“CAROL DAVILA” UNIVERSITY OF MEDICINE AND PHARMACY, BUCHAREST
DOCTORAL SCHOOL
FIELD OF PHARMACOLOGY

“New Perspectives in the Non-Clinical and Clinical Pharmacological Approach – from Molecule to Medicine”

HABILITATION THESIS ABSTRACT

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SUMMARY

The habilitation thesis entitled *"New Perspectives in the Non-Clinical and Clinical Pharmacological Approach – from Molecule to Medicine"* provides a comprehensive overview of my scientific, academic, and professional contributions following the award of the PhD degree in Medical Sciences in 1999. The work is structured into four sections, in accordance with CNATDCU recommendations and national regulatory frameworks.

The first section presents the results of experimental pharmacology research conducted within the Department of Pharmacology, Clinical Pharmacology, and Pharmacotherapy of the "Carol Davila" University of Medicine and Pharmacy, in collaboration with national research institutes and clinical centers. These studies primarily addressed non-clinical neuropsychopharmacology, vascular pharmacology, metabolic modulation and pharmaco-toxicology, employing experimental models relevant for translational medicine. The subsequent sections summarize my teaching and academic activities, including the development of educational materials, coordination of courses and practical activities for medical, dental, and pharmacy students, as well as postgraduate training in clinical pharmacology. Professional experience is further highlighted through my role as a primary care physician in clinical pharmacology, as well as my participation in national and international research projects. The final section outlines the prospective directions of my academic career, emphasizing the consolidation of ongoing research themes, the extension toward therapeutic areas with limited pharmacological coverage, and the commitment to fostering interdisciplinary collaborations.

This thesis thus reflects both the continuity and the evolution of my scientific, educational, and professional trajectory, underscoring the integration of fundamental and clinical pharmacology in the pursuit of innovative therapeutic approaches. The **research directions** pursued throughout my academic career have primarily focused on the following:

➢ **Non-clinical studies in behavioral neuropsychopharmacology.** Since 1995, I have oriented my research activity toward the field of cerebral ischemia, both in my home laboratory under the supervision of Prof. Dr. V. Stroescu, and in the Pharmacochemistry Laboratory of Prof. B.

Roques, within the Molecular Pharmacochemistry Unit, INSERM U266, Paris, where I was introduced to the field of neuropsychopharmacology. In 1999, I defended my doctoral thesis entitled *"Experimental Research on the Pharmacological Modulation of Neuropsychic Changes Induced by Cerebral Ischemia"*. As this work primarily employed adenosine-active substances, I subsequently continued my investigations in this area, which were later consolidated through the publication of studies on the neuropsychopharmacological effects of compounds with cholinergic, dopaminergic, or serotoninergic activity, as well as on their interaction with adenosine agonists and antagonists. In recent years, I have extended this line of research to the experimental **neuropsychopharmacology of aluminum salts**.

➢ **Another research direction** addressed the **control of ocular vascular reactivity** through the administration of substances with adrenergic, histaminergic, or serotoninergic activity. In this context, I investigated differences in vascular reactivity between the iris and the ocular conjunctiva, as well as the response of corneal neovascularization to various histaminergic compounds.

➢ A major priority of my experimental pharmacology research has been the **study of the metabolic effects of newly synthesized substances**. I aimed to highlight a potential **hypoglycemic and hypolipidemic** effect of compounds presumed to act as beta-3 agonists, belonging to the class of beta-phenylethylamines. Within this research, I determined the optimal dose of alloxan capable of inducing alloxan diabetes in a significant proportion of laboratory animals, while ensuring an adequate survival rate without additional insulin administration. This experimental model subsequently enabled the investigation of the antidiabetic action of newly synthesized compounds. In parallel, within a related project, I also evaluated the hypocholesterolemic effect of compounds derived from fermented Red Rice.

➢ Another research line focused on the **evaluation of the cutaneous wound-healing effect** of active principles obtained from plants or fungi, aiming at their potential therapeutic applications.

➢Among the research directions in which I have been involved was also the **pharmacological and toxicological screening of new active principles**, extracted from vegetal sources (such as *Plantago*) or fungi (*Monascus* sp.). The objective was to determine pharmacodynamic

parameters of interest, including the site of action, onset time, and duration of effect. To carry out these studies, I collaborated with the Departments of Biochemistry, Pharmaceutical Chemistry, and Toxicology within our university, as well as with recognized national research institutes Departments of Pharmaceutical Chemistry and Toxicology within the university, as well as with prestigious national research institutes such as ICCF and ICECHIM.

