

Book reviews

Michell, R. H.; Putney, J. W. Jr. (eds.): Inositol Lipids in Cellular Signaling. Series Current Communications in Molecular Biology. Cold Spring Harbor/NY: Cold Spring Harbor Laboratory 1987. xi/ 165 pp. figs. + tabs. Soft-bound.

This latest publication in the series Current Communications in Molecular Biology put out by the Cold Spring Harbor Laboratory, is the result of a meeting of a small group of researchers brought together to consider some key aspects of the role of inositol lipids in transmembrane signaling. It is fitting that R. H. Michell was one of the organizers for this gathering and a co-editor of this book, as he was the first (in 1975) to show that inositol lipid hydrolysis somehow gives rise to an increase in cytosolic Ca^{2+} , and therefore he set the stage for this entire field of research.

A perusal of the 28 chapters presented in this book shows how many hormones and neurotransmitters use the inositol lipid signaling system in mammalian and avian cells. The system is involved in protein and fluid secretion, glycogen degradation, platelet and neutrophil behavior, photoreceptor, fertilization and cell growth, a very wide variety of cellular events. Each of the chapters presents aspects of the effects of various stimuli on phosphatidylinositol-4,5-bisphosphate metabolism and the role of the breakdown products, diacylglycerol and inositol-1,4,5-trisphosphate, in activating protein kinase and releasing calcium ions, respectively. Many interesting points are made in this book. For instance, it is pointed out that several mammalian tissues as well as avian erythrocytes are able to synthesize inositol(1,3,4,5,6)pentaphosphate from inositol(1,4,5,6)tetraphosphate, and that this synthetic pathway is distinct from that involving agonist dependent hydrolysis of phosphatidyl-inositol(4,5)biphosphate. Just where the pathways converge awaits further research on the synthesis of inositol(1,4,5,6)tetraphosphate. Several chapters deal in various ways with the role of a guanine nucleotide binding protein in the regulation of phospholipase C-catalyzed hydrolysis of phosphoinositides. It seems that hormones act by binding first to a receptor, which in turn effects the guanine nucleotide binding protein, and which then leads to activation of phosphatidylinositol-4,5-biphosphate breakdown. Clearly guanine nucleotides play an important role in the inositol lipid signaling process, a fact which explains why almost half of the chapters presented in this book are devoted to the effects of guanine nucleotides and the guanine binding proteins. This then is the most hotly pursued area in this field at the moment, and it is dealt with in great depth in this book. The book finishes with a chapter on inositol lipid metabolism in the central nervous system. While the brain is by far the most heterogeneous and rich in types of chemical transduction known, and therefore cannot be used as a model for any particular one, it too has phosphoinositide-related second-messenger systems. It has a muscarinic postsynaptic receptor linked to phosphoinositide turnover.

The book is a rich source of material for anyone interested in the field, be it for teaching or research, or even for the beginner in either area, and is recommended for your library shelf.

J. F. Jackson, Glen Osmond

Scannerini, S.; Smith, D.; Bontante-Fasolo, P.; Gianinazzi-Pearson, V. (eds.): Cell to Cell Signals in Plant, Animal and Microbial Symbiosis. NATO ASI Series H: Cell Biology, No. 17. Berlin Heidelberg New York: Springer 1988. XX/414 pp., 73 figs. Hard bound DM 238.-.

The NATO Advanced Workshop on the identification of processes involved in contact between cells of hosts and symbiots was held in May, 1987 at Torino. The reviews and lectures presented have been assembled and published in the volume under review. It contains critical reviews on the current state of knowledge of symbiotic systems, an assessment of the evidence for signals, the identification of topics worthy of further investigation, as well as the evaluation of promising experimental techniques. Emphasis has been put on the cellular interaction between host and endosymbionts, ectomycorrhiza, and endocytobiosis. The lectures on signals in plants are restricted to signals in *Rhizobium*- and lichen symbiosis. For the first time, the role of the cell wall as a signal has been recognized; up to now the ergastic cell wall was considered to be something like a "noise" in all theories on cell-cell signals. Suggestions for future research include the application of monoclonal antibodies and genetic engineering, as well as immunocytological studies. The expression of specific genes involved in the synthesis of new proteins in the establishment of ectomycorrhiza and in *Rhizobium*-legume symbiosis has been determined. The *Rhizobium nod* genes are induced by flavonoids, but the host specificity of nodulation is determined in the stages following the *nod* gene induction.

H. F. Linskens, Nijmegen

Rigby, P. W. J. (ed.): Genetic Engineering 5. Orlando: Academic Press 1986. 158 pp., 34 figs., 5 tabs. £ 13.50.

The intention of Peter Rigby, the new editor of this recognized series on advanced technology, is "to edit the results obtainable using the methods of genetic engineering and the concepts to which they have lead". The volume under consideration contains three articles on areas in which genetic engineering has made major contributions to our knowledge. Chris Higgins discusses the ingenious mechanisms involved in the regulation of gene expression in *E. coli* and its bacteriophages. Since the writing of this article, however, more progress has been made. Alan Hall deals with the discovery of cellular oncogenes in human tumors, which is considered to be a breakthrough to the better understanding and the eventual control of human cancer. Lastly, Michael Steinberg reviews our current (1986) knowledge of the major histocompatibility complex, the immunoglobulin genes, the T-receptor complex, and the immunoglobulin superfamily of the mouse, and compares the murine immune system genes with those of other species.

This volume tries to keep pace with the rapid developments in the field – and undergoes the common tragedy of not always being completely up-to-date.

H. F. Linskens, Nijmegen