통증 및 근골격재활
발표일시 및 장소 : **10 월 26 일(금) 15:27-15:39 Room E(5F)**

## OP- Scientific 2-7

# The restoration of proliferative capacity and characteristics of human tenocyte by Vitamin D

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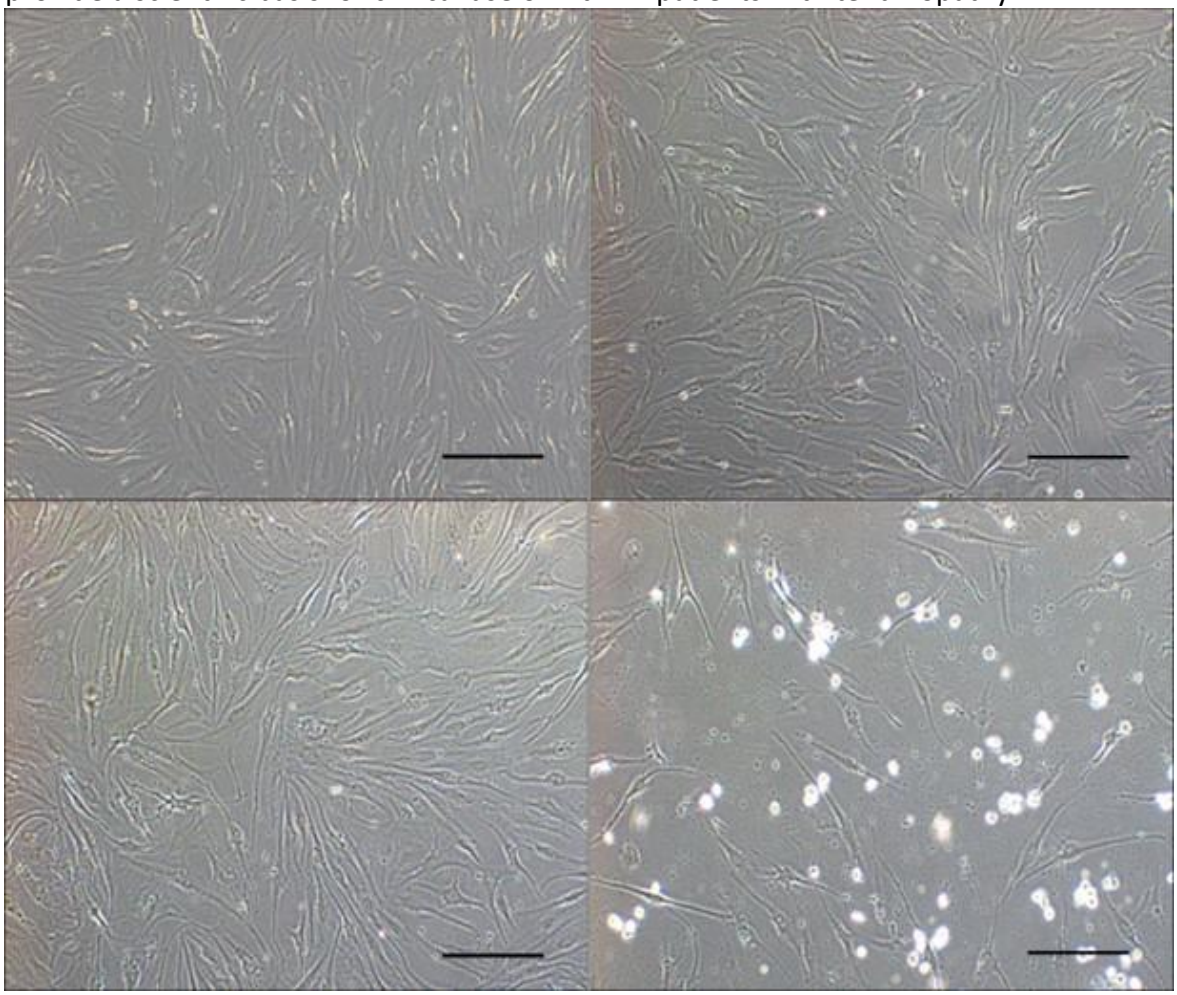
**Background**
Tendinopathies are prevalent and result in pain and activity limitations. To relieve pain in tendinopathies, glucocorticoid (GC) injection can be used. However, GC injection has harmful effects on the mechanical properties of tendon. Recent studies have shown that tenocytes exposed to GC in vitro lose their viability and properties. Vitamin D (Vit D), on the other hand, is known to improve muscle strength other than bone health and could be a candidate drug for tendon recovery. Therefore, we investigated whether Vit D could counterbalance the negative effect of GC on tenocytes.

**Methods**
Human tenocytes were exposed to dexamethasone (Dex) in concentrations from 1 to 100 μM. Cell morphology was observed using microscope and proliferation was measured by WST-1. The changes of tenocyte-specific mRNA expression such as tenomodulin (Tnmd), tenascin C (Tnc), scleraxis (Scx), mohawk (Mkx), collagen (Col) 1 and 3 were measured by qPCR. After exposure to Dex, tenocytes were treated with Vit D at concentrations of 10, 20 and 40 μM for 48 h. Tenocyte-specific protein expressions such as tenomodulin (TNMD) and tenascin-C (TNC) were confirmed by Western blotting. Reactive oxygen species (ROS) were analyzed by 2',7'-dichlorofluorescein diacetate probe.

