

Stephen E. Harding (Ed.), *Biotechnology and Genetic Engineering Reviews*, (vol. 21, 2004, Hardback) 390 p, ISBN 1-898298-91-2

This book is part of a well-established review series with one new volume published each year. The objectives of the series are to review recent developments in industrial, agricultural, and medical applications of biotechnology. The 14 contributions in volume 21 are organised in six parts, namely (1) Techniques, (2) Microbial and Cellular Biotechnology, (3) Pharmaceutical Technology, (4) Protein Biotechnology, (5) Plant Biotechnology, and (6) Economics and Safety Issues.

The first contribution in part 1 briefly describes applications and the potential value of power ultrasound. Emphasis is placed on promotion and control of crystallization (pp. 3–10). Next, the applications of small molecule probes for studying biological processes are presented quite comprehensively (pp. 11–78). The reader will find many examples of cytoskeletal probes, as well as probes for studying receptors and signal transduction, as well as transcription and apoptosis.

Part 2 starts with a review on vaginal microbicides for the prevention of HIV transmission (pp. 81–121). It describes the current state of affairs relating to the scientific and clinical development of vaginal HIV microbicide candidates. Some of the main cell adhesion molecules in plants and animals are described in the next review. The objective of this short contribution (pp. 123–132) is to make comparisons between plants and animals, where possible, to highlight common themes. The last review in this part (pp. 133–143) introduces the use of bone marrow stromal stem cells as a possible method for bone regeneration, since clinically available techniques such as autologous bone graft, allografts, and the use of alloplastic material, all have their limitations. Hence, alternative approaches that may lead to reliable therapies are necessary.

The first review in the “Pharmaceutical Technology” part describes the most applicable polymers in drug delivery. Both, natural and synthetic polymers are considered. Special emphasis is placed on polymeric delivery systems used for vaccination (pp. 147–181). Biotechnological aspects of transport across human skin are discussed briefly introducing electrical and ultrasonic techniques, such as the ViaDerm electroporation system and the GlucoWatch as an example for non-invasive drug monitoring (pp. 183–193).

Neurodegenerative Diseases, such as Alzheimer’s and Parkinson’s diseases, have all been linked to a pathogenic process involving protein/peptide aggregation (amyloidosis). Inhibitors of amyloid aggregation may thus be good candidates to treat these diseases. Technologies for the discovery of novel lead compounds in this area are introduced in part 4 of the book (pp. 197–212).

Part 5 reviews biotechnological aspects of two technically important plant macromolecules, namely starch and lignin. The review on starch focusses on technological aspects of retrogradation of starch (pp. 215–228) whereas the article on re-designing of lignin for industry and agriculture presents the current status of research on lignin biosynthesis and the genetic manipulation of the lignin pathway with a view to controlling lignin quality (pp. 229–245).

Economics and Safety Issues reviewed in this volume focus on plant products. It starts with a review on initial product development and transaction model for the interface between universities and business. The purpose is to explore the causes and loci of obvious transactional asymmetries and bottlenecks in technology transfer (pp. 249–276). The contribution on the liabilities from regulating gene flow in plant-made pharmaceuticals (pp. 277–297) focusses on the state of the art and the challenges of the production of “pharmaceutical crops”, i.e., transgenic crops and human consumption, and plants with engineered human pharmaceutical products, mainly vaccines, antibodies and enzymes. The article that follows describes the US regulatory system for genetically engineered foods and points out deficiencies in both regulatory oversight and corporate testing procedures (pp. 299–324). The topic of the last contribution is the design of safe and biologically contained transgenic plants. It describes tools and technologies for controlled transgene flow and expression (pp. 325–367). Legal issues and requirements are not touched. Instead the authors rely entirely on safety that is generated by underlying technology, and that can be designed through the use of safe components and protocols.

An index completes this volume which is of the high scientific standard seen in previous volumes of the series. The quality of figures and tables is also very good and the book can be recommended mainly to those who are interested in pharmaceutical, technological and regulatory aspects of biotechnology and genetic engineering. Some of the shorter contributions may serve as exotic appetisers, others are more satiable or of more general interest and can hence be used as rich data and reference sources.

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