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4.2.4 Nuclear Membrane Factors; 4.2.5 The Halfbridge; 4.2.6 Structure Summary; 4.3 Microtubule Nucleation; 4.4 Assembly/Duplication of SPBs and Centrosomes; 4.4.1 Electron Microscopic Description of Duplication; 4.4.2 Cell Cycle Regulation of Duplication; 4.4.3 Genetic Analysis of Duplication; 4.5 Signaling Platform; 4.6 Developmental Alteration of SPB Function; 4.7 Parting Thoughts; Acknowledgments; References; 5 Dissection of Basal Body and Centriole Function in the Unicellular Green Alga *Chlamydomonas reinhardtii*; 5.1 Introduction; 5.2 Why Study a Green Alga to Learn about Centrioles and Basal Bodies?; 5.3 Structure of the Basal Body and Centriole in *Chlamydomonas*; 5.4 Additional Fibers that Connect Basal Bodies and Centrioles; 5.4.1 Contractile Fibers; 5.4.2 Rootlet Microtubules; 5.4.3 Non-contractile Fibers; 5.5 Overview of the Cell Cycle of *Chlamydomonas*; 5.6 Duplication of Basal Bodies in *Chlamydomonas*; 5.7 Role of Tubulin Isoforms in Basal Body Duplication; 5.8 Timing of Basal Body/Centriole Duplication in *Chlamydomonas*; 5.9 Function of Basal Bodies and Centrioles in *Chlamydomonas*; 5.10 What Makes a Basal Body Different from a Centriole?; 5.10.1 Transition Zone and Docking; 5.10.2 Transition Zone and Autonomy; 5.10.3 Maturation of Basal Bodies; 5.11 Conclusion; Acknowledgments; References; 6 The Centrosome in Evolution; 6.1 Introduction; 6.2 The Centriole/Basal Body Structure is a Derived Characteristic of Eukaryotes; 6.3 The Basal Body/Axoneme is the Ancestral Structure; 6.4 Functions Associated with the Flagellar Apparatus; 6.4.1 Cell Locomotion; 6.4.2 Sensory Reception; 6.4.3 Cell Division; 6.5 The Conservative Mode of Duplication of the Basal Body/Centriole/SPB: An Essential Clue for Cell Morphogenesis

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## Sommario/riassunto

Discovered over a century ago, the centrosome is the major microtubule organizing center of the animal cell. It is a tiny organelle of surprising structural complexity. Over the last few years our understanding of the structure and composition of centrosomes has greatly advanced, and the demonstration of frequent centrosome anomalies in most common human tumors has sparked additional interest in the role of this organelle in a broader scientific community. The centrosome controls the number and distribution of microtubules - a major element of the cell cytoskeleton - and hence influence

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