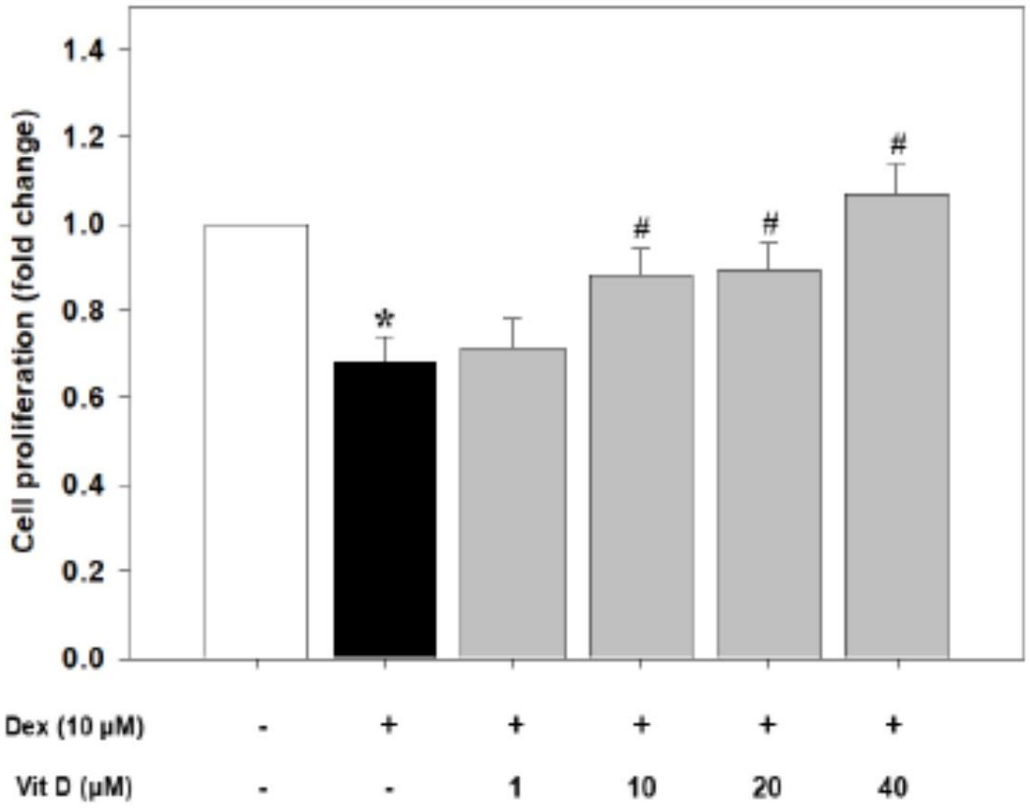
**Results**
After exposure to 10 μM Dex, the growth of tenocytes was significantly inhibited and gene expression of Tnmd, Tnc, Scx, Mkx, Col 1 and 3 also decreased. However, when co-treated with Vit D, cell proliferation increased dose-dependently and the expressions of TNMD and TNC were recovered to normal level. Furthermore, the ROS produced by Dex decreased. Finally, in relation to the cell signaling pathway, we found that the ratio of phosphorylated forms of ERK and p38 increased after Vit D co-treatment.

**Conclusions**

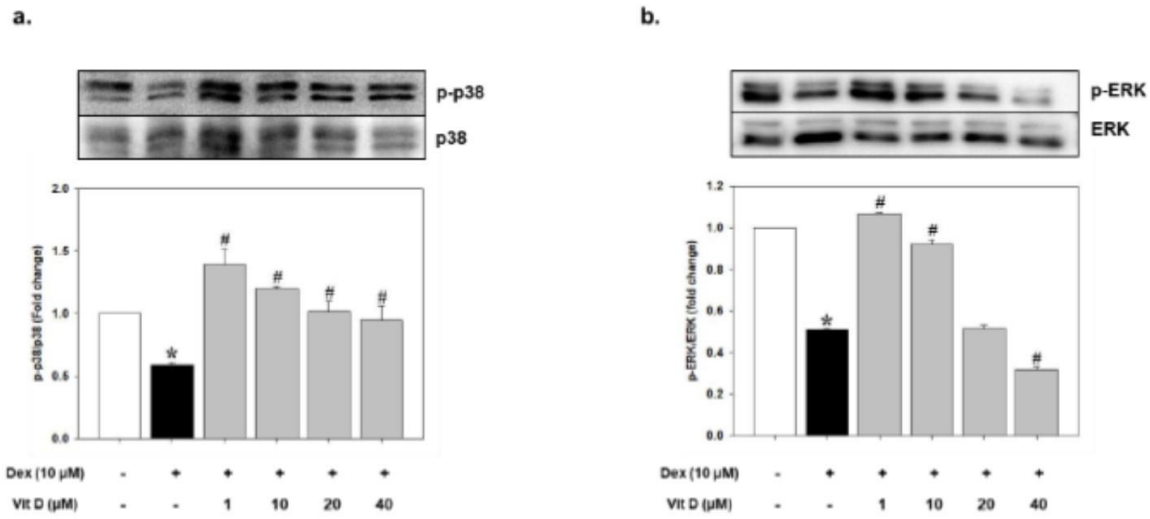
Vit D could play a protective role in tenocytes exposed to Dex. Therefore, our Results may provide a scientific basis for clinical use of Vit D in patients with tendinopathy.



Effect of dexamethasone in tenocyte




Cell proliferation by vitamin D in dexamethasone-treated tenocytes




Changes of p38 and ERK pathways by vitamin D in dexamethasone-treated human tenocytes