



mathematics



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Mathematical Modelling in Biomedicine

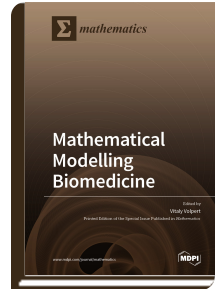
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Mathematical modelling in biomedicine is a rapidly developing scientific discipline at the intersection of medicine, biology, mathematics, physics, and computer science. Its progress is stimulated by fundamental scientific questions and by the applications to public health. This book represents a collection of papers devoted to mathematical modelling of various physiological problems in normal and pathological conditions. It covers a broad range of topics including cardiovascular system and diseases, heart and brain modelling, tumor growth, viral infections, and immune response. Computational models of blood circulation are used to study the influence of heart arrhythmias on coronary blood flow and on operating modes for left-ventricle-assisted devices. Wave propagation in the cardiac tissue is investigated in order to show the influence of tissue heterogeneity and fibrosis. The models of tumor growth are used to determine optimal protocols of antiangiogenic and radiotherapy. The models of viral hepatitis kinetics are considered for the parameter identification, and the evolution of viral quasi-species is investigated. The book presents the state-of-the-art in mathematical modelling in biomedicine and opens new perspectives in this passionate field of research.



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