

Ty Anderson, Catherine Stress, Sara Roberson PhD, Applied Science, Bluefield State University, Bluefield, WV 24701. The role of chemokine signaling in habenular axon projection in zebrafish.

The habenula is a conserved region of the brain that affects emotion and behavior, and is located in the dorsal diencephalon of zebrafish. Previous work has shown that chemokine signaling plays a significant role in the direction of habenular axon growth. The chemokine receptor *cxcr4b* is expressed in habenular precursors and the Cxcr4b protein is found on the newly forming habenular axons. Chemokine ligands Cxcl12a and Cxcl12b are both found in the region around the developing habenula. The focus of this research is to examine the relationship of these two chemokines to determine their respective roles in directing axon outgrowth. The relative expression domains of the two chemokine ligands are of interest, as it is unknown if their expression domains overlap. Additionally, we are identifying fish that are heterozygous for a mutation in the *cxcl12b* gene to examine habenular axons in larvae lacking functional Cxcl12b. To explore the role of Cxcl12a we have performed overexpression experiments using a heat shock protocol in fish carrying a fluorescent marker of the habenular and its axons. However, the current transgenic method to confirm overexpression of the Cxcl12a chemokine ligand interferes with visualization of the habenular region. We plan to employ a chemical protocol to validate disruption of chemokine signaling that does not compromise observation of the habenula and its axons.