Cell and Molecular Biology

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EIGHTH EDITION

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PREFACE

Life has an immense variety of forms that arose by the process of biological evolution, but all living organisms share a master plan of structural and functional organization. This book is about the building blocks—*cells* and *molecules*—that constitute the unity of the living world.

Progress in our field of science has been so rapid that during the lifetime of this book, first published in 1946, we have witnessed the most revolutionary discoveries, such as those involving the recognition of the ultrastructure and macromolecular organization of cell components, the uncovering of the DNA helix, and the molecular basis of the genetic code and gene expression. This tremendous progress necessitated making extensive revisions every five years and changing the original title, *General Cytology*, to *Cell Biology* in 1965 and to *Cell and Molecular Biology* in 1980.

The present, eighth, edition should be seen as a new book rather than as a revision because the changes have been so profound that the text has been entirely rewritten and more than half of the illustrations have been changed or added. We have tried to integrate the most recent advances in molecular biology with our knowledge of the structure and function of cells, while taking into account the work of classical cytologists—often forgotten these days—which laid the foundations of our understanding of the living cell.

The book has been organized to facilitate learning by proceeding from simple to more complex matters. For example, the first three chapters give an overview of the cell and its main structural components, a general introduction to the biochemistry of the cell, and an account of some of the current methods used in the study of cell biology.

Each of the following twenty-one chapters contains an introduction, stating the main objectives; sectional summaries that provide a synopsis of the essential points; and for further information and study, a list of numbered references and additional readings.

The specific fields of cell and molecular biology are presented dynamically, based on experimental data from which the student can draw his own conclusions. All the figures, many of them original drawings that represent classic experiments, are integrated in the text. A special feature of this edition is a glossary that defines words and concepts.

Cell and molecular biology have become the basic pillars on which all biological and medical sciences are based. Although primarily intended for courses at the college level, the book may be useful in more advanced courses, because of the wealth of up-to-date information contained in it. Much of the text should be of interest to those in the applied sciences such as medicine, veterinary, agronomy, and biotechnology.

By emphasizing that cell and molecular biology are in constant progress and much remains to be discovered, we hope to stimulate research among young scientists who want to dedicate their efforts to uncovering the basis of life on our planet.

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Among the illustrations, we have included the original micrographs and designs of many experiments that led to major discoveries in cell and molecular biology. We hope that these experiments help the students to recognize the avenues by which scientific progress is made. We especially wish to express our gratitude to our colleagues who have contributed so generously to the illustrations of the present and past editions and whose names are acknowledged at each special instance.

We would like to thank the staff of Lea & Febiger who have contributed immensely to improving the presentation of this textbook.

We also want to acknowledge the collaboration of the staff of EL ATENEO, publishers of the Spanish edition, for their contribution of many valuable drawings to this book.

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