

**"VICTOR BABEŞ" UNIVERSITY OF
MEDICINE AND PHARMACY TIMIŞOARA
DOCTORAL SCHOOL
MEDICINE**



HABILITATION THESIS

HEART FAILURE - FROM CELLULAR BASIC SCIENCE TO INTERVENTIONAL TREATMENT

A B S T R A C T

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ABSTRACT

This habilitation thesis represents a synthesis of my scientific, professional and academic activity carried out within the University of Medicine and Pharmacy "Victor Babeș" Timișoara. The main research area throughout my career has been in the field of heart failure and electrophysiology.

The first chapter "Professional, scientific and academic contributions" shows my scientific contribution in the current research state, being structured into 4 subchapters. The first chapter sets out my collaboration with colleagues from the Pathophysiology Department regarding a series of fundamental researches that evaluated the role of inflammation and oxidative stress in the development of endothelial dysfunction, as well as the role of avitaminosis in arterial stiffness. Also, this chapter presents a particular subject – cardiotoxicity and cardio-oncology, a new subspecialty – resulted through the collaboration with colleagues from the discipline of Onco-Hematology.

By the nature of my subspecialty in electrophysiology and cardiac device implantation, much of my research work is related to patients with arrhythmias - this is exposed in subchapters 2 and 3. Supraventricular arrhythmias such as atrial flutter, atrial fibrillation are ever-increasing pathologies, and ablative treatment showed its superiority over drug therapy, but for certain categories of people such as the elderly or young people and children the ablative technique involves additional challenges. A number of papers published in summary, as well as in proceedings from national and international congresses, address this issue. Wolff-Parkinson-White syndrome, although with a lower incidence compared with atrial flutter/fibrillation, involves a risk of sudden cardiac death. It is worth mentioning the joint effort made by our research team together with our colleagues from the Transylvania Hungarian University of Sciences and the University of Technology and Economics of Budapest in proposing a new improved method for locating accessory pathways.

The use of implantable cardiac devices has been introduced in the treatment of bradi and tachyarrhythmias more than 30 years ago, but the technical advances

have made it an ever expanding field. The beginning of my research career was marked by the study of cardiac pacemakers, in particular studies on the detection variability in VDD leads, as well as comparative studies regarding the use of DDD versus AAI pacemakers, and I was happy to participate with numerous poster/oral presentations at national cardiology congresses but also at european arithmology congresses (Europace, VeniceArrhythmias). These papers are presented in the third subchapter of the first part, together with the research work in the field of cardiac resynchronization therapy. The use of bicameral pacemakers with only two leads at the right atrium/left ventricle, without the right ventricle lead, in patients with non-ischemic dilatative cardiomyopathy and normal atrioventricular conduction is an innovation in the field of resynchronization therapy. The papers on this topic have been published, in extenso, in ISI indexed journals with cumulative impact factor >8.

The last subchapter of the first part deals with non-interventional treatment - the role of micro-supplements and diet in the prevention of cardiovascular diseases and in the treatment of patients with heart failure, but also the problem of multidisciplinarity in cardiology.

The following 2 chapters of the thesis present my professional evolution and future plans in the scientific and academic field. A brief history of my career shows the main landmarks - the period of research studies in cardiology at the University of Marseille, subsequently obtaining the certification in electrophysiology and cardiac devices, achieving my PhD degree in the field of ablative treatment for atrial flutter, but also studies in the field of public health management, that allowed me to obtain, through competition, the manager position at the Institute of Cardiovascular Diseases in 2015.

Chapter 4 of this thesis presents my plan of academic development within the Cardiology Discipline at the University of Medicine and Pharmacy "Victor Babeș" and at the Institute of Cardiovascular Diseases Timișoara. First of all, I would like to continue to value the collaboration with the discipline of Pathophysiology and Onco-Hematology in the field of fundamental research and cardio-oncology; in this context, in the thesis you can find a number of new research directions. I hope to increase the performance in the Electrophysiology Laboratory by continuing the research in the field of cardiac resynchronization therapy and fusion pacing, but also the

accreditation of the laboratory in new procedures such as device explant and lead extraction, the use of robotic magnetic resonance and intracardiac ecography for complex ablations procedures.

All these new projects involve a multidisciplinary research team and offer a multitude of opportunities - for the hospital and patients regarding the medical procedures we can perform, but also for the medical staff, creating new opportunities for training and young doctors over-specialization, also giving us the chance to increase our visibility in the scientific and academic environment.

This thesis, structured in 3 parts (presentation of professional scientific contributions, presentation of career and academic development plan, as well as the references), fully respecting the recommendations of CNATDCU, attests my ability to carry out original research, visible at national and international level, and also my ability to integrate and support research teams.