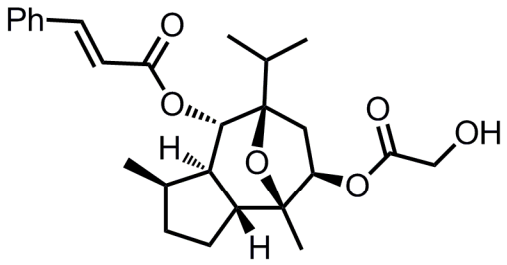
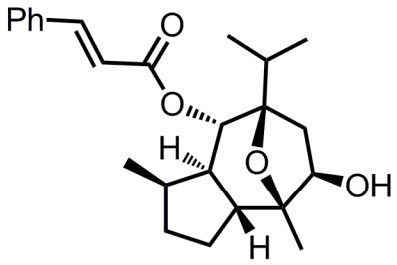
Enantioselective Synthesis of (-)-Englerins A and B

Kian Molawi, Nicolas Delpont, Antonio M. Echavarren*

Angew. Chem. Int. Ed. 2010, Early View

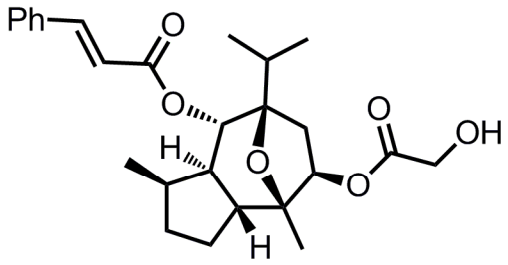




Asymmetric, Protecting-Group-Free Total Synthesis of (-)-Englerin A

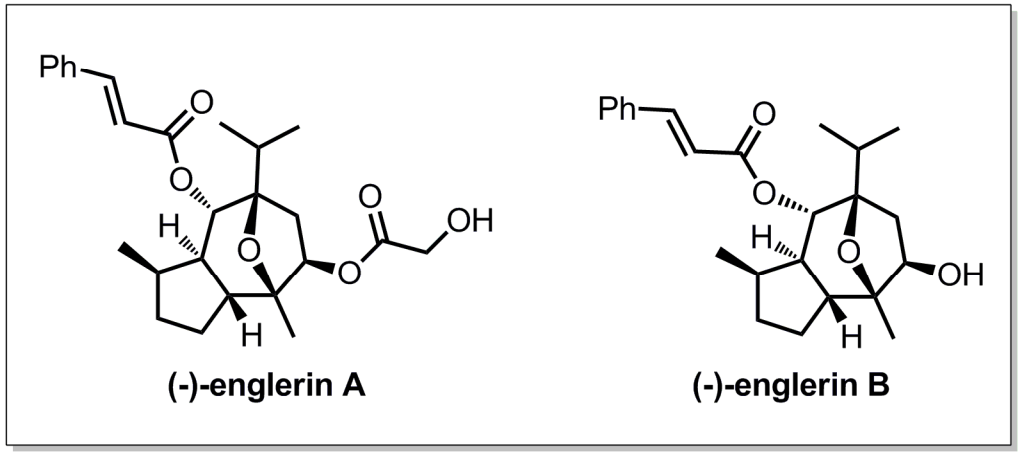
Qianghui Zhou, Xiaofei Chen, Dawei Ma*

Angew. Chem. Int. Ed. 2010, Early View



Nolan Griggs
Current Literature
04-24-2010

(-)-Englerins A and B



• Isolated by Beutler and co-workers from the stem bark of *Phylanthus engleri*, an east African plant.