➢**Analgesic and anti-inflammatory pharmacology.** Over the course of three decades of academic activity, I have also focused on elucidating the analgesic and anti-inflammatory effects of various substances, as well as their interactions with other compounds acting at the level of the central nervous system (CNS). To this end, I investigated the variability of pharmacological responses following administration of active compounds with different mechanisms of action, both in pain induced by chemical, mechanical, or thermal stimuli, and in neuropathic pain associated with alloxan-induced diabetes. The following classes of compounds were evaluated, administered singly or in combination: opioid analgesics (codeine, morphine), cannabinoids or diethylamine, non-steroidal anti-inflammatory drugs (NSAIDs), and CNS-stimulating compounds (nicotine, caffeine).

➢**Development of experimental pharmacological models.** Within these investigations, I developed experimental pharmacological models that enabled the study of drug responses under various pathological conditions, including alloxan-induced diabetic neuropathy in laboratory animals, hypercholesterolemia models, and experimental models of depression.

➢ **Toxicological studies.** Another major objective of my research has been band on the human organism. In this context, I examined the mechanisms of action of diverse agents, including aluminum salts, nicotine, paracetamol, and other substances recognized for their marked nephrotoxic potential.

➢**Clinical pharmacology studies.** More recently, I have extended my research focus to observational clinical studies and the publication of review articles in specialized literature, emphasizing new therapeutic indications in neurodegenerative, oncological, and cardiovascular pathologies.

All **non-clinical research** was conducted in strict compliance with bioethical standards, in accordance with **Law no. 43/2014** on the protection of animals used for scientific purposes and **Directive 2010/63/EU** of the European Parliament. All experimental protocols were approved by the **Bioethics Committee of the Faculty of Medicine** at the "Carol Davila" University of Medicine and Pharmacy, Bucharest.

The results of research conducted between 1999 and 2025 have been disseminated through the publication of **85 full-length articles** (44 in ISI-indexed journals, 20 in BDI journals, and 21 in journals recognized by CNCSIS), as well as through **60 additional articles, meeting abstracts, posters, and oral communications** presented at national and international scientific events, subsequently published in ISI-, BDI-, or CNCSIS-indexed journals. My research experience is further demonstrated by participation in **11 competitively funded research projects**, of which two were conducted in the capacity of **Project Director** and one as **Project Director/Scientific Responsible** on behalf of "Carol Davila" University of Medicine and Pharmacy, Bucharest. I also participated in eight other projects as a **member of the research team**.

The second section of the habilitation thesis presents my **teaching career**, which began in 1994 when, following a competitive selection, I was appointed **University Preparator** in the Department of Pharmacology. Subsequently, I was promoted through competitive selection to the positions of **Assistant Professor** (1996), **Senior Lecturer** (2009), and **Associate Professor** (from March 1, 2016).

My teaching activity has included the delivery of **practical exercises and courses in Fundamental and Clinical Pharmacology** for third- and fourth-year medical students, as well as for residents specializing in Clinical Pharmacology. Additionally, I have conducted courses and practical exercises for third-year students at the Faculty of Dental Medicine and for students at the Faculty of Pharmacy. My academic contribution is also reflected in the **publication of five books** (two as the primary author) and **over 24 book chapters**.

The third section of the habilitation thesis highlights my **professional career**, which began in 1992 upon graduation from the "Carol Davila" University of Medicine and Pharmacy,

Bucharest, and continues to the present, where I serve as a **Primary Care Physician in Clinical Pharmacology** at INRMFB.

The **final chapter** of this thesis is dedicated to outlining the plan for the development of my **academic, professional, and scientific research career**. My **future research** will focus on the deepening and expansion of previously investigated themes, while also **extending into new therapeutic areas that currently have more limited pharmacological coverage**. This approach aims not only to consolidate existing knowledge but also to contribute to innovative solutions in both experimental and clinical pharmacology. In the **educational domain**, I intend to actively contribute to the preparation of comprehensive study materials for students and residents, particularly in the fields of **Clinical and Experimental Pharmacology**. These efforts will be carried out in close collaboration with colleagues from the Department of Pharmacology and Clinical Pharmacology, ensuring a coherent and integrated approach to medical education. From a **professional development perspective**, I will continue to pursue lifelong learning and professional refinement, actively engaging in **postgraduate training programs** for medical practitioners. This includes the organization of conferences, workshops, and specialized courses addressing current topics in pharmacology and pharmacotherapy, in close coordination with the entire department.

In conclusion, I aim to build my future career upon several **core values**: **full integration** into the academic community, **transparency**, **openness to constructive feedback**, sustained engagement with the latest developments in pharmacology, and the reinforcement of **interdisciplinary collaborations** with related scientific and medical fields. These guiding principles will serve as the foundation for both advancing scientific knowledge and contributing meaningfully to medical education and patient care.