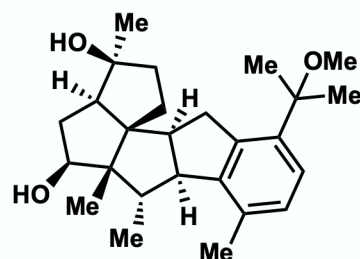


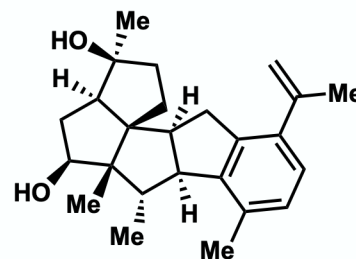
Total Synthesis of (+)-Niduenes A and B

J. Am. Chem. Soc. 2026, 148, 27054-27059.

(+)-niduene A



(+)-niduene B



- Pauson-Khand reaction • Mukaiyama-Michael addition
- Pd catalyzed oxidative cyclization • radical cyclization

Cayley Williams
09/10/2026



Principal Investigator



Yanxing Jia

Education:

- 1993-1997:** B.S. Chemistry, Lanzhou University
- 1997-2002:** Ph.D., Organic Chemistry, Lanzhou University
(Advisor: Yongqiang Tu)

Career:

- 2002-2007:** Post-Doc, Institut de Chimie des Substances Naturelles
- 2007-2011:** Associate Professor, Peking University
- 2011:** Professor, Peking University
- 2020:** Peking University Boya Distinguished Professor



Author Introduction



First Authors:



Chuanzhen Tan

Joined Jia lab in 2023



Hongpeng Lin

Joined Jia lab in 2024

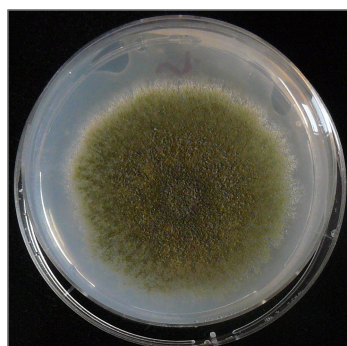
Other Author:



Yuan Wang

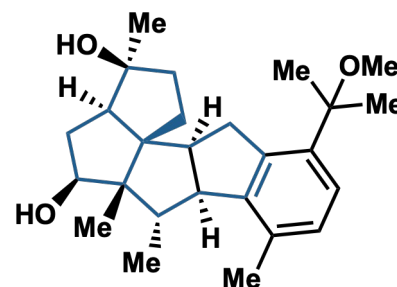
Staff Scientist

Structure and Activity of Niduenes

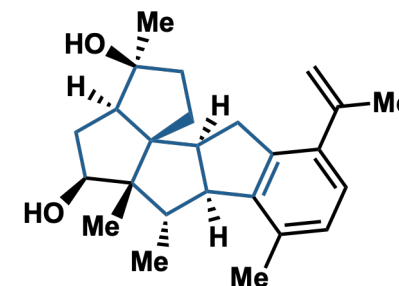


- Isolated from *Asperilligus nidulans* in 2023
- Shown to inhibit P-glycoproteins (which can increase bioavailability of medicines)
- No previous total syntheses

- Unique 5/5/5/5/6 pentacyclic skeleton
- 8 contiguous stereocenters
- 2 quaternary carbon centers

