



**Report
of the Expert Panel
on the REACCREDITATION
of the Postgraduate interdisciplinary university study programme in
Molecular Biosciences
Josip Juraj Strossmayer University of Osijek**

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INTRODUCTION

The Expert Panel appointed by the Agency for Science and Higher Education (ASHE) created this Report on the Re-accreditation of the Postgraduate interdisciplinary university study programme in *Molecular Biosciences* on the basis of the Self-Evaluation Report of the Programme, other documentation submitted and a visit to the Josip Juraj Strossmayer University of Osijek.

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:

- Mark Davies, Professor, Faculty of Health Sciences and Wellbeing, Sunderland University, United Kingdom of Great Britain and Northern Ireland
- R. J. Pieters, Chair of Chemical Biology of Multivalent Systems, Utrecht University, Netherlands
- Mathias Senge, Chair of Organic Chemistry, Trinity College Dublin, Ireland
- Fabian Cerda, doctoral student, Max Planck Institute of Biochemistry, Germany
- Marianne Holmer, Professor, Head of Department of Biology, Syddansk Universitet, Denmark
- Isabel Sá Nogueira, Associate Professor, Head of Laboratory, Faculdade de Ciências e Tecnologia Universidade NOVA de Lisboa, Portugal
- Inger Elisabeth Måren, Associate Professor, Department of Biological Sciences, University of Bergen, Norway

- Peter Bennett, Reader in Biodiversity and Evolutionary Ecology, University of Kent, United Kingdom of Great Britain and Northern Ireland
- Domagoj Vugić, doctoral student, Institut Curie, France
- Maalte Braack, Director of Mathematical Seminar, Christian-Albrechts-Universität, Kiel, Germany
- Barbara Drinovec Drnovšek, Professor, Fakulteta za matematiko in fiziko, Univerza v Ljubljani, Slovenia
- Sebastian Eterovic, doctoral student, Mathematical Institute, University of Oxford, United Kingdom of Great Britain and Northern Ireland
- Donald Bruce Dingwell, Department for Earth and Environmental Sciences Chair of Mineralogy and Petrology, Ludwig-Maximilians-Universität München, Germany
- Giovanni B. Andreozzi, Coordinator of the Ph.D. programme in Earth Sciences, Sapienza Università di Roma, Italia
- Ponfa Roy Bitrus, doctoral student, Department of Geology and Petroleum Geology, University of Aberdeen, United Kingdom of Great Britain and Northern Ireland
- Anders Omstedt, Professor Emeritus, Department of Marine Sciences, The Faculty of Science, University of Gothenburg, Sweden
- Rafael Laso Perez, doctoral student, Max Planck Institute for Marine Microbiology, Germany
- Kai-Olaf Hinrichsen, Professor, Technische Universität München, Germany
- Alexandra Pinto, Associate Professor, Director of PhD programme in Chemical and Biological Engineering, Universidade de Porto, Portugal
- Mohamed Hussien, doctoral student, Faculty of Chemistry and Pharmacy, L. M. Universität München, Germany
- Mikael Rinne, Associate Professor, Aalto University, Finland
- Anders Omstedt, Professor Emeritus, Department of Marine Sciences, The Faculty of Science, University of Gothenburg, Sweden.

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

- R. J. (Roland) Pieters, Chair, Chemical biology of multivalent systems, Utrecht University, Netherlands
- Isabel Sa Nogueira, Universidade Nova de Lisboa, Portugal
- Domagoj Vugić, doktoral student, Curie Institut, Paris, France.

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

- Josip Hrgović, coordinator, ASHE
- Jelena Pataki, interpreter at the site visit, 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
- External stakeholders.

The Expert Panel also had a tour of the library, research and other facilities.

