REPORT
of the Expert Panel
on the

RE-ACCREDITATION OF
Department of Biotechnology University of Rijeka

Date of the site visit:

5th-6th March 2015

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INTRODUCTION

This report on the re-accreditation of the Department of Biotechnology University of Rijeka was written by the Expert Panel appointed by the Agency for Science and Higher Education, on the basis of the self-evaluation of the institution and supporting documentation and a visit to the institution.

Re-accreditation procedure performed by the Agency for Science and Higher Education (ASHE), a public body listed in EQAR (European Quality Assurance Register for Higher Education) and ENQA (European Association for Quality Assurance in Higher Education) full member, is obligatory once in five years for all higher education institutions working in the Republic of Croatia, in line with the Act on Quality Assurance in Higher Education.

The Expert Panel is appointed by the ASHE Accreditation Council, an independent expert body, to perform an independent peer-review-based evaluation of the institution and their study programs.

The report contains:

- a brief analysis of the institutional advantages and disadvantages,
- a list of good practices found at the institution,
- recommendations for institutional improvement and measures to be implemented in the following period (and checked within a follow-up procedure), and
- detailed analysis of the compliance to the Standards and Criteria for Re-Accreditation.

The members of the Expert Panel were:

- Prof Sven Frøkjær, Faculty of Health and Medical Sciences, University of Copenhagen, Kingdom of Denmark (chair)
- Prof Mladen Boban, School of Medicine University of Split, Republic of Croatia
- Prof Renata Mažuran, The Institute of Immunology, Republic of Croatia
- Prof Jason Schnell, St. John's College, Oxford, United Kingdom of Great Britain and Northern Ireland
- Pedro Grilo Diogo, medical student, Faculty of Medicine, University of Porto, Portuguese Republic

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

- Maja Šegvić, coordinator, Agency for Science and Higher Education
- Iva Žabarović, support to the coordinator, Agency for Science and Higher Education
- Lida Lamza, translator, Agency for Science and Higher Education

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

- The Management;
- The Working Group that compiled the Self-Evaluation;
- The representatives of the Committee for Quality Assurance and Improvement of the Department and representative of University Center for Quality Improvement
- The students;
- The Heads of Study Programmes;
- Research projects' leaders;
- Teaching assistants and junior researchers.
- Teachers

The Expert Panel also had a tour of Department - laboratories, IT room, library and the classrooms at the Department of Biotechnology, where they held a brief question and answer session with the faculty and students who were present.

Upon completion of re-accreditation procedure, the Accreditation Council renders its opinion on the basis of the Re-accreditation Report, an Assessment of Quality of the higher education institution and the Report of Fulfilment of Quantitative Criteria which is acquired by the Agency's information system.

Once the Accreditation Council renders its opinion, the Agency issues an Accreditation Recommendation by which the Agency recommends to the Minister of Science, Education and Sports to:

1. **issue a confirmation** to the higher education institution, which confirms that the higher education institution meets the requirements for performing the higher education activities or parts of activities, in case the Accreditation Recommendation is positive,

2. **deny a license** for performing the higher education activities or parts of activities to the higher education institution, in case the Accreditation Recommendation is negative, or

3. **issue a letter of recommendation** for the period up to three (3) years in which period the higher education institution should remove its deficiencies. For the higher education institution the letter of recommendation may include the suspension of student enrolment for the defined period.

The Accreditation Recommendation also includes an Assessment of Quality of the higher education institution as well as recommendations for quality development.