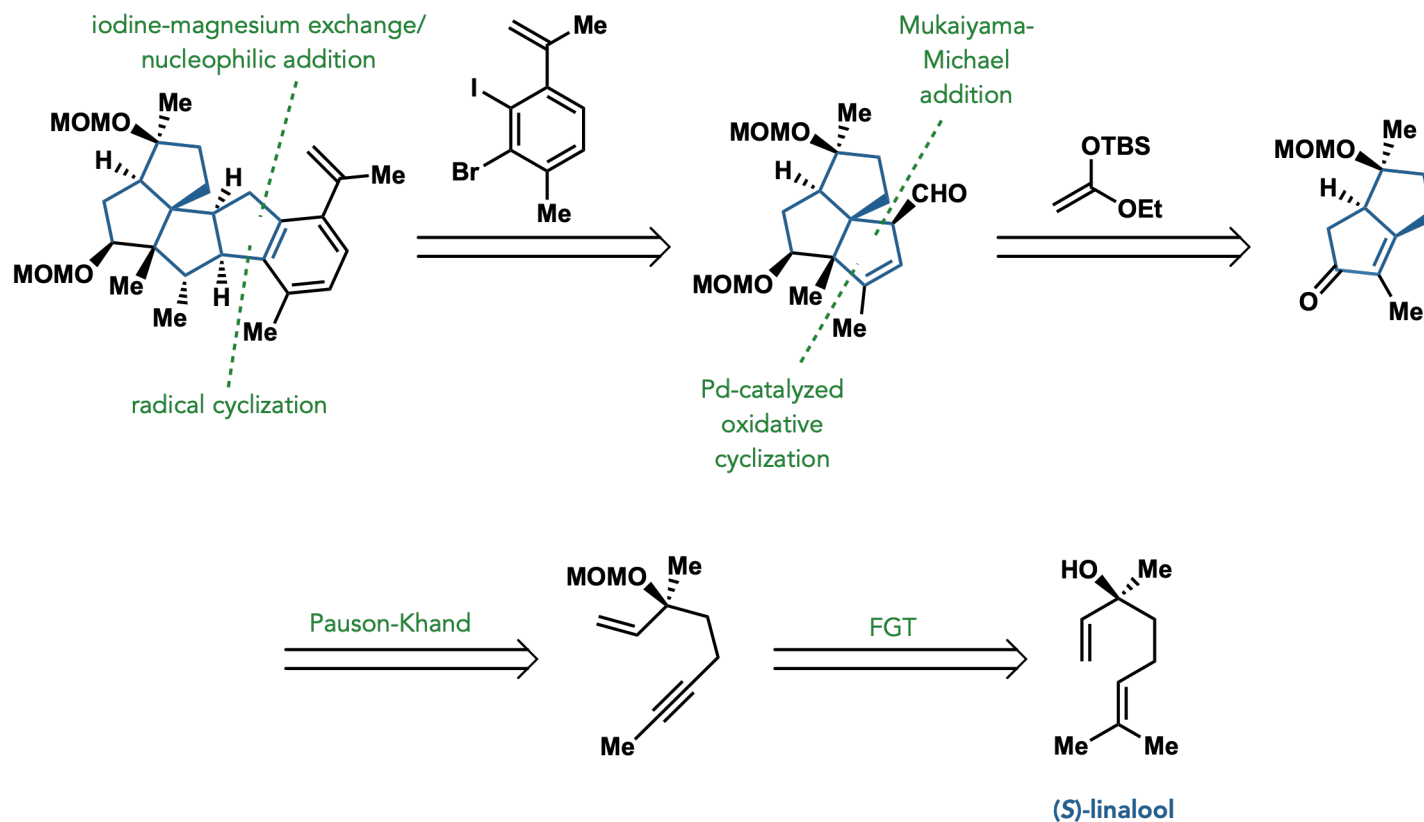


(+)-niduene A

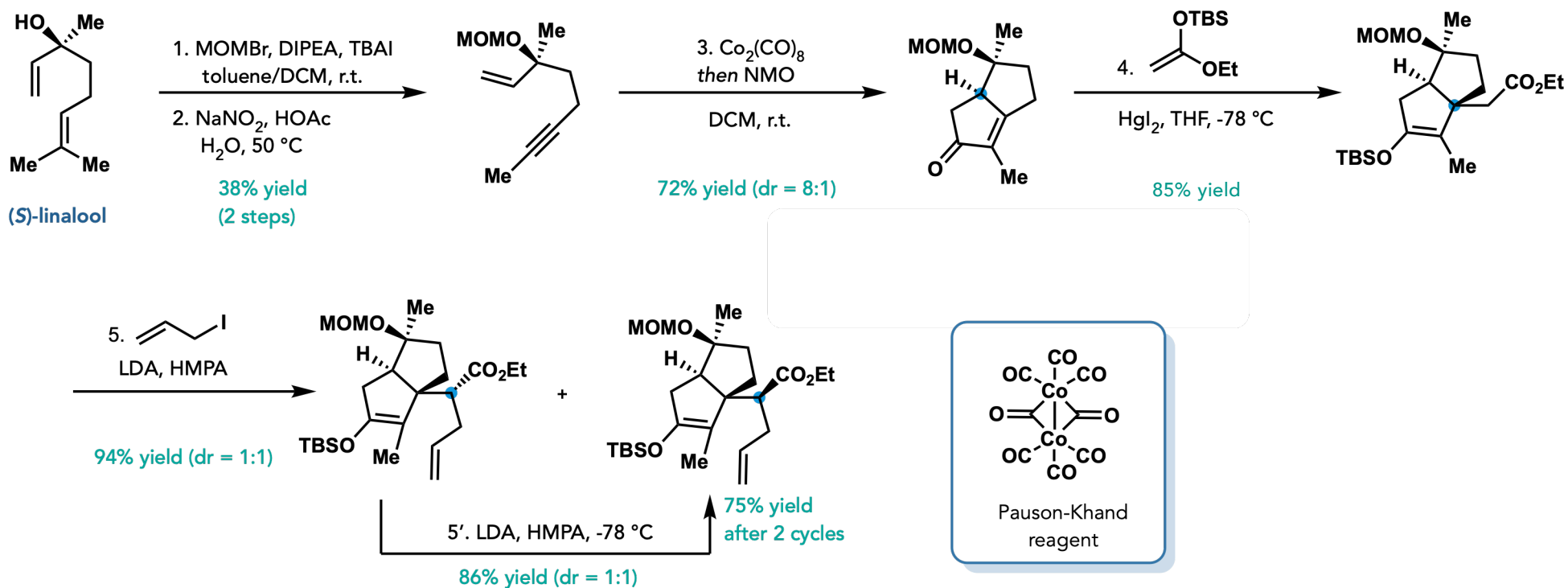