SHORT DESCRIPTION OF THE STUDY PROGRAMME

Name of the study programme contained in the licence: Postgraduate interdisciplinary university study programme in Molecular Biosciences

Institution delivering the programme: Josip Juraj Strossmayer University of Osijek

Institution providing the programme: Josip Juraj Strossmayer University of Osijek (with different constituents, without official contract of joint degree, or cooperation)

Place of delivery: Osijek (although officially registered only in Osijek, the SER lists also Dubrovnik, Zagreb and Rovinj)

Scientific area and field: Officially registered as a programme in Interdisciplinary fields of sciences, but HEI issues diplomas in the fields: Natural Sciences, Biomedicine and Health Sciences, Biotechnical Sciences.

Number of doctoral candidates: 110 at present

29 fully funded for research (employed within HEI or research sector) (26.3 %)

2 funded by employers

75 self-funded (68.2 %)

Since 2006, 201 enrolled out of which 62 graduated, 15 dropped out, 14 inactive

Financed by HEI/research org.: 86 (42.7%)

Financed by employer: 14

Self-financed: 101 (50.2%)

Number of teachers: 96

Number of supervisors: 69 potential supervisors to 62 candidates

Ratio of supervisors to doctoral students: 1.1:1

Courses / Research: 60/120 ECTS (33.3%)

Programme outline:

60 ECTS in courses during 1st and 2nd semester, during 3rd semester, 30 ECTS by publishing papers, during 4th and 5th semester, 60 ECTS by publishing papers and submission of doctoral thesis proposal and in 6th semester, 30 ECTS for writing and defending doctoral dissertation.

Learning outcomes of the study programme: The learning outcomes of the doctoral programme are not defined.

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: (leave on of the outcomes you recommend to the Agency and delete the rest):

issue a letter of expectation for a period of three (3) years in which period the higher education institution should make the necessary improvements.

RECOMMENDATIONS FOR THE IMPROVEMENT OF THE STUDY PROGRAMME

1. Learning outcomes at the programme level need to be clearly defined and aligned with 8.2 level of the CroQF.
2. Increase the degree of internationalisation of the programme.
3. Increase the amount of administrative support to the management of the programme.
4. Adjust the composition of the Council of the Postgraduate Programme to make HEI dominant and add select and dedicated foreign partners.
5. Monitor the alumni formally.
6. Add relevant transferable skills courses.

ADVANTAGES OF THE STUDY PROGRAMME

1. The programme is interdisciplinary and flexible.
2. There are good interpersonal connections between all parties in the programme.
3. Good connections exist between the programme and research institutes and industry.
4. Strong and highly dedicated manager of the programme with a clear vision.
5. No gender balance issues.

DISADVANTAGES OF THE STUDY PROGRAMME

1. No funding is available for all students.
2. Students are spread out over three main areas that are far apart (especially Dubrovnik), so travel or electronic communication is needed.
3. The PhD programme is lacking international components, such as recruiting international students.
4. Training in soft skills, such as pedagogical training or new IT resources. is lacking in the programme.
5. The thesis can be submitted either in Croatian or in English. Submission of the thesis in English should be promoted.

EXAMPLES OF GOOD PRACTICE

1. Making students organize and run a conference.
2. Making students write a research proposal.
3. Course format of ca. 5 hours of instructions and ca. 20 h of practical/experimental work.
4. Awarding ECTS for many important scientific activities motivates the students.
5. Creating a lab facility accessible to all students of the programme.
6. Creating a free accommodation for people who want to use the facilities and stay overnight.

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

Minimal legal conditions	
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*
*If different departments and faculties of the Osijek University are taken into account.	
3. HEI employs a sufficient number of researchers, as defined by Article 7 of 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*
*If different departments and faculties of the Osijek University are taken into account.	
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*
*If different departments and faculties of the Osijek University are taken into account (around 50%).	
5. Student: teacher ratio at the HEI is below 1:30.	YES
6. HEI ensures that doctoral theses are public.	YES http://rektorat.unios.hr/molekularna/dokumenti/zavrsono.html
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	
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	YES*

