

HABILITATION THESIS

„Microbiology – a central pivot in medicine and in interdisciplinary research”

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This habilitation thesis presents part of my research activities following the defense of doctoral thesis entitled "Evaluation of etiology and pathogenicity of microorganisms involved in infectious endocarditis", conducted by Prof. Dr. Radu Deac. The doctoral thesis was defended in 22.03.2010 in the University of Medicine and Pharmacy in Tîrgu Mureş and I was confirmed as PhD on 28.07.2010. This habilitation thesis summarizes the main achievements on academic, scientific and professional field, proving the conditions required for obtaining the habilitation certificate.

My clinical interest from the pre-doctoral stage was redirected towards the preclinical area, particularly looking towards different microbiology fields that are deficient: mycology, experimental virology, new materials with antimicrobial effect, nutritional microbiology. The wide field of microbiology includes bacteriology, virology, mycology and parasitology, and each subdomain comprises a wide range of studies. The scientific papers that were published and that targeted laboratory medicine professionals were performed in different medical fields, thus emphasizing the importance of interdisciplinary studies. In addition, the studies of molecular biology and those that involve high performance equipment, bring information of increased value and novelty in the research field of microbiology.

My academic achievements are the result of more than 12 years of activity with students. My career met all the steps that are needed for an optimal academic development: junior lecturer (2006-2008), assistant professor (2008-2011), lecturer (2011-2016), associate professor (today). The activity with my students resulted in 10 diploma papers and many presentations in students' scientific congresses.

In my scientific work, interdisciplinarity was and will still represent the focus of my microbiological studies. The diversity of publications made possible the development of a broad field of view regarding the implication of microorganisms in everyday life, starting with the symbiosis with our body, continuing with the microbial carriage, implication in nutritional, pharmacological or dental microbiology, and finally, with the main concerns on nosocomial infections with multiresistant bacteria. The research activity presented in this thesis is supported by more than 30 publications in extenso and 50 abstracts. I was an active member in four research grants, director of one local grant and now I am director of one private grant.

I have contributed to the acquisition of lab equipment for the Microbiology Laboratory of the University of Medicine and Pharmacy Tîrgu Mureş, which has allowed and will allow us to perform

domain-specific studies. The recent development of the new Advanced Pharmaceutical and Medical Research Center opened new research opportunities, where I already started to work on two projects. The first one is a follow-up of experiments that I have conducted in the virology research center in Zurich, and involves the development new viral vectors; the second is related to the last privately funded grant and is aimed at quantifying two species of lactobacilli in biological products by duplex qPCR.

From professional perspective, I followed one-year training in a postdoctoral fellowship at the University of Zurich, Switzerland, where I learned new techniques in virology, cellular and molecular biology: viral cloning, gene inhibition by siRNA, confocal microscopy, flowcytometry, immunofluorescence, DNA and RNA manipulation, protein/DNA electrophoresis and membrane transfer (Western blot, Southern-blot). I will use all these techniques together with my colleagues from other fields to initiate complex research projects. I am activating as specialist physician in the bacteriology laboratory sector of the Mureş Clinical County Hospital. I am deputy editor of the Romanian Journal of Laboratory Medicine, indexed in ISI Web of Knowledge, respectively managing editor of the Journal Acta Medica Marisiensis, indexed in international databases and recognized by CNCIS as B+. I am member of the leading committee of Romanian Association of Laboratory Medicine and Director of the M2 Department of UMPH Tg. Mureş. I attended numerous postgraduate courses, professional training courses and scientific events, that are imperative in order to be aware of the new trends and needs in the field of laboratory medicine and medicine in general.

The thesis concludes with a chapter devoted to future perspectives in the academic and scientific career, followed by bibliography. Regarding the future plans for development of the academic career, I intend to continue my activity in the Microbiology Department, several priorities being the further publication of courses and practical materials, to finish the publication of the microbiology atlas for students and to implement an optional course of molecular biology in microbiology. Regarding the scientific and professional development, my priority will be related to the implementation and use of methods and techniques of molecular biology, which can efficiently combine the data from microbiology laboratory and basic research, with data from other clinical and paraclinical fields. Future topics will address the development of therapeutic viral vectors based on AAV2 and HSV-1, or testing of new antimicrobial materials that could combat the antibiotic resistance problems that are becoming more and more common.

My whole work will be based on excellence, fairness, and respect for team work and my colleagues, and will aim for the publication of interesting results that can contribute to the prestige of our University.