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BOOK REVIEW

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Review of Biomimetic and Bioinspired Nanomaterials

Biomimetic and Bioinspired Nanomaterials. Edited by Challa S. S. R. Kumar (Louisiana State University, Baton Rouge, LA). WILEY-VCH Verlag GmbH & Co KGaA: Weinheim. 2010. xxii + 564 pp. $205.00. ISBN 978-3-527-32167-4.

Nature has long been a source of inspiration to scientists and engineers of all stripes and will likely remain so as we strive to duplicate and surpass the remarkable properties of biological systems. Biomimeticists usually fall into two camps: those who use and expand upon the universe of molecules and processes controlling the formation of naturally occurring materials, and those who mimic the structure and function of biomaterials through chemistry and fabrication. Both schools of thought are well represented in *Biomimetic and Bioinspired Nanomaterials*, with the editor drawing authors from fields ranging from chemistry and biology to materials sciences and mechanical engineering. The resulting richness of viewpoints, areas of emphasis, and writing styles contribute to an interdisciplinary feel that is particularly appropriate to the theme of this volume.

The book consists of 14 chapters that vary in length from 20 to over 60 pages. All are well illustrated with high-resolution micrographs and appropriate use of color. Most are thoughtfully written and some are truly excellent. Topics include the usual suspects, e.g., gecko-inspired nanomaterials, tooth-inspired composites, peptide-based nanostructures, S-layer proteins, and protein-aided fabrication of inorganic nanostructures, together with a few surprises, e.g., molecular machines, biomimetic sensors and actuators, nanoscale deformation in biological tissues, and nanomaterials for environmental applications. There is the occasional overlap in content between chapters. However, because the material is treated from different perspectives, this is usually not a problem and makes for an interesting read.

There are also a few glaring omissions. For example, the book does not include a much-warranted chapter on DNA-based nanostructures, and biomimetic "classics" like spider silk, protein adhesives, and superhydrophobic materials are succinctly covered, if at all. The index leaves a bit to be desired, but this is partially compensated for by a detailed table of contents. All chapters are adequately referenced to 2008 and most contain sporadic references from 2009, which is not unexpected considering delays typical in producing books.

Aside from these shortcomings, I found *Biomimetic and Bioinspired Nanomaterials* to be a high-quality volume that provides a broad, interdisciplinary introduction to a content-rich field. The book would be an appropriate supplementary text for teaching at the upper undergraduate or graduate levels and should find a useful place on the reference shelves of most bionanotechnology laboratories.

François Baneyx
University of Washington

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