



Protecting-Group-Free Enantioselective Synthesis of (-)-Pallavicinin and (+)- Neopallavicinin

LITERATURE PRESENTATION

Wenshuai Zhong

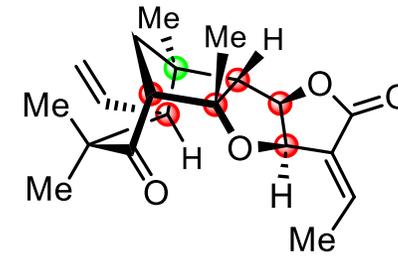
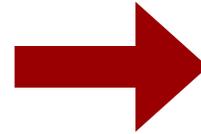
2025/11/13

BACKGROUND

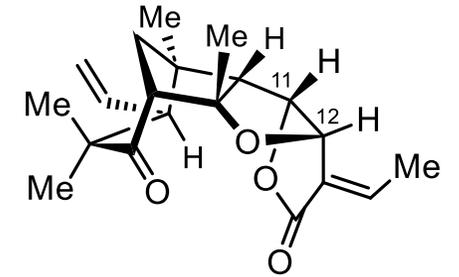


liverworts

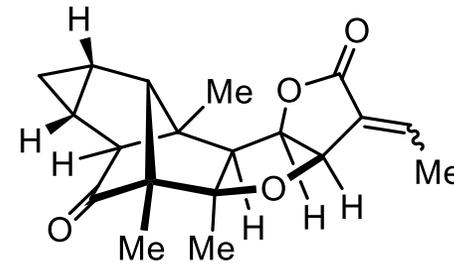
SYNTHESIS



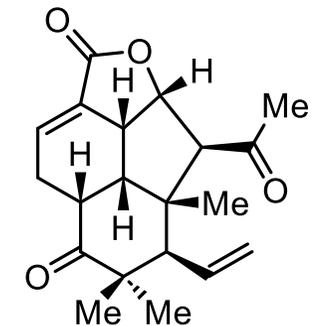
pallavicinin (11*R*,12*R*)



neopallavicinin (11*S*,12*S*)



pallambin A/B



pallavicinolide A

.....



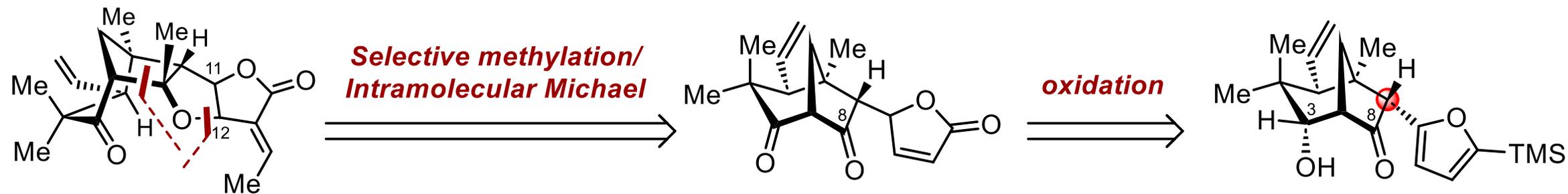
Huang Bin
(黄斌)

Professional Experience

- 2019-present Associate Professor, School of Pharmaceutical Sciences, Soochow University
- 2016-2019 Postdoctoral Fellow, Universität Zürich
Advisor: K. Gademann

Education

- 2011-2016 Ph.D., School of Pharmaceutical Sciences, Peking University **Advisor: Prof. Jia Yanxing**
- 2007-2011 B.S., School of Life Science and Biopharmaceutics, Shenyang Pharmaceutical University

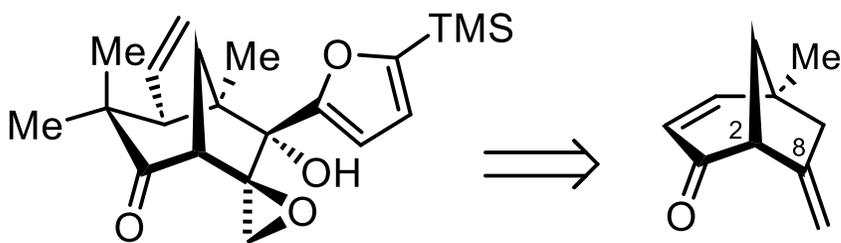


(-)-pallavicinin (**1**) (11*R*,12*R*)
 (+)-neopallavicinin (**2**) (11*S*,12*S*)

3

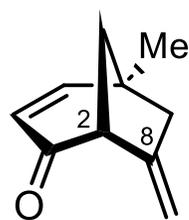
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**LiBHEt₃-induced
fragmentation/
protonation**



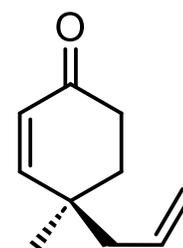
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**Pd-catalyzed
oxidative
cyclization**

