Synthesis of Chiral Nitrogen Heterocycles *via* the Narasaka-Heck Reaction

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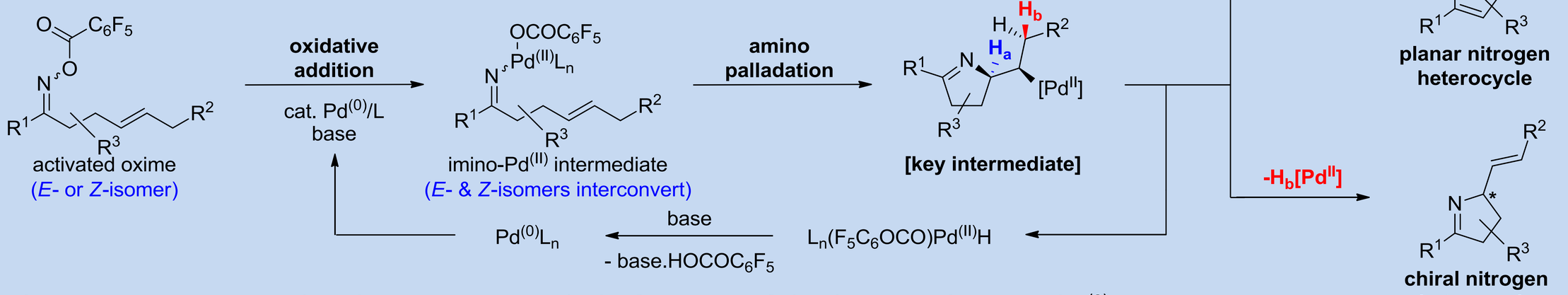
Introduction

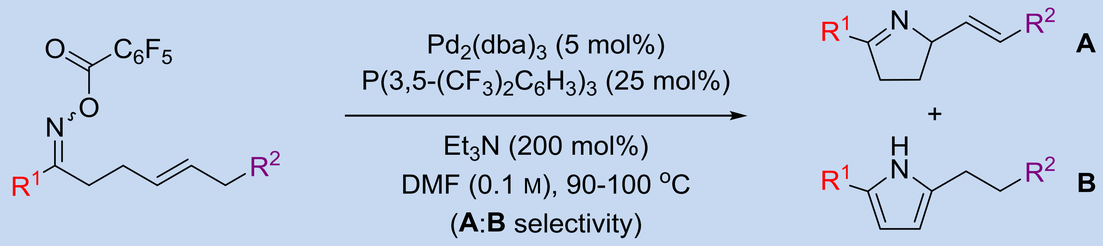
- The Narasaka-Heck reaction has been applied to the synthesis of a range of achiral nitrogen heterocycles (e.g. pyrroles, pyridines, imidazoles)(1)

Project aim:
enhance preference for β-hydride elimination of H_b to deliver chiral scaffold

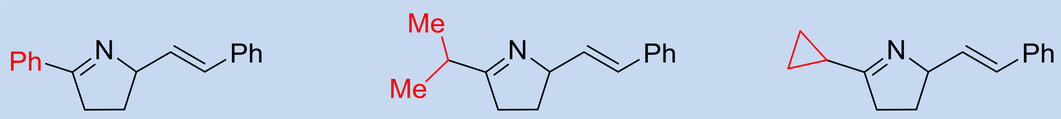


- Work in the Bower group is extending this reaction towards the formation of chiral nitrogen heterocycles(2)
- In this study presented, cyclisation onto 1,2-disubstituted alkenes affords the key intermediate shown – elimination of H_b delivers the chiral product(3)

