
Preface

The eukaryotic microtubule cytoskeleton is involved in a large number of essential processes such as cell migration, polarization, and morphogenesis, as well as intracellular transport, positioning of organelles, and segregation of chromosomes during cell division. Fundamental to the function of the microtubule network is the arrangement of microtubules into highly ordered arrays. The assembly and regulation of these arrays and their remodeling during cell cycle progression or cell differentiation are highly complex processes that we only begin to understand. Increasing our knowledge in this area is an important task, since defects in the microtubule network have been implicated in a large number of pathological conditions ranging from malformations during development to degenerative disorders.

This book does not attempt to cover all aspects of this immense complexity, but instead provides an overview on the organization and function of the microtubule cytoskeleton and how its impairment is linked to disease. By focusing on the key mechanisms and by presenting concepts alongside detailed molecular information, the book should be of interest not only to experts but also to nonexpert readers.

In several chapters leaders in the field describe how microtubules are organized at different cell cycle stages and in different cell types; present insight into the structure and function of the centrosome, the main microtubule organizing center; and highlight important proteins and protein complexes that generate and organize microtubules, modulate their properties, and mediate their function. The chapters also contain information on how malfunction of specific components of the microtubule network, caused by genetic mutation or other mechanisms, leads to pathological conditions.

I am grateful to all authors for their excellent contributions and efforts to align these with the scope of this book. Hopefully, by stimulating discussion and research, their work will make a contribution toward a better understanding of the cell and pathobiology of the microtubule cytoskeleton.

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Organisation, Function and Role in Disease

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