"CAROL DAVILA" UNIVERSITY OF MEDICINE AND PHARMACY BUCHAREST

DOCTORIAL SCHOOL
FIELD OF MEDICINE

PATHOPHYSIOLOGICAL AND IMMUNOLOGICAL BASES OF RESEARCH IN INFECTIOUS DISEASES

ABSTRACT OF HABILITATION THESIS

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My name is Ștefan Sorin Aramă. I am currently a university professor, head of the Discipline of Pathophysiology and Immunology, Department of Dentistry II of the Faculty of Dentistry of the "Carol Davila" University of Medicine in Bucharest. I am also a primary physician in Internal Medicine, a visiting professor at the Department of Bioengineering and Biotechnology of the Faculty of Medical Engineering of the National University of Science and Technology Politehnica Bucharest and a scientific researcher of the second degree at the National Institute of Infectious Diseases "Prof. Dr. Matei Balș" Bucharest (INBI MB).

I am the sole or first author of 5 books addressed to students and doctors, as well as author/co-author of 17 chapters in 11 treatises / specialized books. I am the main author or co-author of a total of 208 scientific papers (94 articles and 114 scientific papers), classified as follows: 36 full-length articles published in ISI indexed medical journals (I am the main author of 17 articles), 58 full-length articles published in medical journals indexed in other BDIs, 46 papers presented at national or international specialty conferences, with abstract published in ISI-indexed journals with IF and 68 papers presented at national or international specialty conferences, with abstract published in non-ISI indexed journals or volumes of abstracts with ISBN/ISSN. The total number of citations of the articles published in Web of Science is 185 citations, with h-index = 9.

I presented in my Habilitation Thesis the following research topics that I have explored in depth over the years and especially after obtaining the title of Doctor of Medicine:

- the involvement of *Helicobacter pylori* in digestive pathology and the effectiveness of eradication regimens;
- disorders of carbohydrate and lipid metabolism associated with antiretroviral treatment in patients with HIV infection;
- impairment of bone metabolism in patients with HIV infection undergoing antiretroviral treatment;
- the involvement of hepatitis viruses in chronic lymphoproliferation;
- inflammatory syndrome and other biological changes as markers of severity in SARS-CoV-2 infection.

The scientific collaboration with students has resulted in a large number of bachelor's theses (over 100) for which I was the coordinator or scientific supervisor, the vast majority of which were given the maximum grade. I have guided the students in the preparation of numerous scientific works, presented in the form of posters or oral communications at national and international student

congresses. Starting from 2018, I coordinate every year the 2-week Immunology internships, intended for residents in the specialty of Periodontology.

I have occupied the position of manager through a competition in two international projects to which Romania has been and is a part, respectively:

- Strengthening institutional capacity for the control of hospital infections and the management of antibiotic consumption in Romania, within the framework of the "Public Health Challenges at European level" Programme, EEA Financial Mechanism, 2014-2021, Iceland Liechtenstein Norway grants, 2020-2022, acronym INBI-PDP-8, total budget = 1741154 euros.
- EU-JAMRAI-2 (Joint Action on Antimicrobial Resistance and Healthcare-Associated Infections), funded by the European Commission, 2024-2027. Budget for Romania = 2535912 euros.

Regarding my career development and evolution plans, I aim to make progress mainly in three areas: development of teaching and student involvement in research; development of scientific and research activity; participation as a manager in the EU-JAMRAI-2 project.

Regarding the first direction, I propose to modernize both the lectures in the classroom and the written materials for individual study. I will use new information technologies to generate interactive presentations that capture the interest of students. I will strive to provide students with the necessary knowledge so that they, in turn, can become vectors of correct, scientifically based information for the general public on medical topics. Especially in recent years, in the context of the COVID-19 pandemic and the controversies related to the discovery and use of vaccines against SARS-CoV-2, the importance of a solid knowledge base in immunology has become paramount in helping the dentist not to be influenced by the various narratives that promote pseudoscience.

I will dialogue with students, to guide them to reach their own conclusions, integrating seemingly separate knowledge. I believe that developing connections between already known and new information is essential for the development of medical thinking. I will particularize the physiological processes, immune defense mechanisms and the principles of pathophysiology of diseases in dental diseases, for example: saliva immunology, dental pulp inflammation, oral cavity involvement in hematological diseases, in immunodeficiencies (e.g. HIV infection), in autoimmune diseases, etc. I want to bring to the examination process, in addition to written checks, an oral examination component, in which I can capture, through questions and by directing the dialogue, the way of thinking and the degree of understanding of the taught subject.

Outstanding students will be involved in submitting research projects and in their effective implementation, in order to learn concepts regarding research activity even from the faculty. Within the research projects, students can participate in examining patients, completing source documents, applying questionnaires, completing and managing databases. Thus, students will come into direct contact with research activities, being attracted, after completing their university studies, to a teaching and research career, in parallel with the medical one. Students involved in the projects will have to be involved in the activity of developing articles that disseminate the results obtained. Participation in research projects will be subsequently capitalized on by students in order to develop their dissertation work. This work represents an important stage in the professional training of future doctors.

Regarding my own research activity, I will benefit from the fact that I am scientific researcher within INBI MB. I will collaborate with the doctors from the institute to conduct research on elements of pathogenesis and prognosis of COVID-19 and other viral infections. The daily experience of the doctors from INBI MB shows that the SARS-CoV-2 infection has not disappeared. The infection now affects especially vulnerable people, with comorbidities and multimorbidities. Studies are still needed to help early detection of cases with severe evolution. In this regard, I want to continue the research directions presented in detail in the thesis and to verify the validity and usefulness of the NLR and PLR reports in the evaluation of other viral infections, mainly infections with influenza viruses.

I will also follow the potential role of IL-1 and IL-6, which are known to be associated with severe forms of the disease. But the question of whether they could also serve as biomarkers that predict the response to therapy or long-term outcomes, respectively whether abnormal levels of IL-1 and IL-6 play a role in the development of long-COVID, needs also to be answered.

I will continue to present at conferences the immunological bases in vaccinology (vaccination platforms, explanation of the post-vaccination immune response and its particularities depending on age), to fight against medical misinformation, given that distrust in medicine in general and in vaccination in particular is still propagated on various media channels, with dramatic effects on the vulnerable population – cases of hospitalizations and deaths from vaccine-preventable diseases

Regarding my involvement as manager for Romania of the EU-JAMRAI2 project, I will continue to supervise the smooth running of the experts' activity and the timely completion of the project deliverables. I will keep in touch with colleagues from participating EU countries and contribute to solving the problems that arise inherently in the context of a project of such magnitude.