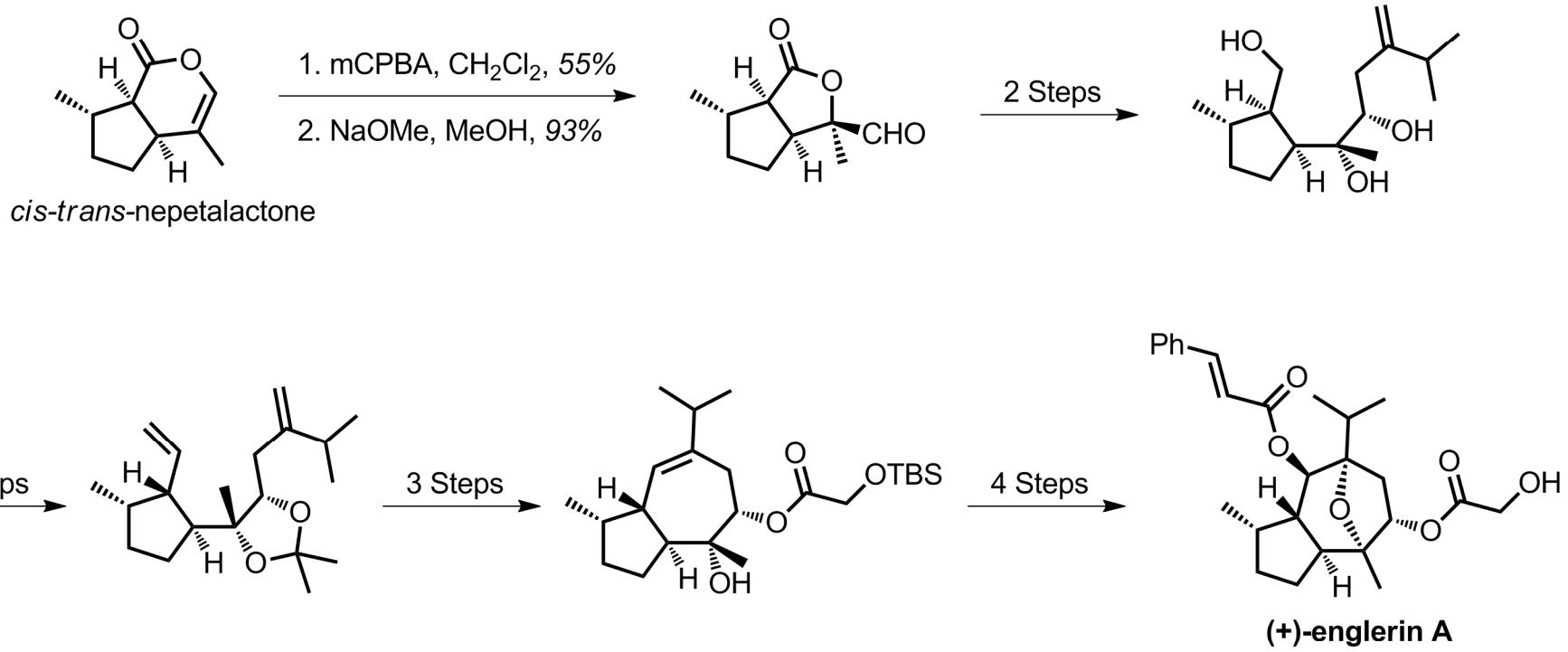
• Englerin A was found to be more active than Taxol when tested against renal cancer cell lines with GI_{50} values < 20 nM.

• Englerin B showed substantially lower ativity indicating the importance of the glycolate ester at the C-9 position.

Org. Lett., **2008**, 11(1), 57-60.

Previous Synthesis of (+)-Englerin A.

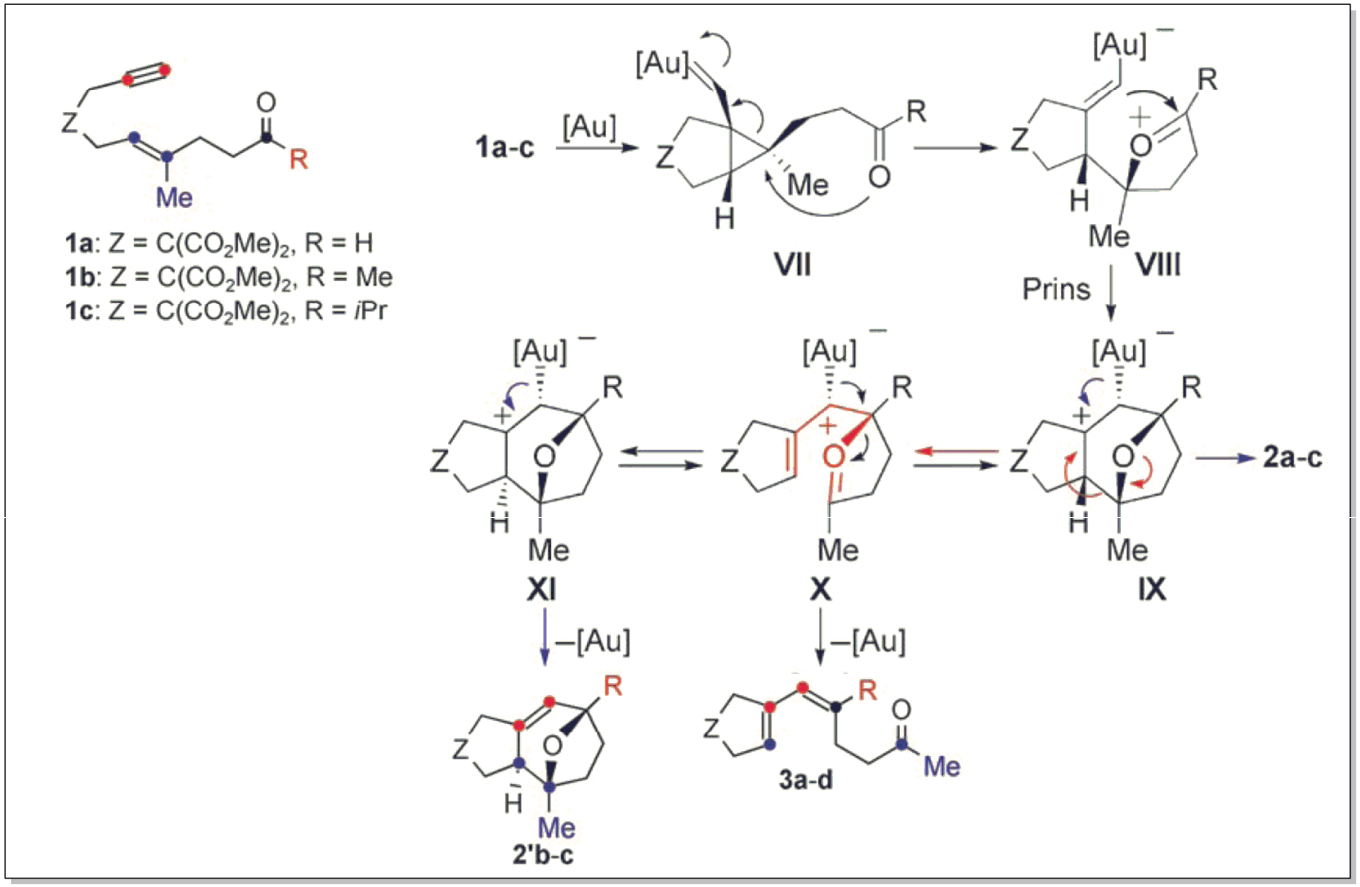
• In 2009, Christmann and co-workers completed a total synthesis and determined the absolute configuration of (+)-englerin A.



