

**“CAROL DAVILA” UNIVERSITY
OF MEDICINE AND PHARMACY IN BUCHAREST
DOCTORAL SCHOOL
DOMAIN: MEDICINE**

**From Ultrastructure to Function:
Characterizing the Application of
Regenerative Elements in Modern
Medicine**

**SUMMARY OF THE HABILITATION
THESIS**

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The present habilitation thesis, titled **“From Ultrastructure to Function: Characterizing the Application of Regenerative Elements in Modern Medicine”** is structured into five chapters, designed to provide a comprehensive overview of my post-doctoral scientific and academic career, to present a robust portfolio of achievements, and to outline my strategic vision for the future as a PhD supervisor. This portfolio is supported by strong bibliometric indicators, including a **Web of Science h-index of 13**, derived from **49 ISI-indexed documents** (including **more than 20 as the senior author**) that have garnered a total of **1,098 citations**.

A unique feature of this thesis is its self-contained nature. The content is supported by a rich collection of 40 figures, all of which originate from my own published papers, and is referenced by 43 publications, all of which are my articles. I have chosen this specific presentation style to demonstrate a coherent and self-sustaining scientific program, where each publication builds upon the previous one, collectively forming a solid foundation for the future research directions proposed herein.

The thesis is structured as follows:

Chapter 1, the Preamble, sets the narrative and conceptual framework for the entire thesis. It introduces the “golden thread” of my career: a unique trajectory defined by a dual specialization in both Dentistry and General Medicine. This chapter argues that this foundation provided an integrative perspective that has consistently guided my work, from fundamental research to clinical applications and educational innovation.

Chapter 2, “Main Scientific Contributions”, details my original post-doctoral research, uniquely structured as a self-contained narrative review built exclusively upon my 40 post-doctoral publications. The chapter explains how the foundational expertise in ultrastructural analysis and interstitial cell biology, gained during my doctoral research on Telocytes, was strategically translated and expanded into a new, independent research program.

This post-doctoral program focused primarily on exploring the regenerative potential of oral tissues. The narrative demonstrates a logical progression, starting from fundamental ultrastructural characterization of stem cell niches in the salivary glands, moving towards in vitro functional studies to assess their behavior, and culminating in research with direct clinical and public health applications in related domains. I chose this thematic structure to showcase a mature and coherent research program aimed at bridging the gap between fundamental discovery and potential clinical translation.

Chapter 3, “Academic, Pedagogical, and Leadership Contributions”, presents my activity as an educator and academic leader, guided by the vision of an “academic architect”. This section details the comprehensive reform of the Histology curriculum for dental students, a process I initiated and led as Head of the Discipline. The centerpiece of this reform was the pioneering introduction of “Regenerative Dentistry” as a core subject, a modern discipline aligned with both European Union directives and the forefront of biomedical science.

Beyond curriculum reform, the chapter outlines the development of a comprehensive educational ecosystem. This reform includes foundational contributions – I was **the only scientist who took part in the Romanian translation of both major histology treatises** – *Junqueira’s Basic Histology* and *Ross’s Histology: A Text and Atlas*, authoring a new, updated cell and molecular biology manual for dental students, and developing a modern digital e-learning platform.

Furthermore, this section highlights my deep commitment to mentorship, evidenced by the coordination of numerous student research projects that have resulted in co-authored publications with students, even in **Q1 ISI-indexed journals**. Finally, the chapter outlines how my involvement in institutional leadership roles was strategically utilized to support and implement this educational vision at both the faculty and university levels.

Chapter 4, “Portfolio of Scientific and Professional Achievements”, serves as the evidentiary foundation of the thesis. It details the publication record summarized in the introduction (h-index of 13 from 49 ISI documents) and critically underscores my transition to a leadership role in research by highlighting that more than 20 of these publications are as a senior author. The portfolio then documents my extensive activity in scientific dissemination, featuring over 70 presentations at national and international conferences. Moreover, the impact of my work is highlighted by the significant number of **50 lectures delivered as an invited speaker**, demonstrating peer recognition of my expertise.

Finally, this section consolidates the evidence of my international standing and integration into the scientific community. It details prestigious editorial responsibilities, such as my role as **Assistant Editor for the *Journal of Cellular and Molecular Medicine*** (Wiley, FI: 4.2), and my activity as a grant evaluator for UEFISCDI. My election as a **Fellow of the Royal Microscopical Society (FRMS)** and a **Member of the Royal Society of Biology (MRSB)**, affiliations that certify a high level of professional achievement, complements the responsibilities mentioned above.

The final section, Chapter 5, “Career Development Plan”, outlines my strategic vision for the next stage of my academic career, focusing on my role as a PhD supervisor. The plan is built upon three interconnected pillars: leading a pioneering research program, delivering excellence in mentorship and education, and contributing to institutional leadership.

The chapter details three priority research axes proposed for future doctoral students, which capitalize on my established expertise: **(1)** Advanced studies in tissue regeneration, focusing on telocytes and stem cell niches; **(2)** The exploration of saliva as a source for non-invasive biomarkers; and **(3)** The development of innovative digital tools for medical education.

My philosophy for PhD supervision is explicitly stated, emphasizing the development of intellectual autonomy, personalized mentorship, and the integration of students into the international scientific community. To ensure the plan’s feasibility, a comprehensive SWOT analysis has been included, demonstrating a realistic assessment of my strengths, weaknesses, opportunities, and threats.

Finally, the chapter provides tangible evidence that this vision is already being implemented. It concludes by presenting a portfolio of **five major editorial projects currently underway**, including books and treaties contracted with prestigious international publishers like **Springer** and **Cambridge Scholars**, thereby transforming future intent into current, verifiable action.