Bionanotechnology: Lessons from Nature

David S. Goodsell
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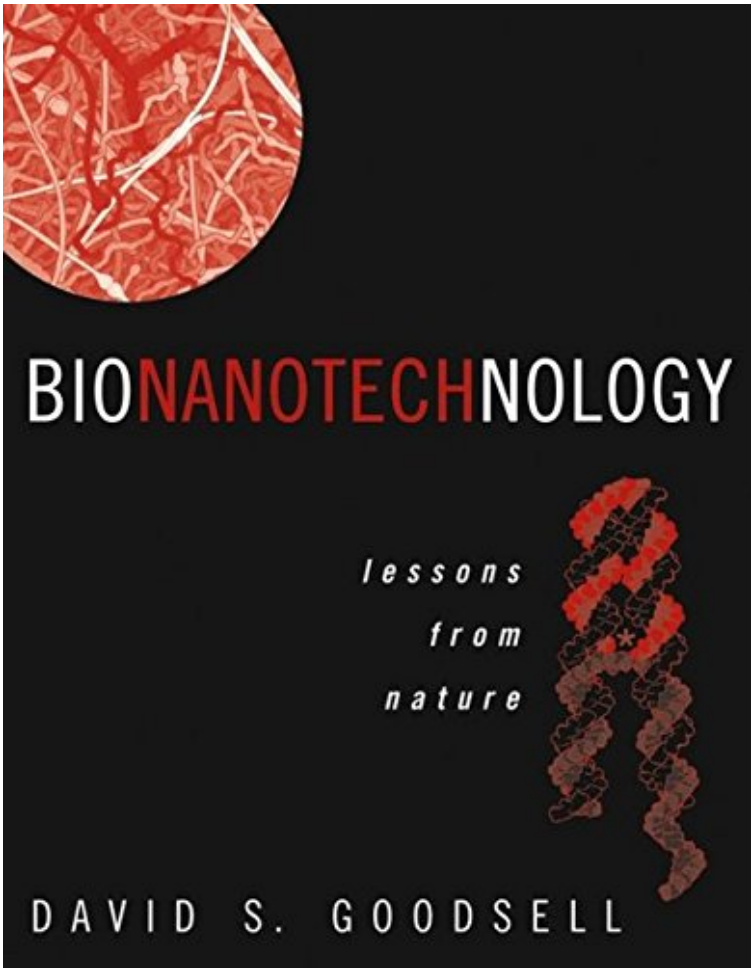

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David S. Goodsell : Bionanotechnology: Lessons from Nature before purchasing it in order to gage whether or not it would be worth my time, and all praised Bionanotechnology: Lessons from Nature:

4 of 4 people found the following review helpful. Excellent guidebook for the imminent revolutionBy Bill NielsenA revolution in science and technology is coming and is already here--the bionanotechnology revolution: understanding nature's subcellular machines and using them for our purposes. David Goodsell's book, though now three years old, is the best primer I've found to the wonderful world of subcellular machinery. He explains, without embroiling the reader in jargon, just how these molecular machines can do their myriads of functions and how the can be--and are--harnessed. I am currently using this masterpiece as a textbook for a college-level, freshman seminar class, which includes science and non-science majors. The following reviews (above) are from my students. Some students have found the book less helpful than other students, which doesn't dampen my appreciation for what Goodsell has done: he has brought the living world of the nano-small into view for the average, college-educated reader. This is truly a tour

de force in science popularization. In response to the preceding reviews (below), I would say that, though I've taken many molecular biology classes as an undergraduate and graduate student and did my Ph.D. in the biology and biophysics of influenza, I was not bored by this book. Also, I do think that this book is better than an undergraduate cell-bio textbook at explaining the world of molecular machines to the college educated lay-person. Finally, I would agree that this book is overpriced and look forward to when Wiley releases it as a paperback.14 of 15 people found the following review helpful. An excellent overview of the tools in the toolkitBy Nick PapadakisA fantastic overview of a sweeping topic. Designed for a reader who is basically familiar with the concepts of molecular biology, but needs to know more about the entire range of well-characterized molecular systems. A specialist will find the information to be highly condensed, but will appreciate the coverage of topics outside their specialty.The book avoids irrelevant technical details (but only the irrelevant ones) in favor of clear, well-distilled summaries of what is known. The emphasis is on the interactions of molecules with each other, and the relationships (functional and evolutionary) between broad classes of molecules. The writing is exquisitely clear and avoids the "scientific" voice that is all too common in textbooks and papers.The illustrations are reminiscent of those of Branden and Tooze in their impact and clarity (though not in their actual execution). Simplified to the point where most of them contain only 2 or 3 colors, they are a fine example of Tufte's ethic of visual communication.The book is not, however, a collection of journal articles. You won't find mathematical details (rate constants, binding energies) or equations. The scope is too broad. The idea is to acquaint the reader with many systems so they can figure out which one (that they hadn't heard of before) might be applicable, and then go and seek details elsewhere.[p.s. Robertorob's review (which was highly negative) said "all this info would be covered in a good textbook on cell biology". This is untrue. Only about 1/3 to 1/2 would be, and the treatment would have been much less informative if what one wanted was an overview.]6 of 6 people found the following review helpful. An engineer's perspective...By TennysohnA fellow chemical engineer recommended this book to me and, I must say, the engineering parallels from the macro to nano scale really drove me through it. This is book is focused towards application as opposed to pure science and therefore may seem mundane (perhaps even elementary) to those with a speciality in biology.I have taken but one biochemistry college course and my graduate research is pharmaceutics. This book concisely covered several promising frontiers for biological nanomachines in the pharmaceutical arena.If you are a biologist, I do not recommend it. If you are an engineer, this is a must read.