Short description of the evaluated institution

NAME OF HIGHER EDUCATION INSTITUTION: Department of Biotechnology University of Rijeka

ADDRESS: Radmile Matejčić 2, 51000 Rijeka

NAME OF THE HEAD OF HIGHER EDUCATION INSTITUTION: Prof Krešimir Pavelić, PhD

ORGANISATIONAL STRUCTURE:
In order to perform educational, professional and scientific activities, institutes, laboratories and centres as organizational units are formed at the Department. Professional services are established in order to perform administrative, technical and general affairs at the Department. Institutes are established for holding lectures and scientific research, as well as professional, technological and innovative work within its scope. The Institute is represented and headed by the Head of Institute. Laboratories are smaller organizational units within the Institute that are established for the purpose of carrying out scientific and technical research and projects as well as performing practical training and demonstration exercises for students.
The centres are designed as interdisciplinary units that coordinate the vital work of similar activities in laboratories or institutes of the Department, thus ensuring better profiling and presentation of the Department from a particular area. The centres may also include related laboratories, institutes and similar structures, and individuals outside the Department. For their operation, the centres do not necessarily require their own space. A centre is presided by the Head of Centre, who is directly responsible to the Head of Department.
Currently, the following institutes, laboratories and centres are organized at the Department:

- **Department of Molecular and Systemic Biomedicine**

Laboratory for High-throughput Analysis
Laboratory for Systemic Biomedicine and Genomics
Laboratory for Human Genetics and Reproduction
Laboratory for Cell Biology
Laboratory for Genetics Behaviour
Laboratory for Nanotechnology in Neurobiology and Medicine
Laboratory for Molecular Neurobiology
Laboratory for Molecular Virology
Laboratory for Haematopoiesis
Laboratory for Neurochemistry
Laboratory for Molecular Immunology

- **Department of Medicinal Chemistry**

Laboratory for Biochemistry and Signal Transmission
Laboratory for Analytical Biotechnology and Proteomics
Laboratory for Organic Chemistry and Solid State Chemistry
Laboratory for Natural Compounds and Metabolomics
Laboratory for Physical Chemistry

- **Centre for High-throughput Technology in Biomedicine**

LIST OF STUDY PROGRAMMES:

Undergraduate study programme – Biotechnology and Drug Research
Graduate study programmes – (1) Development and Drug Research, (2) Biotechnology in Medicine and (3) Medicinal Chemistry
Doctoral study programme – Medicinal Chemistry

NUMBER OF STUDENTS: 285 full-time students

NUMBER OF TEACHERS: 24 full-time, 28 external associates

NUMBER OF SCIENTISTS: 24

TOTAL BUDGET: 16.514.379,36 kn

MSES FUNDING: 6.838.483,43 kn

OWN FUNDING: 8.959.469,18 kn

SHORT DESCRIPTION OF HIGHER EDUCATION INSTITUTION:
After the Senate accepted the Report on the Establishment of the Department in July 2008, the Department of Biotechnology was established in September 2008. The establishment of the Department is in accordance with the adopted strategy of the University of Rijeka, which stresses the need for the development of the University's research profile and the importance of biotechnology, nanotechnology and information technology. Undergraduate and graduate programs are designed in cooperation with the Ruđer Bošković Institute and Fidelta Ltd. research centre in Zagreb, and the Rijeka company Jadran Galenski Laboratorij (JGL) which has played an important role with their support in the implementation of the program and has provided the Department with the technological base and its laboratories for carrying out a part of the practical training. On 1st October 2012 the Department of Biotechnology moved into a newly constructed building of the Department on the campus location. An important issue in the work until the relocation was the dislocation and lectures at several locations. Immediately after the establishment of the Department intensive work began on the writing of the infrastructure project *Research Infrastructure University of Rijeka Campus* which should fully equip the Department of Biotechnology.
Department has 285 full-time students and delivers five study programmes at bachelor (1), graduate (3) and postgraduate (1) levels.

CONCLUSIONS OF THE EXPERT PANEL

ADVANTAGES OF THE INSTITUTION

1. In general, a very enthusiastic and dedicated management, staff, and student population.
2. A dynamic institution located in a new building with well-equipped facilities and with a high standard of laboratory equipment.
3. Good core facilities at hand at the university.
4. Success in attracting top, international researchers and thereby external funding and grants.
5. Creation of interesting and well-designed study programmes in cooperation with external stakeholders, including the pharmaceutical industry.
6. Educational focus on entrepreneurship and innovation as an integrated part of courses and teaching plans.
7. Attracts a high number of students with excellent marks from high school level. The Department, furthermore, has excellent checks and balances to monitor and help students keep a high performance standard.
8. Many teachers have work experience from the industry.
9. Very active student organisation – focusing, for instance, on creating ties to the industry by organising a job fair.

