

[Copper(I)(Pyridine-Containing Ligand)] Catalyzed Regio- and Stereoselective Synthesis of 2-Vinylcyclopropa[b]indolines from 2-Vinylindoles

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The functionalization of indole core is an interesting research field because the indole moiety is present in a huge number of bioactive natural products and pharmaceutical compounds.¹ For this reason, the proposal of new methodologies for indole synthesis and functionalization is still of great interest in synthetic organic chemistry. In the context of our studies on metal-catalyzed cycloaddition reactions of vinylindoles² and on functionalization of indole core,³ we decided to investigate the reactivity of 2-vinylindoles with diazo compounds. We envisioned in this way to functionalize these indole derivatives by means of a new reaction pattern. Thus, the reaction between 2-vinylindole and ethyl diazoacetate was conducted in the presence of copper(I) complexes having a pyridine-containing macrocycle as ligand and led to a series of cyclopropyl vinylindolines with satisfactory yields and with complete regio- and diastereoselectivity (Figure 1). Optimization of conditions, scope and proposed mechanism of the reaction will be illustrated, with preliminary results on an enantioselective version.⁴

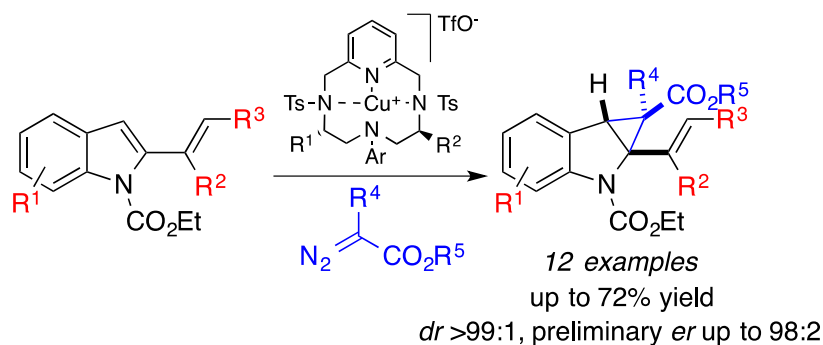


Figure 1: .

References:

- [1] a) A. W. Schmidt, K. R. Reddy, H.-J. Knölker, *Chem. Rev.* **2012**, *112*, 3193-3328; b) A. Głuszyńska, *Eur. J. Med. Chem.* **2015**, *94*, 405-426; c) L. S. Tsutsumi, D. Gundisch, D. Sun, *Curr. Top. Med. Chem.* **2016**, *16*, 1290-1313.
- [2] E. Rossi, V. Pirovano, G. Abbiati, *Eur. J. Org. Chem.* **2017**, 4512-4529.
- [3] V. Pirovano, D. Facoetti, M. Dell'Acqua, E. Della Fontana, G. Abbiati, E. Rossi, *Org. Lett.* **2013**, *15*, 3812-3815; b) V. Pirovano, M. Negrato, G. Abbiati, M. Dell'Acqua, E. Rossi, *Org. Lett.* **2016**, *18*, 4798-4801.
- [4] V. Pirovano, E. Brambilla, G. Tseberlidis, *Org. Lett.* **2018**, *20*, 405-408.