

Starch-Based Systems for the Nano-Delivery of Quercetin

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Abstract : Quercetin is a naturally occurring polyphenol found in many vegetables, such as onion, with antioxidant properties. It is a dietary component with a documented role in reducing different human cancers. However, its low bioavailability, poor water solubility, and chemical instability limit its applications. Different nano-delivery systems such as nanoparticles, micelles, and nanohydrogels have been studied in order to improve the bioavailability of quercetin. Nanoparticles based on natural polymers such as starch have the advantage of being biocompatible, biodegradable, and non-toxic. In this study, quercetin was loaded into starch nanoparticles using a nanoprecipitation method. Different routes, using sodium tripolyphosphate and Tween® 80 as tensioactive agents, were tested in order to obtain an optimized starch-based nano-delivery system. The characterization of the nanoparticles loaded with quercetin was assessed by Fourier Transform Infrared Spectroscopy, Dynamic Light Scattering, Zeta potential, and Differential scanning calorimetry. UV-vis spectrophotometry was used to evaluate the loading efficiency and capacity of the samples. The results showed that starch-based systems could be successfully used for the nano-delivery of quercetin.

Keywords : starch nanoparticles, nanoprecipitation, quercetin, biomedical applications

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