DISADVANTAGES OF THE INSTITUTION

1. There is an asymmetry in the level of power and authority held by the departments vis-à-vis the faculties.
2. Need for further integration within the university structure – several departments and faculties are opposing the process. This may result in a fairly weak university identity that needs to be reinforced.
3. Very low response rates to the student survey, which is the main quality assurance mechanism for the Department.
4. Challenges concerning understaffing and increased use of external consultants/workforce.
5. Need for more centres of excellence as well as a stronger focus on creating an ecosystem to support research of the highest quality.
6. Need for stronger focus on consolidating the formulated strategic goals of the institution within both research and education – fewer projects with a clearer focus and a shared direction between all departments and faculties.
7. University reform is, to a certain extent, in a deadlock due to the fact that faculties are autonomous, legal entities.
8. Laboratories are entities that can (too) easily be established and dissolved, i.e. secure sustainable research groups/critical mass.
9. Access to scientific journals could be improved – especially on the concerning national journals and publications.

FEATURES OF GOOD PRACTICE

1. Established office concerned with regulations for intellectual property.
2. Tech Trans office and Science Park provides space and knowledge on how to run companies – this has led to 6-7 concrete startup companies.
3. University and teachers share patent rights.
4. The use of anti-plagiarism software.
5. Established career programme for students – ties to industry.
6. Strong culture for freedom of research – despite collaborative ties to the industry.
7. An EU project is planned with the goal to determine areas of improvement for the Department's students.
8. High level of students getting international experience during/as part of their studies – for instance through exchange programmes such as Erasmus.
9. Courses preparing teachers to take on teaching assignments is a requirement for advancement into higher teaching grade.
10. The Department keeps track of the needs of external stakeholders, including the pharmaceutical industry – however, this should be more formalized.

RECOMMENDATIONS FOR IMPROVEMENT

1. **Management of the Higher Education Institution and Quality Assurance**
   - The small, dislocated laboratories should be relocated to larger organisational units, e.g. sections.
   - It is recommended to assess the specific laboratory and research field when deciding on the necessary staff – rather than having one professor for each laboratory.
   - There should be an increased awareness of the 'critical mass' to achieve a thriving, sustainable, research environment.

2. **Study Programmes**
   - It is recommended that an external advisory board is set up in order to help further develop the study programmes and assure curriculum monitoring.
   - Better promote the alignment between learning outcomes and assessment over the full range of learning by using contemporary assessment methods.
   - Formally analyse the validity, reliability and discriminative power of each assessment method, as well as the established pass grades, in order to assure a fair assessment system.

3. **Students**
   - Assure that the interview is a positive component of the admission system, relying on structured interview forms and standardized questions that reduce the subjectivity of this method.
   - Formally check that students have familiarized themselves with the Code of Ethics.
   - Go back to the previous method of implementation of the student survey (paper survey at the end of classes) in order to increase response rates or study a new electronic method in association to incentives for students to participate in surveys.

- Encourage students to participate in career programmes, giving them an even stronger connection to external stakeholders.
- Assure that the appeal procedure translated into effective mechanisms to place positive pressure on teachers for improving the quality of teaching and assessment, especially given that study programmes are recently established.
- Feedback from companies with which students have collaborated should be managed by a more formalized process. Allowing for the feedback/response to be written by companies and received by students – all in a timely manner.
- Encourage more students to write their final theses in English.
- Students should be informed about the possibility of contacting the student ombudsman.
- Deliver clear and truthful information to the prospective candidates on employment perspectives and opportunities, both in Croatia and abroad, taking into consideration updated labour market analysis.
- Prepare a follow-up plan for former students, emphasizing the systematic analysis of employment statistics and professional achievements, as well as assessing program effectiveness and highlighting areas needing curricular improvement.