cis-trans-nepetalactone

Angew. Chem. Int. Ed., **2009**, 48, 9105.

Prins Cyclization in Gold-catalyzed Reactions of Enynes

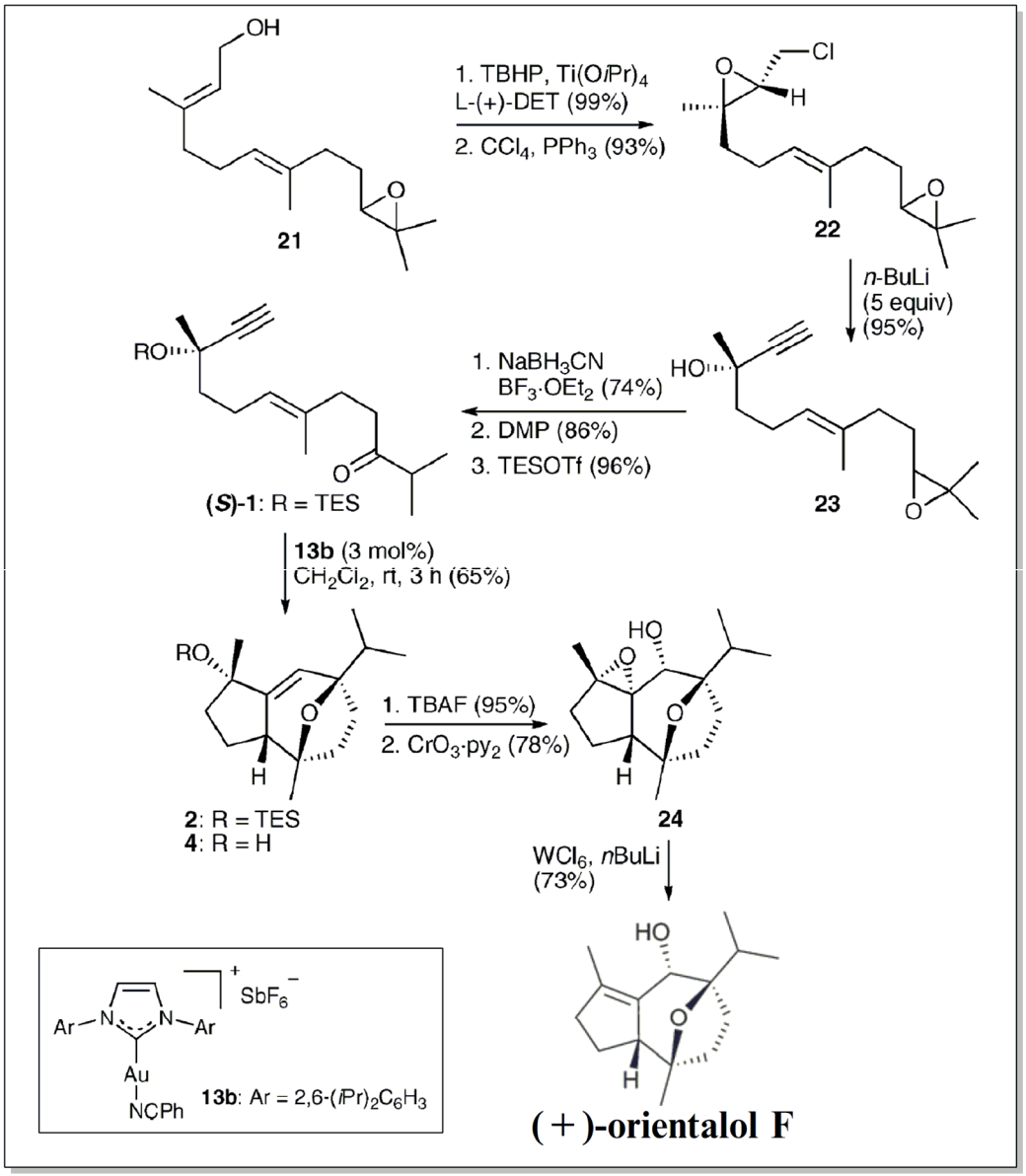


Jimenez-Nunez, E.; Claverie, C. K.; Nieto-Oberhuber, C.; Echavarren, A. M.; *Angew. Chem. Int. Ed.* **2006**, 45, 5452-5455.

