## Acetylcholinesterase from the brain of Monopterus albus as detection of metal ions

## ABSTRACT

Overwhelming amount of heavy metals discharged due to industrialization is a serious global concern. Thus, an investigation was done on acetylcholinesterase (AChE) from Asian swamp eel, Monopterus albus, as an alternative biosensor to detect various metal ions. AChE from the brain of M. albus was purified through ammonium sulphate precipitation and procainamide affinity chromatography. Enzyme recovery was obtained at 38.73% with the specific activity of 1847 U µg-1. The Michaelis constant (Km) value and maximal velocity (Vmax) were determined at 8.910 mM and 29.44 µmol min-1 mg-1, respectively for acetylthiocholine iodide (ATC). Based on effective coefficient ratio, AChE from M. albus brain showed higher affinity to ATC compared to butyrylthiocholine iodide (BTC) and propionylthiocholine iodide (PTC) at the value of 3.304, 1.515, 2.965 Vmax.Km -1 respectively. Optimum activity of AChE was obtained at 40°C and incubated in 0.1M Tris HCl buffer pH 9.0. Inhibition study performed on 10 heavy metals of resulted in this descending order inhibition mercury<chromium<zinc<copper<arsenic<silver<cobalt<cadmium<lead<nickel, with mercury and chromium showing more than 50% inhibition at 10 ppm. Data from this study can be further utilized to develop a cheaper, easier, and faster heavy metal detection method as compared to conventional methods available