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(57) Abstract :
ABSTRACT Luteolin Thermosensitive In-situ Nanogel The present invention relates to a thermosensitive in-situ nanogel formulation comprising luteolin-loaded solid lipid nanoparticles (LT-SLNs) for targeted periodontal therapy. LT-SLNs are prepared using high-shear homogenization and ultrasonication by emulsifying a lipid phase containing Compritol 888 ATO and phospholipon 90G with an aqueous phase containing Tween 80. The nanoparticles are lyophilized with mannitol and incorporated into a cold gel base of Carbopol 934 and Poloxamer 407. The resulting nanogel remains a liquid at 4°C and undergoes sol-to-gel transition at approximately 32°C upon administration into the periodontal pocket. The formulation exhibits biphasic luteolin release for up to 192 hours, enhanced drug stability, and improved bioavailability. It demonstrates appropriate gelation time, pH, viscosity, sterility, and sustained antimicrobial action, making it an effective localized drug delivery system for treating chronic periodontitis. The nanogel is optimized using statistical software and complies with ICH guidelines for stability. Fig. 1

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