

BOOK REVIEWS

The Biology and Medicine of Signal Transduction. Advances in Second Messenger and Phosphoprotein Research, Vol. 24. Series edited by P. GREENGARD and G. A. ROBISON. Volume edited by Y. NISHIZUKA, M. ENDO and C. TANAKA. Published 1990 by Raven Press, New York. No. of pages: 784. ISBN: 0-88167-670-5. Price at June 1990: US \$119.

This volume is the *Proceedings of the 7th International Conference on Cyclic Nucleotides, Calcium, and Protein Phosphorylation*, held in Kobe, Japan, on 8–13 October 1989.

One of the most important current topics in biology and medicine is that of intracellular signal transduction. The chapters in this volume cover many of the areas under intensive study and rapid development, such as the structure and modulation of various receptors and ion channels, receptor and effector coupling, generation and action of second messengers, cross-talk between various signalling pathways, gene expression and cell cycle control, and regulation of growth and differentiation.

Both chapters of general appeal and those covering specific research topics within a particular area have been included. As such, this book will be useful to all scientists interested in the mechanisms by which external signals are transmitted to the interior of cells, eventually leading to the processing and regulation of a variety of physiological and pathological cellular responses.

This volume will be particularly useful and interesting for people working in the fields of molecular biology, biophysics, biochemistry, biology, and physiology, as well as for advanced students.

Membrane Technology. Serono Symposia Publications from Raven Press, Vol. 64. Edited by R. VERNA. Published 1989 by Raven Press, New York. No. of pages: 168. ISBN: 0-88167-510-5. Price at May 1990: US \$79.50.

The use of biological systems has been known for centuries and applied to the chemistry of fermentation to produce beer, wine and milk derivatives. Only recently this technology has been directed towards the industrial preparation of antibiotics and enzymes for detergents.

Today, due to innovative techniques and the progress in basic knowledge of molecular biology and immunology, biotechnology is involved in an increasing number of applications. The most important new technologies which include genetic material manipulation, the generation of monoclonal antibodies and the manipulation of bacteria and animal cells have determined the present quality standards in the utilization of biological systems and confer to biotechnology a leading position in medicine.

Great importance is devoted, in this latter field, to the technology of plasma membranes which not only contain the cellular material but also regulate the communications of each cell with the rest of the body.

This book would be useful for people working in the fields of molecular biology, biophysics, biochemistry, biology, and physiology, as well as for advanced students.

Activation of Hormone and Growth Factor Receptors: Molecular Mechanisms and Consequences. NATO ASI (Advanced Science Institutes) Series, Series C: Mathematical and Physical Sciences, Vol. 295. Edited by M. N. ALEXIS and

C. E. SEKERIS. Published 1990 by Kluwer, Dordrecht, Netherlands. ISBN: 0-7923-0573-6. Price: US \$99; £63; DFI 190.

This volume contains the Proceedings of the NATO Advanced Research Workshop: *Activation of Hormone and Growth Factor Receptors: Molecular Mechanisms and Consequences* held in Nafplion, Greece, 25–30 September 1988.

The following main topics are covered:

- Signal transduction and control of cell proliferation and differentiation;
- The role of oncogene activation;
- Steroid receptors and transcriptional control;
- Structure and function of steroid receptors;
- Clinical implications of steroid receptor research.

This book would be useful for people working in endocrinology, molecular endocrinology, oncology, biology, molecular biology, biophysics, biochemistry, and physiology, as well as for advanced students.

Growth Factors—From Genes to Clinical Application, Karolinska Institute 17th Nobel Conference, Stockholm, 1989. Edited by V. S. SARA, K. HALL and H. LOW. Published 1990 by Raven Press, New York. No. of pages: 283. ISBN: 0-88167-627-6. Price at April 1990: US \$132.

Although the existence of growth-promoting factors in serum and tissue extracts has been recognized since the turn of the century, it was not until the 1970s that growth factors were isolated and characterized. The first two to be characterized were nerve growth factor (NGF) and epidermal growth factor (EGF). Rita Levi-Montalcini and Stanley Cohen were awarded the Nobel Prize in physiology or medicine in 1986 for their discovery of these two growth factors. At the first Nobel symposium on growth factors in 1974, the structures of both EGF and NGF were described. No other growth factor had as yet been characterized. The insulin-like growth factors (IGFs) were still not chemically characterized but could be quantitated by various assay techniques. The IGFs held great promise for clinical diagnostic and therapeutic applications. However, it was not until four years later that the primary structures of the IGFs were determined. Also in 1974, the terms platelet-derived growth factor (PDGF) and fibroblast growth factor (FGF) were heard for the first time, and the existence of additional growth factors with divergent biological activities was raised.

In this volume, four major areas of growth factor research are presented:

1. The characterization of growth factor genes and their protein products;
2. Growth factor receptors and signal transduction by the receptors to mediate biological action;
3. The biological actions of the various growth factors;
4. The role of growth factors in health and disease and their possible clinical application.

The topics covered include the following:

- Structure of the IGFs and their variants;
- Isoforms of PDGF receptor types;
- Tyrosine kinase activation;

- Structure of G-proteins in biological membranes;
- Possible therapeutic application of NGF in the treatment of Parkinson's and Alzheimer's diseases;
- PDGF's possible role in the development of several fibroproliferative diseases and its therapeutic application in wound healing;
- The possible use of angiogenic inhibitors in tumor treatment.

This book would be useful for people working in biology, molecular biology, biochemistry, biophysics, physiology, endocrinology, molecular endocrinology, and oncology, as well as for general clinicians and advanced students.

