



Introduction to Cell Mechanics and Mechanobiology

By Christopher R. Jacobs, Hayden Huang, Ronald Y. Kwon

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Introduction to Cell Mechanics and Mechanobiology is designed for a one-semester course in the mechanics of the cell offered to advanced undergraduate and graduate students in biomedical engineering, bioengineering, and mechanical engineering. It teaches a quantitative understanding of the way cells detect, modify, and respond to the physical properties within the cell environment. Coverage includes the mechanics of single molecules, polymers, polymer networks, two-dimensional membranes, whole-cell mechanics, and mechanobiology, as well as primer chapters on solid, fluid, and statistical mechanics, and cell biology.

Introduction to Cell Mechanics and Mechanobiology is the first cell mechanics textbook to be geared specifically toward students with diverse backgrounds in engineering and biology.

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Review

"The new text from Jacobs, Huang, and Kwon is fully worthy of the honor of being the first text reviewed in *Cellular and Molecular Bioengineering*. After reading through the clear, simple, but rigorous text, I can say that their work does far more than just tie together some important notes in a single binding....this text is potentially transformative for the field, much in the way that the famous texts by Beer and Johnston, in the 1960s were transformative for the undergraduate study of mechanics of materials and machines." - *Cellular and Molecular Bioengineering*

"This excellent book by a group of internationally recognized authors meets a real existing need in contemporary bioengineering education, and it does it effectively and successfully....The book was exactly what I wanted; it was entirely devoted to cell-scale problems, with numerous examples, each providing the relevant engineering or mathematical formulation, at a level suitable for good undergrad BME students....All chapters are comprehensible, logically-built and concise, and each is supported by high-quality graphics which add very much to the clarity of the contents...this book is a 'must-have'." - *Computer Methods in Biomechanics and Biomedical Engineering*

"...[*Introduction to Cell Mechanics and Mechanobiology*] touches on all the main current techniques used to apply force to cells and to measure the forces exerted by cells....the physics behind them is well explained and derived...The book sets up a good context for why one would want to study mechanobiology and gives some good tips for designing an experiment, taking into account the fundamental differences in biology and engineering practices."

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