

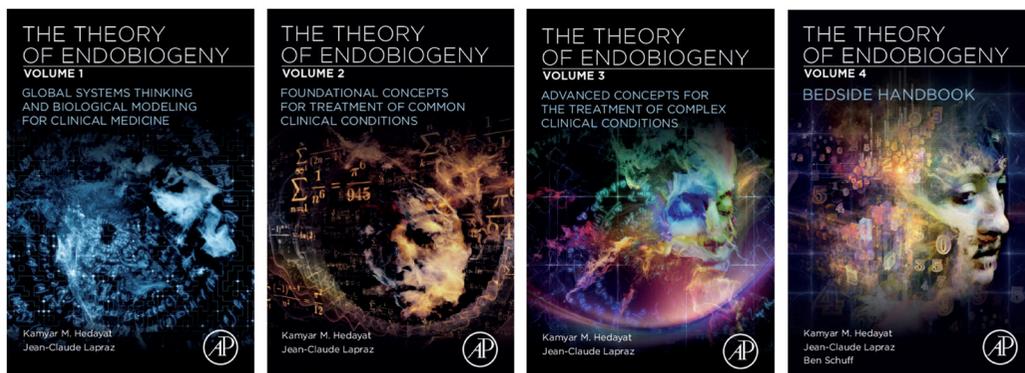
# Book Review: The Theory of Endobiogeny

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Complex systems theory holds great promise in many fields of inquiry. In the field of human physiology, great strides have been made in characterizing and quantifying biological and physiologic activity. At the cellular level great strides have been made in characterizing metabolomics, proteomics, etc. At the systems level, there is bioelectric and biophysical characterization of cardiac activity (heart rate variability, cardiac output, etc.). A coherent theory of global systems functioning of the human being as a whole system has not been characterized – until now. The theory of Endobiogeny is a four-volume set written by the world-wide authorities on the subject. It offers both the theoretical foundations of the theory and its clinical applications.



## Volume 1: Global Systems Thinking and Biological Modeling for Clinical Medicine

The theory of Endobiogeny is a global systems approach to complex systems. It's based on the concept of terrain: the sum of all the material elements of a biological system and its functional activities. According to this theory, metabolism is the sum of all activities related to the transformation of energy and matter related to the creation, existence, adaptation and restoration of an organism. The authors theorize that because organisms are coherent in their structure and function that there must be a single system that manages all systems as they relate to the global whole. They define the criteria as one that is ubiquitous, regulates metabolism and is self-regulating. They conclude that the endocrine system is the manager, calibrated by autonomic nervous system activity. They posit that this combined “neuroendocrine system” is, effectively, the manager of the system. They do clarify that the other branches of the nervous system, especially the central branch, influence both the autonomic nervous system and endocrine system. The influence of external factors, such as geographic, meteorological, and cosmobiologic are briefly touched on as they relate to the regulation of the organism both as an electromagnetic system as well as a rhythmic biochemical system that must adapt its metabolism to variations in temperature and light.

A good portion of the first volume is dedicated to explaining the functions of both the autonomic and endocrine systems. It reviews how they interrelate to each other, affect metabolism, and regulate various types of adaptation syndromes. The theory appears to be built upon Selye's description of a “general adaptation syndrome” but far exceeds Selye's in depth and variety of adaptation syndromes.

The single largest chapter of this first volume is dedicated to their mathematical approach to quantification of human physiology, called the Biology of Functions. The approach appears at once simple and complex and is completely different than the standard approach to mathematical

biology and physiology. Rather than using measurements of the activities of systems, the theory of Endobiogeny posits that global systems activity must be modeled through indirect assessment. Biomarker are viewed as the downstream output from tissues, which have been influenced by upstream regulators of metabolism. It relies on combinatorial mathematics and pattern analysis, building upon simple, direct indexes and complex, meta-indexes. The approach claims to be able to model fractal levels of metabolic management: sub cellular, cellular, tissue, and organ levels. The experimental evidence behind the reasoning for the construction of indexes is reviewed for a number of indexes.

The theory of Endobiogeny was posited by a general physician in private clinical practice. The authors discuss that theory grew out of clinical needs. As such, the first volume concludes with a discussion of the basic elements of the clinical practice of Endobiogeny: anamnesis, physical examination, and selection criteria for various types of therapeutic interventions.

### **Volume 2: Foundational concepts for Treatment of Common Clinical Conditions**

The remaining three volumes are increasingly geared toward clinicians. In volume 2, the basic elements of clinical assessment for symptomatic treatment are discussed. For example, the authors devote three chapters to signs and symptoms related to autonomic and endocrine activity. The essential elements of immunity and symbiosis are discussed, along with the role of the liver and exocrine pancreas in regulation of the terrain and in various disorders. From this foundation, dysbiosis and infectious disorders are discussed. Based on clinical evidence of the lack of efficacy of antibiotics for these disorders, the authors put for a rational, clinical approach to the selection of medicinal plants, diet and to some extent lifestyle modification as novel approaches to treatment. The recommendations are based on the experience of the authors, with case studies presented, including the use of the Biology of Functions in clinical practice.

### **Volume 3: Advanced Concepts for the Treatment of Complex Clinical Conditions**

The third volume explores complex clinical disorders. It is here that this global systems approach to medicine appears to have some value. Disorders such as atopic disease (asthma, eczema and allergies), menstrual disorders, prostate disorders, inflammatory bowel diseases (ulcerative colitis and Crohn's) are discussed along with other disorders. The authors present an intriguing approach to diagnosis of disorders based on integrative pathophysiology rather than purely on symptoms. The role of the Biology of Functions as an objective assessment of evolution of the terrain under various treatments becomes clearer in the third volume.

### **Volume 4: Bedside Handbook**

The fourth volume is a recapitulation of the first three volumes. The authors state that it is written for bedside use in the clinic. As such, it offers a very succinct review of what is a lengthy but intriguing series of concepts over 1000 pages or so. This volume presented detailed formulations of healing plants as well as various diets and lifestyle modifications for use in the clinical.

### **Conclusions**

In general, the fourth volume is recommended as a first read for clinicians, and the first volume as a first read for researchers. The authors are highly heterodox and at times unorthodox in their approach to complex systems, which allows them to maintain the patient as a whole living organism at the center of their study. It is definitely the work of clinicians with a scientific background rather than the work of a biologist or mathematician with clinical interests. All four volumes highly recommended for both researchers of complex systems and clinicians. If a common language can be found, the perspectives of both groups can inform each other, and greater clinical applications can be ground for complex systems theory in clinical practice.