Professional Activity marked as at least "partly implemented" (3).	
* This is a university programme (university was not reaccredited as a whole, nor the programme, only the faculties and the departments, which all do fulfil this criteria).	
3. The doctoral programme is aligned with the HEI's research strategy.	NO
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 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.	PARTLY*
* The panel could not verify in detail due to the fact that SER (appendix tables) does not include links (CROSBI) to research pages of teachers and supervisors. NO to training of supervisors.	
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).	*
* Seems to be the case but cannot be verified in detail due to the fact that SER (appendix tables) did not include links (CROSBI) to research pages of teachers and supervisors.	
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.	NO
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

QUALITY ASSESSMENT

<p>1. RESOURCES: TEACHERS, SUPERVISORS, RESEARCH CAPACITIES AND INFRASTRUCTURE</p>	
<p>1.1. HEI is distinguished by its scientific/artistic achievements in the discipline in which the doctoral study programme is delivered.</p>	<p>Improvements are necessary The research outputs of teachers and supervisors are analysed in the Self-Evaluation Report (SER) in a series of different tables.</p> <p>As mentioned in the SER, in the 5-year period research staff involved in the programme published 1,757 scientific papers. They have also published 161 textbooks, monographs and book chapters. In the same period, their publications have received 25,326 citations and the h-index for all teachers together is 963. On the other hand, other analysis (p. 14) show that, among 1,757 papers, only 761 scientific papers were published in journals indexed in CC (7.92 papers per teacher). These overall records of the research staff are not based on referenced databases, such as Scopus or the Web of Science (WoS). An individual analysis of each teacher and supervisor is however presented in the appendix, in a series of tables displaying the outputs of research according to Scopus and WoS.</p> <p>This is confusing, but the most expressive figure is that the 62 defended doctoral theses resulted in the publication of 117 scientific papers (1.89 per thesis), and 25% of the papers were published in high-ranking (high impact factor Q1 journals). Six papers (out of 117) are in first 10% in the category according to WoS. These are very positive signs, but compared to European norms there is still a way to go before excellence is reached.</p> <p>Moreover, contrary to European norms, there was no evidence that the quality of the publication record of staff was used in their appointment, or in annual performance or promotion procedures.</p> <p>The Panel also regarded the active involvement of teachers in national and international projects, either as principal investigators (project leaders) or collaborators, as a putative strength.</p> <p>Recommendations: The Department is advised to implement an incentive-based scheme to significantly increase the number of</p>

	<p>publications in high-impact international journals by the staff. This will enhance visibility. The Department is also recommended to promote opportunities to engage in international collaborative research, thereby helping to exploit international opportunities for major EU grant funding.</p>
<p>1.2. The number and workload of teachers involved in the study programme ensure quality doctoral education.</p>	<p>High level of quality A total of 96 teachers are involved in the doctoral studies, and there are 110 active students. In practice, each teacher delivered, on average, 17.4 norm-hours of teaching per year. Teacher's workloads are in line with the normative provisions.</p>
<p>1.3. The teachers are highly qualified researchers who actively engage with the topics they teach, providing a quality doctoral programme.</p>	<p>Improvements are necessary The teachers are actively engaged in research on the topics taught at the programme in Molecular Biosciences. In the last 5 years, the teachers have published 761 scientific papers in journals indexed in CC (7.92 papers per teacher). 79 ongoing national projects and 33 ongoing international projects.</p>
<p>1.4. The number of supervisors and their qualifications provide for quality in producing the doctoral thesis.</p>	<p>Improvements are necessary Sixty-nine persons have been appointed as supervisors at the doctoral studies in <i>Molecular Biosciences</i>. To date, 62 doctoral theses have been written and defended under their supervision, while 7 are in progress. The supervisors actively lead and/or participate in international and/or national scientific research projects. According to the SER, in the last 5 years, the supervisors have published 992 scientific papers, which have received 30,363 citations. Their h-index is 963. However, it is not mentioned if the papers are in journals indexed to referenced databases (see 1.1.). Nevertheless, the 62 successfully defended thesis resulted in the publication of 1.89 papers per thesis, some of which in high-ranked journals in the field of Molecular Biosciences.</p>
<p>1.5. The HEI has developed methods of assessing the qualifications and competencies of teachers and supervisors.</p>	<p>Improvements are necessary According to the SER, the following methods are used for assessing the qualifications and competencies of teachers and supervisors: 1. All teachers are subject to regular evaluation procedure for promotion or reappointment; 2. When modifications are made to the curriculum, the teachers are required to submit their updated CVs, including a list of their</p>

