Report
of the Expert Panel
on the Reaccreditation
of the University Postgraduate (Doctoral) Programme
Medicinal Chemistry

University of Rijeka Department of Biotechnology

Date of the visit:
September 5, 2018

December, 2018

The project was co-financed by the European Union within the European Social Fund.
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CONTENTS

INTRODUCTION

The Expert Panel appointed by the Agency for Science and Higher Education (ASHE) created this Report on the Re-accreditation of the University Postgraduate (Doctoral) Programme *Medicinal Chemistry* on the basis of the Self-Evaluation Report of the Programme, other documentation submitted and a visit to the University of Rijeka Department of Biotechnology.

The Agency for Science and Higher Education (ASHE), a public body listed in EQAR (European Quality Assurance Register for Higher Education) and a full member of ENQA (European Association for Quality Assurance in Higher Education), re-accredits higher education institutions (hereinafter: HEIs) and their study programmes in line with the Act on Quality Assurance in Science and Higher Education (Official Gazette 45/09) and the Ordinance on the Content of a Licence and Conditions for Issuing a Licence for Performing Higher Education Activity, Carrying out a Study Programme and Re-Accreditation of Higher Education Institutions (OG 24/10). In this procedure parts of activities of higher education institutions and university postgraduate study programmes are re-accredited.
Expert Panel is appointed by the Agency's Accreditation Council, an independent expert body, to carry out independent evaluation of post-graduate university study programmes.
The Report contains the following elements:

- Short description of the study programme,
- The recommendation of the Expert Panel to the Agency's Accreditation Council,
- Recommendations for institutional improvement and measures to be implemented in the following period (and checked within a follow-up procedure),
- A brief analysis of the institutional advantages and disadvantages,
- A list of good practices found at the institution,
- Conclusions on compliance with the prescribed conditions of delivery of a study programme,
- Conclusions on compliance with the criteria for quality assessment.

Members of the Expert Panel:

1. President of the Expert Panel, Professor Gernot Riedel, University of Aberdeen, UK
2. Professor Michael Drinnan, University of Newcastle, UK
3. Professor Justin McCarthy, University College Cork, Ireland
4. Dr. Dorte Gilså Hansen, Syddansk universtitet, Dansmark
5. Giovanni Marco Nocera, doktorand, Max Planck Institute, Germany
6. Massimiliano Ferrucci, doktorand, KU Leuven, Belgium

The higher education institution was visited by the following Expert Panel members:

- **Moderator of site-visit, Professor Justin McCarthy, University College Cork, Ireland**
- Professor Gernot Riedel, University of Aberdeen, UK
- Professor Michael Drinnan, University of Newcastle, UK
- Giovanni Marco Nocera, doktorand, Max Planck Institute, Germany
- Massimiliano Ferrucci, doktorand, KU Leuven, Belgium

In the analysis of the documentation, site visit and writing of the report the Panel was supported by:

- Marina Matešić, coordinator, ASHE,

During the visit to the Institution the Expert Panel held meetings with the representatives of the following groups:

- Management,
- Study programme coordinators,
- Doctoral candidates,
- Teachers and supervisors.

The Expert Panel also had a tour of the premises.

SHORT DESCRIPTION OF THE STUDY PROGRAMME

Name of the study programme contained in the licence: Medicinal Chemistry
Institution delivering the programme: University of Rijeka Department of Biotechnology
Institution issuing the degree: University of Rijeka
Place of delivery: Rijeka
Scientific area and field: Interdisciplinary area of research, Filed: Biotechnology in Biomedicine (including natural sciences, biomedicine and biotechnology)

Number of doctoral candidates: 51 (all have appointed supervisors)
Funding available for 40 (11 are self-funded or employer-funded)
Number of teachers: 42 (11 at the department, 10 from Medical Faculty, 21 from other University departments/faculties, 14 at research institute, 7 at private company research departments)
Number of supervisors: 31

Learning outcomes of the study programme: generic

Programme outline:
30 – 65 ECTS in courses (obligatory 30; and 35 in elective activities that can be courses or conferences, summer schools, workshops, outside courses etc.); the rest in research, including mandatory publishing of papers, research conducted at another institution, defence act.

RECOMMENDATION BY THE EXPERT PANEL TO THE ASHE'S ACCREDITATION COUNCIL

Upon the completion of the re-accreditation procedure and the examination of the materials submitted (Self-Evaluation Report etc.), the visit to the higher education institution and interviews with HEI members in accordance with the visit protocol, the Expert Panel renders its opinion in which it recommends to the Accreditation Council of the Agency the following:
Issue a confirmation on compliance for performing parts of activities (renew the licence).

RECOMMENDATION BY THE EXPERT PANEL TO THE ASHE'S ACCREDITATION COUNCIL

It is the overarching opinion of the panel that the programme presents in a mature form and has established the principle elements required for a smooth running of the programme. Despite intense interrogations of all participants of the HEI, students and stakeholders, we have not been able to identify grave concerns about conduct and achievements.
However, in the course of the discussions, it became obvious that the programme is in a serious dilemma. Although explicitly entitle 'Medicinal Chemistry', both research of the department and taught courses have shifted towards more biological subjects, for example virology, neuroscience, etc. This is driven mainly by scientific support and success, which at the present time guarantees income to the University in the above subjects and cancer for example. In contrast to this development, stakeholders are adamant that teaching and expertise in chemistry is lost, but would be a continuous requirement for their engagement in the programme. It is therefore clear that the Department of Biotechnology with its excellent infrastructure needs to reconsider the financial model of how this post-graduate programme is supported.
Although this was a subject of concern for the panel, we did not place particular weight on this issue and concentrated on the structural elements of the programme, the satisfaction rates of participants, the governance and training elements required to deliver high quality research in a competitive international context, and to establish education compatible with European guidelines and exchange programmes.
Together with management and supervisors, but also the input of students and stakeholders, the panel has identified areas that require consideration, and we do list those in our detailed response below. We are content that implementation of improvements is no easy endeavor given the limitations (personnel, finances,) and strains the Faculty and the Department are under. Yet changes are needed to equip this PhD programme for competition with similar programmes in a European context, but also bring the standards to a level so that international exchange between PhD programmes, research institutions and the private sector is facilitated and the candidates experience a smooth transition when joining Croatian education streams. Reciprocally, this will set up the Croatian students for more competitive and successful international careers.
Our intense discussions with all parties involved in the programme of 'Medicinal Chemistry' suggest that there is internal acceptance of many of the issues raised by the panel. The panel also experienced the will to communally explore new avenues and to

remedy shortfalls, and to address issues of governance and support, which are required in modern day higher education. Although shortfalls weigh not strong enough to affect the general framework of the PG programme (the issue of programme content is intrinsic to the Department and the University as a whole), we have expectations listed as recommendations to achieve conformity with equivalent European programmes within the follow-up period. We would hope to see the PG programme management in Medicinal Chemistry (incl. Department/Faculty/University where appropriate) embark on a constructive dialogue with ASHE, who will oversee the follow-up period, but also may become instrumental in advising on good practice and methods how to attain and maintain excellence.

It is hoped by the panel that this process will, once completed, set this PhD programme up as a high achieving PG education stream within the University of Rijeka.

ASSESSMENT STRATEGY

In our assessment, we kept in mind the following three broad principles:

1. That the programme should aspire towards the best practices of (see below):
    a. The Bologna Seminar on "*Doctoral Programmes for the European Knowledge Society*";
    b. CroQF, level 8.2;
    c. EU Principles for Innovative Doctoral Training.

2. That there should be a common benchmark for scope and quality in PhDs across the EU, in order that qualifications have extrinsic value and can be considered transferrable between member countries.

3. That strategic decisions about the programme be made always in the best interests of patients and healthcare across the EU, and the rest of the world. This is in keeping with the research priorities of national agencies such as NICE, as well as the major national and international funding bodies.

Special weight was given to the self-nominated study objectives, and how these are contained within best practice. The assessment was based on the Self-evaluation report provided by the Department of Biotechnology of the Faculty of Medicine, University of Rijeka and a site visit conducted by the Expert Panel on 5. September 2018.

The Bologna Seminar on "*Doctoral Programmes for the European Knowledge Society*"

i. The core component of doctoral training is the advancement of knowledge through original research. At the same time it is recognised that doctoral training must increasingly meet the needs of an employment market that is wider than academia.
ii. Embedding in institutional strategies and policies: universities as institutions need to assume responsibility for ensuring that the doctoral programmes and research training they offer are designed to meet new challenges and include appropriate professional career development opportunities.
iii. The importance of diversity: the rich diversity of doctoral programmes in Europe – including joint doctorates – is a strength, which has to be underpinned by quality and sound practice.
iv. Doctoral candidates as early stage researchers: should be recognized as professionals – with commensurate rights – who make a key contribution to the creation of new knowledge.
v. The crucial role of supervision and assessment: in respect of individual doctoral candidates, arrangements for supervision and assessment should be based on a transparent contractual framework of shared responsibilities between doctoral candidates, supervisors and the institution (and where appropriate including other partners).
vi. Achieving critical mass: Doctoral programmes should seek to achieve critical mass and should draw on different types of innovative practice being introduced in universities across Europe, bearing in mind that different solutions may be appropriate to different contexts and

in particular across larger and smaller European countries.
vii. Duration: doctoral programmes should operate within an appropriate time duration (three to four years full-time as a rule).
viii. The promotion of innovative structures: to meet the challenge of interdisciplinary training and the development of transferable skills.
ix. Increasing mobility: Doctoral programmes should seek to offer geographical as well as interdisciplinary and inter-sectorial mobility and international collaboration within an integrated framework of cooperation between universities and other partners.
x. Ensuring appropriate funding: the development of quality doctoral programmes and the successful completion by doctoral candidates requires appropriate and sustainable funding.

