



Apr 18th, 1:30 PM - 2:30 PM

The Total Synthesis of a Conformationally Constrained Organophosphorus Analog of Acetylcholine

Dustin Mergott
Illinois Wesleyan University

Jeff Frick, Faculty Advisor
Illinois Wesleyan University

Follow this and additional works at: <https://digitalcommons.iwu.edu/jwprc>

Mergott, Dustin and Frick, Faculty Advisor, Jeff, "The Total Synthesis of a Conformationally Constrained Organophosphorus Analog of Acetylcholine" (1998). *John Wesley Powell Student Research Conference*. 15.

<https://digitalcommons.iwu.edu/jwprc/1998/posters2/15>

This is protected by copyright and/or related rights. It has been brought to you by Digital Commons @ IWU with permission from the rights-holder(s). You are free to use this material in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/ or on the work itself. This material has been accepted for inclusion by faculty at Illinois Wesleyan University. For more information, please contact digitalcommons@iwu.edu.

©Copyright is owned by the author of this document.

Poster Presentation 33

THE TOTAL SYNTHESIS OF A CONFORMATIONALLY CONSTRAINED
ORGANOPHOSPHORUS ANALOG OF ACETYLCHOLINE

Dustin Mergott and Jeff Frick*

Department of Chemistry, Illinois Wesleyan University

Acetylcholinesterase (AChE) is an important enzyme in the human nervous system. AChE helps nerves function by catalyzing the hydrolysis of acetylcholine (ACh) into choline and acetate. AChE has been targeted as having a potential role in the pathology of neurodegenerative diseases such as Alzheimer's disease. It is known that AChE is inhibited by organophosphorus compounds such as soman and sarin. Past research has focused on the use of different organophosphorus inhibitors to study the structure of AChE, the mechanism by which it catalyzes the hydrolysis of ACh, and the stereoselectivity of AChE phosphorylation. This research has yielded conflicting results about the stereoselectivity of the phosphorylation of AChE. We propose that a conformationally constrained analog of ACh may provide more definitive answers about the stereoselectivity of the mechanism of AChE phosphorylation. These answers could lead to a better understanding of how AChE catalysis works. We intend to synthesize a novel organophosphorus analog of ACh. Long term goals of the project include the synthesis of all four stereoisomers of this inhibitor followed by biological assays to determine the inhibitory potency of these compounds.