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Targeted drug delivery of injectable *in situ* gel of Methotrexate sodium for the treatment of rheumatoid arthritis**M P Venkatesh and T M Pramod Kumar**

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The present study aims to develop MTX-S (Methotrexate sodium) *in situ* gels as an effective way for the treatment of Rheumatic Arthritis (RA). The *in situ* gels composed of Pluronic F-127 as a polymer and Hydroxy Propyl Methyl Cellulose K4M (HPMC K4M) and Polycarbophil (PCL) as copolymers were manufactured by cold method. The *in situ* gels were characterized for gelation time, gelation temperature, syringeability, viscosity, sterility, *in vitro* release and drug content. The biocompatibility and efficacy of MTX-S *in situ* gels ascertained using histology analysis and Freund's complete adjuvant model, respectively. The results of the present study showed that the optimized formulation (M4) was thermo-sensitive and exhibited drug release of 93.26 ± 2.39 at 96 h. Moreover, MTX-S was evenly distributed in the optimized formulation which was sterile and syringeable through 18 gauze needle. *In vivo* study on the wistar rats showed significant decrease in rat paw volume during a 28 day study period. Thus, MTX-S *in situ* gel could be successfully used for targeting specific treatment of RA.

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