# Enhancing therapeutic efficacy through optimizing drug delivery from nanoparticles

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Abstract
Nanoparticle-based drug delivery systems offer exciting new approaches due to their small size and special characteristics, which enable precise control over drug distribution, targeted delivery, improved solubility, sustained release, and protection against degradation. To take advantage of their unique properties the size, shape and/or surface chemistry of nanoparticles need to be optimized, allowing their functions to be modified for various biological applications.
The aim of this study is to provide a comprehensive overview of optimization strategies for nanoparticles, with a focus on enhancing targeting efficiency and optimizing drug release rates.
Articles from the last decade were identified and reviewed to address the advancements in understanding the structure of nanoparticles.
Several studies report that drug release is influenced by elements like the drug's encapsulation, size, shape, and composition of the nanoparticles. Modification techniques and stimuli-responsive nanoparticles are identified as effective means to achieve controlled release. Optimization strategies, such as formulation techniques and surface engineering, are presented to improve drug release profiles and enhance therapeutic outcomes.
The review concludes by emphasizing the significance of optimizing drug release from nanoparticles and proposing future research directions in this field, with the aim of further advancing the capabilities of nanoparticle-based drug delivery systems.

**References**

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