



STUDIJŲ KOKYBĖS VERTINIMO CENTRAS

Vytauto Didžiojo universiteto
***MOLEKULINĖS BIOLOGIJOS IR
BIOTECHNOLOGIJOS PROGRAMOS (621C71001)***
VERTINIMO IŠVADOS

**EVALUATION REPORT
OF MOLECULAR BIOLOGY AND BIOTECHNOLOGY
(621C71001)
STUDY PROGRAMME**
at Vytautas Magnus University

Grupės vadovas:
Team Leader:

Prof. dr. habil. Halina Gabrys

Grupės nariai:
Team members:

Prof. dr. habil. Indrikis Muiznieks

Prof. dr. Kari Keinänen

Prof. dr. habil. Radim Brdicka

Prof. dr. Ilona Miceikienė

Tadas Juknius

Išvados parengtos anglų kalba
Report language - English

Vilnius
2013

DUOMENYS APIE ĮVERTINTĄ PROGRAMĄ

Studijų programos pavadinimas	<i>Molekulinė biologija ir biotechnologija</i>
Valstybinis kodas	621C71001
Studijų sritis	Biomedicinos mokslai
Studijų kryptis	Molekulinė biologija, biofizika ir biochemija
Studijų programos rūšis	Universitetinės studijos
Studijų pakopa	antroji
Studijų forma (trukmė metais)	Nuolatinė (2)
Studijų programos apimtis kreditais	120
Suteikiamas laipsnis ir (ar) profesinė kvalifikacija	Molekulinės biologijos magistras
Studijų programos įregistravimo data	2009-08-31 , Nr.1-73

INFORMATION ON ASSESSED STUDY PROGRAMME

Name of the study programme	<i>Molecular biology and biotechnology</i>
State code	621C71001
Study area	Biomedical Sciences
Study field	Molecular Biology, Biophysics and Biochemistry
Kind of the study programme	University studies
Level of studies	second
Study mode (length in years)	Full-time (2)
Scope of the study programme in credits	120
Degree and (or) professional qualifications awarded	Master of Molecular Biology
Date of registration of the study programme	Order No. ISAK-1-73 of 31 August, 2009

© Studijų kokybės vertinimo centras
The Centre for Quality Assessment in Higher Education

CONTENTS

CONTENTS	3
I. INTRODUCTION.....	4
II. PROGRAMME ANALYSIS	4
1. Programme aims and learning outcomes.....	4
2. Curriculum design	6
3. Staff	7
4. Facilities and learning resources	8
5. Study process and student assessment.....	8
6. Programme management	9
III. RECOMMENDATIONS	10
IV. SUMMARY	11
V. GENERAL ASSESSMENT	13

I. INTRODUCTION

The Master degree study programme of Molecular Biology and Biotechnology (further MBB SP) at VMU is organized by the Department of Biology at the Faculty of Natural Sciences (hereinafter FNS). FNS includes also departments of Environmental Sciences, Biochemistry and Biotechnologies, and Physics, and the Centre of Environmental Research. These structural units are involved in the study implementation (through teaching) of the Programme.

Evaluation Team

The team leader: Prof. in Plant Physiology Halina Gabryś, Dr. habil. Biology Jagiellonian University, Krakow, Poland; team members: Prof. in Microbiology Indriķis Muiznieks, Dr. habil. Biology University of Latvia, Riga; Prof. in Molecular Biology Kari Keinänen, Dr. Biochemistry, University of Helsinki, Helsinki, Finland; Prof. emeritus in Biology and Genetics Radim Brdicka, M.D., Dr. habil., Charles University, Prague, Czech Republic; Prof. in Genetics Ilona Miceikienė, Dr. Biology, University of Health Sciences, Kaunas, Lithuania; student, Mr. Tadas Juknius, University of Health Sciences, Kaunas, Lithuania.

The procedure of the evaluation

The Self Evaluation Report (hereinafter – SER) of the BB SP was made available to the expert team in end January 2012. All the members of the expert team examined the SER individually, preparing preliminary reports and indicating problem questions or discussion points. The experts obtained further information during the site visit in Kaunas on February 27 through interviews with Programme co-ordinators, Department heads, senior and junior members of the teaching staff, students, graduates and employers. After the visit, on February 28 the expert group held a meeting, discussed the contents of the evaluation report and agreed upon the numerical evaluation of every section of the evaluation. The draft report was composed through electronic exchange of opinions within the expert team and forwarded to VMU. After receipt of the comments from the VMU the Evaluation Team members prepared final versions of their reports, which were integrated into one document by the group leader.

