Cu(II)-PHOX-Catalyzed Highly Enantioselective Malonate Addition onto 3-Hydroxy-2-oxindoles: Formal Total Syntheses of Dimeric Pyrroloindoline Alkaloids

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Abstract:

The construction of vicinal all-carbon quaternary stereocenters in an enatioselective fasion is one of the most challenging aspect in the synthesis of complex molecules.[1,2] Although the biological ativitities of only a few alkaloids of this family has been studied in detail because of their unavailability in significant quantities a variety of this family show antibacterial and cytotoxinic activities,[3a] few of the congeners are potent competitive substance pantagonist with respect to human neurokinin-1.[3b]

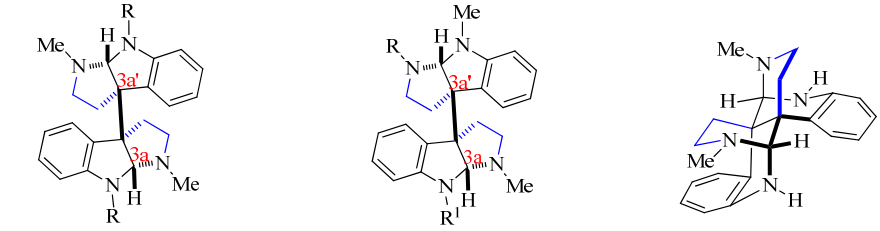
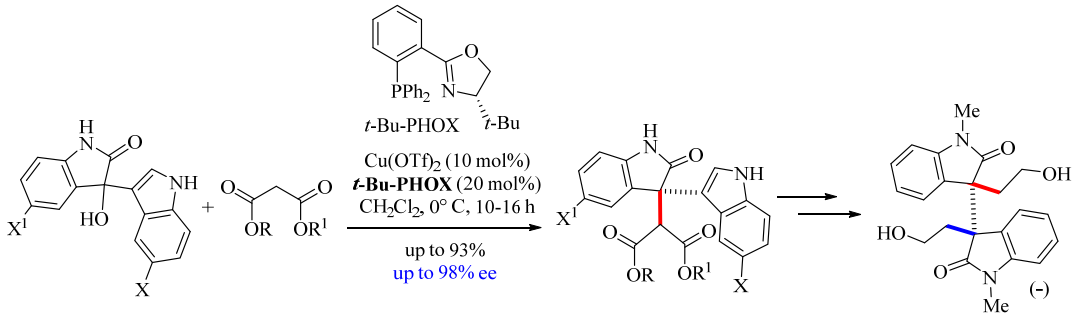


Figure 1. Alkaloids sharing a vicinal all-carbon quaternary stereocenters.

For a unified strategy of these targets,[4,5] we explored novel methodologies that addresses installation of all-carbon quaternary stereocenters following a lewis acid catalyzed malonate addition on 3-hydroxy 3-indolyl oxindoles. We have explored our methodology for the synthesis of enantioenriched dimeric 2-oxindoles having vicinal all-carbon quaternary stereocenters and applied in formal total synthesis of (-) folicanthine (**1b**) (Scheme 1).



Scheme 1. Our approach *via* Lewis acid-catalyzed enantioselective malonate addition.

References and Notes:

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