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 Book Reviews
 

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**Kimura, M. (ed.): Molecular Evolution, Protein Polymorphism and the Neutral Theory.** Berlin, Heidelberg, New York: Springer 1982. xiv + 363 pp. Hard bound DM 98,-; US \$ 43.60.

This volume contains contributions from the collaborators in a Japanese studygroup on the elucidation of the mechanisms of evolution, with special emphasis on molecular evolution. The first chapter gives a detailed and very useful exposition of the neutral mutation-random drift hypothesis by M. Kimura: in his own words "the most comprehensive review of the neutral theory to date". The contents of this chapter is moreover intended to form the unifying principle for all other contributions. Chapters by T. Ohta, T. Maruyama, N. Takahata and Y. Tateno are theoretical in nature, and deal with the evolution of multigene families, population genetics, duplicate gene expression, and phylogenetic tree construction, respectively. Another 4 chapters present statistical analyses of population genetical data. Discussed are: balancing selection in *Drosophila* (T. Mukai et al.); genetic variability in a haploid plant (T. Yamazaki); mean and variance of heterozygosity for protein loci in relation to protein function (T. Gojobori); blood genetic markers in Asian-Pacific human populations (K. Omoto). A useful survey of the present knowledge of evolutionary changes and functional constraints in DNA sequences is given in a chapter by T. Miyata. Finally, the last 6 chapters describe the molecular evolution of specific molecules: papova viruses, hemoglobin, ferredoxin, cytochrome c and cytochrome oxidase, legume double-headed proteinase inhibitors, and heat adaptation of tRNA in a thermophilic bacterium.

Overall this volume provides well-written, clear and up-to-date information. It certainly can be recommended to supplement the molecular evolutionary documentation in the libraries of research institutes interested in this field.

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**Nover, L.; Luckner, M.; Parthier, B. (eds): Cell Differentiation. Molecular Basis and Problems.** Berlin, Heidelberg, New York: Springer 1982. 650 pp. 228 figs., 65 tabs. Hard bound \$ 55.00.

This book is divided in three parts: the first two parts, introduction and general part describe the biochemistry of gene expression and the molecular basis of cell differentiation, while the third part presents some experimental systems in which differential gene activity can be studied. This book quite rightly focuses on the understanding of differential gene activity as a prerequisite for the understanding of developmental processes, yet the mendelian concept of independent genes is prominently absent in chapter 3 that describes the history of concepts in developmental biology. Despite the brevity with which developmental aspects are treated and some shortcomings such as the absence of a description of cytoskeletons, the first two parts offer an exhaustive yet concise introduction to the topic of differential gene activity. The choice of the experimental systems in part 3 seems to be rather hap-hazard, probably because the contributors were mainly found in Halle (DDR). The attention paid to the so often neglected higher plant systems must be appreciated, even though these systems, due to the peculiarities of plant material, cannot compete with animal systems. The chapters concerning the crown gall tumors and, to a lesser extend the chloroplast biogenesis however, compare well to the chapters describing animal systems. The choice of topics of two chapters, the arabinose regulon in *E. coli* and phage gene expression in *E. coli*, can be regarded as mistaken if the book is to be seen as an introduction to cell differentiation and development, mainly eucaryotic problems. Instead of these chapters attention could have been paid to the molecular aspects of spermiogenesis/oögenesis and embryogenesis/larval development in for example *Drosophila* or amphibians. However in itself almost every chapter presents a thorough description of an experimental system.

This book impresses by its "Gründlichkeit" (thoroughness) even if it leads sometimes to minor defects such as too many subdivisions of the text.

Though this book is not a complete or representative survey of cell differentiation – which book could be – its first two parts and a majority of the third part, make it a very useful and recommendable book that justifies its title.

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