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Self-assembling polymeric nanocarriers to target inflammatory lesions in ulcerative colitis.

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Abstract

We have developed a self-assembling polymeric nanocarrier to deliver the potent immunosuppressive drug Cyclosporine A (CsA) to inflammatory lesions in ulcerative colitis (UC) patients. Our nanocarrier has a high drug loading capacity and efficiently targets its CsA payload to the diseased tissue after local administration. Tissue drug levels were several orders of magnitude higher in animals suffering from a trinitrobenzene-sulfonic acid (TNBS) - induced colitis, compared to healthy control animals; no drug was detectable in the plasma, underlining the localized delivery strategy. An efficient reduction in inflammation score was obtained with a CsA dose of 1mg/mL. Therapeutic efficacy was comparable to 5-aminosalicylic acid (5-ASA), the positive control treatment in the TNBS-induced colitis model. Repetitive treatment of healthy animals with CsA nanocarriers for seven days was well tolerated with no alterations in colon histology.