

Preface

This book summarizes the important structures of viruses, prokaryotes, and eukaryotic cells. The emphasis is on ultrastructure; the basic information and concepts of cell biology are presented as much as possible in terms of pictures, and text is kept to a minimum. The book aims to provide a supplement for texts in general biology and more advanced courses such as cell biology, genetics, developmental biology, physiology, histology, plant anatomy, and biochemistry that do not include a sufficiently extensive description of cell ultrastructure, particularly in areas of more contemporary interest. With this purpose in mind, the micrographs and descriptions included cover all of the major cell structures in a wide range of prokaryotic and both plant and animal eukaryotic cells.

The first two chapters introduce the primary features of prokaryotic and eukaryotic cells. The following chapters illustrate the major cell parts and organelles, including membranes; the nucleus and its major structures and functions; organelles concerned with cellular energy procurement, the mitochondria, chloroplasts, and peroxisomes; structures associated with protein synthesis, secretion and absorption, including ribosomes, the endoplasmic reticulum, and lysosomes and their roles in endocytosis; microtubules, microfilaments, and their activities in cell motility; the cytoskeleton; cell junctions; extracellular structures of animals, and the cell walls of plants and prokaryotes; mitotic and meiotic cell division; and the structure and function of viruses. An appendix surveys the major techniques and instrumentation used in electron microscopy, including fixation, embedding and sectioning, shadowing and negative staining, freeze-fracture preparations, autoradiography, and a description of the

transmission and scanning electron microscopes and their principles of operation. While text is kept to a minimum, care has been taken to include and emphasize the major structural and functional concepts of cell biology.

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