



BOOK REVIEWS

Plant Membrane Biology, edited by I. M. MOLLER and P. BRODELIUS, *Proceedings of the Phytochemical Society of Europe Series, Vol. 38*. Oxford Science Publications, 1996, 294 pp., £75. ISBN 0-19-857776-1.

This is the latest volume in the Proceedings of the Phytochemical Society of Europe series and is based on papers read at the Lund meeting (April 1994). As with most 'proceedings' books this is not a 'stand-alone' book, dealing, as it does, with many specialist topics. Nevertheless, an introductory chapter (by the editors) does serve to provide background material at least on the types of subcellular membranes encountered in plants and some aspects of the use of vesicles and determination of their sidedness. Of course, in addition, the individual chapters each provide an introduction which, in some cases, is quite a good scene setter.

The book is arranged in five parts. These are, respectively: (1) signal transduction, (2) biogenesis and turnover, (3) redox processes, (4) dynamics of membrane domains and (5) transport across membranes. These vary in size from three chapters in Section 3 to six individual chapters in Section 1. Clearly, coverage of each overall part is patchy and can really be said to address some of the latest areas of research—as one would expect from a proceedings book. Higher plants are the dominant phyla discussed but there are individual contributions dealing only with green algae and some chapters of a more comparative nature.

Within Part 1 there are chapters in GTP-binding proteins, inositides, nuclear genes involved in chloroplast gene expression, anion uptake, photoreceptor proteins and flowering (in relation to plasma membrane properties). Some offerings (such as "Inositides and plant cell signalling" by Drobak *et al.*) are small reviews while others (such as "Flowering and plasma membrane properties of spinach leaves" by Bellamine and Greppin) are short and specialized. The chapters appear to have been bang-up-to-date when originally written in 1994 and there has obviously been some opportunity to update with the occasional 1996 reference appearing. My knowledge of the subjects covered is uneven but, so far as I can tell, the authors' coverage is reasonably unbiased and doesn't just cover their own work although this tends to be concentrated on in the more specialized chapters. I had no difficulty in learning interesting facts from each chapter but then I don't suppose that will surprise my friends and colleagues!

Part 2—on biogenesis and turnover—deals exclusively with proteins. This is a trifle unfortunate since lipids are also major membrane constituents and there have been significant advances in knowledge of their metabolism and turnover recently. The first chapter describes mitochondrial protein import. There are

then three that deal with aspects of chloroplast proteins (protein import, proteolytic activities and intra-organelle sorting) while the last provides an interesting short comparison of *in vitro* experiments on the import of *Chlamydomonas reinhardtii* proteins into the alga's chloroplast or higher plant mitochondria.

The three chapters on the third part of the book (redox processes) are each very much a specialized contribution. They cover (some) NADH-ferri-cyanide reductases, a surprising second role for the spinach bc₁ complex as a processing peptidase and the production of modified D₁ polypeptides in a cyanobacterium. Most of the information given is really for experts in the field. Very many obvious gaps in the area's coverage could be cited. For example, the exciting work on diiron proteins would have made a splendid topic for inclusion. Perhaps the conference organisers tried but failed to get speakers in some of these other areas.

Dynamics of membrane domains (the fourth part) offers chapters on thylakoid domains, turnover of endoplasmic reticulum lamellar cisternae, thylakoid protein phosphorylation and inhibition of complex formation in thylakoids. This seems a reasonable representation of most of the aspects I would have immediately thought about. Of course, few people will find their own favourite experimental system written about, but if one can draw analogies (as most scientists do all the time!) then useful examples are depicted in detail here.

Finally, four specific transport systems (vacuolar H⁺-pyrophosphatase, plasma membrane H⁺ ATPase, use of Brij 58 to create sided membrane vesicles, tonoplast malate transporter) are written about in the last part. The first two of these chapters (by Rea *et al.* and by Lanfermeijer *et al.*, respectively) provide a wealth of detail, though I, for one, would have appreciated something on the general physiology and biophysics of membrane transport rather than having to rely on a failing memory to provide the necessary background for proper comprehension of the specialist transport systems described in Part 5 of the book!

How useful is this book then? Well, if you are looking for up-to-date examples of aspects of plant membrane biochemistry, then it is very useful. Most of the chapters are eminently readable and many provide considerable information and a wealth of references. If you want a rounded book dealing with the subject as a whole, then this is not the book for you. As such it is likely to have very limited sales to anything other than the main libraries. But I will be ordering it for ours!

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