

# MECHANOBIOLOGY HANDBOOK

Mechanobiology—the study of the effects of mechanical environments on the biological processes of cells—has evolved from traditional biomechanics via the incorporation of strong elements of molecular and cell biology. Currently, a broad range of organ systems are being studied by surgeons, physicians, basic scientists, and engineers. These mechanobiologists aim to create new therapies and further biological understanding by quantifying the mechanical environment of cells and the molecular mechanisms of mechanically induced pathological conditions.

To achieve these goals, investigators must be familiar with both the basic concepts of mechanics and the modern tools of cellular/molecular biology. Unfortunately, current literature contains numerous studies that misuse standard mechanical estimations and terminology, or fail to implement appropriate molecular analyses. Therefore, the **Mechanobiology Handbook** not only presents cutting-edge research findings across various fields and organ systems, but also provides the elementary chapters on mechanics and molecular analysis techniques to encourage cross-field understanding and appropriate planning.

Aided by the continuous advancement of research tools in both mechanics and biology more sophisticated experiments and analyses are possible, thus fueling the growth of the field of mechanobiology. Considering the complexity of the mechanics and the biology of the human body, most of the world of biomechanics remains to be studied. Since the field is still developing, the **Mechanobiology Handbook** does not force one unified theory, but brings out many different viewpoints and approaches to stimulate further research questions.

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6000 Broken Sound Parkway, NW  
Suite 300, Boca Raton, FL 33487  
270 Madison Avenue  
New York, NY 10016  
2 Park Square, Milton Park  
Abingdon, Oxon OX14 4RN, UK



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