Steroid hormone receptors

Receptors and Hormone Action. Vol. 2. Edited by B. W. O'Malley and L. Birnbaumer. Pp. 602. (Academic: New York and London, 1978.) $46; £32.65.

As the editors mention, there has been a tenfold expansion in research on hormone action. Because receptors are the central issue of understanding how hormones regulate the activity of their target cells, this "explosion" is also reflected in published research on hormone receptors. In this second of a three-volume series, 600 pages are devoted to steroid hormone receptors (if one accepts vitamins A and D as honorary members of the steroid club). The main theme to emerge repeatedly in the 19 chapters by different authors is the confirmation of Jensen's and Gorski's original two-step mechanism, whereby a cytoplasmic protein combines with the hormone, the complex is then translocated into the nucleus where it initiates the target cell's physiological response.

The book begins with an account by Clark *et al.* on the relationship between the binding of oestrogen, and its agonists and antagonists, to uterine nuclear receptor and nuclear RNA synthesis followed by growth of the tissue. They conclude that the mere nuclear accumulation of the hormone–receptor complex is not enough to cause uterine growth but only if the receptor–oestrogen complex resides in the nucleus for a substantial period of time. The temporal requirement is explained by the conversion of the receptor complex from one state to another. In the next chapter, Notides discusses the possibility of the cytoplasmic oestrogen receptor existing in conformationally distinct dormant and active forms, the transformation being the key to hormonal action. Stormshak *et al.* deal with oestrogen and DNA synthesis, a hormonal effect most likely to be remote from the primary site of action.

Four chapters are exclusively devoted to androgen receptor and action, three to glucocorticoids, two to progesterone and one each to mineralocorticoid and vitamins A and D receptors. McEwen, McGuire *et al.* and Westphal also cover many of these hormones in their chapters on receptors in neuroendocrine tissue, breast cancer, and circulating steroid-binding proteins, respectively. Not surprisingly there is much repetition, but many novel ideas also emerge. To cite a few, Liao's group suggest that the binding of androgen–receptor complex to ribonucleoprotein particles in prostatic nuclei might mean that the complex not only regulates transcription but also RNA processing and packaging. Baxter and Ivarie discuss some genetic approaches to studying glucocorticoid receptor in cultured lymphoma cell variants showing steroid resistance, a study initiated by the late Gordon Tomkins.

The importance of genetic approaches has not been fully realised and it is a pity that the topics of testicular feminisation syndrome and ecdysone receptors in insect cells have not been included. The genetical approach is also cited by Mainwaring as one of the "desirable trends in future research", the others being the question of purification of the receptor and the development of new experimental systems and new technology for a functional study of the receptor. Indeed, the true physiological relevance of all work on 'receptors' will only emerge when some means will be found to link the mass of data on the binding of steroid hormones to various cellular constituents, on the one hand, and the variety of biochemical reactions they provoke in their target cells, on the other.

For the general reader a chapter, preferably written by one of the editors, summarising the common themes as well as the uniqueness of some hormone receptors, would have been most useful. But this book is not for the general reader. It is a timely and valuable treasury of information for those already working on receptors and actions of steroid hormones. It will also be useful to those interested in steroid biochemistry, endocrinology, regulation of protein synthesis and nucleocytoplasmic interactions.

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Southern perspective on climatic change

Climatic Change and Variability: A Southern Perspective. Edited by A. B. Pittock, L. A. Frakes, D. Jenssen, J. A. Peterson and J. W. Zillman. Pp. 455. (Cambridge University Press: Cambridge, New York and London, 1978.) £17.50.

THIS book arose out of a conference on the theme "climatic change and variability, with particular reference to the Australian or Southern Hemisphere region" which was held at Monash University in December, 1975. It consists of edited versions of invited review papers, supplemented by a small selection of heavily edited versions or amalgams of contributed papers. The contributors are nearly all acknowledged world experts in their respective fields and the book is intended as a university level text suitable for introductory courses in the Earth sciences. Among the topics discussed are: a description of the physical basis of climate; the long- and short-term climatic record; models and mechanisms of climatic change; climatic forecasting; and the economic social and political implications of climatic change.

As the authors are all experts in their particular fields, *Climatic Change and Variability* contains information on much of the latest thinking on climatic change. The disadvantage of this multi-author book is that it lacks a uniform style, and the general level of treatment is somewhat uneven. It is a little too condensed to be a successful introductory text, and there is a tendency to assume that the reader is familiar with most of the climatological and meteorological concepts being discussed. For example, G. B. Tucker gives an excellent summary of the general circulation, but his description of the energy cycle is much too terse for use by a student who is not already familiar with this particular concept. There is a tendency for the authors to overlap in their treatment of certain subjects. Thus, both L. A. Frakes and R. W. Fairbridge discuss long-term geological changes in climate. There are also some odd oversights, as for example when R. G. Barry produces a diagram showing the world's greatest observed rainfalls which has been out-of-date for many years.

The book ends with a report of a panel discussion on possible future climatic trends. H. Flohn comments that the probability of a transition to the type of climate leading to an ice age in the next 100 years is less than 1%, but that the probability of large-scale human interference with climate leading to a global warming next century is great. Indeed it is a pleasant change to see a climatological textbook which does not take the extremely pessimistic view that mankind is doomed by the weather to suffer the deprivations of a new ice age. The final chapters do stress the importance of climate to the economy and include an interesting section by R. A. Bryson on "The Cultural, Economic and Climatic Records".

Climatic Change and Variability is well produced and the equal of any book published in the past year in the field of climatic change. I recommended it to all environmental science students, especially those living in Australia and New Zealand.

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