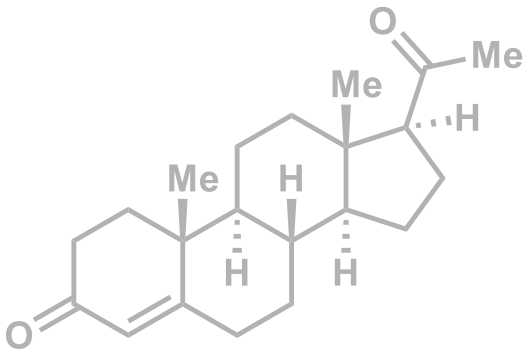
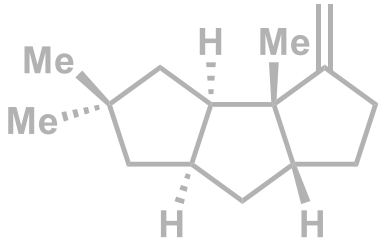
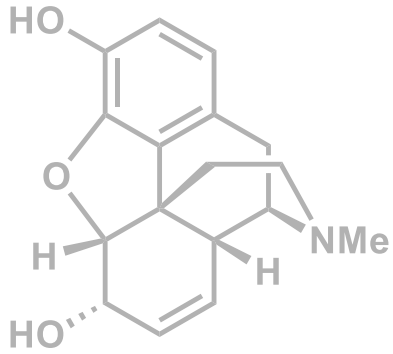
Cascades in Total Synthesis



