Progress in Accessing the Ergoline Framework by Innovating the Witkop Photocyclization

Rhemrose B. Sabio
Department of Chemistry, University of California Davis, Shields Avenue, Davis, CA, USA

Mark Mascal*
Department of Chemistry, University of California Davis, Shields Avenue, Davis, CA, USA

Abstract:

Ergot alkaloids, a class of natural products derived from rye fungus Claviceps purpurea, possess a diverse range of therapeutic applications. The FDA-approved lysergic acid derivatives bromocriptine, dihydroergotamine, and dihydroergocristine, for the treatment of diabetes, migraines, and dementia, respectively, are being studied as potential Alzheimer's Disease treatments. This repurposability illustrates the diverse therapeutic potential of compounds containing the ergoline moiety. A renaissance in psychedelic research has revived interest in this class of molecules, due to their known neuroplastic and anti-neuroinflammatory effects. Thus, concise synthetic routes to the ergoline framework are of significant interest. The Witkop photocyclization reaction is a highly efficient method for the preparation of extracyclic indoles, and an approach to ergolines involving this strategy is developed here.

Keywords:

Ergoline, indoles, natural products, Witkop reaction, photochemistry.