

**Gene Expression in Recombinant Microorganisms;** Edited by A. Smith, Marcel Dekker, Inc.; New York, 1994; xii + 410 pp. \$175.00. ISBN 0 8247 9543 1

'Gene Expression in Recombinant Organisms' is the 22nd in a series of books covering bio-process technology. The book consists of seven chapters of which the first six are devoted to expression of genes in various microorganisms and the seventh to safety and regulatory aspects.

All chapters in the book are written by specialists and give a comprehensive and excellent description of the state-of-the-art for each organism. The topics covered go from a chapter on expression in *E. coli* (written by Joan Stader) and a chapter on expression in *Bacillus* (written by Matti Sarvas) through gene expression in different yeasts, with a chapter on *S. cerevisiae* (by A. Hinnen et al.) and methylotrophic yeast (by Gerd Gelissen et al.) to expression in filamentous fungi (by Jaap Visser et al.), and ends with a chapter on expression in Streptomyces (by Richard H. Baltz).

Each chapter includes description of the various aspects of expression in the particular microorganism, with focus on vector systems, selectable markers, elements involved in transcription and translation regulation, as well as signals for secretion. All chapters give

examples of peptides and proteins that have been successfully expressed, but also problems and limitations in the expression systems are dealt with. The very last chapter of the book focuses on the safety and regulatory aspects related to the use of recombinant organisms. An excellent summary is given of the legislations that have been introduced in different countries in order to control the work with GMO.

The editor's intention of presenting a book that provides the documentation of gene expression in the most important classes of recombinant microorganisms has no doubt been accomplished. The Book is recommendable to both specialists, who want to get an update on less familiar systems, and to scientists with general interest in the area. Considering the fast development of new systems for expression and the speed with which review books become outdated, a minor criticism should be that there are no chapters describing new potential systems as e.g. alternative yeasts that may evolve in the future.

Henrik Dalbøge

**Peptides: Design, Synthesis and Biological Activity;** Edited by C. Basava and G.M. Anantharamaiah, Birkhauser; Boston, 1994; 352 pp. DM 198.00. ISBN 0 8176 3703 6

The continued vigorous growth in peptide research over the past twenty years has shown no signs of abating. This is in large part due to the development of new instrumentation and techniques as well as the sustained evolution of long-established methods. Major annual peptide conferences, each spawning comprehensive proceedings publications, are now supplemented by a wide variety of specialist meetings covering all aspects of peptide chemistry, biology, immunology and physiology. In addition, several new journals dedicated to the reporting of peptide research have been established in recent times. Taking this into account, it is indeed a brave editor or two who is prepared to compile a collection of review articles touching on just some of the wide range of subjects involving peptides.

This book is one such compilation and was printed in honour of the contributions to peptide research by Professor Sivanandaiah of Bangalore University, India. This well-presented tome consists of eighteen chapters, seventeen of which are divided into four principal sections. The first of these, Peptide Synthesis and Methodology, covers a suitably diverse range of subjects from the chemical synthesis of cyclic peptides, both homodetic and heterodetic, and of cysteine-containing peptides, and glycopeptides. Enzymatic semi-synthesis is also discussed as is the use of catalytic transfer hydrogenation and hydrogenolysis.

The second section of the book, Peptide Design and Application, also has five chapters, three of which have a para-medical orientation. These include the synthesis and study of bioelastic materials and of apolipoprotein peptides associated with coronary artery disease. The development of potential peptide vaccines by de novo engineering

constitutes an increasingly important branch of peptide research and this is well-reviewed in one chapter. The remainder of this section describes the use of molecular mechanics to study peptide conformational space and bond length, as well as a discussion of the intriguing subject of complementary peptides and their potential application in molecular recognition strategies.

Section three, Studies of Peptide Hormones, consists of just three chapters with the first being in the style of a research paper detailing the synthesis and activity of oxytocin antagonists. Another chapter is an excellent, up-to-date mini-review of calcitonin, and the final chapter covers conformational aspects of calcium binding to synthetic peptides.

The four chapters comprising the final section of the book, which is entitled Other Biologically Active Peptides, are diverse in their subject matter. These range from modelling analyses of various folding patterns of the HIV-1 loop to the binding of peptides to acid lipid membranes.

The production quality of the book is excellent. It is beautifully edited, remarkably free of typographical errors, and has a pleasingly comprehensive index. The list of authors include several who are much respected in peptide research. While most of the chapters are topical and well-written, others are less so. For this reason, while it would be a good book for the shelf of a university's chemistry or medical library, its contents may become obsolete sooner than desirable. Consequently, it is better suited for the practising peptide researcher's personal collection, and slowly read and thoroughly enjoyed.

John D. Wade

**Immunotoxicology and Immunopharmacology, Second Edition;** Edited by J.H. Dean, M.I. Luster, A.E. Munson and I. Kimber, Raven Press; New York, 1994; xxii + 761 pp. \$170.50. ISBN 0 7817 0219 4

The emphasis in this second edition is slightly different to that of the first. With the development of immunotoxicology from a 'hanger-on' of toxicology and immunology to a subject in its own right, various chapters have now been added on, for example, the immune system of the skin and the lungs, immunosuppression mediated by UV light, and immunotoxicological studies in non-mammals.

