MADISON MANLY AND CHARLES ANTHONY. Department of Chemistry/Biochemistry West Virginia Wesleyan College Buckhannon, WV 26201. Apoptosis through MMR repair in response to alcohol induced DNA damage.

Neuronal stem cells that are exposed to moderate doses of alcohol sustain a large amount of oxidative stress and suffer significant DNA damage. Many of the symptoms associated with Fetal Alcohol Spectrum Disorders (FASD) are associated to this cell loss. The MMR system is responsible for eliminating cells that suffer severe DNA damage, and it has been associated with a p73 dependent apoptosis. The objective of this study was to determine if a p73, MMR mediated, apoptosis could be responsible for the death of alcohol exposed neuronal stem cells. The experimental group of NSCs was exposed to 400 mg/dL of alcohol. Western blot analysis was used to determine the difference between hMSH2, Chk1, and p73 protein levels in experimental cells and control cells. Immunohistochemistry was performed to determine the prevalence of the purine derivative, 8-oxoguanine, and to determine if the if the MMR proteins, hMSH2 and PMS2, are recruited to this lesion site. Given that hMSH2's expression is regulated by E2F1, and the overexpression of E2F1 is elevated from alcohol exposure, it is likely the alcohol treated cells will exhibit higher levels of hMSH2. Since Chk1 is responsible for cell cycle arrest after DNA damage, its expression level should also be elevated.