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Scleraxis Expression within the Axial Tendon Population in Zebrafish

Jessica Bernaba
Belmont University, jessica.bernaba@pop.belmont.edu

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Advisor: Nikki Glenn, Ph.D.

Zebrafish are a well-established model organism for vertebrate development. During embryonic development, a pattern of segmentation of mesoderm yields somites, which give rise to specific cell fates. Somites, bilateral blocks of mesoderm along the neural tube in developing vertebrate embryos, subdivide into sclerotome as the vertebrate matures. Depending on migratory position, sclerotome cells give rise to various components of the axial skeletal system, including bone, cartilage, and tendon. Each fate is determined by gene expressions within the sclerotome and occupy distinct domains of the body plan. By method of *in situ* hybridization, we studied the expression of the *scleraxis (scxa)* gene which is required for tendon formation in order to assess its expression within the axial tendon population. Research has found that *scxa* is necessary for the condensation and differentiation of specific tendon populations and that muscle is required for the formation of axial tendon as compared to cranial and limb regions. We are interested in understanding the mechanism by which the sclerotome differentiates into its fates. To alter sclerotome development, two genes expressed within the sclerotome were knocked down via morpholino injection at the single cell stage. Our results demonstrate that both the *twist1b* and *twist2* genes are necessary to induce *scxa* expression. In future studies, we seek to further analyze this induction through experimentation of the FGF pathway and other tendon progenitors, such as *pea3*.