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Department of Chemistry

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**Natural Product Biosynthesis:**

**Inspiration for Chemistry, Enzymology, and Drug Discovery**

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**Abstract:** Natural products are among the best sources of drugs and drug leads and serve as outstanding small molecule probes for dissecting fundamental biological processes. Natural product biosynthesis continues to push the frontier of modern chemistry, biochemistry, and molecular biology by revealing novel chemical reactions, complex enzyme systems, and intricate regulatory mechanisms. The progress made in the last two decades in connecting natural products to the genes that encode their biosynthesis has fundamentally changed the landscape of natural products research. Synthetic biology has made it possible to produce designer analogues by rational metabolic pathway engineering. Genome mining has allowed targeted discovery natural product scaffolds by exploring the vast combinatorial biosynthesis repertoire found in Nature. Our efforts on the enediyne natural products will be presented to highlight the progress of the field and impact of the enediynes on modern chemistry, biology, and medicine.

**Brief Biography:** Born and raised in China, Ben received B.Sc. from Hangzhou University (1982), M.S. from the Chinese Academy of Sciences (under the Prof. Chutsin Liu, 1984), Ph.D. from Oregon State University (under Prof. Steven J. Gould, 1990), all in chemistry, and carried out postdoctoral research in Mol. Biology and Biochemistry at University of Wisconsin-Madison (under the late Prof. C. Richard Hutchinson, 1991-1995). Ben served on the faculty at the University of California, Davis (Department of Chemistry, 1995-2001) and University of Wisconsin-Madison (School of Pharmacy and Department of Chemistry, 2001-2010) before joining The Scripps Research Institute (TSRI) in 2011. Currently, Ben is Professor of Chemistry and Molecular Medicine and serves as the Chair of the Department of Chemistry for the TSRI Jupiter campus and Director of Natural Products Library Initiative at TSRI.

**Research Interests:** The Shen lab takes a multidisciplinary approach to study natural product biosynthesis in actinomycetes by asking the following questions: what are the reactions available in nature, what are the enzymatic mechanisms of these reactions, how are these reactions linked to produce complex structures, what are the regulatory mechanisms of these pathways, and, ultimately, how can we manipulate nature's biosynthetic machinery for the discovery and development of new drugs. The Shen lab has authored >255 publications and 11 published patents (<http://www.scripps.edu/research/faculty/shen>).