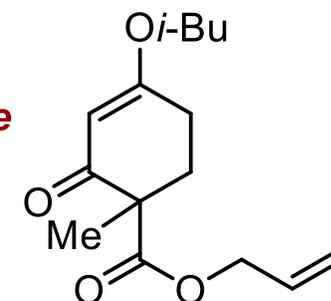


6

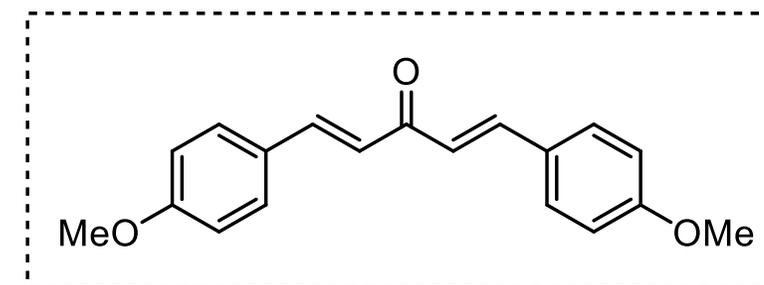
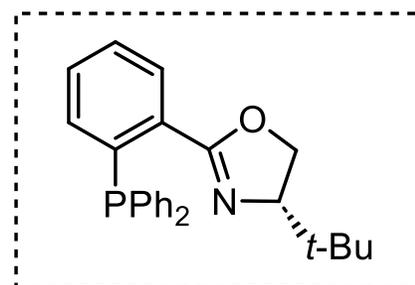
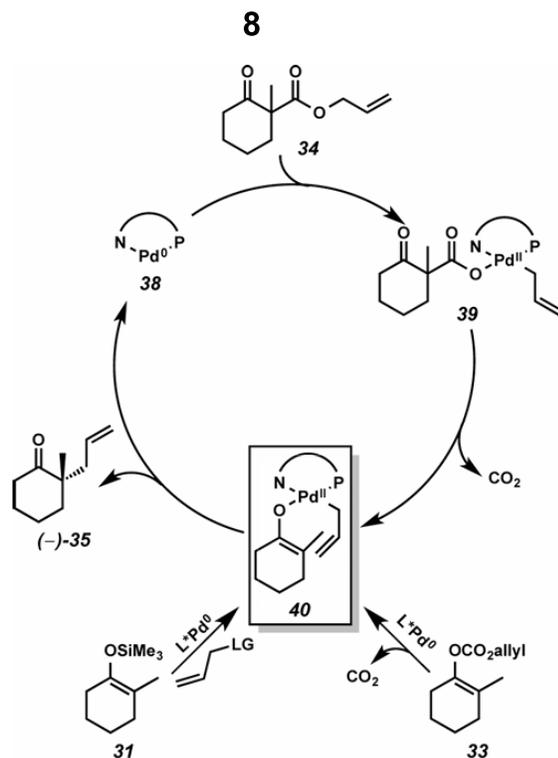
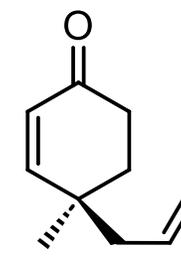
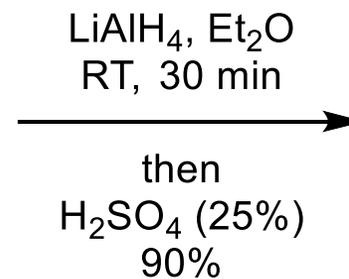
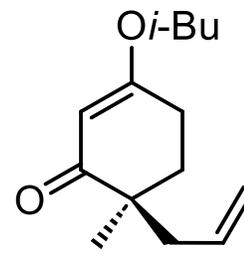
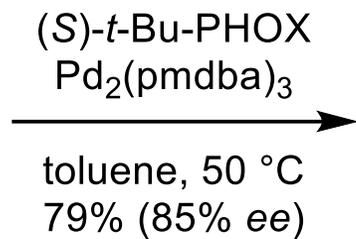