Mechanisms of Chromosome Distribution and Aneuploidy. Progress in Clinical and Biological Research, Vol. 318. Edited by M. A. RESNICK and B. K. VIG. Published 1989 by Liss, New York. No. of pages: 400. ISBN: 0-8451-5168-1.

This volume contains the *Proceedings of an International Meeting on Aneuploidy* held at Reno, Nevada on 4–7 January 1989 and entitled "Aneuploidy: Mechanisms of Origin". Its purpose was to address many aspects of the processes by which chromosomes are distributed to daughter cells and the consequences of disturbances to those processes.

The relevance of aneuploidy to human health is apparent. Whole chromosomal aneuploidy is an important source of human abnormalities and its incidence in abortuses is well over 20–30%. In recent years the importance of somatic cell aneuploidy has been revealed by observations that the uncovering of cancer-associated recessive alleles may occur through errors of chromosome distribution. To understand how whole chromosomal aneuploidy occurs, it is necessary to understand all aspects of the segregational apparatus, the processes of segregation, the chromosome components and interactions, and the errors and correctional systems that might give rise to malsegregation, as well as agents, both physical and chemical, that may alter the segregation.

This book would be useful for people working in biology, molecular biology, biochemistry, biophysics, physiology, endocrinology, molecular endocrinology, and oncology, as well as for general clinicians and advanced students.

The Molecular Biology of Fertilization. Cell Biology: A Series of Monographs. Edited by H. SCHATTEN and G. SCHATTEN. Published 1989 by Academic Press, San Diego. No. of pages: 396. ISBN: 0-12-622595-8.

The origins of cell and molecular biology are rooted firmly in studies on fertilization. Those familiar with the classic monograph of E. B. Wilson (1928): "The Cell in Development and Heredity", will recognize that almost all of the central and still challenging problems in cell and molecular biology were investigated first in a developmental system, often an invertebrate gamete or embryo. Experimental manipulation of eggs from lower vertebrates, especially amphibians, expanded the conclusions derived from these fertilization studies. Moreover, the recent advances in routinely reliable methods for *in vitro* fertilization and embryo culture of mammalian oocytes, including those from humans, coupled with the power of molecular probes are resulting in conclusions with important and often surprising implications for cell and molecular biology. The goal of "The Molecular Biology of Fertilization" and its companion volume "The Cell Biology of Fertilization" is to bring together reviews from leading laboratories in which various aspects of the fertilization process are studied. An assortment of experimental approaches is presented, using methods of cell biology, molecular biology, biochemistry, biophysics, enzymology, and immunology. A diversity of animal models is considered and representatives from five invertebrate phyla are presented, including nematodes,

clams, insects, ascidians, and the classic sea urchin. Amphibians and mammals are the best understood vertebrates, and it is encouraging that a diversity of mammals is now being explored. The articles consider the familiar mouse, rat, and hamster models, and also inquire about the fertilization process in farm animals, including pigs, sheep, and cows, as well as in humans.

The book is divided into the following main sections:

- The molecules involved in sperm-egg recognition and binding;
- Pronuclear formation and cytoskeletal events resulting in syngamy and cell cycle progression;
- Gene activation, protooncogenes, and nuclear determination at fertilization and during embryogenesis.

This book would be useful for people working in biology, molecular biology, biochemistry, biophysics, physiology, endocrinology, molecular endocrinology, and oncology, as well as for gynecologists, pediatricians, general clinicians and advanced students.

Cellular and Molecular Events in Spermiogenesis: Scientific Basis of Fertility Regulation. Edited by D. W. HAMILTON and G. M. H. WAITES. Published 1990 by Cambridge University Press, Cambridge for the World Health Organization. No. of pages: 334. ISBN: 0-521-37265-8.

This book contains the *Proceedings of a WHO Symposium held at Oaxtepec, Mexico on 11–13 March 1987*.

Despite considerable research over the past several decades, there is at present no systemic method of male contraception that is safe, highly effective and reversible. Over 30 years ago, tumor-inhibiting substances, such as tretamine, were studied for their antispermatogenic properties. Since that time, numerous classes of compounds ranging from sulfonic esters and sulfamates to chlorinated hydrocarbons and gossypol have been examined, but only a very few have reached the stage of clinical testing. While hormonal regulation of male fertility with the use of steroids or LHRH analogues, or both, has achieved some degree of success in limited clinical trials, its widespread applicability still depends upon considerable further development.

Many of the cellular and molecular events that occur during spermiogenesis are unique and yet are essential for the production of fertile sperm. From the precision with which the cellular changes occur in spermiogenesis it is clear that there are control mechanisms of which we have no knowledge at present. The specific properties of spermatids could offer vulnerable points for targeted intervention without generalized effects on the early stages of spermatogenesis, including the genome of the developing germ cells. A drug intervening with one or other of the unique processes in spermatids would have several advantages, offering a specific action which should be safe, rapid in onset and reversible.

This book would be useful for people working in biology, molecular biology, biochemistry, biophysics, physiology, endocrinology, molecular endocrinology, and oncology, as well as for gynecologists, pediatricians, general clinicians and advanced students.

Progress in Comparative Endocrinology. Progress in Clinical and Biological Research, Vol. 342. Edited by A. EPPLÉ, C. G. SCANES and M. H. STETSON. Published 1990 by Wiley/Liss, New York. No. of pages: 752. ISBN: 0-471-56800-7. Price: US \$160.

This book contains the *Proceedings of the Eleventh International Symposium on Comparative Endocrinology*, held in Malaga, Spain on 14–20 May 1989.