	<p>publications in the last 5 years. New teachers are required to include a complete list of publications in their CVs; 3. On submission of the doctoral thesis proposal, the proposed supervisor is required to enclose relevant scientific papers related to the research topic of the doctoral dissertation which have been published in the last 5 years; 4. A survey on the quality of teaching activities is kept permanently open on the Postgraduate university study programme website (http://rektorat.unios.hr/molekularna/); 5. Students have the right to present any complaints they may have concerning the work of a teacher or a supervisor. However, appropriate mechanisms for assessing and monitoring the qualifications and the performance of the supervisors are not formally in place. There is also no internal mechanism for reviewing the quality of PhD supervision on a regular basis by senior independent academics.</p> <p>Recommendation: The University should implement formal mechanisms for applying these criteria.</p>
<p>1.6. The HEI has access to high-quality resources for research, as required by the programme discipline.</p>	<p>High level of quality The resources available for PhD research training are of high quality. According to the SER, the research resources include libraries and laboratories of the institutions at which the teachers involved in the doctoral studies are employed. The members of the Panel were only able to visit the laboratory of the postgraduate interdisciplinary University Study Programme in Molecular Biosciences, and did not visit the library or IT facilities. However, both supervisors and students, when questioned about access to these facilities, seemed pleased with them. The Panel consider an example of good practice the establishment of the Postgraduate Interdisciplinary University Study Programme in Molecular Biosciences Laboratory at the Department of Biology of Josip Juraj Strossmayer University of Osijek, which is equipped for molecular biology research, biochemical analyses, immunochemical analyses and microscopy.</p>
<p>2. INTERNAL QUALITY ASSURANCE OF THE PROGRAMME</p>	
<p>2.1. The HEI has established and accepted effective procedures for proposing, approving and delivering doctoral</p>	<p>High level of quality The doctoral programme is relevant and the need is obvious and well supported by the need of the country, as</p>

<p>education. The procedures include identification of scientific/ artistic, cultural, social and economic needs.</p>	<p>is also obvious from the many collaborations of the programme and the high employability of its graduates.</p>
<p>2.2. The programme is aligned with the HEI research mission and vision, i.e. research strategy.</p>	<p>Improvements are necessary Since the research mission and vision of the UNIOS is not very well defined (yet), the alignment for the programme is difficult to achieve. Nevertheless, the following alignments were noted: 1) HEI prioritizes science, technology and mathematics. The present programme is focused on two of these. 2) Agriculture is also a priority, which is part of the doctoral programme. 3) The University is involved in a centre of excellence with corporate participation in the medical, agricultural and chemical sciences, topics which are at the core of the Doctoral School.</p>
<p>2.3. The HEI systematically monitors the success of the programmes through periodic reviews, and implements improvements.</p>	<p>Improvements are necessary HEI needs to review the quality of various aspects and international panels such as the present evaluations are useful for an outside perspective.</p> <p>Monitoring the supervisor performance is discussed in 2.4.</p> <p>Monitoring the performance of the students happens through the logging of ECTS acquired by the students by their supervisor and this information reaches the Council.</p> <p>Monitoring the impact of the programme by keeping track of the alumni is not currently happening in a formal sense, although informally a lot is known, and should be more formally organized.</p> <p>Courses are evaluated by the students using an always open on-line format. Teachers who get bad evaluations more than once are replaced.</p> <p>The programme as a whole is monitored by the Council, which has an unbalanced composition with 3 members each of the Osijek, Dubrovnik and RBI locations. While it is good that all locations are represented, the majority should be derived from Osijek. Furthermore, it is advisable to enable (i.e. remove administrative barriers) the participation of foreign affiliated researchers in the Council, to benefit from their alternative perspective.</p>
<p>2.4. HEI continuously monitors supervisors' performance and has</p>	<p>High level of quality The supervisors' qualifications are regularly</p>