CroQF, level 8.2:

Descriptors of learning outcomes for this level are:
Knowledge - creating and evaluating new facts, concepts, procedures, principles and theories in a field of research that extends the frontier of knowledge;
Cognitive skills - using advanced, complex, original, highly specialized knowledge, skills, activities and procedures required for developing new knowledge and new methods as well as for integrating different fields;
Practical skills - creating, evaluating and performing new proposed specialized activities and new methods, instruments, tools and materials;
Social skills - creating and applying new social and generally acceptable forms of communication and cooperation in interaction with individuals and groups of different affiliations and different cultural and ethnical origin;
Autonomy - demonstrating personal, professional and ethical authority, managing scientific research activities and a commitment to development of new ideas and/or processes;
Responsibility - taking ethical and social responsibility for successful execution of research, socially beneficial results and potential social consequences.

EU Principles for Innovative Doctoral Training

Research Excellence - Striving for excellent research is fundamental to all doctoral education and from this all other elements flow. Academic standards set via peer review procedures and research environments representing a critical mass are required. The new academic generation should be trained to become creative, critical and autonomous intellectual risk takers, pushing the boundaries of frontier research.

Attractive Institutional Environment - Doctoral candidates should find good working conditions to empower them to become independent researchers taking responsibility at an early stage for the scope, direction and progress of their project. These should include career development opportunities, in line with the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

Interdisciplinary Research Options - Doctoral training must be embedded in an open research environment and culture to ensure that any appropriate opportunities for cross-

fertilization between disciplines can foster the necessary breadth and interdisciplinary approach.

Exposure to industry and other relevant employment sectors - The term 'industry' is used in the widest sense, including all fields of future workplaces and public engagement, from industry to business, government, NGO's, charities and cultural institutions (e.g. musea). This can include placements during research training; shared funding; involvement of non-academics from relevant industry in informing/delivering teaching and supervision; promoting financial contribution of the relevant industry to doctoral programmes; fostering alumni networks that can support the candidate (for example mentoring schemes) and the programme, and a wide array of people/technology/knowledge transfer activities.

International networking - Doctoral training should provide opportunities for international networking, i.e. through collaborative research, co-tutelle, dual and joint degrees. Mobility should be encouraged, be it through conferences, short research visits and secondments or longer stays abroad.

Transferable skills training - "Transferable skills are skills learned in one context (for example research) that are useful in another (for example future employment whether that is in research, business etc.). They enable subject- and research-related skills to be applied and developed effectively. Transferable skills may be acquired through training or through work experience". It is essential to ensure that enough researchers have the skills demanded by the knowledge-based economy. Examples include communication, teamwork, entrepreneurship, project management, IPR, ethics, standardisation etc.
Business should also be more involved in curricula development and doctoral training so that skills better match industry needs, building on the work of the University Business Forum and the outcomes of the EUA DOC-CAREERS project.6 There are good examples of interdisciplinary approaches in universities bringing together skills ranging from research to financial and business skills and from creativity and design to intercultural skills.

Quality Assurance - The accountability procedures must be established on the research base of doctoral education and for that reason; they should be developed separately from the quality assurance in the first and second cycle. The goal of quality assurance in doctoral education should be to enhance the quality of the research environment as well as promoting transparent and accountable procedures for topics such as admission, supervision, awarding the doctorate degree and career development. It is important to stress that this is not about the quality assurance of the PhD itself rather the process or life cycle, from recruitment to graduation.

The common approach should provide a framework of reference, whilst preserving flexibility and autonomy for institutions and doctoral candidates.

A ADVANTAGES OF THE STUDY PROGRAMME

A1 Enthusiastic students: All students were highly motivated, engaging and willing to make their views known. We noted a high percentage of females were present with excellent spoken English and very supportive of the English language medium. Moreover, we were delighted to hear that active engagement in research starts immediately in the first terms despite minor issues with taught courses, students agreed on their relevance and overall benefit.

A2 Multidisciplinarity: The panel was impressed on meeting a highly motivated & enthusiastic programme committee that represents and encourages the involvement of interdisciplinary academic staff. Doctoral training and research in biotechnology and medicinal chemistry are under-represented in Croatian HEI, which provide uniqueness to this programme. Of particular importance and a clear positive of this programme is the complimentary and very significant participation of external institutions in curriculum delivery, student supervision & mentorship.

A3 Ambitions for expansion. We noted that the programme is in a difficult transition phase. On the one hand, the inclusion of the Medical Faculty in the running of the programme has led to a re-orientation of topics that are researched (for example neuroscience and cancer), thereby drifting away from Medicinal Chemistry as such. We are encouraged that discussions are under way that will address this issue. More importantly though, the programme will concert to fully English post-graduate training including thesis writing and examination. This is highly appreciated and the panel were unanimous in supporting this ambition for i) expanding the programme; ii) internationalization and recruitment of candidates from abroad; iii) aspiring to a higher quality of training and exchange on an international stage including examining of candidates through members of EU postgraduate schools. We also see a clear benefit for the candidates in terms of career and job prospects.

A4 Progress and improvements. The panel was delighted to see that both supervisors and programme committee members are critical about the post-graduate studies and continuous in their efforts to implement change whenever necessary. Examples of the past have highlighted this; a trajectory for upcoming modifications and improvements also underlined this ambition. While we would like to see some of these projections to be fast-tracked, we fully understand the internal (University/Faculty) and external (Croatia as a whole) constraints in need of consideration.

D DISADVANTAGES OF THE STUDY PROGRAMME

D1 Taught course content and training: The panel noted, especially from potential employers of post-graduates, that some research relevant topics are under-represented in the teaching curriculum. These relate specifically to Pharmaceutics, documentation and transferrable skills including proposal writing and management/organizational

skills. But also some key areas of Medicinal Chemistry such as Biotechnology would benefit from more in-depth training.

D2 Single mentoring. A single PhD mentor is currently the standard. We note that in the majority of cases the relationship works well. Nevertheless, to give a wider academic perspective, we strongly advise and encourage a move towards two mentors. This is particularly important for a multidisciplinary programme and in the context of growth. We admit that the principle supervisor will carry the main burden of training and supervision while the role of the second supervisor is dormant for most of the post-graduate studies. However, activities may be awakened in case of personal issues, absence of the principle supervisor because of new posts elsewhere.

Moreover, there is a genuine concern that the pool of supervisors will be diluted without co-supervision across the board. New supervisors need the support of a senior supervisor with successful experience; and senior supervisors are often successful and busy, and therefore need the support of junior members who can offer hands-on support.

D3 Depth of study in PhD research: Review of theses revealed considerable heterogeneity in terms of scientific breadth. Many were less than 100 pages, reported on a single research theme, and contained brief *Methods* and *Results* sections. Some theses were extremely short. In the European context the panel feel it unlikely that these would be considered an adequate synthesis of a 3(4)-year programme of PhD-level work unless the quality was unprecedented. In comparison to the European norm, the body of work is typically more in keeping with a Masters (MPhil or MD) thesis, approximating to no more than two years of full-time research work. We suggest a more laboratory - driven approach combined with a broader approach engaging multiple techniques to lift the standard to EU norm.

D4 Supervisor support: Quality of supervision has already been noted, and the best supervisors are to be encouraged and incentivised. A more formalized and transparent supervisor development programme may be established. In contrast to European norms, there was no evidence to indicate whether the publication record was used in the appointment, performance assessment or proportion of academic staff.

D5 Governance and metrics: While we noted that the overall structures for governance of the programme are in place and act successfully, some smaller issues were raised concerning availability of data and a complete understanding of the metrics required to define the successful conduct of the programme. Details are listed in the respective sections of our report. Of particular importance is the improvement on reporting metrics if growth of the programme is to be achieved and better tracing of students will become essential. Such data can be readily used to identify students that are struggling/failing and help may be provided. Moreover, they provide important benchmarks for part-time / full-time student ratio's and would help to streamline the programme towards a more full-time uptake and becoming fully funded. We believe that outcome metrics will also be an important tool in the long-term evolution of the programme in an international setting. Without ready access to such statistics, it will be

difficult for the programme to differentiate itself, to be attractive to incoming students and to other stakeholders.

We also noticed that students are not always in the know if it comes to specific permissions (for example to work with genetically modified tissue, etc.). It became clear that supervisors have all necessary permits in place and have instructed their students, who seem to have forgotten. The development of better metrics can also extend into these field and training records for such extremely important elements of the programme be kept in a central data base. Similar arguments apply for formal complaints procedures for students and also for mentors.

GP EXAMPLES OF GOOD PRACTICE

GP1 Relationship between mentors and students: The panel recognized the high quality of the supervisors; it is based on positive student recommendations and a seemingly close relationship between student and supervisor.

GP2 Internationalisation: We were encouraged by the ambition for more internationalization of the programme and the plans to convert to English as teaching and research language. Although this is to happen in the next 2 years and the panel encouraged the faculty to bring this forward, it is definitely a move in the right direction and will substantially improve alignment to other European post-graduate programmes.

R RECOMMENDATIONS FOR THE IMPROVEMENT OF THE STUDY PROGRAMME

R1 Taught course structure: As an overall aspiration, and this is taken from numerous programmes the panel has assessed, we believe that programmed teaching should account for no more than 20% of the entire course. Clearly, generic skills remain central to the early education programme, but specialist knowledge relevant to each individual PhD topic should be acquired by self-study or alternative means; lab meetings; scientific interactions with supervisor; regular study reports; etc. We support a more project-based approach for the achievement of merit and are pleased to see experimental work to start very early in the programme. We recommend (as a general advise) that the faculty review their programme of compulsory and optional teaching courses taking into consideration:

- Compulsory attendance should be limited to 3 or 4 courses teaching the essentials of research. For example: study design and medical statistics; bioethics; and academic & grant writing.

- Other modules are optional, in order that *each* student can compose a portfolio of courses to suit their own learning needs and at the same time avoiding too much overlap between topics.
- Students can opt out of specific modules if they can demonstrate prior learning from an accredited higher education programme.
- Consider use where appropriate of Massively Open Online Courses (MOOCs). There are excellent specialist MOOCs available that have been developed using resources that are not available to any but the largest institutions. They are widely applied in panel member's host institutions.

