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MEETING ABSTRACTS

AN ALTERNATIVE SUBSTRATE FOR HUMAN ERYTHROCYTE ACETYLCHOLINESTERASE ACTIVITY DETECTION

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Acetylcholinesterase (AChE) is the target of pesticides like organophosphates (OP). OP exert their toxic effect by irreversible phosphorylation of the AChE leading to cholinergic crisis and neurotoxicity. Erythrocyte AChE is the surrogate biomarker for the detection of inhibition by OP. There are numerous methods for the detection of AChE activity.[1] Unfortunately, the method popularly used for AChE detection has inherent limitations.[1] To overcome such a problem, we have explored 1-Naphthyl acetate (1-NA) as an alternative substrate for the assessment of AChE activity using in silico tools and in vitro experiments. The in silico results have shown that 1-NA is a better substrate for AChE. The fluorescence and chromogenic properties of 1-naphthol were studied. The results proved that 1-NA has specificity for AChE similar to Acetylthiocholine. Moreover, it was observed that in terms of Michaelis constant (Km) 1-NA is a better substrate than Acetylthiocholine. We believe that 1-NA is a candidate substrate for development of a method for screening of OP poisoning.

Keywords: 1-naphthyl acetate; organophosphorus pesticides; acetylcholinesterase

References

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