



## Handbook of Biomimetics and Bioinspiration Biologically-Driven Engineering of Materials, Processes, Devices, and Systems (In 3 Volumes) (World Scientific Series in Nanoscience and Nanotechnology)

*By Esmail Jabbari, Deok-Ho Kim, Luke P Lee, Amir Ghaemmaghami,  
Ali Khademhosseini*

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Global warming, pollution, food and water shortage, cyberspace insecurity, over-population, land erosion, and an overburdened health care system are major issues facing the human race and our planet. These challenges have presented a mandate to develop "natural" or "green" technologies using nature and the living system as a guide to rationally design processes, devices, and systems. This approach has given rise to a new paradigm, one in which innovation goes hand-in-hand with less waste, less pollution, and less invasiveness to life on earth. Bioinspiration has also led to the development of technologies that mimic the hierarchical complexity of biological systems, leading to novel highly efficient, more reliable multifunctional materials, devices, and systems that can perform multiple tasks at one time. This multi-volume handbook focuses on the application of biomimetics and bioinspiration in medicine and engineering to produce miniaturized multi-functional materials, devices, and systems to perform complex tasks. Our understanding of complex biological systems at different length scales has increased dramatically as our ability to observe nature has expanded from macro to molecular scale, leading to the rational biologically-driven design to find solution to technological problems in medicine and engineering.

The following three-volume set covers the fields of bioinspired materials, electromechanical systems developed from concepts inspired by nature, and tissue models respectively.

- Volume 1: Bioinspired Materials
- Volume 2: Electromechanical Systems

- Volume 3: Tissue Models

This three-volume set is a must-have for anyone keen to understand the complexity of biological systems and how that complexity can be mimicked to engineer novel materials, devices and systems to solve pressing technological challenges of the twenty-first century.

**Key Features:**

The only handbook that covers all aspects of biomimetics and bioinspiration, including materials, mechanics, signaling and informatics; Contains 248 colored figures;

Readership: Undergraduate and graduate students studying bioengineering, and researchers, engineers, chemists, biologists, physicists, material scientists and physicians.

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