

**„VICTOR BABEȘ” UNIVERSITY OF MEDICINE  
AND PHARMACY FROM TIMIȘOARA  
DOCTORAL SCHOOL  
MEDICINE DOMAIN**



# **HABILITATION THESIS**

## **BREAKING BOUNDARIES IN CARDIOVASCULAR CARE: THE POWER OF MULTIDISCIPLINARY APPROACH FOR UP-TO-DATE MANAGEMENT**

### **A B S T R A C T**

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## ABSTRACT

My habilitation thesis entitled "BREAKING BOUNDARIES IN CARDIOVASCULAR CARE: THE POWER OF MULTIDISCIPLINARY APPROACH FOR UP-TO-DATE MANAGEMENT" includes the most important professional, academic and scientific achievements obtained after completing my doctoral studies.

The evolution of my professional career has followed all the essential stages for the development of my medical career, demonstrating significant progress in both medical practice and contributions to the fields of education and research.

In January 2007, I completed my doctoral thesis entitled "Late Potentials in Myocardial Infarction". I began my teaching career as a university preparator in the Cardiology discipline and currently hold the position of associate professor in the same discipline. I obtained the qualification of internal medicine specialist, as well as that cardiology specialist, currently holding the position of primary physician in both specialties. After obtaining the title of cardiology specialist, I started my professional activity at the Cardiology Clinic of the Emergency County Clinical Hospital "Pius Brînzeu" in Timișoara, where I still work today and have been leading since 2018.

The results of my scientific activity have materialized in 47 scientific publications (32 in extenso articles as main author/co-author) indexed in various databases – Clarivate Web of Science, Scopus, with an H-index of 8. This habilitation thesis is drafted in accordance with the indicative guide for writing the habilitation thesis published by CNATDCU and legislated in the methodology of the Victor Babeș University of Medicine and Pharmacy in Timișoara.

The structure of the habilitation thesis comprises four chapters as follows:

***The first chapter - highlights my academic and professional achievements.***

After obtaining the position of assistant professor at the Cardiology Discipline and the Doctor of Medicine title conferred upon the completion of my doctoral studies in 2007, my teaching activity has encompassed a wide area of development. In collaboration with my colleagues in the Cardiology Discipline, I have written 17 books and numerous teaching resources, including electronic and print course support and

practical training book support for fourth-year medical students. These resources are updated yearly.

I have participated in National and International Congresses/Conferences addressing various topics related to cardiac pathology as well as interdisciplinary studies, where I have delivered oral presentations on various topics of interest.

In my 17 years of professional activity, I have continued to give special importance to the study of cardiac arrhythmias in their various aspects – within cardiac pathology or as an epiphenomenon in the context of specific comorbidities such as nephrological, endocrinological, and obstetrical, collaborating in these interdisciplinary research studies with colleagues from various specialties. At the same time, I have paid special attention to the particular situation of patients with conduction disorders requiring cardiac pacemaker implantation, performing numerous such implantation interventions.

The work invested both in the teaching activity and in medical practice has resulted in obtaining the title of associate professor at the Cardiology Discipline and advancing to the position of Head of the Cardiology Clinic in 2018. In 2020, I obtained the certificate of complementary studies in Health Services Management (diploma series C no. 048372), and in 2022, I obtained the certificate of complementary studies in Implantable Cardiac Stimulators and Defibrillators (diploma series C no. 053946).

***The second chapter - includes relevant information about my scientific contributions.***

I began my scientific research activity within the Coronary Intensive Care Department. In 1993, I presented a scientific paper at the National Cardiology Congress in Bucharest, addressing the topic of serial determinations of the circadian variation of ventricular refractory periods. This work was noticed by Professor George Georgescu, under whose guidance I began my doctoral studies. His premature passing led to the completion of the thesis under the guidance of Professor Dr. Cătălina Arsenescu Georgescu, and in 2007, the doctoral thesis entitled "Late Potentials in Myocardial Infarction" was defended in a public session at the "Grigore T. Popa" University of Medicine and Pharmacy, Iași, granting me the title of Doctor of Medicine, series E no. 0007484.

After completing my doctoral studies, my research activity took place in a context characterized by diversity and multidisciplinary, in collaboration with highly qualified university colleagues from various departments of the "Victor Babes" University of Medicine and Pharmacy (nephrology, gynecology, endocrinology, anesthesia and intensive care, diabetes, nutrition and metabolic diseases), as well as experts in medical biostatistical analysis.

My research, along with colleagues from the Cardiology Department as well as research groups from various related departments, led to the publication of 32 in extenso articles indexed in various prestigious databases, such as Clarivate Web of Science and Scopus, with a Hirsch index of 8.