<p>mechanisms for evaluating supervisors, and, if necessary, changing them and mediating between the supervisors and the candidates.</p>	<p>evaluated/monitored e.g. in cases of promotion and reappointment. Their papers of the last 5 years are an important factor in this. The qualifications of the supervisors are of a solid quality considering the level of facilities and funds.</p> <p>Completion rates of students could be better, but especially self-funded students may quit due to financial limitations.</p> <p>Students can provide their opinion on the supervisor, and when they are unhappy launch a complaint with office of student affairs.</p>
<p>2.5. HEI assures academic integrity and freedom.</p>	<p>High level of quality The doctoral study programme in Molecular Biosciences as a university study programme applies the University rules to these issues. Supervisors should catch plagiarism, in papers to be published, but availability of software to detect this would be useful.</p>
<p>2.6. The process of developing and defending the thesis proposal is transparent and objective, and includes a public presentation.</p>	<p>High level of quality HEI has a proper system in place with an application form, a public seminar, a committee with an external (not from science faculty) member. Details are readily available.</p>
<p>2.7. Thesis assessment results from a scientifically sound assessment of an independent committee.</p>	<p>High level of quality HEI has a proper system in place with an obligation of one published paper in a recognized journal, a committee with an external (not from science faculty) member. Details are readily available. The time and place of the defence of the doctoral thesis topic is announced on the study website and the bulletin board.</p>
<p>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.</p>	<p>High level of quality HEI publishes the needed information on a website.</p>
<p>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).</p>	<p>High level of quality The amount of the tuition fee of 15,000.00 HRK (2000 euros) per year, or 45,000.00 HRK (6000 euros) for the entire programme, covers all necessary costs such as paying supervisors and teachers, the web manager, secretary, the programme manager and the lab facilities dedicated to the programme.</p>

<p>2.10. Tuition fees are determined on the basis of transparent criteria (and real costs of studying).</p>	<p>High level of quality The tuition fee was estimated on the basis of the calculation of the real reimbursement costs of teachers for the lectures held, for travel expenses connected to it, and for the attendance of committee members at public dissertation and dissertation topic defences, assuming that it would be realistic to expect about 20 students in one generation.</p>
<p>3. SUPPORT TO DOCTORAL CANDIDATES AND THEIR PROGRESSION</p>	
<p>3.1. The HEI establishes admission quotas with respect to its teaching and supervision capacities.</p>	<p>High level of quality Admission quotas are in accordance with the teaching and supervision capacities, bringing the student teacher ratio close to 1:1. The students are admitted to the programme every second year, and there is good workload balance of teaching hours and number of students per supervisor. Supervisors are selected according to their research and teaching positions. All the supervisors need to meet the criteria of excellence in their research field measured by publications related to the topic. Often students are assigned a co-supervisor.</p>
<p>3.2. The HEI establishes admission quotas on the basis of scientific/ artistic, cultural, social, economic and other needs.</p>	<p>High level of quality Admission quotas are based on the research capacities of the Department/University, and candidates are admitted every second year. Most of the PhD students are employed by the higher education system, and others are employed by external institutions. Many PhD students continued their scientific career as postdoctoral researchers or they take up permanent positions at universities in the Croatian higher educational system. External candidates from the private sector continue their career within the company after completing the PhD.</p>
<p>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.</p>	<p>High level of quality Most PhD students are receiving funding and are financed by the research projects or Croatian higher education system. Tuition fees are usually covered for the PhD students working externally by the institutions they are working for. Self-funded candidates noted the benefit of low tuition fees. However, a significant drop-out rate was observed for the candidates without any funding.</p>
<p>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</p>	<p>High level of quality Each student is provided with an advisor/potential supervisor in the first semester of the study programme, and most students have co-supervisors. The advisor is</p>

