Lysosomes. Biology, Diseases, and Therapeutics

Description: Traditionally known as the “stomach of the cell,” lysosomes contain enzymes to break down and recycle internal and external macromolecules, like waste materials and cellular debris. The roles of lysosomes have been expanded to include much broader functions such as membrane repair and amino acid sensing. The organelles also emerge as a signalling hub for mTOR to maintain energy homeostasis. With significant implication in various pathological conditions, lysosomal pathways are evaluated as a pharmacological target for lysosomal storage diseases, cancer, and neurodegeneration. Lysosomes also involve the delivery of other biologicals and antibody drug conjugates. In addition, many drugs are found to accumulate inside lysosomes, thus allowing them to contribute to our understanding of pharmacokinetics, drug–drug interactions, and toxicity profiling.

Discussing recent findings, up-to-date research, and novel strategies, Lysosomes integrates perspectives from cell biology, pharmacology, toxicology, and biochemistry to illustrate both the basic properties of lysosomes and their potential roles in drug discovery and development. With perspectives from various fields, this book illustrates the potential of lysosomes beyond their cellular function, focusing on disease and drug targeting. An opening section covers basic cell biology and functions of lysosomes including chapters on the lysosome’s role in therapeutic pathways, cancer, cell death, and metabolism. The second section explores lysosomes in various aspects of drug development and toxicity and features discussion of autophagy intervention for cancer and neurodegeneration, ADC delivery and efficacy, and drug sequestration in lysosomes and its therapeutic and toxicological consequences.

With in-depth coverage of a broad range of material, Lysosomes presents a number of key benefits to readers that include:

Integration of key aspects of lysosomes to present an understanding of their roles, potential, and future prospects
Discussion of lysosomes in drug targeting, apoptosis, cancer, aging, autophagy, metabolism, toxicity, and membrane repair
Exploration of basic principles and properties of lysosomes that allow them to act as therapeutic targets and impact various aspects of drug development

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