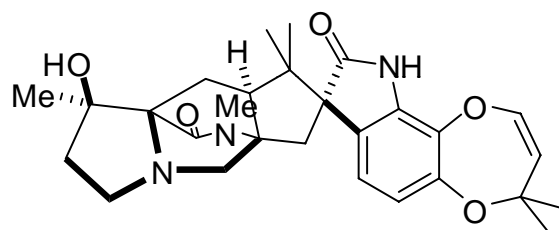
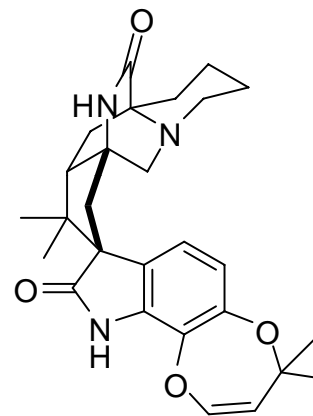


# Total Synthesis of Paraherquamide A and Marcfortine B

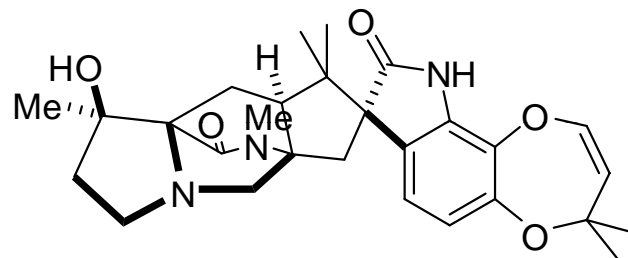


paraherquamide A



marcfortine B

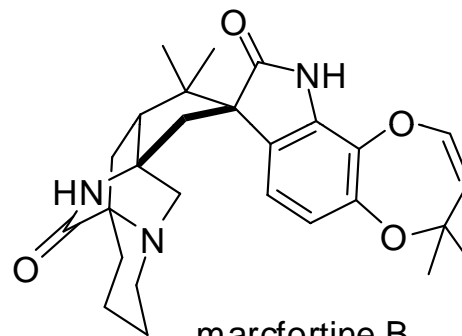
# Background



paraherquamide A

## ■ Paraherquamide A

- ❑ Isolated in 1981 by Yamazaki and coworkers from cultures of *Penicillium paraherquei*
- ❑ Displays potent antihelmitic activity (expels parasitic worms from the body) and antinematodal activity (treatment of nematode infestations)
- ❑ Due to drug resistance of parasites, broad spectrum antihelmitic agents have lost efficacy; paraherquamides represent new structural class of antiparasitic agents
- ❑ Mode of action not confirmed but believed to be selective competitive cholinergic antagonists (blocks actions of acetylcholine)
- ❑ First total synthesis by Williams in 2000