R2 Move towards co-supervision for all students. We recommend that where possible, students have two supervisors (supervisor & co-supervisor or supervisor & advisor). The co-supervisor/advisor may have more a pastoral and supportive role; regular meetings could document interactions with the PhD student in order to help monitor progress, but also to identify problems early on and diffuse them efficiently. The panel realized that the interaction with multiple commercial entities that function as stakeholders, offers the unique opportunity to make members of these institutions co-supervisors/advisors, especially when students are sponsored through these institutes. In case of international collaborations, colleagues from institutes outside Croatia may also function as co-supervisors.

R3 Length of PhD; full-time vs. part-time study: We recommend that the faculty encourage all students to engage in full-time study where appropriate. Although there are a good number of students fulfilling these criteria, we also identified individuals who are self-funded and on a more part-time trajectory, as are students fully financed through collaborative institutes. These often also have other commitments and cannot pursue a full-time PhD. We here recommend that mechanisms could be developed to accept such activities as post-graduate contribution including credit contribution.

R4 Governance and metrics: We have made a number of comments regarding governance and metrics for the programme. This is such an important and multifactorial issue for the development of an internationally competitive programme that some recommendations are addressed in more detail below.

The panel agreed that the recording and regular publication of progress and completion rates is a vital element of the quality control that can be expected from every PhD programme. Good statistics on PhD outcomes will help to rank the School nationally and internationally, and will, in the longer run, attract high quality students. For example, we note that on an international comparison, high quality Universities/Institutions present with better completion rates, and this is considered an important measure of programme quality https://www.timeshighereducation.com/news/phd-completion-rates-2013/2006040.article.

We believe that many of the issues with the programme would be resolved with proper programme governance, supported by good information on individual students, and aggregate data that will become the course metrics for success. Below we give the key

functions of the graduate school or a similar organisation and propose some metrics and statistics that can be used to monitor them. We are content that some of these are already implemented, but list them for completion with those that the programme may particular attention to.

Entry requirements and admissions

The University/Programme should record each application for the programme, the outcome of the application with a reason as appropriate. Where the student joins the programme, then the start date and other relevant documentary details should be recorded.

- Total number of applications
- Qualifications of applicants
- 'Offer to study' rate
- Acceptance rate
- Intake per year

All of these are important indicators of the success of a programme, and give early indication of growth, decline or changes in the student demographic.

Appointment of supervisors and learning agreements

Rules for appointment of supervisors should be better established, each student having a minimum of two supervisors. The lead supervisor should have previous experience of doctoral mentorship, whereas the co-supervisor can be a new mentor as appropriate. In line with our own institutions, we recommend that panels be appointed by discussion between supervisors and the existing committee to make the appointment transparent and balanced with the needs of the student. There should exist signed learning agreements between the student, supervisors and faculty. These set down responsibilities of all parties and form the basis of their collaboration. The learning agreement should specify a schedule of meetings between student and supervisors, at least once per month.

Metrics, summary statistics and outcomes

- The names of the supervisors, and the date on which they were appointed.
- Date of signing the learning agreement.

These metrics can be used as an early indication of students who are not engaging with their supervisory team, or vice versa.

Ongoing progress assessment

Students opined that they had little or no formal feedback from their progression reports, and would greatly appreciate independent reviews from independent assessors. The panel felt that a more defined framework needs to be developed that monitors and documents the progress of the student by regular reviews. These meetings should be documented as a record of research progress that can be reviewed by faculty in the case of difficulty.

In line with our own institutions, we recommend that panels be appointed between supervisors and the faculty council. There should be early contact with the assessors at submission of the project proposal. Then at least yearly, each student should have a review of progress. This can take the form of (for example) a one-to-one meeting, an open 'PhD day'. A progress report for the student may be compiled by the assessors and reviewed by a faculty committee/post-graduate school. It should include measures of quality and achievement of milestones. Slow progression and non-achievers need to be identified early and contingencies put in place for help to improve the student's prospects.

Metrics, summary statistics and outcomes

- The names of the progression panel, and the date on which they were appointed.
- Date of submission and approval of the project proposal.
- Dates of meetings.
- Progression report, with recommendation for progression.
- Publications and other scientific outputs from PhD research

These support structures and their success/failure needs to be monitored and revised.

- **Programme engagement and attendance** can be monitored from submission of the project proposal, and the attendance at regular meetings. In addition, a delayed approval of the project should be followed up as an early indicator of a potential difficulty.
- **Progression review:** At least annually, the student's progress against the expectations for a student at that stage can be monitored. Students who are not performing to standard can take remedial action.
- **Stage of study:** This gives early warning of failing or disengaged students. The panel noticed a conflict between research and employment for many Croatian students, and this can reduce their ability to commit time to post-graduate studies. In the worst case, there is anecdotal evidence from other Institutions that students stay in the system indefinitely, and their research loses currency. In the situation where a student is failing, it is preferable to identify this at an early stage so as not to waste the time, money and effort of all members of the research team. While we did NOT note any such concerns here, these data provide objective evidence for outside agencies, giving the confidence to invest in students with an expectation of a return in a reasonable time period.
- **Publications as a metric of quality.** Although this point is not without contention, publications can be used as a metric of the quality of the students and the study programme.

Appointment of examiners and thesis defense

We recommend that panels be appointed by discussion between supervisors and the existing committee. We believe this will make the appointment transparent and balanced between basic science and medicine. Where possible, we encourage the team

to invite an external examiner from a different country. As with all our institutions, this will be an important part in building the case for comparable quality across all programmes in the EU. Members of the expert panel have agreed to make themselves available as volunteers.

Metrics, summary statistics and outcomes

- The names of the examination panel, and the date on which they were appointed.
- Date of submission of thesis.
- Date of defense of thesis.
- Outcome of thesis defense.
- Completion rate
- Time to completion

Completion statistics are a direct indicator of the health of a higher education programme. Despite poor statistics, we understand that completion rates are low across Croatia when compared to PhD completion rates in other EU member countries. Of particular concern is the lack of monitoring in all Institutions, and it frequently remains elusive what happens to the students that initially enroll. A take-away message from our visit to Rijeka is that engagement and completion is relatively good; in which case, it is all the more important that these statistics are transparent and freely available for students and industry who wish to invest time and money into this programme.

Complaints and resolution

Although not the norm, there will inevitably be occasions, where students fail to thrive academically, where they have disagreements with their supervisors or mentors, or where they have other personal difficulties. This may include supervisors being hired away and students being unable to follow for personal reasons. It is crucial to establish a transparent formal complaints procedure, which would protect students and supervisors alike in the event of difficulties. Although these often are not specified in the SER, many programmes have them 'sort of' in place, but they are not clearly formalized and known to the students or supervisors. The panel considers their establishment a genuine sign of excellence even though they may never be put into action.

Metrics, summary statistics and outcomes

- Good records of complaints can be helpful in establishing patterns of poor practice.

COMPLIANCE WITH THE PRESCRIBED CONDITIONS FOR THE DELIVERY OF A STUDY PROGRAMME

Minimal legal conditions:	**YES/NO notes**
1. Higher education institution (HEI) is listed in the Register of Scientific Organisations in the scientific area of the programme, and has a positive reaccreditation decision on performing higher education activities and scientific activity.	YES
2. HEI delivers programmes in the two cycles leading to the doctoral programme, i.e., first two cycles in the same area and field/fields (for interdisciplinary programmes), and employs a sufficient number of teachers as defined by Article 6 of the Ordinance on the Content of a Licence and Conditions for Issuing a Licence for Performing Higher Education Activity, Carrying out a Study Programme and Re-Accreditation of Higher Education Institutions (OG 24/10).	YES
3. HEI employs a sufficient number of researchers, as defined by Article 7 of the the Ordinance on Conditions for Issuing Licence for Scientific Activity, Conditions for Re-Accreditation of Scientific Organisations and Content of Licence (OG 83/2010).	YES
4. At least 50% of teaching as expressed in norm-hours is delivered by teachers employed at the HEI (full-time, elected into scientific-teaching titles).	YES
5. Student: teacher ratio at the HEI is below 30:1.	YES
6. HEI ensures that doctoral theses are public.	YES
7. HEI launches the procedure of revoking the academic title if it is determined that it has been attained contrary to the conditions stipulated for its attainment, by severe violation of the studying rules or based on a doctoral thesis (dissertation) that has proved to be a plagiarism or a forgery according to provisions of the statute or other enactments.	YES
Additional/ recommended conditions of the ASHE Accreditation Council for passing a positive opinion	**YES/NO notes**
1. HEI (or HEIs in joint programmes) has at least five teachers appointed to scientific-teaching titles in the field, or fields relevant for the programme involved in its delivery.	YES
2. In the most recent reaccreditation, HEI had the standard Scientific and Professional Activity marked as at least "partly implemented" (3).	YES
3. The doctoral programme is aligned with the HEI's research strategy.	YES
4. The candidate: supervisor ratio at the HEI is not above 3:1.	YES
5. All supervisors meet the following conditions: a) PhD, elected into a scientific title, holds a scientific or a scientific-teaching position and/or has at least two years of postdoctoral research experience; b) active researcher in the scientific area of the programme, as evidenced	YES

by publications, participation in scientific conferences and/or projects in the past five years (table 2, Supervisors and candidates); c) confirms feasibility of the draft research plan upon admission of the candidate (or submission of the proposal); d) ensures the conditions (and funding) necessary to implement the candidate's research (in line with the draft research plan) as a research project leader, co-leader, participant, collaborator or in other ways; e) trained for the role before assuming it (through workshops, co-supervisions etc.); f) received a positive opinion of the HEI on previous supervisory work.	
6. All teachers meet the following conditions: a) holds a scientific or a scientific-teaching position; b) active researcher, recognized in the field relevant for the course (table 1, Teachers).	YES
7. The supervisor normally does not participate in the assessment committees.	YES
8. The programme ensures that all candidates spend at least three years doing independent research (while studying, individually, within or outside courses), which includes writing the thesis, publishing, participating in international conferences, field work, attending courses relevant for research etc.	*
* Yes, for those that do only minimum coursework (30 ECTS), but NO for those that do 65ECTS	
9. For joint programmes and doctoral schools (at the university level): cooperation between HEIs is based on adequate contracts; joint programmes are delivered in cooperation with accredited HEIs; the HEI delivers the programme within a doctoral school in line with the regulations and ensures good coordination aimed at supporting the candidates; at least 80% of courses are delivered by teachers employed at HEIs within the consortium.	NO*
* Taught part of the programme is delivered with Medical Faculty of the same University (54%), and the rest of classes by research institutes and professionals.	

