

**"VICTOR BABEȘ" UNIVERSITY OF
MEDICINE AND PHARMACY TIMIȘOARA
DOCTORAL SCHOOL
PHARMACY**



**CONTRIBUTIONS TO THE DEEPEN OF THE
PHARMACOLOGICAL POTENTIAL OF BIOLOGICALLY
ACTIVE SUBSTANCES, OF NATURAL AND SYNTHETIC
ORIGIN, PURE AND/OR FUNCTIONALIZED WITH THE
AIM OF IMPROVING BIOAVAILABILITY**

ABSTRACT

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ABSTRACT

The habilitation thesis with the title "*Contributions to the deepening of the pharmacological potential of biologically active substances, of natural and synthetic origin, pure and/or functionalized with the aim of improving bioavailability*" briefly presents the national and international scientific visibility, the results of scientific research activities (obtained subsequently awarding the title of Doctor, in 2012) along with the academic and professional course, ending with career development perspectives. The title of the habilitation thesis was carefully selected, in such a way as to reproduce as well as possible the aspects of scientific interest that were constantly present during my scientific and academic career in the field of Pharmacy. I believe that interdisciplinarity and innovation are key factors in the development of the pharmaco-toxicology field, on all three levels, scientific, academic, and professional.

The postdoctoral scientific research activity naturally continued the research direction approached in the case of doctoral studies, in the field of compounds of natural origin and their functionalization (derivatization, encapsulation in cyclodextrins, etc.) in order to increase bioavailability, later expanding into related areas.

The habilitation thesis is structured on four main chapters, which are presented in the following.

The first chapter is dedicated to the scientific achievements since the completion of the doctorate until now. It is presented the involvement in experimental scientific research activities and the way of disseminating the results obtained, through the prism of scientific publications, book chapters in specialized treatises, projects, awards obtained as a result of the research activity, these being supplemented by a subchapter containing other relevant information attributed to scientific research. Thus, I am the author or co-author of 95 full text scientific papers, published in ISI Web of Science (WOS) indexed journals, with an impact factor, of which 86 are original full text articles (in 37 of which I am the main author) and 9 review articles (in 3 of them I am the main author). At the same time, I participated in a series of international conferences in the pharmaco-toxicological field, being visible on the Web of Science over 20 abstracts in the volumes of scientific events, published in recognized international journals, with an impact factor (for example Toxicology Letters or Naunyn-Schmiedeberg's Archives of Pharmacology). I am the co-author of 3 specialized book chapters (two of which were published under the auspices of Elsevier). Regarding the projects, I have been involved, since the completion of my doctorate until now, in 17 projects (3 international and 14 national), in two of them having the quality of manager (1 international project,

1 national project) and in one the quality metabolomics responsible. I have obtained several awards for scientific activity, including the Diploma of Excellence in Research - 3rd place - for the publication of research activity at the national and international level - "Victor Babeş" University of Medicine and Pharmacy from Timisoara (UMFVBT), October 2022 and beyond 20 awards in the Research Results Award category, UEFISCDI. In the section of other information relevant to the scientific research carried out, I have presented: (i) Hirsch index (17 according to WOS), (ii) total impact factor (132.05, articles as main author throughout the career), (iii) Brainmap ID profiles, Scopus author ID, ORCID ID and Google Scholar ID, (iv) membership of profile societies (e.g. EUROTOX, SSFR), (v) guest editor activity at journals in the field, PubMed, ISI, with an impact factor (e.g. Frontiers in Pharmacology, Pharmaceutics, Toxics), the journals for which I performed reviews of scientific publications (for example International Journal of Nanomedicine, Food and Chemical Toxicology, Plants, Cells, etc.), (vi) the events at which I was an invited lecturer and (vii) meetings held for the purpose of developing international collaborations. The chapter continues with the main research directions. Thus, the main research themes addressed throughout the academic career at the Faculty of Pharmacy, the discipline Toxicology, Drug Industry, Management and legislation, are detailed, namely: (i) natural resources - contributions to the evaluation of antitumor potential, (ii) the functionalization and /or the encapsulation of biologically active compounds - contributions to the increase of pharmacological activity and (iii) other bioactive compounds of interest - contributions to the deepening of the mode of action on tumour cells. The main research topics were presented from the perspective of the studies and publications carried out and in the global context of significant and current scientific achievements, in each sub-field addressed. In the presentation of each research topic, I experienced a series of challenges but also enormous satisfactions. When conducting experimental studies, I always applied the most diverse methods, from research in the area of chemical/biochemical synthesis and physico-chemical characterization to preclinical pharmaco-toxicological evaluation, thus focusing my experimental research on a multidisciplinary approach. I have also demonstrated innovative spirit when I developed new synthetic routes and obtained new platforms for the targeted delivery of biologically active substances or contributed to the modernization of existing techniques/methods.

