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 Book reviews
 

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**Rothwell, N. V.: Understanding Genetics.** New York, Oxford: Oxford University Press 1983. xvi + 647 pp, several figs, several tabs. Hard bound \$ 28.95.

In the preface Norman V. Rothwell explains the main task of his book as follows: "... encompassing the details of classical genetics best enables students to appreciate the excitement of today's research." In 22 chapters dealing with more than 160 special questions he shows his point of view by fulfilling this task. The book is a "conservative" textbook starting with achievements before 1900 followed by Mendelian genetics, information on chromosomes and genes, leading to molecular mechanisms of heredity. Beginning with Mendel's experiments, different types of crosses are explained. In two chapters the author deals with chromosomes and the distribution of genetic material during mitosis and meiosis, including chromosome morphology and banding techniques. Genic interactions leading to modified ratios, e.g. in connection with epistasis, penetrance, pleiotropy and variable expressivity of alleles, are dealt with the help of examples one will not find in every second textbook. Sex and inheritance are described mainly by means of *Drosophila* and man. Detailed examples are given for linkage and recombination, the theories of crossing-over, chromosome mapping and changes in chromosome structure and number. Afterwards the author takes up the molecular level of heredity, the level of DNA. Structure and replication as well as information transfer through the processes of transcription and translation are explained by describing basic experiments. Speaking about processing of RNA stands in close connection with the problem of "colinearity" of DNA and protein. Long chapters provide information on bacterial genetics and viral genetics. Control mechanisms in prokaryotes (operon models, transposons) and eukaryotes are connected with questions of differentiation. The modern techniques of genetic engineering (artificial genes, cleavage maps, sequencing DNA, genetic manipulation) are comprehensively described. The chapter about extrachromosomal inheritance also includes information concerning the special genetic code in mitochondria. The reviewer missed more basic facts on chloroplast genetics in higher plants and the ontogenic formation of immunoglobulins.

A high number of schemes of very good quality and well-ordered arrangement optically support the text. Excellent photographs, especially in connection with cytological questions, are combined with drawings which stress the essential assertions. At the end of each chapter references are given so that it is easy to find basic literature. At the same position there are also some review questions about the most important facts to check the degree of understanding. The correct answers one can find at the end of the book together with a glossary of used special terms.

The book is a profit for everybody who studies or teaches elementary genetics and prefers the "conservative" approach to present-day genetics. M. Lindenhahn, Halle

**Sund, H.; Veeger, C. (eds): Mobility and Recognition in Cell Biology.** Berlin, New York: W. de Gruyter & Co. 1983. xix + 586 pp., several figs., several tabs. Hard bound DM 190,-.

The present volume, edited by H. Sund and C. Veeger, contains the proceedings of a FEBS lecture course on "mobility

and recognition in cell biology" held in Konstanz, West Germany, in September 1982.

This symposium covered a wide range of topics and provides a very interesting insight into some rather complicated processes of cell biology. This volume is quite readable, the papers being grouped into logical sequence, and the discussion sections appended to each paper are most often enjoyable.

This book is divided into five main sections. In the first one, papers discuss the mobility and dynamics of biopolymers. Evidence for mobility within macromolecules comes from numerous physical and theoretical approaches. The dynamic properties of macromolecules as well as their size, shape, degree of complexation and constraints offered by environment are of fundamental importance in the interchange of chemicals and signals between the interior and the exterior of the cell. In this section several papers illustrate the structural and functional aspects of protein flexibility or dynamic properties, acquisition of the three dimensional structure consisting in sequential folding reaction or water motion at the protein surface.

This theme is picked up again by some papers of the second section "Interaction of proteins with proteins, nucleic acids and lipids". The authors draw our attention to the dynamics aspect of those interactions.

Some lectures of this section and those of the third one "mechanisms of recognition" deal with recognition in biological systems which implies interactions among multi or single-cell organisms, subcellular structures, macromolecules and small molecules. Within this context, the authors outline the mechanistic characteristics of some complex web of interactions such as autogenous regulation of protein synthesis, recognition of specific DNA target site by regulatory proteins, or between RNA-polymerase and some DNA sequence within the promoter region. At the end of the spectrum is the association between bacteria and plants that results in a nitrogen-fixing symbiosis.

The next section is restricted to the resolution of the biochemical processes linking ligand-receptors interactions at the cell membrane with the eventual cellular activation. Influx of Ca ions is assumed to be a transmembrane signal most probably common to a large number of cell activation processes. This ion is said to play a central role in mast cell and basophils degranulation. The mediation of Calcium is achieved via specific protein receptors represented by calmodulin. The use of cloned calmodulin structural gene to transfect normal cells provide insight into the complex web of cell regulation. Organellar protein transport and transmembrane translocation are also major riddles in this section.

The last section is concerned with chemotactic movements brought by modulation of flagellar rotation in response to perceived changes in attractant or repellent concentration. A model for a flagellar rotary motor in *E. coli* is presented and also for energization and switching of this motor. Some detailed structure of eventual chemosensors is also depicted.

The individual essays are highly specialized, but this volume certainly brings together a lot of new informations in those fast growing fields. It will be of a great value to well informed people and a useful addition to any specialized library. C. Delbart, Lille