II. PROGRAMME ANALYSIS

1. Programme aims and learning outcomes

The aims of Masters Study Programme in Molecular Biology and Biotechnology are defined in the SER (paragraph 16):

1. to deepen competencies in genetics, biochemistry, immunobiology, microbiology and other subjects essential for an advanced level of molecular biology specialist;
2. to provide students with the scientific, intellectual, and practical education in order they would be capable to empower themselves for lifelong learning and a career in biosciences research;
3. to provide for students the supportive learning environment, which fosters their academic, professional and personal development. Learning outcomes are used in the design of the programme and are clearly specified and harmonised with the study programme aims; they are achieved by teaching specific subject courses included in the curriculum.

The learning outcomes of the MBB SP are defined taking into account corresponding international and local directives and documents. They constitute the aggregate of four categories: (1) knowledge; (2) cognitive skills; (3) practical skills; (4) transferable skills, including social and personal skills. Each category is subdivided into 4 – 5 outcomes.

Apparently the outcomes listed under code B (Cognitive skills) and C (Practical skills) have been interchanged, as the outcomes under the code "Cognitive skills" clearly belong to the code "Practical skills" and vice versa. Learning outcomes in the knowledge and code C designed areas of the MBB SP demonstrate clear upward development towards more advanced skills and detailed knowledge in comparison to the outcomes of the same groups in the Biochemistry Bachelors' programme, which is delivered by the neighbouring department. In this context the identity of planned outcomes in code groups C and D of the Master and Bachelor programmes needs some revision, since increased complexity of outcomes in the second level study programme (Master) in comparison to the first level programme (Bachelor) can be expected.

Links between MBB SP courses and learning outcomes, which are given in the table 4 of the SER provide a general, although not fully comprehensive overview how the expected outcomes shall be achieved. Evidently, the transferable skills can be achieved in many other study courses additional to those shown in the table. In the course descriptions, e.g. Molecular methods in forensic medicine, the approaches to evaluate the attainment of course outcomes are described rather formally, referring mostly to knowledge and cognitive skill descriptors, while the other components, especially transferable skills have obtained disproportionately small, if any, attention, although their expected presence is indicated in the table 4. Also, the situation that among comparable courses, one (Biotechnology for Medicine) is not anticipated to deliver any outcome within transferable skill group, while the other (Molecular methods in forensic medicine) should provide all of them (Table 4) is peculiar and needs to be revised. Furthermore, the Evaluation Team would suggest considering possibilities of including additional learning outcomes relevant to future activities in the role of employer, not only employee in the labour market.

The information about Masters Study Programme in Molecular Biology and Biotechnology is presented in the yearly book published by VMU. This publication, together with presenting video materials and corporate souvenirs, are distributed via school information points. Visitors can also obtain the required information from the VMU Studies Marketing Division as well as on websites of VMU (www.vdu.lt), VMU FNS (<http://gmf.vdu.lt>) and the Association of Lithuanian Higher Education Institutions LAMA BPO (<http://www.lamabpo.lt>).

Master programmes in Molecular Biology exist in numerous universities worldwide. During the last decade there has been a steady growth in the number of programmes and enrolments to the programmes offering an integrated, transdisciplinary, problem-oriented approach to Biotechnology and Molecular Biology. EU strategic planning documents (e.g., Midterm review of the Strategy on Life Sciences and Biotechnology) confirm the great potential for the development of Biotechnology and related Life Science fields.

The SER refers to the feasibility study performed in 2007 by the Institute of Biotechnology "Top-level specialist training, research and experimental development in science, intensive business in the field of biotechnology", which has shown that the demand for specialists in Lithuanian labour market in the research laboratories of molecular biology and biotechnology, biotechnological companies and commercial organizations especially appreciate specialists of the biochemical profile. The demand for specialists in biotechnological and biopharmaceutical sectors during the period of 2007-2015 is expected to increase more than two times - from 223 to 490, and it will amount to 30.5% of all workers in this sector.

