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Synthesis of PLGA-based nanoparticles loaded with lupinifolin extracted from Derris reticulate

Lupinifolin is a prenylated flavonoid isolated from several medicinal plants, such as Myriopteron extensum, Eriosema chinense, Albizia myriophylla and Erythrina fusca. It is also reported to be a major compound of Derris reticulata. There are several lines of evidence demonstrating that lupinifolin exerts antimicrobial activities. However, due to its very insoluble property, poor bioavailability of lupinifolin is anticipated. Thus, this study aims to improve oral bioavailability of lupinifolin isolated form Derris reticulate, by encapsulation with poly[lactic-co-glycolic acid] (PLGA), a biocompatible, biodegradable and FDA approved polymer. Lupinifolin-loaded PLGA nanoparticles (NPs) were produced by single emulsion-solvent evaporation technique with 96% encapsulation efficiency. Regarding the morphology of the NPs, TEM images showed that the lupinifolin-loaded NPs had spherical shape and the size agreed with the result from dynamic light scattering measurement (194 nm in diameter). The polydispersity index and zeta potential were 0.05 and -28.30 mV, respectively, indicating that lupinifolin-loaded NPs obtained from the present study were nearly monodispersed and moderately stable. Their releasing profile and oral bioavailability in Caco-2 permeability model will be further investigated.

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