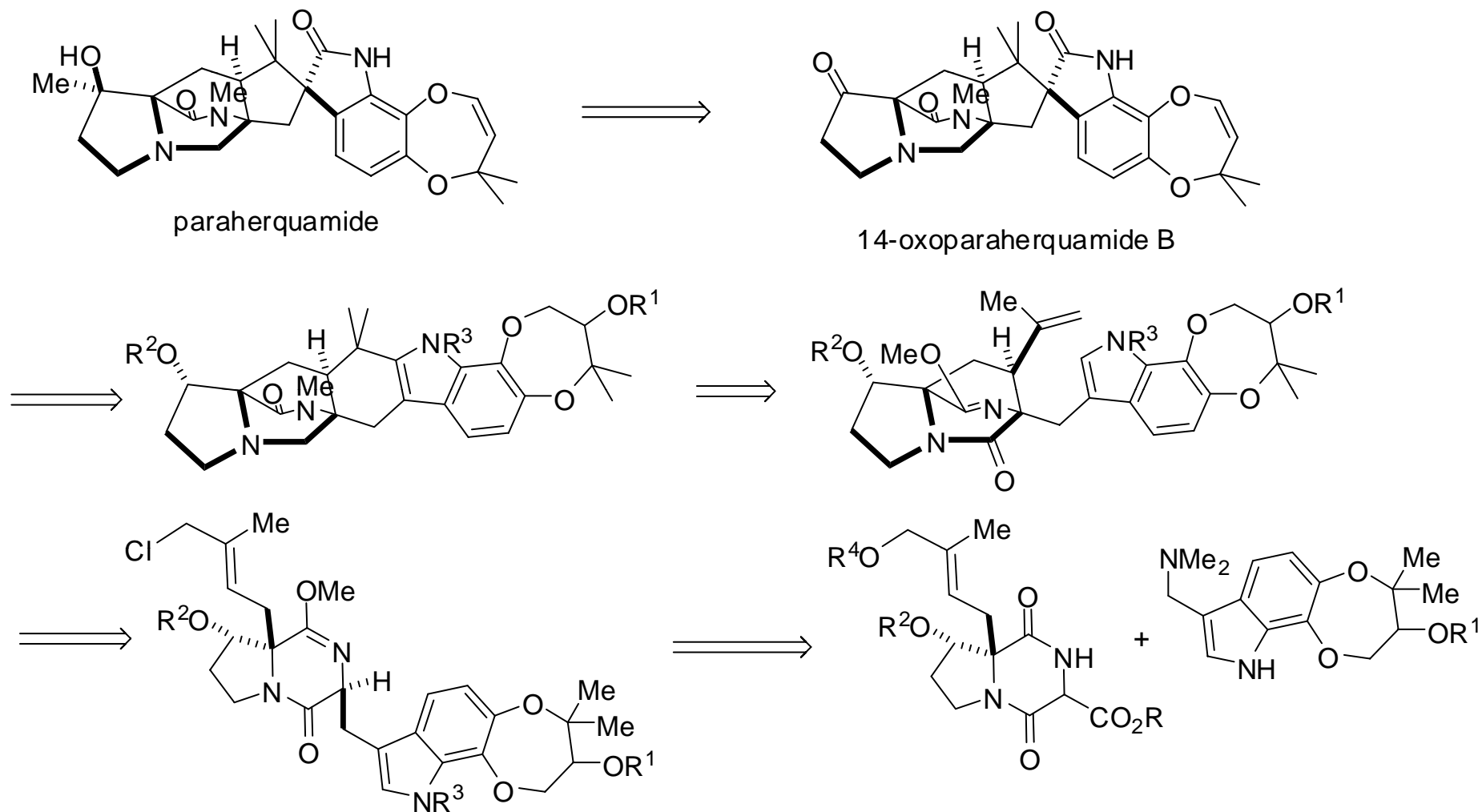


marcfortine B

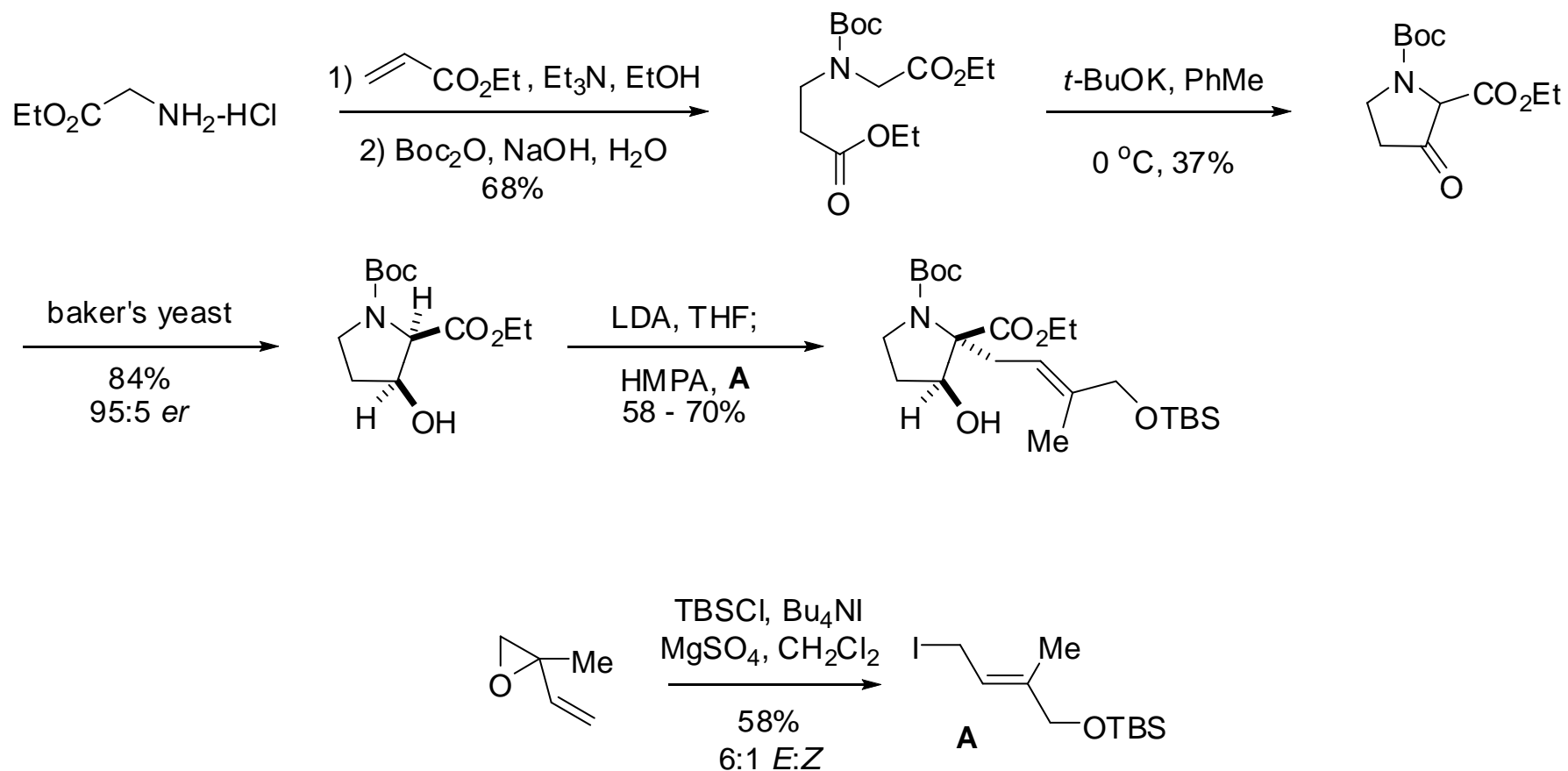
## ■ Marcfortine B

- ❑ Isolated in 1980 by Polonski and coworkers from cultures of *Penicillium roqueforti*
- ❑ Displays potent antihelmitic activity
- ❑ First total synthesis by Trost in 2007