The learning outcomes of the MBB SP are assessed every two years. The Study Programme Committee (further SPC), consisting of programme teachers, social partners, students and alumni, is responsible for the assessment and update of the programme learning outcomes.

The second cycle MBB SP leads to the qualification Master of Molecular Biology/Biotechnology on the basis of acquisition of the learning outcomes that are compatible with the qualification offered. The name of the Masters Study Programme in Molecular Biology and

Biotechnology, its learning outcomes, content and the qualifications offered are compatible with each other.

2. Curriculum design

The duration of the MBB SP at VMU is 2 years (4 semesters) and the total volume is 120 ECTS credits in conformity to the national regulations. The Programme volume corresponds to the requirements for graduate programmes, set by the national regulations in the “General Requirements for Study Programmes” to be in the interval of 90-120 credits. The study form is full-time studies. The conferred degree grants the possibility of seeking doctoral degree at the VMU or at other universities.

The SPC should analyze whether the extended duration of studies (6 years, instead of 5 in most European countries) needed to obtain the Masters degree may create disadvantages for the students seeking to obtain the qualification and to use the exchange possibilities with other European universities.

The structure of the Programme is set up according to requirements laid down by the Lithuanian Minister of Education and Science. The curriculum design meets legal requirements. The content is appropriate for students' achievement of the intended learning outcomes, but there are several shortcomings concerning the curriculum such as: Microbiology/Virology are underrepresented in the curriculum as well as proteomics part in the Molecular Biology course, besides, Bioethics and Bioinformatics should be added to curriculum as postulated by employers and students. Some course contents overlap both inside Molecular biology and Biotechnology programme and also between Biology/Molecular biology and Biotechnology (currently, most students come to MBB after finishing Biology). The component subjects cover different molecular biology and biotechnology themes.

The curriculum has a layered structure which allows the students to progress in a meaningful order, earlier courses providing the foundation for later ones. The description of study subjects reveals a rigid and monotonous structure of the teaching and learning methods. Course descriptions in all subjects include the same distribution of workload, 45 hours lectures and 15 hours laboratory work. This rigid division, apparently imposed by University rules, was criticized both by teachers and students during the site visit. The relatively small amount of practical laboratory work indicated by the course description was discussed with teachers and students during the site visit of the Evaluation Team. It appears that while the students had complaints about too little laboratory practise during the courses, the actual laboratory hours are higher than suggested by the course descriptions because it is done also as individual work. Interestingly, discussions with a few employers of programme graduates indicated that the employers are quite satisfied with the practical skills of the students. The Evaluation Team would recommend the programme to (1) increase diversity in teaching and learning methods, and (2) to make the description more transparent and consistent with the actual allocation of hours between lectures, laboratory work and self-learning.

The programme is of 120 ECTS credits. 60 credits (10 study subjects) are awarded to the compulsory courses of the study field. 12 credits are awarded to elective courses (2 study subjects from 6 available). The molecular biology direction study subjects contribute 72 credits. Not more than 5 subjects per semester are planned in the curriculum. 62.5 % of workload for all the subjects are dedicated to individual work, but it is not clear how this component is assessed. The research contributes 18 credits and the Master thesis 30 credits. Subject descriptions and requirements of Master thesis have not been presented in the SER. The quality of language in the English summaries of a number of Master theses presented to the evaluation team was quite poor and indicative of a need to improve the language skills of the students and to take the language into account in the assessment of the theses.

There are numerous inconsistencies in subject descriptions in Annex P1. No subject descriptions are provided for “Special Course”, “Systems biology”, “Master thesis”; two subjects “Membranes and bioenergetics”, “Enzymology” are given only in Lithuanian language, the description of “Integral analysis of biological systems” is literally taken from another programme “Biochemical analysis”, etc.

Overall, the scope of the programme is sufficient to ensure achievement of the learning outcomes. The content of the programme also reflects the latest developments in science and technologies within such courses as Bionanotechnology and Biomodeling or Molecular biotechnology.

