University of New Haven

Department of the Biology and Environmental Sciences

Summer Undergraduate Research Fellowship (SURF)

Summer 2017

"Evaluating cell survival and DNA damage of cells that are deficient in a DNA repair gene exposed to disinfectant chlorine dioxide"

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Abstract:

Chlorine dioxide (ClO_2) is an effective biocidal product used to decontaminate medical utensils, swimming pools, and for the treatment of drinking water. ClO_2 is thought to be an oxidizing agent however the mechanism of action is not well known. The purpose of this research was to compare the cell survival rates and DNA damage of mouse embryonic fibroblasts (MEF_1) cells that are normal (MEF WT) versus cells that lack the essential DNA repair polymerase beta protein (MEF Pol β). An MTT which is a colorimetric assay for assessing cell survival and metabolic activity, was performed on the two cell lines with ClO_2 concentrations ranging from 2.5mM to 250mM. The ClO_2 concentration of 2.5mM showed a large gap between the MEF WT and MEF Pol β cells indicating increased cell death in the MEF Pol β cells. Flow cytometry data obtained from MEF WT cells stained with the anti-phosphor H2AX antibody showed that cells treated with ClO_2 experienced more DNA double stranded breaks than untreated cells. The results suggest that ClO_2 can be used as a possible treatment for cancer cells which are usually deficient in DNA repair genes because the MEF Pol β cells experienced more cell death.

Acknowledgements:

A special thanks to the Summer Undergraduate Research Fellowship (SURF) program at the University of New Haven, Carol Withers, and Lynne Resnick for this unique opportunity to gain research experience as an undergraduate. Thank you, Dr., Senejani for being a great advisor and welcoming me into your lab. I also thank Niuska Alvarez for giving me this opportunity to continue her research and graduate students Joey Magrino and Amanda Marston for their extensive guidance in lab.

Autobiography:

My name is Syria McCullough and I am a junior at the University of New Haven. Next, I plan to attend graduate school and ultimately work in a lab pertaining to one of my majors, Forensic Science and Biology.