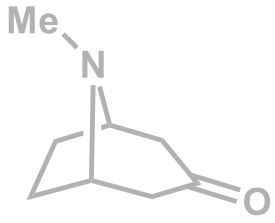
progesterone



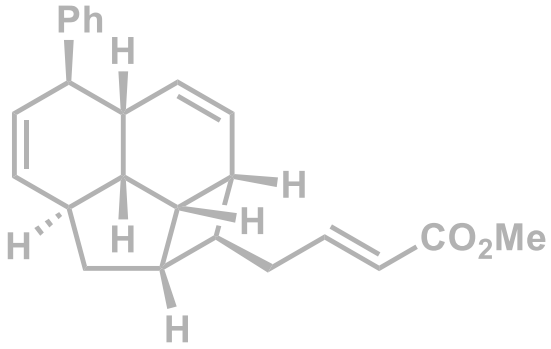
hirsutene



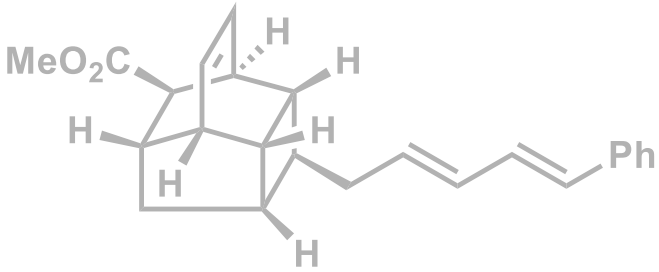
morphine



tropinone



endiandric acid B
methyl ester



endiandric acid C
methyl ester

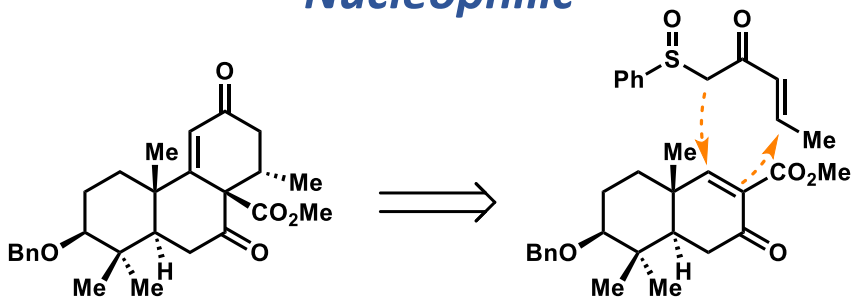
Garry (Lande) Hu

Literature Group Meeting

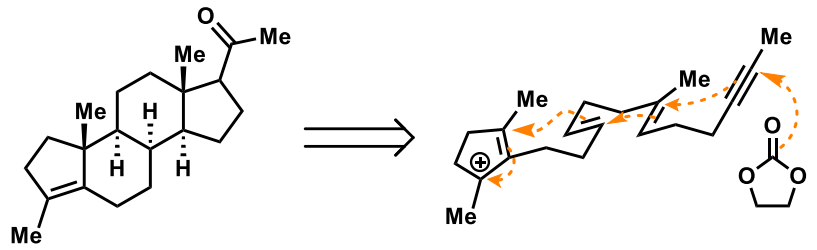
Oct. 10th, 2025

Cascades in Total Synthesis

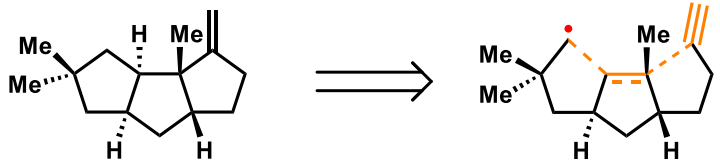
Nucleophilic



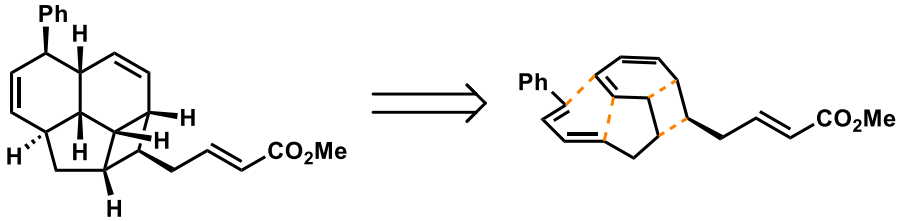
Electrophilic



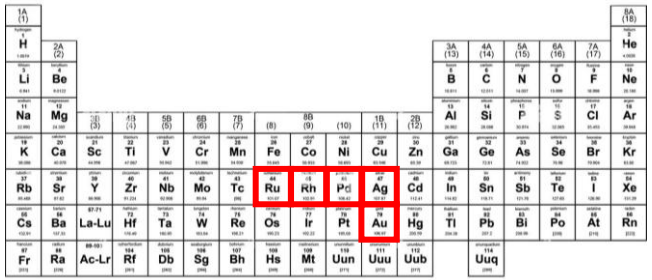
Radical



Pericyclic

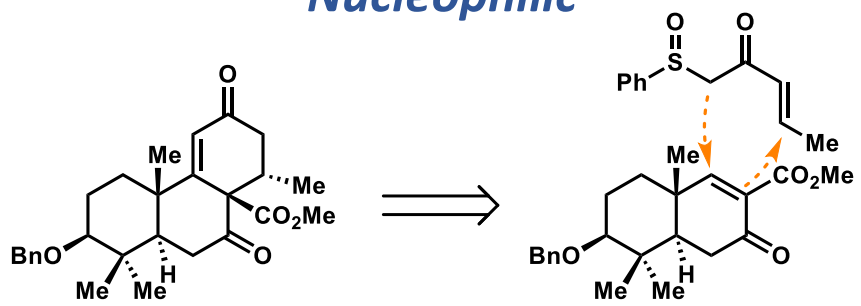


Transition Metal

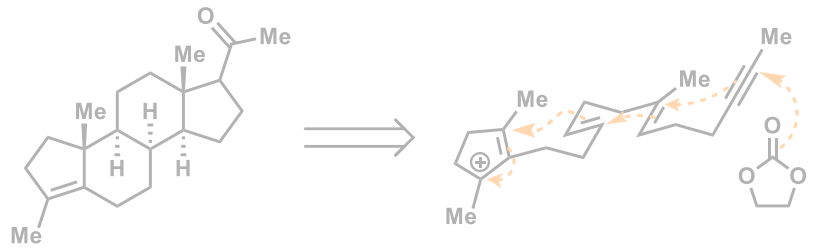


Cascades in Total Synthesis

Nucleophilic



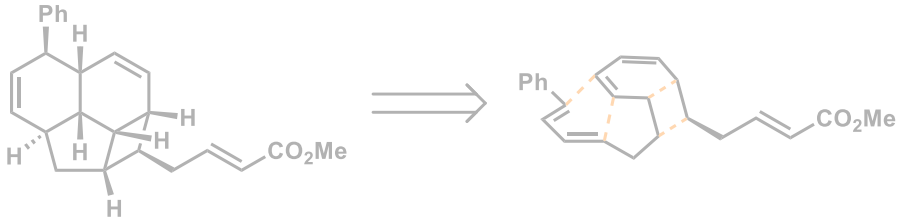
Electrophilic



Radical



Pericyclic

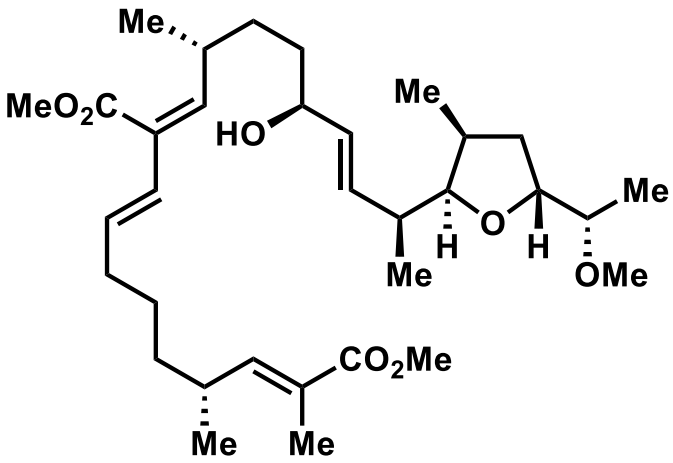


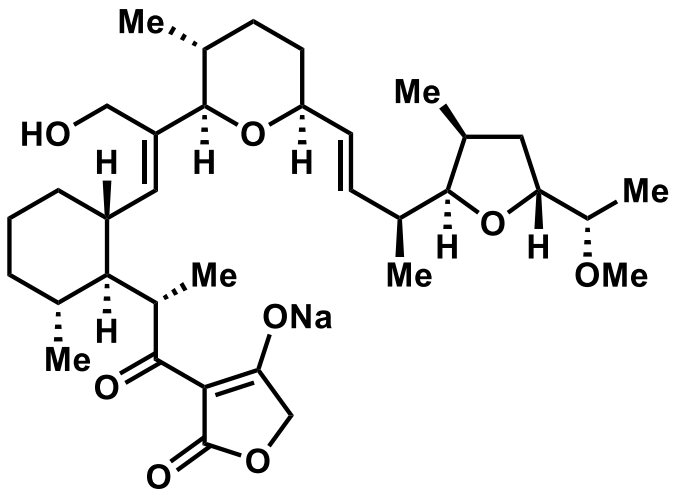
Transition Metal



Nucleophilic Cascades

tetronasin by Ley



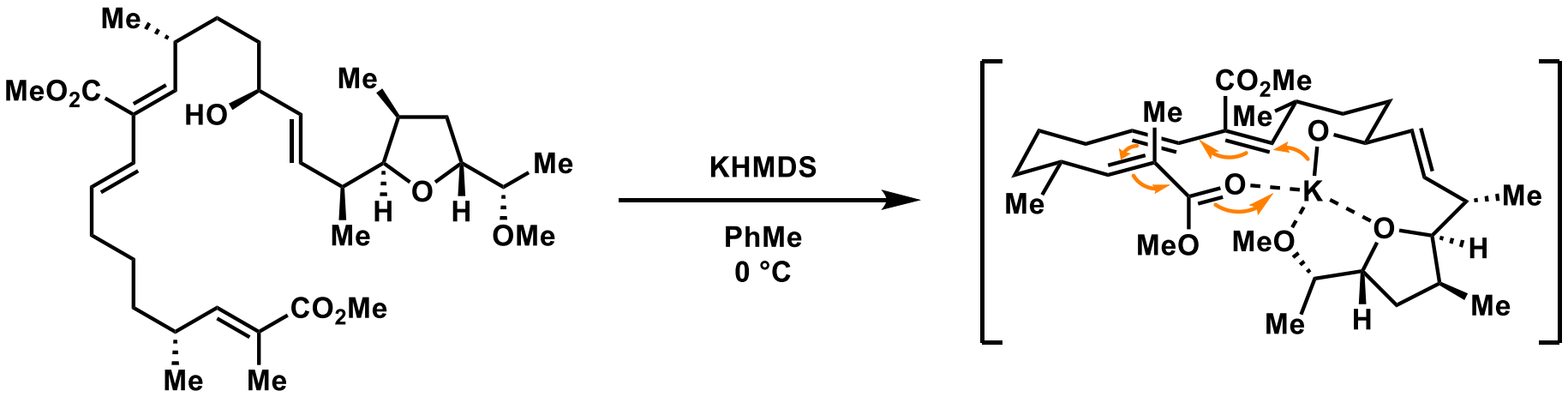


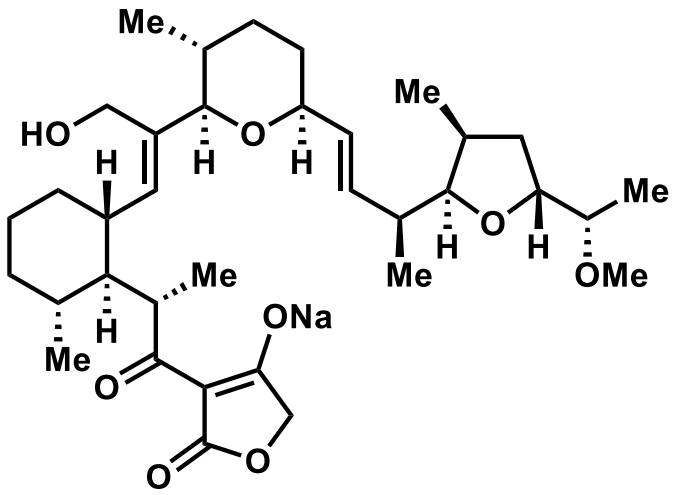
tetronasin

Boons, G.-J.; Brown, D. S.; Clase, J. A.; Lennon, I. C.; Ley, S. V. *Tetrahedron Lett.* **1994**, *35*, 319.
Boons, G.-J.; Lennon, I. C.; Ley, S. V.; Owen, E. S. E.; Staunton, J.; Wadsworth, D. J. *Tetrahedron Lett.* **1994**, *35*, 323.

Nucleophilic Cascades

tetronasin by Ley



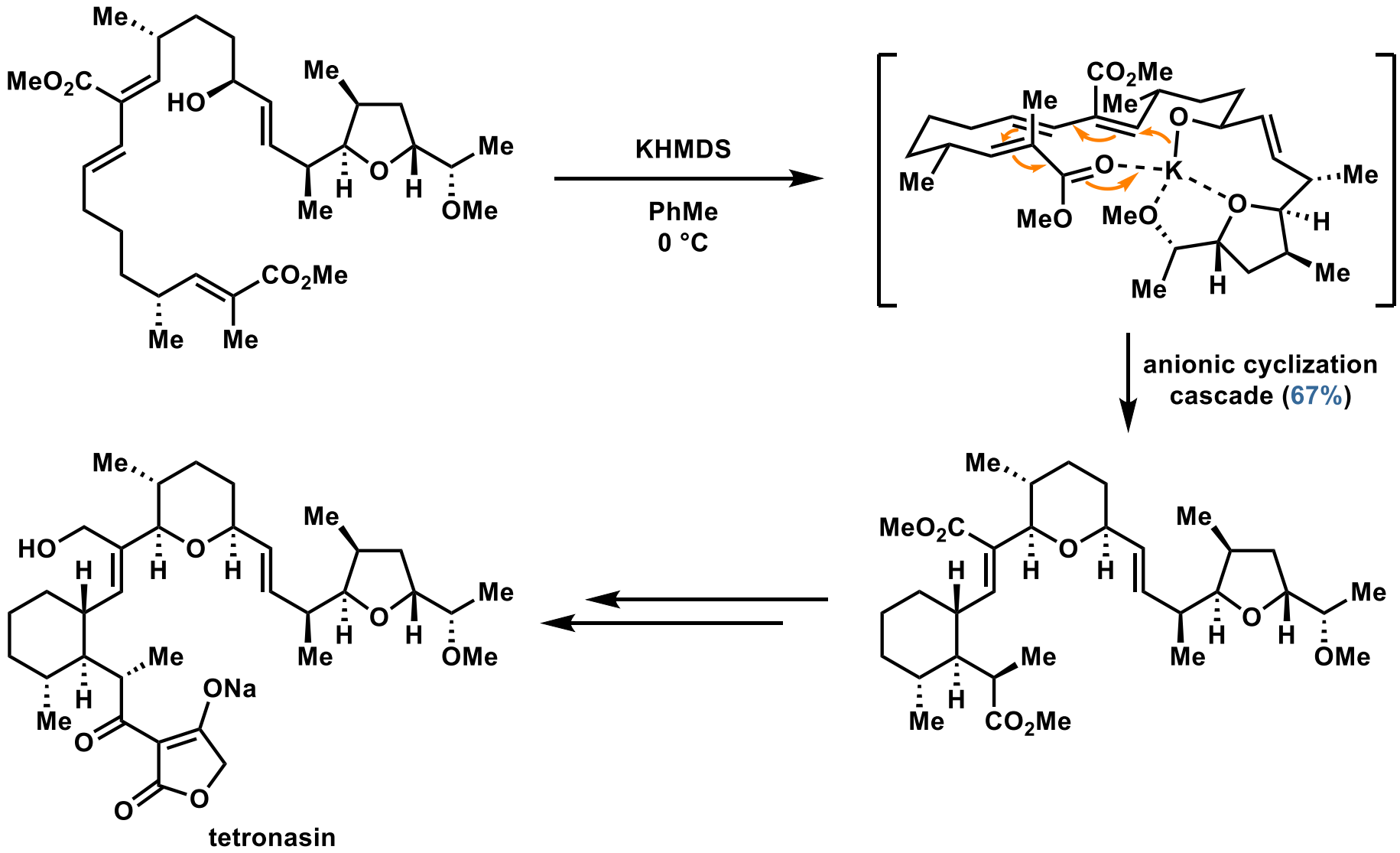


tetronasin

Boons, G.-J.; Brown, D. S.; Clase, J. A.; Lennon, I. C.; Ley, S. V. *Tetrahedron Lett.* **1994**, *35*, 319.
Boons, G.-J.; Lennon, I. C.; Ley, S. V.; Owen, E. S. E.; Staunton, J.; Wadsworth, D. J. *Tetrahedron Lett.* **1994**, *35*, 323.

Nucleophilic Cascades

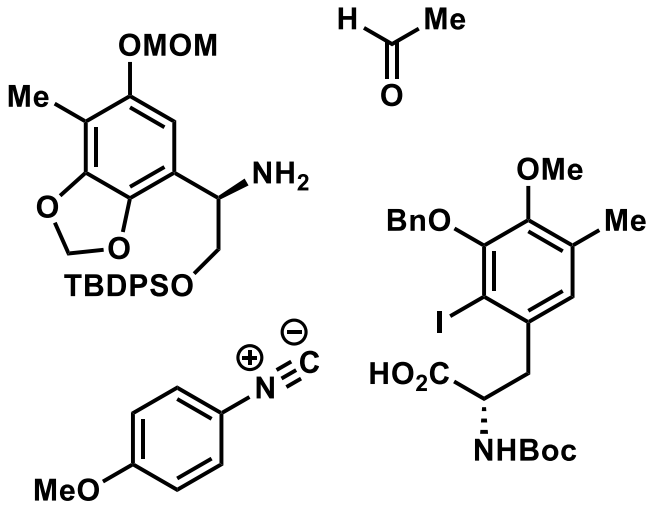
tetronasin by Ley

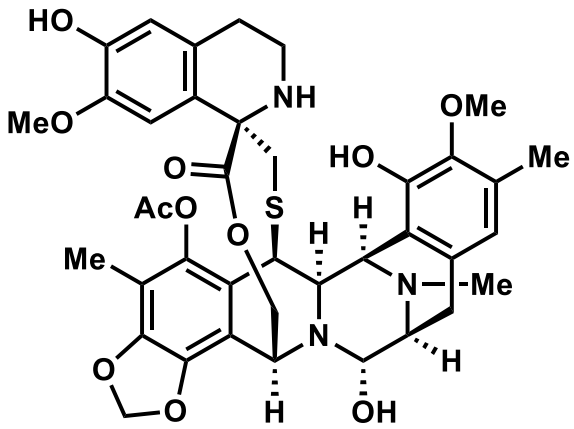


Boons, G.-J.; Brown, D. S.; Clase, J. A.; Lennon, I. C.; Ley, S. V. *Tetrahedron Lett.* **1994**, *35*, 319.
Boons, G.-J.; Lennon, I. C.; Ley, S. V.; Owen, E. S. E.; Staunton, J.; Wadsworth, D. J. *Tetrahedron Lett.* **1994**, *35*, 323.

