

Book Reviews

Bionanotechnology: Lessons from Nature. By David S. Goodsell. Hoboken, New Jersey: Wiley-Liss, Inc.; 2004, 352 pp. \$88.50, Hardcover.

Bionanotechnology is in some senses a redundant title because biotechnology takes place on the nano level. The combination of these two words seems like an attempt to capitalize on the two hottest trends in science: nanotechnology and biotechnology. Given these reservations I had with the title, I did my best to approach the book with an open mind. Overall, I feel the book succeeds as an advanced popular science book but not as an undergraduate science textbook.

The first half of the book possesses less detail than what a fundamental biochemistry textbook such as a Stryer's *Biochemistry* would provide. Compounding this shortcoming, the book does not squarely focus on nanotechnology. In trying to catch two birds at once, the text may have failed to give both biology and nanotechnology adequate treatment. Stryer's book would be a better substitute to acquire biochemistry fundamentals. Perhaps, in the next edition, the text could focus on highlighting and integrating the practical and potential industrial aspects of biochemistry and less on fragmenting the two disciplines.

The second half of the book provides an interesting overview of the current technical applications such as DNA computers, catalytic enzymes, and DNA tweezers. Although the book is not meant for a professional scientist, the broad overview of the technical applications is clear. There are no mathematical details such as rate constants, binding energies or equations. The idea is to acquaint the read-

er with many systems so he can figure out which one might be applicable and then seek details elsewhere. Thankfully, the reference list is well-developed enough to indulge a growing curiosity.

So if you're looking for a cursory overview of the latest developments in biotechnology, Goodsell's book is a good start. But if you're looking for a text that's a little meatier, it may be best to look elsewhere.

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Essential Cell Biology, Second Edition. By Bruce Alberts, Alexander Johnson, Julian Lewis, et al. New York, New York: Garland Science; 2004, 740 pp. \$105.00, Hardcover.

Essential Cell Biology by Bruce Albert and colleagues is an absolute must for students embarking on a journey to understand how the cell functions. The text is a condensed version of the book affectionately dubbed, "Big Alberts," but retains a level of insight with an appropriate amount of detail for beginning students.

One effective pedagogical feature of the book is the inclusion of many questions in the text margins at the end of the each chapter. They are thought provoking, encouraging critical thinking and, in some cases, fanciful speculation.

From the previous version, a chapter on "Genetics, Meiosis and the Molecular Basis of Heredity" was added. There are also new sections on many topics frequently in the news, including stem cells, cloning, DNA microarrays, programmed cell death, and cancer.

The biggest and most noteworthy improvement over the previous version is the *Essential Cell Biology* Interactive CD-ROM. It contains over 100 video clips, animations, molecular structures, and high-resolution micrographs designed to go hand-in-hand with each of the chapters. If pictures are worth a thousand words, then seeing a video is priceless. One cannot watch cells crawling, dividing, segregating their chromosomes, or rearranging their surface without a sense of awe at the molecular mechanisms that govern these processes. Each video will make the learning of cell biology both memorable and rewarding.

Essential Cell Biology could be a lot like your first kiss. It's short, sweet, and memorable. And who knows, you may fall in love with cell biology.

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Microbial Inhabitants of Humans: Their Ecology and Role in Health and Disease. By Michael Wilson. New York: Cambridge University Press; 2004, 476 pp. \$65.00, Hardcover.

As a current second-year medical student studying microbiology, my head is swimming with the names of a multitude of different bacteria. Sometimes, I think of these bacteria anthropomorphically, smirking diabolically as they attempt to invade my body. But, of course, I know better — bacteria are not merely attempting to invade my body, they are already lounging comfortably on a frighteningly large portion of it. That is what makes *Microbial Inhabitants of Humans* such an interesting read — this text goes over some pathology, but its other focus is to underline the fact that many of the nooks and crannies of our bodies are filled with a variety of resident bacteria. Michael Wilson explains the secret life of the bacteria that lurk around and inhabit our bod-

ies. Using anatomy, physiology, and biology, we are introduced to the sometimes harsh realms of our bodies in which these organisms cleverly live (as a side note, the anatomy and physiology sections that begin each section are good quick reviews for those who are in a health professional education program).

The incredible breadth of the text is both a positive and a negative aspect at the same time. In one sense, Wilson provides a great reference for finding out an amazing amount of information about human microbial colonies prefaced by the information pertinent to understanding these different microbial environments or ecologies. On the other hand, there is sometimes what seems to be an overabundance of information.

The text includes many details that would satisfy the most curious of microbial paramours. However, even for those who are most inquisitive and might enjoy finding out about the three species known to completely degrade mucins in the gastrointestinal tract, it seems a bit extraneous to find out how many amino acids MUC2 (a major type of mucin found in the gastrointestinal tract) has. These types of small details are distracting from what is otherwise a fascinating description of all the cellular and molecular players that can possibly aid and/or harm us. In some cases, these bacteria do neither, and really are “loungers” — unassuming guests that don't pay us rent but keep pretty quiet and don't mess up the place.

There are a number of interesting images interspersed in the text, but what are most effective are the tables. There is a plethora of tables spanning a wide range of useful general information (“environmental features of and microbial activities in the three main regions of the colon”) to the more specific topics that may be interesting to a smaller subset of the audience (“microbiota of the external urethral orifice and navicular fossa of 97 uncircumcised adults”).

The book is described by the publisher as a “core textbook for advanced students taking courses in microbiology, medical microbiology, microbial ecology, and human biology.” This is an appropriate description, as this would not be useful as an introductory text to microbiology. In addition, this text would not be a very user-friendly way to learn medical microbiology for the first time, as there are too many details to get through to find the basic human pathology. However, this text would serve as an excellent reference to those who are interested in complete

depictions of the microbial inhabitants of humans but do not want to go searching for hundreds of journal articles (Wilson has done the work for you!). There is a wealth of information in this text about what seems to be almost everything you’d want to know about numerous bacterial species — information one would probably be hard-pressed to gather on one’s own and compile in such a clear and organized manner.

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