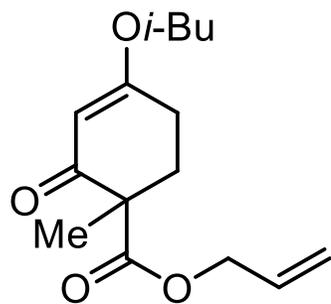
**Pd-catalyzed
asymmetric
decarboxylative
allylation**

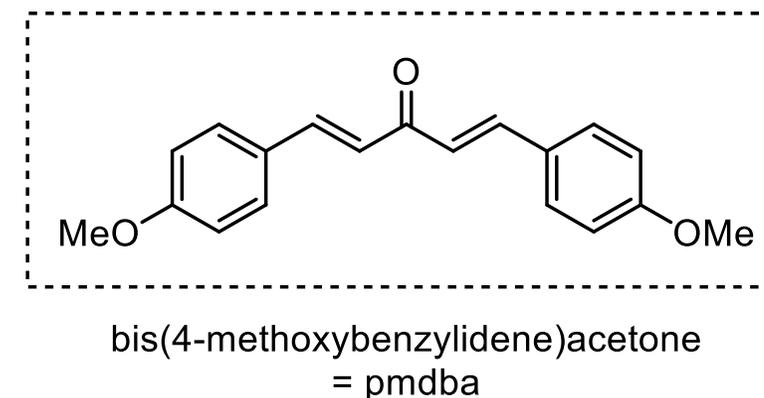
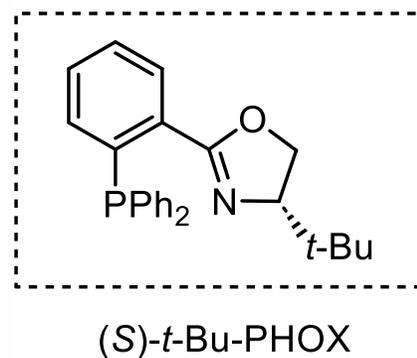
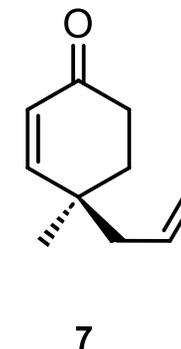
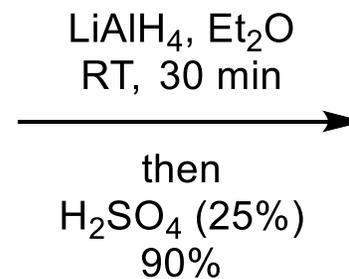
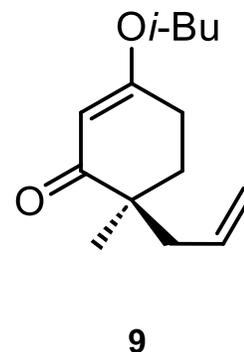
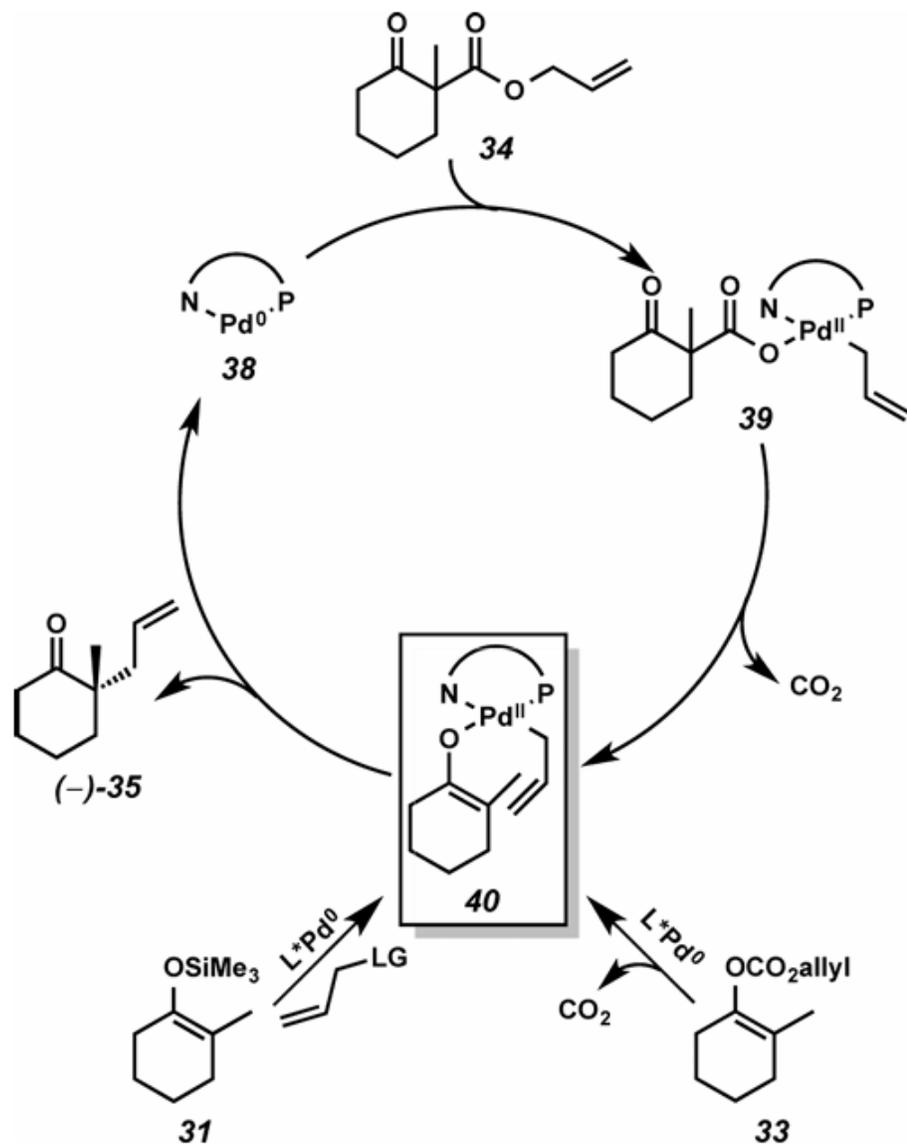