4. Teachers

- Formally check that teachers have familiarized themselves with the Code of Ethics.
- Seek to achieve a transparent and fair mechanism for the distribution of teaching hours.
- Achieve a critical mass of highly qualified teachers for each selected area – this will ensure a constant high level of teaching, for instance when colleagues need to cover for each other.
- Guidelines for distribution (and especially re-distribution) of workload (including teaching, research, and administrative duties) among departmental staff members should be produced.

5. Scientific and Professional Activity

- Establish a detailed strategic research agenda.
- There should be more focus on rewarding scientific excellence and use this as an instrument of incentive.
- PhD theses should be encouraged to be written in English.
- PhD students should be offered training for writing grant applications.

6. International Cooperation and Mobility

- Encourage even more students to take time to study abroad and collect international experience.
- Lectures given in English would attract more international students and teachers.
- Creation of specific strategic steps to attract students from neighbouring countries.

7. Resources, Administration, Space, Equipment and Finance

- Best practice in managing overhead costs should be taught and advocated.

- Additional resources for scientific journals and databases.
- Establish annual personal/career development reviews for non-teaching staff.

DETAILED ANALYSIS OF INSTITUTIONAL COMPLIANCE TO THE STANDARDS AND CRITERIA FOR RE-ACCREDITATION

Institutional management and quality assurance

1.1 The University of Rijeka has a very well-developed strategy for 2014-2020 with clearly defined goals and objectives, including key performance indicators and targets. The Department had not developed a specific strategic plan, and is not required to do so. However, it felt that the Department could clearly benefit from developing its own, detailed strategic plan since they do not fall under a University strategic plan.

1.2 The Department has a well-described organisational structure. However, the panel questioned the effectiveness of the laboratories when compared to the number of scientific staff, i.e. lack of critical mass within laboratories. Although laboratories can be flexibly established and dissolved, it can cause difficulties in establishing long-term research and teaching plans.

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1.4 The study programmes were all in line with the overall institutional mission and meet international standards, including clearly defined learning outcomes.

1.5 The Department is in the progress of implementing quality policies and procedures. They have close collaboration with external stakeholders and with students. However, the more formal procedures are not fully implemented.
The lack of responses on student surveys puts the quality of the feedback into question. The Department is aware of the problem and plans to change the format of the survey.

1.6 The teachers receive formal pedagogical training that seems comparable to most other European universities.
Regarding student feedback see 1.5

1.7 The Department keeps records on research activities, and each researcher has a research portfolio.

1.8 The Code of Ethics is in place, and all students and members of staff are well-informed about it. However, a formal monitoring system seems not to be fully implemented.

Study programmes

2.1 The Department has clearly described study programmes, including learning outcomes. They also have a formal process for receiving student feedback. However, the response rate is very low which makes the outcome less valuable. The Department is in the progress of changing the survey's methods of implementation in order to improve the response rate. The Department has close contact to its key stakeholders. This is considered to be very effective, although a more formalized external advisory board might be beneficial.

2.2 The study programmes are all rather new and the initial quotas have been justified by discussion with stakeholders. The Department clearly indicated that future adjustment of quotas will be based on responses from stakeholders and from employment surveys and taking into account the overall economic environment and situation on the labour market

2.3 The ratio between teaching staff and students seems absolutely justified. The students enrolled in the programmes have top grades from high school and gave an overall very enthusiastic impression to the panel.

2.4 The Department has learning outcomes of the different courses, which correspond to the overall objectives of the study programmes.

2.5 The learning outcomes are – depending on the course – assessed at various stages, including a final examination. This is considered satisfactory. Nevertheless, high-order skills such as creative thinking and entrepreneurship that are stated as macro learning outcomes must also be aligned with teaching and assessment.

