered by university associated entities. It is advisable to bring this subject up again towards the end of the programme when students have a firmer grasp of research.

We recommend the programme to try marketing itself further, in order to attract more interest from both potential students, national and international, and industry. The programme as a whole is very attractive and successful. With increased marketing efforts, highlighting the quality and uniqueness of the programme, a larger number of qualified students are likely to apply, which will contribute to the viability of the programme.

Contact efforts toward industry is already made, but could increase, *e.g.*, by having "shadow days" where students could join an interesting person for a day, study trips to selected industry sites, industry-focused seminars, *etc.*

Although the students as a group are trained early in writing, individual writing is introduced quite late in the programme. We recommend that individual writing is introduced earlier, together with peer-to-peer review. By reading and commenting on other students' text the students will also learn to write.

*9. that students/doctoral students have influence on the planning, implementation and follow-up of the study programme*

**Strengths**

We commend that the students are clearly heard and helped by the programme coordinator and the teachers. We also commend that the teachers have significantly adjusted courses based on the students' evaluations, and that the students are made aware of these changes.

**Development opportunities**

We recommend increasing the efforts to receive evaluations from the majority of the students, for example by scheduling time for written evaluations and oral discussions in connection with a lecture or seminar at the end of the course. This could be done also at the end of each study year, to receive general feedback on the programme.

*10. that an appropriate study environment is available to all  
students/doctoral students*

**Strengths**

We commend the programme for supporting its students and making them feel heard. We also commend you for the flexibility the students have in choosing courses and substituting them for smaller internships when students show that they have knowledge overlap from earlier courses.

**Development opportunities**

We recommend the programme, potentially jointly with other programmes, to provide opportunities for students with less practical experience for an introduction to the most basic techniques, preferably pre-course. Such an effort would provide great support to otherwise theoretically very strong and motivated students and possibly allow practicals to be run more smoothly. This could potentially also alleviate any potential stress. Such events also allow for (early) networking between programmes.

We recommend making the kick-off slightly longer, in order to homogenize the group more, and to introduce quizzes in the beginning(s) for both the teachers and the students themselves to assess the students' level in relation to the organizers' expectations. We also recommend introducing a second meeting with the students further on during the first semester to check whether they have become organised properly in their new surroundings.

*11. that continuous follow-up and improvement of the study programme is  
carried out*

**Strengths**

We commend that students' opinions are included in course reports and that courses are adjusted based on the student reports. Additionally, we note an enthusiasm and general willingness to improve and develop the courses by teachers. No doubt this reflects a long-standing ambition among course organizers and teachers, as was testified by the student group we met during our site-visit.

**Development opportunities**

We recommend that once a year selected alumni are invited to present how their careers developed after they finished the programme and to discuss their experiences in general with the current students. In other words, these alumni may act as role models of successful activities after completion of the programme. Of importance in this context is that not only alumni that continued with research studies are invited but also those that moved on to activities outside academia, in order to highlight and inspire the students to such a future career.

To ensure that all relevant staff are involved in the programme and that the programme gets the support it needs to develop strategic discussions at the department are needed. We therefore strongly recommend the head of the Department of Medical Biochemistry and Microbiology to be more involved in the programme.