

**"VICTOR BABEȘ" UNIVERSITY OF
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DOCTORAL SCHOOL
MEDICINE DOMAIN**



**TRANSLATION OF FUNDAMENTAL RESEARCH
REGARDING DIGESTIVE SYSTEM CONDITIONS INTO
CLINICAL PRACTICE – “FROM BENCH TO BEDSIDE”**

ABSTRACT

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The current habilitation thesis entitled: “***Translation of fundamental research regarding digestive system conditions into clinical practice – from bench to bedside***” encompasses the most important part regarding the research activity as well as academic activity that I performed in the last 17 years since I finished my PhD thesis. Moreover, the thesis underscores also the academic career perspectives as well as scientific perspectives.

Gastric cancer is a complex disease influenced by a plethora of clinical and pathological factors that interact to determine disease progression and patient outcomes. From molecular markers and genetic profiles to histopathological features and comorbid conditions, a comprehensive understanding of these factors is essential for personalized treatment approaches and prognostic assessments in gastric cancer patients. By integrating insights from epidemiological, biological, and clinical studies, healthcare providers can tailor management strategies to individual patients, ultimately improving outcomes in this challenging malignancy.

The multifaceted research efforts in gastric cancer have provided a wealth of novel insights and future perspectives that hold promise for improving the diagnosis, treatment, and prevention of this challenging disease. From genomic and proteomic studies to advancements in immunotherapy, artificial intelligence, and surgical techniques, the landscape of gastric cancer research is evolving rapidly, offering hope for more effective and personalized approaches to combat this significant health burden.

Exploring various types of cancers reveals the complex nature of this disease. Each type of cancer presents unique challenges in diagnosis and treatment. Geospatial methodologies, atypical presentations, multiple primary tumors, and molecular mechanisms all contribute to our understanding of cancer development and progression. Collaborative research efforts, innovative treatment strategies, and a comprehensive approach to cancer care are essential for addressing the diverse landscape of tumors and improving patient outcomes worldwide.

Inflammatory bowel diseases represent a complex group of chronic inflammatory conditions that not only affect the gastrointestinal tract but also have systemic implications affecting various organ systems. The interplay between genetic predispositions, environmental factors, and lifestyle choices contributes to the pathogenesis and clinical course of IBD. Comprehensive care strategies that address the multifaceted nature of IBD, including genetic susceptibilities, systemic manifestations, and lifestyle considerations, are

essential for optimizing outcomes and quality of life for individuals living with these challenging conditions.

My main area of research has been in gastroenterology and oncology, focused especially on digestive neoplasms. This direction of research can be seen as a continuation of the research undertaken within the doctorate, more precisely the identification of the most significant factors involved in estimating prognosis and outcome, as well as the most efficient therapeutic management of patients with gastric cancer, in correlation with some specific markers. These studies were conducted by analyzing some clinical-morphological factors and implementing some modern immunohistochemically methods on gastric cancer resection specimens. Further, I focused on the correlations between survival and clinical as well as morphological parameters, such as demographic data, early vs. advanced gastric cancer, location, histologic type, and so on.

Based on these considerations, the habilitation thesis was structured as follows:

- ❖ In the first chapter, I described my scientific achievements in detail. The subchapters that constitute this part include the most relevant research regarding my area of expertise, such as novel insights and future perspectives regarding gastric cancer and other types of cancer; current and future perspectives regarding inflammatory bowel disease; the use of artificial intelligence for the prediction and diagnoses of digestive neoplasms and other cancers. In addition, this chapter presents the research results obtained, such as books, articles, and participation in scientific events, including awards, throughout my entire career.
- ❖ In the second and third chapters, I described my achievements regarding didactic activity and my professional activity, which means education and training courses, as well as professional experience, presented in detail.
- ❖ In the last chapter of the habilitation thesis, I propose some didactic and scientific perspectives, as well as a plan for integrating the didactic activities within the research ones.







Regarding my expertise area, the habilitation thesis describes in detail studies regarding the prognostic significance of the expression of different immunohistochemical markers such as cyclooxygenase-2 (COX-2), E-cadherin, p53 protein, mucins in gastric cancer patients. Moreover, my scientific work focused on the correlation between clinicopathological factors and the survival of patients with gastric tumors. I concentrated my scientific efforts on delving into novel challenges and future perspectives in the pathogenesis and therapeutic armamentarium of this aggressive neoplasm. In this

direction, I assessed the value of angiogenesis, indispensable for the development and carcinogenesis of gastric tumors, by evaluating the expression of vascular endothelial growth factor (VEGF) as a prognostic factor in gastric cancer. Furthermore, I studied the plethora of modern targeted molecular agents used in the novel algorithms of gastric cancer management, their indications, and their level of efficacy. Subsequently, I focused on the impact of the tumor microenvironment on cancer behavior and progression, and I pinpointed the role of immunotherapy in the modern treatment approach of these patients. The main idea of my research underscores the essential role of personalized therapeutic strategy targeted to each cancer patient in the era of precision medicine, by adding a substantial benefit to their overall and disease-free survival.

Future perspectives in diagnosing both premalignant and malignant digestive lesions include the use of AI-assisted medical devices and endoscopes, able to improve the detection rate of these conditions. Shortly, the development of this technology will help clinicians in their daily practice, and will offer the possibility of accessing, for example, endoscopic datasets from large platforms and asking for a “second opinion”.

The epidemiological spectrum of inflammatory bowel diseases represents a dynamic and challenging topic that drew my attention, therefore I focused my scientific research on the incidence, phenotypic characteristics, specific treatment, outcome, and healthcare resource utilization of IBD patients from the western part of Romania. This research started as part of a prospective multicentric international study initiated in 2010 by the Epicom ECCO including 31 centers from both Eastern and Western Europe, with a batch of 1365 IBD patients to observe the existing differences among these regions. The information collected was analyzed and published in numerous famous international journals in this area, quoted with a high impact factor. Moreover, these data consisted of the background of a unified register for accessing more easily the comprehensive patient records, extremely helpful for the management of these patients.

The portfolio that quantifies my entire scientific research activity consists in:

-  35 ISI-indexed full-text articles – 17 as the main author
-  27 ISI-indexed abstracts – 14 as the main author
-  3 ISI-indexed full-text articles as collaborator
-  9 international databases full-text articles – 2 as the main author
-  9 BDI-indexed full-text articles – 4 as the main author
-  more than 100 articles published in volumes of abstracts (book of abstracts), presented at national/international manifestations

✚ 4 Romanian-indexed full-text articles with ISSN / ISBN – 2 as the main author
more than 300 scientific communications presented at international manifestations

✚ 8 scientific communications presented at national manifestations

✚ research grants: member in 3 national research scientific projects

The recognition and impact of my entire activity are underlined by the 62 papers (full-text and abstracts) detected by the ISI system, more than half of them cited in ISI Thomson Reuters-rated journals, summing a number of 1175 citations (without self-citations), accumulating a Hirsch index $H = 18$.