(+)-niduene B

Retrosynthetic Analysis

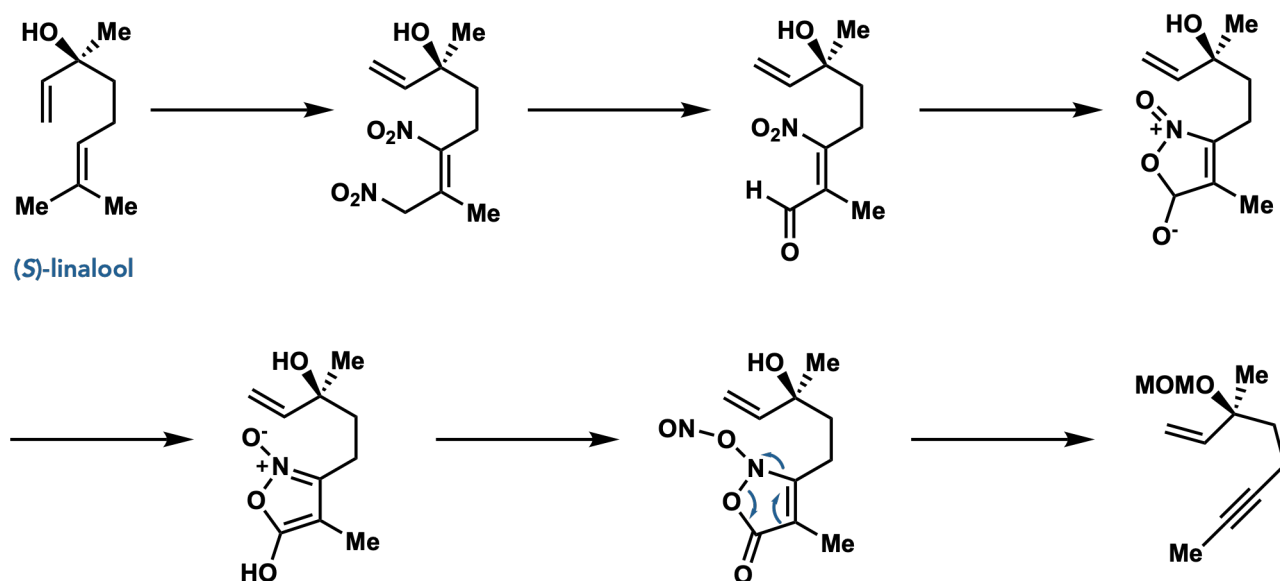


Synthesis of