

## Book Review

***Biopharma: Biopharmaceutical Products in the U.S. Market***

Which monoclonal antibody is conjugated to a linker-peptide group then reacted with In111 to form ProstaScint? Which companies manufacture adenosine deaminase and what is its approval status? What exactly comprises the scaffold for the cultured skin product Dermagraft and which patents cover it? Answers to such questions as these, and many thousands more details, are provided in *Biopharma: Biopharmaceutical Products in the U.S. Market* by Ron Rader (the Biotechnology Information Institute). This massive tome could more accurately be titled "Everything you ever wanted to know about biopharmaceuticals but didn't even know you could ask."

Describing the third edition of Rader's *Biopharma* as "comprehensive" is a bit like defining botulinum toxins as merely pathogenic. Rather than relying on a collection of product labels, Rader appears to have scoured the industry for information on these products and has collected the fruits of his work in an in-depth look at the scientific, molecular, legal, regulatory, and other aspects of more than 300 biopharmaceuticals.

Each product monograph includes the product class, approval status, a highly specific description of its physical characteristics and use, varied nomenclature, development history (including technology transfer), manufacturing details, indications (including disease descriptions), patent number(s), financial information, and clinical trial progress. To keep readers up to date, Rader provides current updates on the companion website ([www.biopharma.com](http://www.biopharma.com)), which also features a free online search function for the physical publication. In short, *Biopharma* is the king of biopharmaceutical reference books.

Because so much of this industry's foundation is proprietary intellectual property, the book is necessarily inconsistent. Some products have so much information regarding their manufacture that readers may wonder who Rader bribed to get the data. In fact, the preface states that, "Much of this information comes from unpublished, unconfirmed, and/or ephemeral sources" and has neither been confirmed nor peer-reviewed by manufacturers. Information on other products appears to be derived mainly from product labels and press releases. Most of Rader's product monographs densely cover at least one page, and often up to three or four.

The book is well organized and thoroughly cross-referenced. Its chapters are straightforward: recombinant DNA products, monoclonal antibodies, vaccines, enzymes, blood products, and the like. It is in the twelve indices that the utility of the book really stands out. For example, products are listed by company, global marketing territory, manufacturer (or R&D), and monograph number. An approval date index gives a timeline to the industry, and all products are grouped by product class, regulatory status, and medical indication. Rader also provides a biological index that covers organisms, cell lines, recombinant constructs, media and components, and bioprocessing terms. Even non-active agents, adjuvants, and other ancillary materials are exhaustively listed in a chemical index.

*Biopharma* is a fascinating read for those with a serious scientific curiosity about this industry, an invaluable and unique resource for students, and practically a must-have for anyone whose business depends on biopharmaceutical development. Densely filled with scientific terminology, *Biopharma* is not easy to dive into, but very worthwhile.

- Book Review by Gordon Kelley  
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