Nucleophilic Cascades

ecteinascidin 743 by Fukuyama: the Ugi four-component coupling



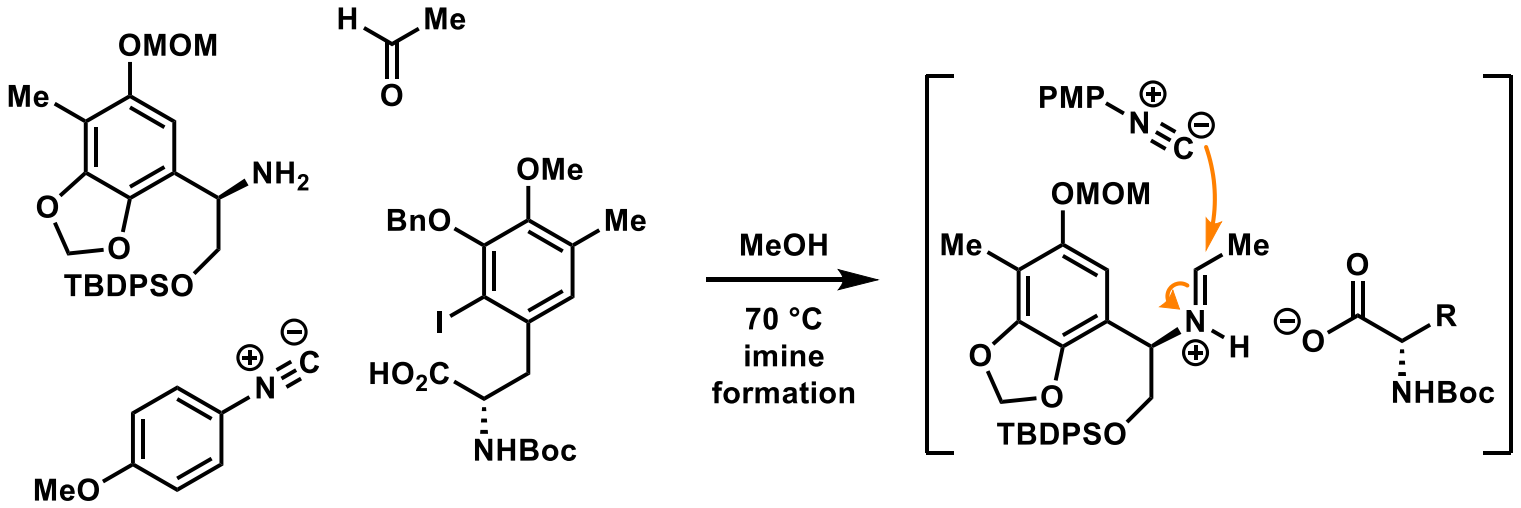


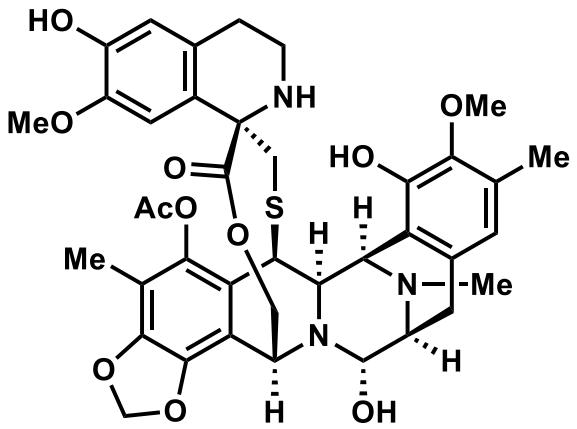
ecteinascindin 743

Endo, A.; Yanagisawa, A.; Abe, M.; Tohma, S.; Kan, T.; Fukuyama, T. *J. Am. Chem. Soc.* **2002**, *124*, 6552.

Nucleophilic Cascades

ecteinascidin 743 by Fukuyama: the Ugi four-component coupling



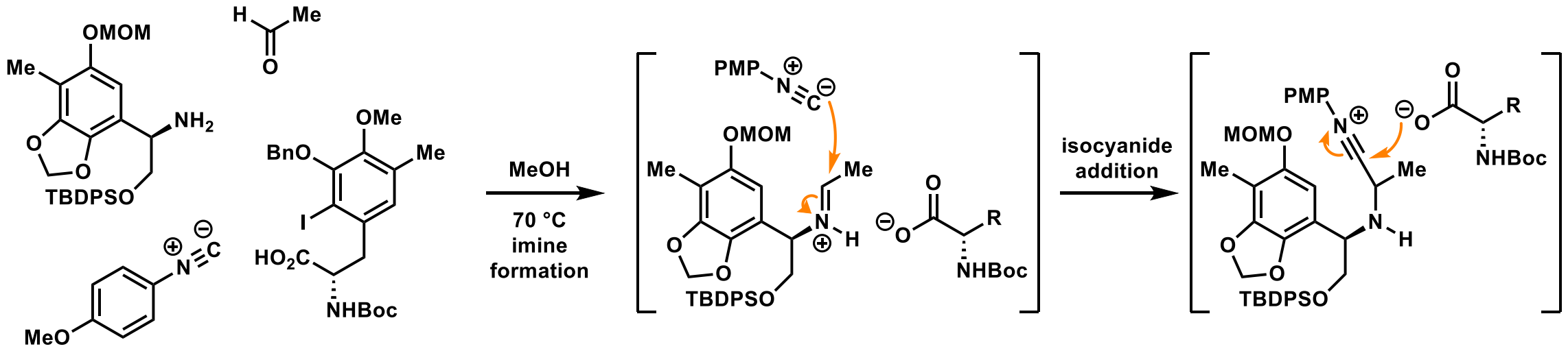


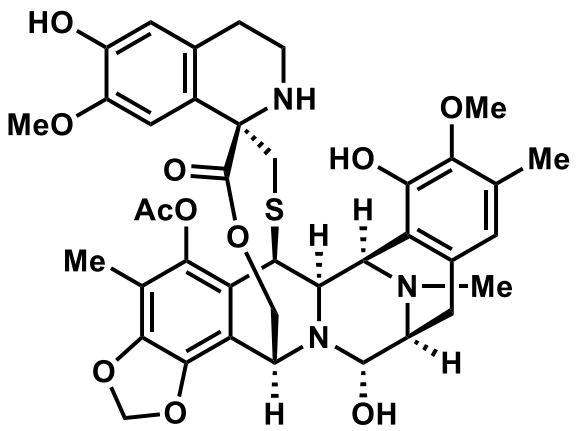
ecteinascidin 743

Endo, A.; Yanagisawa, A.; Abe, M.; Tohma, S.; Kan, T.; Fukuyama, T. *J. Am. Chem. Soc.* **2002**, *124*, 6552.

Nucleophilic Cascades

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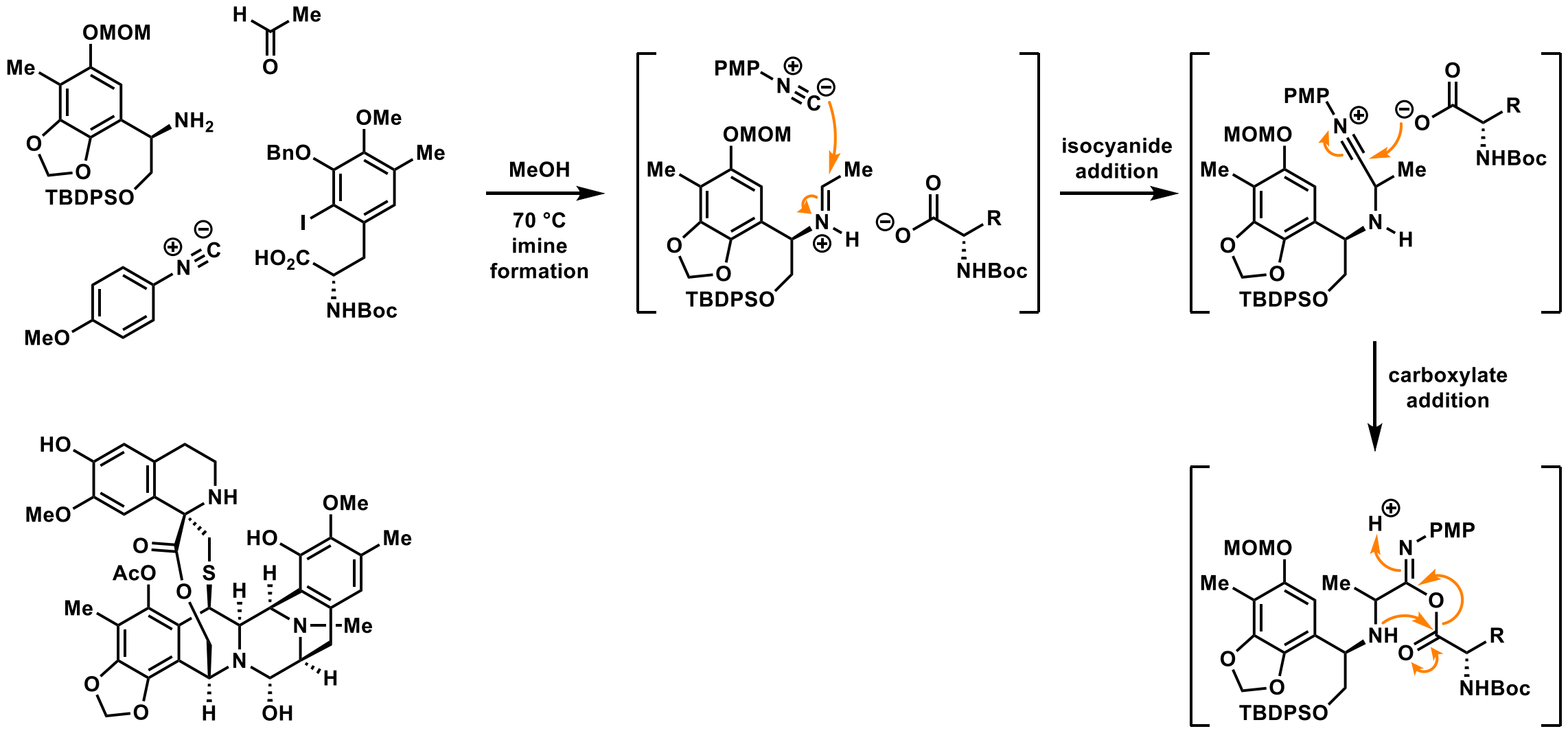


ecteinascidin 743

Endo, A.; Yanagisawa, A.; Abe, M.; Tohma, S.; Kan, T.; Fukuyama, T. *J. Am. Chem. Soc.* **2002**, *124*, 6552.