Angular Triquinane

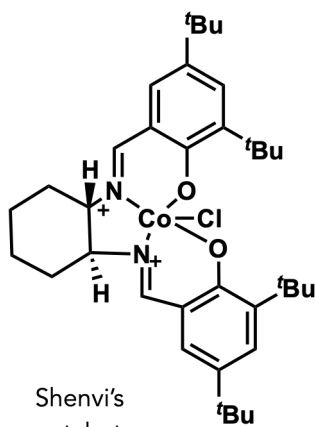
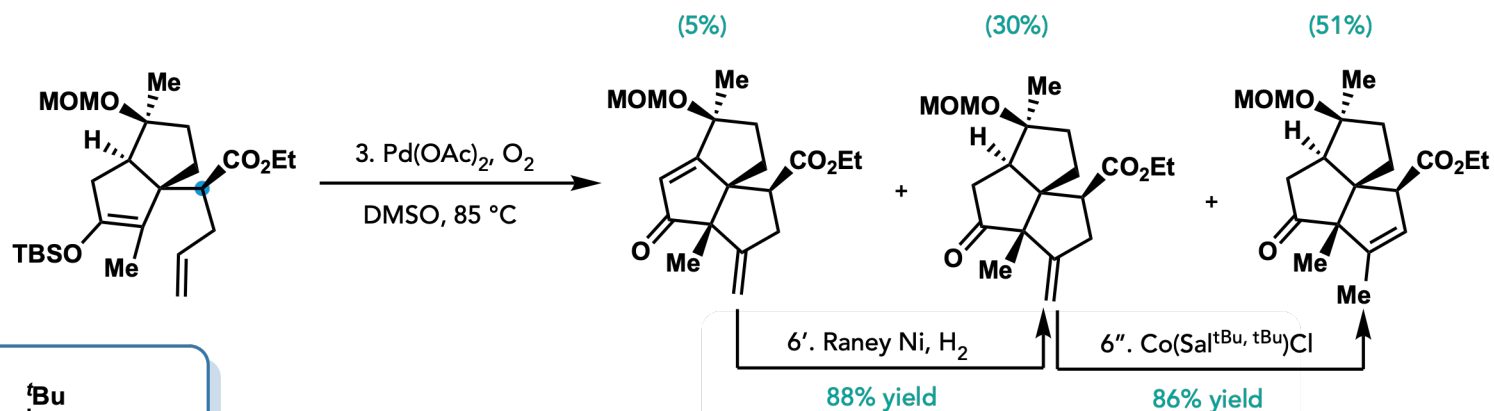