There are now three distinct sections: immunosuppression, autoimmunity, and hypersensitivity reactions, as corresponding to the definition of adverse side effects on the immune system. While the chapters about substance-induced autoimmunity and hypersensitivity reactions have been considerably expanded, some review and

introductory articles have been left out. However, these three sections (immunosuppression, autoimmunity, and hypersensitivity reactions) are quite different in structure.

Five articles introduce the section about immunosuppression. The first, by E.S. Tucker, gives a very good overview of possible interactions of substances with the immune system (dysregulation), including a helpful and extensive list of references.

Three articles (J.G. Vos et al., R.E. Biagini et al. and M.I. Luster et al.) are about the (risk) assessment of findings from immunotoxicological studies: suitable animal models, the value of epidemiological and clinical studies, and an evaluation of animal studies

from the authorities' point of view. New techniques, such as the use of animals with immunodeficiency (SCID; transgenic mice) or molecular biological studies (PCR) are also discussed here.

The paper by Luster et al. in particular shows clearly that it is still much too early for a definite assessment of the various approaches, since there has been hardly any experience of screening methods combined with routine toxicology.

The chapter finishes with an article by J.T. Zelikoff, who gives a report of immunotoxicological studies in fish as a model for screening studies. The effects of substances on the immune system of fish are indeed readily comparable to those in mammals. In addition, a better understanding of the immune system of fish might also be of benefit when using these animals as biomarkers.

The second edition, about immunosuppression, describes studies with 'environmental substances'. In addition to the frequently described effects of TCDD, halogenated and polycyclic aromatic hydrocarbons (HAH, PAH), heavy metals, organic solvents, pesticides, and mycotoxins on the immune system, articles are also included that describe clinical experience of the change in immunological parameters with recombinant cytokine treatments in AIDS and transplant patients and with cytostatic agents. Since the transfer of animal findings to humans is often fraught with difficulty, information about the clinical use of immunomodulators and about the mechanisms investigated in animal models is very valuable when making a risk assessment. Studies in patients treated for drug and alcohol abuse naturally give particularly good information about the capacity of the immune system to buffer systemic changes. Analyses of this kind are described in the last three articles of the chapter.

Overall, this chapter shows very clearly how difficult it still is to construct suitable animal or even in-vitro models so as to predict structure–response relationships in immuno-modulation or to distinguish between secondary and primary effects on the immune system.

The section on the immunosuppressive effects of substances ends with chapters about immunotoxic effects in the lungs and in the skin, and three papers about special interactions of substances with the immune system. Almost all of these last 9 papers are good review articles which concentrate on mechanical processes and are therefore also of interest to specialist readers.

In addition to asbestosis and beryllium lung disease, the chapters on immunotoxic effects in the lungs also cover the effects of air pollution and tobacco smoke. The final paper, by M.L. Sopori et al., is particularly remarkable for its very detailed and objective account of tobacco's effects on the immune system. It is interesting that the effects via the lungs (tobacco smoke) are comparable to those after oral use (chewing tobacco).

The last chapter 'Selective Immunotoxicity' discusses chemically-induced apoptosis, immune-mediated hepatotoxicity, and the third type of 'immune defence' (in addition to humoral and cellular): the biochemical 'immune response' in the liver. This connection between metabolism and immune system is often overlooked.

The section about autoimmunity is not subdivided further and consists of 5 papers; those by N.R. Rose and K.H. Kilburn and R.H. Warshaw are a good introduction to the problems and provide explanations of mechanisms. The other 3 papers are on the very well researched autoimmune model with mercury (Pelletier et al.) and drug-induced autoimmunity (J.W. Coleman and E. Sim; M.E. Kammüller and N. Bloksma).

The last section about hypersensitivity reactions is divided into 2 chapters. The first summarizes the clinical aspects of contact dermatitis and respiratory allergies, as well as immune-mediated side effects in antirheumatic treatment and allergy to laboratory animals.

The second chapter of the section is headed 'Assessment of Hypersensitivity', and gives a more or less critical appraisal of predictive animal models for detecting photocontact allergy, contact allergy and respiratory allergy in guinea pigs and mice. The individual methods are clearly presented next to one another, but it is pointed out that a certain amount of standardization and validation work is needed before any one of these animal models can be clearly favoured or routinely used.

This final chapter also shows the poor structure of the book; thus, for example, an article on the immunosuppressive effects of UV-B light is found in the chapter 'Immunotoxicity and the Skin', whereas articles on contact allergy and photocontact allergy appear in different chapters. The quality of the articles is just as variable as the structure of the chapters and sections. Some articles are slightly amended versions of more or less wellknown published material, whereas others are very good, extensive and informative reviews. Many also examine mechanisms and offer explanations instead of purely descriptive reviews. Thus even experts are sure to find some of the articles in the book interesting and stimulating.

Overall, both the clinical consequences of immunotoxicity and the interpretation of the experimental data for risk assessment are given greater emphasis here than in the first edition. The book is therefore recommended not only for experts in the field, but also for interested toxicologists, immunologists, clinical scientists and others working in similar areas. The book is also not inappropriate for those involved in workplace and safety evaluations or in regulatory affairs. Since almost all the articles were written by recognized experts in their fields, the reader can be certain that the information given is sound.

H.-W. Vohr