

Book reviews

Campbell, A.; Baker, B. S.; Herskowitz, I.; Sandler, L. M. (eds.): Annual Review of Genetics, Vol. 21. Palo Alto (USA): Annual Reviews 1987. 501 + XII pp., 45 figs., 13 tabs. Hard bound \$ 34.00.

This volume of the *Annual Review of Genetics* consists of articles on the different problems of modern molecular genetics. From the contents, it is very obvious that research interests are now directed towards the problem of gene expression, both in pro- and eukaryotes, and the genetical analysis of development. Two of the chapters dealing with gene regulation are of general interest. These are reviews on the role of alternative promoters in gene expression (U. Schibler and F. Sierra) and on the transcription termination regulation (D. I. Friedman et al.). Both cover a wide range of organisms from pro- to eukaryotes. In the chapter devoted to alcohol dehydrogenase (AdH) regulation in *Drosophila*, W. Sofer and P. F. Martin paid special attention to the molecular basis of the Adh *cis*- and *trans*-acting regulatory elements using mutational and hybridizational analyses along with the "reversed genetics" (in vitro mutagenesis + transformation) methods. Mechanisms of DNA replication regulation during *Drosophila* development as well as gene activity regulation through differential replication are discussed by A. Spradling and T. Orr-Weaver. The multiplicity of transcription signal sequences and their corresponding regulatory proteins in the context of their complex interplay in the regulation of gene activity in yeasts are discussed in the review by L. Gounaris.

A few chapters of the volume are devoted to higher levels of gene manifestation. Among them are a brief review of genetical and molecular analyses of biological rhythms in *Drosophila* (R. J. Kanopka) and a discussion of the fine genetic structure of the *Drosophila* bithorax complex with a special emphasis on the *Ubx* domain (I. Duncan). In contrast to studies on *Drosophila*, those conducted on behavioral mutants of *Paramecium* having impaired ion channels (Y. Saimi and C. Kung) provide the researcher with a more direct understanding of the mechanisms of the connections between the primary gene action and the corresponding trait at the organismal level. Among multicellular organisms, the small nematode *Caenorhabditis elegans* seems to be an excellent model for such studies; this is evident from the review by J. Hodgkin devoted to sex determination and dosage compensation in this organism. The connection between a gene and single cell morphology is discussed by T. C. Huffaker et al. in their article on genetic analysis of the yeast cytoskeleton.

Most of the chapters in this volume are devoted to animal genetics; only one deals with plant genetics. In the review on *Arabidopsis thaliana* (E. M. Meyerowitz), perspectives on the use of this small weed as a model for plant molecular genetics are discussed. While *A. thaliana* does possess many unique properties that make it particularly suitable for molecular and genetic studies, it has one feature which restricts its applicability: up to now, all efforts to obtain protoplast culture of this plant have failed; therefore, the somatic genetics of *Arabidopsis* is a serious task for future research.

The chapter on natural variation in the genetic code by T. D. Fox is very interesting, especially the second part devoted to site-specific variations in coding. Such facts as those discussed in this review make it evident that one should clearly understand the temporary nature of any dogmas.

Two chapters are devoted to the genetics of evolution. J. F. Crow discusses the history of populational genetics. This article essentially expresses his personal opinion since only theoretical aspects are discussed with especial emphasis on the contribution by Haldane, Fisher, and Wright. A discussion of studies of real populations is absent to all extent and purposes. The second by H. L. Carson deals with the role of the genetic system (deme) in the origin of species.

Finally, the volume of course includes a few articles devoted to *E. coli* genetics. Among them, the personal account of the discovery of genetic recombination in bacteria by Joshua Lederberg is of general interest to every geneticist.

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Fox, J. E.; Jacobs, M.: Molecular Biology of Plant Growth Control. UCLA Symposia on Molecular and Cellular Biology, New Series, Vol. 44. New York: Alan R. Liss 1987. 467 pp. Hard bound £ 50.00.

Molecular Biology of Plant Growth Control is the proceedings of the ARCO Plant Cell Research Institute – UCLA Symposium held in Lake Tahoe, California, February 22–28, 1986. This proceedings presents interesting and exciting advances, both theoretical and technical, in the field of molecular control of plant growth. The first section, on hormone-modulated gene expression, begins with a complete review on auxin-regulated gene expression that includes a historical perspective and a description of the current state. Regulation of gibberellin-, abscisic acid-, and ethylene-responsive gene expression is also extensively described, e.g., the control of α -amylase expression by gibberellin and abscisic acid, the accumulation of auxin-induced mRNAs, ethylene-induced gene expression in fruit and storage organs, etc. Section two describes methods for studying the molecular biology of plant hormones. The workshop summary focuses on two techniques used most effectively: mutants and monoclonal antibodies. There is also an introduction to enzyme-immunoassay for the quantitative analysis of ABA. The third section covers some impressive approaches to the study of auxin, gibberellins, abscisic acid, and ethylene receptors, and binding moieties. Purification, characterization, and function analysis by various auxin-binding proteins are demonstrated. Although the actual mechanism of GA remains unclear, several articles report on in vitro GA binding to soluble proteins and partial purification of a GA-binding protein. Evidence of calcium as a second messenger in plant hormone action and a review of plant pathogen regulation of plant hormone synthesis and metabolism are presented in the next two sections. The volume ends with a section on the role of light in the regulation of plant growth. In this section, one article attributes the differentiation program of chloroplasts to hormone and light action; another, the structural features of the phytochrome molecule and feedback regulation of the expression of its genes.

Molecular Biology of Plant Growth Control will be an excellent reference book for scientists, technicians, and students who work and study in the area of plant physiology and biochemistry, as well as for molecular biologists, pathologists, geneticists, and researchers involved in the plant and soil sciences.

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