

## Book Review

**Polansky, H.: Microcompetition with Foreign DNA and the Origin of Chronic Disease.** 543pp, The Center for the Biology of Chronic Disease, Rochester, New York, 2003. ISBN 0-9740463-0-2 Paperback \$79.99.

No student of biomedical sciences could ignore the appearance of a new theory offering explanations for the origin of chronic diseases. Systematic testing and better understanding of a framework outlined by such a theory may lead to a paradigm shift in scientific view on the nature of “health” as well as causality of “disease.”

According to a new book, *Microcompetition with Foreign DNA and the Origin of Chronic Disease*, by Dr. Hanan Polansky, the current paradigm holds that viral proteins are the sole mediators of the viral effect on the host cell, in other words, “no viral protein, no effect.” Since “no viral proteins,” or almost “no viral proteins,” is a characteristic of a latent viral infection, the current view holds that a latent viral infection should be mostly harmless.

In contrast with the current “viral protein”-dependent paradigm, the book presents a newly discovered, “viral protein”-independent effect, called microcompetition. In brief, the effect of “microcompetition” can be described as a sequence of elementary processes and their interactions. The transcription factor GABP binds the promoter/enhancer of many cellular genes. GABP binds and transactivates many viral promoters/enhancers, such as the promoter/enhancer of Cytomegalovirus (CMV), Epstein-Barr virus (EBV), Herpes Simplex Virus 1 (HSV-1), Polyomavirus, Rous Sarcoma Virus (RSV), Moloney Murine Leukemia Virus (Mo-MuLV), Human Immunodeficiency Virus (HIV), and Human T-cell lymphotropic virus (HTLV). GABP binds the p300/cbp co-activator. Since p300/cbp is limiting, the transcription complex GABP · p300/cbp is also limiting. A persistent latent infection with a virus that binds this transcription complex competes with the cellular genes, and decreases the availability of the complex to the cellular genes. The decreased availability of the GABP · p300/cbp complex results in abnormal transcription of the cellular genes and abnormal cell functioning. Therefore, the proposed new theory of “microcompetition” suggests that a latent viral infection is not harmless; it actually leads to disease.

To be honest, it took me three attempts to read this book. The first attempt resulted in frustration and confusion. The unusual writing style, complex terminology, and volume of information was daunting. I put the book aside, but the seeds of curiosity had been planted, and intriguing ideas took root. They began to grow, and soon I was forced to return to my reading. My second attempt was far more productive but nevertheless challenging. I went through all seven chapters of technical notes. It was a slow process, not because of the numerous mathematical equations (which were straightforward and well-supported) but because I found myself repeatedly distracted by independent thoughts and ideas triggered by the content of the book. I would read a sentence or two and immediately attach my own observations to the proposed frame, and test the fit; I was amazed by the serendipities. My third attempt was joyous; the book served its purpose – it made me think differently! What had first seemed like cumbersome technical notations became transparent when I connected them to the work

I perform daily. I also realized that the area of my research interest – mathematical modeling of disease temporality – would benefit greatly by applying many fruitful ideas presented in Dr. Polansky's book.

The general underpinning of this work is to outline a foundation for understanding mechanisms behind the origins of chronic diseases and provide a methodology for investigating complex biological systems. The foundation laid out is an elegant set of fundamental concepts and operational rules for their connection, which form a unique language of complex systems. By applying this language, Dr. Polansky's theory of microcompetition and chronic disease initiation, progression and resolution, was delivered with amazing elegance and ease.

Understanding complex living systems is an enterprise that is interdisciplinary in its nature. In the interdisciplinary environment, to effectively communicate ideas, facts, and inferences, a common language is a must. Dr. Polansky's work compellingly demonstrates a framework that could bring together researchers from different fields. His proposed theory will work its magic by clarifying ambiguous definitions, identifying similarities and differences in various biological processes, and discovering new pathways.

The value of a unifying language for an interdisciplinary biomedical research is impossible to overestimate. I can easily come up with a number of areas of an active research interest, where interdisciplinary teams of researchers from different fields, such as virology, immunology, microbiology, biochemistry, genetics, and mathematics, would clearly benefit from using the framework suggested by Dr. Polansky. The tasks of understanding virus-host interactions at the micro- or macro- levels, mechanisms for generation and maintenance of a virus-induced immune memory, processes involved in chronic disease exacerbation due to virus re-exposure are never easy tasks. These scientific adventures require an expertise in many fields, but even more, they require a unifying language, a framework, a system where any experts can tap on the knowledge and talents of others.

I consider this book a guide for recognizing scientific puzzles, solving them, and collecting pieces for future ones. This book is a well-justified manual of fascinating algorithms for putting seemingly disconnected observations into a multi-dimensional framework for understanding chronic disease etiology. The content of the book is presented in an array of logical sequences of conceptual building blocks, corresponding models, anticipated outcomes, and collections of observations. While challenging to read initially, the book stimulates constructive thinking and teaches one to look for the unexpected while leaving room for creativity and imagination.

I believe that Dr. Polansky's book will catalyze the scientific learning process, promote interdisciplinary cross-fertilization, stimulate development of treatment strategies and drug discovery, and leave the reader inspired.

*Elena N. Naumova  
Department of Family Medicine and Community Health,  
Tufts University School of Medicine, Boston, MA, U.S.A.*