“OVIDIUS“ UNIVERSITY CONSTANȚA
DOCTORAL SCHOOL

DOCTORAL FIELD: MEDICINE

ABSTRACT OF HABILITATION THESIS

„INFECTIOUS PATHOLOGY: BETWEEN EXPOSURE AND RISKS”

CANDIDATE,

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ABSTRACT OF HABILITATION THESIS

„Infectious pathology: between exposure and risks”

The habilitation thesis was drafted, complying with the provisions of the Order of the Ministry of Education and Scientific Research, 3121/21.01.2015; Regulation of the "Ovidius" University from Constanța, 141/16.05.2016, regarding the organization and conduct of the process of obtaining the certificate of qualification.

The present habilitation thesis presents a synopsis of my professional, scientific and academic achievements, following the support of the PhD thesis in 2003, entitled "Contributions to the study of antiretroviral therapeutic schemes in HIV-AIDS infection in adults", having Prof. Univ. Dr. Ștefan Dimitriu as scientific coordonator. The thesis was presented at the Faculty of Medicine of the UMF „Gr. T. Popa ”from Iași. Also, the scientific title of Doctor of Medicine was conferred on the basis of the Order of the Minister of Education and Research no. 5663 of 15.12.2003.

Over time, there has been a proliferation of health initiatives that seek to develop both a series of protective factors on the human body and various initiatives in the development of medicines and therapies in the fight for human survival.

In recent years, **I have been particularly interested** in the way environmental factors, climate, influence infectious diseases, but also on the antimicrobials and innovative treatments role against HIV infection.

Climate change can be represented by a weather pattern over a particular area, which lasts longer than one season. This may be represented by higher or lower average temperatures and precipitation, or frequent storms. In this sense, the climate can favor or alternate the growth of different insects, or other animals that spread the disease, or modify the seasonal availability of hosts that can cause infections of the human body. It can also stimulate the evolution of different pathogens, thus making it difficult to obtain drinking water or developing cereals. Precisely for this reason, some researchers claim that the global prevalence of infectious diseases will increase in the coming years. Thus, given the changes characteristic of certain populations, the tools of epidemiological models that use demographic factors that help to spread the infectious diseases should be constantly monitored.

Antimicrobial solutions refer to solutions specifically designed to reduce the number of living microorganisms on the skin surface, the most common form of administration to medication being soap and disinfectant solutions. The main target of antimicrobial compounds are bacteria that commonly colonize the surface of the skin. These include bacteria from the genera Staphylococcus and Streptococcus. Normally, these bacteria are harmless, but once they enter the body, they can cause serious illness until death. At present, both antimicrobial medication and their solutions have become a standard feature of applicability in hospitals, being necessary in both the control and spread of infections. The use of these solutions, especially on the skin surface, prevents the spread of methicillin-resistant Staphylococcus aureus (MRSA) bacteria. Due to the fact that MRSA is resistant to most antibiotics, their use for the purpose of removing infections becomes difficult to achieve. Moreover, in patients with low immunity, once infected with MRSA, it can lead to worsening diseases and even their death. Thus, antimicrobials become an extremely interesting area to study, including in the fight against their resistance, increasing their applicability in suppressing different infectious diseases.

Human immunodeficiency virus, HIV is a microorganism responsible for acquired immunodeficiency syndrome or AIDS. Its target is the immune system, leaving the body with no defense alternatives including against other opportunistic infections. HIV is a type of "retrovirus" having a genetic code consisting of ribonucleic acid (RNA), lacking deoxyribonucleic acid (DNA). Since it does not contain the DNA needed to create copies of the viral RNA genome, it uses the DNA of the infected host cells to create a new RNA genome. Research to determine an effective treatment against HIV infection will continue, as in the case of cancer, the effort to find new remedies, going to the atomic structure of the viral envelope including molecular mechanisms of genetic replication. HIV is an amazingly versatile and adaptive enemy, probably due to millennia of evolution, offering itself a new and relatively open niche through the prism of humanity.

Except for the summary of the qualification thesis, the introduction, the conclusions and the references, the habilitation thesis is structured in 2 sections, each containing some chapters.

Thus, **Section I: Professional, academic and scientific achievements** is structured in six main chapters: **Chapter 1**. Professional activity with the subchapters: Professional career: professional degrees, internships and training courses, certificates obtained; Professional experience; Recognition of professional activity, awards and distinctions. **Chapter 2.** Academic activity with the subchapters: The course of the academic activity and the main didactic responsibilities; Coordination of the license theses; Participation in projects, grants and clinical studies; Ongoing projects; Completed projects/grants through competition; Clinical studies -co-investigator/sub-investigator; Clinical studies - principal investigator; Prospective international studies in collaboration with the Baylor Black Sea Foundation and Bayllor College of Medicine Houston Texas; Professional development and international recognition; Management and leading experience. **Chapter 3.** Scientific activity, general notions with the subchapters: Publicistic activity-summary of articles published in prestigious journals indexed in international databases; and Doctoral research, the beginning of the research activity. **Chapter 4.** Research field on "The impact of exposure to environmental factors on infectious pathology". **Chapter 5.** Research field on „The risk of antimicrobial resistance”; and **Chapter 6:** Research field on „HIV infection from the risk of transmission to the risk of death”.

Section II: The plan for the development and evolution of the professional, academic and scientific career, also includes 3 chapters, as follows: **Chapter 1.** Ability to coordinate research teams, organize and manage teaching and research activities; **Chapter 2.** Professional career development plan; and **Chapter 3.** Development plan for research activity, with the 3 main research directions established:

- Diffuse damage of the lung parenchyma and identification of imaging and functional abnormalities post COVID-19 or other germs;

- Materno-fetal transmission of various infectious diseases, including new pathogens for human pathology such as SARS-CoV-2;

- Management of the use of antimicrobial medication in infectious pathology of children and adolescents;

Regarding the relevance and impact of scientific results, the research topics are structured in several directions and are materialized in published books and articles, which prove the ability to synthesize, fit into the concept and scientific level. I have published, in extenso, a number of 24 articles, as main author or in collaboration with other researchers, in ISI-rated scientific journals, with impact factor, and over 37 articles in BDI-rated scientific journals. Publications in various journals and international magazines with scientific impact have accumulated a **h-index of 6 in the Web of Science and Google Scholar databases and 5 in the Scopus database**.

The last part of the habilitation thesis includes an increased number of references.

This thesis is the result of my professional experience and also the results of research work, which was achieved through transparency, adaptability, collegial and team spirit and last but not least, through a lot of dedication and perseverance.

In conclusion, I have tried to summarize the main achievements and perspectives of the research activity in such a practical and dynamic medical field of infectious diseases.