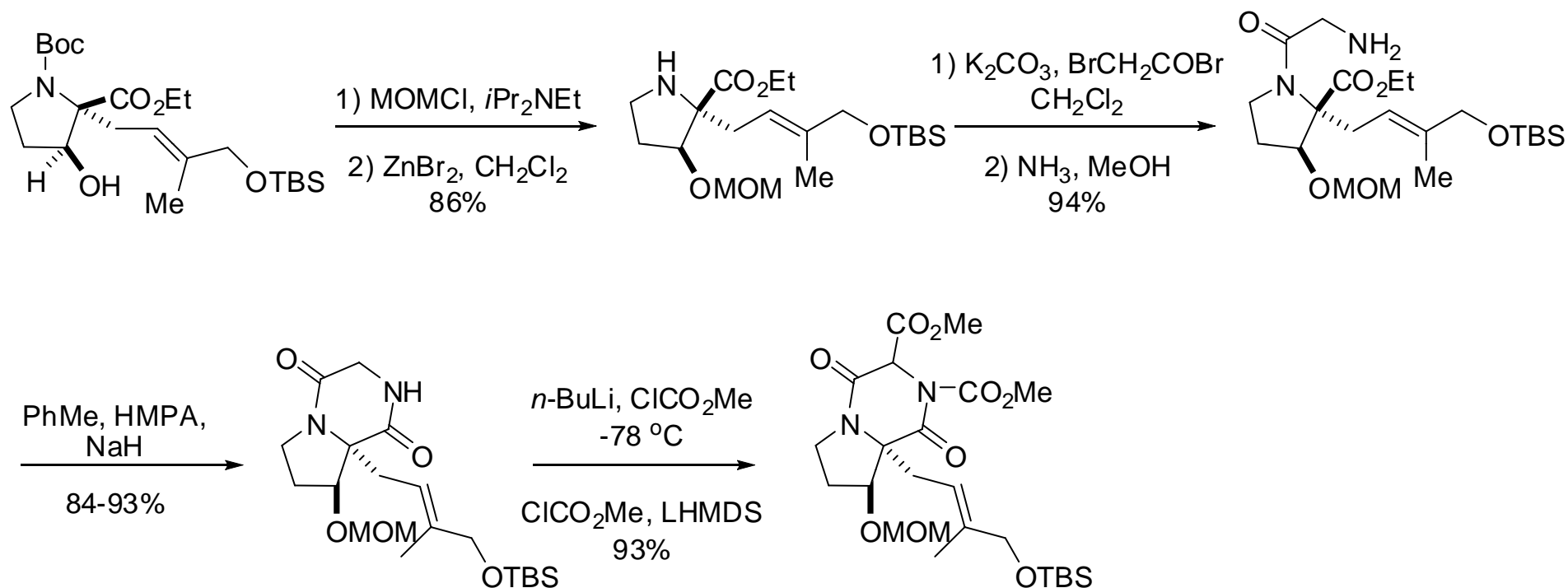
# Williams Retrosynthesis



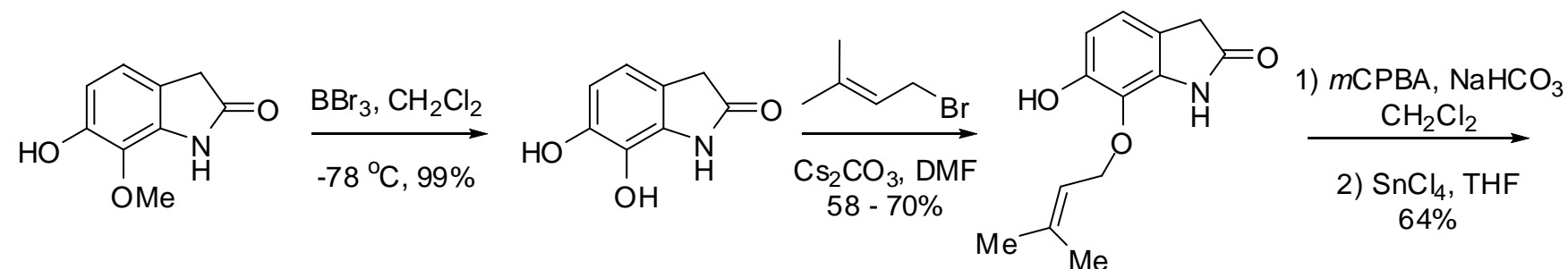
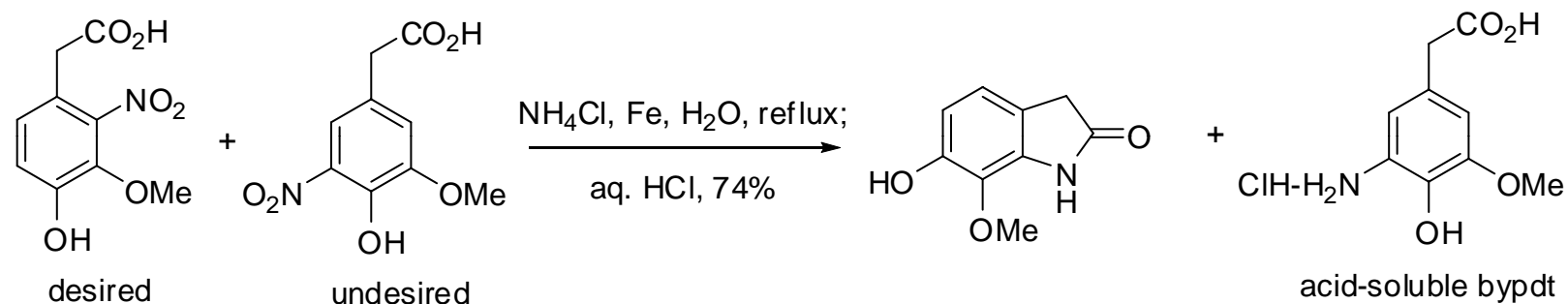
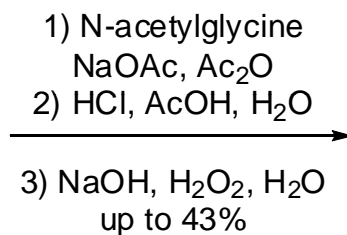
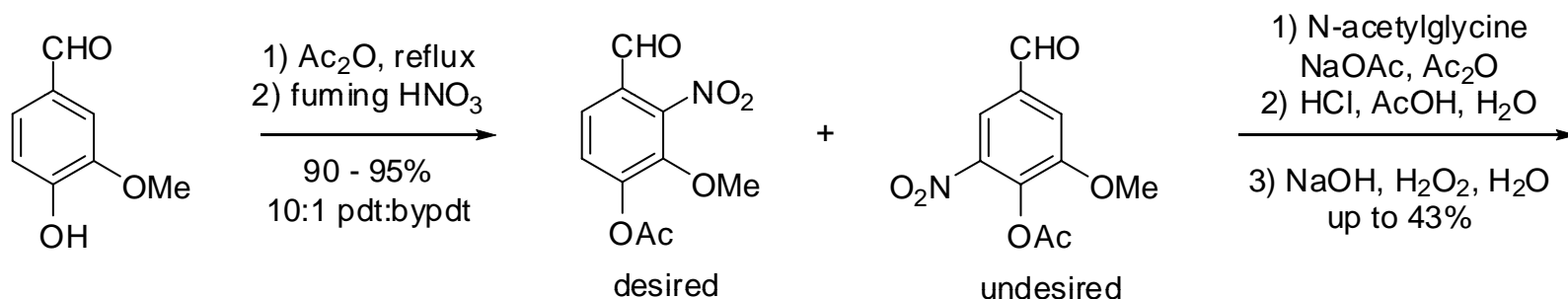
# Williams – Synthesis of Diketopiperazine