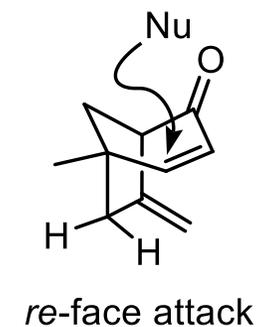
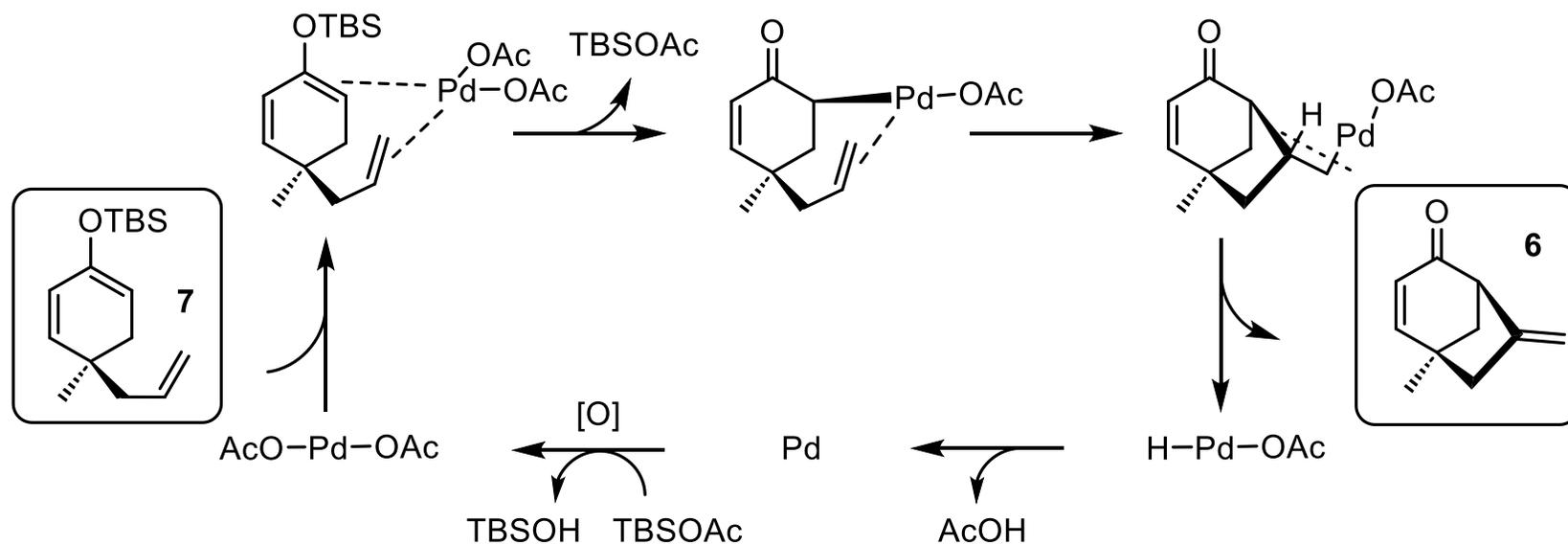
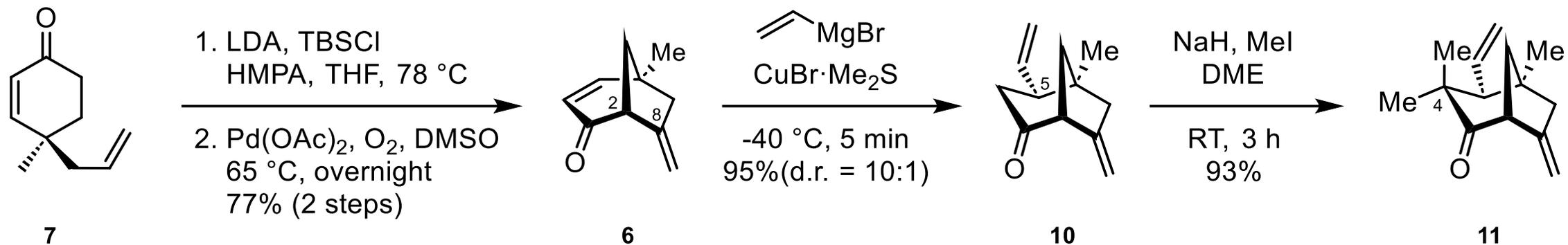
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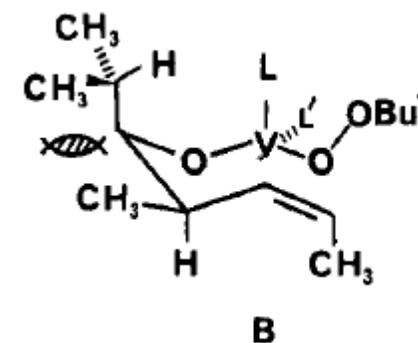
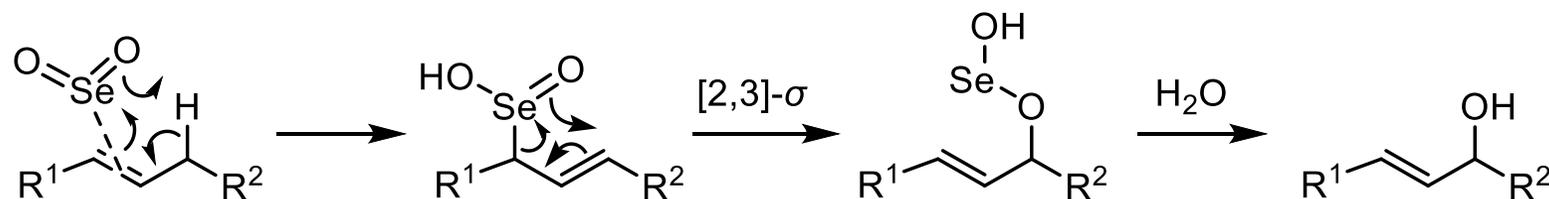
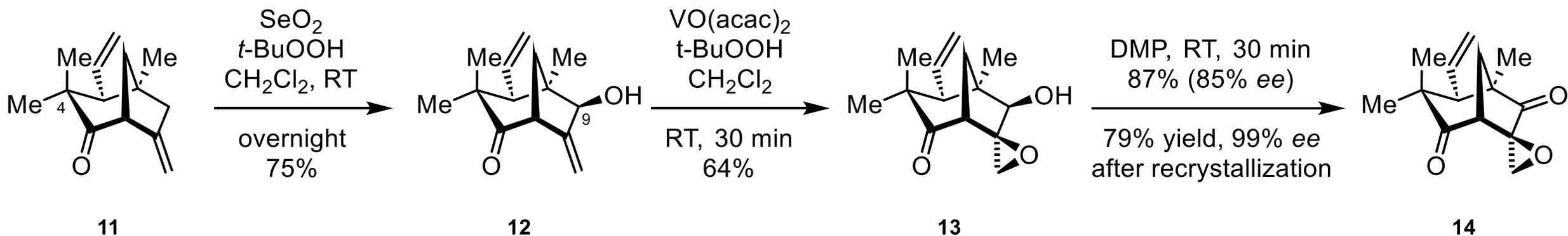




