

**University of Rhode Island  
Department of Chemistry**

Student Seminar

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**Chemical Methods Applied to Enzyme Inhibition**

Enzymes, or biological catalysts, are of paramount importance for living organisms. These substances interact with substrates by virtue of being complementary to a substrate – this match is also known as “lock-and-key” interaction. Depending on the nature and functionality of an enzyme and substrate, this interaction gives rise to different chemical reactions taking place in a living organism. Enzyme inhibition occurs when a substance is introduced and disrupts the “smooth” interaction between an enzyme and substrate. Disruption of this kind is known as “enzyme inhibition”.

In a recent study, certain inhibitors were shown to bind covalently to an array of enzymes thereby causing slower rates of the reactions between these enzymes and their respective substrates. In the course of the given research work, a set of potent electrophilic agents was evaluated for their non-covalent interaction and subsequent covalent inhibitory binding with enzymes. The effectiveness of the ensuing inhibition events was assessed through kinetic experiments. Furthermore, the cytotoxicity of the inhibitors and nature of formed adducts, “inhibitor-enzyme”, was investigated.