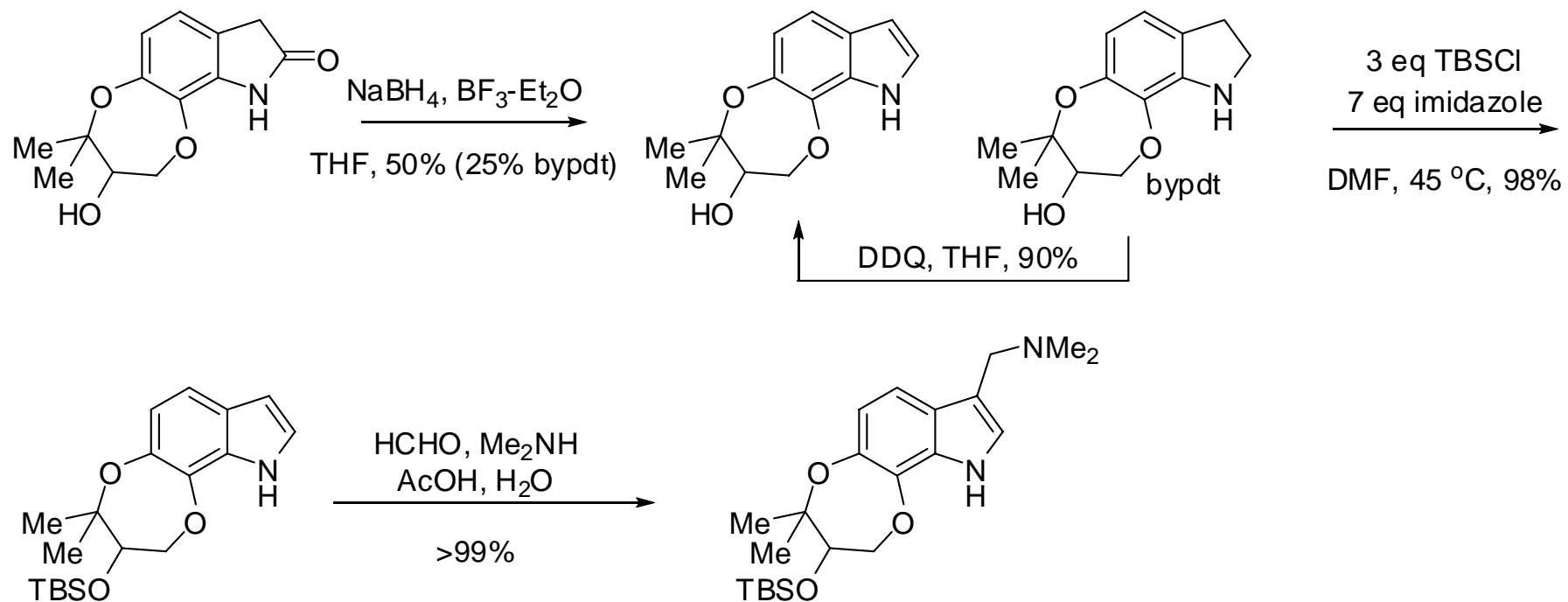
# Williams – Synthesis of Diketopiperazine