3. Staff

The legal requirements foreseen for 2nd degree study programme concerning staff number and qualifications are fulfilled. Altogether 14 teachers: 11 employees of VMU and 3 persons employed elsewhere (1 professor - at The State Forensic Medicine Service and 2 lecturers, one at Vilnius University and the other at Lithuanian Institute of Horticulture) participate in teaching Master study programme special courses at VMU. Among them are 7 professors, 1 associate professor (doc. dr.) and 6 doctors of sciences.

Qualifications of the teaching staff are adequate to ensure an appropriate level of courses and laboratory practice offered within frame of the Molecular Biology and Biotechnology programme. The staff members are employed according to a competitive procedure. Their teaching experiences range from 7 to 27 years. The academic competence of the teaching staff, as deemed from their involvement in research, guarantees that students have ample opportunities to acquire the expected learning outcomes at a very good level. Only in 2 cases (Bionanotechnology and Molecular biology of medicinal plants) the taught subjects do not conform to the documented research profile of the providers.

The number of teaching staff is adequate to guarantee the assumed learning outcomes. According to the list of academic staff (Annex P2) three lecturers employed in other institutions have been invited to strengthen the specialization profile in the fields of Molecular methods applied in forensic medicine, Molecular biotechnology and Plant biotechnology. The ratio of permanent teachers/students ca. 1:5 is fully sufficient to ensure learning outcomes when viewed within frame of the programme, but more than half of the teachers have teaching assignments also in other study programmes at VMU.

There were only slight changes in the group of teaching staff in the reported period. The SER gives the same data as in the case of Bachelor programme in Biochemistry: “9% (1 out of 11) of teachers of the main group of study subjects“, and the same reason: maternity leave. The age structure of the group is acceptable for now but employment of younger researchers is necessary to prevent a generation gap and provide sustained education process in Molecular Biology and Biotechnology, two very rapidly developing fields. While 9 teachers can be considered in the most productive age period of the academic work, from 40 to 55 years old, only 2 teachers are younger than 40. Yet, as a substantial part of master students’ activity takes place in laboratories, the teaching process at this stage is strongly supported by younger researchers - PhD students.

The members of the teaching staff raise their qualifications among others by participation in various forms of international cooperation including joint international projects and inter-university exchange. Each year from 10 to 30% of FNS research/teaching staff participate in LLP/Erasmus exchange for teaching and research visits to universities in foreign countries. Since 2010 there have been 16 outgoing (to USA, Finland, Turkey, Croatia, Italy, France, Belgium, UK and Latvia) and 23 incoming (from various scientific institutions in all above mentioned countries plus Switzerland, Netherlands, Norway, Poland and Ukraine) staff exchange events.

Seminars covering various research topics in biosciences are regularly organized by VMU FNS with participation of researchers from different Lithuanian and foreign universities.

The Molecular Biology/Biotechnology teaching staff is deeply involved in research, in most cases directly related to the evaluated study programme. This is reflected in the number of scientific publications (over 50 publications per year, including about 20 papers in the category of ISI Web of Science). Staff members are involved in expert and organizational activities in the Biomedical Sciences area. Again, the same data are given in both SERs although the groups of teachers differ. In general, "copy-and-paste" technique has been used while preparing both reports. An institution providing two different programs should put more attention to appropriate justification of various issues at the level of SERs.

4. Facilities and learning resources

Facilities available to and used by the Programme of Molecular Biology and Biotechnology MA Programme are shared with the Biochemistry BA Programme, and are mainly located in the building of the Faculty of Natural Sciences (FNS). The description of facilities in the respective SERs of these two programmes was also nearly identical. The classrooms, computer classes in the FNS building appeared to be adequate and in a clean condition. Signs of recent and still ongoing modernization were visible. In addition, classrooms and computer classes situated elsewhere at the University can be used for teaching and studying purposes if needed. According to SER, the conditions in the computer classes and lecture rooms are analyzed on a regular basis. The FNS building is equipped with high-speed internet connections and WiFi zones, which facilitates efficient use of computers for study and research.

The laboratory facilities and equipment in the basic teaching laboratories are partly quite modest and in need of updating. In contrast, many of the specialized laboratories were much better equipped, due to recent substantial investments in laboratory equipment via EU funds. Small size of some laboratories may restrict their efficient use in teaching. The site visit revealed that not all lab safety measures were strictly followed in teaching laboratories (e.g., the use of safety glasses, gloves). Overall, the classrooms, computer classes and laboratories used by the Programme meet the requirements of student practise.