Synthesis of Angular Triquinane

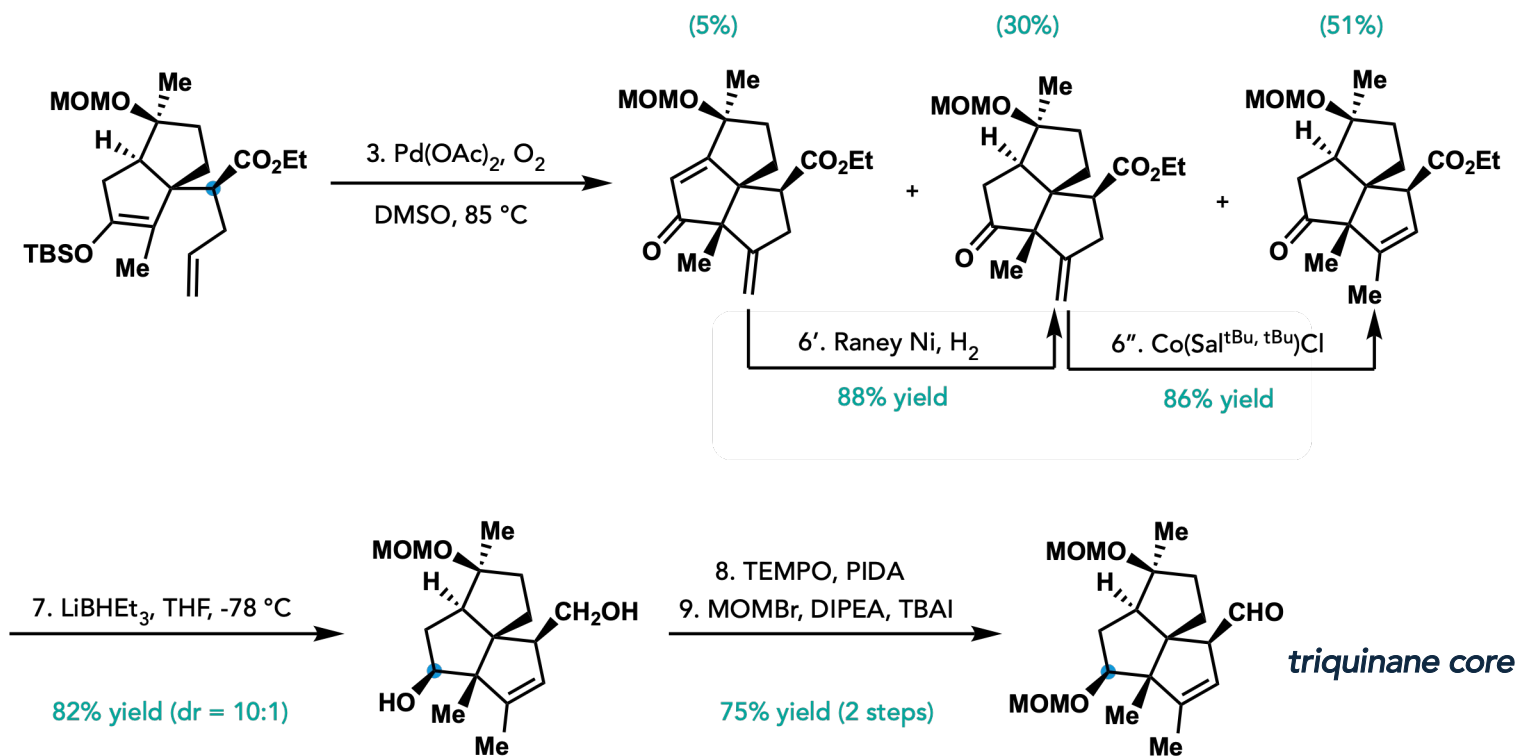
Abidi protocol



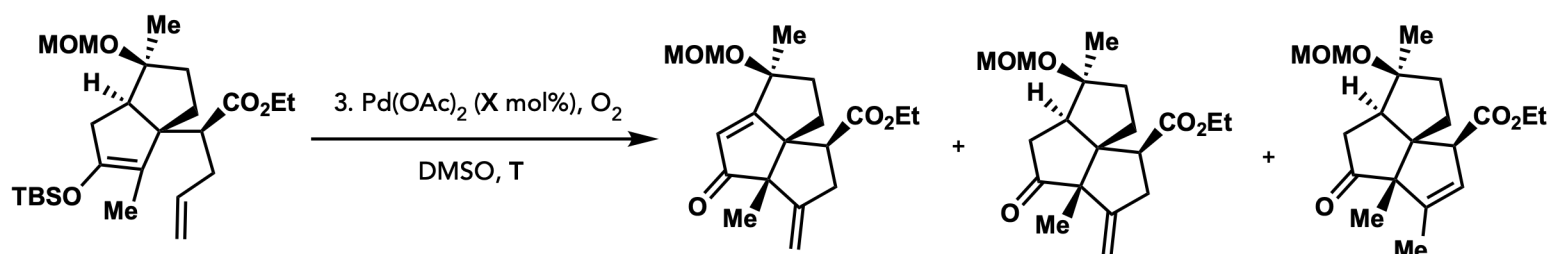
Synthesis of Angular Triquinane



Synthesis of Angular Triquinane



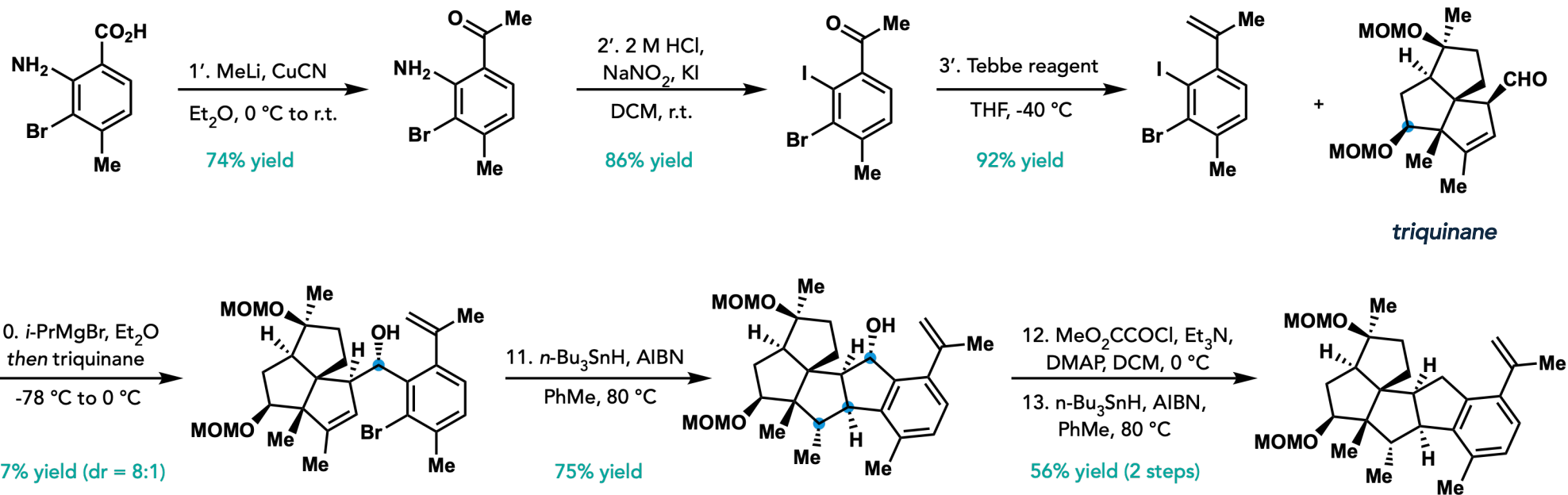
