

## Polymer Nanocarrier for Rheumatoid Arthritis Therapy

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**Abstract :** To develop a potential nanocarrier for diagnosis and treatment of rheumatoid arthritis (RA), we prepared a hyaluronic acid (HA)-5 $\beta$ -cholic acid (CA) conjugate with an acid-labile ketal linker. This conjugate could self-assemble in aqueous conditions to produce pH-responsive HA-CA nanoparticles as potential carriers of the anti-inflammatory drug methotrexate (MTX). MTX was rapidly released from nanoparticles under inflamed synovial tissue in RA. In vitro cytotoxicity data showed that pH-responsive HA-CA nanoparticles were non-toxic to RAW 264.7 cells. In vivo biodistribution results confirmed that, after their systemic administration, pH-responsive HA-CA nanoparticles selectively accumulated in the inflamed joints of collagen-induced arthritis mice. These results indicate that pH-responsive HA-CA nanoparticles represent a promising candidate as a drug carrier for RA therapy.

**Keywords :** rheumatoid arthritis, hyaluronic acid, nanocarrier, self-assembly, MTX

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