Yeast Molecular Biology

The Molecular Biology of the Yeast Saccharomyces. JEFFREY N. STRATHERN, ELIZABETH W. JONES, and JAMES R. BROACH, Eds. Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y., 1981–1982. In two volumes. Volume 1, Life Cycle and Inheritance. xii, 752 pp., illus. $75. Volume 2, Metabolism and Gene Expression. xii, 680 pp., illus. $75. Cold Spring Harbor Monograph Series.

The field of yeast molecular biology has exploded in the last five years. Its remarkable growth has resulted from the intrinsic advantages of working with a lower eukaryote (short generation time and ease of manipulation), the fundamental contributions of the classical yeast geneticists, the advent of recombinant DNA technology, and the ability to transform yeast cells. This combination of factors made it inevitable that yeast would play a major role in present-day endeavors to understand eukaryotic gene regulation.

This two-volume work attempts to review the range of subjects that are under investigation by yeast researchers. It grew out of a meeting on the molecular biology of yeast at Cold Spring Harbor Laboratory in 1979; however, it is a collection of solicited reviews rather than a compilation of research papers. The first volume covers mapping procedures, mutagenesis, genome structure, meiosis, mitosis, gene conversion, the life and cell cycles, mating type, and extrachromosomal inheritance. The second volume covers gene regulation of carbohydrate and nitrogen metabolism, the biosynthesis of lipids, amino acids, nucleotides, and cytochrome *c*, and the utilization of galactose and phosphate, as well as the roles of tRNA's, ribosomes, polymerases, the cell wall, secretion, transport, and suppression. A chapter on recombinant DNA technology reviews procedures and vector systems developed recently that have contributed so much to the popularity of yeast as an experimental system.

The editors have undertaken the ambitious task of synthesizing an enormous amount of information and have succeeded in creating a most noteworthy collection. The papers vary in both length and level of sophistication. Some can be understood by any well-informed biologist, whereas others require previous knowledge of the intricacies of nomenclature peculiar to yeastologists. Many of the papers were clearly intended to be definitive reviews of a subject, for example, a 130-page chapter on mitochondria. Others are treatises of from 15 to 40 pages on more defined subjects. A number of authors thoroughly review their fields, whereas others confine their remarks more narrowly to summaries of their own work. However, regardless of length or emphasis, the papers are uniformly excellent.

One of the strengths of the book is its coherence, with frequent references within a given chapter to material covered in other chapters. There is an extensive bibliography following each chapter, which should prove convenient for anyone wishing to explore a particular subject in depth. However, one of the drawbacks of the second volume is that many of the reviews have bibliographies that only go up to 1980.

Additional highlights of the books are the appendixes. An up-to-date genetic map of the yeast genes and alphabetical listings by gene name, function, and product provide in one source an extremely valuable cross-referencing guide for all identified genes. The index is also a thoughtful compilation.

In summary, it can be said that the two volumes are eminently readable and convey the extraordinary excitement that now pervades research on the molecular biology of yeast. After reading them, one is left with an appreciation of the phenomenal impact that the study of this lower eukaryote is having and will continue to have on the molecular biological studies of other organisms as well. The book is a must for all yeast researchers and is highly recommended for all biologists studying gene expression and development in other prokaryotic and eukaryotic systems.

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Advances in Cell Culture. Vol. 2. Karl Maramorosch, Ed. Academic Press, New York, 1982. xvi, 334 pp., illus. $36.

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