

FOREWORD

Cell biology is the study of the cell, the fundamental unit—both structural and functional—of every living organism.

This work aims to present the main cellular organelles—those specialized structures located within the cytoplasm—by describing their structural and biochemical characteristics, and then detailing their respective roles in cellular function.

Readers will discover, in particular, the three-layered architecture of the plasma membrane that envelops the cell, as well as the membranes that delineate the various organelles or endomembranes, thereby illustrating the concept of membrane unity. Special attention is paid to the chemical composition of these membranes, which share remarkable similarities and form a functional continuum essential for the biosynthesis of the cell's diverse biochemical compounds, reflecting the notion of membranous continuity.

This volume, the result of a rigorous synthesis of recent publications in cell biology, is primarily intended for students in the common core of the Earth and Universe Sciences (STU, Geology) and Territorial Planning programs, for whom mastery of cellular concepts provides pertinent insights into biological and environmental processes. It is also addressed to students of Life and Natural Sciences, as well as those in Medical Sciences. Moreover, it serves as a valuable pedagogical resource for instructors preparing lectures, tutorials, and laboratory sessions in these disciplines.

This work remains open to improvement, and any suggestions aimed at enriching or enhancing its content will be received with the utmost appreciation.

We would like to pay special tribute to our teacher, Mrs. Fadhila Hamoudi, pioneer of General Biology at the University of Science and Technology Houari-Boumediène (USTHB). Through her expertise, dedication, and passion, she has conveyed to generations of students the foundations and challenges of cell biology, inspiring the vocation of many future biologists. Her influence deeply informs this volume, and we extend to her our most sincere gratitude.