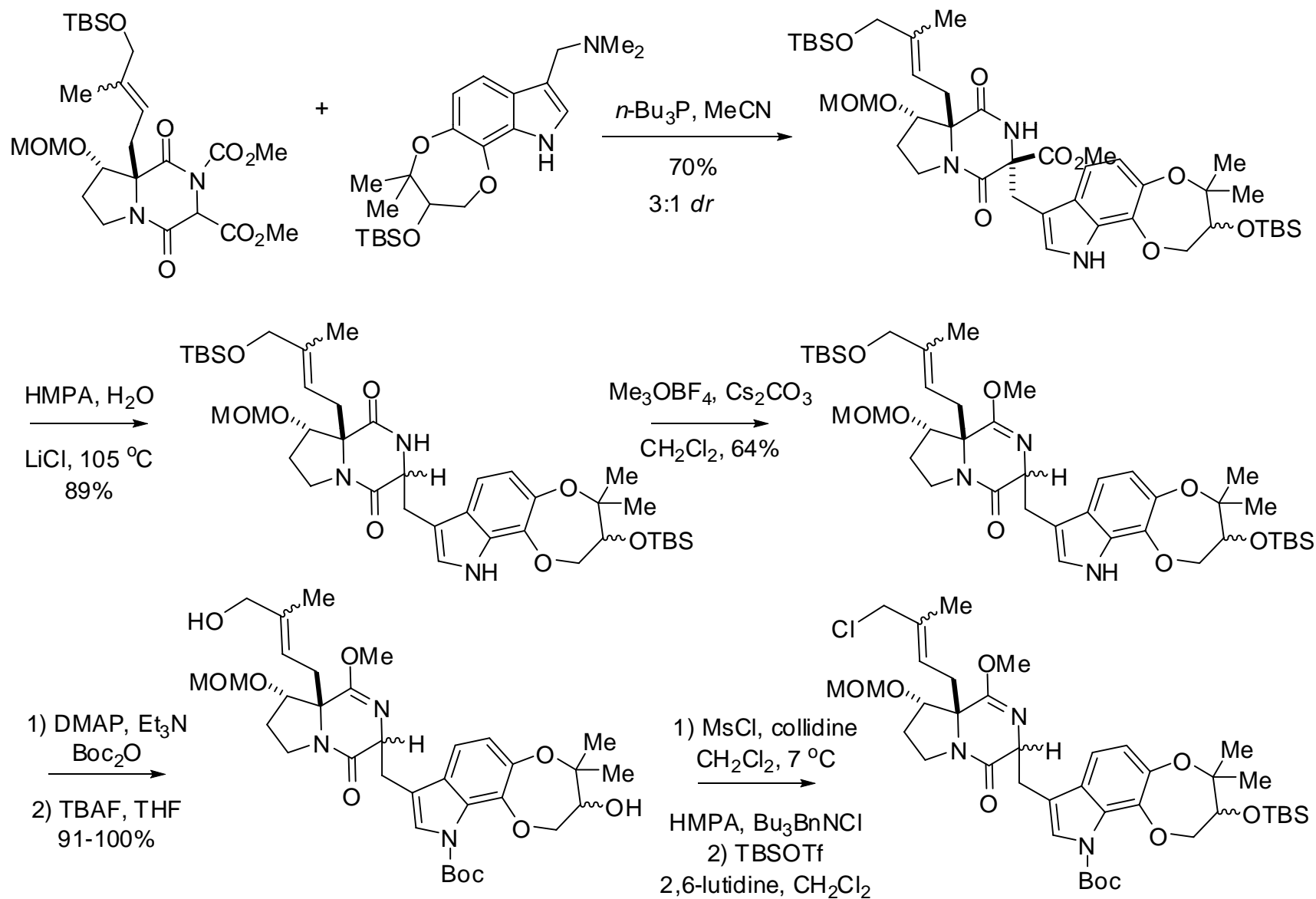
# Williams - Synthesis of Indole Fragment



