

HABILITATION THESIS SUMMARY

The habilitation thesis entitled **"Elements of Anatomical Hermeneutics – A Guideline of Good Medical-Surgical Practices of an Anatomist's Mind"**, drafted in accordance with the regulations of CNATDCU (National Council for the Attestation of University Titles, Diplomas, and Certificates), provides a structured synthesis of my entire professional, research, and teaching activity, interconnecting the most significant scientific results published since obtaining the title of Doctor of Medicine in 2011.

The content of the habilitation thesis is organized into three main sections as follows:

Section 1 presents an overview of my professional career, highlighting the scientific and academic achievements obtained over 25 years of continuous activity in the fields of anatomy, cardio-vascular medicine and oncology, together with a synthesis of the main research directions in which I have achieved results disseminated in various prestigious national and international scientific journals.

My professional medical-surgical activity began upon graduating from the Faculty of Medicine of the University of Medicine and Pharmacy of Târgu-Mureș in 1999. This activity included positions as an intern physician at the County Clinical Hospital of Târgu-Mureș (2000), followed by research physician at the Thorax Centrum Rotterdam, Rotterdam, the Netherlands (2001). Subsequently, I continued as a resident physician in cardio-vascular surgery (2002), then as a specialist consultant (2009), and finally as a senior consultant in cardio-vascular surgery (2017) - all these positions were within the Cardio-Vascular Surgery Clinic of the Institute for Emergency Cardiovascular Diseases and Transplantation of Târgu-Mureș. In addition, I currently hold the administrative position of medical director of the same institute IUBCVT from Târgu-Mureș.

My teaching career began in 2000 as a university pre-assistant, and through successive promotions and examinations I advanced to the positions of university assistant (2006) and after that lecturer (2012), currently holding the position of associate professor (2025) within the Department of Anatomy–Embryology at the „GE Palade” University of Medicine, Pharmacy, Science and Technology from Târgu-Mureș.

My interest in research started during my medical studies, continued in the first year after graduation in an international Dutch setting, and has remained a constant focus throughout both my academic and surgical career. This includes my doctoral studies at the University of Medicine and Pharmacy of Târgu-Mureș, under the supervision of Prof. Dr. Radu Deac. I successfully defended my thesis entitled *"The Radial Artery – Graft for Surgical Myocardial Revascularization in the Experience of the Cardio-Vascular Surgery Clinic of Târgu-Mureș"*, earning the title of „Doctor of Medicine” in 2011.

This habilitation thesis integrates three major directions of research and professional expertise in anatomy and medical-surgical practice, namely:

- *Elements of Applied Anatomy*: with an emphasis on functional morphology and posture, reflecting not only the health of the musculoskeletal system but also neuromuscular balance, biomechanical efficiency, and the level of physical activity. Within this research direction, we addressed four themes. The first of these evaluates the correlations between anthropometric variables and electromagnetic parameters, the study consisting in highlighting a range of anatomical-morphological parameters associated with obesity, using magnetic resonance and bioimpedance technologies for data collection, associated with the comparison of subjects with different physical activity indices, separated by sex. The impact of obesity on the capacity of the cardiovascular system represents a second research direction, within which the metabolic changes associated with the transition from adolescence to early adulthood were studied in subjects with low levels of physical activity, comparing the level of obesity, body composition

parameters and the capacity of the cardiovascular system in young adults using bioelectrical impedance analysis. The third research direction is related to anatomical concepts in identifying postural deviations, aiming to detect critical asymmetries in body posture, comparing anterior and posterior segments and using a mobile application based on artificial intelligence related to postural dynamics. Prevention of degenerative damage to the optic nerve is the fourth research direction, investigating the relationships between the anatomical substrate, risk factors and visual function parameters of patients with primary open-angle glaucoma and increased intraocular pressure compared to patients with the same condition but with normal intraocular pressure.

- *Cardio-Vascular Medico-Surgical Elements:* cardiovascular diseases currently represent the leading cause of global mortality. In this context, the need for early and accurate diagnostic methods has become essential. Moving beyond conventional evaluations, modern cardiovascular surgery and cardiology have made a qualitative leap through the use of advanced imaging techniques, which allow particularly clear cardiological diagnoses followed by precise and targeted surgical treatment. Within this research direction, we addressed three themes. The incidence of arrhythmias after pediatric cardiovascular surgery is the first of them – given the lack of a clear assessment of the incidence of early postoperative arrhythmias in pediatric patients with coronary artery disease, we reviewed the specialized literature in order to clarify this incidence and to identify the risk factors that contribute to the development of these arrhythmias with severe impact on the postoperative evolution. The second theme addressed is focused on modern cardiac echographic assessments - the study had as its main objective the establishment of reference intervals for stratified segmental longitudinal myocardial deformation, among a selected population of patients without a history or clinical signs of cardiovascular disease, the establishment of reference values being essential for clinical practice, allowing a distinction between physiological changes and those suggestive of a regional myocardial dysfunction. Nosocomial infections in critically ill cardiovascular patients represent the third research direction, in which we evaluated the risk of death among patients admitted to intensive care with cardiovascular pathology, but who do not present nosocomial infections compared to those with relatively similar pathology but who associate nosocomial infections, a current problem with connotations that go beyond therapy itself.
- *Oncological Anatomo-Therapeutic Elements:* the oncological context has shown an unfortunate progression in recent decades, despite genetic, therapeutic, and management advances. From a prognostic and survival perspective, the understanding and reshaping of good medical-surgical practices, using a well-defined anatomical approach combined with both traditional and modern medical-surgical treatments, allow for the refinement of therapeutic methods and the more effective application of pharmacological therapies and targeted radiotherapies. Within this research direction, we had as our first theme the diagnostic and therapeutic challenges in the case of a tumor of embryological origin, namely the immature teratoma - the study having as its objective the identification and synthesis of the most recent data from the specialized literature regarding epidemiology, histology and clinical particularities, all of these corroborated with the current therapeutic strategies applied, with an emphasis on the role of conservative surgery and adjuvant chemotherapy. The risk of malignancy in adenomyosis is the second theme addressed - the pathogenic mechanism of malignant transformation being unknown. The anatomical-histological description is important for standardizing the description of tumors developed from adenomyosis and for differentiating them from those that appear simultaneously with adenomyosis without knowing the exact relationship between them, these aspects modifying the therapeutic strategy. The third research direction is represented by the evaluation of current prognostic factors in breast oncological pathology - with the aim of evaluating biomarkers in the field of molecular pathology, together with classical biomarkers and their prognostic roles, in order to assess their relevance and the need for new management, diagnostic and therapeutic strategies for this type of tumor damage, which is currently particularly widespread in women.

Section 2 of the habilitation thesis reviews the prospects for the development of the academic, scientific, and professional career, carried out along the following directions:

- scientific plan: I will continue efforts in the above-mentioned areas of general interest, in order to deepen and expand the results already obtained, and to develop them further to identify new directions of research.
- academic plan: I intend to continue improving teaching skills and techniques within my current fields of expertise at the Department of Anatomy - Embryology, „GE Palade” University of Medicine, Pharmacy, Science and Technology of Târgu-Mureș.
- professional medico-surgical plan: together with the team of the Cardiovascular Surgery Clinic at the Institute for Emergency Cardiovascular Diseases and Transplantation in Târgu-Mureș, where I am currently working, I will continue to explore new surgical and non-surgical approaches to the cases encountered in our daily activity.

Section 3 presents the bibliographic references that were necessary for the elaboration of the content, including my own published articles.

OCTOBER 1st, 2025

ASSOC. PROF. DR. LIVIU MORARU