QUALITY ASSESSMENT

HQ: "high level of quality" **IN: "improvements are necessary"** R-recommendations for improvements	
1. RESOURCES: TEACHERS, SUPERVISORS, RESEARCH CAPACITIES AND INFRASTRUCTURE	
1.1. HEI is distinguished by its scientific/ artistic achievements in the discipline in which the doctoral study programme is delivered.	**HQ:** Biopharmaceutical and biotechnology industries have a high demand for qualified doctoral candidates with an interdisciplinary training in pharmaceutics, biotechnology and medicinal chemistry. As international industries move from chemistry-based to protein-based therapeutic strategies, the interdisciplinary curriculum of this programme is forward-looking and will ensure sustainability of the programme and employability of graduates long into the future. External stakeholder particularly highlighted relevance. Information from the self-evaluation report indicates that there are a total of 42 teachers that deliver the curriculum at the postgraduate doctoral study programme in Medicinal Chemistry. The Department of Biotechnology and the Faculty of Medicine at the home institution of the University of Rijeka employs 11 and 10 full-time teachers, respectively. A further 21 teachers are employed by partner institutions; 14 at the Ruder Boskovic Institute, 6 at the Fidelta d.o.o. Research centre Zagreb and 1 employed at the company Triadelta Partners d.o.o. of Zagreb. There are total of 31 mentors/supervisors of doctoral candidates. The staff has published 266 papers (245 scientific papers and 21 book chapters) in journals with a range of impact factors from 1 to 27.4. From the revised and corrected h-index data of 21 mentoring staff provided during the site-visit, the 21 mentoring staff has WoS h-indices in the range of 5-47 with 3 staff > 30; 13 staff 12-22; and remaining 5 staff ≤ 8. **R:** Continue to encourage staff to increase the number of publication in high-impact international journals to

	improve citations and research impact. Introduce incentive-based scheme to reward staff that secure national & international research funding and publishing in high impact journals. In the past 5 years the staff participated in a number of national and international projects as leading PI or collaborators. Most notable are Marie Curie FP7 Projects, 2 ICGBE Trieste Projects and 5 projects from the Croatian Science Foundation that a lead by staff from the Department of Biotechnology. The staff is also involved as collaborators in at least 50 international research projects, which provide evidence of significant efforts in internationalization of research, education, student mobility and funding. The amount of external funding is significant, relative to the number of staff. On returning to Croatia, new staff should be encouraged to apply for EU reintegration grants. Continue to promote opportunities for staff to engage in more international research projects and exploit more collaborative funding opportunities through research partnerships with external partners and industry. This would help to exploit international opportunities for major EU grant funding to support high quality research in Croatia.
1.2. The number and workload of teachers involved in the study programme ensure quality doctoral education.	**IN:** The curriculum is delivered by teaching staff at the Department of Biotechnology, Faculty of Medicine and External partners (Fidelta, IRB and Triadelta). A total of 42 teachers are involved in the programme. The majority (51%) of the curriculum is delivered by employed staff at the department of Biotechnology and Medical faculty, with appropriate attention given to their total teaching workload and no staff exceeds the 360 norm-hours teaching load. The department is growing with the recent addition of several motivated academic staff and researchers. There is good evidence of shared delivery of the curriculum and student supervision between the department of Biotechnology, Faculty of Medicine and external partners. This enables the maximum utilization of limited staff expertise and resources. It also benefits the doctoral candidates in ensuring the delivery of a modern medicinal

	chemistry and biotechnology curriculum and student mobility in an attractive interdisciplinary doctoral programme. This is a very relevant doctoral programme of high value to external stakeholders and ensures future employment of graduates. Stakeholders did indicate their desire for graduates to have more training in pharmaceutics, documentation and transferable skills, such as proposal writing, and management/organizational skills. **R:** Perform a critical analysis of the teaching curriculum to provide a more student and discipline-focused curriculum which should take account of prior learning of each student, ultimately providing a more streamlined curriculum and reduced staff contact hours. Introduce a curriculum with a reduced number of obligatory modules and enhance discipline-specific elective modules (e.g. Medicinal Chemistry, Biotechnology, and or Pharmaceutics), maximum of 30 credits. Allow students exemptions from areas of study already completed as part of prior learning as undergraduate/postgraduate students. This should provide more time for staff to focus on research supervision, leadership, collaboration and writing.
1.3. The teachers are highly qualified researchers who actively engage with the topics they teach, providing a quality doctoral programme.	**HQ:** The faculty hold scientific-teaching titles, and consist of quality scientists some of which are active in science and peer-reviewed publication in low-medium impact scientific journals with a range of impact factors (1 - 27.4). The faculty employ a sufficient number of qualified and experienced staff with a diverse level of research output, some are comparable to expected European norms, and others could improve research activity and outputs. The research areas of individual staff vary considerably (neuroscience, medicinal chemistry, oncology) adding diversity to the research training, though this may also dilute the focus of the curriculum and training away from medicinal chemistry. **R:** An incentive programme to reward and retain staff publishing at the highest standards should be considered. For example, reduce the teaching and administration

	burden on staff that secure independent research funding or participate in international research collaborations.
1.4. The number of supervisors and their qualifications provide for quality in producing the doctoral thesis.	**IN:** The department and faculty doctoral candidate mentors all hold scientific-teaching titles, and consist of scientists who are active in science and peer-reviewed publication in scientific journals (IP 1.0-14), with a low/mid range citation count. The supervisor/mentor to doctoral candidate ratio is 1:1.65, which is significantly lower that the prescribed maximum (1:3) and indicates the potential for significant future growth of the programme through the admission of funded doctoral candidates. **R:** Supervisors reported that they have large administrative and teaching burden, which should be reviewed to enable increased research activity of staff. Encourage and prioritize recruitment of talented early career researchers (especially Marie Curie fellows) that are supported with reduced teaching & administration responsibilities to enable research career development.
1.5. The HEI has developed methods of assessing the qualifications and competencies of teachers and supervisors.	**HQ:** The Department of Biotechnology have established formal mechanisms for evaluating and assessing qualifications of the mentors, which are prescribed and available online. Before being appointed as a mentor the staff member must fulfil prescribed criteria such as, minimum of 2 year postdoctoral experience, be a PI or co-PI in a national or international research project, minimum level of scientific research activity, minimum number of research publications in past 5 years and a minimum h-index of 4. In section 1.5 of the SER, it is stated that candidates provide an annual report (more detail on Appendix 19 of the SER) on the quality of supervision. The candidates grade their supervisors on a scale of 1 to 5 taking into consideration the following criteria: (a) Clarity in defining research goals and setting expectations on the candidate, (b) Support in planning research activities and professional/personal development, (c) Regularity of the

	supervisor's involvement in the candidate's research, (d) Encouragement and assistance in the publication of research articles, and (e) Quality of relationship between supervisor and candidate. Furthermore, the HEI provides candidates with the ability to change supervisor by way of the request form in Appendix 25 of the SER. From the site visit, it was evident that the doctoral candidates were overall satisfied of the quality of supervision and mentorship they were receiving from their supervisors. **R:** Introduce a more rigorous and auditable doctoral student and supervisor/mentor evaluation policy and procedure. This could become part of the existing annual PhD Day enabling the formal review of research project and student-supervisor performance.
1.6. The HEI has access to high-quality resources for research, as required by the programme discipline.	**HQ:** Biopharmaceutical and biotechnology industries have a high demand for qualified doctoral candidates with an interdisciplinary training in pharmaceutics, biotechnology and medicinal chemistry. As international industries move from chemistry-based to protein-based therapeutic strategies, the interdisciplinary curriculum of this programme is forward-looking and will ensure sustainability of the programme and employability of graduates long into the future. The department is located in a new building with modern research laboratories and facilities. The department has modern research equipment suitable and sufficient for doctoral research projects, including confocal microscopy and mass spectrometry. With the relatively small number of doctoral candidates, the panel had some concerns on how the researchers will provide sufficient use of this equipment. There are also some concerns about how the department will finance maintenance-contracts, repair or replacement of such essential and expensive equipment. Stakeholders did indicate their desire for graduates to have more training in pharmaceutics, regulatory affairs, GMP, documentation, transferable skills, such as proposal writing, and management/organizational skills. **R:**

