

# ORGANIC SEMINAR

## Total Synthesis: A Bridge Between Art and Science

### Marc Harper

Graduate Student, Ghosh Group, Purdue University



**Abstract:** Total synthesis is not simply a science, it is an art which requires a deep understanding of the principles of chemistry as well as a sense of creativity. Through this, we are able to push the boundaries of what is possible. Often, we are challenged by nature to mimic its most intricate designs.

To this end, Feng and coworkers isolated alkaloids with an unprecedented tetracyclic tetrahydroquinoline – oxazine – ketohexaside fused framework in low quantities from *Lycium Barbarum* fruit, named Lycibarbarines A-C and reported their neuroprotective activity. The first total synthesis of this molecule was carried out in 11 steps, with a longest linear sequence of 6 steps, from commercially available starting materials. This synthesis features a Reimer Tiemann formylation and a spiroketalization reaction. The route is amenable to facile generation of derivatives in the interest of creating a new class of HIV-1 protease inhibitors with these novel frameworks as P2 ligands.

Additionally, we began efforts towards the total synthesis of complex natural products Chafurosides A and B belonging to the class of C-glycosyl flavonoids and exhibiting potent anti-inflammatory activity. This seminar will discuss the trials and strategies of total synthesis in the Ghosh Group.



Tuesday, April 29, 2025



4:30 pm



WTHR 104