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Co-administration of methotrexate and aceclofenac shows synergistic effect on rheumatoid arthritis when delivered through lipid nanocarriers

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Methotrextae (MTX), a potent disease modifying anti-rheumatic drug (DMARDs) and aceclofenac (ACE) a well-known NSAIDs, are widely used drugs for the treatment of rheumatoid arthritis. MTX and ACE were encapsulated in wellcharacterized lipid polymer hybrid Nanoparticles (LPHNPs) and nanostructured lipid carriers (NLCs) respectively. The efficiency of both drugs as mono- and cotherapy was assessed in lipopolysaccharide (LPS) treated and inflammation mimicked human monocytic (U937) cells. The efficiency of these drugs was confirmed by the estimation of surface inflammatory biomarkers (Immunocytochemistry) as well as transcript (RT-PCR), proteome (western blot), and histopathology. The ex-vivo results were corroborated by the results obtained in an experimentally induced (complete Freund's adjuvant supplemented with mycobacterium tuberculosis animal model) arthritis animal model. Our results present co-administration therapy (administration of MTX and ACE via LPHNPs & NLCs through intravenous and transdermal route, respectively) as an efficient therapeutic approach to treat rheumatoid arthritis. We have compared the market formulations of ACE gel and MTX administered through transdermal and subcutaneous route. Collectively, our results show the administration of developed combination drug delivery systems which may efficiently augment the enrichment of both drugs at the site of arthritis which in turn prodigiously suppresses the arthritis growth.

Biography

Rajeev K Tyagi completed his PhD and he is currently a Professor in Department of Periodontics, College of Dental Medicine, Augusta University, Augusta, USA and a part of Biomedical Parasitology and Nano-Immunology Lab, Amity University, India

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