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Novel Solid Lipid Nanoparticles for Oral Delivery of Oxyresveratrol: Effect of the Formulation Parameters on the Physicochemical Properties and in vitro Release

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Abstract : Novel solid lipid nanoparticles (SLNs) were developed to improve oral bioavailability of oxyresveratrol (OXY). The SLNs were prepared by a high speed homogenization technique, at an effective speed and time, using Compritol® 888 ATO (5% w/w) as the solid lipid. The appropriate weight proportions (0.3% w/w) of OXY affected the physicochemical properties of blank SLNs. The effects of surfactant types on the properties of the formulations such as particle size and entrapment efficacy were also investigated. Conclusively, Tween 80 combined with soy lecithin was the most appropriate surfactant to stabilize OXY-loaded SLNs. The mean particle size of the optimized formulation was 134.40 ± 0.57 nm. In vitro drug release study, the selected S2 formulation showed a retarded release profile for OXY with no initial burst release compared to OXY suspension in the simulated gastrointestinal fluids. Therefore, these SLNs could provide a suitable system to develop for the oral OXY delivery.

Keywords : solid lipid nanoparticles, physicochemical properties, in vitro drug release, oxyresveratrol
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