



Improving the Phototoxicity of the Zinc Phthalocyanine by Encapsulation in Nanoparticles: Preparation, Characterization and Phototherapy Studies

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SUMMARY. Nanoparticles are widely utilized to overcome drugs insolubility problems and sustain release improving the bioavailability. Zinc phthalocyanine, a hydrophobic photosensitizer with solubility problems, was loaded in PLA nanoparticles. Photosensitizer loaded in polymeric nanoparticles was produced with the following characteristics: size in the 200-300 nm range, negative zeta potential (-15 to -19 mV), low polydispersity index (< 0.1), satisfactory encapsulation efficiency (70-80%), low residual PVA, smooth surface and spherical shape. The photosensitizer release from nanoparticles was sustained and the kinetic followed Higuchi's model. ZnPc loaded in polymeric nanoparticles exhibited higher phototoxicity than free photosensitizer. Phototoxicity of the ZnPc loaded in Resomer® R203 nanoparticles was improved for increasing photosensitizer concentration (1 to 4 µg/ml), light dose (10 to 30 J/cm²) or incubation time (2 to 4 h). The phototoxicity of the zinc phthalocyanine was improved by encapsulation in nanoparticles and this nanocarrier is a promising delivery system for photodynamic therapy use.

KEY WORDS: Cancer, Nanoparticles, Photodynamic therapy, Photosensitizer.

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