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(54) Title of the invention : DEVELOPMENT AND CHARACTERIZATION OF BAICALEIN-LOADED SOLID LIPID NANOPARTICLES FOR BRAIN TARGETING

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(57) Abstract :

The present invention relates to a pharmaceutical composition comprising baicalein-loaded solid lipid nanoparticles specifically designed for brain targeting applications. The formulation comprises baicalein, a neuroprotective flavonoid, encapsulated within a solid lipid matrix composed of glyceryl monostearate or tripalmitin, stabilized by poloxamer 188 and soy lecithin. The nanoparticles are prepared using hot homogenization followed by ultrasonication technique, yielding particles with mean size of 80 to 200 nanometers, polydispersity index below 0.3, negative zeta potential, and entrapment efficiency exceeding 75 percent. The formulation demonstrates sustained drug release over 48 hours and exhibits enhanced brain uptake through the blood-brain barrier compared to conventional drug suspension. The invention provides a promising drug delivery system for the treatment of neurodegenerative disorders including Alzheimer's disease, Parkinson's disease, and ischemic brain injury by combining the therapeutic benefits of baicalein with the brain targeting capabilities of solid lipid nanoparticles.

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