

The role of Cxcl12b and axon projection in the zebrafish habenula. *Alicia Horn, Sara Roberson, PhD., *Department of Arts and Sciences*, Bluefield State College.

The habenula is a brain region that is conserved in all vertebrates. It plays a role in regulating emotion-related behaviors such as anxiety, fear, punishment versus reward, depression, and addiction. The habenula has also been implicated in schizophrenia, bipolar disorder, and major depressive disorders. Earlier studies indicate that chemokine signaling is required for the habenular axons to project in the correct direction, towards the midbrain. Chemokines are small cytokines, or signaling proteins, secreted by cells. A major role of chemokines is to act as a chemoattractant in guiding the migration of cells. The two chemokine signals present in the habenular region are Cxcl12a and Cxcl12b. Mutations in Cxcl12a have been shown to produce an axon phenotype however, the role of Cxcl12b in habenular axon projection has yet to be determined. Additionally, previous publications suggest that *cxcl12a* and *cxcl12b* may be expressed in non-overlapping domains in this area and may have unique functions in this process. We plan to perform an RNA *in situ* hybridization to determine if *cxcl12a* and *cxcl12b* co-express in the habenular region. To test if Cxcl12b is essential for habenular axon projection, we will overexpress *cxcl12b* in zebrafish embryos carrying a transgenic marker for habenular neurons. We will visualize the habenular axons in larvae 5 days post fertilization using fluorescent microscopy and score the images based on previously published methods. We hypothesize that if Cxcl12b is overexpressed then habenular axons will project in the wrong direction, towards the forebrain. (Supported by NIH Grant P20GM103434 to the West Virginia IDeA Network for Biomedical Research Excellence; NIH WV INBRE Grant#)