

Microtubules: The Structural Backbone of Cellular Transport

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Abstract

Microtubules, essential components of the cytoskeleton, play a pivotal role in cellular organization and transport. Composed of tubulin heterodimers, microtubules form dynamic filaments that extend throughout the cell, providing structural support and serving as tracks for intracellular transport. This review explores the structural properties of microtubules, their assembly dynamics, and their involvement in various cellular processes, particularly intracellular transport mechanisms mediated by molecular motors such as dynein and kinesin. The regulation of microtubule dynamics by associated proteins and post-translational modifications ensures precise spatial and temporal control over cellular activities. Dysregulation of microtubule function is implicated in numerous diseases, highlighting their importance as therapeutic targets. Understanding the intricate roles of microtubules in cellular physiology and pathology is crucial for advancing biomedical research and developing novel therapeutic strategies.

Keywords:

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Conclusion

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