



EDUCATION IN MEDICAL BIOCHEMISTRY IN SERBIA

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Abstract

Medical biochemistry is the usual name for clinical biochemistry or clinical chemistry in Serbia. Medical biochemistry laboratories and medical biochemists as a profession are part of Health Care System and are regulated through: the Health Care Law and rules issued by the Chamber of Medical Biochemists of Serbia. The first continuous and organized education for Medical Biochemists in Serbia dates from 1945, when Department of Medical Biochemistry was established at Pharmaceutical Faculty in Belgrade. In 1987 at the same Faculty a five years undergraduate branch was established, educating Medical Biochemists under a special program. Since 2006 the new five year undergraduate (according to Bologna Declaration) and postgraduate program of four-year specialization according to EC4 European Syllabus for Post-Graduate Training in Clinical Chemistry and Laboratory Medicine has been established. The Ministry of Education and Ministry of Public Health accredits the programs. There are four requirements for practicing medical biochemistry in the Health Care System: University Diploma of the Faculty of Pharmacy (Medical Biochemistry), successful completion of the profession exam at the Ministry of Health after completion of one additional year of obligatory practical training in medical laboratories, membership in the Serbian Chamber of Medical Biochemists and licence for skilled work issued by Serbian Chamber of Medical Biochemists.

INTRODUCTION

Medical biochemistry is the usual name for clinical biochemistry or clinical chemistry in Serbia, and medical biochemist is the official name for the clinical chemist (or clinical biochemist). This is the largest sub-discipline of the laboratory medicine in Serbia. It includes all aspects of clinical chemistry, and also laboratory hematology with coagulation, immunology, etc. Medical biochemistry laboratories in Serbia and medical biochemists as a profession are part of Health Care System and their activities are regulated through: the Health Care Law and rules issued by the Chamber of Medical Biochemists of Serbia.

The first continuous and organized education for Medical Biochemists (Clinical Chemists) in Serbia dates from 1945, when the Department of Medical Biochemistry was established at the Pharmaceutical Faculty in Belgrade. Further development in the education of Medical Biochemists was in 1955 with the introduction of a postgraduate specialization in Medical Biochemistry at the Pharmaceutical Faculty of Belgrade University. In 1987 at the same Faculty a four years undergraduate branch was established, educating Medical Biochemists under a special program,

and in 1991 four-year study become five-year study. In order to get a license to work in clinical chemistry laboratories, students must have one year practical work experiences in hospital laboratories after graduation (1).

Since school-year 2006/2007 as a result of the Decision of the University Senate in Belgrade the Faculty of Pharmacy has been offering courses according to new curricula and syllabuses, entirely in the line with the Bologna Declaration, i.e. with the study programmes of the EU member-states. The Bologna process represents a standardization of the European higher education area thus enabling compatibility and comparability of different study programmes, mobility of students and teaching staff as well as the possibility of degree recognition (2-4). One of important attainments of the Bologna process is the European Credit Transfer System (ECTS). In order to meet the requirements of the National Accreditation Committee the adjusted study syllabuses have been adopted for the integrated graduate five years studies of Pharmacy and Pharmacy-Medical Biochemistry (5).

EUROPEAN CREDIT TRANSFER SYSTEM AND THE ASSESSMENT OF STUDENTS

Each subject from the study programme is assigned a value expressed in ECTS credits and the scope of studies as a whole is expressed as an overall of ECTS credits. One ECTS credit stands for 25 to 30 hours a student has to spend on all types of class work and individual study to complete all planned learning activities. ECTS credits are allocated to a specific subject based on the estimated overall time spent in order for an average student to acquire the expected knowledge and skills that the subject in question requires. A total of 60 ECTS credits equal the overall workload of an average student within 40-hours work week during one academic year. Student earn their ECTS credits only after passed exams, i.e. only after having completed all the necessary requirements outlined by the curriculum and the syllabus.

The performance of students in learning activities is monitored and expressed through points. By fulfilling the pre-exam obligatory activities and by passing the final exam a student can score a total of 100 points. Pre-exam activities bring a minimum of 30 and a maximum of 70 points. Students obligatory activities consist of: class activities (lectures, theoretical exercises and laboratory practice, consultations), individual study, assignments (tests), exams, final paper and voluntary work in the local community.

The planned teaching methods encompass lectures, laboratory (experimental) exercises that students do on their own, theoretical exercises and coursework. Interactive teaching, implemented at the Faculty of Pharmacy, implies students' active participation in the teaching process for better acquisition of necessary knowledge and skills.

