

# Encapsulation of Metal and Metal Oxide Nanoparticles by Nutraceuticals: Implications for Biological Activities

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**Background:** The concept of nutraceuticals has gained increased attention recently as it is based on using natural substances for therapeutic applications. However, limitations such as low bioavailability have restricted the use of these substances thus far. Nanoencapsulation of nutraceuticals has been proposed as a promising solution to circumvent such issues by increasing their bioavailability and targeting their release. Metal and metal oxide nanoparticles are amongst the inorganic nanocarriers that have been studied for their ability to encapsulate nutraceuticals.

**Objectives:** The aim of this article is to provide an overview of metal and metal oxide nanoparticles and their synthesis and applications. Furthermore, the conjugation of these nanoparticles with nutraceuticals will be discussed, along with their potential applications.

**Conclusion:** It has been observed that the conjugation of nutraceuticals with metal nanoparticles resulted in the cumulative properties of both these factors with increased effectiveness. Such advancements are crucial for nutraceutical use in important theranostic applications that combine diagnosis and therapy.

**Keywords:** Encapsulation, metal nanoparticles, metal oxide nanoparticles, nutraceuticals, phytochemicals.