

Paclitaxel-Loaded PLGA-TPGS Nanoparticles for Intra-Articular Treatment of Rheumatoid Arthritis

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SUMMARY. The purpose of this research is to evaluate the efficacy of an intra-articular, paclitaxel-loaded PLGA-TPGS nanoparticle formulation in rabbit models of rheumatoid arthritis. Paclitaxel-loaded nanoparticles of poly(lactide-co-glycolide) (PLGA) and poly(lactide-co-glycolide)-d- α -tocopheryl polyethylene glycol 1000 succinate (PLGA-TPGS) were prepared and characterized. The paclitaxel-loaded PLGA-TPGS nanoparticles were found to be of spherical shape with an average size of around 150 nm. The *in vitro* drug release profile of both nanoparticle formulations showed a clear biphasic release pattern. Efficacy studies that included measurements of joint swelling, cell infiltration, proteo-glycan loss and chondrocyte necrosis demonstrated that the single injection of 80 mg of 10 % paclitaxel-loaded PLGA-TPGS nanoparticles significantly reduced all aspects of the chronic arthritic condition in rabbits, suggesting that paclitaxel-loaded PLGA-TPGS nanoparticles have considerable therapeutic potential for rheumatoid arthritis.

KEY WORDS: Nanoparticles, Paclitaxel, PLGA-TPGS, Rheumatoid arthritis

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