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Expression of tgf-beta ligands during Sclerotome Development

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During early embryogenesis in vertebrates, somites are formed by the segmentation of the presomitic mesoderm (Gomez, Ozbudak, Wunderlich, Baumann. Lewis and Pourquie 2008). The somite possesses several domains within it and the ventral part of the somite is called the sclerotome. The sclerotome gives rise to the axial skeleton and tendons. Twist 1b and Twist 2 are genes that are expressed in the sclerotome during axial skeletal development. Our experiments were developed to help understand the roles of Twist1b and Twist2 in tendon development. By utilizing microinjection to alter gene expression, the Twist 1b and Twist 2 genes can be knocked down via morpholino within the sclerotome of zebrafish embryos. *In-situ* hybridization is used to visualize cells that express the genes of interest: Transforming growth factor beta 1a (TGFβ1a) and Transforming growth factor beta 3 (TGFβ3). TGFβ1a and TGFβ3 are proteins belonging to the transforming growth factor beta superfamily. The mechanical force of muscles can activate TGFβ signaling which is required for tenocyte (tendon cell) morphogenesis (Subramanian, Kanzaki, Galloway and Schilling 2018). Understanding tendon development and its relationship to TGFβ1a and TGFβ3 will be useful in efforts that focus on developing tendon injury treatments.