Library facilities present in the FNS building (Informatics and Natural Sciences Library) and elsewhere at the University (e.g., Central Library) are adequate. The short opening hours (8-10 hours daily) do not, however, support studies during evening hours. The Central Library is also open on Saturdays and during exam periods, on Sundays. The collection of books and journals in the fields of biochemistry, molecular biology and biotechnology is somewhat limited, especially considering the broad nature of the disciplines. Students complained about books being unavailable due to long reservations by other students.

The library provides an internet access for the staff and students to major electronic databases of scientific literature (from University IP addresses), which is a major asset and to some extent compensates for the insufficiencies in the collections of printed books and journals.

5. Study process and student assessment

The admission to MBB SP is organized by the Association of Lithuanian higher education institutions for joint admission. It is organized according to the admission recommendations of the Ministry of Education and Science in the Law on Research and Higher Education and the rules approved by the VMU Rector; the admission rules are published on VMU webpage. There are two categories of students: state-funded, the number of whom is regulated by the Ministry of

Education and Science, and self-funded. The Bachelor degree is required for admission to the Master programme.

The organisation of the study process allows students to constitute individual study plans to proceed in an optimal way and to achieve supposed learning outcomes. Participation of the students in research is supported, and the students have possibility to present their research at an annual conference “The Vital Nature Sign” and in other conferences and events.

There are programmes to support the exchange between the VMU students with universities in many other European countries. In spite of the possibilities offered by the LPP-ERASMUS cooperation, the students of Molecular Biology and Biotechnology MA have not participated in the exchange. When asked for reasons for this apparent reluctance, the students mentioned their general satisfaction with the content and quality of teaching in VMU as the main factor. In addition, the students did not find the studies available in the partner universities relevant or suitable for them. The Evaluation Team would encourage the students to more actively explore the possibilities available through the exchange programmes.

The University provides strong support for the students both on the study process and on social aspects. According to the VMU Studies Regulation, all full-time teachers spend at least 20 hours per semester for consulting students on study-related issues. The VMU Office for Student Affairs allocates places in student dormitories, administers social and enhancement scholarships and subsidies for studies and living expenses. In addition, there is ample support for health issues and career planning.

The criteria for assessment are sufficiently clear. The evaluation system is based on the scale of 10 marks with the lowest positive of 5. An exam re-take is possible only once. The assessment of Master theses has room for improvement: only the highest two grades (9 and 10) are in use, as noticed during the site visit, while the variation in the quality of the theses appeared substantially higher. The assessment of the Master thesis should include also the English language in the summaries.

Molecular Biology and Biotechnology Programme graduates are trained to work as specialists, analysts, consultants, researchers, project and department managers in companies of different size. They also are supposed to have sufficient knowledge and skills for opening their own business companies. The placement of MBB SP graduates confirms that graduate students are well prepared for attaining good positions in different institutions – university or research institutes, biotechnology industry, clinical laboratories etc.

6. Programme management

Molecular Biology and Biotechnology study programme committee (SPC) is the major organ responsible for the management, monitoring and assessment of the programme, and works in collaboration with the Department of Biology and the Faculty of Natural Sciences. Decisions made by SPC are approved by Faculty Board and executed by the Department of Biology. The role and activities of SPC are subject to university-level regulations. SPC includes four professors from the Department of Biology, one professor from VMU Botanical Garden of Kaunas, one representative from the Institute of Horticulture (Lithuanian Research Centre for Agriculture and Forestry), and two student members. However, it seems to be little interaction at this level with the Department of Biochemistry and Biotechnologies, which - as the experts' group learned during the site visit - is going to be divided into two departments and to initiate a MA Programme in Biotechnology separate from the current programme under evaluation. SPC organizes regularly an assessment of the programme based on self-assessment materials provided by the Department. It is mentioned in SER that "teachers and students of the Programme, as well as social partners, are encouraged to provide study programme update suggestions to SPC". It is

not clear, however, how the feedback from students, alumni, and employers and other social partners is actually collected, and to what extent it has had an impact.