<p>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.</p>	<p>responsible for introducing the candidate to the obligations and expectations throughout the programme and to follow the candidate's work throughout their study. Advisors help student with choosing the courses and engage them in extracurricular activities. Advisors periodically report the candidate's progress, usually on a yearly basis and through the regular student supervisor meetings.</p>
<p>3.5. The HEI ensures that interested, talented and highly motivated candidates are recruited internationally.</p>	<p>Improvements are necessary The number of international candidates is still quite low, and internationality is almost not present. The recruitment of international students to the programme could be improved by providing more information in English on the website, including PhD research proposals, and by allowing the supervisors to become more international by supporting their mobility throughout their entire career. Submission of the thesis in English could be promoted to encourage the students to engage more in the international community through collaboration. By including an international member in the thesis Committee the submission of the thesis in English is encouraged.</p> <p>Recommendation: In order to improve international recruitment, research proposals together with the potential supervisors should be introduced in the process, for example, by advertising them on the programme's webpage together with the official call. All the information and documents including the official call need to be available and easy to find in English on the programme's webpage.</p>
<p>3.6. The selection process is public and based on choosing the best applicants.</p>	<p>Improvements are necessary The criteria for the evaluation of applicants include their study area, grade point average earned during their graduate study level, interest expressed in scientific research, published papers and attendance of conferences, teacher/former supervisor and potential supervisor recommendations, good command of at least one foreign language and a proposed project. Applicant interviews are an integral part of the process. Although the requirements for admission are clearly defined in the call for applications for admission at doctoral programme, they are not completely available in English.</p>
<p>3.7. The HEI ensures that the selection procedure is transparent and in line with published criteria, and that there</p>	<p>High level of quality Selection of the candidates is transparent and applicants have the right to complain. The selection procedure and list</p>

<p>is a transparent complaints procedure.</p>	<p>of admitted candidates is public. Applicants whose applications are rejected may examine the documents and obtain the explanation why they did not fulfil the criteria for the admission. Most rejected applicants do not fulfil the formal criteria for the admission and there were no complaints about the procedure.</p>
<p>3.8. There is a possibility to recognize applicants' and candidates' prior learning.</p>	<p>High level of quality Students are allowed to transfer from other postgraduate study programmes and continue studying at Molecular Biosciences PhD programme if they have completed a similar postgraduate master's degree programme and have obtained a master's degree in science. The Study Council regulates and recognises prior student achievement measured by ECTS credits. Students with recognized credits are allowed to continue studying in a higher semester of the programme.</p>
<p>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.</p>	<p>Improvements are necessary PhD candidates/students may get familiar with their rights and obligations, primarily through the website of the PhD programme, consultations with the supervisor and at the time of signing the contract. The contract is signed between the student and Chairman of the Study Council representing the University. Candidates that are employed from an institution outside of the higher educational system are obtaining their rights based on the contract signed with their employer. Recommendation: The Department and University should provide more clarity concerning this matter, namely at the website of the programme and possibly in an introductory lecture addressing the candidates' rights and obligations, since some students complained about lack of information and guidance through certain procedures.</p>
<p>3.10. There are institutional support mechanisms for candidates' successful progression.</p>	<p>High level of quality The PhD students who are employees of the University and the ones that are external, both have support from the research projects and the University. This includes ensuring conditions for scientific research (computer and laboratory equipment) and funding their attendance at scientific workshops and conferences within the country and abroad. Support for the candidates' extracurricular activities through the funding of their attendance at the conferences or publication of scientific papers is also provided.</p>
<p>4. PROGRAMME AND OUTCOMES</p>	

