

**New methods in phosphorus chemistry** (*Prof. Paul R. Hanson*). One of the major goals of Prof. Hanson's research is to investigate new synthetic methods in phosphorus chemistry with an emphasis on developing a fundamentally new approach for the use of phosphates and their analogs in the synthesis of building blocks for complex, biologically active targets. Temporary tethering of two advanced intermediates constitutes a powerful tool in streamlining asymmetric synthetic sequences *en route* to natural products. Current efforts of the Hanson group are aimed at exploring the use of temporary phosphate tethers to generate mono- and bicyclic phosphates and subsequent selective cleavage reactions that exploit latent leaving group ability provided in the phosphate tether. REU participants will explore two underdeveloped aspects of the phosphate chemistry: their use as *temporary tethers* capable of *multivalent activation*, *i.e.*, activation of multiple functional groups upon leaving of the phosphate monoanion. Thus, REU students will be actively involved in developing new phosphate methodology to showcase phosphates as synthetic tools in organic chemistry. Overall, students will gain valuable experience in organic protocols and efficiently completing synthetic sequences. Concurrently, they will partake in literature research, compound characterization (NMR, IR, MS, group problem sets), and presentations of their research. Since 1999, Prof. Hanson has published nine papers with undergraduate co-authors including six with REU students.

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2. Moore, J. D.; Herpel, R. H.; **Lichtsinn, J.**; Flynn, D. L.; Hanson, P. R. "ROMP-Generated Oligomeric Sulfonyl Chlorides as Versatile Soluble Scavenging Agents". *Org. Lett.* **2003**, *5*, 105.
3. Moore, J. D.; Sprott, K. T.; **Wroblewski, A. D.**; Hanson, P. R. "Double Diastereoselective Intramolecular Cyclopropanation to *P*-Chiral [3.1.0]-Bicyclic Phosphonates". *Org. Lett.* **2002**, *4*, 2357.
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5. Dougherty, J. M.; Hanson, P. R.; Klein, T. A.; Moore, J. D.; Probst, D. A.; Robinson, R. E.; **Snelgrove, K. A.** "Ring-Closing Metathesis Strategy to Cyclic Sulfamide Peptidomimetics". *Tetrahedron* **2000**, *56*, 9781.
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