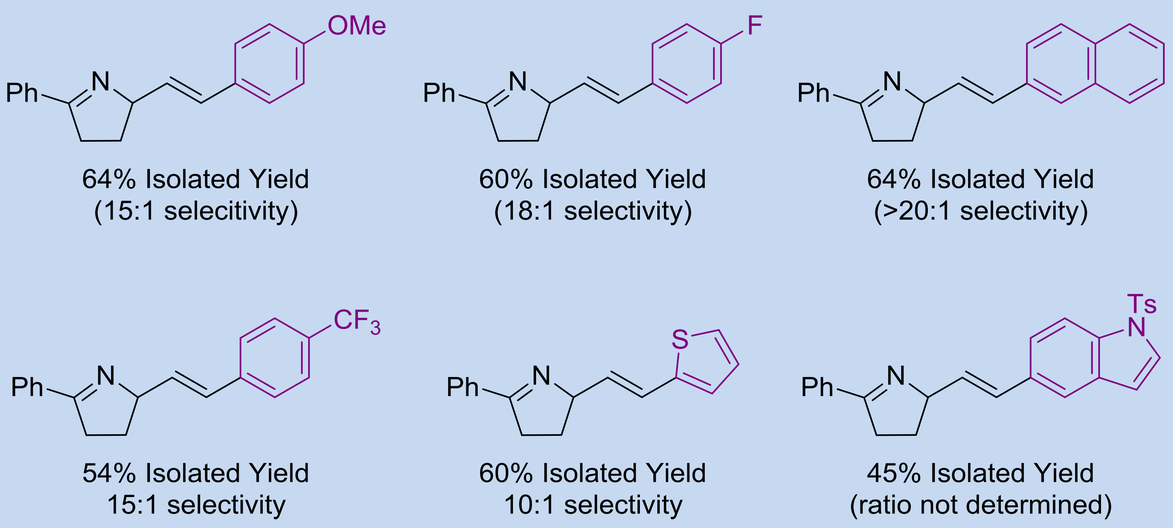
Substrate controlled β-hydride elimination



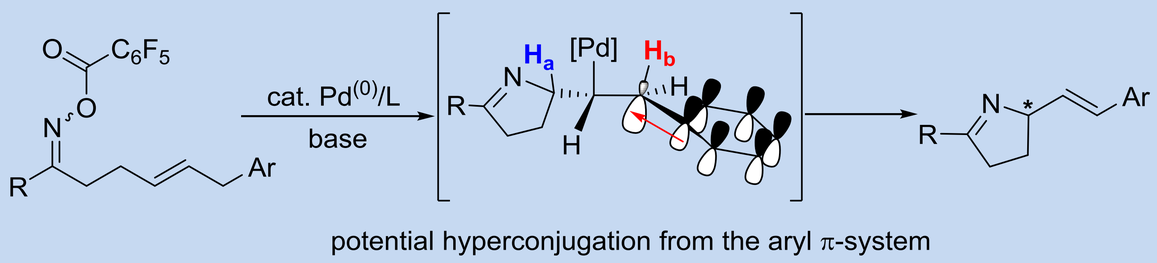
Scope of the oxime ester (R^1)



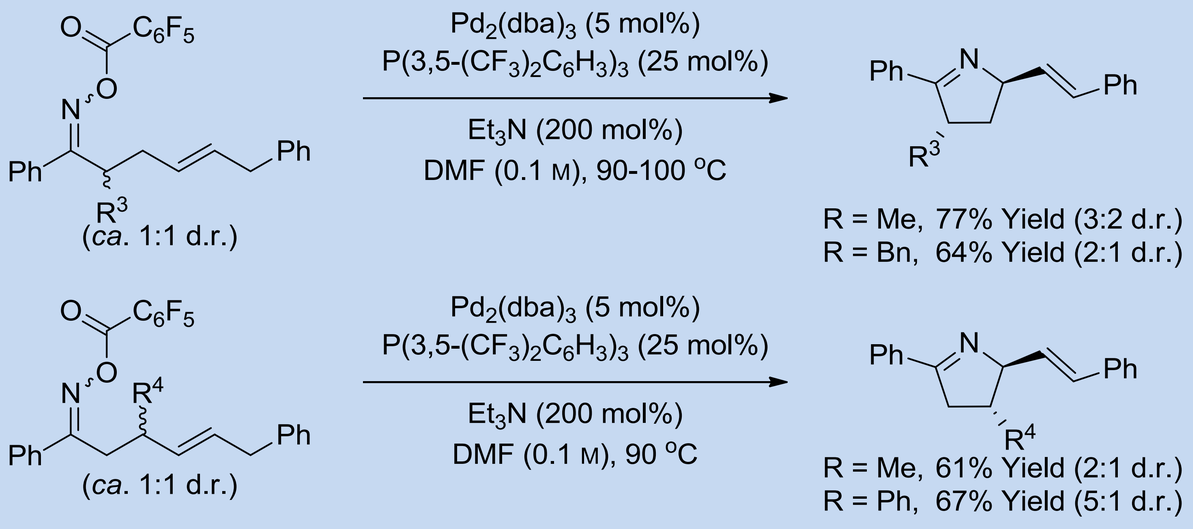
Scope of the aryl group (R^2)



