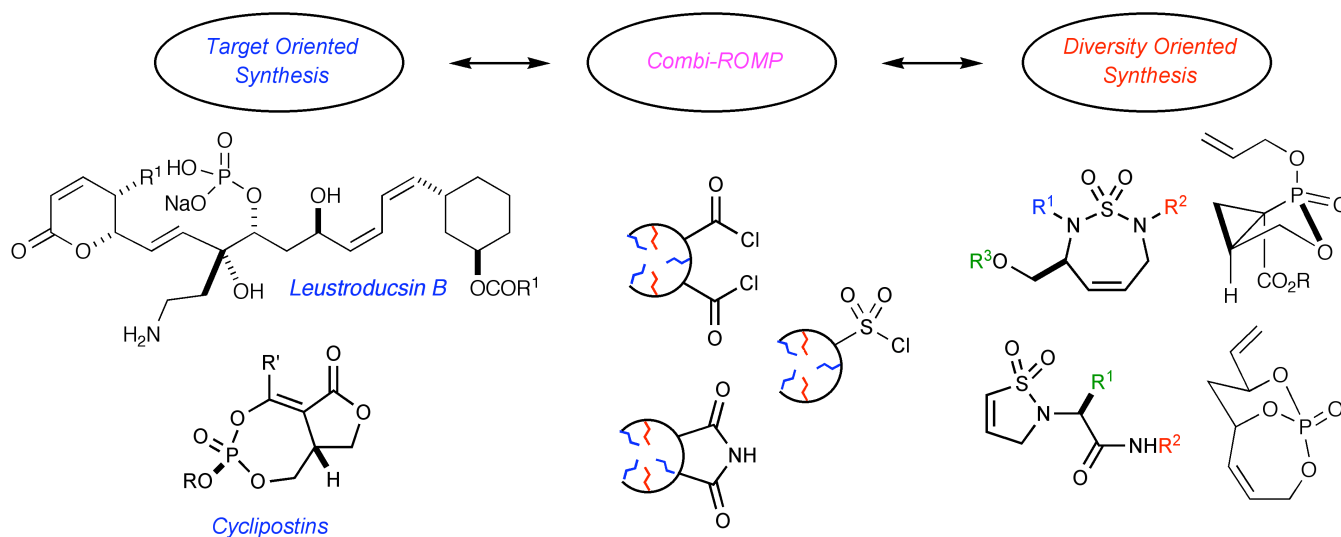


# New Strategies to Diverse Heterocycles and Functional Oligomers

The major goal of our research program is the development of new synthetic routes to structurally diverse phosphorus- and sulfur-containing small molecules that will serve as building blocks for the synthesis of novel pharmaceutical agents and various natural products. In particular, we have focused our attention on the utilization of both ring-closing metathesis (RCM) and intramolecular cyclopropanation (ICP) reactions as a means to produce *S*- and *P*-heterocycles exhibiting both biological and synthetic utility. Central to these methods is the generation of *P*-chiral motifs via desymmetrization processes and/or the use of temporary phosphorus tethers (*P*-tethers) en route to phosphonosugars, DMP 323 analogs and an array of biologically potent natural products.



Another facet of our program is aimed at using ring-opening metathesis polymerization (ROMP) en route to the generation of high-load, soluble oligomers as tools for organic synthesis and combinatorial purification strategies. Two general strategies are being investigated: i) *in situ* ROM polymerization of norbornenyl-tagged monomers mediated by the Grubbs catalyst as an integrated and general purification operation, and ii) utilization of ROM polymerization to produce *high-load*, functional oligomers with *tunable solubility profiles* that can be exploited in library production. Fundamental to this effort is the development of ROMP technologies such as capture-ROMP-release, scavenge-ROMP-filter, ROMP-scavenge-filter, and soluble ROMP supports.

## Prospective Graduate or Undergraduate Students:

If you are interested in joining our group, and would like more information, feel free to [e-mail](#) Paul and/or make an appointment to speak with him. You can also visit the [University of Kansas](#) website (info on [Graduate School](#)) and the [Chemistry Department](#) website (info on [Graduate Program](#)).

Our group is committed to training scientists for careers in both academic and industrial environments, and to that end provide a number of training opportunities. Among these, include both Wednesday and Friday problem sets, which expose the organic synthetic student to current literature in the form of "fill in the blank" or "roadmap" problems based on a recently published article. Our group also engages in **Molecule of the Month** meetings (MOM-meetings), in which students work in teams to propose synthetic routes towards the construction of natural products. Most training takes place in the lab itself, including the use of modern synthetic techniques, training in NMR, Gas Chromatography, High Performance Liquid Chromatography, gel permeation chromatography, light scattering, microwave synthesis and data base searching techniques.

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