	Offer external partners or contract research organizations access to core-equipment for a competitive fee. This will provide the department with additional funds to support research activities. Consider recruiting academic staff and researchers with expertise and complementary research interests to increase use and return for investment in such equipment. Consider the introduction of course material in pharmaceutics, regulatory affairs and more desirable generic and transferable skills. External departments or stakeholders may deliver these courses.
2. INTERNAL QUALITY ASSURANCE OF THE PROGRAMME	
2.1. The HEI has established and accepted effective procedures for proposing, approving and delivering doctoral education. The procedures include identification of scientific/ artistic, cultural, social and economic needs.	**HQ:** The SER set down the reasons for establishing the programme in 2008. Notably this included the engagement of local stakeholders in an inter-disciplinary development. For their part, the stakeholders and students were very good ambassadors for the programme. Passionate, but willing to elaborate on quality improvements that have been described here. The SER rightly places high importance on breadth and multidisciplinary in the programme. Currently every unit/department is legally separate; each can establish its own doctoral studies. However since 2016 the Institute of Biomedicine joined strategically with the Faculty of Medicine (now with joint decision-making). The Medical School has its own doctoral programme, and a School of doctoral studies is being proposed at University level (3-5 years hence) to oversee all governance issues related to existing (and new) post-graduate programmes. In principle this should allow for enhanced inter-disciplinary collaborations, but also complicates matters with respect to curriculum content. We learned of the plan to develop a choice of introductory modules over the next 1-2 years. But in practice, current students report financial and/or legal obstacles to their access into a *school of medicine* development programme. The SER places emphasis on internationalisation. We are encouraged with this direction and ambition; studies are primarily in English, all students had worked in a different laboratory, and 5/15 had worked abroad. Nevertheless, we were concerned that the programme did not have a strong

	outward facing profile that might attract further students or collaborators from outside of Croatia. It was difficult to find appropriate information on the website for in-looking students or scientists. The SER had no statistics on employability, and there was a sense that Croatian students had a poor reputation elsewhere; one had submitted 300 CVs overseas without success. This will only be resolved through improved internationalisation. **R:** Develop and advertise the outward-facing presence of the programme. We would like to see a living website with key activities, outputs and performance indicators. Develop and introduce an annual review of PhD student progress. This could be incorporated into the existing annually organized 'PhD day'. The annual review would allow PhD students the opportunity to present their research, allow the course team to review research progress and monitor PhD student-supervisor/co-supervisor relationships.
2.2. The programme is aligned with the HEI research mission and vision, i.e. research strategy.	**IN:** The University's research strategy was provided as an accompanying document. The panel felt this was forward-looking, and helpful in setting the scene for Rijeka on a pan-European stage. Notably, the indicators are accompanied by targets that in most cases are objective outcome measures. The content of the research section (pages 8-10) sets down some ambitious targets that include a 100% increase in doctoral students, and establishing a top-300 position among EU Universities. This document does not fully explain what is happening on the ground where there is a changing profile of the programme. Anecdotally the interests of the supervisors and therefore the areas of PhD study are closer to molecular biology and biomedicine than chemistry. While inter-disciplinarily is encouraged, only 2/15 students in our cohort considered themselves to be medicinal chemists. We read that: The development of private pharmaceutical companies and the strategic goal of the City - building a

	university hospital, developing the research potential of the University – resulted in the need for highly educated staff from the field of natural sciences and medicine. However it was later explained that the name of programme and the specialist courses are historical only. Indeed from the stakeholders there was the feeling that the programme is drifting away from chemistry; that being the case there are other competitive programmes in Croatia. Stakeholders explained that as research-active institutions that don't award degrees but perform research, they require the curriculum to address their needs. In addition to chemistry this included practical industry-facing skills such as regulatory affairs and soft scientific skills: writing; presenting; coping in the world! However, the stakeholders acknowledge that with <1 student per year from each stakeholder institution on average, there are probably not enough chemistry students to sustain the course in its own right. Overall there was a sense that the programme currently has no defined identity and its name Medicinal Chemistry is misleading. There was a suggestion of a need for two programmes or one over-arching programme. At least, the stakeholders agree with the opportunity for students to take elective modules. The department is planning consequent changes in the curriculum and publicising this change through the documents. **R:** Develop better statistical reporting. Thereby establish outcome measures against which the research mission can be evaluated. The programme should seek to establish its identity in a co-design between academics and stakeholders. This needs to account also for the inclusion of Medicine in this programme and the potential support coming from this Faculty. Note: This is an issue inherent to the post-graduate programme and not one of the organisation and conduct of the programme. Consequently, this weighs less in our assessment, but we feel it to be of concern and in need of resolution. Our discussions have clearly established that both programme committee and stakeholders are weary of

	this fact and will address these concerns.
2.3. The HEI systematically monitors the success of the programmes through periodic reviews, and implements improvements.	**IN:** The SER described some assessment of programme quality, but there was a notable lack of statistical evidence to prove this point. The overall monitoring practices were fragmented and in need of an overhaul with stricter timelines and better-defined proxies that objectively measure programme and candidate success. A formal monitoring and feedback process was not seen. In particular, there is some concern that completion is low for some groups of students, particularly those in part-time and teaching assistant roles. Only around 50% of 2011 enrolments have completed. Without adequate progress monitoring and record keeping, it is very difficult to identify issues and the emergence of trends with time. Our own institutions across the EU are obliged to provide these statistics for National Higher Education agencies on a regular basis and the success of students (yearly if not more frequent). Their timely progress is a proxy for the success of the PhD programme of the Schools and Institutions. Better monitoring and the setting of strategic goals may also support progress for attaining grants and funding young researchers. **R:** We would hope to see better record-keeping for future (self) evaluations, in which the metrics (for example: number of applicants, number of enrolled candidates, number of students and stage of study, percentage of dropouts, information on duration of studies, information on how long does it take to complete in time 1st, 2nd or 3rd year, etc.) is readily available and organised per annum. In addition (see also above), statistics on publishing of both students and supervisors could be improved. A more stringent handling of timescales with a strong preference for full-time study. The mandated maximum 10-year programme is too long and should be shortened. This has the added benefit of retaining the currency of the work.
2.4. HEI continuously monitors supervisors' performance and has	**IN:**

mechanisms for evaluating supervisors, and, if necessary, changing them and mediating between the supervisors and the candidates.	11/13 of the supervisors met by the panel were women, and we welcome this clear encouragement into academic roles. The supervisors reported themselves to be limited by time and funding; optimistically their time was split 50:50 research vs. administration and teaching. In addition they are paid based on their teaching role; therefore they cannot readily trade off grant income against teaching. They pointed out that neither the Government nor the University has a long-term strategy for mentorship and development of career researchers; there is an EU office and at the practical level the support of colleagues with little between. Every 5 years the supervisors are considered for promotion: publications; teaching; research are judged by a national committee. Research income is not really assessed, and therefore research can be a labour of love rather than a smart career choice. By the admission of faculty, monitoring of supervisors is not strong with no clear system in place for doing so. The so-called 'direct' measures of impact factor don't necessarily relate to good supervision. Indeed, the faculty appears to break its own rules requiring an H-index > 3 for becoming a supervisor as several are below that; though this is (probably) a mistake in reporting in the SER. 2/15 of the students had co-supervisors, the remainder had 1 supervisor. While this is not best practice, students and supervisors mostly interact well. Candidates were positive about their supervision, but the ambition to expand the programme will inevitably bring difficulties to this practice. At the moment, the students would go to PhD committee with supervisory problems. However they were unsure of the formalities. **R:** Establish a supervisor development programme that actively supports research-active academic staff. A proportion of students have only a single PhD mentor. We note that in the majority of cases the relationship works well. Nevertheless, to give a wider academic perspective, we prefer that students have two mentors. This is particularly important for a multidisciplinary programme and may indeed lead to further cross-fertilisation of ideas between faculties. A related concern is the lack of an appropriate framework to support the student, should there be personal or scientific disagreement with their respective supervisors.

	While this has not been a problem to date, the second supervisor or mentor offers a light-touch means of resolving disagreements without the need to raise a formal grievance. Finally, there is a concern that the pool of supervisors will be diluted without co-supervision across the board. New supervisors need the support of a senior supervisor with successful experience; and senior supervisors are often successful and busy, and therefore need the support of junior members who can offer hands-on support.
2.5. **HEI assures academic integrity and freedom.**	**HQ:** This issue was not discussed in depth. However the University employs systematic methods of plagiarism detection (*TurnItIn*). The panel's experience suggests that this is an appropriate and highly effective way of maintaining academic integrity when used properly. In addition students undergo a public review of their work at which clear breaches of protocol would become apparent and might be reported.
2.6. The process of developing and defending the thesis proposal is transparent and objective, and includes a public presentation.	**HQ:** Documentation regarding the procedures of production and evaluation of a doctoral thesis proposal and defence was referred to, with a comprehensive summary provided in the SER. The appendices were not provided for review, but some were available on the website in English. A committee with at least three (one external) members is responsible for the evaluation of the thesis proposal. The supervisor should not be a member of this committee. The thesis is defended in public before the committee; details were given in the SER.
2.7. Thesis assessment results from a scientifically sound assessment of an independent committee.	**HQ:** Documentation describing the thesis development, structure, and defence was provided for review. We note that two high-quality publications are a requirement of graduation. The panel had the opportunity to review a selection of theses produced from the programme. We note that theses can be written under the Scandinavian model of published works, though this route is relatively uncommon.