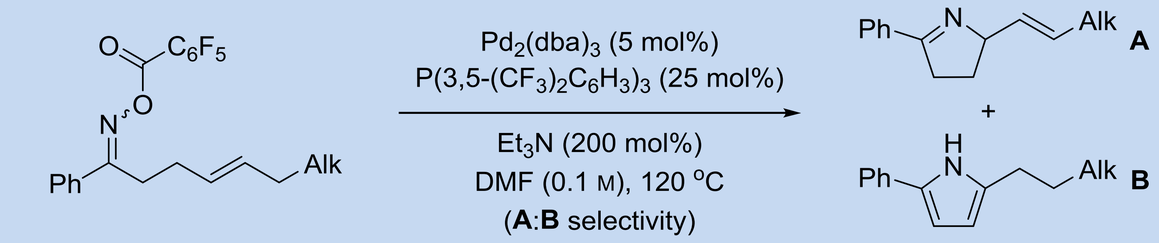
Aryl directed β-hydride elimination?(4)

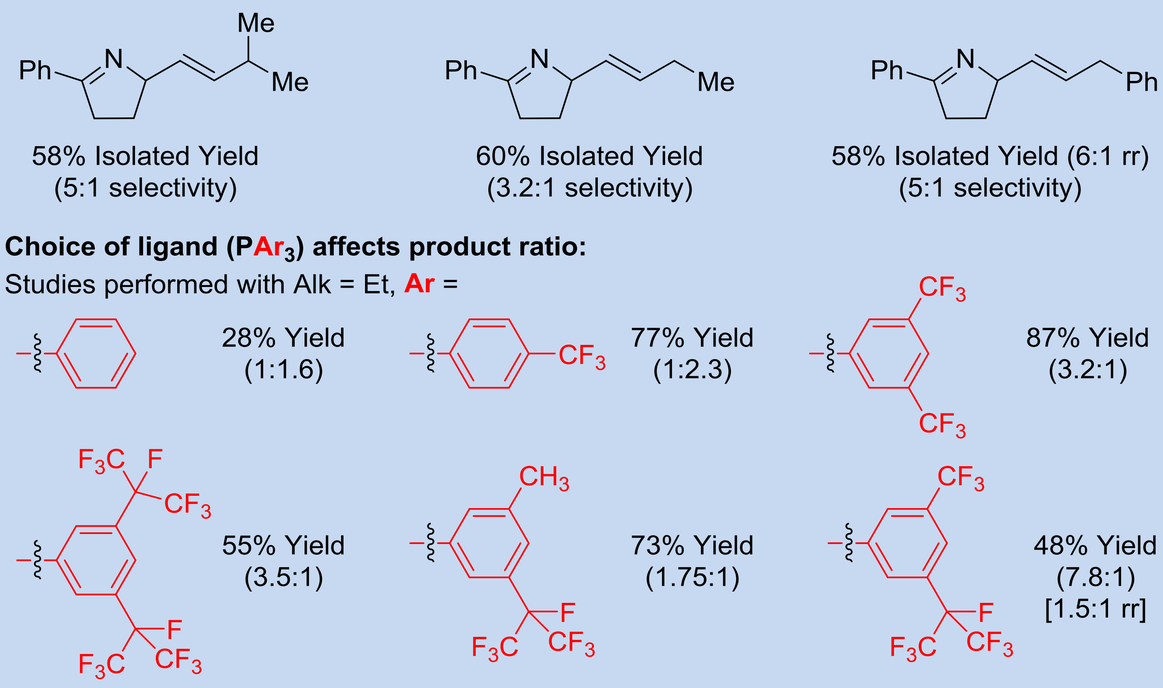


Diastereoselectivity in the cyclisation

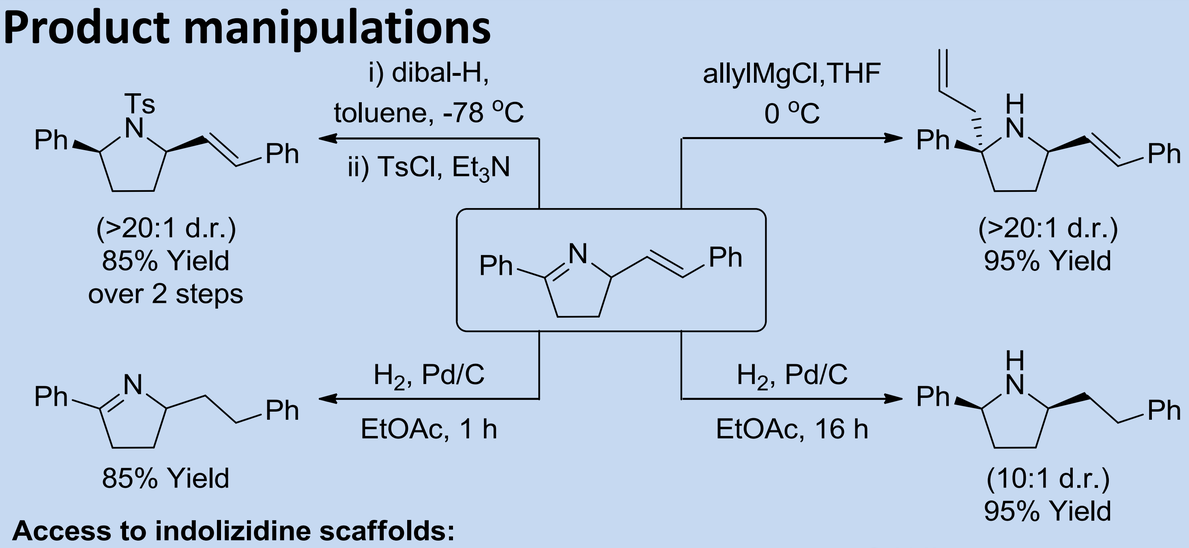


Alkyl-substituted alkenes also give chiral products

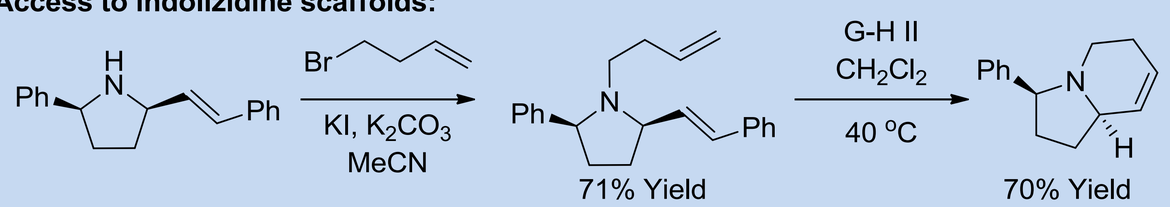




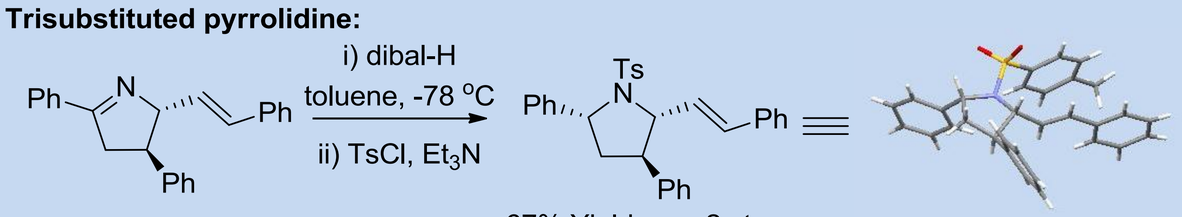
Product manipulations



Access to indolizidine scaffolds:



Trisubstituted pyrrolidine:



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References

(1) Kitamura, M.; Narasaka, K. *Chem. Rec.* **2002**, *2*, 268 (2) a) Faulkner, A.; Bower, J. F. *Angew. Chem. Int. Ed.* **2012**, *51*, 1675 b) Faulkner, A; Scott, J. S.; Bower J. F. *Chem. Commun.* **2013**, *49*, 1521

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