

**UNIVERSITY OF MEDICINE AND PHARMACY
„CAROL DAVILA” BUCHAREST
DOCTORAL SCHOOL
PHARMACY DOMAIN**

**NEW BIOACTIVE SMALL MOLECULES-
APPROACHES CONCERNING THEIR SYNTHESIS
AND BIOLOGICAL APPLICATION**

ABSTRACT OF THE ABILITY THESIS

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Thesis Summary

The habilitation thesis entitled "New small bioactive molecules- approaches concerning their synthesis and biological applications" refers to my academic and research activity carried out after 2005, when I presented my doctoral thesis entitled "New amides with eventual pharmacological activity", coordinated by Prof. Alexandru Missir.

The habilitation thesis is divided in four sections.

The first section, **Scientific Activity**, presents the addressed research topics during my career in the field of pharmaceutical chemistry, carried out within a dynamic group, with an intense didactic and research activity. The addressed research directions are in the field of synthesis, characterization and testing of small molecules, with biological potential, having the objective of obtaining bioactive original compounds from several chemical classes. The main theme is the development of new molecular amidic structures, within them the *R-substituted N-(2-dialkylaminoethyl)-N-(R₁-phenyl)benzamides*, following two types of biological effects that can be attributed: the *effect on the central nervous system* and the *antimicrobial activity*. Following the tests performed, we established the chemical structure-biological activity relationships through which we outlined a molecular model with certain bioactive valences. The interdisciplinary collaboration in the field of the synthesis of pharmacologically active substances from the benzanilide class was appreciated by *awarding the prize* of the Design of bioactive substances section in the 15th National Congress of Pharmacy (Iasi, 2014). Aiming the synthesis of biologically active amides, we also synthesized *2-(((4-R-phenoxy)methyl)-N-(phenylcarbamothioyl)phenyl-substituted benzamides*, *phenyl-substituted 2-((4-chlorophenoxy)methyl)-N-(phenylcarbamothioyl)benzamides*, *N-(1-adamantyl-carbamothioyl)benzamides* and *thioureas of thiophene-carboxylic acids*. Other research directions are the synthesis of *new 1,3,4-oxadiazole derivatives*, *new O-acyl-oximino-dibenz[b, e]oxepines*, *O-acyl-oximinic derivatives of 5H-dibenzo[a,d]cycloheptatriene* and *10,11-dihydro-5H-dibenzo[a,d]cycloheptadiene*, *N-[4-[(phenylcarbamoyl)amino]phenyl]-benzenesulfonamide* and *acylated derivatives of 2-methyl-4-oxo-quinazoline-3(4H)-yl-acetohydroxamic acid*. Both the testing of the antimicrobial action performed by the qualitative and the quantitative screening, as well as the studies regarding the influence of the newly synthesized compounds on the development of the microbial biofilms, highlighted the *antimicrobial potential of the proposed molecular models*. The

nanotechnological solutions that have been tested as an alternative treatment for infections associated with catheter infections such as *Staphylococcus aureus* or *Pseudomonas aeruginosa* are also presented. All the studies were carried out in collaboration with groups of renowned specialists in the field of synthesis, characterization and testing of bioactive compounds. A permanent concern was also the correlation of the chemical structure with toxic effect of drugs, following the databases (Livertox, PubMed, Scopus, ScienceDirect etc.), to update the knowledge regarding the structural alerts, presented in a review.

The following are mentioned: participation in 15 research projects in collaboration with researchers from different fields, the publication of 30 ISI articles (24 as principal author), over 90 papers presented at national and international scientific events, two book chapters, 3 patents filed, conducting reviews of scientific articles proposed for publication in recognized journals (*Current Computer Aided Drug Design, Journal of Molecular Structure, Molecules, Coatings* etc.), awarding of published articles by UEFISCDI, participation in the organization of scientific events.

The second chapter, **Academic activity**, refers to my activity in the discipline of Pharmaceutical Chemistry, having academic positions from Junior Assistant to Associated Professor. Since 2006 I have coordinated 33 graduation papers and 28 scientific papers that were presented at the student scientific communications sessions, 14 being awarded. I participated in the organized exams (admission, bachelor's, residency, doctorate, promotion) and in promoting Faculty of Pharmacy in highschoools.

The third chapter, **Professional activity**, describes the activity as a pharmacist (trainee, resident, specialist, mayor), as well as involvement in holding conferences for pharmacists and students, through which I tried to draw attention to current issues of the pharmaceutical and medical devices, such as counterfeit medicines.

The last chapter refers to **career development**. From a didactic point of view, I intend to participate in the editing of updated textbooks, to involve myself in the training of professional training courses for pharmacists, to improve myself and to apply modern pedagogical methods, which will facilitate the learning process. The addressed research topics will be continued and deepened, but I will expand the field of research in the field of *innovative nanostructured composite materials, antimicrobials, chemical synthesis using microwaves, hybrid molecules*.

By applying the above, I want to build an academic career and an excellent professional reputation, thus contributing to increasing the prestige of pharmaceutical education provided by UMF "Carol Davila" Bucharest.