

Formulation and characterization of PEGylated PLGA nanoparticles containing artesunate

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Summary: *The aim of this study was to formulate and characterize physiochemical properties of PEGylated poly(D,L-lactide-co-glycolide) acid nanoparticles containing artesunate (nano ART/PLGA-PEG). The nanoparticles prepared by a single emulsion solvent evaporation method were optimized by central composite design. The optimal formulation of nano ART/PLGA-PEG consisted of 1.85% w/w of Tween 80, 46% w/w of ART/ PLGA-PEG, 0.15% w/w of oil/water phase. The particle size, PDI and drug loading efficiency of optimal nano ART/PLGA-PEG were 176.5 nm, 0.189 and 27.96%, respectively. These experimental output variables were virtually in agreement with the predicted values. X-ray powder diffraction (XRPD) indicated the amorphous state of ART in optimal nanoparticles. The obtained results by using scanning electron microscopy (SEM), proton nuclear magnetic resonance spectroscopy (¹H-NMR) showed that the optimal nanoparticles had the spherical shape and core-corona structure. The drug release from nanoparticles in phosphate buffer of pH 7.4 had the biphasic model and was capable of sustained release for 48h.*