

Growth Factor – Induced Gene Expression of Human Adult Ligament Cells *in vitro*

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Being a fairly new field of science, tissue engineering serves to create desired tissue types for replacement or recovery throughout the human body. When grown in three-dimensional scaffolds or matrices, cell responses may or may not deviate from desired ones. However, naturally healing tissues within the body utilize numerous growth factors which greatly benefit recovery processes. Thus, understanding how different growth factors affect cells may prove to be useful in engineering tissues with desired properties.

While many growth factors have been implicated in ligament/tendon healing and regeneration studies, the roles of these molecules are not well understood. This study aims to investigate the response of human ligament cells to various growth factors. Reverse Transcriptase-Polymerase Chain Reaction and bright field imaging were used to investigate the gene expression and morphology of ligament cells when treated with different isoforms of Transforming Growth Factors (TGF) β and Growth and Differentiation Factors (GDF). Both TGF β and GDF up-regulated collagen type I production. Figure 1 compares day 11 cell responses of TGF β -1 and GDF-7 treated cells. Relative to controls, both TGF β and GDF appeared to increase cell proliferation, while TGF β increased cell size as well. Elucidating the effects of these growth factors on ligament cells *in vitro* may lead to a greater understanding of the role of TGF β s and GDFs in development, healing and regeneration of ligaments and tendons.