Nucleophilic Cascades

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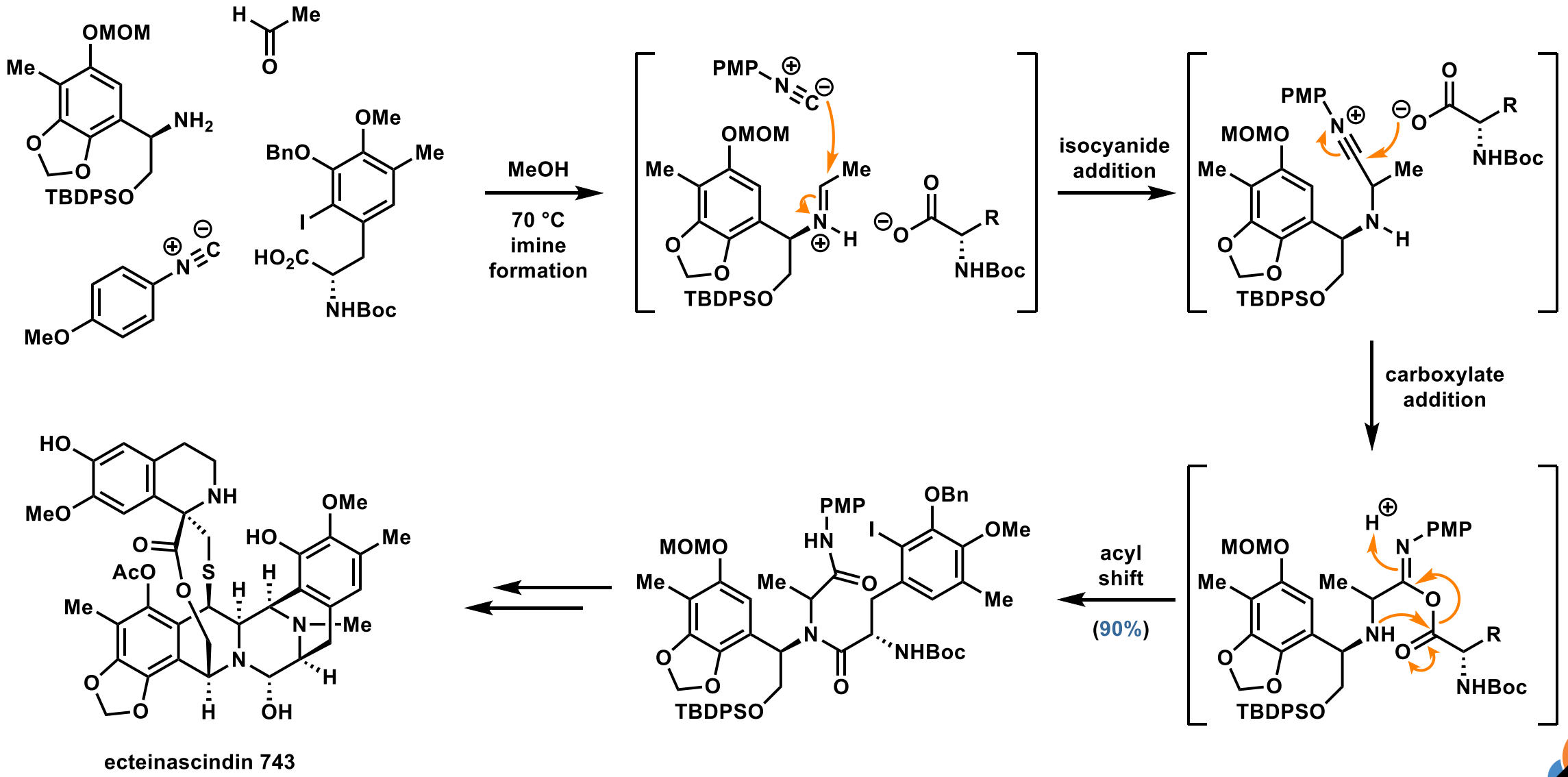


ecteinascidin 743

Endo, A.; Yanagisawa, A.; Abe, M.; Tohma, S.; Kan, T.; Fukuyama, T. *J. Am. Chem. Soc.* **2002**, *124*, 6552.

Nucleophilic Cascades

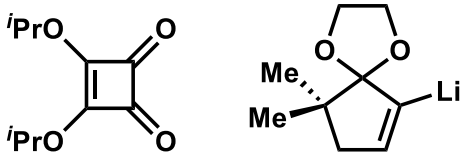
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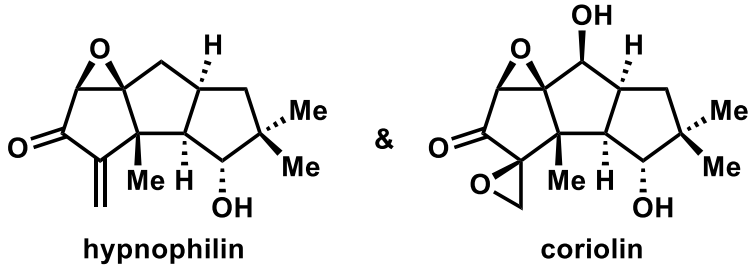


Endo, A.; Yanagisawa, A.; Abe, M.; Tohma, S.; Kan, T.; Fukuyama, T. *J. Am. Chem. Soc.* **2002**, *124*, 6552.

Nucleophilic Cascades

hypnophilin and coriolin by Paquette and Geng



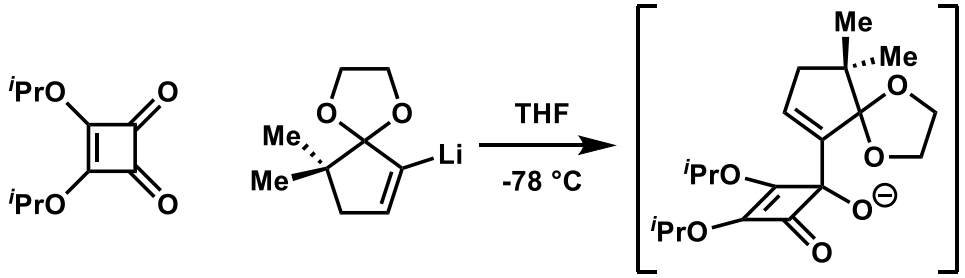


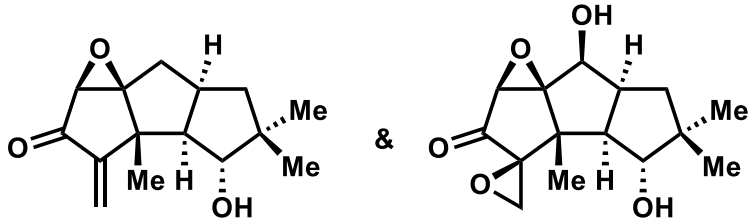
hypnophilin coriolin

Geng, F.; Liu, J.; Paquette, L. A. *Org. Lett.* **2002**, *4*, 71. Paquette, L. A.; Geng, F. *J. Am. Chem. Soc.* **2002**, *124*, 9199.

Nucleophilic Cascades

hypnophilin and coriolin by Paquette and Geng

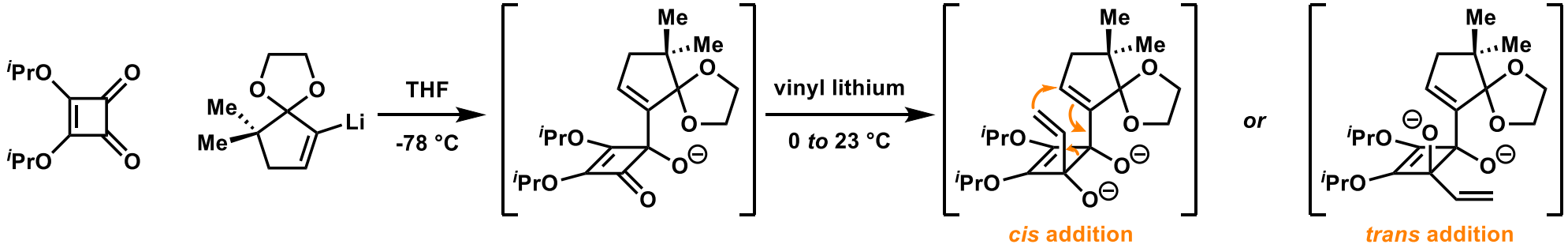


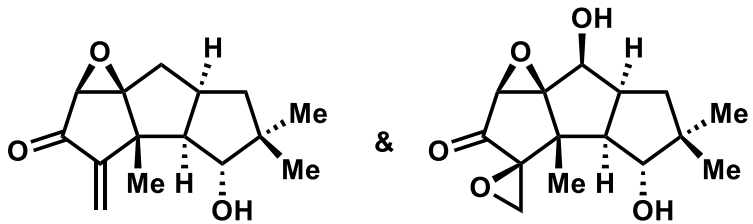


Geng, F.; Liu, J.; Paquette, L. A. *Org. Lett.* **2002**, *4*, 71. Paquette, L. A.; Geng, F. *J. Am. Chem. Soc.* **2002**, *124*, 9199.

Nucleophilic Cascades

hypnophilin and coriolin by Paquette and Geng

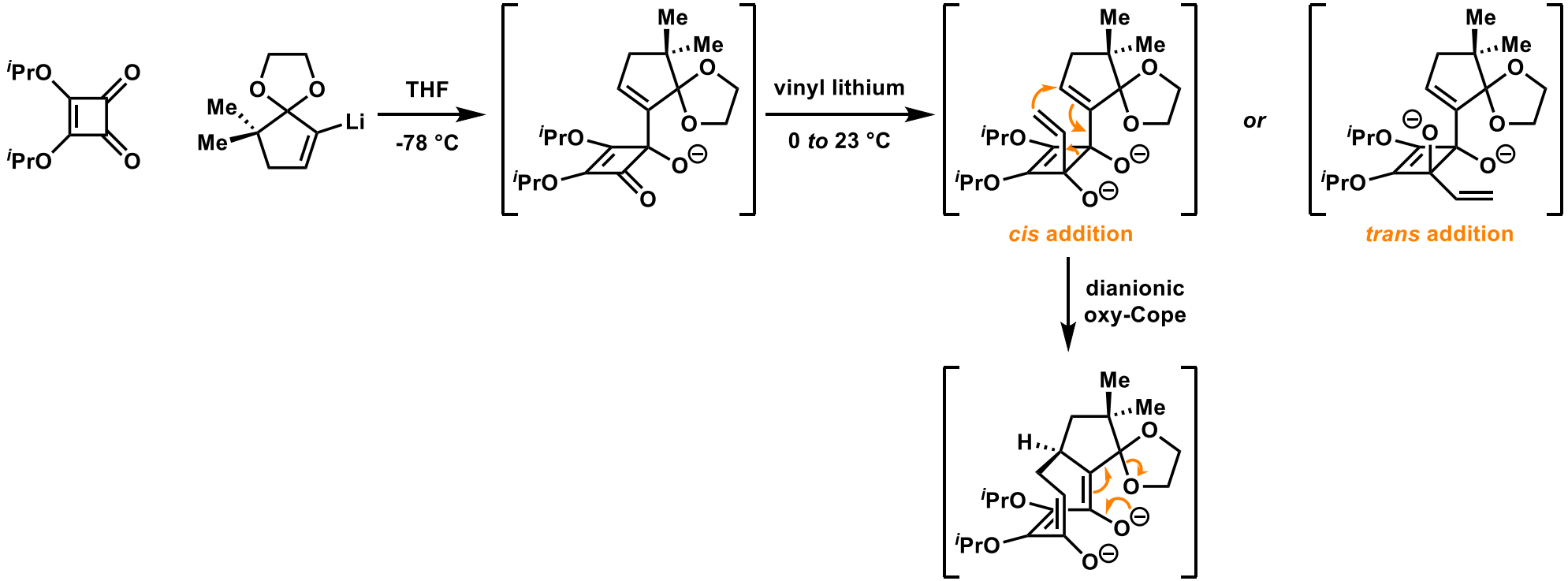


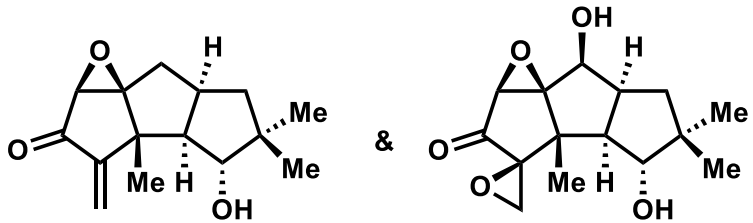


Geng, F.; Liu, J.; Paquette, L. A. *Org. Lett.* **2002**, *4*, 71. Paquette, L. A.; Geng, F. *J. Am. Chem. Soc.* **2002**, *124*, 9199.

