

**UNIVERSITATEA DE MEDICINĂ ȘI FARMACIE  
“CAROL DAVILA” BUCUREȘTI  
ȘCOALA DOCTORALĂ  
DOMENIUL MEDICINĂ**

**Cardiovascular physiology and pathology  
From theoretical concepts, to experimental studies and clinical practice**

**ABSTRACT OF THE HABILITATION THESIS**

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The habilitation thesis with the theme "Cardiovascular physiology and pathology - From theoretical concepts, to experimental studies and clinical practice" includes the main scientific, academic and professional achievements accomplished after the defense of the doctoral thesis with the title "Dynamics of medullary progenitor cells in anesthetic preconditioning induced by sevoflurane", at "Carol Davila" University of Medicine and Pharmacy in Bucharest, in 2011, followed by the career development and development plan. The scientific path followed the academic one, with fundamental research themes giving way to translational, and later, clinical ones. However, whenever I have the opportunity, I return to physiology and the intimate mechanisms of pathophysiological processes, for a better understanding of cardiovascular diseases, and intervention and prevention possibilities. The thesis is structured in four chapters, as presented briefly below, and ends with the bibliography.

*Chapter 1* includes the main activities and scientific achievements carried out since the beginning of my career, initially in the Division of Physiology and Neurosciences, Department of Functional Sciences of the Faculty of Medicine, University of Medicine and Pharmacy "Carol Davila" and later on in the Department of Cardiology, Elias University Emergency Hospital, of the same university. The first chapter is structured in four subchapters, as follows.

- 1.1. The main field of research - This first sub-chapter includes an overview of scientific activities and achievements, associated with my academic and professional career and the evolution of research themes from preclinical to clinical, consistent with the topic of the habilitation thesis. The scientific papers resulting from my research are not presented as a single list, but separately, together with the research topic they represent.
- 1.2. Research topics - This second sub-chapter on research topics is grouped into three parts, each with sub-parts as follows: experimental research studies, translational research studies, and clinical studies. Experimental research studies include investigating myocardial preconditioning with sevoflurane by mobilizing endothelial progenitor cells and studying blocking this effect, especially in the late phase, by blocking the SDF-CXCR4 axis. Translational studies refer to data observed experimentally, which must also be confirmed in humans, in this case testing the effect of the sevoflurane preconditioning protocol in patients with coronary artery disease. Given that a set of biomarkers that could discriminate between coronary patients with stable and unstable disease would be extremely useful in the clinic, we recruited patients in whom various biomarkers (microRNA, dysfunctional HDL, etc.).

- 1.3. Research projects - Here are included the research projects I participated in during my post-doctoral career. These include completed or ongoing projects ranging from the study of myocardial anesthetic preconditioning, its effect on endothelial cell mobilization in both rats and humans, and the identification of prognostic biomarkers in coronary artery disease.
- 1.4. The results of scientific and research activity - In this sub-chapter I presented the scientometric indices related to my scientific work, consisting in a Hirsch index of 8 and 302 citations in ISI Web of Science Core Collection journals and a Hirsch index of 10 and 460 citations according to Google Scholar. Reviewer activity for eminent ISI-rated publications and membership of various national and international professional-scientific structures, as well as the award of scientific activity at the national or international level, are also included in this subchapter. The publications include 16 papers as main author in ISI listed impact factor Journals, 7 papers as secondary author in ISI listed Journals, 2 papers in ISI listed Journals without an impact factor, and 10 papers in BDI indexed Journals.

*Chapter 2* includes my academic achievements, starting with my teaching assistant position, followed by assistant lecturer and senior lecturer positions. My academic activity includes teaching in both Romanian and English for both physiology and cardiology and in Romanian for emergency medicine students. It also includes writing manuals for both physiology and cardiology students, as well as encouraging them to write their bachelor's thesis on a cardiology-related subject. My participation in admission, bachelor and residency exams is also mentioned.

*Chapter 3* states my professional achievements, initially as resident doctor in cardiology, then senior cardiologist and cardiology consultant. It also includes a list of training courses and supplemental certifications. Moving forward, it describes my clinical activity in the acute cardiac care ward. I also included my participation in multiple examination committees.

*Chapter 4* comprises my future plans for academic career development. They are structured in two subchapters: development of educational activity and development of scientific and research activity. I find the two to be intimately connected, as I plan to instill in my students and residents the eagerness and desire to do research work. I have always been interested in broadening my horizons, and my recent acceptance in a master program, MSc in Clinical Trials at Oxford University, I hope will do just that, and bring added value to what I am able to teach my younger colleagues. Based on my current and future knowledge I plan to recruit as many

willing students, residents, and hopefully PhD students, as possible to design, prepare and submit future research projects. I also plan to maintain and expand my connections with my peers in both the same specialty and other specialty, as cardiology brings many interdisciplinary research opportunities.

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Şef de Lucrări Dr. Mihaela Popescu-Moraru