2.6 The student workload seems in general to be assessed realistically and may be adjusted based on input from students.

2.7 The panel got a very positive impression of the quality and content of the study programmes and was especially impressed by the possibilities to interact with external stakeholders, e.g. the pharmaceutical industry as well as the scientific staff. This "outreach approach" is absolutely comparable to the best European institutions.

2.8 Teaching methods are adequate to the study programme's learning outcomes and promote student active learning and motivation. A capstone course is highlighted as a notable example of the Department's commitment to prepare students for the labour market. Further developments on teaching-learning methods that foster student interaction with the profession and the industry in an effective and outcome-based way are recommended.

2.9 There seems, in general, to be a lack of sufficient access to scientific literature. The staff is often dependent on an international network in order to get direct access to the most recent

literature. This is a barrier both in relation to teaching and research.

2.10 See 2.7

Students

3.1 As the study programmes are all established quite recently, with only a few graduates, an evaluation of the demands for the future careers of the graduates seems premature. The interview is a positive component of the admission system, which enriches the information about the candidates but may also introduce subjectivity to judgements on candidate's admissions.

3.2 The Department seems to be strongly supportive of the students' extracurricular activities – both professional and social. The progressive development of the student's association must be supported by the Department, which should foster the creation of meaningful joint projects on the improvement of teaching-learning strategies.

3.3 The Department has a good system for career guidance offered to students, which is also supported by the close collaboration with external stakeholders/future employers during their training. A student mentorship is also established, which helps freshmen to adapt to higher education and to the Department.

3.4 The Department seems to have a well-established system for assessing student progress as well as a system for student appeal against a decision concerning assessments. However, due to the low response rate from student surveys, the learning outcome may not be optimal.

3.5 As the study programmes are all established quite recently – with only a few graduates – an evaluation of their employment is not fully implemented. However, the Department must take advantage of this situation to develop a plan for the future follow-up of former students.

3.6 The Department seems to be active in its communication to the public.
The student organisation is actively involved in promoting natural science in primary schools. This is a very impressive initiative taken by the students.

3.7 The panel got a clear impression of an open and productive communication culture at the Department, although the students were not aware of the term "Ombudsman". However, they were well informed about the function of this institution.

3.8 The Department should keep giving feedback to students, encouraging student engagement in decision-making processes, especially regarding education and science. Student representatives must continue to produce valuable cooperation efforts.

Teachers

4.1 The study programmes are absolutely comparable to similar programmes at other European universities, although the study programmes as such seem to have a unique profile.
The Department covers many disciplines of importance in medical biotechnology. This means that they, to some extent, rely on external teachers either from industry or other institutions. This is a point for consideration, because it makes some of the courses more sensitive to changes in teaching.

4.2 The Department seems to have a good reputation, a strong international network, as well as a good doctoral programme where most of the students have come from other institutions of higher education. This means that the Department is in a good position for employing talent. However, as the Department does not have a fully implemented strategy, it is partly unclear to the panel how new staff is hired.

4.3 The ratio of permanent teaching staff to the number of students seems absolutely justified. However, because medical biotechnology is a very broad field, the Department seems to be significantly dependent on external teachers (see 4.1).

4.4 In general, the Department seems to offer the staff good possibilities for professional development, although it is not yet fully formalized as an institutional policy.

4.5 The teaching load for each staff member seems to be transparent, although there are significant differences in the workload between the teachers. However, this may be justified by a departmental strategy to focus on a specific growing scientific area for a period of time. The average teaching load (workload) seems to be at a level comparable to other European institutions.

4.6 The Head of Department is informed about and approves external commitments. This ensures that the quality and efficiency of their institutional obligations are not compromised.

Scientific and professional activity

5.1 The Department works according to the University strategic programme but indicates that a more formal departmental strategic programme for research is in the progress of being written. This is strongly encouraged as it facilitates coherent decisions regarding staffing and resource allocation.
However, it should be emphasised that the vision on which the Department was established in 2008 - as well as the implementation of the vision - seems to advance together with the Department.

5.2 The Department has a strong focus on collaboration with external partners including links to both external stakeholders, e.g. the pharmaceutical industry, and research institutions both in Croatia and abroad.