***The third chapter*** - describes the main scientific, professional, and academic achievements.

This chapter is structured into four subsections as follows:

*Subsection 3.1 is titled "Research on cardiovascular disease"* and encompasses the results of research conducted in the realm of cardiac conditions. The articles within this subsection focus on the study of cardiac vulnerability, highlighting less common rhythm disorders and analyzing late potentials. Another area addressed is the impact of energy drink consumption on the incidence of cardiac events in young individuals, a relevant issue in contemporary times. My research has also investigated potential predictors of major cardiovascular events, as well as new cardioprotective medications, topics of particular interest in the current medical community.

*Subsection 3.2 is titled "Research on cardiovascular disease and pregnancy"* and focuses on the evaluation of pregnancy-induced hypertension/preeclampsia, a condition that represents a significant risk factor for both maternal and perinatal health. The research conducted in this direction aimed at the identification and anticipation of the onset and progression of these complications among pregnant women. One of the significant studies in this research direction demonstrates that pulse wave velocity (PWV) could serve as a promising predictive indicator for early-onset preeclampsia in women at high risk of developing this condition.

*Subsection 3.3 is titled "Research on cardiovascular disease and kidney disease"*. The rationale for promoting such a cardio-renal research approach can be categorized into three main directions: the physiological interdependence between

the two organs – dysfunctions in one system can adversely affect the performance of the other; the risk of comorbidities – patients with cardiac conditions often have impaired renal function and vice versa; therapy optimization – separately addressing cardiac and renal diseases can lead to suboptimal therapeutic decisions, and collaborative research can unveil pharmacological interactions and therapeutic synergies contributing to more effective treatment protocols. By publishing studies conducted in collaboration with colleagues from the Nephrology Clinic, I have consolidated the concept of cardiorenal syndrome, highlighted the significant relationship between echocardiographic changes and their prognostic value among hemodialysis patients, and evaluated the impact of acute kidney injury on in-hospital mortality in critically ill patients.

*Subsection 3.4 is titled " Research on mixed diseases related to or unrelated to cardiology"* and represents a synthesis of my research activity in various multidisciplinary study domains. This subsection encompasses 15 clinical and fundamental studies validated through publication as full-length articles in WOS-indexed journals. One of the detailed studies in this subsection re-evaluates the close association between cardiovascular diseases, chronic kidney disease, and the incidence of dyslipidemia in diabetic patients. Another significant study examines the correlation of microRNAs with the incidence of sepsis in polytraumatized patients. Additionally, the subsection includes several studies evaluating various aspects of thyroid nodules, whether ultrasonographic or elastographic. Other studies analyze the prognosis of deep venous thrombosis or the impact of novel medications, such as antmelanoma therapy or the antioxidant properties of various extracts.

***The fourth chapter*** - outlines the development plan of my professional, scientific, and academic career. Concerning my research activities, I intend to continue my scientific work in the direction that I have consistently pursued over the past ten years of my career, aiming to delve deeper, enhance, and refine my previous work.

In terms of the teaching activities within the Cardiology Discipline, I aim to introduce new perspectives, aligning with the annual updates of European guidelines. This will provide our graduates with the opportunity to develop theoretical and practical knowledge in line with accepted European standards, enabling them to compete effectively in an increasingly integrated job market.

Furthermore, I have set out to provide each teaching staff member of cardiology discipline with the opportunity to enhance their professional development in the coming years by assigning them a "research unit" based on their demonstrated interest and previous successful results. These research groups will also involve young doctoral candidates, interns, and students who are keen to familiarize themselves with research methodologies or intend to complete their graduation thesis in our clinic.

Another important direction I aim to develop is the addition of the long-awaited interventional cardiology facility to our department, serving as a crucial asset not only for the best patient care but also for the teaching process and the training of future cardiologists in evidence-based contemporary medicine. The project has been approved on a large scale but has yet to be finalized. I will do everything in my power to expedite its completion.

When, after the habilitation I will have PhD candidates I will strive to provide them the highest possible standard of research. I will closely monitor their progress, make necessary adjustments, provide assistance and guidance, without being intrusive or condescending, and without overly directing them; the thesis should be theirs and theirs alone, under my supervision.

***The final section*** of the thesis includes the bibliographic references related to the studies mentioned throughout the habilitation thesis.

Building upon the results of the conducted studies, current research interests, and accumulated professional experience in the field of cardiology and interdisciplinary studies, as well as considering future plans, my aspiration is to obtain habilitation. Furthermore, as a long-term plan, I aim to acquire the title of university professor in the field of cardiology, my area of specialization, by continuing my professional activities in a methodical, authentic, and informed manner.

