

ABSTRACT

The habilitation thesis is structured into two sections each containing several chapters.

Thus, Section I: Professional and Scientific Achievements is structured into 3 chapters - Chapter I, Scientific Achievements, contains two subchapters - I.1 Contributions to Knowledge, a subchapter that contains information about the doctoral research, the beginning of the research activity, the publishing activity - a summary of articles published in prestigious journals indexed in international databases, information about the visibility of research, review activity, participation in scientific events as an invited speaker, participation in the organizing and scientific committees of various events, editorial activity, participation in examination and competition boards; I.2 Research Grants and Patents - includes the projects and grants in which I participated as a team member or local coordinator, as well as national and international clinical studies in which I was an investigator or subinvestigator of the team from Cluj-Napoca. Chapter II, Professional Achievements - includes the professional activity with subchapters: professional career: professional degrees, internships, and professional training courses, obtained attestats, professional experience; coordination of professional activity; coordination of residents; membership in various professional societies. Chapter III, Academic Achievements - includes academic activity with subchapters: academic activity and main teaching responsibilities; coordination of bachelor's and dissertation theses; publication of textbooks, books, and book chapters for educational purposes, continuous professional training activity, participation in educational and training projects, awards and distinctions obtained.

Section II: Proposal for Career Development also includes 3 chapters, namely: Chapter 1 Plan for the Development of Scientific Activity in which I outlined the main objectives that I propose for the future in research activity; Chapter 2, Professional Development Plan, in which I outlined the plan for the development of the professional career with the main objectives; Chapter 3, Academic Development Plan - contains the main academic development strategies.

The first part of the habilitation thesis represents a synopsis of all my professional, postdoctoral research and academic achievements. In 2011, I completed my doctoral thesis on "Rehabilitation treatment in hip arthroplasty" under the coordination of Prof. Liviu Pop M.D., thus becoming a doctor of medicine in 2012. Also, in 2012 I became a specialist in Rehabilitation, Physical Medicine, and Balneology. I have gone through all the classic stages of the university career, from assistant professor in 2007, lecturer in 2015, to associate professor in 2022.

The study of physical factors and their application in the recovery of patients with various conditions has been a continuous concern over time. Thus, electrotherapy, the study of different forms of electrical energy as such or derived forms of current with applicability in various pathologies that address the specialty of Physical Medicine and Rehabilitation, represented a therapeutic challenge.

Physical agents have anti-inflammatory, antioxidant and regenerative effects at the tissue level, effects that are particularly important in the treatment of chronic degenerative diseases, considering the oxidative stress and inflammation involved in their etiopathogenesis.

In addition to classical methods used in physical medicine and rehabilitation, the use of telerehabilitation in various conditions and situations such as the Covid-19 pandemic has represented an optimal alternative to therapy, especially in the case of post-stroke patients. In this regard, we published a systematic review on the role of teletherapy and telerehabilitation.

The rehabilitation treatment of post-stroke patients has been a continuous concern driven by the need to improve the functionality of these patients and limit the disabilities of this condition. We studied and published an article on the effects of high-intensity electromagnetic field therapy in reducing post-stroke spasticity.

The specialty of Physical Medicine and Rehabilitation is a complex field, with multiple natural and artificial physical factors at its disposal and a wide range of patients with diverse pathologies seeking specific rehabilitation programs. My concerns have been multiple; one of them, during my PhD, was the study of osteoporosis, the mechanisms involved in the decrease of bone mineral density, the consequences of osteoporosis and pharmacological and non-pharmacological therapeutic possibilities.

Another interesting research was about the effectiveness of intermittent hypoxia-hyperoxia therapy in various pathologies with possible metabolic implications, including the remodeling of bone tissue by stimulating osteoblastic activity.

Research activities have been carried out in parallel with participation in two national grants and two international clinical studies. Throughout my professional career I have participated in numerous training courses and obtained complementary certifications in musculoskeletal ultrasound, electromyography, and healthcare management. Recognition of my professional activity has materialized through numerous awards, invitations to national and international scientific events.

Throughout my teaching career I have tried to involve and guide students and residents in the complex act of knowledge and at the same time I have guided them in the process of translating the knowledge acquired through research into quality scientific materials. I have been the scientific coordinator for over 100 completed final theses, undergraduate or master's studies. I have been appointed a member of numerous examination boards for positions in higher medical education or in health units of the same field.

Publishing activities have been a continuous concern in academic activities, thus trying to promote the image of the Faculty of Medicine of the "Iuliu Hatieganu" University of Medicine and Pharmacy nationally and internationally. The synthesis of publishing activities carried out throughout the academic career is represented by numerous articles published in extenso in ISI Web of Science/Clarivate Analytics-indexed journals, ISI Proceedings or other journals indexed in international databases (BDI) - achieving an H-index of 6 in the Web of Science database, 7 in Google Scholar, and 4 in the Scopus database, as well as numerous communications at specialized conferences/congresses/workshops published in abstract volumes with ISBN, as well as 10 books or book chapters/monographs published by prestigious publishers.

In the second part of the thesis, the main plans for my professional, academic, and research development that I propose for the future are outlined. The lines of professional development are constantly updated to the latest knowledge in the medical field in which I am active, through the acquisition of new competencies and skills in the field, updating knowledge related to innovative medical therapies in the field. Evolving in the spirit of knowledge, having the chance of a favorable research climate since my early PhD years, having valuable mentors in my professional and academic activity who have decisively influenced my steps on the chosen complex path, research has represented the pillar of my professional and academic evolution.

The main directions of future research activity will focus on identifying the pathogenetic mechanisms by which natural and artificial physical factors intervene in the healing process in chronic degenerative neurological and osteoarticular diseases, the effectiveness of robotic rehabilitation in neurological and orthopedic conditions, and the effect of PRP infiltrations in knee osteoarthritis.

Academic activity will be dominated by the continuous updating of teaching materials, modeling, and continuous adaptation of teaching support. I will actively involve students and residents in the complex process of learning by participating in scientific events on specialized or interdisciplinary topics and will continue to supervise students in the completion of their bachelor's and master's theses. I will encourage young PhD/master students to access funds for fundamental research in medicine/scholarships and sources of funding for young researchers, and I will ensure an annual continuous publishing activity, through publications in ISI and BDI indexed specialized journals, to increase the visibility and reputation of the university.