Gold(I)-Catalyzed Carboaminations of Tetrahydro-β-carbolines to Allenes

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The indoloquinolizine or indolizinoidoie patterns are widely found in natural products possessing interesting pharmacological properties. Over the last few years, we have been looking for new routes to these scaffolds via metallo-catalyzed cyclizations of conveniently functionalized tetrahydro-β-carbolines allowing the ring-closure of the cycle D.

In this context, we have developed the synthesis of novel compounds from chiral N-allyl tetrahydro-β-carbolines bearing an allene function, resulting from an asymmetric Pictet-Spengler reactions catalyzed by chiral phosphoric acids between N-allyl tryptamines and allenaldehydes. Our first strategies relied on palladium-catalyzed tandem reactions of deprotection/ cyclization affording polycyclic compound via a formal hydroamination. In this process, the allyl protecting group was lost. More recently, we found that Au(I) catalysts promote carboaminations which result in both the ring closure and a transfer of the allyl group to the allene function. The allyl protecting group is then converted into a useful three carbon synthon. The regioselectivity of this reaction diverges depending on the substituent R².

References

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