<p>4.1. The content and quality of the doctoral programme are aligned with internationally recognized standards.</p>	<p>Improvements are necessary The programme has many elements that are in agreement with international standards or similar to the way more established programs operate. Many of this have been described in this report already. Nevertheless, there are issues that can be improved. Several of those are related to the fact that the programme and associated partners do not have the level of funding to perform high quality research across the board and to teach courses and practicals associated with this high quality. The programme overcomes this in part by alignment with partners with complementary facilities in institutes and industry.</p> <p>According to SER, the study programme of 180 ECTS points consists of 16 ECTS in compulsory courses and 44 ECTS in elective courses. That makes 1/3 of a three-year programme. Although the Panel has been told that the students start their research right away during the first semester, it is hard to achieve a goal of the European and international standards as well as the CroQF (defining that programs should provide for at least three years of independent research experience).</p>
<p>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 requirements of doing research.</p>	<p>Improvements are necessary While the presence of well described learning outcomes are no guarantee that these are being used and verified and vice versa, it is a requirement to create realistic outcomes and use them as tools in the evaluation of modules and the programme, and the Panel strongly recommends that the HEI address this issue. Strong emphasis in the overall learning outcomes development should be put on ethics in scientific research.</p>
<p>4.3. Programme learning outcomes are logically and clearly connected with teaching contents, as well as the contents included in supervision and research.</p>	<p>Improvements are necessary The content and the topics of the courses as well as the format of them, with ca. 5 hours of lectures and the rest being experimental, are all being highly appreciated by the students. As such, they fulfil an important part of the programme and make it possible for the candidates to perform research at a good level. However, since the HEI didn't present the learning outcomes for the programme, the issues covered under this criterion require improvements. HEI should create the learning outcomes for the programme and clearly align the teaching contents to them.</p>

<p>4.4. The doctoral programme ensures the achievement of learning outcomes and competencies aligned with the level 8.2 of the CroQF.</p>	<p>Improvements are necessary The theses are of a good quality, and papers (at least one) need to be published before a degree can be awarded. The required is only 1 publication if the journal is indexed to CC or WoS, or more than one if indexed to other databases. However, since the learning outcomes for the programme were not available to the Panel, the issues covered under this criterion require improvements. The Panel recommends that the HEI create learning outcomes for the programme and align them to 8.2 level of the CroQF.</p>
<p>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.</p>	<p>High level of quality “The programme of the Postgraduate interdisciplinary university study in Molecular Biosciences (http://rektorat.unios.hr/molekularna/studij/i-godina.html) defines that the lessons are held in five forms of instruction, i.e. lectures, seminars, research seminars, practicums and experimental exercises. When all courses carried out within the programme are taken into account, 58% of the lessons would take place in those forms of instruction in which the student should be personally actively engaged either in literature searching (scientific papers) and making use thereof to write seminar papers or in conducting independent research, i.e. collecting material independently and presenting the results of their work to both their colleagues and the lecturer (research seminar).” This research-oriented teaching methodology defined in the SER is appropriate for level 8.2 of the CroQF.</p>
<p>4.6. The programme enables acquisition of general (transferable) skills.</p>	<p>Improvements are necessary Although elements of this are present in some of the obligatory courses, more is needed and also requested by the students. A good thing is that students reported to learn some of these skills by organizing the conference every generation gets to do. The Panel consider an example of good practice that within the framework of the Methodology of Writing a Research Paper research seminar, the students organise a scientific conference, such that they act as the Organising Committee, the Scientific Committee, technical support, the chairpersons of sections and the active participants in the congress. Recommendations: The University should provide soft skills courses to both students and teachers/supervisors.</p>

<p>4.7. Teaching content is adapted to the needs of current and future research and candidates' training (individual course plans, generic skills etc.).</p>	<p>High level of quality The courses were generally found to fulfil an important role in providing the relevant skills for the PhD research. There was also a mechanism in place where students could complain/provide feedback on line on courses, should they not be optimal.</p>
<p>4.8. The programme ensures quality through international connections and teacher and candidate mobility.</p>	<p>Improvements are necessary There are certainly international elements in the programme, but we believe that it can be improved. Some classes are in English, some teachers come from abroad, a significant portion of the theses is in English, scientists collaborate with foreign groups on projects and publish together, and students get to participate in international conferences. But these are still limited. The website and various important documents for the PhD programme are not in English. When more of these things are in place, internationalisation, EU grants, etc. will become more realistic.</p>

*** 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.