5.3 Several of the key scientists have an internationally well-recognized profile. However, partly due to the interdisciplinary area of research (and teaching), there are examples of disciplines where the Department is more weak and dependent on external staff.

5.4 The scientific staff has a good publication record in international peer reviewed journals, but this is to some degree a result of a highly productive minority part of the staff.

5.5 The Department has a system for monitoring scientific output. However, a formal system for rewarding scientific productivity has not been implemented.

5.6 The number of publications is absolutely satisfactory, but a more equal distribution between staff members would be beneficial and would further strengthen the scientific profile of the Department. The sanctioning/motivating measures for faculty members that scientifically underperform are not clear.

5.7 The Department has a significant number of both national and international projects, including projects with important stakeholders. However, the strong profile of the Department could be improved by a more focused approach.

5.8 The Department has a clear focus on technology transfer to target stakeholders, including the pharmaceutical industry. This is facilitated both by joint research projects and student projects. However, there may be a lack of sufficient administrative support to facilitate the resolution of contractual issues. This could be developed further.

5.9 The Department has good examples of contract research supporting the economy and their core research activities. The panel finds that this is an area that could be further developed to the benefit of both the Department and society.

5.10 The Department has one doctoral programme (medicinal chemistry). The programme is adequately supported by the scientific staff actively involved in research at the Department. However, as the programme is rather new, with only a very few (one) graduate, a deeper evaluation is difficult to perform.
The panel suggests that the Department strongly encourages the doctoral students to write their theses in English.

International cooperation and mobility

6.1 The focus on external collaboration combined with a good international personal network gives a good platform for student mobility, both to other academic institutions and industry. The administration and staff actively support students who have an interest in taking courses abroad.
Admission to study curricula at the Department seems to be absolutely transparent and open to foreign students.
The Department indicated that an increasing number of courses will be given in English which will further facilitate the mobility of students from abroad.

6.2 See 6.1

6.3 A significant number of staff (teachers and researchers) have spent time at foreign institutions, e.g. as postdocs. However, a formal analysis of the implementation of international experience is not fully implemented.

6.4 The Department/staff are members of the most important international associations within the medicinal biotechnology field.
The success rate in EU applications is good. However, the panel got an indication that some of the research groups, unfortunately, lacked resources for participation in international networks and meetings.

6.5 See 6.1

6.6 The panel got a clear indication that the Department was open for attracting foreign teachers. Although the facilities and teaching environment offered by the Department are good, language issues may turn out to be a barrier for many foreigners, because most of the courses are given in Croatian.

6.7 The Department has been rather successful in attracting Erasmus scholarships as well as participating in bilateral cooperation. The programmes cover both student and staff exchanges.

Resources: administration, space, equipment and finances

7.1 The Department offers very modern and well-equipped classrooms, laboratories, and a library – at a level comparable to renowned European institutions. All classrooms are equipped with rather new computers (1-2 years old). However, the resources for scientific journals and access to databases seem inadequate.

7.2 The organisational structure at the University of Rijeka, where the institution is a department and not a faculty, may be the reason why the ratio of teaching staff and non-teaching staff seems suboptimal.

7.3 The Department does not have a formal plan concerning professional development of non-teaching staff, although certain possibilities for career development seem possible also for this group of employees.

7.4 Laboratories and equipment are, in general, of a high standard and in many cases brand new (still partly unpacked).
Parts of the courses take place in research laboratories, which gives the students an opportunity to see/work with modern equipment.

7.5 See 7.4

7.6 The library, including study space, is new and absolutely well-organized. However, there seems to be limited resources for subscriptions to journals etc. Particularly the library has rather limited number and availability of textbooks and teaching texts in general.

7.7 The Department has been successful in attracting external funding and is absolutely well-equipped.

7.8 The Department seems to generate significant income from external sources. However, there could be additional possibilities for attracting income with the potential of generating research within the core expertise areas of the Department – benefitting both teaching and research.