Optimization of Oxidative Cyclization

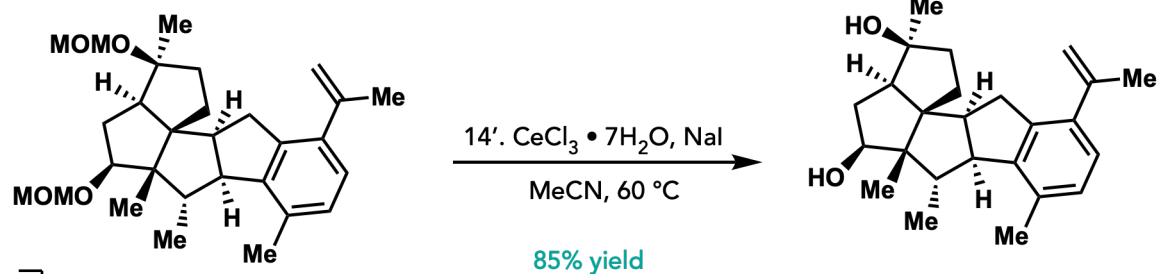


Entry	Cat. Loading (mol%)	T/°C	Yield a (%)	b (%)	c (%)
1	10	45	17	20	0
2	20	45	36	30	0
3	50	45	38	27	0
4	20	65	10	40	22
5	20	85	5	30	51

