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# Current Advances in the Use of Nanophytomedicine Therapies for Human Cardiovascular Diseases

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## Abstract

Considering the high prevalence of cardiovascular diseases (CVDs), the primary cause of death during the last several decades, it is necessary to develop proper strategies for the prevention and treatment of CVDs. Given the excessive side effects of current therapies, alternative therapeutic approaches like medicinal plants and natural products are preferred. Lower toxicity, chemical diversity, cost-effectiveness, and proven therapeutic potentials make natural products superior compared to other products. Nanoformulation methods improve the solubility, bioavailability, circulation time, surface area-to-volume ratio, systemic adverse side effects, and drug delivery efficiency of these medications. This study intended to review the functionality of the most recent nanoformulated medicinal plants and/or natural products against various cardiovascular conditions such as hypertension, atherosclerosis, thrombosis, and myocardial infarction. Literature review revealed that curcumin, quercetin, and resveratrol were the most applied natural products, respectively. Combination therapy, conjugation, or fabrication of nanoparticles and nanocarriers improved the applications and therapeutic efficacy of herbal- or natural-based nanoformulations. In the context of CVDs prevention and/or treatment, available data suggest that natural-based nanoformulations are considerably efficient, alone or in blend with other herbal/synthetic medicines. However, clinical trials are mandatory to elucidate the safety, cardioprotective effect, and mechanism of actions of nanophytomedicines.

**Keywords:** cardiovascular diseases; medicinal plants; nanoformulation; nanoparticles; natural products.

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## Figures



**Figure 1** A schematic figure illustrating the...



**Figure 2** The nanophytomedicines mechanism of action...

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