	The majority of theses were less than 100 pages, reported on a single research theme, and contained brief Methods and Results sections. Some theses were extremely short. In the European context the panel feel it unlikely that these would be considered an adequate synthesis of a 3(4)-year programme of PhD-level work unless the quality was unprecedented. In comparison to the European norm, the body of work is typically more in keeping with a Masters (MPhil or MD) thesis, approximating to no more than two years of full-time research work. Nevertheless, our impression was that the scientific content of the theses was of high quality. **R:** With the goal to improving thesis quality to a European standard, thesis committees are to include at least one external member that is from a different European country; we note that this member at present can be from other faculties, or from partner institutions. Since the examination is an enormously important part of the PhD process and of the quality control for the programme, we believe that external members should where possible be exactly that; from a University/Institution with no link to the University of Rijeka. In particular, an international presence in defence panels would be desirable.
2.8. **The HEI publishes all necessary information on the study programme, admissions, delivery and conditions for progression and completion, in accessible outlets and media.**	**HQ:** The web site provides helpful information on the study programme in the English language. This includes: news; programme guidelines; the syllabus; project outlines; scientific outputs; important contacts. We note however that the website is not current (last post: September 2017), and some of the web links have not been populated (for example: e-learning). In addition, there is room for further information on Internationalisation and on providing student-friendly information. The site is functional, but there is little to attract a prospective student. **R:** A very helpful start. We note that on occasions, the programme does not market itself as effectively as possible. This includes: missing or out-of-date information on websites; and missed opportunities to bring the

	programme to wider attention. The HEI should develop the web site and invest in informing students and incoming academics of their opportunities.
2.9. **Funds collected for the needs of doctoral education are distributed transparently and in a way that ensures sustainability and further development of doctoral education (ensures that candidates' research is carried out and supported, so that doctoral education can be completed successfully).**	**IN:** While the tuition fee is competitive, the evidence to support it is weak. The SER gives a very anecdotal explanation of the costs of running the institution, appealing to the high costs of modern equipment and facilities. The link with Medicine is also used to muddy the waters. For example: *candidates can enrol and take up two modules from the programme of Faculty of Medicine* adds academic value but doesn't seem relevant to the costs, and in addition has been contradicted by the students themselves on the ground (see: 2.1). In addition, we heard anecdotally that some students enrol without paying, and some teachers teach without being paid. All this points to a lack of transparency and/or equality. **R:** We have no reason to dispute the costs, but transparency to the students and to others looking in (for example: to this panel) would have been helpful. We must reserve judgement on this question.
2.10. **Tuition fees are determined on the basis of transparent criteria (and real costs of studying).**	**IN:** Tuition fees are (apparently) calculated by dividing the total costs of the institute by the number of students to arrive at a reasonable and defensible figure. However the basis of the calculation was not clear. This makes sense if the *Class 3 costs* and *Class 4 costs* shown in the calculation are in fact income, while *Reduction of Income* are the costs. None of this is clear. The panel also felt uneasy about the status of many students, for which only data were available for when they enrolled, but not for which academic class they had progressed to and consequently what fees were yet to be paid. **R:** While the basis of the fees calculation – total cost divided by number of students - is reasonable, it is difficult or impossible from the information given to make an assessment of expenditure versus income for the costs.

	This is effectively the same observation as for 2.9 and a more stringent accounting system and better student class lists are needed.
3. SUPPORT TO DOCTORAL CANDIDATES AND THEIR PROGRESSION	
3.1. **The HEI establishes admission quotas with respect to its teaching and supervision capacities.**	**HQ:** The HEI has established an annual admission quota of 20 new PhD candidates from a systematic evaluation of their supervising capacity (currently there are 31 supervisors and 51 doctoral candidates, providing a supervisor: candidate ratio of 1:1.64) and supervisor competence (outlined in detail in section 1 of the SER and Appendix 17). The criteria for supervision are described in section 1 of the SER and in Appendix 14 ('Regulations on Studies of the University of Rijeka') and Appendix 16 ('Minimal requirements for supervisor selection on postgraduate university studies at the University of Rijeka'). According to the SER, while not all current supervisors meet the established criteria, the HEI anticipates full systematic implementation of the supervisory requirements in the 2018/2019 academic year. From the site visit, it was evidenced that the candidates were overall satisfied of the quality of supervision they were receiving from their supervisors.
3.2. **The HEI establishes admission quotas on the basis of scientific/ artistic, cultural, social, economic and other needs.**	**IN:** The admission quota provided in section 3.1 of the SER (20 new candidates annually) also considers the industrial needs within the Republic of Croatia, as evidenced by the HEI's connection to Ruđer Bošković Institute and Fidelta, and scientific and academic needs worldwide (see section 2.2. of the SER, in which the HEI references global trends in Biotechnology). Furthermore, the HEI considers local needs, for example in the 'City of Rijeka Development Strategy' (Appendix 24 of the SER). According to the SER, each graduated PhD candidate is employed. 6 of the 7 graduated candidate's work in the public/academic sector, while only 1 graduated candidate works in industry. The HEI is actively remediating this discrepancy in candidate's exposure to industry through direct communication with the private sector. In the SER,

	the HEI emphasizes the success of these communications by mentioning the fact that the Fidelta pharmaceutical company currently employs 6 of their 51 doctoral candidates. The HEI appears to have a growing interest in neuroscience and molecular biology. The economic interests of the stakeholders (Fidelta, HALMED, BIOcentar Zagreb, JGL) are predominantly in pharmaceutics. The meeting with the stakeholders indicated that they are fond of the Medicinal Chemistry doctoral program, in particular it's interdisciplinary. However, stakeholders voiced concern about the taught elements in the doctoral program moving away from Chemistry and towards Biotechnology. Stakeholders are motivated to take an even more active role in the shaping of the curriculum to ensure graduates are prepared for careers in industry. **R:** The HEI is encouraged to consider the discrepancies in stakeholder expectations and the perceived direction of the curriculum of the doctoral programme in terms of its sustainability. At the site visit, the management indicated that it is the HEI's intention to bring in more Chemistry expertise to the programme suggesting some discrepancies are already being addressed. The stakeholders have shown willingness to contribute in this regard, for example by providing teaching in the under-represented research fields and to be more involved in the advising of the program curriculum. A programme advisory board could be established, consisting of the program team and representatives from industry and employers.
3.3. **The HEI establishes the admission quotas taking into account the funding available to the candidates, that is, on the basis of the absorption potentials of research projects or other sources of funding.**	**IN:** According to the SER, all candidates are funded in full or partially by research projects. Appendix 39 of the SER provides a list of the candidates and the research projects from which they are funded. While the candidates were satisfied with the support they receive from supervisors, many were performing their doctoral studies without salary. The HEI has indicated that their goal is to ensure all newly recruited students are on projects with stipend. The majority of research funding at the HEI is from the Croatian Science Foundation, which limits the number of PhD salaries it can fund to 1. This limitation is not applicable to the purchase of equipment, materials, and

	other research expenditures. The HEI has been able to therefore fund the research costs of multiple PhD students from their Croatian Science Foundation funds. The number of unsalaried candidates is disconcerting. However, the candidates were made well aware of these circumstances prior to enrolling. The fact that candidates enrolled and continue to be passionate ambassadors for their research at the HEI (as evidenced in the site visit) is a testament to the quality of the HEI. A positive note from the meeting with candidates is their mobility. The annually organized 'PhD day' brings in speakers from industry and research institutes to inform candidates of possible career paths and opportunities. **R:** The HEI is encouraged to reduce and eventually eliminate the number of doctoral candidates without a salary. This goal can be achieved, for example, by continuing their efforts in seeking funds, e.g. from the Croatian Science Foundation and from the European Union. The success rate of proposals could be further increased by introducing an effective proposal writing support structure, either within the HEI or at the university with the help of other departments. Furthermore, the HEI has a strong network of stakeholders that are willing to take steps forward to ensure sustainability of the doctoral program. Involving stakeholders in proposed research projects can add to their effectiveness and increase probability of success.
3.4. **The HEI should pay attention to the number of candidates admitted as to provide each with an advisor (a potential supervisor). From the point of admission to the end of doctoral education, efforts are invested so that each candidate has a sustainable research plan and is able to complete doctoral research successfully.**	**HQ:** When applying to the doctoral program, prospective candidates are required to identify a supervisor, who is encouraged to also provide a recommendation letter for the applicant. When reviewing an application, the Commission for Postgraduate Studies ensures that the approved candidate is provided with a suitable supervisor and, in the case that the supervisor is absent, provides a temporary supervisor. The HEI requires that candidates have a supervisor throughout the entire duration of their studies. The HEI does not currently mandate that all of its students produce a work plan; at present, only students funded by the Croatian Science Foundation, among other competitive

	research institutions, are required to have a work plan for all years of study upon enrolment. The HEI, however, works towards making a doctoral work plan a prerequisite for all students, irrespective of funding source, by the end of their first year of studies. Furthermore, the HEI proposes to introduce a rigorous requirement for candidates to defend their doctoral thesis topic in the first half of the second year of study as a milestone for progression into year 3, as opposed to the current defence of this topic prior to enrolment. Fulfilments of these requirements by the candidate are reported yearly to the Council of the Department of Biotechnology by the supervisors, see 'Supervisors Annual Report' (Appendix 38). Despite the limited funding, the general opinion of the candidates with respect to their relationship to supervisors and pastoral care was positive. All candidates at the site visit indicated that they are involved in doctoral research from day 1 of the program. Furthermore, the HEI organizes an annual 'PhD day', in which candidates showcase their research. These practices in monitoring and supporting candidates are commendable. However, most candidates had no co-supervisor or independent advisor. **R:** As a general suggestion, the panel would like to see candidates assigned co-supervisors and an independent (e.g. external) advisor to provide more robust support in the case issues arise. Furthermore, the panel has observed that requiring candidates to enrol every year can strengthen progress monitoring as it gives candidates and supervisors alike the opportunity to review their obligations.
3.5. **The HEI ensures that interested, talented and highly motivated candidates are recruited internationally.**	**HQ:** Industry partners are informed about calls for applications by the HEI through announcements in the HEI's Official Gazette, in well-known media outlets, and on the HEI's website. Advertisement of these calls does not currently have an international scope, even though the HEI involves students from abroad (three foreign students are currently enrolled in the PhD study program). The HEI is taking a proactive approach to broadening their international reach through several strategies, including

	the introduction of official study programs in English and increasing advertisement. Furthermore, the HEI is seeking dedicated financing for this transition from the European Structural Funds. The HEI has indicated that they foresee the introduction of English-based curriculum by the 2020/2021 academic year. An international student at the HEI was satisfied with the HEI's delivery of the program in English, which serves as a testament to the capacity of the HEI to successfully conduct the PhD program in English. The HEI is taking steps towards ensuring the best undergraduate and graduate students at the university are informed and prepared for high quality doctoral study. There is also a plan to improve recruitment and reputation among the PIs/researchers in Croatia, particularly among the collaborating institutions (IRB institutes in Zagreb, among others). **R:** The panel commends the HEI for these efforts and encourages the HEI to take steps in introducing the English instruction as soon as possible. As the HEI enrols more international candidates, it should consider establishing a dedicated office for international student support. Such an office can be instituted earlier and include efforts in increasing internationalization of the PhD program, e.g. through recruitment and advertising abroad. Mobility of supervisors can also help to increase visibility of the study program to foreign students.
3.6. **The selection process is public and based on choosing the best applicants.**	**HQ:** The HEI has an established scoring mechanism when evaluating applications, described in section 3.4 and Appendix 41 of the SER. The selection is performed by the Commission for Postgraduate Studies. Criteria in the scoring include the applicant's past academic performance (by way of the grade point average), a recommendation letter by prospective supervisor (not mandatory, but helpful), previous research work and publications, and motivation to pursue the study program (by way of motivation/personal statement). As mentioned in section 3.4, the defence of doctoral thesis topic is currently a condition for application to the third year of study. The HEI seeks to change this as per 3.4. At the site visit, candidates