THE STUDIES AT THE FACULTY OF PHARMACY-UNDERGRADUATE STUDIES

Syllabus Pharmacy-Medical Biochemistry

The studies at the Faculty of Pharmacy are integrated academic studies that last for five academic years, i. e. 10 semesters, including the work on the Diploma Paper, and result in 300 ECTS credits realized through two syllabuses: Pharmacy and Pharmacy-Medical Biochemistry. Having finished the studies, students obtain a degree of Master of Pharmacy and Master of Pharmacy-Medical Biochemist (5).

The syllabus Pharmacy-Medical Biochemistry encompassing 35 compulsory courses and 18 optional courses (out of which a student should choose 9). In the first year a student attends 11 courses, in the second 8, in the third 7, in the fourth 8 and in the fifth year of their academic studies a student attends 10 courses. In the 10th semester it is obligatory for the student to write a final (Diploma) paper, worth 10 ECTS credits and allocated 150 working hours. The 10th semester also comprise 75 hours of pre-graduate practice work, worth 2 ECTS credits. All subjects are divided into the following groups: general-academic (represented with 15,3%), theoretical-methodological (17,7%) and applied professional (32,3%). The optional courses make 19,7% of the overall score of ECTS. The majority of optional courses are professional and applied professional subjects.

The program is designed for candidates who plan to pursue a career in medical biochemistry laboratories within the Health Care System or a career in pure and applied medical biochemistry research and education. Creative work and research in medical biochemistry requires broad formal training in basic natural sciences and medicine and extensive

laboratory experience. During the studies Pharmacy-Medical Biochemistry, medical biochemist is qualifying for work in clinical-biochemical, toxicological and sanitary laboratory dealing with medical biochemical, toxicological and sanitary practice.

In the course of education, a student is expected to acquire knowledge on: human organism, disease, role of biochemical laboratory in diagnostics and health care system. In the course of the study, a student is expected to acquire abilities and skills for: laboratory work, quality control that assures continuous process of checking and assessment measuring values to obtain reliable result and medicinally relevant information, handling with instruments and equipments, protection of laboratory staff and safe handling with chemicals and biological materials as well as pharmaceutical/medicinal waste.

REQUIREMENTS FOR STARTING A CAREER IN MEDICAL BIOCHEMISTRY

Medical biochemistry laboratories in Serbia and medical biochemists as a profession are part of the Health Care System and their activities are regulated through: The Health Care Law and The Rules issued by the Chamber of Medical Biochemists of Serbia.

According to the number and complexity of the tests performed as well as to the qualifications of the personnel in laboratory the medical biochemistry laboratories are: General (in a primary health care setting), Special (in a community or country hospital), Subspecial (in a special hospital or clinical hospital), and Clinical (in a University clinical hospital). Clinical medical biochemistry laboratories as a part of the University hospitals are a teaching units for undergraduate and postgraduate education of medical biochemists. Private laboratories are either general or special laboratories. All medical biochemistry laboratories and the list of tests performed are licenced through the Ministry of Health.

There are four requirements for practicing medical biochemistry in the Serbian Health Care System:

1. University Diploma of the Faculty of Pharmacy (Study of Medical Biochemistry),
2. Successful completion of the profession exam at the Ministry of Health after completion of one additional year of obligatory practical training (interim) in the medical biochemistry laboratories,
3. Membership in the Serbian Chamber of Medical Biochemists,
4. Licence for skilled work issued by the Serbian Chamber of Medical Biochemists

In 2006 according to Health Law the new institution – The Chamber of Biochemists of Serbia has been established with aim to do licensing of the medical biochemists. In cooperation with Ministry of Health the Chamber prepared the documents that regulate the program of Continuing Medical Education (CME) and Regulation of Licensing of Medical Biochemists. The program of CME should be accredited by the Republic Health Council, and in program realization the Pharmaceutical and Medical Faculties, The Society of Medical Biochemists and The Chamber of Biochemists of Serbia are participated. The License of medical biochemists will be renewed every 7 years on the basis of successful completion of continuing education requirements during that period. Minimum requirement for renewal of the license is 24 credits per year gathered from different types of the programmes (courses, symposiums, congresses, publications, etc.)

A variety of programs organized by various groups, for example the Faculty of Pharmacy (scientific degrees), Society of Medical Biochemists (symposia, congresses), Chamber of Medical Biochemists (courses), programs of other scientific societies (research and publishing activity), and other activities will be recognized as continuing education by *The Rules of Continuing Education of Medical Biochemists issued by the Chamber of Medical Biochemists* (www.komorabiohemsrbije.org.rs).

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