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Design of turmeric rhizome extract nano-formula for delivery to cancer cells

Novel turmeric rhizome extract nanoparticles (TE-NPs) were developed from fractions of dried turmeric (*Curcuma longa* Linn.) rhizome. Phytochemical studies, by using HPLC and TLC, of the fractions obtained from ethanol extraction and solvent-solvent extraction showed that turmeric rhizome ethanol extract (EV) and chloroform fraction (CF) were composed mainly of three curcuminoids and turmeric oil. Hexane fraction (HE) was composed mainly of turmeric oil while ethyl acetate fraction (EA) was composed mainly of three curcuminoids. The optimal TE-NPs formulation with particle size of 159.6 ± 1.7 nm and curcumin content of 357.48 ± 8.39 μ M was successfully developed from 47-run D-optimal mixture-process variables experimental design. Three regression models of z-average, d50, and d90 could be developed with a reasonable accuracy of prediction (predicted r^2 values were in the range of 0.9120–0.9992). An in vitro cytotoxicity study using MTT assay demonstrated that the optimal TE-NPs remarkably exhibited the higher cytotoxic effect on human hepatoma cells, HepG2, when compared with free curcumin. This study is the first to report nanoparticles prepared from turmeric rhizome extract and their cytotoxic activity to hepatic cancer cells compared with pure curcumin. These nanoparticles might serve as a potential delivery system for cancer therapy.



เหง้าขมิ้นชัน (*Curcuma longa* Linn.)

Finely Dry Turmeric *Curcuma Longa* Linn Powder Stock Photo - Image of ground, longa: 133779484 (dreamstime.com)

Reference:

Auychaipornlert S, Lawanprasert PP, Piriyaprasarth S, Sithisarn P, Mangmool S. Design of turmeric rhizome extract nano-formula for delivery to cancer cells. *Molecules*. 2022;27:896. doi: 10.3390/molecules 27030896



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