

Advances in Cellular Trafficking: Insights and Implications

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Abstract

Cellular trafficking plays a pivotal role in maintaining the homeostasis of eukaryotic cells, governing the transport of molecules, organelles, and information within the cell. This dynamic process is crucial for various cellular functions, including signal transduction, protein turnover, and organelle maintenance. In this review, we highlight recent advances in our understanding of cellular trafficking and its implications for cellular biology and human health. In eukaryotic cells, cellular trafficking encompasses the regulated movement of proteins, lipids, and organelles from the site of synthesis to their functional destinations. This process involves a complex network of cytoskeletal elements and membrane-bound transport vehicles, such as vesicles and microtubules. Dysregulation of cellular trafficking can lead to various cellular defects and diseases, including neurodegenerative disorders, cancer, and immunodeficiencies. This review discusses the molecular mechanisms underlying cellular trafficking, focusing on the roles of motor proteins, cytoskeletal elements, and membrane trafficking pathways. We also explore the implications of cellular trafficking in cellular homeostasis and its potential as a therapeutic target for various diseases.

Keywords: Cellular ; Homeostasis; Cell signalling

Introduction

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