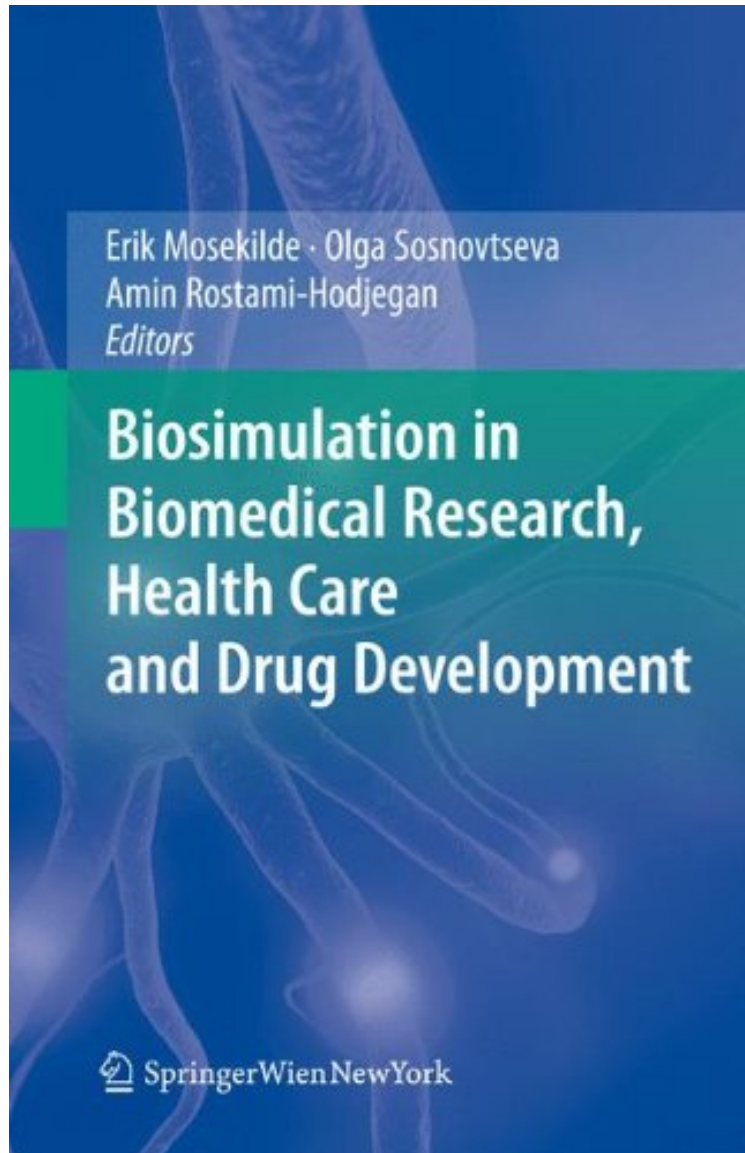


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Biosimulation is an approach to biomedical research and the treatment of patients in which computer modeling goes hand in hand with experimental and clinical work. Constructed models are used to interpret experimental results and to accumulate information from experiment to experiment. This book explains the concepts used in the modeling of biological phenomena and goes on to present a series of well-documented models of the regulation of various genetic, cellular and physiological processes. The way how the use of computer models allows optimization of cancer treatment for individual patients is discussed and models of interacting nerve cells that can be used to design new treatments for patients with Parkinson's disease are explained. Furthermore this volume provides an overview on the use of models in industry, and presents the view of regulatory agencies on the topic.

From the Back Cover Biosimulation is an approach to biomedical research and the treatment of patients in which computer modeling goes hand in hand with experimental and clinical work. Constructed models are used to interpret experimental results and to accumulate information from experiment to experiment. The book explains the concepts used in the modeling of biological phenomena and goes on to present a series of well-documented models of the regulation of various cellular and physiological processes, emphasizing particularly the role of self-sustained biological activity. The way how the use of computer models allows optimization of the treatment of various diseases for individual patients is discussed and models of interacting nerve cells that can be used to design new treatments for patients with Parkinson's disease are explained. Furthermore this volume provides a discussion of the use of models in the pharmaceutical industry, and presents the view of the regulatory agencies on the topic.

About the Author Erik Mosekilde was born in Århus, Denmark on May 26, 1941. In March 1966 he graduated (summa cum laude) from The Technical University of Denmark as an electrical engineer specialized in solid state physics, and in September 1968 he completed his Ph.D. studies at Physics Laboratory III with a thesis on acoustoelectric effects in piezoelectric semiconductors. Having performed his military service Erik Mosekilde was offered a postdoctoral position at Physics Laboratory III and shortly after received a postdoctoral fellowship from IBM, which allowed him to spend 9 months at Thomas J. Watson Research Center, Yorktown Heights, New York. In July 1972 Erik Mosekilde was appointed associate professor in modern physics, and in August 1977 he defended a dissertation on "Linear and Nonlinear Acoustoelectric Effects in Heavily Doped GaAs Epitaxial Single Crystals" for the Danish Doctor's degree at The University of Copenhagen. In September 2000 he was appointed Professor in Biological Applications of Nonlinear Dynamics at The Technical University of Denmark. Erik Mosekilde has been a member of various educational boards (1977-1982) and for six years (1982-1988) he was a member of Konsistorium, the governing body of The Technical University of Denmark. He has also served and as Vice President and member of the Policy Council for The System Dynamics Society (1984-1993), as member of the steering committee and chairman of the Scandinavian Simulation Society (1986-1992), as member of the Academic Advisory Group for the ERASMUS programme (1988-1990), as member of the J.W. Forrester Award Committee (1987-1997), as statistical consultant in medicine (1986-1998), as member of the steering committee for the Center for Chaos and Turbulence Studies, CATS (1992-2002), as chairman for the Center for Modeling, Nonlinear Dynamics and Irreversible Thermodynamics (1992-2006), as member of the steering committee for an EU COST-program on nonlinear dynamics in mechanical processing (1997-2001), as member of the steering committee for the Danish Graduate School in Nonlinear Science (1997-2002), as member of the steering committee for an INTAS program on coupled biological oscillators (2002-2005), as head of the Department of Physics (1996-2005), and as evaluator for a variety of national and international science foundations.