”VICTOR BABEŞ” UNIVERSITY OF
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PHYSIOLOGY BETWEEN EDUCATION AND RESEARCH

ABSTRACT

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The habilitation thesis **PHYSIOLOGY BETWEEN EDUCATION AND RESEARCH** describes the results of my scientific, academic, and professional activity since 2002, the year I defended my doctoral thesis titled "Stress through immobilization - experimental and clinical research," conducted under the supervision of Prof. Dr. Francisc Schneider, until the present day, along with the directions of academic career development and scientific research in the coming years. The thesis was laid out according to the recommendations of the Ministry of Education and Research no. 5, 229 of August 17, 2020, as well as the Guide for the Elaboration and Drafting of the Habilitation Thesis within the Victor Babeș University of Medicine and Pharmacy of Timișoara, elaborated based on CNATDCU recommendations. The thesis includes four chapters: the first consists of the presentation of scientific achievements and international visibility, the second and third refer to academic and professional achievements, respectively, and chapter four presents the plans and perspectives for teaching and scientific career development. At the end of the thesis, I included the bibliographic references.

CHAPTER 1. After a review of the main events of the postgraduate career and a brief presentation of the doctoral thesis, this chapter describes the main scientific achievements and international visibility.

I listed the **research projects** I was part of and presented details of those I considered most representative. Among the international projects stands out EU-Q-Blood-SOP (2005-2007), which laid out the methodology for carrying out standard operating procedures (SOP), based on the requirements of the directive of the European Commission on quality assurance and safety in handling blood. This material was made available to all county blood centers in the hopes that it will contribute to the understanding and management of the quality processes in hematology services. Among the national projects, the one that was the most complex and brought me the most satisfaction was the eMediqual project because it was focused on medical education and the management of educational activities. Within this project, I had the chance to participate in and organize events (conferences, workshops, seminars, symposia) with the general theme of improving the process of medical education by using various new methods whose usefulness we discovered by applying them within the project courses. In the 2003-2021 period, I participated in a total of **32 research projects**, 6 of which were international and 26 national, and in one of which I was the UMF official.

Further on, I describe my **scientific research activity**, an essential component of my professional activity which was focused on both the development of the field of physiology-immunology and interdisciplinary collaborations. I grouped the research I participated in as follows: (a) experimental research in the field of stem cells, (b) research in clinical laboratory, (c) studies on medical education. The results obtained form the basis of data published in a large number of articles.

I opened with the results of experimental research in stem cells, with particular emphasis on the studies that I considered most representative. First referenced were two review articles that aimed to collect and briefly present the latest data, at the time of publication, on stem cell research. I then continued with the description of a study on the adhesion and secretory profile of mesenchymal stem cells on contact with some biomaterials, and its continuation, a study on their viability and proliferation capacity on contact with the same biomaterials. Other studies described in the thesis refer to the *in vivo* migration of human adult mesenchymal stem cells to inflammatory lesions, after transfection with CD29 siRNA on an animal model in mice, and to the characteristics of lipid metabolism along the path of differentiation of human mesenchymal stem cells to mature adipocytes, respectively. Some of the published articles are only mentioned in the thesis since they can be found as bibliographic titles.

My research within the clinical laboratory represented a research direction that I consider a continuation of the type of experiments performed during my doctoral thesis, regarding the correlation of some biochemical parameters with a particular status of the patient. I described in detail the results of two studies, one that evaluated the effect of Magnegita® (gadopentetate dimeglumin) on routine laboratory parameters in patients with renal or hepatic failure who underwent magnetic resonance imaging, with the conclusion that monitoring these parameters can be vital in helping medical staff to quickly take the appropriate measures to prevent possible serious adverse events. Another study focused on evaluating the beneficial effects of Trimetazidine (TMZ) as a supplementary drug to conventional medical therapy in patients with myocardial infarction, concluding that metabolic modulators such as TMZ demonstrate promising therapeutic potential in patients with myocardial infarction and deserves to be taken into consideration for therapy in addition to the conventional established hemodynamic agents.

I then described an article referring to the third direction of study, on medical education, and which reports the experience of our discipline within the eMediqual project, related to the extracurricular modular courses that took place to assess the impact of integrated medical programs.

The result was 368 publications, of which 27 were books, 106 in-extenso articles (20 ISI articles with impact factor and 86 included in other international databases), 235 scientific events abstracts (44 international and 191 national). Also within chapter 1, I present a short description of the invention which was patented with no. 123049 of 30.08.2010, granted by the Bucharest State Office for Inventions and Trademarks, and the reasons that led to its realization and the enumeration of its benefits.

International visibility of the research activity was another subchapter of the scientific achievements, where I detailed the citations obtained, the membership in professional-scientific structures, as well as membership in editorial teams. I am a **member of several professional societies** but what I detailed most in my thesis was my affiliation

to the Romanian Society of Physiology, since 1994, participating with scientific papers in all the scientific events organized by the society. For 8 years, between 2012 and 2020 and for as long as the management of the Romanian Society of Physiology was provided by the Physiology Discipline of Timișoara, I held the position of Secretary-General. At many of the company's conferences and congresses I was part of the scientific committee, organizer and chairperson.

I am the **co-editor-in-chief of the journal Fiziologia - Physiology**, the official journal of the Romanian Society of Physiology, and simultaneously the contact person. At the same time, I monitor the quality of the information on the magazine's official website.

CHAPTER 2 refers to the **academic achievements**, with the chronological description of the stages of my development, from the didactic title of preparator to that of Associate Professor, as well as the main didactic responsibilities that have fallen to me over time. I list the training courses I took part in, especially during the eMediqual project, and highlight how my participation in all the organized seminars, workshops and courses changed my perspective on my role as a teacher and strengthened my conviction that the new teaching methods I learned about by participating in all the events of the project are essential in the quality education of our students. My participation in five of the Graz conferences on medical education, organized by the University of Medicine in Vienna, was a vital contribution to assimilating the new teaching methods and putting them into practice.

