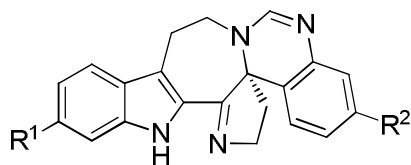


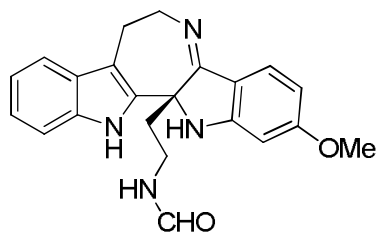
Gravel-Ward-Majewski Synthetic Challenge #3 June 15, 2010

Total Synthesis of Trigonoliimine A



Trigonoliimine A: R¹ = H, R² = OMe

Trigonoliimine B: R¹ = OMe, R² = H



Trigonoliimine C

The goal of this Challenge is to develop and defend a synthetic strategy for the total synthesis of trigonoliimine A. This dimeric indole alkaloid was isolated from the leaves of *Trigonostemon. lii*, collected in Yunnan province (Tan *et al. Org. Lett.* **2010**, *12*, 2370-2373). Its structure was determined by a combination of NMR methods. The absolute configuration of trigonoliimine A was assigned based on a computationally predicted optical rotation, whereas that of the related alkaloid trigonoliimine C was assigned from CD spectroscopy. Although a common biosynthetic pathway seems plausible, it would leave the assignments of absolute configuration in doubt. Thus, an enantioselective synthesis of trigonoliimine A would allow its absolute configuration to be firmly established.

Your presentation should consist of a brief retrosynthetic analysis explaining the reasons behind important disconnections, followed by a synthetic plan which details the reagents used and possible protecting groups. As would be the case for a real research proposal, issues of chemo- and enantioselectivity must be addressed. Extra brownie points will be awarded for a synthesis that also allows access to trigonoliimine C or its enantiomer. Your synthesis should possess a good balance between originality and feasibility. In this regard, it would be beneficial to briefly show some precedent for the most difficult/uncertain steps in the sequence. Each team's synthesis should take ~30-45 minutes to present.

While this Challenge is not mandatory, both undergraduate and graduate students are encouraged to participate. Students from other groups are also welcome. For this third edition of the Challenge, you are free to form your own teams, provided these rules are followed:

- 1) Maximum of 5 members per team (4 ideally)
- 2) Members from at least two different research groups

As soon as your team is formed, please provide the list of members as well as a team name to Dr. Gravel.