

8th CLINICAL MICROBIOLOGY CONFERENCE

October 26-28, 2017 | Paris, France

Phosphylated oximes increase organophosphate toxicity

Sarah Eysoldt

Florida International University, Miami, USA

Oximes are small chemical compounds utilized as treatments for organophosphate toxicity. Organophosphorous nerve agents prevent the enzyme acetylcholinesterase from performing its function - breaking down the neurotransmitter, acetylcholine. Nerve agents inhibit acetylcholinesterase by phosphorylation. Oximes dephosphorylate acetylcholinesterase, restoring normal function. When this takes place, the end result is a potentially fatal by-product known as a phosphorylated oxime. Phosphorylated oximes may be dangerous because they can inhibit acetylcholinesterase more potently than organophosphates; resulting in toxicity rather than a cure. The objective of this study is to evaluate inhibitory capacity and the toxicity of phosphorylated oximes to mammalian cells. The series of experiments conducted involved varying amounts of different oximes (K027, 2-Pralidoxime, etc.) and organophosphates (asinphos, dicrotophos, etc.) on NIH-3T3 cells, and SH-SY5Y cells. These experiments included: in- cell westerns, colorimetric assays, flux analysis, mass spectrometry, and a novel on- cell western blot. These experiments will examine the contributions of oximes, organophosphates, and the combination of both chemicals on acetylcholinesterase function and off- target toxicity. The results of this study suggest that the combination of nerve agents and oximes increases toxicity within neuronal cells by allowing the ability to permeabilize the cell membrane and disrupt normal functioning. All experiments conducted are indicative that the treatment method of oximes is deadly, more so than nerve agents alone. From these results, it can be determined that oximes are not a safe and effective treatment method for organophosphate toxicity. The findings in this study have the potential to change how organophosphate intoxication is treated.

Biography

Sarah will graduate with a B.S in molecular biology and anthropology at the age of 21 years from the University of South Florida. She has completed multiple years of research at Florida International University, and has taken part in novel cancer research of an experimental drug at Moffitt Cancer Center. She has won a national conference competing against 4000 attendees. She also currently works at the Bureau of Public Health Laboratories in Tampa, tracking virus mutations and participating in virus surveillance across the state of Florida, and communicating data to the Centers for Disease Control and Health Prevention.

seysosarah@gmail.com

Notes: