

PHD STUDY „BIOMEDICINE AND HEALTH“ – PERSPECTIVE AND EXPERIENCES OF THE FACULTY OF MEDICINE UNIVERSITY OF MOSTAR

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In the academic year 2009/2010 the Faculty of Medicine University of Mostar introduced a PhD study in Biomedicine and Health. This represented an important step towards establishing the Faculty as a higher education and scientific institution, but also represented the final chapter in the implementation of the Bologna process. Nevertheless, to fully understand the reasons which led to the introduction of this study, it is necessary to look back to the year 1997 when the Faculty of Medicine University of Mostar was founded.

As a regional capital of Herzegovina, Mostar did not have a Faculty of Medicine until 1997. Physicians from the region sought their education at other faculties of medicine in Bosnia and Herzegovina and in the Republic of Croatia. As a consequence, the region experienced a sort of negative selection of human resources, as a relatively small number of graduates, especially those more successful, returned to their birthplace. At the time of its inception, a regional deficit of 500 physicians was estimated, primarily the result numerous migrations of the population. Accordingly, the Faculty was founded firstly as a means to fill the deficit, but also with a clear goal of establishing an institutional cornerstone for the improvement of the professional and general level of the health care as well medical science in the region. Teaching was possible due to the grand and unselfish help and work of professors from the Republic of Croatia. The need to continuously adapt and improve the teaching process resulted in the introduction of ECTS credits and the implementation of the Bologna process at the Faculty in the academic year 2003/2004. Simultaneously with the advancement of the teaching process at the undergraduate level, many activities were undertaken in order to tackle one of the greatest challenges of this young Faculty: the creation of a domestic scientific and teaching staff and the development of research and science.

In the beginning, the shortage of teaching staff was primarily addressed by engaging young associates from the Clinical Hospital Mostar and offering them possibilities for postgraduate studies in Croatia and B&H. The Faculty made a significant step forward by introducing a Master's study specifically tailored for

clinicians, titled "Medical care and Public Health", that the first generation of students could enroll into upon the completion of their studies in the academic year 2003/2004. At the same time the Faculty allowed a PhD thesis defense for those who completed their Masters in the country and abroad. Several graduates from the first and the second generation of students got the chance to acquire a PhD in basic sciences by working on research projects in Croatia and USA. In the academic year 2007/2008 the last generation of Masters students was enrolled due to adjustments to the Bologna process, to which there is no second cycle for medical studies and the passing of the Framework Law on higher education in 2007. This also marked a period in which intensive preparations for the introduction of the PhD study took place. Prior to the beginning of the PhD study, 25 out of 171 Master students graduated during four generations, while 7 PhD theses were defended. With this data in consideration, it was decided that MSc students would be allowed to finish their studies in the next five years and that the PhD study would function in parallel with the PhD thesis defense until further deadlines were defined by the Law on higher education at the level of Herzegovina-Neretva Canton, which was passed finally in March 2012. In addition to this program overview it is necessary to emphasize that the introduction of the PhD study followed the moving of the Faculty to a new building that fulfilled all modern standards for teaching and where the process of acquiring a supply laboratory equipment was underway. These processes overlapped with the return of our young sciences fellows, who acquired their PhDs at Universities in Croatia and USA. Therefore, it has been and remains a permanent wish and intention of the Faculty's management that these young fellows continue their research at the Faculty, and contribute to the advance of their future colleagues as well as to the higher scientific and research activities and recognition of the Faculty. Finally, it is important to emphasize that it was management's intention to adjust the PhD study to be in agreement with the recommendations of the European Association of PhD studies in Biomedicine and Health (ORPHEUS). Those adjustments are evidenced by the existence of clear criteria for the enrollment of students, a list of Mentors

and conditions which need to be met to qualify for a mentor, organized teaching, and the evaluation of activities needed for a PhD.

Description and structure of the PhD study

The PhD study in Biomedicine and Health has been developed with the cooperation of the Faculty of Medicine, University of Osijek. It covers fields of Basic and Clinical Medical Sciences, and Public Health and Health Protection.

The study is a minimum of three years duration and upon its completion a student should have acquired an equivalent of at least 180 ECTS. The maximum duration of study is five (5) years for students studying full time and seven (7) years for students studying part-time and working outside higher education institutions.

In principle, students who are graduates of medicine are entitled to apply, but exceptions are extended to students who have graduated from Faculties in a wider field of Biomedicine if they are or will be employed in an institution within Biomedicine and Health. The grade average required for consideration is 3,5 (8 in a grade system 5-10). Applicants with a lower grade average need at least two letters of recommendation from persons with a scientific background and one of these persons must be a mentor. Knowledge of spoken and written English requisite for the understanding of scientific literature, writing of scientific papers and use of computer programs is an obligatory component of the application. Students apply to the study via a public call and are admitted according to a rank list which is determined according to a set of predefined criteria that evaluate performance during graduate studies and motivation for scientific work and research.

