

통증 및 근골격재활

발표일시 및 장소 : 10 월 26 일(금) 14:55-15:05 Room B(5F)

## OP1-2-5

### Anti-Inflammatory Effect of Low dose Triamcinolone-Nanoparticle Complex

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#### Objectives

Triamcinolone (TA) is a synthetic glucocorticoid that has been widely used for symptomatic arthritis and repetitive injections are necessary for treating the synovial inflammation of advanced arthritis. Unfortunately, use of high-dose repetitive corticosteroid injections is sometimes accompanied by severe and/or irreversible side effects (i.e., adrenal insufficiency, hyperglycemia, Cushing syndrome, Charcot arthropathy, etc.). For this reason, we assessed the efficacy of low dose triamcinolone-nanoparticle complex (TA-NP) for suppressing the inflammation of fibroblast-like synovial cells (FLS cells) and in vivo arthritis animal models.

#### Materials and Methods

The TA-NP complex was fabricated by non-covalently conjugating TA with PEG-coated NPs. We investigated the anti-inflammatory efficacy of TA-NP by observing the suppression of inflammatory-inducing genes from FLS cells of osteoarthritis patient (in vitro study). For vivo study, we investigated the collagen induced arthritis animal model, which tail of mice were injected with the mixture of Freund's complete adjuvant and Bovine Type II collagen. Mice were divided into 6 group: Control, NP, TA-NP (low dose & high dose), TA alone (low dose & high dose). We investigated inflammation score of feet and histologic examination and analysis of suppression of inflammatory cytokine such as TNF- $\alpha$ , IL-1 $\beta$ , IL-6, and IF- $\gamma$  using immunohistochemistry.

#### Result

Suppression of TNF- $\alpha$ , IL-1 $\beta$ , IL-6, MMP-1, and MMP-3 gene expression were observed from FLS cells, when treated with a low dosage of TA-NP (Figure 1, in vitro study). Score of inflammation from collagen induced arthritis animal model demonstrated inhibited inflammatory score of TA-NP using low doses (2 mg/kg) compared with conventional and low dose of TA (both 2 and 5 mg/kg). Suppressed expressions of TNF- $\alpha$ , IL-1 $\beta$ , IL-6, and IF- $\gamma$  using low dose TA-NP complex in histological examination, we confirmed the anti-inflammatory effect of a low dose TA-NP complex in vivo model

## Conclusion

Our in vitro and in vivo study demonstrated that our low dose TA-NP complex can suppress inflammatory-related genes expression and decrease the inflammation score in animal model, suggested the possibility of low dosage TA-NP injection therapy for arthritis treatment.

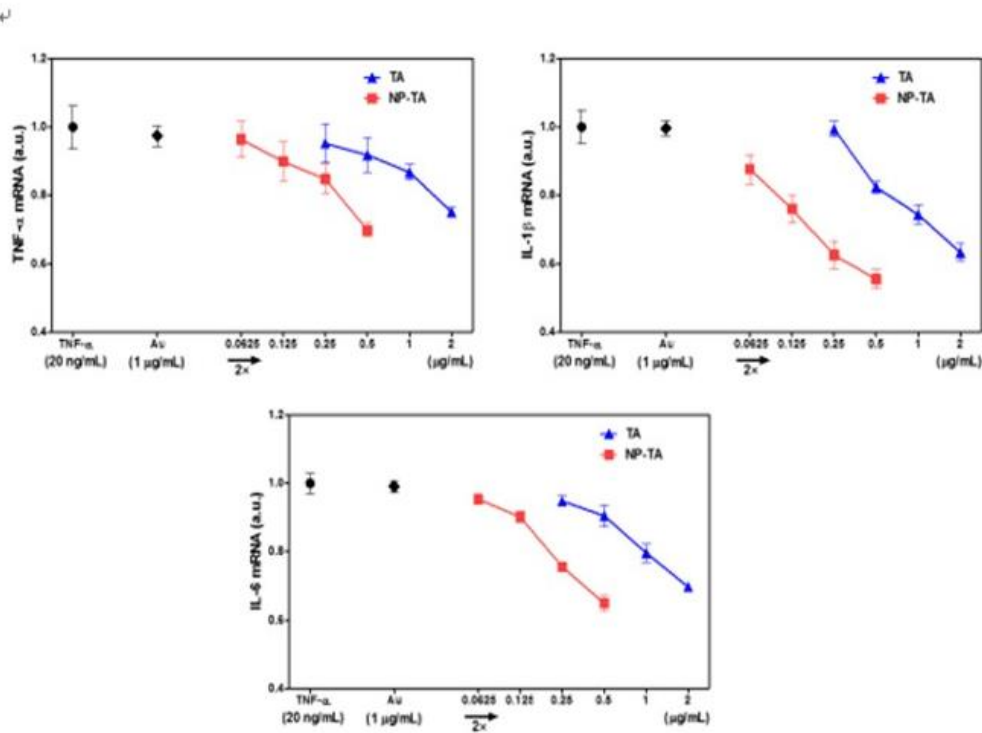


Fig1. Inhibitions of TNF- $\alpha$ , IL-1 $\beta$ , IL-6, MMP-1, and MMP-3 from fibroblast-like synovial cells (FLS cells), isolated from a patient suffering osteoarthritis when treated with a low dosage of TA-NP(in vitro study).