	indicated that their enrolment included a discussion with their prospective supervisors, in which the candidate's research skills and previous collaborations were taken into consideration. Candidates were very motivated despite financial limitations at the HEI.
3.7. **The HEI ensures that the selection procedure is transparent and in line with published criteria, and that there is a transparent complaints procedure.**	**HQ:** Upon making a decision, the HEI publishes the names of selected candidates on their website. According to the SER, a rejected applicant is given 7 days to file a complaint on the outcome of the selection process. The Commission for Postgraduate Studies will provide rejected applicants with feedback on the application, detailing the shortcomings and providing constructive feedback to help the applicant rectify them. At the site visit, candidates were not aware of a concrete complaints procedure. Any issues that arose would be communicated informally. **R:** The panel strongly advises the HEI to establish formal procedures for managing complaints. If procedures are already established, the HEI should inform candidates of their existence and where they can be found upon enrolment and preferably also at regular intervals throughout the study, e.g. annually at PhD events.
3.8. **There is a possibility to recognize applicants and candidates' prior learning.**	**IN:** The candidate can request recognition of past ECTS credits, such as those from previous doctoral programs. The HEI also allows for conversion of research activities into equivalent ECTS credits. As laid out in Appendix 14 and Appendix 26, the HEI can exempt the candidate from the doctoral requirement to take classes and exams in the case that the candidate (a) publishes at least three first-author papers, (b) attends at least one semester at a research institution, and (c) has actively participated in at least two international scientific conferences. Candidates who hold a Master's degree in a similar field will have much of the required fundamental knowledge covered in the required coursework (30 ECTS). This can lead candidates to take courses that do not add to their skillset. These courses could be substituted, for example, with more practical training such as operation of specific equipment necessary for upcoming research. Candidates

	found that the most useful course among those that are mandatory is 'Methodology in Scientific Research'. The candidates indicate that their research background and skills are recognized by their prospective supervisors upon enrolment. However, the coursework requirements at the HEI do not provide the same customization to a candidate's prior learning. **R:** The panel would like to see the HEI increase the level of customization in the required coursework to the candidate's past learning. Furthermore, stakeholders (employers) indicated their desire for graduates to have more training in transferable skills, such as responsible conduct of research (research integrity) research ethics, statistical analysis, proposal writing, and management/organizational skills.
3.9. **Candidates' rights and obligations are defined in relevant HEI regulations and a contract on studying that provides for a high level of supervisory and institutional support to the candidates.**	**HQ:** Sections 2.6 and 2.7 of the SER outline the step-by-step process that a candidate must follow to successfully complete the doctoral study program. The official documents providing detailed information on the rights and obligations of the candidate are Appendix 14, Appendix 27, and Appendix 28 of the SER. A table is provided in section 3.9 of the SER to simplify the contents of Appendix 28 for review. The HEI provides applicants to the program a public discussion on the structure of the doctoral study and explicitly presents the rights and obligations of candidates. The HEI also organizes annual meetings for candidates (at any level of their doctoral study) to be informed on their rights and obligations. The possibility of changing the direction of doctoral research is also discussed in these meetings, which ensures the candidates are aware of the institutional support provided by the HEI. Upon acceptance, the candidates have the opportunity to tailor the curriculum to their research interests (being able to account for 35 ECTS of elective courses). In section 1.5 of the SER, it is stated that candidates provide an annual report (more detail on Appendix 19 of the SER) on the quality of supervision. The candidates grade their supervisors on a scale of 1 to 5 taking into consideration the following criteria: (a) Clarity in defining research goals and setting expectations on the candidate, (b) Support in planning research activities and professional/personal development, (c) Regularity of the

	supervisor's involvement in the candidate's research, (d) Encouragement and assistance in the publication of research articles, and (e) Quality of relationship between supervisor and candidate. Furthermore, the HEI provides candidates the ability to change supervisor by way of the request form in Appendix 25 of the SER. The candidates are aware of their obligations, although the formal complaints procedures were not well known. The HEI organizes an annual PhD day in which they update candidates with respect to their rights and obligations. **R:** The suggestion in section 3.7 regarding more transparency in the complaints procedures is also relevant here. While the candidates are fully informed of the uncertainty in salary and are generally satisfied with the level of supervision and pastoral care, the panel would like to see the HEI ensure more institutional support in terms of securing research funding and salaries. Furthermore, the panel suggests that all candidates be provided with a co-supervisor and/or an independent advisor to strengthen institutional support mechanisms.
3.10. **There are institutional support mechanisms for candidates' successful progression.**	**IN:** Each step of the candidate's development of the research topic requires consent of the supervisor and approval by the appropriate committee on ethics at the HEI. The HEI provides supervision of a candidate's progression by way of the compulsory supervisor's annual reports. The annual candidate's report on the quality of supervision also adds to the robustness of the support mechanisms in the case that the supervisor is not suitable. The Commission for Postdoctoral Studies oversees each candidate's progression by reviewing the annual reports and any requests it receives; the SER states that the Commission for Postdoctoral Studies issues decisions on issues readily. At the time the SER was compiled, the HEI did not have any institutional framework for financially supporting candidates in the participation at national and international conferences. However, the HEI plans to introduce a dedicated fund for this purpose. Additionally, the HEI envisions introducing awards for high quality doctoral theses. As a further motivation for successful progression, candidates are required to publish at least one first-author research paper or at least two co-author

	papers in renowned research journals. In section 1.1 of the SER, the HEI states that doctoral candidates begin their doctoral research immediately. This was verified by discussions with candidates at the site visit. Many doctoral candidates were not salaried; this is a large source of concern for the panel. However, 40 of 51 candidates were exempt from paying tuition fees. Decisions on research costs rests solely on the supervisors. Despite the large number of unsalaried candidates, the HEI has been able to maintain a supportive environment as evidenced by the candidate satisfaction survey and the feedback received from candidates at the site visit. The mobility of those candidates at the site visit who were in their later years of doctoral study was laudable. Annual events such as the 'PhD day' being organized at the HEI help in the monitoring of candidate progression and are praised by the panel. These efforts are indicators that the HEI has organized itself to ensure satisfaction and successful progression of candidates. **R:** The panel would like to see the HEI ensure salaries for every doctoral candidate. The HEI is encouraged to increase their efforts in seeking funding, for example from European sources. The strong industry/stakeholder relationship and international network (observed from mobility of candidates) can be an asset in the writing of successful research proposals. Stakeholders are willing and motivated to participate in this regard. Having a doctoral school at the level of the university would significantly strengthen the support of candidate progression. This is particularly relevant given the interdisciplinary nature of the doctoral programme.
4. PROGRAMME AND OUTCOMES	
4.1. The content and quality of the doctoral programme are aligned with internationally recognized standards.	**IN:** Although there are numerous elements that were considered as positives for this programme, there is an offset by elements that weigh negatively. Pros: - the panel accepted the need and enrichment of the research culture through intense collaboration with partner institutions as strength. This offers a concrete job perspective for either industrial or academic careers for the students. - a benefit that also arises from these collaborations is the

	access to specialist equipment provided by the partners. Our assessment of the equipment within the department itself offered a mixed insight into setups; there was high tech new equipment available for specialist analyses but we found little breadth in modern technologies and identified the need for a better global infrastructure. - students engage in laboratory activities very early on during the course of the programme and interact regularly with their mentors; supervisors have a keen interest in publication as a metric for their own success and documentation towards their employer. Cons: - There is a low level of state funding for PhD projects available although the panel was impressed by an overall good success rate of programme mentors for such funds. In addition, there are very limited alternative sources available as Croatia does not have a charity culture, which is available in other European countries (UK, France, etc.). We noticed that there is limited progress in the coming years on this issue. - A high percentage (>50%) of enrolled students do not pay fees. A trade off of the inter-institutional collaboration for this programme is the fact that fee waivers are provided for students from other HEI or partner organisations. While this on one hand makes the programme an attractive and financially lucrative option for these partners and leads to increased numbers of students, it on the other hand places considerable financial strain on the department and university for the conduct of the programme. Although the department considers introduction of a fee-for-all policy, this may have other consequences. For example, teachers and supervisors from partner institutions contribute their efforts in kind and are not drawing on departmental reimbursements. This money saving arrangement may be in jeopardy if fees become compulsory. An overall lowering of taught course work would possibly help and reduce overall costs. In a more international /inter-European context, some issues came up: i) we already alluded to the fact that considerable amount of teaching efforts and costs are devoted to course work that often is irrelevant for specific students. This is not only time consuming for the students, but also lecturing staff. A total of 65 credits (ECTS) are excessive in a pan-European comparison. ii) we noticed that as a nation-wide rule, a maximum of 10

