Skin Complexion Improvement by Nano Particle Delivered Notoginsenoside - A Novel Formulation

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Many synthetic whitening products brought side effects while achieving whitening effect. In this work, we performed toxicity and whitening screening using cells and zebrafish embryos, and also optimized the liposome dosage form. We tested the hypothesis that the toxicity and whitening effects of different ginsenosides from panax notoginseng to zebrafish embryo and human cells is within the safe range. Ginsenosides were first examined for cytotoxicity in B16 and HaCat cells, and then examined for the ability to inhibit tyrosinase activity and melanin content in cells. Next, zebrafish embryos were used for screening of decolorization effects and toxicity evaluation, and melanin content and tyrosinase activity were also measured. Then, ethosomes of uniform size were prepared by homogenization and the characteristics of ethosome vesicles were observed. According to the results of cytotoxicity and inhibition of tyrosinase and melanin synthesis in cells, we found that PTS, ginsenoside Rg1 and ginsenoside Re showed no significant cytotoxicity, and both ginsenoside Rg1 and ginsenoside Re were effective in whitening. When applied on the zebrafish embryos, PTS was effective in reducing pigmentation of zebrafish embryos in vivo without affecting the embryo development. In the preparation of ethosomes, we optimized the formulation so that the most stable ethosome can be stored for more than 3 months. In conclusion, we identified the most effective and safe ingredients and improved the skin permeability of the saponins by embedding them in ethosome. By optimizing the formulation, we obtained a more stable ethosome with a higher drug encapsulation rate. This study has great promise for the subsequent development of safe and effective skin lightening products.

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