

Autophagy in Cellular Homeostasis and Disease

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Abstract. Autophagy, a cellular degradation process, is fundamental for maintaining cellular homeostasis and responding to stress. Its dysregulation is associated with various diseases, including cancer, neurodegeneration, and infections. This review delves into the molecular mechanisms of autophagy, emphasizing its dual role in cell survival and death. By understanding these pathways, researchers can develop targeted therapies to modulate autophagy in disease treatment and prevention.

Keywords: Autophagy, Cellular Homeostasis, Cancer, Neurodegeneration, Therapeutic Modulation

Introduction

Autophagy is a highly conserved cellular process that degrades and recycles cytoplasmic components, thereby maintaining cellular homeostasis and allowing cells to adapt to stress. It involves the formation of double-membrane vesicles known as autophagosomes, which sequester and deliver cargo to lysosomes for degradation. The regulation of autophagy is complex, involving numerous signaling pathways that respond to various cellular cues. Dysregulation of autophagy has been implicated in a wide range of diseases, including cancer, neurodegenerative disorders, and infectious diseases. Recent studies have shed light on the intricate balance autophagy maintains between cell survival and death, offering potential therapeutic implications. This review provides a detailed overview of the autophagic process and discusses how manipulating autophagy could lead to novel treatments for various diseases.

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References

1. Shukurova, Z. Y., & Shukurlu, Y. H. (2024). Retraction Note: Non-mulberry silkworm *Saturnia Pyri* (Denis & Schiffmüller, 1775) and a new perspective source of biomaterials.