S27-4 Strategies for the Development of Designer Protein Catalysts: Enamine Catalysis

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We have developed designer protein catalysts that accelerate aldol, retro-aldol, and Michael reactions via an enamine mechanism. Our strategies for the creation of the designer catalysts include (i) screening of catalysts with 1,3-diketone derivatives that covalently react with nucleophilic amino groups, (ii) screening and evaluation of catalysts using fluorescence-based catalytic assays with fluorogenic substrates, and (iii) computational design of catalytic active sites with transition state models of the reactions. In this talk, the strategies, the state of our success, and further approaches for the creation of superior designer catalysts will be discussed.