Asymmetric Total Syntheses of *Amaryllidaceae* Alkaloids *via* a DYKAT Following a Key Pd(0)-Catalyzed Decarboxylative Allylation

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Abstract: The development of efficient methods to synthesize complex biologically active natural products continues to be a vital area of research. *Amaryllidaceae* alkaloids are a subset of compounds that have received substantial interest due to their medicinal properties and impressive structures (Figure 1).[1] These alkaloids contain a challenging all-carbon quaternary stereocenter at the pseudobenzylic position (Figure 1).[2] Reportedly, several congeners of these alkaloids possess anti-tumor, anti-viral, anti-neoplastic, neurodegenerative disorder, and cytotoxic activity. Therefore, there is growing interest for the total syntheses of these alkaloids. Accordingly, few elegant syntheses of certain members of this group of alkaloids are reported.[3]

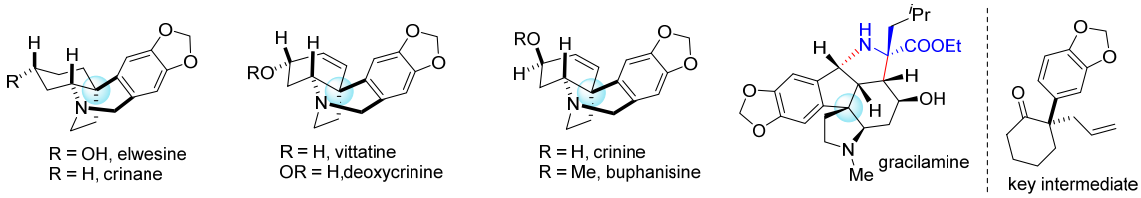
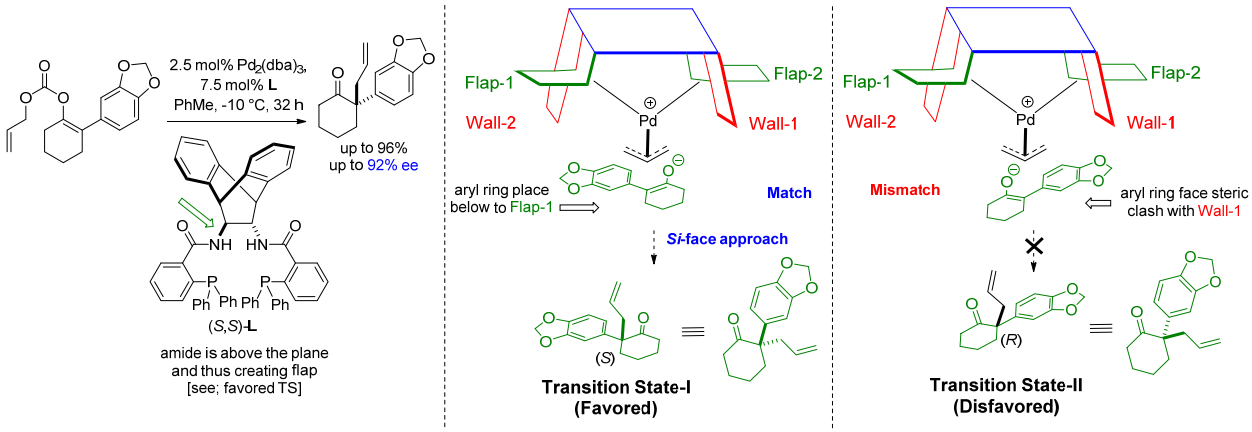


Figure 1. Selected *Amaryllidaceae* alkaloids.

In this poster, I would like to discuss an efficient divergent synthetic strategy for the synthesis of the *Amaryllidaceae* alkaloids via a Dynamic Kinetic Asymmetric Transformation (DYKAT) following key Pd(0)-catalyzed enantioselective decarboxylation allylation (DcA) (Scheme 1). This reaction sets an all-carbon quaternary stereocenter, required for these alkaloids, in high yield and enantioselectivity (Scheme 1). Utilizing this strategy total synthesis of several congeners of *Amaryllidaceae* alkaloids will be discussed.[4]



Scheme 1. Pd(0)-catalyzed DYKAT for synthesis of key intermediate for *Amarylidaceae* alkaloids.

References and Notes:

1. Jin, Z.; Li, Z.; Huang, R. *Nat. Prod. Rep.* **2002**, *19*, 454.
2. (a) Ghosh, S.; Bhunia, S.; Kakde, B. N.; De, S.; Bisai, A. *Chem. Commum.***2014**, *50*, 2434. (b) Yang, X; Toste, F. D. *J. Am. Chem. Soc.* **2015**, *137*, 3205.
3. (a) Das, M. K.; De, S.; Shubhashish, S.; Bisai, A. *Org. Biomol. Chem.***2015**, *13*, 3585. (b) Das, M. K.; De, S.; Shubhashish, S.; Bisai, A. *Synthesis***2016**, *48*, 2093. (c) For a recent review, see; Jin, Z. *Nat. Prod. Rep.* **2009**, *26*, 363.
4. Das, M. K., Kumar, N., Bisai, A. *Manuscript under preparation*.