The study program entails that an equivalent of overall 180 ECTS be distributed to:

- organized classes, 45 ECTS,
- individual research work of a PhD candidate on PhD thesis evaluated by original scientific articles worth 60 ECTS and the thesis itself 30 ECTS;
- elective, extracurricular scientific and teaching activities, 45 ECTS.

Every PhD candidate must acquire at least 18 ECTS during the first year of study from an obligatory module "Basic scientific and research work" in a segment of organized classes. The purpose of this module is to equip PhD candidates with the theoretical and practical knowledge needed for successful completion of the PhD study and research work. In the next two years, students should acquire 27 ECTS by choosing among 67 elective subjects divided into three elective modules: "Experimental biomedicine", "Clinical biomedicine" and "Public Health". Every student chooses a mentor during the first year of the study. The mentor assists the student with the selection of elective subjects which are

presented in an Individual study plan, and advises, directs and guides the student during the study and research. The mentor is required to hold a PhD, to be elected to the scientific position, and his or her scientific work and papers need to be from a field a student does his research in. Potential mentors are known and available to students in a List of potential mentors which contains their personal and contact data and field of scientific interest. Mentors present a very important part in the quality of the study as their contribution is essential for the second and the most important part of the study - individual research work. The most common tools for the evaluation of a PhD work are published scientific articles. Therefore, for a successful defense of a PhD a candidate needs to publish at least two original scientific papers in internationally recognized journals, where the candidate is the first or the second author and one of those papers needs to be published in a journal indexed in Current Contents. The third segment of the study program, elective scientific and teaching activities, motivates and evaluates a PhD candidate's participation in the scientific and research community. The criteria used for this evaluation entail the active participation in scientific conferences, research work at other institutions in the country and/or abroad, membership in scientific associations and societies, and the participation in activities concerned with the popularization of science. Since one of the main motives for establishing the PhD study was to create a domestic scientific and research staff, a candidate's motivation and level of teaching skills and activities carry much importance, because clear and understandable transfer of knowledge to others is one of the generic components of every PhD.

Finally, it should be emphasized that the PhD thesis is evaluated by a Committee which consists of three to five members, who are mostly inside the Faculty, but at least one member has to be from an institution outside of the University of Mostar. To avoid a potential conflict of interest, a candidate's mentor cannot be a member of the Committee for the evaluation and defense of the PhD thesis. The defense is announced and performed as a public defense.

On account of this description, we can see that the structure of the study program is complementary to other programs in the geographic region, primarily in the Republic of Croatia, and represents a quality basis for the scientific and research training of physicians.

Experience

Through three generations, a total of 50 students enrolled into the PhD study, 22 in the first generation, 13 in the second and 15 in the third.

All students study part-time. It had been originally planned that students would enroll every second year, therefore intending to enroll 20-30 students. However,

due to a relatively high number of elective subjects and the consequent scatter of students amongst those subjects, it was decided to organize the study each year and enroll a lesser number of students.

More than two thirds of students in the first generation and almost all students in the second generation enrolled into the PhD study within 5 years from graduation. This was expected considering the majority of students who were more than 5 years outside of graduation enrolled in a Masters study and a PhD thesis defense type of study, which run parallel at the Faculty. Only two students from the first generation are Doctors of dental Medicine, while all other students are physicians. Two thirds of those students did not start their specialization prior enrollment in the PhD study. Students are required to select their mentor, field and specialization for research already during the first year of the study, and 24 out of 35 students from the first two generations outlined their intent to do their research in the field of Clinical Medical science, 8 in Basic Medical Science and 3 in the field of Public Health. The majority of first generation students (16 out of 22) submitted their PhD thesis proposal at the final deadline during their third year, which could also be expected as all students study part-time and are busy with their work at the Clinic.

Considering the short experience in the organization of the PhD study, it is not possible to make long-term conclusions and judgments. Nevertheless, adjustments could be made in the coming period to certain elements in the organization of the study, primarily related to a more active engagement of students. A revision of elective subjects is planned for the new generation, with the aim to decrease their number and adjust them better to the needs and interest of students. To motivate students towards more active research and comply with

the recently passed rules on PhD studies at the University of Mostar, students will be obliged to submit their proposals already during the first year of the study. Mentors need to be additionally trained and motivated to work actively with students, in an effort to create a rich research environment - a crucial element and condition for the existence and organization of a PhD study, as frequently outlined in the presentation of PhD studies from numerous countries during ORPHEUS conferences.

Exchanging of experiences with colleagues reveals that the research environment is based on structured and quality oriented financial support for science from a state level, which has already been proven and experienced by developed countries. Therefore, a wish and hope must be expressed for a more serious organization of a financial support system for our scientists, mentors, PhD students especially, despite the complexity and institutional limitations of our country and system of higher education. There is a need for closer cooperation in the fields of Biomedicine and Health, establishment of research groups in cooperation with colleagues from other Faculties in the country and abroad, increased international cooperation, and participation in EU programs - because this is where we belong and where we can and need to be. The time has come to allow our knowledge, our innate human desire for research, and our desire to discover the unknown, bring us all together so that together we may create an environment in which our young scientists can express their full potential.

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