Nucleophilic Cascades

hypnophilin and coriolin by Paquette and Geng

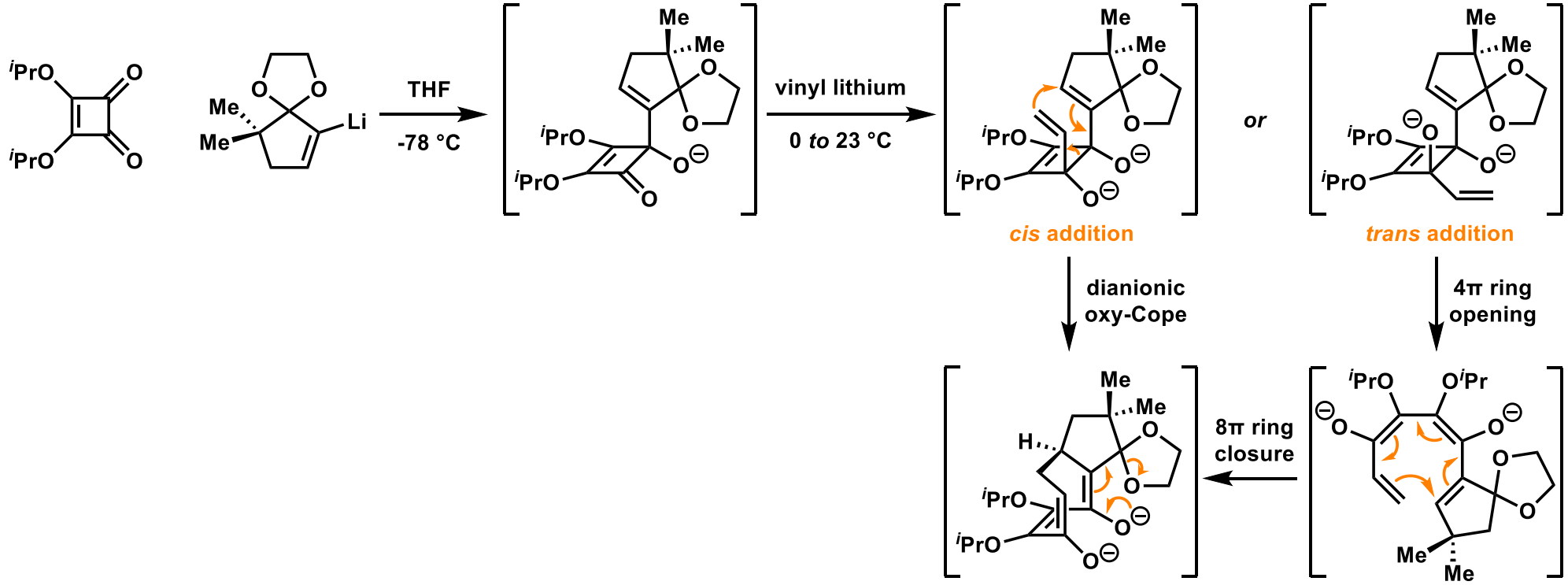


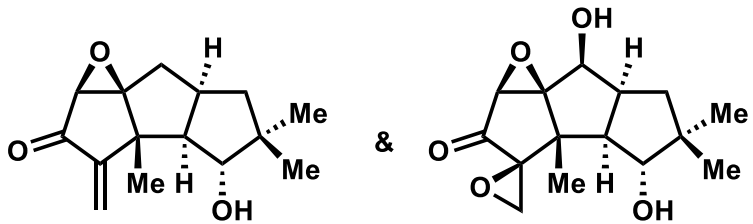


Geng, F.; Liu, J.; Paquette, L. A. *Org. Lett.* **2002**, *4*, 71. Paquette, L. A.; Geng, F. *J. Am. Chem. Soc.* **2002**, *124*, 9199.

Nucleophilic Cascades

hypnophilin and coriolin by Paquette and Geng



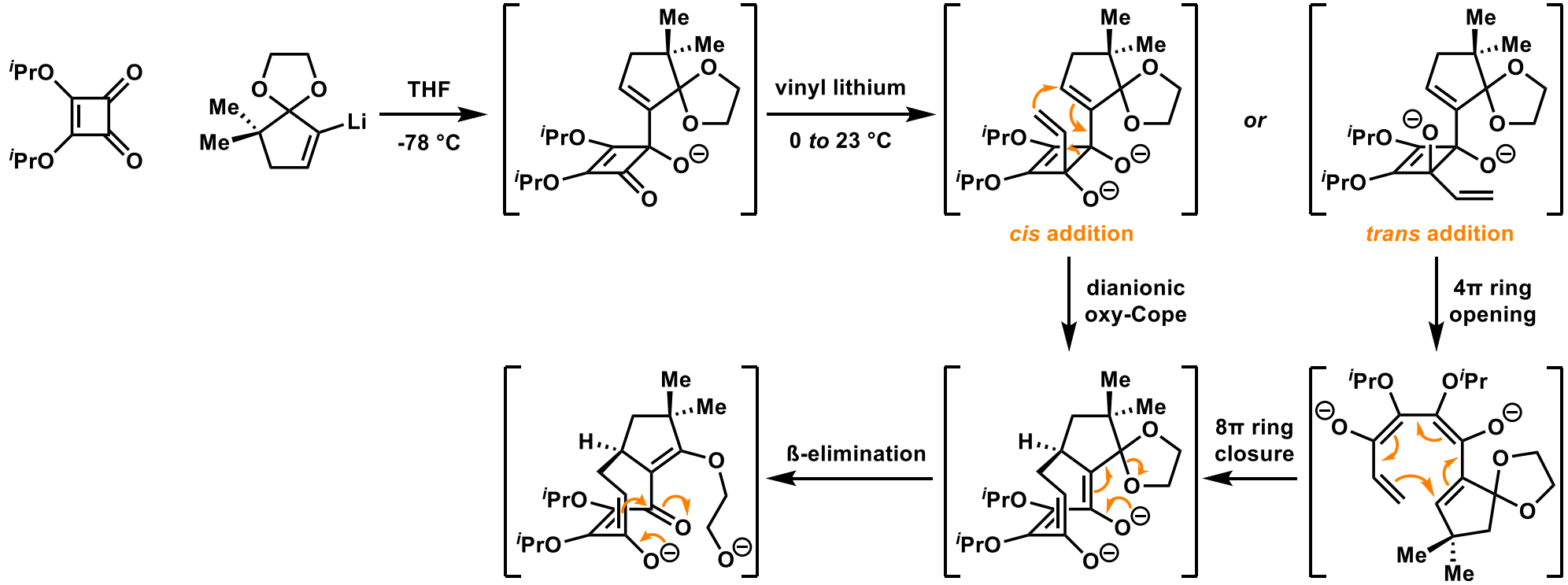


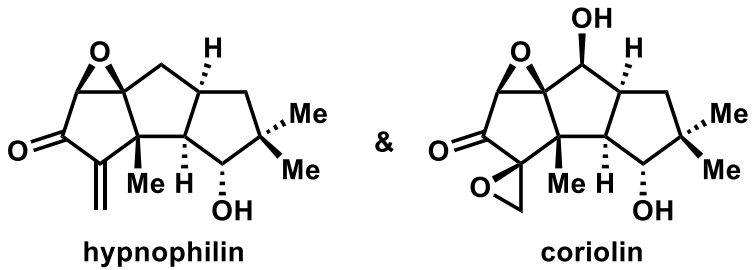
hypnophilin coriolin

Geng, F.; Liu, J.; Paquette, L. A. *Org. Lett.* **2002**, *4*, 71. Paquette, L. A.; Geng, F. *J. Am. Chem. Soc.* **2002**, *124*, 9199.

Nucleophilic Cascades

hypnophilin and coriolin by Paquette and Geng



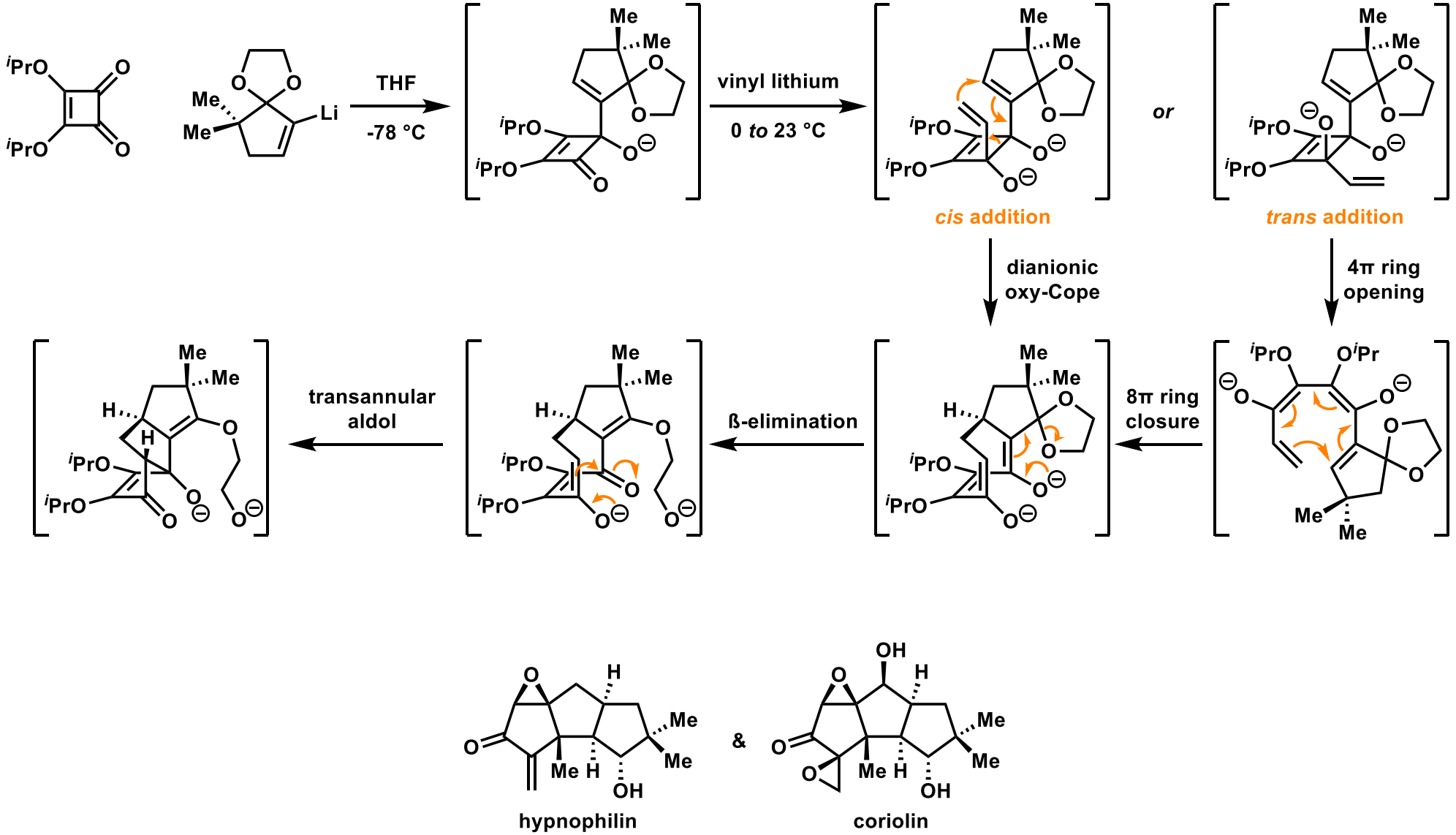


hypnophilin coriolin

Geng, F.; Liu, J.; Paquette, L. A. *Org. Lett.* **2002**, *4*, 71. Paquette, L. A.; Geng, F. *J. Am. Chem. Soc.* **2002**, *124*, 9199.

