Total Synthesis and Biological Evaluation of Several Nuphar Alkaloids and their Derivatives

The hydroxylated dimeric nuphar alkaloids are found in the common yellow water lily. In particular, 6-hydroxythiobinupharidine has been shown to induce apoptosis in human leukemia cell lines (U937) faster than any known small molecule. However, the only two studies concerning their biological mechanism of action are inconclusive. The first synthesis of any dimeric Nuphar alkaloids was reported in 2013, but was of an inactive compound. This lecture will describe our work in carrying out the first total syntheses of the biologically active hydroxylated dimeric nuphar alkaloids.¹² We also report novel methods for preparing the quinolizidine core,³ as well as apoptosis data on several other compounds, including unnatural monomeric analogs previously unknown to nature.⁴

Leading References:


Short Bio – Prof. Wu obtained his bachelor’s degree from Princeton University in 1998 and then took a position as an associate chemist at Merck Process Research for two years before attending Harvard University where he obtained his PhD in chemistry from Prof. David Evans. Following this, he was an NIH postdoctoral scholar with Prof. Barry Trost at Stanford University before beginning his independent academic career at Dartmouth College in 2007 where he was promoted to associate professor in 2013. Research in the Wu group focuses on the development of new reaction methodology for synthesizing new compositions of matter and complex natural product targets that have potential therapeutic value.