## LIST OF 10 REPRESENTATIVE SCIENTIFIC PAPERS

1. Albulescu Nicolae; Ivan Vlad; Apostol Adrian; Iovanescu Gheorghe; **Ivan Mihaela Viviana**; Schiller Adalbert. *Cardiac Electrical Vulnerability after Acute Myocardial Infarction Associated with Respiratory Infections*; Revista de Chimie, Volume 70, Issue 1, 207-210, 2019 (IF 1.412)  
LINK: <https://www.revistadechimie.ro/Articles.asp?ID=6883>
2. **Ivan Viviana Mihaela**; Georgescu Marius; Apostol Adrian; Albulescu Nicolae; Serb Alina Florina; Tatu Carmen Sofica. *Trimetazidine, a Metabolic Modulator, with Cardioprotective Effects Against Myocardial Ischemia*; Revista de Chimie; Volume 69, Issue 7, 1616-1620, 2018 (IF 1.412)  
LINK: <https://www.researchgate.net/publication/327527221>
3. Lighezan Rodica; Sturza Adrian; Duicu Oana ; Ceausu Raluca; Vaduva Adrian; Gaspar Marian; Feier Horea; Vaida Monica; **Ivan Viviana**; Lighezan Daniel; Muntean Danina; Mornos Cristian. *Monoamine oxidase inhibition improves vascular function in mammary arteries from nondiabetic and diabetic patients with coronary heart disease*; Can J Physiol Pharmacol. 2016;94(10):1040-1047. (IF 1.822)  
LINK: <https://cdnsiencepub.com/doi/abs/10.1139/cjpp-2015-0580>
4. Ivan Vlad, Albulescu Nicolae, Albulescu Iuliana, Apostol Adrian, Buzas Roxana, Schiller Adalbert, Timar Romulus, Lighezan, Daniel, **Ivan Mihaela**. *Predictive Value of Several Echo Parameters for Cardiovascular Events in Hemodialysis Patients with Mid-range and Preserved Ejection Fraction Heart Failure*. Revista de Chimie. (2019). 70. 1479-1484. 10.37358/RC.19.4.7154. (IF 1.412)  
LINK: <https://revistadechimie.ro/Articles.asp?ID=7154>
5. **Ivan Mihaela Viviana**, Rogobete Alexandru, Bedreag Ovidiu, Papurica Marius, Popovici Sonia, Dinu Anca, Sandesc Mihai, Beceanu Alexandru, Bratu Lavinia, Popoiu Calin, Sandesc Dorel, Boruga Ovidiu, Fulger Lazar. *New Molecular and Epigenetic Expressions as Novel Biomarkers in Critically Ill Polytrauma Patients with Acute Kidney Injury (AKI)*. (2018) Clinical laboratory, 64(5), 663–668. (IF 0.848)  
LINK: <https://www.researchgate.net/publication/325047160>

6. Gadalean Florica, Simu Mihaela, Parv Florina, Vorovenci Ruxandra, Tudor Raluca, Schiller Adalbert, Timar Romulus, Petrica Ligia, Velciov Silvia, Gluhovschi Cristina, Bob Flaviu, Mihaescu Adelina, Timar Bogdan, Spasovski Goce, **Ivan Viviana**. (2017). *The impact of acute kidney injury on in-hospital mortality in acute ischemic stroke patients undergoing intravenous thrombolysis*. PloS one, 12(10), e0185589. (IF 2.23)  
LINK: <https://pubmed.ncbi.nlm.nih.gov/29040276>
  
7. Munteanu Mircea, Apostol Adrian, **Ivan Viviana** - *New Considerations Regarding Chronic Kidney Disease, Cardiovascular Disease and Dyslipidemia in Diabetic Patients* - REVISTA DE CHIMIE Aug 2018 Volume: 69 Issue: 8 Pages: 2064-2066 Cod WOS 000444602300028 ISSN 1932-6203 (IF 1.412)  
LINK: <https://www.researchgate.net/publication/328074514>
  
8. Rogobete Alexandru Florin, Sandesc Dorel, Bedreag Horia Ovidiu, Papurica Marius, Popovici Sonia Elena, Bratu Tiberiu, Popoiu Calin Marius, Nitu Razvan, Dragomir Tiberiu, Aabed Hazzaa IM, **Ivan Mihaela Viviana** (2018). *MicroRNA Expression is Associated with Sepsis Disorders in Critically Ill Polytrauma Patients*. Cells, 7(12), 271. (IF 4.829)  
LINK: <https://www.mdpi.com/2073-4409/7/12/271>
  
9. **Mihaela Viviana Ivan**, Izabella Petre, Brigitha Vlaicu, Adrian Apostol, Dan Tesloianu, Mircea Munteanu, Radmila Costachescu, Lavinia Cristina Moleriu, Lazar Fulger - *The Use of Pulse Wave Velocity in Predicting Pre-Eclampsia in High-Risk Women*. Revista de Chimie, Bucuresti, pag: 1260 – 1263, Vol 69, Nr 5, 2018 Cod WOS 000434954100048 ISSN 0034-7752 (IF = 1.605)  
LINK: <https://revistadechimie.ro/Articles.asp?ID=6303>
  
10. Stoian Dana, **Ivan Viviana**, Sporea Ioan, Florian Varcus, Mozos Ioana, Navolan Dan, Nemescu Dragos (2020). *Advanced Ultrasound Application - Impact on Presurgical Risk Stratification of the Thyroid Nodules. Therapeutics and clinical risk management*, 16, 21–30. (IF 2.251)  
LINK: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6996024/>