# Williams - Synthesis of Indole Fragment (cont.)

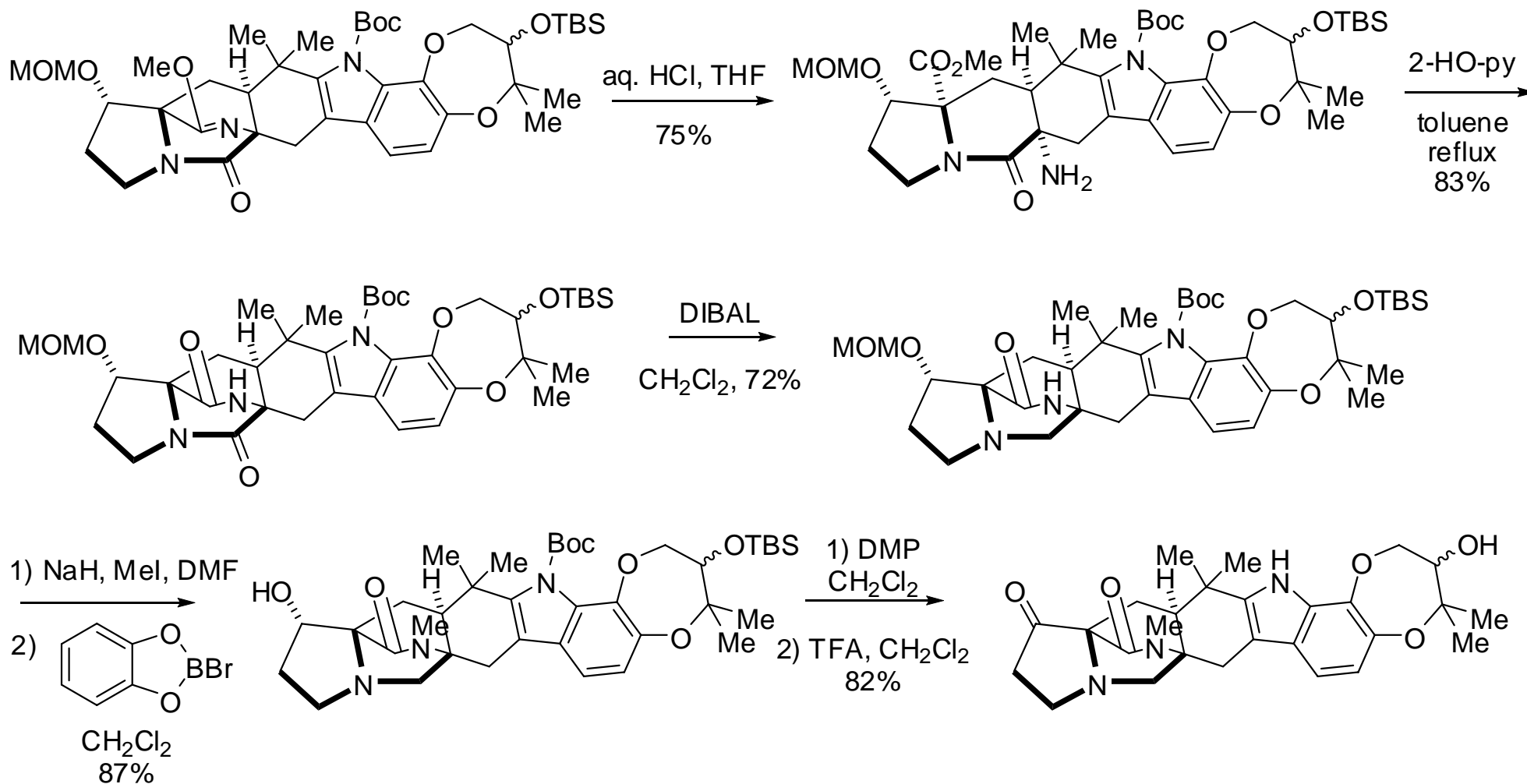


# Williams – Coupling of Fragments

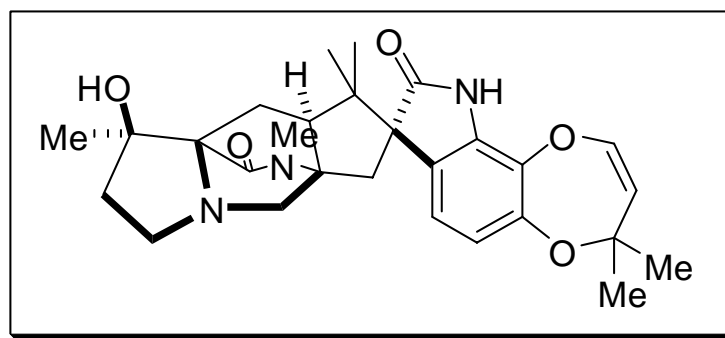
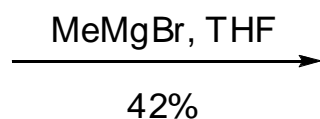
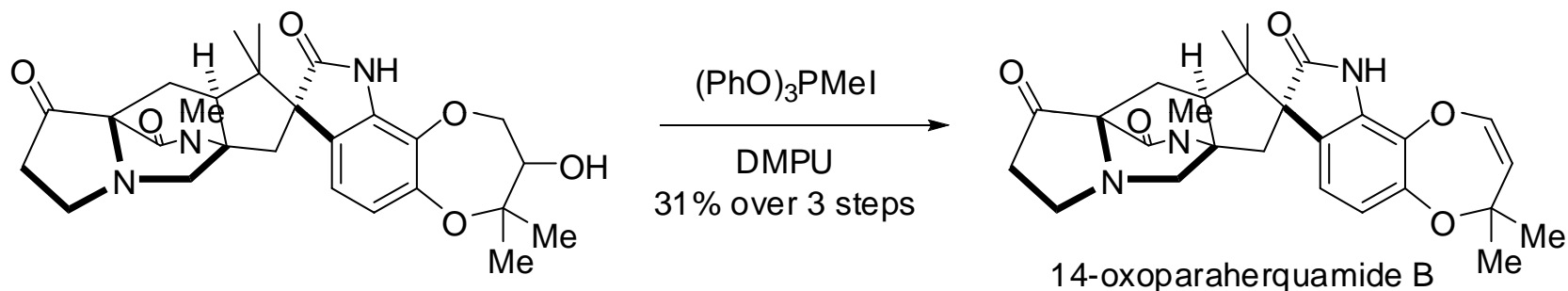
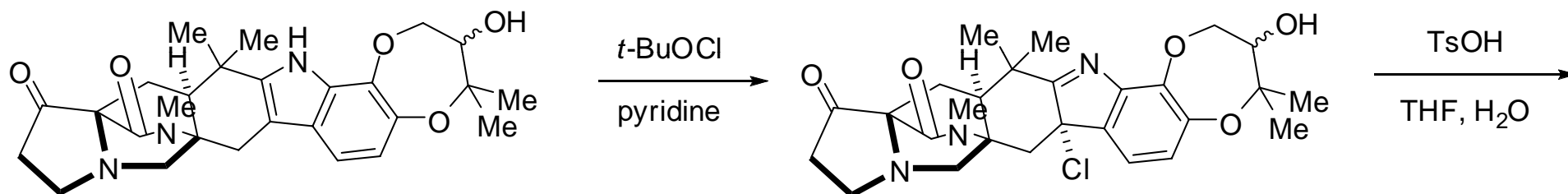