BACKGROUND

SYNTHESIS

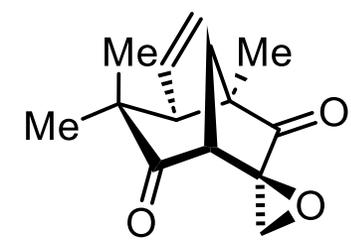
SUPPLEMENT



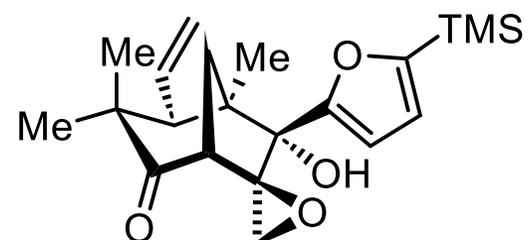
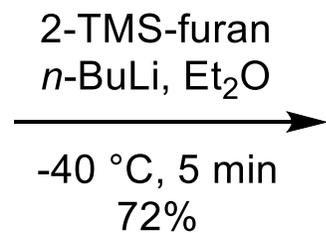
BACKGROUND

SYNTHESIS

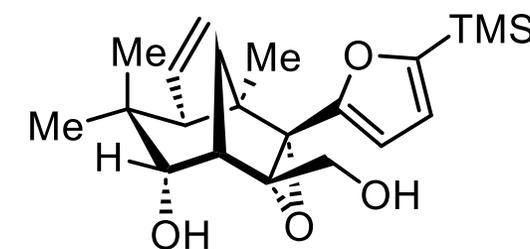
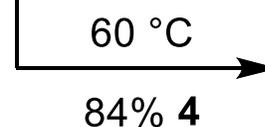
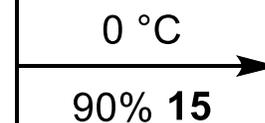
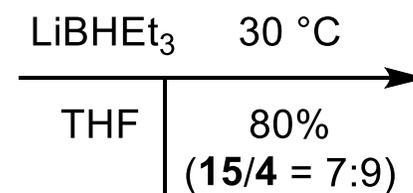
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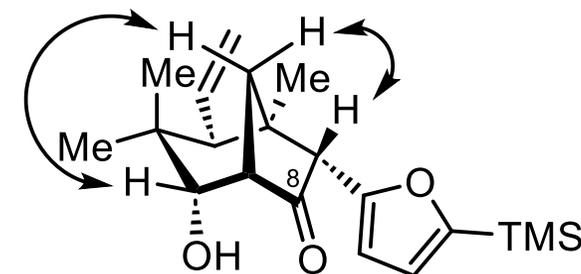
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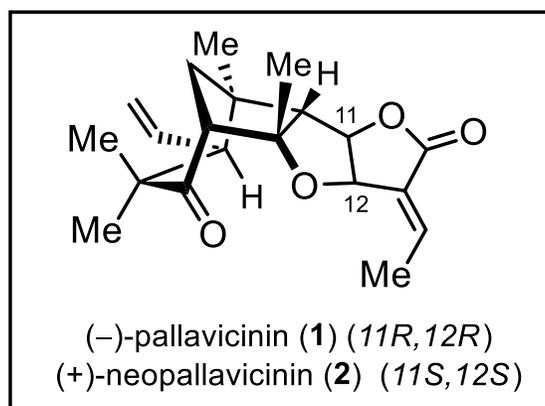
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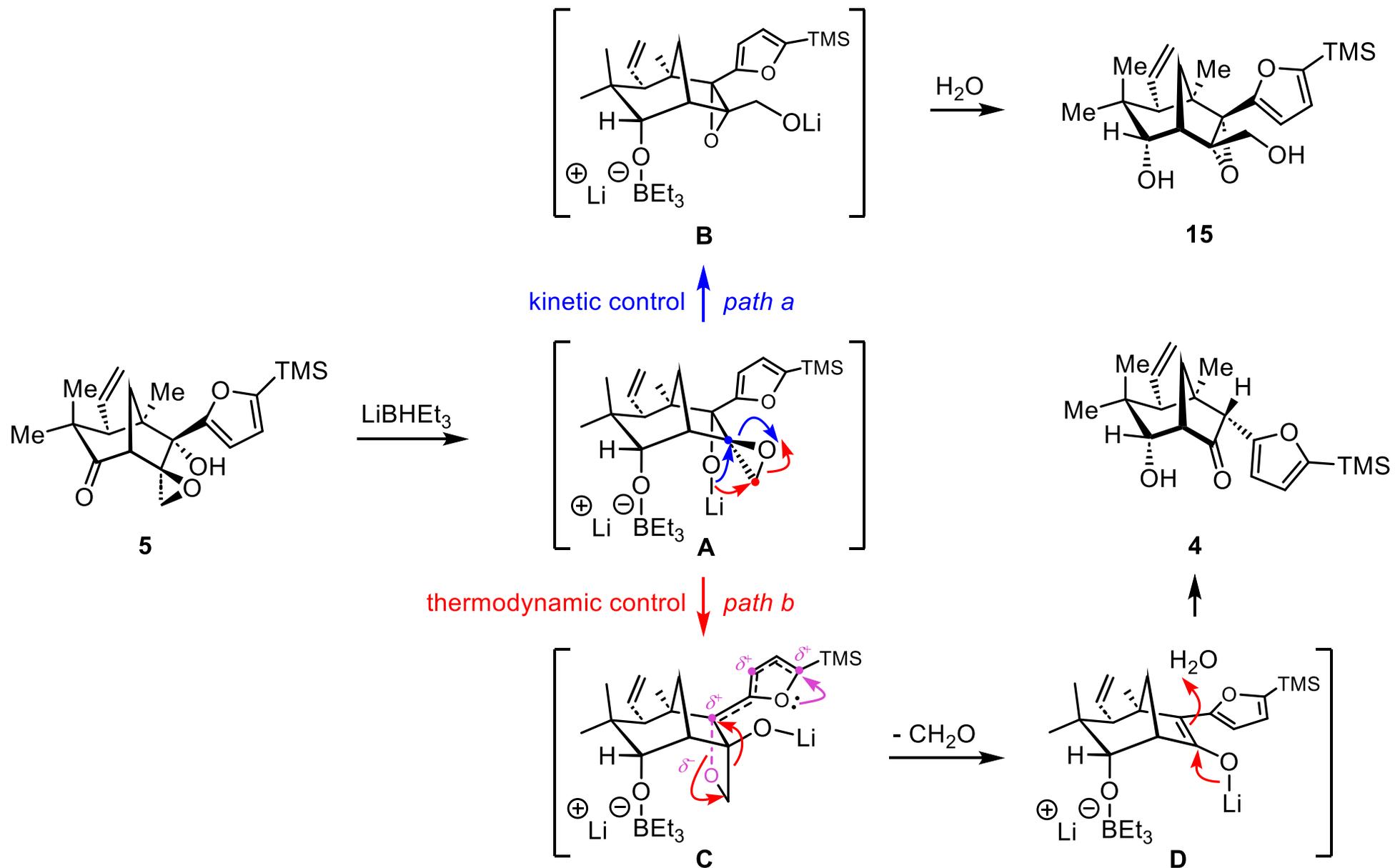