In the subchapter **Developed Teaching Materials,** I highlighted my contribution to the editing of 12 lectures and practical laboratories for students, continuously adapted to the current literature.

In another subchapter, I described my **Participation in Extracurricular Courses and Summer Courses** as lecturer in the discipline of Physiology. The courses we described were organized within the eMediqual project in order to assess the impact generated by an integrated modular medical curriculum. In order to appreciate the effects of the new teaching system, we initiated a pilot study consisting of three courses:

(a) *Biosignals - Clinical applications* was addressed to first-year general medicine students in order to assess whether a modular medical curriculum would be appropriate for their needs. I envisioned this course's organization as cooperation between several first-year disciplines, which overlapped on a similar medical domain while regarding it from different perspectives. We co-opted colleagues from the disciplines of Cellular and Molecular Biology, Biophysics and Medical Informatics, and, together with Physiology, chose a topic, on which we designed the individual discipline's objectives of the courses and practical laboratories. In the end, we developed an integrated schedule that included four modules: neuron, striated muscle, myocardium and a clinical exploration module, which totaled 20 hours of courses and 12 hours of practical applications in a four-week program. In this course I participated both as organizer and as a lecturer in teaching physiology courses.

(b) *The pilot module - Clinical Anatomy* was addressed to a number of 60 students of General Medicine 4th year, and was conducted in two series, with the aim of correlating the main information of systematic anatomy with the base symptoms of pathologies of the main organs and systems.

(c) *The pilot module - Fundamental Clinical Skills* had as main objective the introduction of fundamental clinical skills in the UMF university curriculum, and aimed at testing the students' feedback to achieve this goal. The course was addressed to 2nd year General Medicine students and was organized in two series.

The final conclusion of the pilot study was that this way of teaching has the potential to improve the quality of both teaching and learning processes, and the great gain of this special experience for students is that they have been able to compare the traditional way of teaching with the alternative offered by us.

I then described my experience in participating in five summer schools, where students had the opportunity of interactive communication with experts in the field, become familiar with new integrative teaching methods, acquire updated information presented in a modern and interdisciplinary manner, and develop a range of practical and teamwork skills.

Further on, in the same chapter, I highlighted my participation in the coordination of **license papers**, in the period 2008 – 2019, and in the coordination of groups of students in student scientific sessions, on which occasion a presented paper was awarded a prize at the Timisoara Medical Educational Days, 3rd edition, March 24 - 26, 2014.

I took part in the **admission examinations** as member of the commission of BIOLOGY specialists, and I am involved in designing the tests for the entrance exam at our university, both for license (undergraduate) and short-term studies.

I was part of numerous promotion committees in the disciplines of Physiology, Pathophysiology, Immunology, Anatomy, according to the decisions of the rector.

CHAPTER 3 discusses **Professional Achievements** and describes the **Professional Journey** from resident to primary physician in Laboratory Medicine. I described my activity as part-time clinical integration activity within the Regional Center for Transplant Immunology – the Central Medical Laboratory, within the Clinical Hospital no.1 of Timisoara County, between 2001 and 2017, and its continuation from 2017 to the present day with the Center for Gene and Cellular Therapies in Cancer Treatment - OncoGen. At OncoGen, I hold the position of head of the human cells and tissues bank, I participate in a series of projects of the OncoGen center, and I am involved in the process of quality management. Thus, in 2015 I participated on behalf of OncoGen (as a section of the Emergency County Clinical Hospital "Pius Brînzeu" Timișoara) in the preparation of the necessary documents for the accreditation of ANMCS.

I am currently handling the RENAR accreditation process, and the inclusion within the hospital of a set of precision and advanced diagnostic tests in Allergology and Clinical Immunology, in the context that there has been an increase in the prevalence of allergy to

various allergenic sources among the population. My activities regarding the involvement in quality management are justified by my qualification as an internal auditor for quality management systems in medical laboratories on certain quality standards.

My actions, along with several colleagues, have resulted in the registration of the OncoGen Center on various platforms and consortia in order to increase visibility, cooperation and interaction with other entities in the scientific community interested in collaborations. I have continuously perfected by participating in a large number of professional training courses in my chosen specialization, courses that have had a decisive impact on my career (listed in this chapter).

I then described the way in which I managed to harmoniously blend my didactic activity with my laboratory one by participating as organizer and lecturer in several postgraduate courses for doctors and laboratory nurses at UMF Timișoara, but also on the occasion of participating in the IMUNOLAB project between 2010 and 2013 (described in Chapter 1) in which I gave a series of courses on the "Principles of Organizing the Medical Paraclinical Investigations" in various pre-established locations in the country for staff employed in immunology laboratories.

Participation in specialization and contest commissions and **Awards** are other subchapters detailed here.

CHAPTER 4 includes the plans and perspectives for the development of my academic career, with an emphasis on **teaching** and **scientific activities**.

We grouped the proposals for the development of teaching activities in:

1. Proposals for the development of practical skills
2. Proposals for the development of the way of evaluating practical abilities
3. Proposals for the development of communication skills

Also detailed are several realistic ideas and plans adapted to the needs of the future regarding the development of scientific research activities.

Teaching will continue to be a priority of my concerns. I want to continue to improve by participating in congresses, conferences, workshops, and any events that can bring benefits and improvements, both in terms of medical education and in my profession as a laboratory physician.

The list of bibliographic references completes and concludes the habilitation thesis.