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Aquatic Ecotoxicity of Nanoparticles

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Environmental Nanotoxicology

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Abstract

Nanotechnology is a cutting-edge, multidisciplinary field that encompasses a vast array of fundamental and applied sciences for the creation and use of nanoscale materials for novel solutions. However, nanoparticles (NPs) have garnered significant attention due to their widespread applications in various industries. However, their release into aquatic ecosystems has raised concerns about potential adverse effects on aquatic organisms.

Nanoparticles, due to their unique properties, can enter water bodies and interact with aquatic organisms, potentially disrupting their physiology, metabolism, and growth. This can lead to ecological imbalances, affecting aquatic species and ecosystems, and necessitates thorough assessment to understand potential risks and mitigate harmful impacts. Given the findings of several ecotoxicological studies documenting their negative consequences, there is growing concern today regarding synthetic nanomaterials. This chapter explores the adverse effects nanoparticles can have on aquatic ecosystems, their exposure routes in aquatic systems and entry routes into aquatic organisms, their toxicity mechanisms, environmental conditions that affect their activities, and the ecological imbalances they result in. To mitigate the potential for ecological imbalances, it is essential to understand the risks associated with nanoparticle pollution and implement measures to minimize their release and exposure in aquatic environments.

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