

## SYNFACTS Highlights in Current Synthetic Organic Chemistry

This electronic reprint is provided for non-commercial and personal use only: this reprint may be forwarded to individual colleagues or may be used on the author's homepage. This reprint is not provided for distribution in repositories, including social and scientific networks and platforms.

**Publishing House and Copyright:**

© 2015 by  
Georg Thieme Verlag KG  
Rüdigerstraße 14  
70469 Stuttgart  
ISSN 1861-1958

Any further use  
only by permission  
of the Publishing House

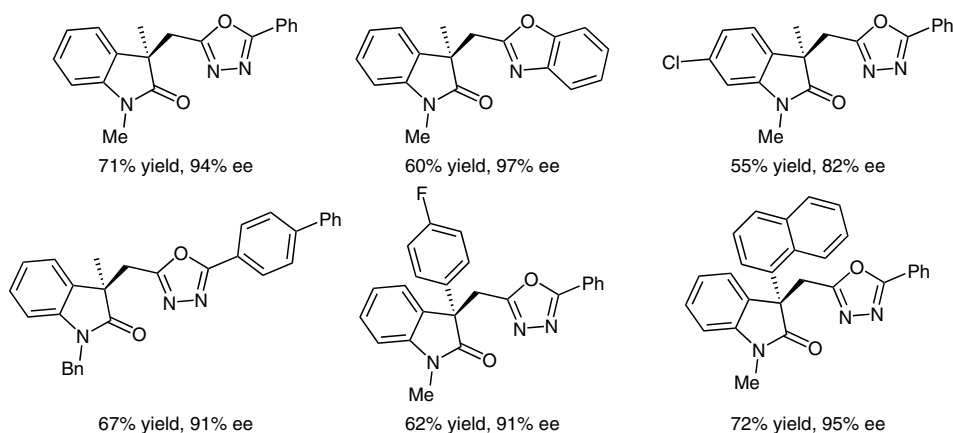
W. KONG, Q. WANG, J. ZHU\* (ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE, SWITZERLAND)

Palladium-Catalyzed Enantioselective Domino Heck/Intermolecular C–H Bond Functionalization: Development and Application to the Synthesis of (+)-Esermethole  
*J. Am. Chem. Soc.* **2015**, *137*, 16028–16031.

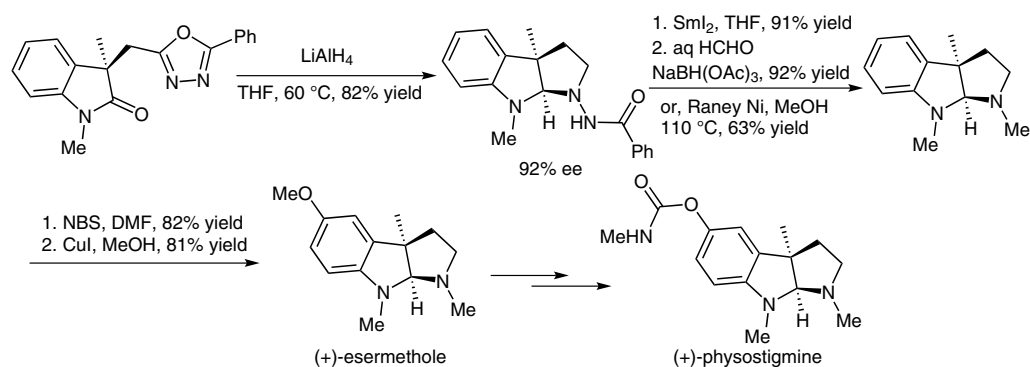
## Asymmetric Domino Heck/Intermolecular C–H Bond Functionalization



Selected examples:



Reductive cyclization of oxindole to pyrroloindoline: synthesis of (+)-esermethole and (+)-physostigmine:



**Significance:** Whereas carbopalladation/nucleophilic trapping of  $\sigma$ -allylpalladium(II) intermediates has been well studied, the asymmetric variant of this domino sequence is underdeveloped. The authors present the first examples of an asymmetric domino Heck/intermolecular direct arylation process for the synthesis of 3,3-disubstituted oxindoles by means of palladium catalysis.

**Comment:** Two C–C bonds are produced with concurrent formation of an all-carbon quaternary stereocenter. A particular class of oxindole products was successively converted into the corresponding pyrroloindolines. The synthetic utility of the protocol was demonstrated by concise syntheses of (+)-esermethole and (+)-physostigmine.

**SYNFACTS Contributors:** Hisashi Yamamoto, Sukalyan Bhadra  
*Synfacts* 2016, 12(3), 0274 Published online: 16.02.2016

**DOI:** 10.1055/s-0035-1561726; **Reg-No.:** H00416SF