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THE

CYTOSKELETON

Preface

IT HAS BEEN 40 YEARS SINCE THE Cold Spring Harbor Laboratory Press published the three-volume set of books titled *Cell Motility*. The chapters in these volumes summarized the contributions of participants who attended a meeting held at the laboratory in 1976. The seeds for organizing this meeting were planted during the 1972 Cold Spring Harbor Symposium on *The Mechanism of Muscle Contraction*, where we met each other for the first time. Although the Symposium focused mainly on skeletal muscle contraction, Jim Watson decided that there should be a few presentations on nonmuscle contractile systems, a field still in its infancy. The 1976 meeting was the first to highlight the importance of the cytoskeleton in nonmuscle cell motility, and it provided early glimpses of the roles of nonmuscle cytoskeletal systems in other areas of cell structure and function. Coincidentally, both of us, in addition to Joel Rosenbaum, were involved in organizing and editing those 1976 volumes.

Needless to say, the field of cytoskeletal research has advanced at a remarkable pace in the ensuing years. Since that time the results obtained by many researchers scattered throughout the world have provided critically important insights into a wide range of cellular activities that go well beyond the locomotory activities of cells. Given the rapid growth that has taken place, it would be impossible to cover in a single volume the tremendous breadth of research on the cytoskeleton. Rather we have tried to provide snapshots that capture the basic properties of each of the three major cytoskeletal systems: actin, intermediate filaments, and microtubules.

We have divided the book into five major parts preceded by an overview of the evolution of cytoskeletal systems.

Part 1 contains descriptions of the structural proteins comprising the three major cytoskeletal systems, their associated motor proteins, and proteins involved in integrating the activities of the three systems. Part 2 is dedicated to the roles of cytoskeletal networks in determining cell and tissue architecture, cell adhesion, and the regulation of the mechanical properties of cells and includes an introduction to the more recent discoveries that the nucleus contains analogous nucleoskeletal proteins. In Parts 3 and 4, emphasis is placed on the intracellular transport of organelles and molecules involving the three cytoskeletal elements, as well as their roles in both muscle contraction and cell motility. Finally, Part 5 summarizes the advances that have taken place in our understanding of the roles of the cytoskeleton in mitosis and cytokinesis.

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