Preparation and Characterization of Green Curcumin Loaded Polyglycerol Polymeric Nanoparticles: Stability and Molecular Docking

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Abstract:

Polymeric based drug delivery systems emerged as a promising approach in drug loading means to maximize drug bioavailability and lessen its accidental effects. Inflammatory diseases which affect millions worldwide can be controlled by anti-inflammatory drugs as curcumin. While curcumin is recognized for its potent anti-inflammatory properties, its efficacy is limited by the extremely low water solubility (0.6 µg/ml) and bioavailability. Polymeric formulations effectively overcome these challenges by creating a sustained-release system that improves drug retention based on the larger size of the polymeric loaded drug in comparison to the free drug, ensures more consistent delivery because of the extended-release profile of the produced particles, and enhances therapeutic efficacy by size dependent internalization of nano range particles. The aim of this work is to establish a green, more advantageous and reliable polymeric delivery system that can be used for curcumin loading as polymeric nanoparticles at the adjusted size (100 to 200) for cell internalization.

Keywords:

BTK inhibitor, Curcumin, Nanoparticles, Polymeric system, Solubilization.