Genome sequencing and pathway elucidation studies of nature’s biodiversity, including plants, ocean bacteria and blue-green algae, have created quantum leaps in developing our understanding of “How Nature biosynthesizes compounds with astounding diversity?” In today’s high-throughput era, identification of putative gene clusters responsible for secondary metabolic pathways is routine, while significant challenges arise in establishing enzyme function for select genes of those clusters. In order to validate these novel biosynthetic machinery, we synergize tools such as microbial culturing, genome sequencing, asymmetric synthesis, heterologous enzyme expression, biochemical assays and tandem MS. The incentive for pursuing this challenge is two-fold: 1. We embark on a journey that unravels remarkable biocatalysts that generate unique functional groups and 2. These natural products are selective bioactive agents and inspire lead optimization against various pathologies. My seminar will highlight recent successes in elucidating the biosynthetic steps leading to a diverse array of secondary metabolites including an ~80-member super family of anti-cancer alkaloids from cyanobacteria. Furthermore, we have recently characterized unique cyclic dipeptide synthases, prenyltransferases and modular rapamycin-like pathways in marine actinomycetes. I will present highlights of projects that have recently culminated in targeting cancer, serious bacterial pathogenesis and biochip applications.

Wednesday 2/18/15
4:45 pm W201
Science Center, Physics Building

A reception will be held at 4:30 in the Anderson Lounge
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