Discussions of the basic structural, nanotechnology, and system engineering principles, as well as an introductory overview of essential concepts and methods in biotechnology, will be included. Text is presented side-by-side with extensive use of high-quality illustrations prepared using cutting edge computer graphics techniques. Includes numerous examples, such applications in genetic engineering. Represents the only available introduction and overview of this interdisciplinary field, merging the physical and biological sciences. Concludes with the authors' expert assessment of the future promise of nanotechnology, from molecular "tinkertoys" to nanomedicine. David Goodsell is author of two trade books, Machinery of Life and Our Molecular Nature, and Arthur Olson is the world's leader in molecular graphics and nano-scale representation.

a stimulating volumeborrow it from your library (Journal of Chemical Technology and Biotechnology, Vol. 80 (8), August 2005) "Goodsell's book is a good start." (Yale Journal of Biology and Medicine, May 2005) "David S. Goodsell's new book is a useful introduction to bionanotechnology" (NanoToday, May 2005) This is a stimulating volume borrow it from your library. (Journal of Chemical Technology and Biotechnology, 2005; Vol. 80, 964-965) concludes with chapters on applications, surveying some of the exciting bionanotechnology tools and techniques that are currently in development (CAB Abstracts, 2005) "will quickly bring intelligent readers up to speed on the most important aspects...I enthusiastically recommend this timely and well-written book on this important, emerging field." (The Quarterly of Biology, December 2004) "a wonderful introductory text for those who want to understand nanotechnology from a biological perspectivean outstanding work for the educated novice as well as for the seasoned nanotechnologist." (ASM News, October 2004) "this book appears to be one of the only overview texts available. (E-STREAMS, September 2004) "...best window into the nanoworld...highly readable...will not only educate students but also reach a wider audience..." (Chemistry World, August 2004) "Goodsell's fresh perspective on nanotechnology and persuasive arguments about the future of bionanotechnology have certainly made me into a believer--Bionanotechnology is going to be big!" (Biotechnology Focus, July 2004) "Bionanotechnology: Lessons from Nature is well written and informative. That alone would make it a good read for chemists.But there's a bonus: The book is full of Goodsell's unique illustrations of biomolecules and cells." (CEN, June 14, 2004) "Written in the style of an excellent biochemistry textbook, Bionanotechnology points the reader to general principles of the biological nanoworld, and thus provides readers with guidance on the design of their own devices and systems. I can highly recommend this book. I enjoyed reading every single page" (Nature, July 2004)From the AuthorUsing the natural nanomachines found in living cells and building upon the nanoscale principles of their operation, nanotechnology is a reality today, and is accessible with remarkably modest resources. In this book, I present many of the lessons that may

be learned from biology and how they are being applied to nanotechnology. The book is divided into three basic parts. In the first part, I explore the properties of the nanomachines that are available in cells. In the second part, I look to these natural nanomachines for guidance in the building of our own nanomachinery. By surveying what is known about biological molecules, we can isolate the general principles of structure and function that are used to construct functional nanomachines. The book finishes with two chapters on applications, surveying some of the exciting applications of bionanotechnology that are currently under study and then looking to the future, speculating about what we might expect.From the Back CoverBiological molecules are themselves the premier, proven examples of the feasibility and utility of nanotechnologyin effect, "lessons from nature" informing the design of nanoscale machines. Bionanotechnology encompasses the study, creation, and illumination of the connections between structural molecular biology and molecular nanotechnology. The very first resource to address this discipline comprehensively and exclusively, Bionanotechnology: Lessons from Nature delivers an accessible overview that features a stunning set of original watercolor illustrations by the author. Bionanotechnology: Lessons from Nature shows both students and practitioners how the lessons that may be learned from biology can be applied to nanotechnology today. The first part of the book explores the properties of nanomachines that are available in cells. The second looks to the structure and function of natural nanomachines for guidance in building nanomachinery. The book then concludes with chapters on applications, surveying some of the exciting bionanotechnological tools and techniques that are currently in development, and speculating on those that may prove feasible in the not-too-distant future. Features of this one-of-a-kind reference include: High-quality illustrations produced by cutting-edge design programs Discussions of basic structural, nanotechnological, and system engineering principles Numerous real-world examples, such as applications in genetic engineering Undergraduates, graduate students, practicing researchers, and policymakers will find David Goodsells Bionanotechnology an accessible, visually compelling introduction to this exciting field.