# Williams – Manipulation of Heptacycle

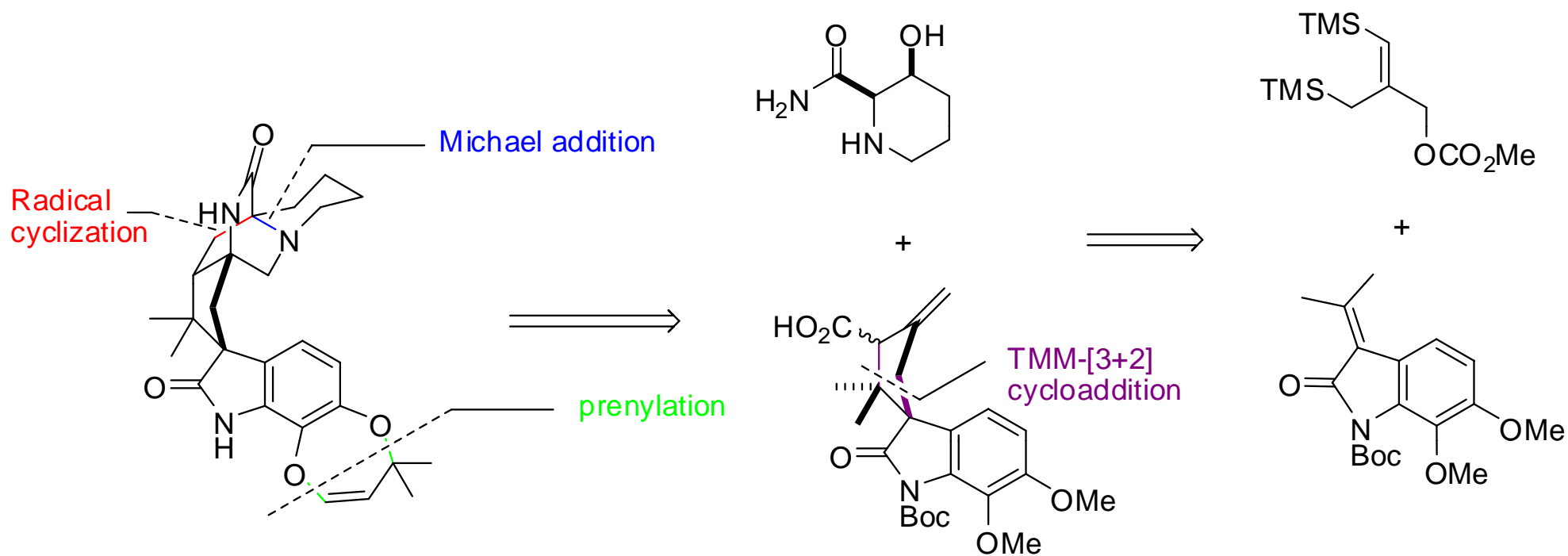


# Williams – Completion of Synthesis

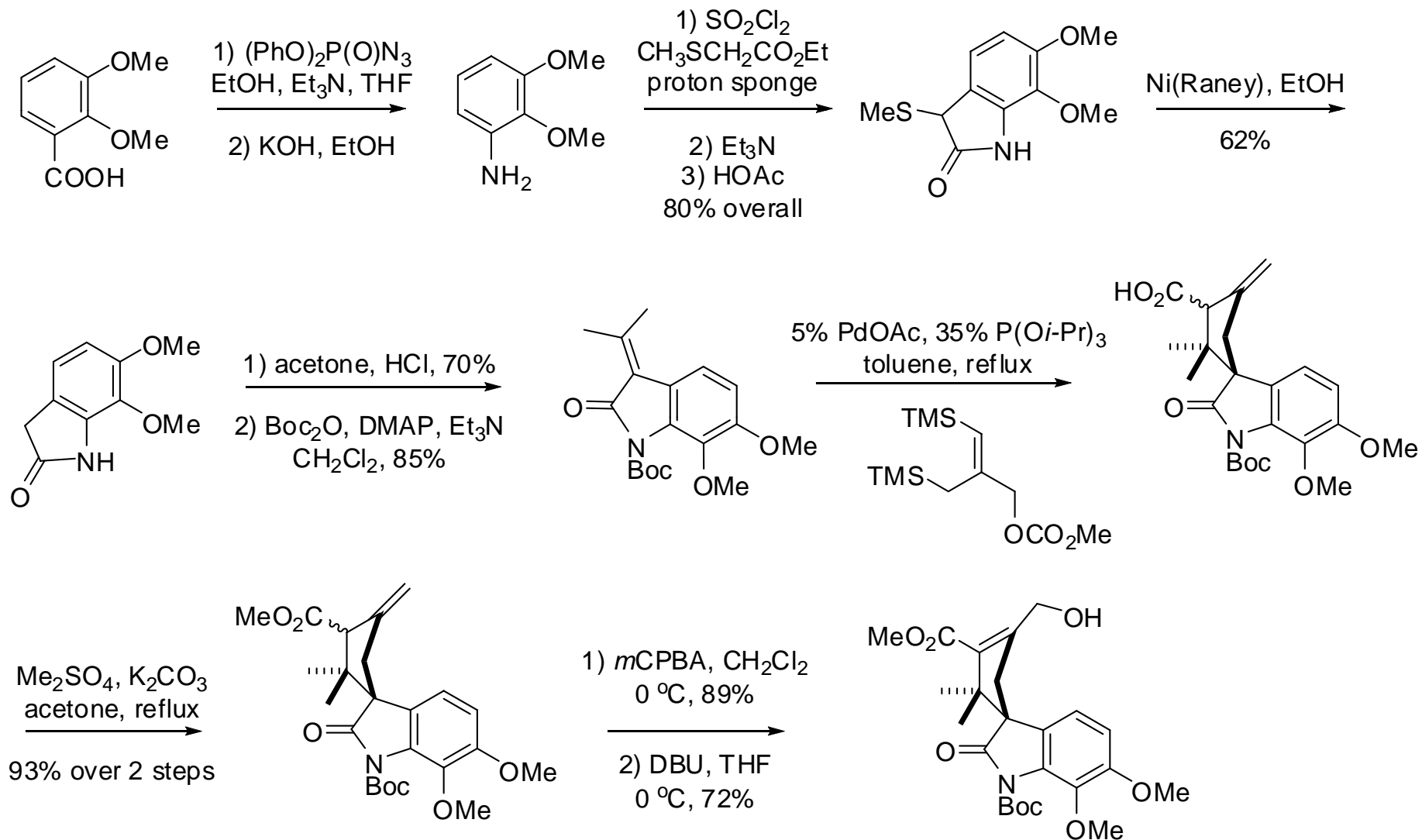


46 total steps  
34 longest linear steps

# Trost Retrosynthesis



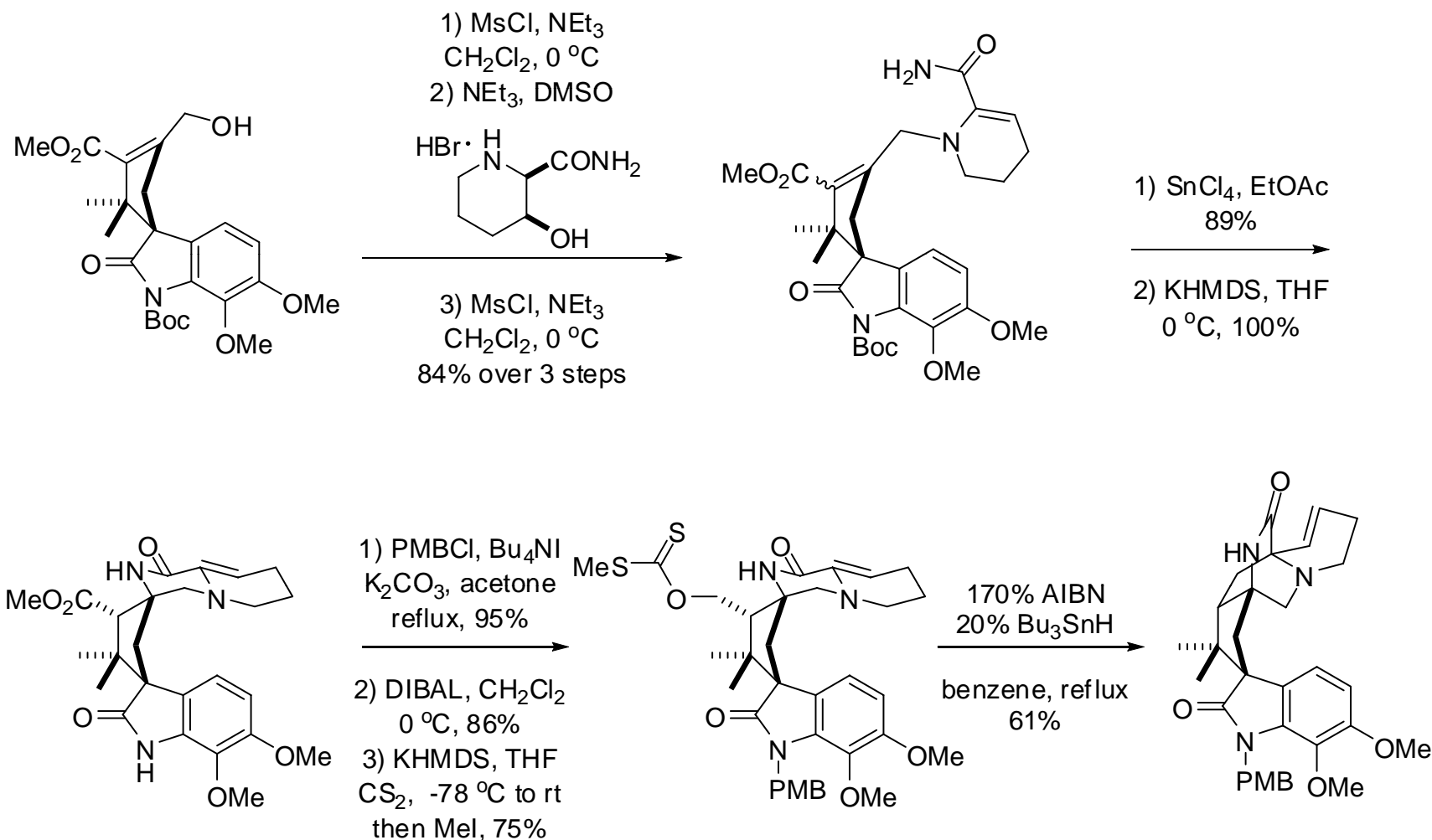
# Trost – Synthesis of Marcfortine B



McWhorter, W. W.; Savall, B. M. *JOC* **1996**, 8696-8697.

Trost, B. M.; Cramer, N.; Bernsmann, H. *JACS* **2007**, 129, 3086-3087.

# Trost – Synthesis of Marcfortine B



# Trost – Synthesis of Marcfortine B