Aromaticity of IX: Alder, R.; Harvey, J.N.; Oakley, M. T.; *J. Am. Chem. Soc.* **2002**, 124, 4960-4961

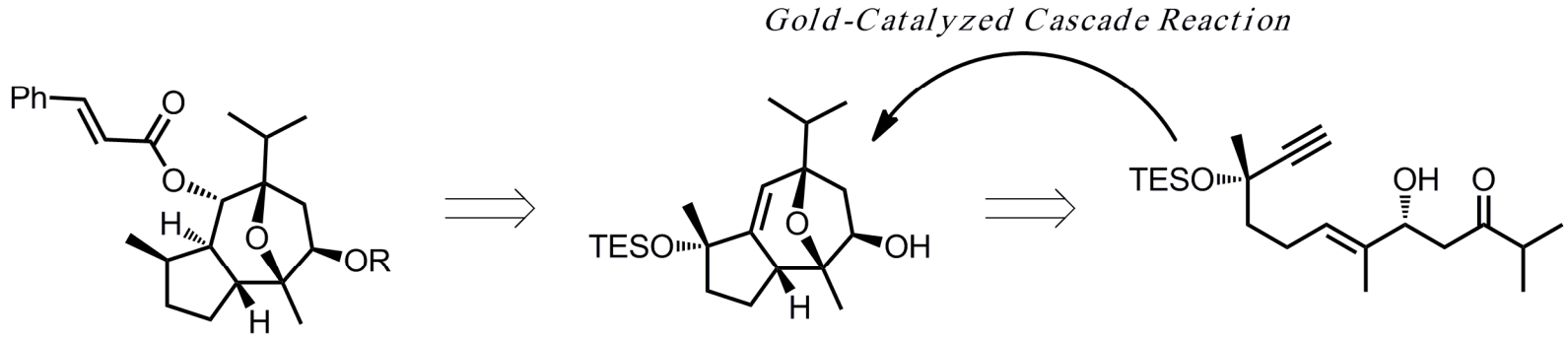
Reveiws on Gold-catalyzed cycloadditions: *Angew. Chem. Int. Ed.* **2008**, 47, 4268-4315.
Chem Rev. **2008**, 108, 3326-3350.
Angew. Chem. Int. Ed. **2007**, 46, 3410-3449.

Synthesis of (+)-Orientalol F

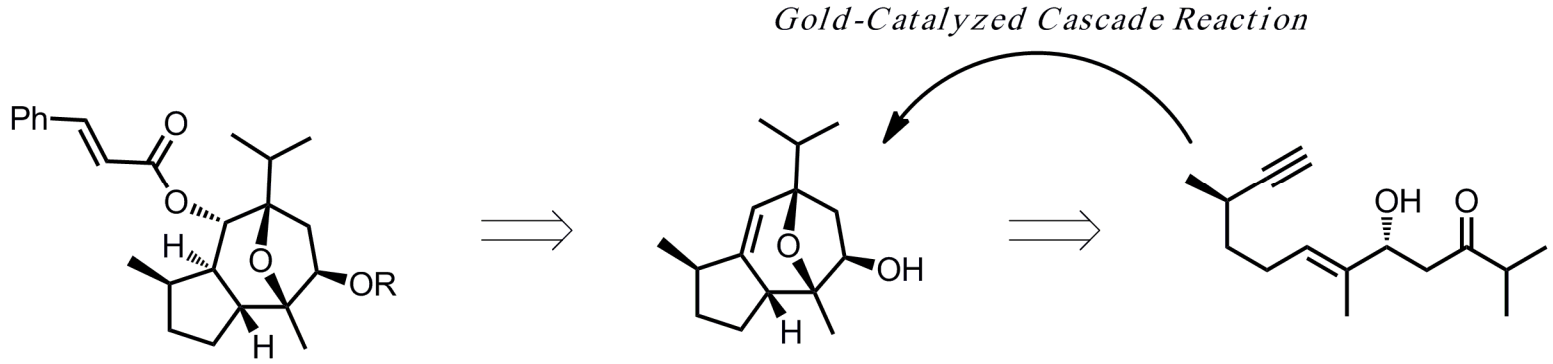


Jimenez-Nunez, E.; Molawi, K.; Echavarren, A. M.; *Chem. Comm.* **2009**, 7327-7329.

