SWAYDE CARPENTER#, ANA RAMIREZ, AMY PARSONS-WHITE, and NADJA SPITZER, Department of Biological Sciences, Marshall University, Huntington, WV, 25755, Department of Biological Sciences, Department of Biological Sciences, Department of Biological Sciences. **Changes in morphology of adult neural stem cells following low-level manganese exposure in vitro.**

Adult neural stem cells (NSCs) are neural progenitor cells that differentiate into neurons and glial cells in the brain throughout an organism's life. The sub ventricular zone(SVZ) in mammals holds a niche of NSCs that are involved in neurologic plasticity, brain damage repair, behavioral response to stimuli, and learning and memory formation. Cultured SVZ-derived NSCs offer an accessible model for investigating the cellular and molecular mechanisms in brain function. Manganese causes neuronal dysfunction, but its cellular mechanisms are unknown. While exposure to manganese results in a neurodegenerative condition known as manganism that mimics symptoms of idiopathic Parkinson's Disease, people living in mining and industry communities are chronically exposed to manganese through drinking water or inhalation at levels below EPA limits. We are investigating the effects of such low-level manganese on cellular functions of neural cells. The investigation is directed towards examining changes in intracellular signaling pathways and cellular mechanisms in adult NSCs exposed to manganese of adult neurogenesis. We found that MnCl2 impairs normal development and proliferation of neural stem cell behavior. Cultured adult NSCs from the SVZ displayed abnormal morphology when exposed to 500uM and 800uM concentrations of MnCl2 for 24 hours. However, the manganese concentrations causing morphology impairment do not undergo apoptosis. Excess manganese exposure is a concern for West Virginia due to the abundance of welding, mining, and metal manufacturing industries in the area. This research recognizes the unique vulnerability of the brain to manganese and could be used for regulation of manganese exposure limits.