

criticism is that there is no real discussion of the possible advantages of the photoproteins, which are not commercially available and therefore certainly more labour-intensive. The final chapter is unashamedly specialized and based on characterization of the insulin receptor in transfected cells. However it was presumably chosen as a representative of tyrosine kinase receptors, and those working with other examples of this class may

still derive useful hints and ideas from reading the chapter. Overall the volume can be particularly recommended to research students or more senior workers who are just commencing a project involving the mechanism of action of an extracellular messenger, even if it is not a peptide hormone.

D.G. Hardie

Biochemical Messengers: Hormones, Neurotransmitters and Growth Factors; By D.G. Hardie; Chapman & Hall; London, 1991; x + 311 pages; £13.95.

The rush of books, covering what might be described as the 'Cell signalling' field that have appeared over the past few years has only served to make me feel relieved that I did not let any publisher talk me into writing one! Indeed, not only is the market place becoming crowded with specialist texts but also the major textbooks have increasingly sophisticated and elegant chapters which cover this topical area. Thus any text aimed at the student audience must offer something special at a competitive price. Certainly the subject is topical and, as such, we can be assured that courses on it will feature high in a variety of disciplines. However, it is also moving extremely rapidly which can be dangerous for texts aimed at students. So how does Grahame Hardie's book fare? The author is an international figure in the protein phosphorylation field particularly as to how it relates to metabolic control. This is a crucial area and a complex one to which we are treated to a tour de force in chapter 8. The chapter has detail, breadth and insight. However, I feel that the passion that pervades this chapter and really lifts it above the crowd is not apparent in the rest of the book. For example, whilst I wholeheartedly agree with Grahame Hardie that this is a multidisciplinary subject, the edges between disciplines in the biological sciences are now so blurred as to be almost non-sensical, which poses the problem of how much background is needed. The central theme is 'cell-cell' signalling... (sic) and thus, one might really class the first five chapters as background material as they define 'cell-signalling' and the types of molecules employed, their structure, biosynthesis and release. However, this is all really material found in standard texts and one wonders if a more focussed cheaper book could have been produced with this material condensed to a single introductory section with a directed reading list. The remaining material could then provide a marketable specialised book for a focussed course and would have the advantage of being cheaper; but this is a personal view.

Descriptions of signalling pathways were all covered with particular attention to their physiological significance. However, molecular details were patchy. Many examples of Diagon plots are presented to indicate homology between families of proteins but whether the information is worth the space is a moot point. The disposition of G-protein linked receptors in the plasma membrane is nicely shown but the relationship of their interaction with G-proteins and those with signal generators is not developed. Indeed, details of the structure of G-proteins are curiously absent except for a 'ribbon' diagram of p21ras. This seems a missed opportunity to link up various chapters where G-proteins feature and which talk about GTP hydrolysis, action of cholera toxin and the gsp oncogene where key residues in an around the GTP-binding site are altered. It would also provide the chance to indicate domains involved in coupling to effector and receptor molecules and indicating the structural heterogeneity of G-protein classes. Like many texts whilst it emphasises the machinery which leads to the production of a bio-active compound or activated proteins it tends to ignore those which terminate or inactivate species despite the fact that in a number of instances these provide important control points and have proved to be of particular importance useful in developing therapeutically useful reagents. A number of speculative issues are detailed including, for example, a possible role for IP₃ and the form of an insulin 'mediator' for provocative tutorials.

Biochemical Messengers is a well-written book. It has nice clear diagrams with summaries and a directed reading list at the end of each chapter and is worthy of consideration as a supplementary text associated with tutorials.

M.D. Houslay

Molecular and Cellular Biology of Cytokines — Progress in Leukocyte Biology, Volume 10A; (From the proceedings of the Second International Workshop on Cytokines held at Hilton Head Island, South Carolina, December 10–14, 1989.) Edited by J.J. Oppenheim, M.C. Powanda, M.J. Kluger and C.A. Dinarello; Wiley-Liss; New York, 1990; xii + 570 pages; \$150.00

The study of cytokines and their effects is one of the most rapidly expanding areas in cellular biology and immunology. We are just beginning to comprehend the key regulatory roles cytokines play

in a myriad of processes such as antibody production, activation of the immune response, etc. It is also becoming clear that they may offer a whole new plethora of biological weaponry to be used