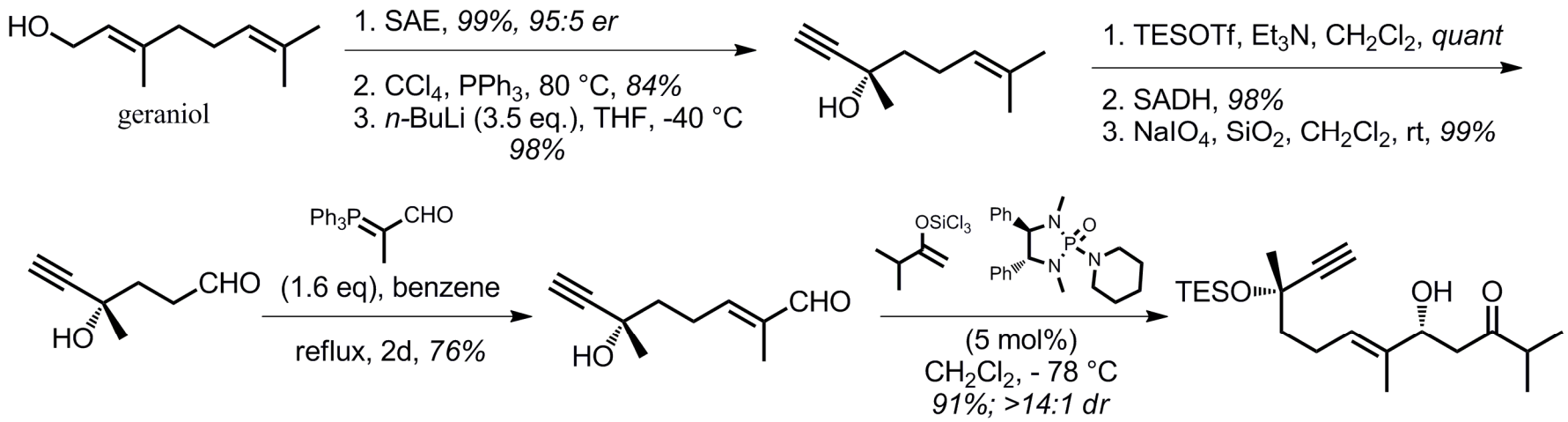
Echavarren, A. M. et al.



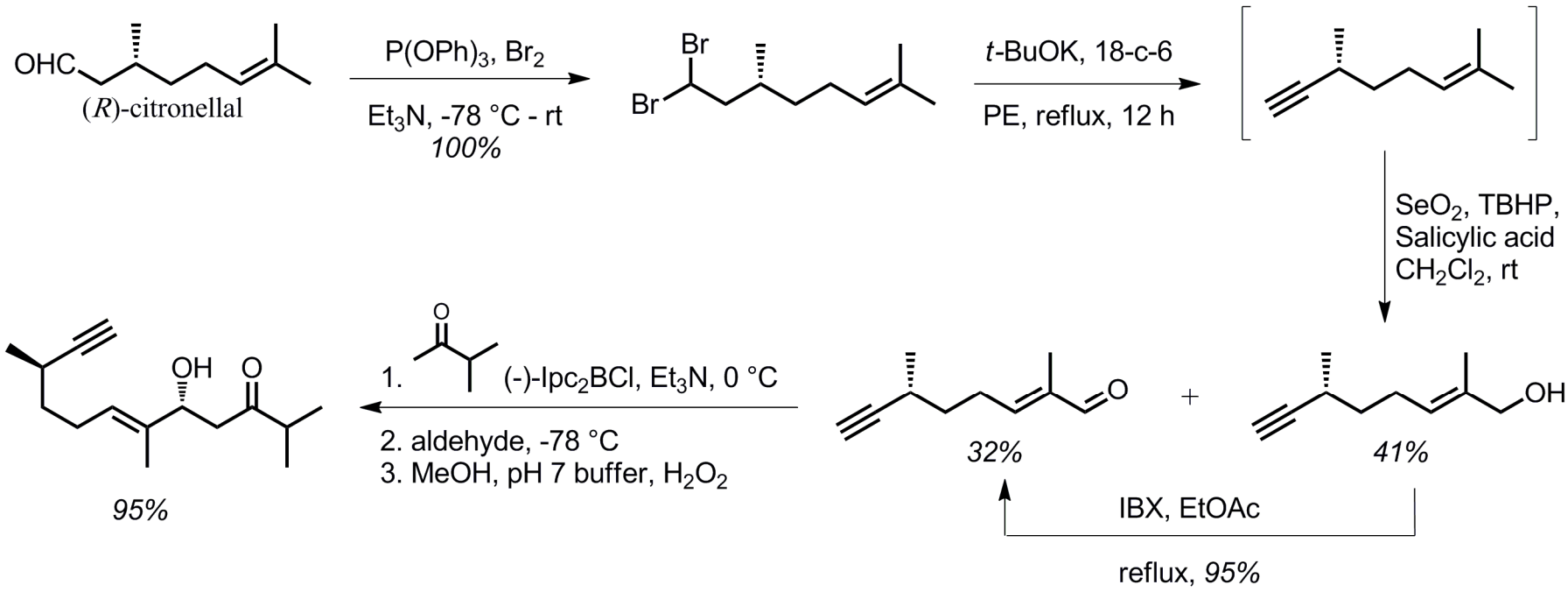
Ma, D. et al.