Based on the analysis of self-assessment materials, the SPC proposes changes to the programme, which are then subjected to a wider discussion involving the Department. The programme has been subjected once to an external evaluation which led to full accreditation. It was recommended to strengthen bioinformatics in the curriculum. It is not clear to what extent this recommendation has been followed, because the need of including more bioinformatics was still emphasized also during the current site visit by the social partners (as employers of VMU graduates). Although procedures to collect information and data on the implementation of the programme have been established, careful analysis of this information should be used more efficiently as a tool for the continuous development of the programme.

The procedures for internal quality assurance are defined and consist of an institutional (University) level quality assurance system and its implementation by faculty institutions, the SPC, the faculty board and the department. The main instrument of the regular assessment is the periodical survey involving both teachers and students, and covering 2-3 study subjects at the end of each semester. The results are analyzed at the departmental level; the role of the SPC should be increased in this process. No examples are given on the changes that may have been introduced to the programme as a result of such procedures. During the site visit, the students expressed their overall satisfaction with the programme, but expressed wishes to include "more new material" to courses, and felt that there is some unnecessary overlap between the courses. Thus, internal evaluations are used as a tool for the continuous improvement of the programme, but their efficiency can be improved.

Discussions with the administration, teachers, students, and social partners left a positive impression with high level of satisfaction and good spirit in the programme, suggesting that on a general level, the programme is well-managed.

III. RECOMMENDATIONS

1. Increase the content of virology, proteomics, bioinformatics, and bioethics in the programme. This may need new recruitments of younger professionals active in these fields.
2. Increase interaction between teaching staff within and between Departments to avoid overlap in course contents (and to better identify possible gaps).
3. Diversify teaching and learning methods and adjust the contact hours between lectures, laboratory work and self-learning accordingly.
4. Improve the English language skills of the students and introduce a system to assess the language in the English summaries of Master's Theses.
5. Analyze carefully (together with the Department of Biochemistry and Biotechnologies and with social partners) whether having two separate MA programmes on modern biotechnology is justified on educational, financial and scientific grounds and by the needs of the society.

IV. SUMMARY

1. Programme aims and learning outcomes

The aims and learning outcomes of the molecular biology and biotechnology study programme are consistent with the actual content and, by and large, correspond to the international standards. The description of the learning outcomes is, however, partly confusing and in need of some revision. The emphasis of the programme is biased towards research career and neglects training of business and entrepreneurial skills normally expected from a biotechnology programme.

2. Curriculum design

The curriculum meets the legal requirements and covers a wide range of fields relevant to molecular biology and biotechnology education. Feedback from students and employers suggests that especially bioinformatics, but also virology, proteomics and bioethics should be strengthened. Some overlap between courses exists both within the programme and between this programme and Biochemistry BA programme. The division of teaching between classes and laboratory work does not seem to correspond to reality and should be made more transparent.

3. Staff

Teaching staff of the programme meets the legal requirements and expectations both in number and quality. Of the 14 teachers involved in the programme, 7 are professors. The teachers have long experience and are active in research as evidenced by the output of published studies. The age structure of the staff is not quite balanced as only 2 (out of 14) are under 40 years. New recruitments would make it possible to extend the scope of the programme to the fields currently neglected (see above), and at the same time, bring younger blood to the staff.

4. Facilities and learning resources

The classrooms, computer classes and internet connections, laboratories and library services used by the Programme are adequate and meet the requirements of teaching and learning equipment and student practise. Recent and ongoing modernization of the facilities and instrumentation is visible and will guarantee successful operation of the programme in the future. Small size of some of the laboratories may restrict their efficient use in teaching. The book collections of the library, including the most popular textbooks should be expanded.

5. Study process and student assessment

The admission procedure is functional and the study process is organized in a manner that allows students to follow individual study plans in an optimal way and to achieve their supposed learning outcomes. The experts' group obtained an impression of a family-like community feeling that has developed within the programme, between the students and the teachers, which is a strong indicator of a well-working programme. The assessment of Master theses has room for improvement: only the highest two grades (9 and 10) were in use although the variation in the quality of the theses is clearly larger. Furthermore, a formal assessment of the quality of the English language in the summaries of the theses should be organized.