Nucleophilic Cascades

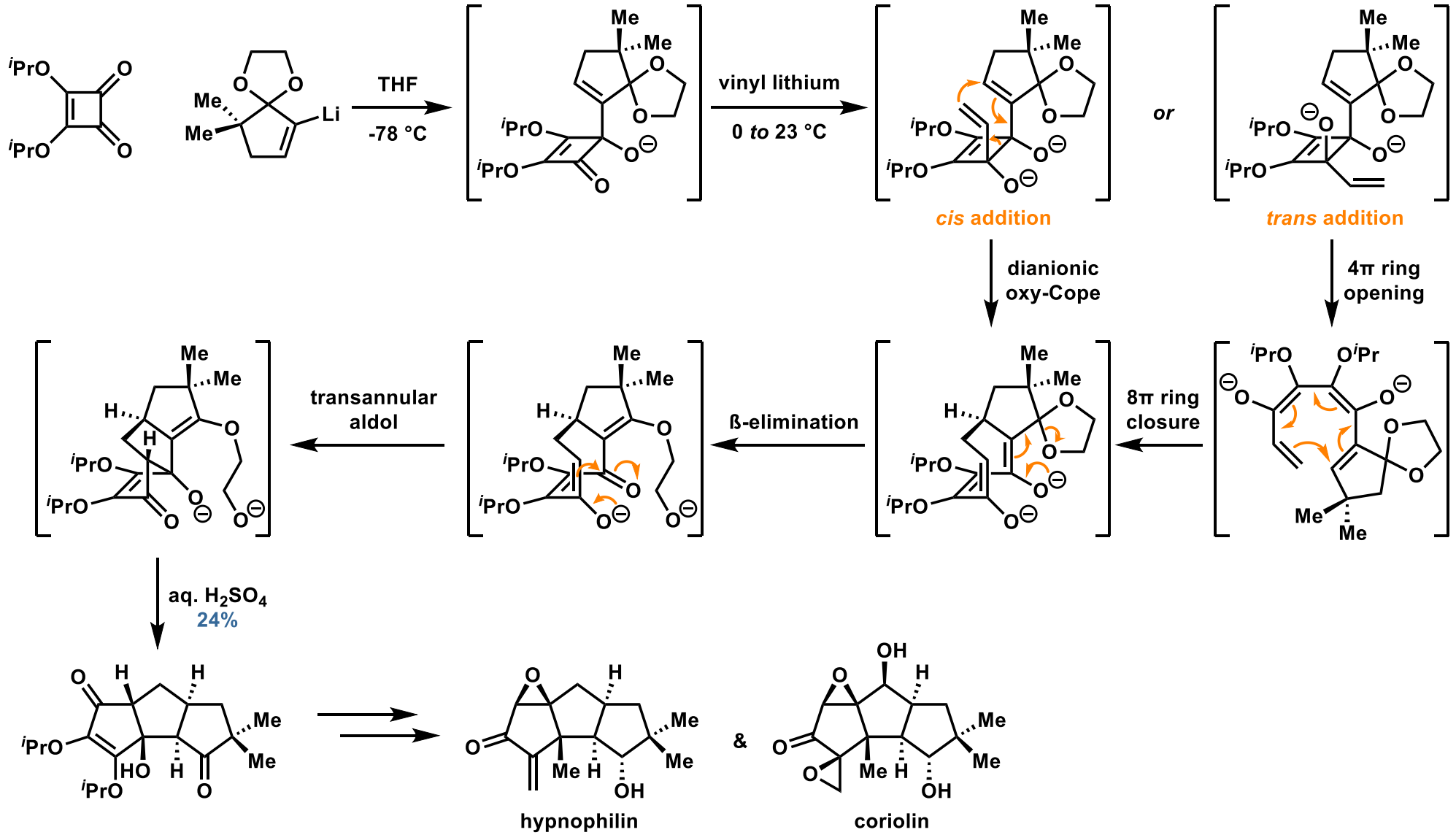
hypnophilin and coriolin by Paquette and Geng



Geng, F.; Liu, J.; Paquette, L. A. *Org. Lett.* **2002**, *4*, 71. Paquette, L. A.; Geng, F. *J. Am. Chem. Soc.* **2002**, *124*, 9199.

Nucleophilic Cascades

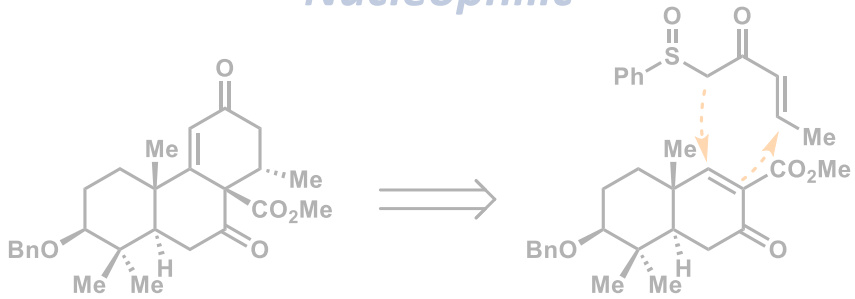
hypnophilin and coriolin by Paquette and Geng



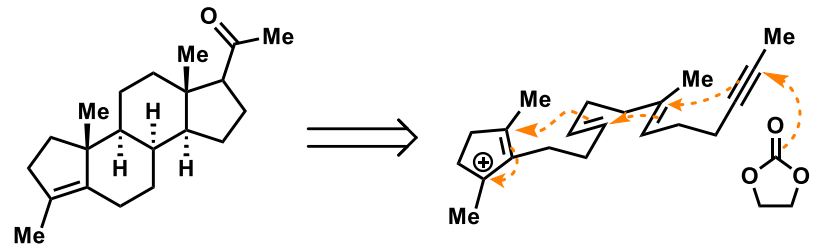
Geng, F.; Liu, J.; Paquette, L. A. *Org. Lett.* **2002**, *4*, 71. Paquette, L. A.; Geng, F. *J. Am. Chem. Soc.* **2002**, *124*, 9199.

Cascades in Total Synthesis

Nucleophilic



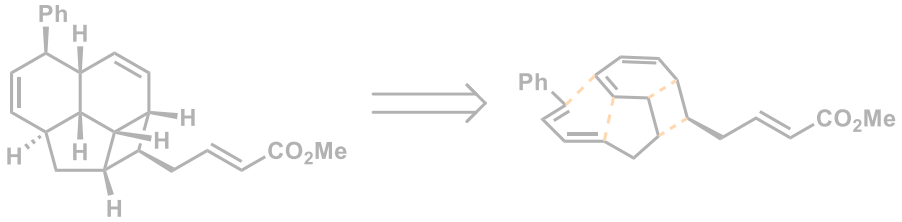
Electrophilic



Radical



Pericyclic

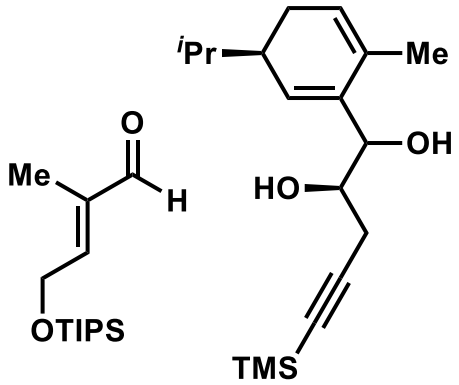


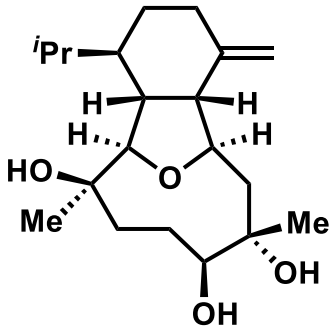
Transition Metal



Electrophilic Cascades

sclerophytin A by Overman and MacMillan: Prins/pinacol cascade



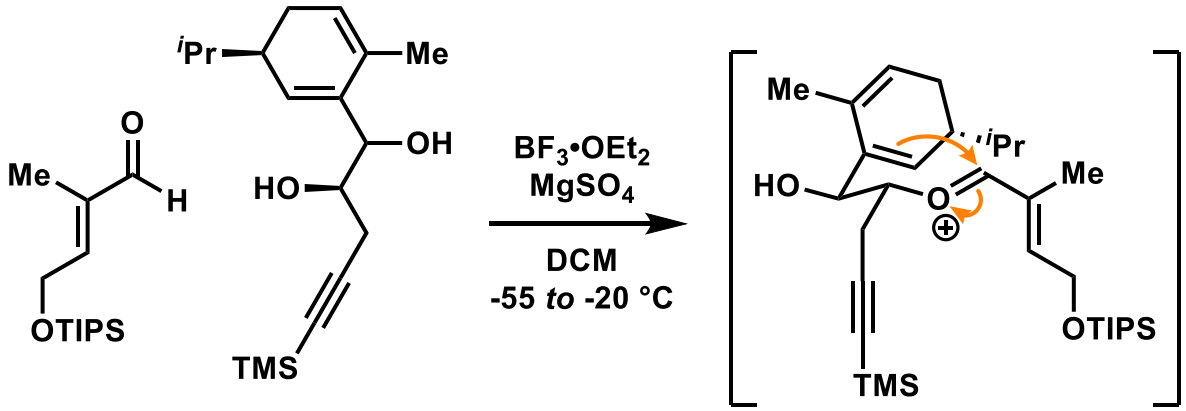


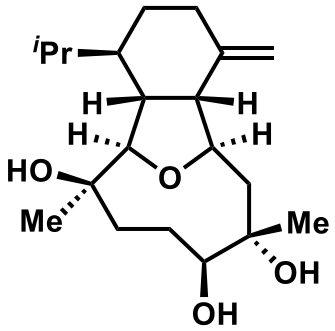
sclerophytin A

MacMillan, D. W.; Overman, L. E.; Pennington, L. D. *J. Am. Chem. Soc.* **2001**, *123*, 9033.

