

Trapping the Enzyme-catalyzed Reactions using different Approaches of X-ray Crystallography

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Abstract: Molecular details of substrate recognition, binding, and catalysis plays an important role in understanding the fundamental enzyme-catalyzed reactions. However, co-crystal structure determination of enzyme-substrate complexes can be challenging due to photoelectric effects of X-ray that can catalyze the reaction *in-situ* leading to the product formation. Here, two approaches have been presented; first, the co-crystal determination of one of the most poisonous Botulinum neurotoxin (BoNT) with its neuronal substrate-cum-inhibitor VAMP using traditional X-ray Crystallography and, second, determination of crystal structure of Stachydrine-demethylase (stc2) using X-ray free-electron laser using drop-on-demand Serial Femtosecond Crystallography.