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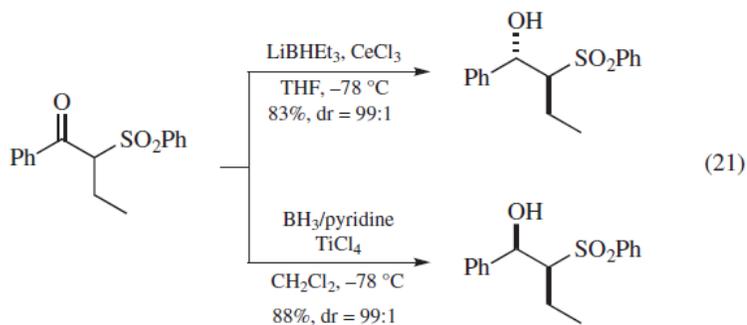
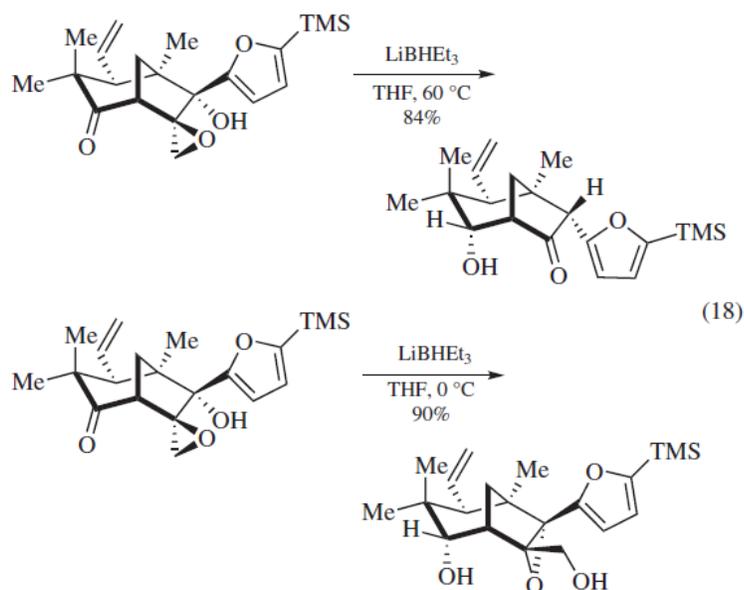




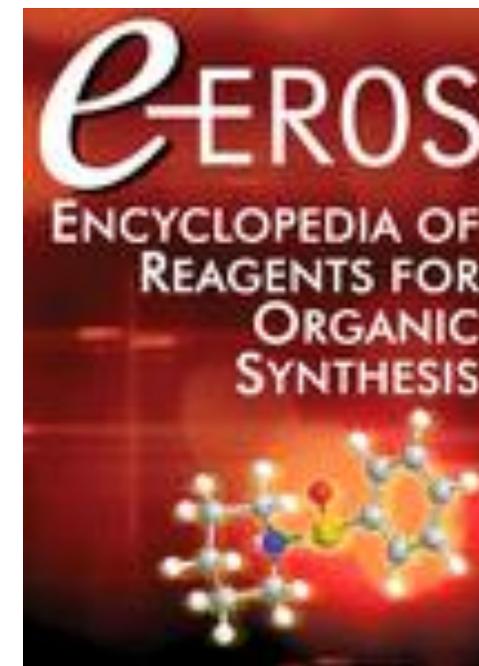
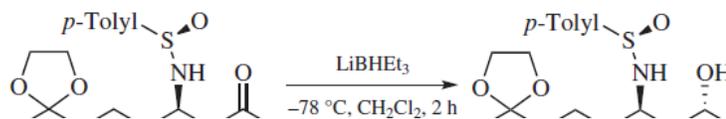
Deoxygenation of Alcohols. Selective deoxygenation of unhindered alcohols has been achieved via a one-pot reduction of diphenyl phosphate esters with lithium triethylborohydride in THF at room temperature (eq 15).⁵⁰

Epoxides. During the total synthesis of (–)-pallavicinin, the formation of an α -furyl ketone was reported from an α -hydroxy epoxide via a lithium triethylborohydride-induced fragmentation/protonation sequence (eq 18).⁵⁴ Lowering the reaction temperature provided the Payne rearrangement product with high selectivity.

4 LITHIUM TRIETHYLBOROHYDRIDE



An asymmetric synthesis of acyclic *anti*-1,3-amino alcohol derivatives has been achieved via the reduction of *N*-sulfinyl- β -amino ketones using lithium triethylborohydride (eq 22). On the other hand, utilization of $\text{Li}(t\text{-BuO})_3\text{AlH}$ results in the formation of *syn*-1,3-amino alcohols.⁶¹

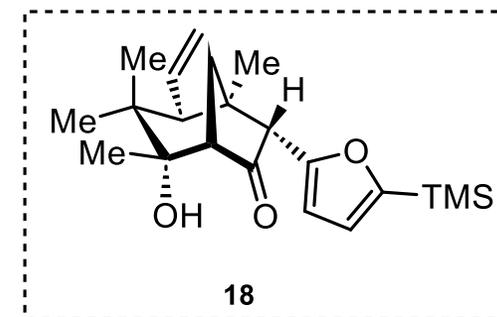
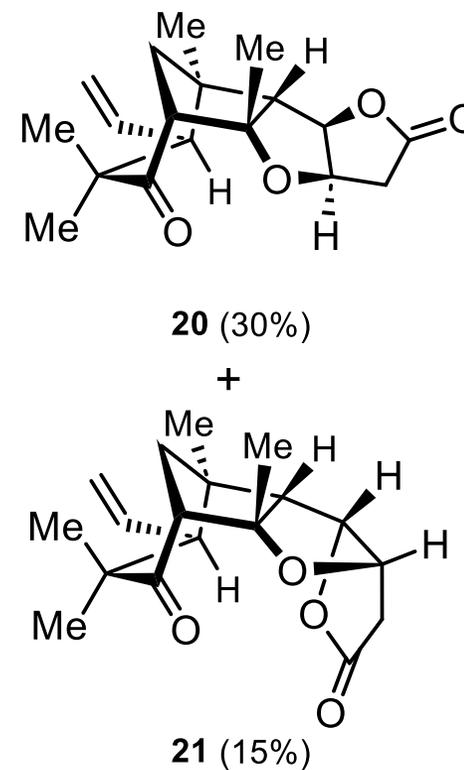
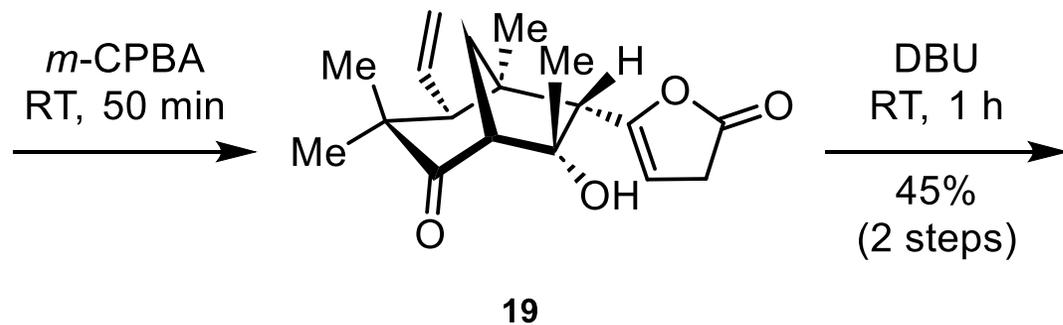
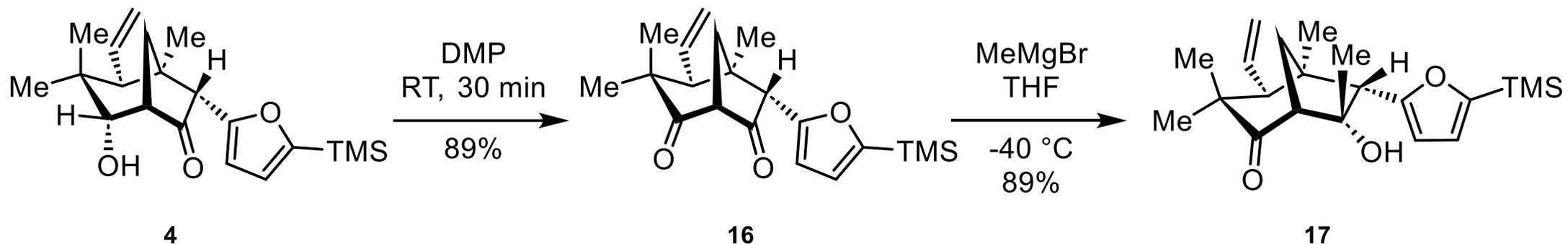


