

## Multiscale Modelling in Biomedical Engineering

Multiscale Modelling in Biomedical Engineering Discover how multiscale modeling can enhance patient treatment and outcomes In Multiscale Modelling in Biomedical Engineering, an accomplished team of biomedical professionals delivers a robust treatment of the foundation and background of a general computational methodology for multi-scale modeling. The authors demonstrate how this methodology can be applied to various fields of biomedicine, with a particular focus on orthopedics and cardiovascular medicine. The book begins with a description of the relationship between multiscale modeling and systems biology before moving on to proceed systematically upwards in hierarchical levels from the molecular to the cellular, tissue, and organ level. It then examines multiscale modeling applications in specific functional areas, like mechanotransduction, musculoskeletal, and cardiovascular systems. Multiscale Modelling in Biomedical Engineering offers readers experiments and exercises to illustrate and implement the concepts contained within. Readers will also benefit from the inclusion of: \*

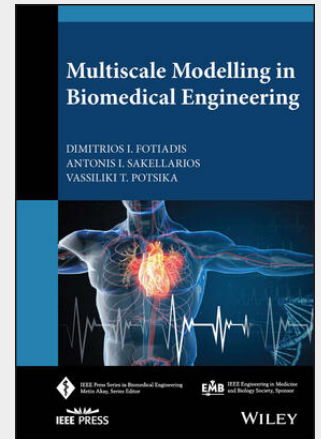
- \* A thorough introduction to systems biology and multi-scale modeling, including a survey of various multi-scale methods and approaches and analyses of their application in systems biology
- \* Comprehensive explorations of biomedical imaging and nanoscale modeling at the molecular, cell, tissue, and organ levels
- \* Practical discussions of the mechanotransduction perspective, including recent progress and likely future challenges
- \* In-depth examinations of risk prediction in patients using big data analytics and data mining

Perfect for undergraduate and graduate students of bioengineering, biomechanics, biomedical engineering, and medicine, Multiscale Modelling in Biomedical Engineering will also earn a place in the libraries of industry professional and researchers seeking a one-stop reference to the basic engineering principles of biological systems.

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