6. Programme management

The administrative structure and procedures used for the implementation of the programme and for its assessment are adequate. Discussions with the administration, teachers, students, and social partners left a positive overall impression with a high level of satisfaction and good spirit in the programme, suggesting that on a general level, the programme is well-managed. A major item for further development is the interaction with the Department of Biochemistry and Biotechnologies, which is currently insufficient as most strikingly reflected by the plan to launch a new MA Programme in Biotechnology (by a Department of Biotechnology to be separated from the Department of Biochemistry and Biotechnologies). The rationale behind this decision

as opposed to developing the existing Molecular Biology and Biotechnology Programme in collaboration was not made clear to the experts' group. A world-wide trend in molecular bioscience and biotechnology education is towards more unification, quite the opposite to the development in VMU.

V. GENERAL ASSESSMENT

The study programme *Molecular biology and biotechnology* (state code – 621C71001) at Vytautas Magnus University is given **positive** evaluation.

Study programme assessment in points by fields of assessment.

No.	Evaluation Area	Evaluation Area in Points*
1.	Programme aims and learning outcomes	3
2.	Curriculum design	3
3.	Staff	4
4.	Material resources	3
5.	Study process and assessment (student admission, study process student support, achievement assessment)	3
6.	Programme management (programme administration, internal quality assurance)	3
	Total:	19

*1 (unsatisfactory) - there are essential shortcomings that must be eliminated;

2 (satisfactory) - meets the established minimum requirements, needs improvement;

3 (good) - the field develops systematically, has distinctive features;

4 (very good) - the field is exceptionally good.

Grupēs vadovas:

Prof. Halina Gabrys

Team Leader:

Grupēs nariai:

Prof. Indrikis Muiznieks

Team members:

Prof. Kari Keinänen

Prof. Radim Brdicka

Prof. Ilona Miceikienė

Tadas Juknius

<...>

V. APIBENDRINAMASIS ĮVERTINIMAS

Vytauto Didžiojo universiteto studijų programa *Molekulinė biologija ir biotechnologija* (valstybinis kodas – 621C71001) vertinama **teigiamai**.

Eil. Nr.	Vertinimo sritis	Srities įvertinimas, balais*
1.	Programos tikslai ir numatomi studijų rezultatai	3
2.	Programos sandara	3
3.	Personalas	4
4.	Materialieji ištekliai	3
5.	Studijų eiga ir jos vertinimas	3
6.	Programos vadyba	3
	Iš viso:	19

* 1 - Nepatenkinamai (yra esminių trūkumų, kuriuos būtina pašalinti)

2 - Patenkinamai (tenkina minimalius reikalavimus, reikia tobulinti)

3 - Gerai (sistemiškai plėtojama sritis, turi savitų bruožų)

4 - Labai gerai (sritis yra išskirtinė)

IV. SANTRAUKA

1. Programos tikslai ir studijų rezultatai

Molekulinės biologijos ir biotechnologijos studijų programos tikslai ir studijų rezultatai dera su turiniu ir didžia dalimi atitinka tarptautinius standartus. Tačiau studijų rezultatų aprašas iš dalies nenuoseklus ir reikalauja peržiūros. Programoje labiausiai akcentuojama mokslinė karjera, bet neskiriama dėmesio verslo ir verslumo įgūdžių mokymui, kurio paprastai tikimasi iš biotechnologijų programos.

2. Studijų turinio planas

Studijų planas atitinka teisinius reikalavimus ir apima įvairias su molekulinės biologijos ir biotechnologijos išsilavinimu susijusias sritis. Studentų ir darbdavių atsiliepimai rodo, kad reikėtų ypač sustiprinti ne tik bioinformatikos, bet ir virusologijos, proteomikos ir bioetikos dėstymą. Tiek pačioje programoje, tiek tarp šios programos ir biochemijos bakalauro programos kursų yra besidubliuojančių dalykų. Mokymo per paskaitas ir laboratorinių darbų krūvis paskirstytas nevienodai, neatitinka tikrovės ir turėtų būti aiškesnis.

3. Akademinis personalas

Programos akademinio personalo skaičius ir kokybė atitinka teisinius reikalavimus ir lūkesčius. 7 iš 14-os programą dėstančių dėstytojų yra profesoriai. Dėstytojai turi ilgametės patirties ir aktyviai dalyvauja moksliniuose tyrimuose, ką įrodo ir publikuotų tyrimų skaičius. Akademinio personalo sudėtis pagal amžių nėra gerai subalansuota, kadangi tik 2 (iš 14) dėstytojų yra jaunesni kaip 40 metų. Priėmus naujų darbuotojų, būtų galima išplėsti programos apimtį į šiuo metu apleistas sritis (žr. aukščiau) ir tuo pat metu į akademinio personalo gretas įlieti jaunesnio kraujo.