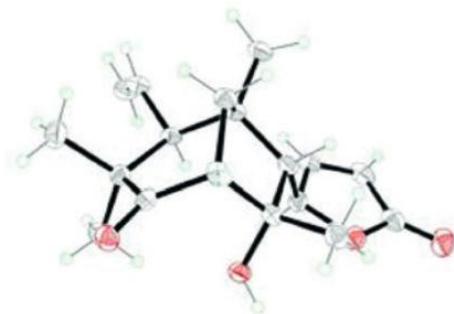
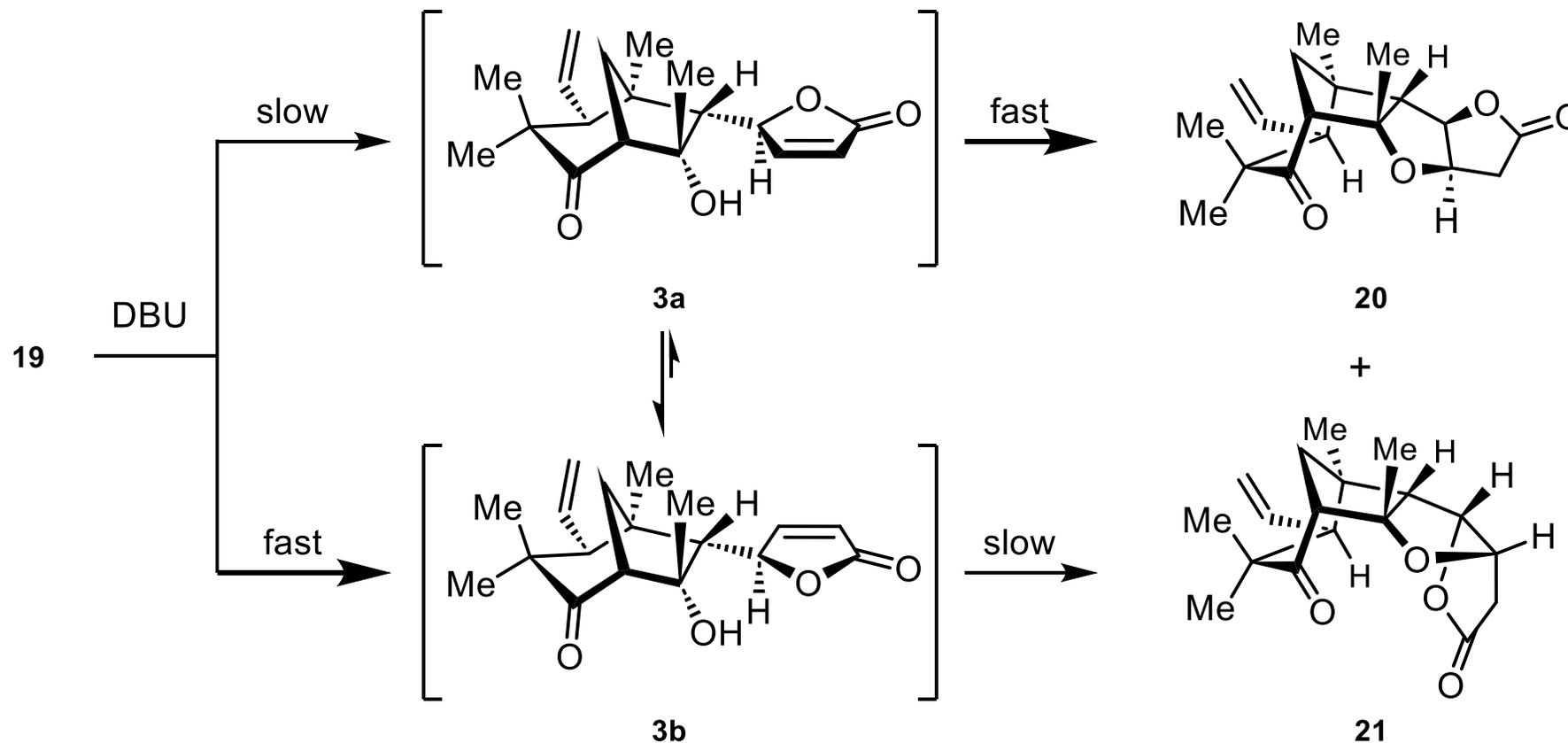
**Encyclopedia of Reagents
for Organic Synthesis**

