

# PhD Oral Defense



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Graduate Student

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**26 April 2018, Thursday  
10am – 11am**

**MD10 Anatomy Museum  
Level 2, Seminar Room**

## **Cytotoxicity Mediated by L-Amino Acid Oxidase Isolated from the Venom of *Crotalus Michellii Pyrrhus***

Snake venoms contain L-amino acid oxidase (LAAO), which is known to induce apoptosis. In this study, the mechanism of cytotoxicity of LAAOcmp, an LAAO isolated from the venom of *Crotalus michellii pyrrhus*, was investigated in prostate cancer cells *in vitro*. It was found that LAAOcmp was both cytotoxic and genotoxic to LNCaP cells as evidenced by the induction of apoptosis and DNA damage. LAAOcmp reduced the viability of LNCaP cells which was accompanied by abolishment of the mitochondrial membrane potential. LAAOcmp also induced endoplasmic reticulum stress and autophagy as demonstrated by electron microscopy and the associated gene expression analysis. LAAOcmp was observed to enhance reactive oxygen species (ROS) production, concomitant with an increase in antioxidant Peroxiredoxin 1 (PRX1) expression. siRNA-mediated silencing of PRX1 expression sensitized LNCaP cells to the cytotoxic and ROS-inducing effects of LAAOcmp. On the other hand, deglycosylation of LAAOcmp and co-treatment with catalase, glutathione, guanabenz, chloroquine and bafilomycin A1 decreased the cytotoxicity of LAAOcmp. The findings show that LAAO is a potential ROS-based cancer therapeutic.