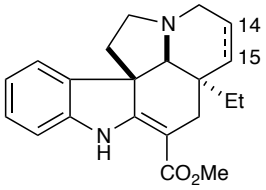
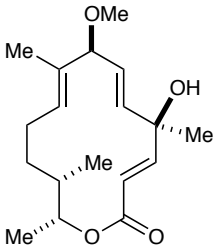
Natural Products Synthesis and the Development of Novel Synthetic Methodology

Rodrigo B. Andrade, Ph.D.
Associate Professor
Department of Chemistry
Temple University
Philadelphia, PA 19122

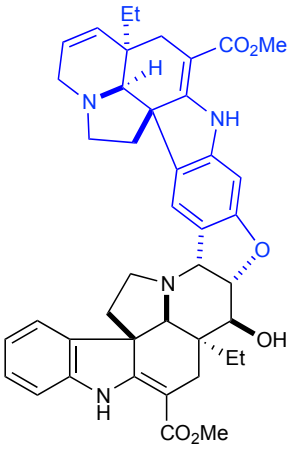
In 2013, our laboratory developed the use of *N*-sulfinyl metallodienamines (NSMDs) for the concise asymmetric total syntheses of *Aspidosperma* alkaloids (–)-tabersonine and (–)-vincadifformine. We showed that these chiral synthetic intermediates react with electron-deficient alkenes in a domino Michael-Mannich sequence to afford cycloadducts in high yields and with good diastereoselectivities. We have expanded the scope of NSMD methodology by showing they can react with aldehydes in a vinylogous aldol fashion and oxidants to afford alpha-hydroxy carbonyl compounds. In 2017, we reported a 14-step asymmetric synthesis of (–)-albocycline using this novel methodology. We are currently engaged in the first total synthesis of bis-*Aspidosperma* alkaloid (–)-melodinine K using NSMDs.



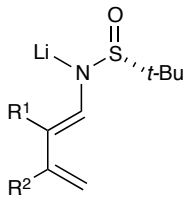
(–)-tabersonine, $\Delta^{14,15}$
(–)-vincadifformine



(–)-albocyline



(–)-melodinine K



N-Sulfinyl Metallo-Dienamines (NSMDs)