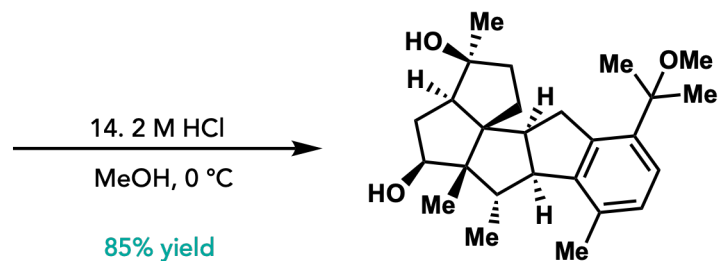
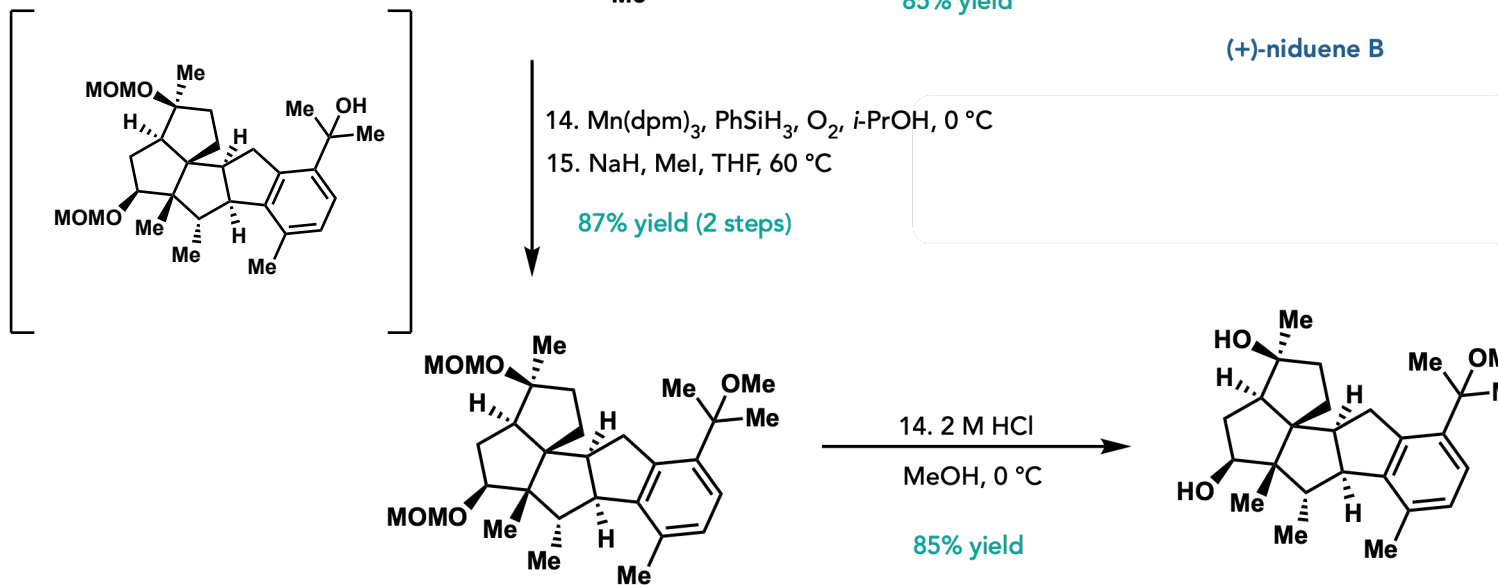


Endgame





(+)-niduene B



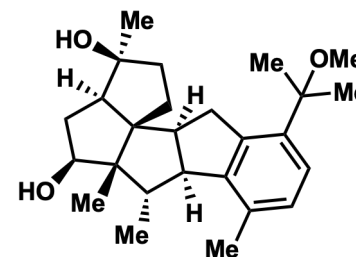
(+)-niduene A



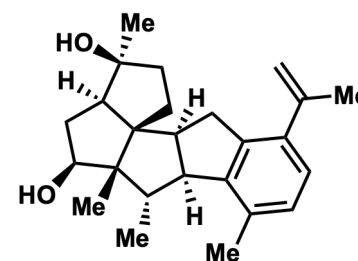
Summary



- Niduenes A and B were made in 16 steps and 14 steps, respectively.
- Key steps include a Pauson-Khand reaction, a Pd-catalyzed oxidative cyclization, and a radical cyclization with $n\text{-Bu}_3\text{SnH}$ and AIBN
- Issues with scalability in the latter steps of the synthesis



(+)-niduene A



(+)-niduene B