Echavarren, A. M. et al.



Ma, D. et al.



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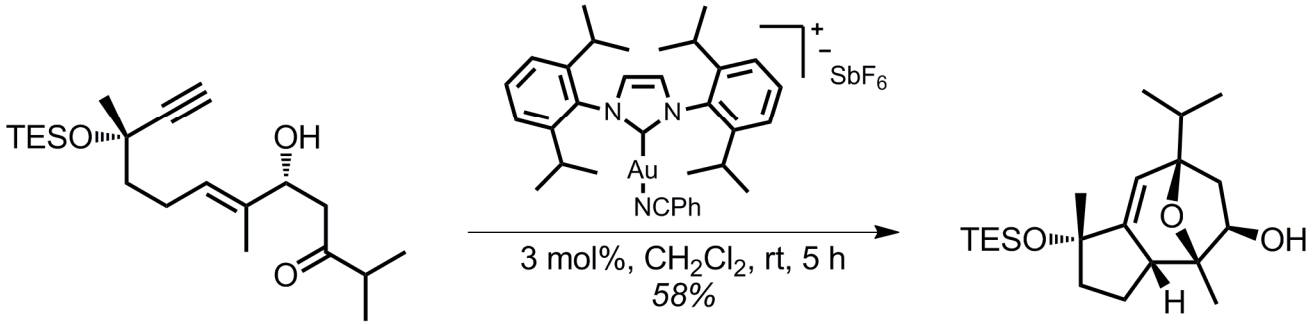
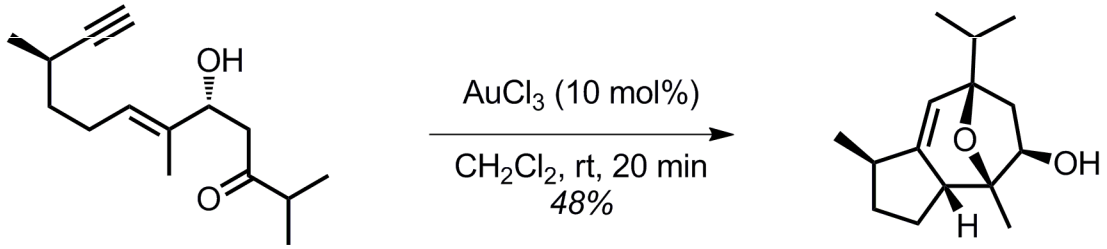
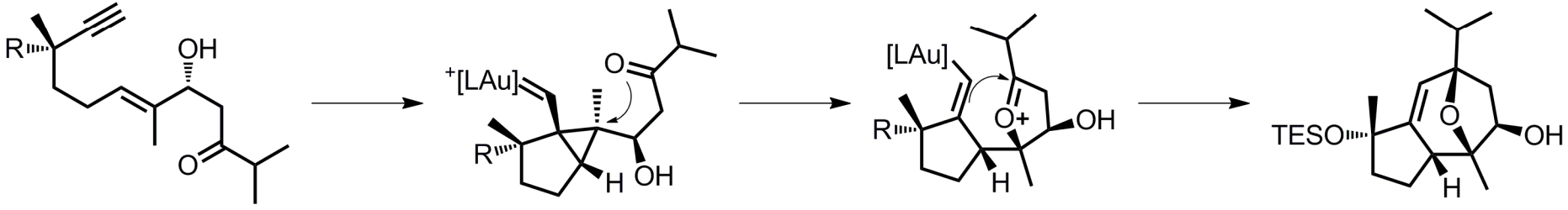


Ma, D. et al.



Proposed Mechanism:



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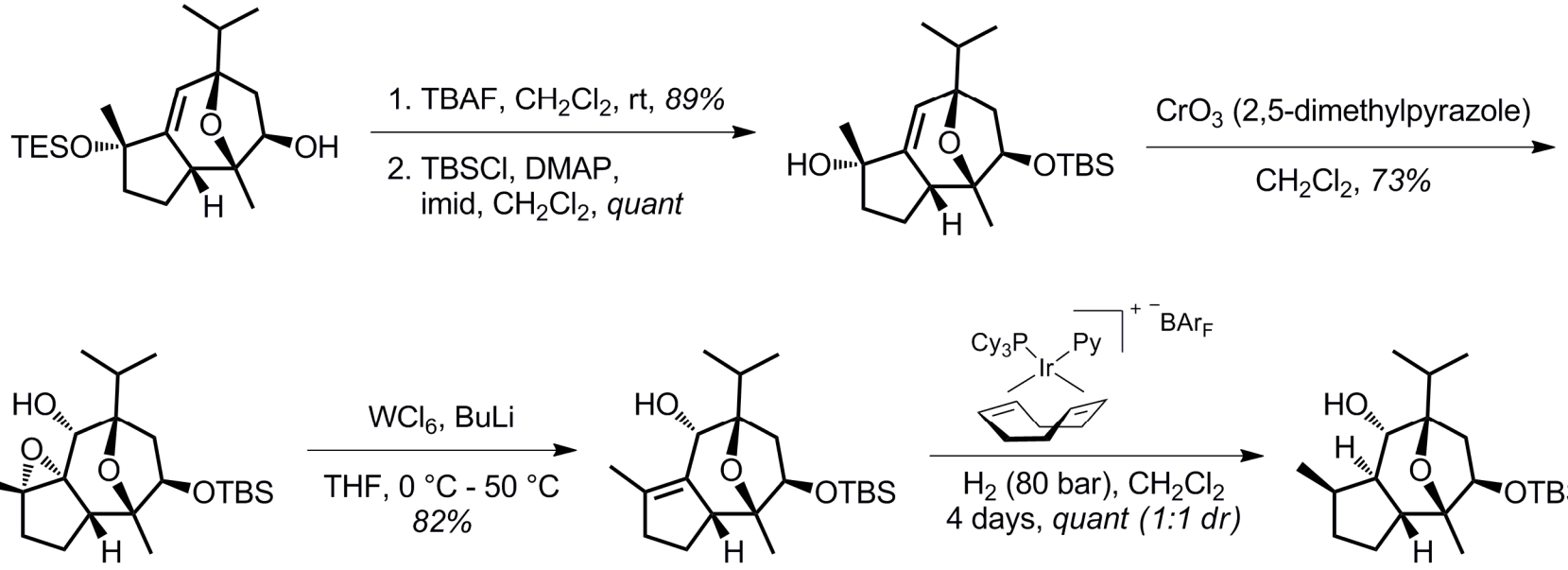

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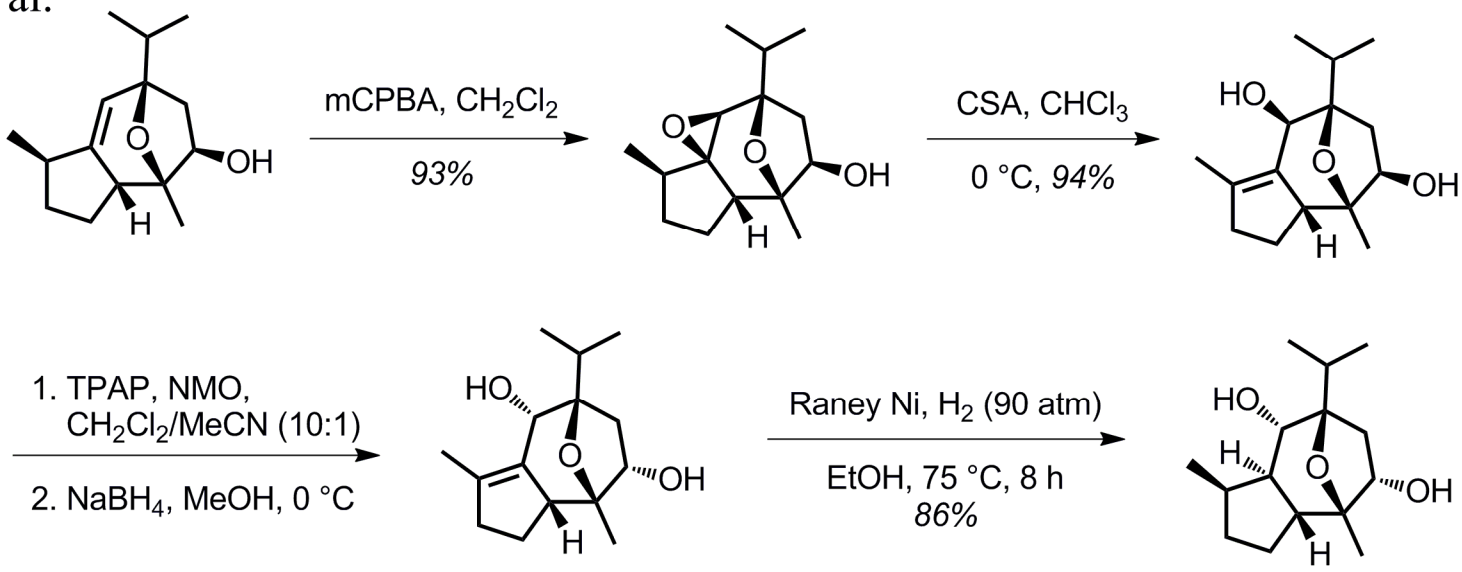