BACKGROUND

SYNTHESIS

SUPPLEMENT

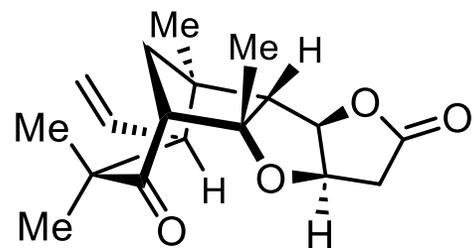




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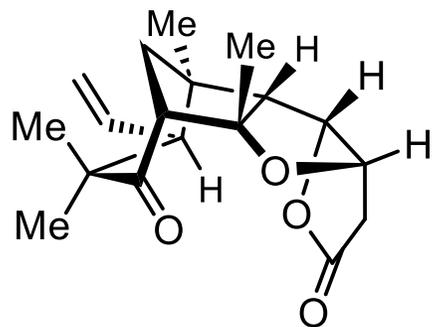
SYNTHESIS

SUPPLEMENT



20

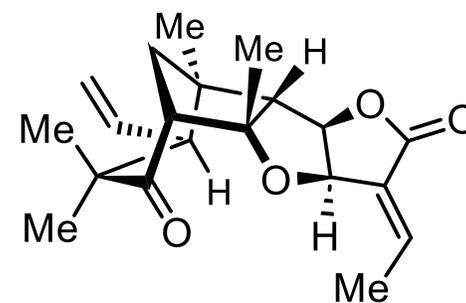
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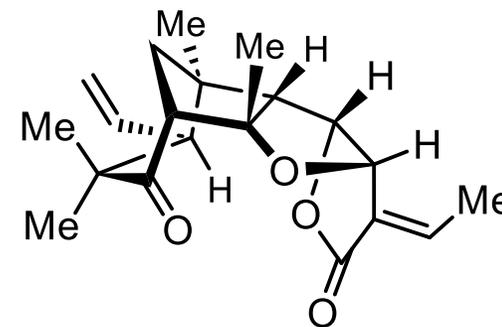
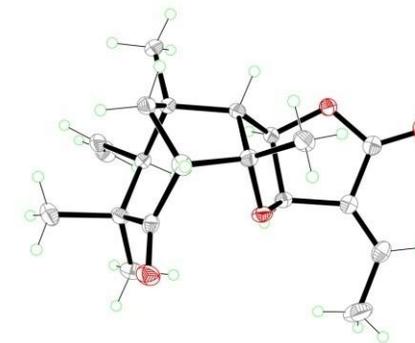
1. LDA, CH₃CHO, THF, -78 °C
2. MsCl, Et₃N, DMAP, CH₂Cl₂

1: 55% (2 steps)
2: 12% (2 steps)



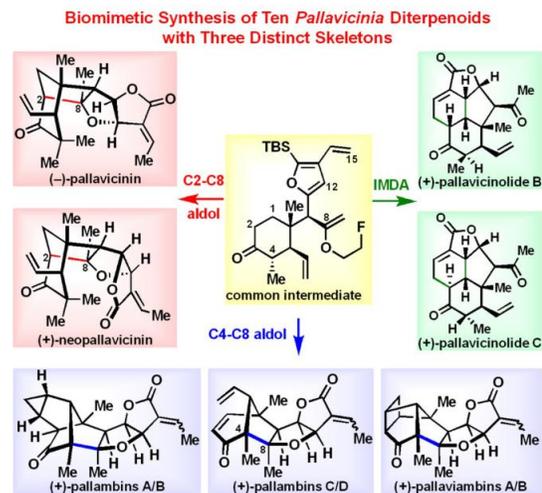
(-)-pallavicinin [(-)-1]

≡

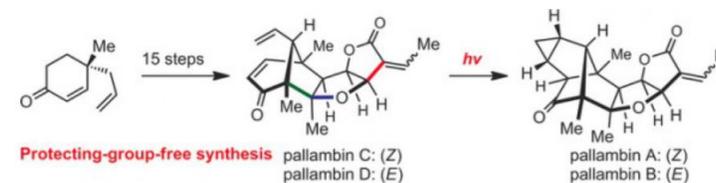


(+)-neopallavicinin [(+)-2]

109. "Biomimetic synthesis of pallavicinin, neopallavicinin, pallambins A–D, pallaviambins A/B, and pallavicinolides B/C", Lijun Chen, Peng Chen, Xiwu Zhang, Yu Zhang, **Yanxing Jia***. *Chem* **2024**, *10*, 2473–2483.



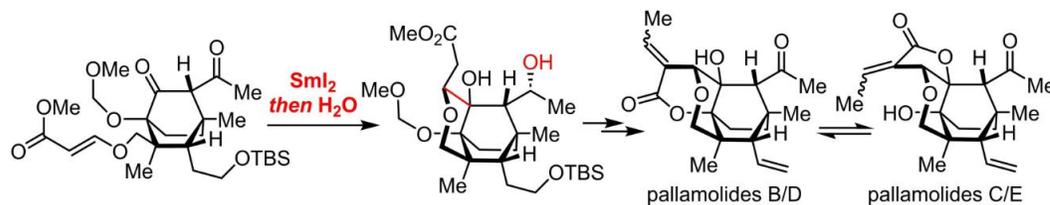
89. "Enantioselective Total Syntheses of Pallambins A–D", Xiwu Zhang, Xinxian Cai, Bin Huang, Lei Guo, Zhongrun Gao, **Yanxing Jia***. *Angew. Chem. Int. Ed.* **2019**, *58*(38), 13380–13384. *Angew. Chem.* **2019**, *131*(38), 13514–13518.



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107. "Total Synthesis of Pallamolides A–E", Yu Zhang, Lijun Chen, **Yanxing Jia***. *Angew. Chem. Int. Ed.* **2024**, *63*, e202319127.



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LITERATURE PRESENTATION

Wenshuai Zhong

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