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## Resveratrol nanoformulations: challenges and opportunities.

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#### Abstract

Resveratrol, a naturally occurring polyphenol and phytoalexin, has received significant attention in recent years due to its vast therapeutic effects including anticancer, antioxidant and anti-inflammatory effects. However, poor pharmacokinetic properties such as low aqueous solubility, low photostability and extensive first pass metabolism result in poor bioavailability, hindering its immense potential. Conventional dosage forms such as dry powder capsules and injections have met with limited success, demonstrating challenges faced in developing an effective formulation. Recently, nanotechnology-based formulations (nanoformulations) are being looked upon as a novel method for improving the pharmacokinetic properties, as well as enhancing targetability and bioavailability of resveratrol. This review outlines the therapeutic potential of resveratrol, explores its mechanisms of action and pharmacokinetic limitations, and discusses the success and challenges of resveratrol-encapsulated nanoparticles in the last decade. Potential techniques to improve encapsulation of the drug within nanoparticles, thereby enhancing its clinical potential are highlighted.

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**KEYWORDS:** Anticancer; Nanoformulation; Resveratrol; Solubility enhancement; Targeting

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