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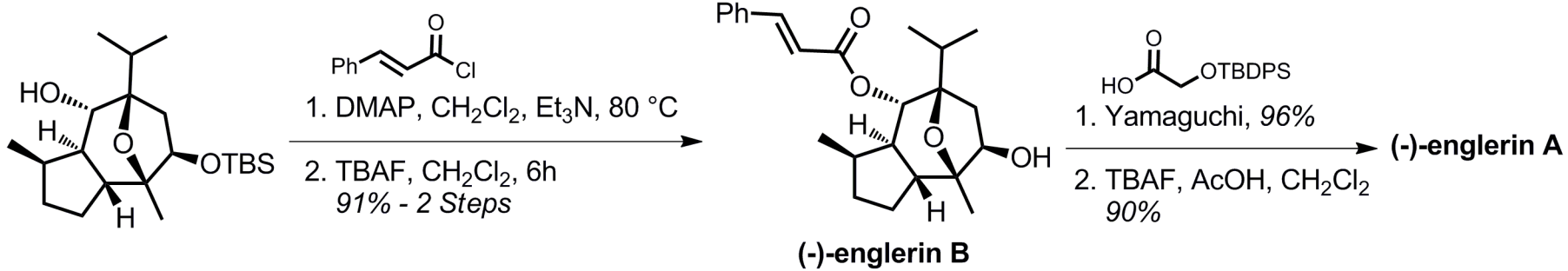

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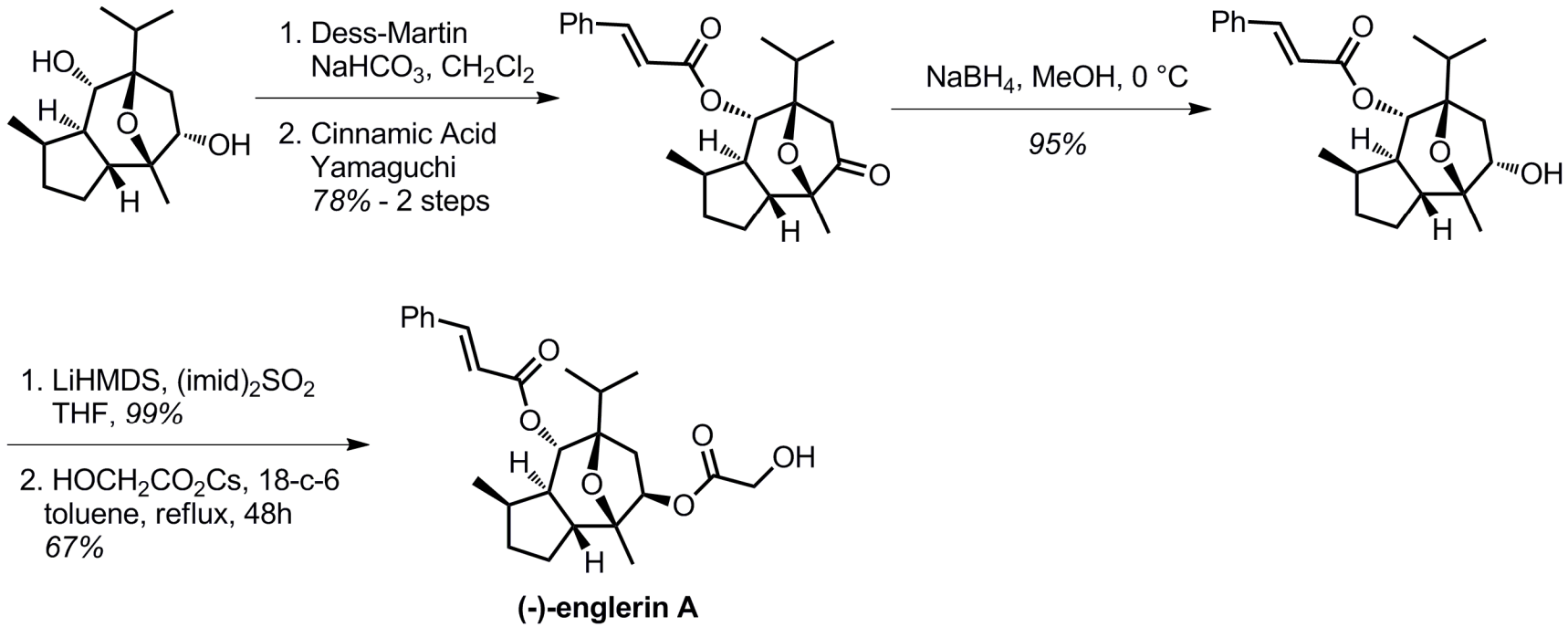

Summary

Echavarren, A. M. et al.

- Englerin A was synthesized in 18 steps with an 7% overall yield starting from geraniol.
- Highlights of the synthesis include the utilization of a very selective gold-catalyzed enyne cyclization/Prins cascade reaction with a free alcohol at a stereogenic allylic position.

Ma, D. et al.

- Englerin A was synthesized in 15 steps with an 8.1% overall yield starting from (*R*)-citronellal.
- Highlights of the synthesis include the utilization of a gold-catalyzed enyne cyclization/Prins cascade reaction.
- Synthesis is protecting group free.