	years is allowed for students to complete their PhD. This is highly irregular in an international context where students typically take no longer than 3-4 years (a 4-year PhD funding period is considered for all funders in UK as a maximum. We noted that the whereabouts of some students are not clear and find this not acceptable in terms of the responsibility of the University as an institution. **R.** The issue of financial support and whether the fees are a compulsory element or can be waived is to be discussed between the Department and collaborating partners and we have little to contribute here. Suffice to say that a lower teaching burden may also alleviate some of the financial constraints and the integration of the Medical School offers the possibility for a revamp of the current cost model. We have already identified course work as a burden for students and staff and suggest an overall reduction of the taught elements to no more than 20 percent of the overall contribution in ECTS. The panel accepted that efforts have been made in recent years towards this aim, but generic courses on skills and methodology, ethics, statistics and microscopy or imaging etc. should become more wide-spread and could, given there are other post-graduate programmes at University of Rijeka, even be shared with these programmes. We feel they would then provide real value for money. In terms of time limits, we accept that self-funded students often struggle to adhere to full time study, but taking a year of absence should only be supported in case of exceptional reasons. A formally agreed gap year (example: motherhood) then should not be counted towards the PhD at all and students should be encouraged to swiftly return and complete their studies. Delays such as inaccessibility of equipment or unavailability of drugs etc. should be avoided under all circumstances.
4.2. **Programme learning outcomes, as well as the learning outcomes of modules and subject units, are aligned with the level 8.2 of the CroQF. They clearly describe the competencies the candidates will develop during the doctoral programme, including the ethical**	**HQ:** Contradictory was the discussion about Ethics and how it was taught. While students seemed to be unaware of it, supervisors clearly explained that all structures are in place to provide ethical guidance and adherence to international standards. It thus seems that the University has all structures in place necessary for the planning and conduct of work with for instance human samples or

requirements of doing research.	animal and individual permissions have to be acquired and are time limited. It therefore appears that students do not value the importance of research ethics as high as is required in modern day's science and this has to be reinforced through a more formal process. Experience tells that similar student behaviour can be observed in other European countries and is not unusual in Croatia. The panel is confident that these minor glitches can be ironed out within the department in due course and this may include the use of supervisors and mentors.
4.3. Programme learning outcomes are logically and clearly connected with teaching contents, as well as the contents included in supervision and research.	**HQ./(IN.)** While the panel perceived the teaching content in general as positive and well aligned with the requirement s and competencies needed to adhere to level 8.2 of the CroQF, and the main teaching genuinely addresses issues of Medicinal Chemistry. This is likely historical, and at odds with the current departmental students and research profile, which lacks in chemistry. We have commented on this issue several times in this document; with us, the supervisors and teaching staff are aware of this disconnect and in the process of remediation. As for the teaching content as such, it clearly supports a 'Medicinal chemistry' focus and appears of high quality.
4.4. The doctoral programme ensures the achievement of learning outcomes and competencies aligned with the level 8.2 of the CroQF.	**IN:** The panel assessed whether the research outcome is equivalent in the context of EU requirements and self-formulated aims. This was based on: ● Sample theses provided. These were mixed in terms of data volume and presentation, and some contained only short results sections, while others linked to multiple publications; ● Sample publications listed. These again appeared of mixed quality from high to low impact and from substantial review of literature to brief communication of results. Given the breadth of the programme and the considerable deviation from Medicinal Chemistry as a research topic, this result is to be expected. Add to this the fact that many students are simultaneously conducting research for the programme partners and this has priority, multiple levels of depth in their

	theses and publications are a given. Issues identified here closely connect to others already highlighted above, such as the discrepancies between teaching and research topics, self-funded students and their need to find support for their living wages etc. There is clearly the potential to improve the overall quality of the programme, and it is the suggestion of the panel, that stronger competition at entry to pre-select high performing students and an audit of the quality of work from mentors / supervisors would be worthwhile in this context. This was unfortunately not possible during our audit, but should be conducted regularly through a University internal review.
4.5. Teaching methods (and ECTS, if applicable) are appropriate for level 8.2 of the CroQF and assure achievement of clearly defined learning outcomes.	**HQ:** In depth examination of this question was impossible given time constraints. There is also some overlap with proposed learning outcomes (see above) and we noted that many courses are lecture heavy and credits hinge on successful completion of an end-of-course examination. This in itself does not carry a negative connotation, but the panel felt that post-graduate education should embrace multiple teaching styles (seminars, students presenting case studies, tutorials, interactive discussions of research data) and examinations may be avoidable through regular in-course assessment of individual performances. Some courses (generic skills, statistics) were highlighted as clearly enabling and supporting the research. Other generic courses may be set up in the near future. Highly commended elements specific to post-graduate education include the post-graduate day with presentations and posters of the student work.
4.6. The programme enables acquisition of general (transferable) skills.	**IN:** Soft and transferable skills are addressed in specific courses and modules include grant writing and project management. These are important elements of today's research but we were unable to follow up on the research governance within each research group or how strictly these guidelines are considered

	in every day bench work of individual students. We are content that such elements could be strengthened with more in depth or advanced methods of statistics, experimental design, data reproducibility, and others. The reduction of specialist courses would allow for a more generic teaching in year one and support both scientific practice, but also principles of scientific conduct. We also realize that some students become teachers themselves, a not always fully paid activity. As compensation, they may be awarded extra ECTS for the generic skill of teaching and education. As a side note, this may help to curtail the length of study in these students.
4.7. **Teaching content is adapted to the needs of current and future research and candidates' training (individual course plans, generic skills etc.).**	IN. We have already highlighted the fact that research within the department and the close ties with the Medical School has shifted the research more towards biological subjects, neuroscience and cancer amongst them. Financial support in these areas of research also helped to establish high quality research in these fields. This contrasts with the original ambition of a department with considerable Medicinal Chemistry skills. At present, taught course are more in line with Medicinal chemistry and do not strongly support the research. Nevertheless, management is aware and seeking to resolve this disconnect. A somewhat related issue are reports from students not being able to enter valuable courses at the collaborating Medical Faculty, which runs a post-graduate programme itself. However, the panel feels that the novel collaboration will smoothen as such teething problems are already addressed.
4.8. **The programme ensures quality through international connections and teacher and candidate mobility.**	**HQ:** The panel noted considerable internationalisation in this programme, especially based on research collaborations and engagement in international research projects. The students benefit from this situation as many spend small parts of their research

	work in laboratories outside Croatia. We are aware of the selection of foreign laboratories and in a considerable number of cases these are Croatian-led laboratories. Such a positive element should be widened and a brief stint in a foreign laboratory may become a compulsory element of this programme. The students clearly seemed to like the challenge in terms of foreign laboratory, research approaches, language and living and recent recruits clearly favor writing a thesis in English as their 'research language'. Somewhat limiting to this internationalization process is the fact that taught courses are not yet in English and thesis writing is not yet compulsory to be using the English language. A transition is projected for the coming years and considered vital for the broadening of the programme and the better integration into European post-graduate studies. In addition, we have not seen co-supervision from two European partners (co-tutelle) in this programme, but are confident that a broadening of nations of candidates will generate such structures in due course.

*** NOTE: RECOMMENDATIONS OF THE EXPERT PANEL TO THE ASHE'S ACCREDITATION COUNCIL AND QUALITY LABEL**

The role of the Expert Panel in the re-accreditation of doctoral study programmes is manifold. The Expert Panel or part of the Expert Panel visiting a higher education institution drafts a report on the basis of a self-evaluation report, the accompanying relevant documentation, and a site visit to HEI. The draft report is adopted by all members of the Cluster Expert Panel, while the president of the Cluster Expert Panel is responsible for coordinating the assessment levels.

The report contains an assessment on whether a doctoral study programme delivered at a higher education institution complies with the prescribed laws and by-laws, as well as any additional/recommended requirements defined by the Agency's Accreditation Council, and whether a higher education institution can obtain a positive, i.e. satisfactory quality assessment according to the criteria set out in this document. Moreover, the Expert Panel must make recommendations for quality improvement.
Based on the assessment of all these elements, the Expert Panel may propose to the Accreditation Council of the Agency to issue either a confirmation on compliance, a letter of expectation for the period up to three (3) years in which period the higher education institution should eliminate the identified deficiencies, or to deny the license.

If the Expert Panel has assessed that a doctoral study programme delivered by a higher education institution does not meet legal and other requirements or that the quality of a study programme is not ensured (i.e. that HEI does not meet additional requirements or recommendations made by the Accreditation Council, or has a very poor quality assessment), they should propose to the Accreditation Council to deny the license.

If the Expert Panel considers that the relevant laws and bylaws have been met by a higher education institution, but that certain elements mentioned above do not meet the quality requirements, while they consider that the identified shortcomings can be corrected within a time frame of three years, they should issue a letter of expectation.

If the Expert Panel considers that all legal and additional/recommended requirements have been met and the quality assessment is satisfactory, i.e. that a study programme fulfils the learning outcomes appropriately defined for that level and scientific area, they may propose the issuance of a certificate and have a HEI commit to quality improvement and reporting to the Agency during the follow-up period.

Finally, if the Expert Panel has, in accordance with the criteria mentioned above, proposed issuing the certificate of compliance and assessed that, in addition to meeting the minimum quality requirements – i.e. the qualification framework level - for a study programme, the programme should be identified as a doctoral programme of a 'high level of quality', the Expert Panel may propose to the Agency's Accreditation Council that such a doctoral study programme be awarded the 'high quality label'. Thus the Agency, with the consent of the Accreditation Council, grants a higher education institution the right to use the label for their academic and promotional purposes.
The 'high quality label' cannot be proposed or awarded to a programme or a higher education institution that does not comply with the requirements laid down by the laws and bylaws mentioned

in this document, and any additional requirements recommended by the Accreditation Council. Moreover, the quality assessment awarded to a study programme should reflect a high level of quality inasmuch that at least half of the sub-criteria in each of the quality assessment criteria are assessed as being of high quality. The Accreditation Council of the Agency issues a final opinion on the label awarded. The content and form of the quality labels shall be prescribed by the Agency in a relevant general act.

The Accreditation Council of the Agency discusses the final report with all recommendations and suggestions, and issues their opinion on the report. Based on a prior opinion of the Accreditation Council, the Agency issues an Accreditation Recommendation to the minister responsible for science and higher education, and upon receipt of the minister's final decision on the outcome of the procedure, awards the 'high quality label" to a higher education institution.