The second chapter deals with aspects of my academic development and achievements. Thus, in all the years since I have been Associate Professor (2014-present) in the discipline of Toxicology, Drug Industry, Management and legislation, I have participated annually in the organization of postgraduate courses, scientific circles, summer schools and workshops for students and specialists in the field, with guests from both the country and abroad. At the same time, in order to increase the quality of the teaching and research activity, I actively participated in the preparation of all the necessary documents for the purchase of high-performance equipment in order to create new opportunities and research directions for students, masters and doctoral students of the discipline. Therefore, I was involved in the request for offers, the analysis of the offers, the

preparation of the standard documentation and I was co-opted as an expert to evaluate the submitted technical offers. In short, I started my academic career in the Faculty of Pharmacy in 2014, in the discipline of Toxicology, Department II (University of Medicine and Pharmacy "Victor Babeș" from Timișoara). This activity within the habilitation thesis is presented in three sub-chapters, namely: (i) didactic activity - taught courses and published books, coordination of undergraduate and dissertation theses, coordination of students within the Volunteering in Academic Development Activity (VADA) program, involvement in institutional and didactic development projects; (ii) participation in specialized commissions within the "Victor Babeș" University of Medicine and Pharmacy in Timișoara, the Faculty of Pharmacy and other higher education institutions in the country; (iii) other relevant activities – organizing events for and/or involving students (summer schools, workshops, didactic and scientific events) and teaching postgraduate courses. I was involved, as a member of the examination commissions, in the competitions for filling vacant teaching and research positions, organized by the "Victor Babeș" University of Medicine and Pharmacy from Timișoara. At the same time, as the president of the Educational Quality Assurance and Evaluation Commission (CEACE) within the Faculty of Pharmacy, I participated in meetings and work sessions with the accreditation commissions of the Romanian Agency for Quality Assurance in Higher Education (ARACIS) for the Pharmacy programs RO section, FR section, EN section, the ISO accreditation of the University of Medicine and Pharmacy "Victor Babeș" from Timișoara and the international accreditation of UMFVBT. Starting from the current year, I am part of the team of national evaluators of the files submitted for obtaining scholarships for studies abroad, for the field of Medicine and Health, Ministry of Education.

The third chapter presents my professional path to date detailing the main achievements. This chapter is structured, in turn, into three subchapters: (i) professional training, (ii) participation in continuing professional training courses in the field and (iii) professional experience. In the sub-chapter of professional training, the details related to graduation from the faculty, completion of master's and doctorate studies are presented. The continuing professional training courses that I participated in nationally and internationally recognized courses, and among them are: the quality management systems manager course, the entrepreneurial skills course, the advanced course in Toxicology, the Internal Auditor Course for testing laboratories and calibration according to SR EN ISO/IEC 17025:2018 and ISO 19011:2018 standards, psycho-pedagogical training courses, etc. Regarding the professional experience in the field of research, this is a solid one, also certified by the membership in the Scientific Committee of the UMFVBT, which entails a series of duties: (i) ensuring the consultation and coordination framework for promoting excellence in scientific research in to increase the international visibility of UMFVBT; (ii) the elaboration of strategies, regulations, analyses and the formulation of proposals and points of view regarding research, development and innovation activity in accordance with the Scientific Research Strategy within the UMFVBT; (iii) establishing the evaluation criteria of the scientific research activity carried out within the UMFVBT

by the teaching and research staff, students, master's students, doctoral students; (iv) periodic monitoring and evaluation of the scientific research activities carried out within the UMFVBT by the teaching and research staff, students, master's students, doctoral students; (v) monitoring and evaluating the activity and work procedures of the Scientific Research Ethics Committee (CECS) of the UMFVBT and arbitrating referrals and appeals related to the CECS activity; (vi) establishing the criteria, regulations and methodology for awarding prizes and other distinctions that reward scientific research activity within and in connection with UMFVBT, as well as honorary titles (Doctor Honoris Causa, Professor Honoris Causa, Professor Emeritus, Visiting Professor) ; (vii) analysing the files for awarding honorary titles (Doctor Honoris Causa, Professor Honoris Causa, Professor Emeritus, Visiting Professor) of UMFVBT.

The last chapter, the fourth, presents the perspectives related to the scientific and didactic activity. Based on extensive interdisciplinary and didactic research experience (pharmaceutical industry, chemistry, biotechnologies, toxicology, etc.), management and at the same time advanced knowledge of a foreign language (English, French), use of various common and specific computer programs (software and special data analysis and processing programs for physico-chemical characterization, pharmaco-toxicological evaluations, etc.), accumulated over time, I propose a fruitful development of my university career complementary to that of an experienced researcher, which leads to greater international visibility, regarding the fields indicated so that I can increase my personal visibility, but also contribute to an increased reputation of the discipline, the faculty, the university where I am affiliated. At the same time, I want to apply my attributes and pluses as a coordinator in everyday activities, to be able to plan and manage financial resources regarding specific projects (educational, institutional development and research), as well as to implement the best approaches in the area of toxicology, the drug industry and pharmaceutical biotechnologies (with applicability in various fields such as cosmetics, food, pharmaceutical, health). As I mentioned above, I want to further develop my career in the academic field, being able to offer students and younger colleagues from my practical experience, accumulated in the more than 15 years spent in fields such as Pharmacy, Chemical Engineering, organization, leadership. I am more than interested in sharing information and knowledge about my areas of expertise with students and professionals in the field, as well as being able to bring them as many examples from the practical sphere as possible to arouse their interest to participate in the events (didactic, scientific) physically and actively and developing practical skills through experimental sessions.

The qualification thesis ends with: (i) the up-to-date bibliographic references, which include personal publications and (ii) the list of 10 representative publications.