Electrophilic Cascades

sclerophytin A by Overman and MacMillan: Prins/pinacol cascade



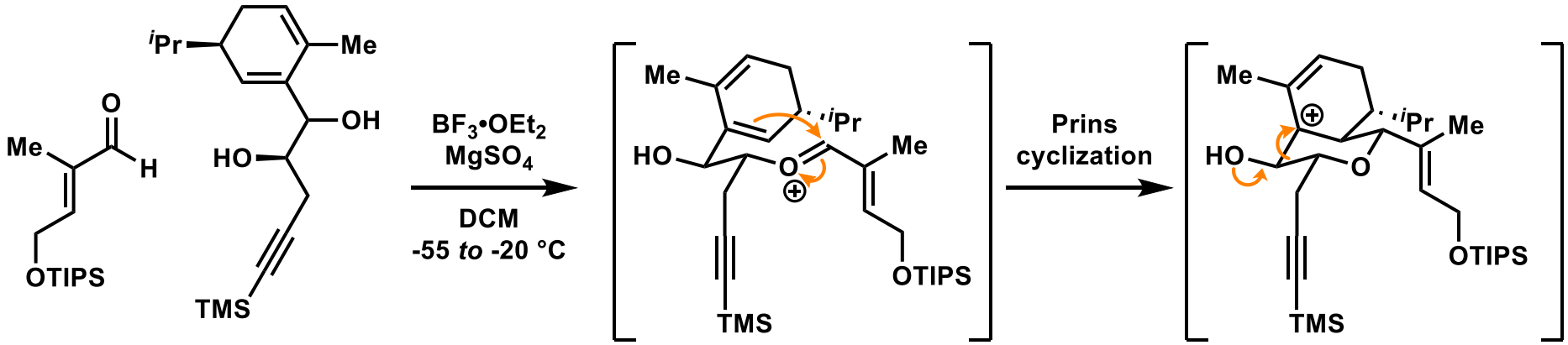


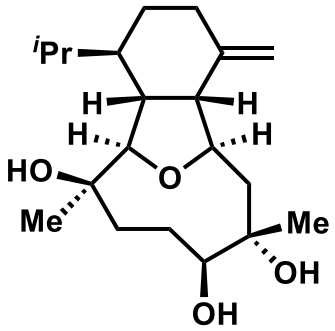
sclerophytin A

MacMillan, D. W.; Overman, L. E.; Pennington, L. D. *J. Am. Chem. Soc.* **2001**, *123*, 9033.

Electrophilic Cascades

sclerophytin A by Overman and MacMillan: Prins/pinacol cascade



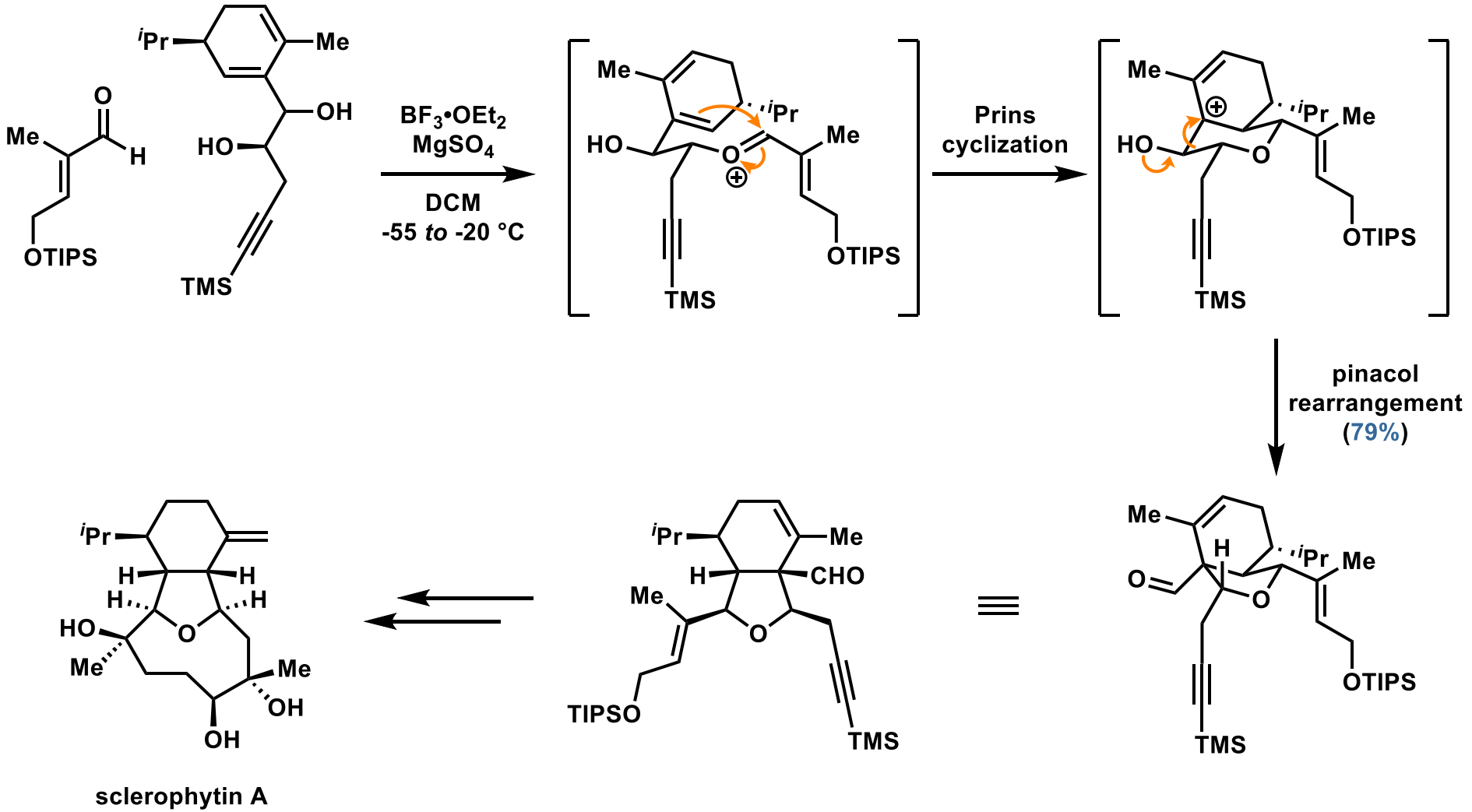


sclerophytin A

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Electrophilic Cascades

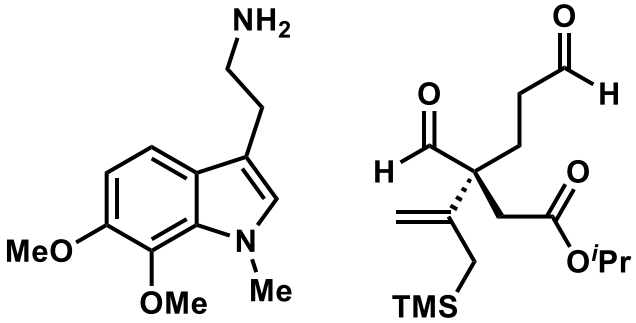
sclerophytin A by Overman and MacMillan: Prins/pinacol cascade

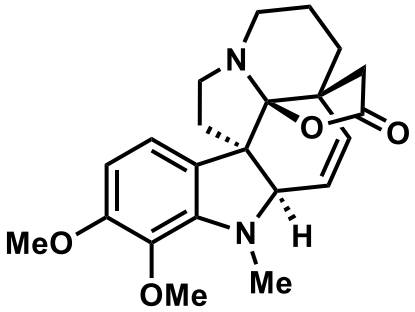


MacMillan, D. W.; Overman, L. E.; Pennington, L. D. *J. Am. Chem. Soc.* **2001**, *123*, 9033.

Electrophilic Cascades

aspidophytine by Corey: a series of iminium cyclizations



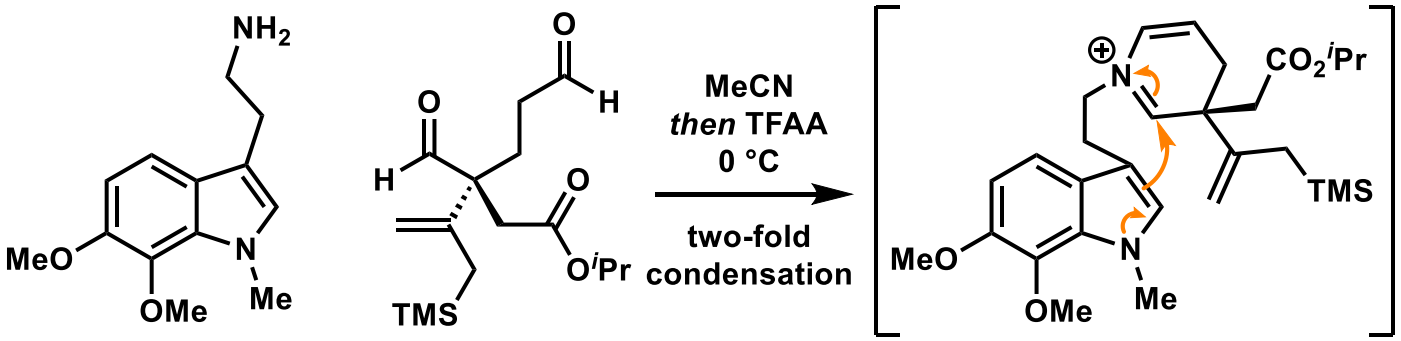


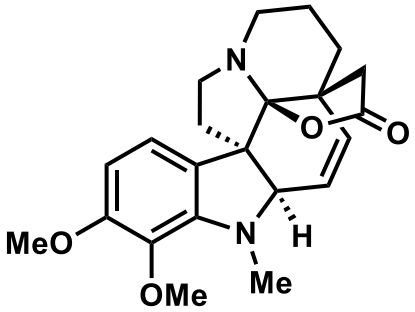
aspidophytine

He, F.; Bo, Y.; Altom, J. D.; Corey, E. J. *J. Am. Chem. Soc.* **1999**, *121*, 6771.