4. Patalpos ir studijų priemonės

Programai naudojamos auditorijos, kompiuterių klasės ir interneto ryšys, laboratorijų ir bibliotekos paslaugos yra tinkamos ir atitinka dėstyto ir studijų įrangai bei studentų praktikai keliamus reikalavimus. Aiškiai pastebima neseniai pradėta ir toliau tęsiama patalpų bei įrangos modernizacija, kuri ateityje užtikrins sėkmingą programos vykdymą. Dėl nedidelio laboratorijų dydžio kai kurias jų sunku efektyviai naudoti mokymui. Reikėtų plėsti ir bibliotekos knygų, ypač populiariausių vadovėlių, rinkinius.

5. Studijų procesas ir studentų vertinimas

Priėmimo procedūra veikia gerai, studijų procesas organizuojamas taip, kad studentai galėtų mokytis pagal optimalų individualių studijų planą ir siekti numatytų studijų rezultatų. Ekspertų grupei susidarė įspūdis, kad tarp programos studentų ir dėstytojų jaučiamas šeimyniškas bendruomeniškumas – tai neabejotinai rodo, kad programa veikia gerai. Dar yra ką tobulinti vertinant magistro baigiamąjį darbą: rašomi tik du aukščiausi pažymiai (9 ir 10), nors dideli baigiamųjų darbų kokybės skirtumai – akivaizdūs. Be to, reikėtų formaliai tikrinti baigiamųjų darbų santraukų, parengtų anglų kalba, kokybę.

6. Programos vadyba

Administracinė struktūra ir procedūros, naudojamos programai įgyvendinti ir vertinti, yra tinkamos. Apskritai diskusijos su administracija, dėstytojais, studentais ir socialiniais partneriais paliko teigiamą įspūdį: visi atrodo labai patenkinti ir programą vertina palankiai, o tai reiškia, kad, bendrai paėmus, programai yra tinkamai vadovaujama. Svarbiausias tolesnės plėtros uždavinys – sąveika su Biochemijos ir biotechnologijų katedra, kuri šiuo metu yra nepakankama, ką labai akivaizdžiai parodė ketinimai pradėti naują biotechnologijų magistro programą (nuo Biochemijos ir biotechnologijų katedros atskiriant Biotechnologijų katedrą). Tokio sprendimo logika ekspertų grupei liko neaiški, kadangi prieštarauja bendradarbiavimui plėtojant jau vykdomą molekulinės biologijos ir biotechnologijos programą. Pasaulinė tendencija iš esmės yra priešinga tam, kas daroma VDU – molekulinės biologijos ir biotechnologijos mokslus kaip tik siekiama kuo labiau apjungti.

III. REKOMENDACIJOS

1. Didinti programoje dėstomo virusologijos, proteomikos, bioinformatikos ir bioetikos turinio apimtį. Dėl to gali tekti įdarbinti daugiau jaunesnių specialistų, aktyviai dirbančių šiose srityse.
2. Didinti sąveiką tarp paties akademinio personalo ir tarp katedrų, kad būtų išvengta dėstomų kursų turinio dubliavimosi (ir būtų galima geriau nustatyti spragas).
3. Diversifikuoti dėstyto ir mokymosi metodus bei atitinkamai paderinti kontaktines valandas tarp paskaitų, laboratorinių darbų ir savarankiško mokymosi.
4. Pagerinti studentų anglų kalbos įgūdžius ir įdiegti magistro darbo santraukos, pateikiamos anglų kalba, vertinimo sistemą.
5. Nuodugniai išanalizuoti (kartu su Biochemijos ir biotechnologijų katedra bei socialiniais partneriais), ar dvi atskiros magistro laipsnį suteikiančios šiuolaikinių biotechnologijų programos pasiteisina švietimo, finansiniu ir moksliniu požiūriu bei atitinka visuomenės poreikius.

<...>