Phosphate tether-mediated approaches to bioactive natural product synthesis (*Prof. Paul R. Hanson*). The primary goal of this project is to implement phosphate tether-mediated methods developed in our laboratory for the synthesis of complex biologically relevant natural products. In the course of this work, the synthetic and biological utility of cyclic phosphates will be explored. IKD-8344 is a novel 28-membered macrodiolide antibiotic that was isolated from an unidentified *Actinomycete* strain. IKD-8344 possesses selective antifungal activities against the mycelial form of *Candida albicans*, a human fungal pathogen that frequently infects immunocompromised and immunosuppressed patients. Interest in synthesizing IKD-8344 is sparked by its intriguing molecular complexity, functional similarities and disparities to other biologically active ionophores, and potent biological properties, which have not been fully explored in structure-activity relationship studies. This project will involve the development of enabling technologies for small molecule and natural product synthesis. The REU student will work closely with a graduate student or postdoctoral mentor who will train him or her to acquire state-of-the art skills in synthesis and characterization of organic compounds. The student will gain familiarity with modern approaches to solving biologically relevant problems in early phase drug discovery and chemical biology. Prof. Hanson has 7 peer-reviewed publications co-authored by NSF REU participants, and many publications with other undergraduates, including 12 since 2010.

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