Electrophilic Cascades

aspidophytine by Corey: a series of iminium cyclizations



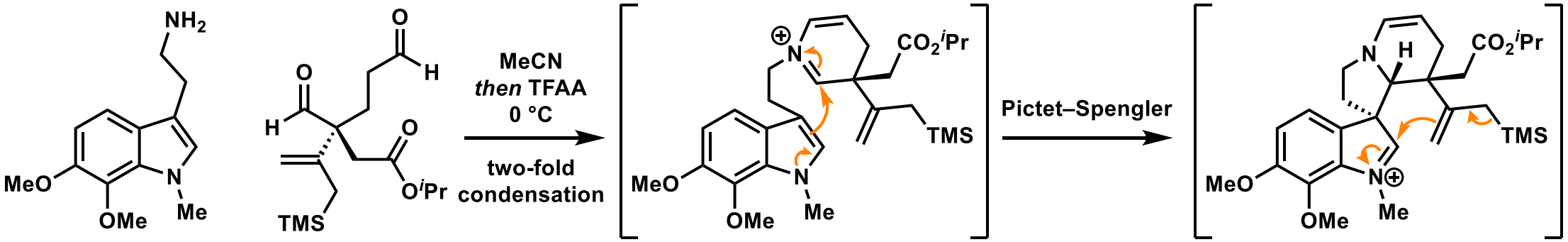


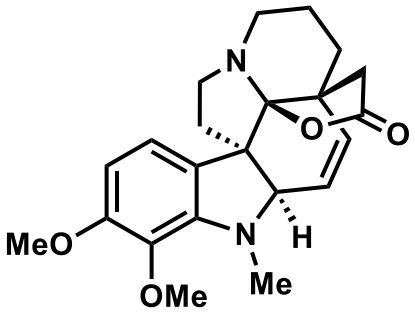
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Electrophilic Cascades

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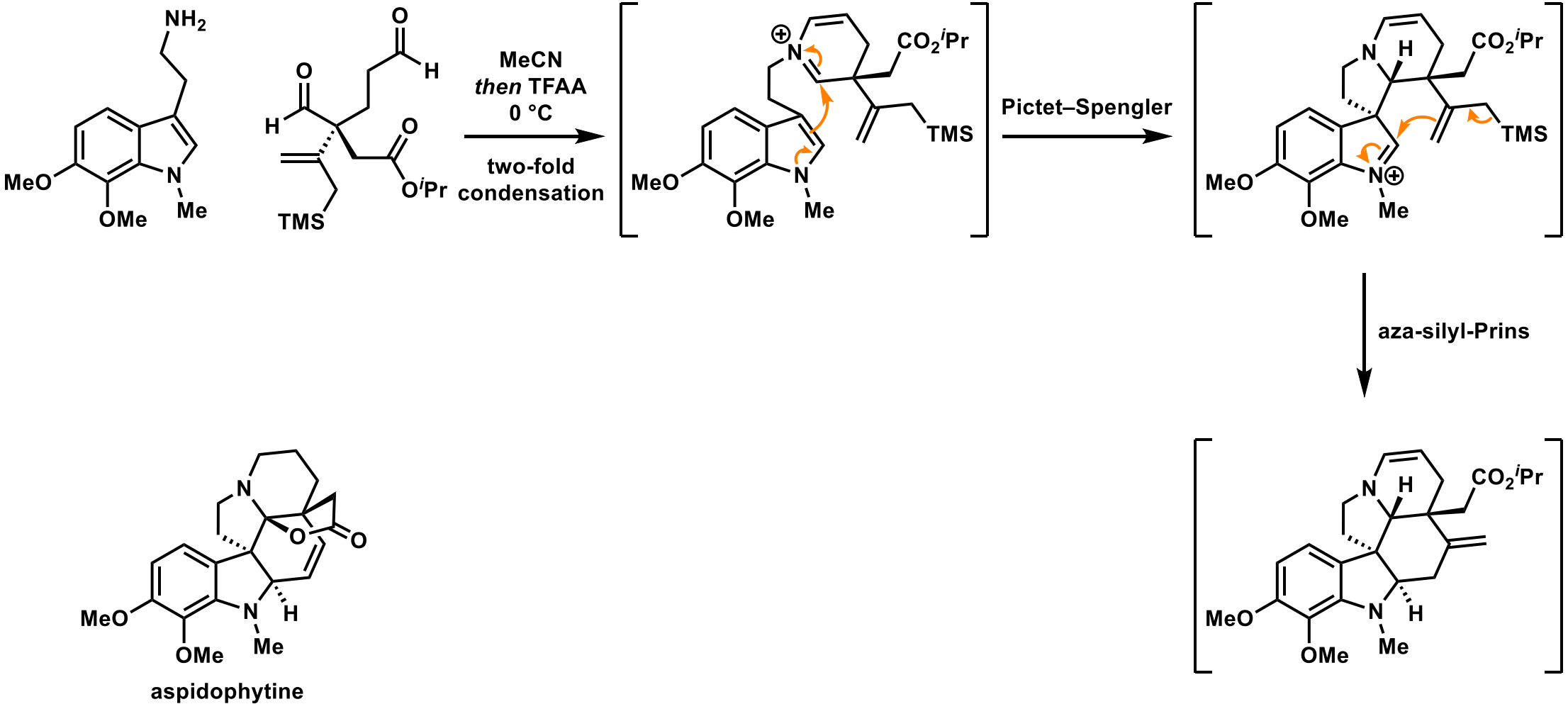


aspidophytine

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Electrophilic Cascades

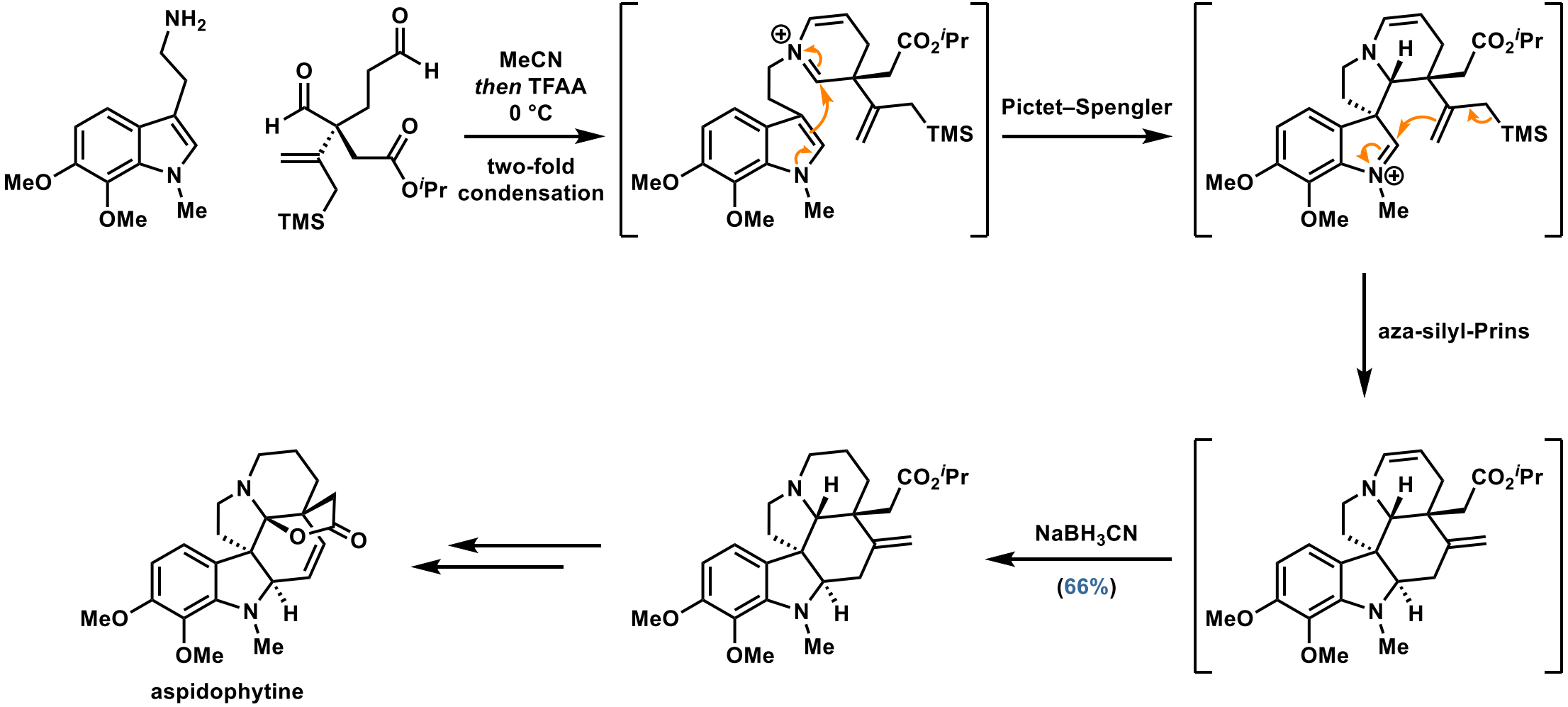
aspidophytine by Corey: a series of iminium cyclizations



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Electrophilic Cascades

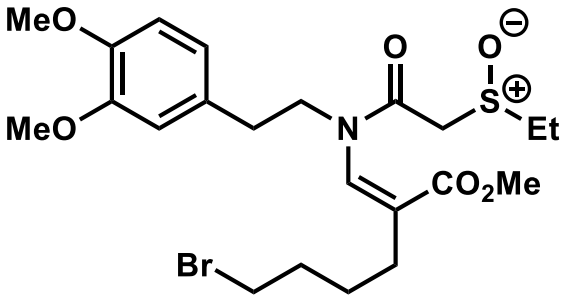
aspidophytine by Corey: a series of iminium cyclizations



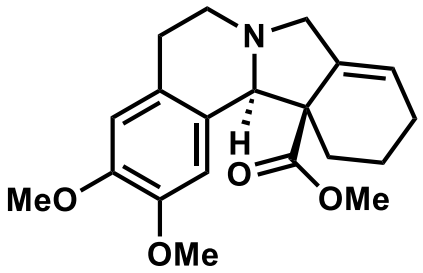
He, F.; Bo, Y.; Altom, J. D.; Corey, E. J. *J. Am. Chem. Soc.* **1999**, *121*, 6771.

Electrophilic Cascades

jamtine by Padwa and Danca: Pummerer/Pictet–Spengler cascade



Z/E 4:1

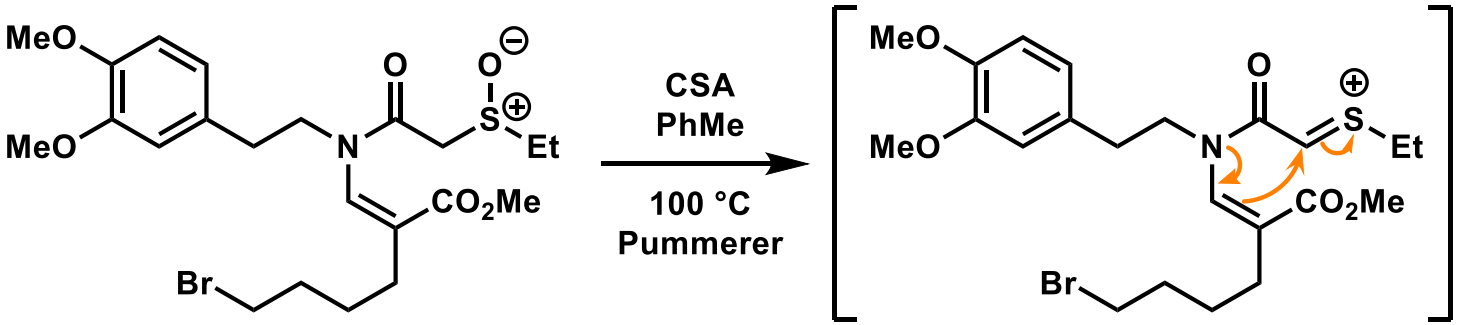


jamtine

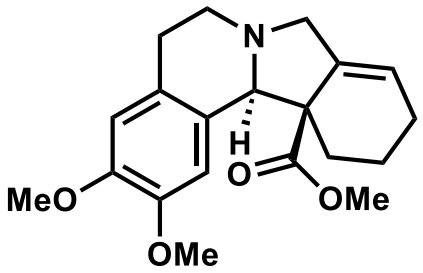
Padwa, A.; Danca, M. D. *Org. Lett.* **2002**, *4*, 715. Padwa, A.; Danca, M. D.; Hardcastle, K. I.; McClure, M. S. *J. Org. Chem.* **2003**, *68*, 929.

Electrophilic Cascades

jamtine by Padwa and Danca: Pummerer/Pictet–Spengler cascade



Z/*E* 4:1

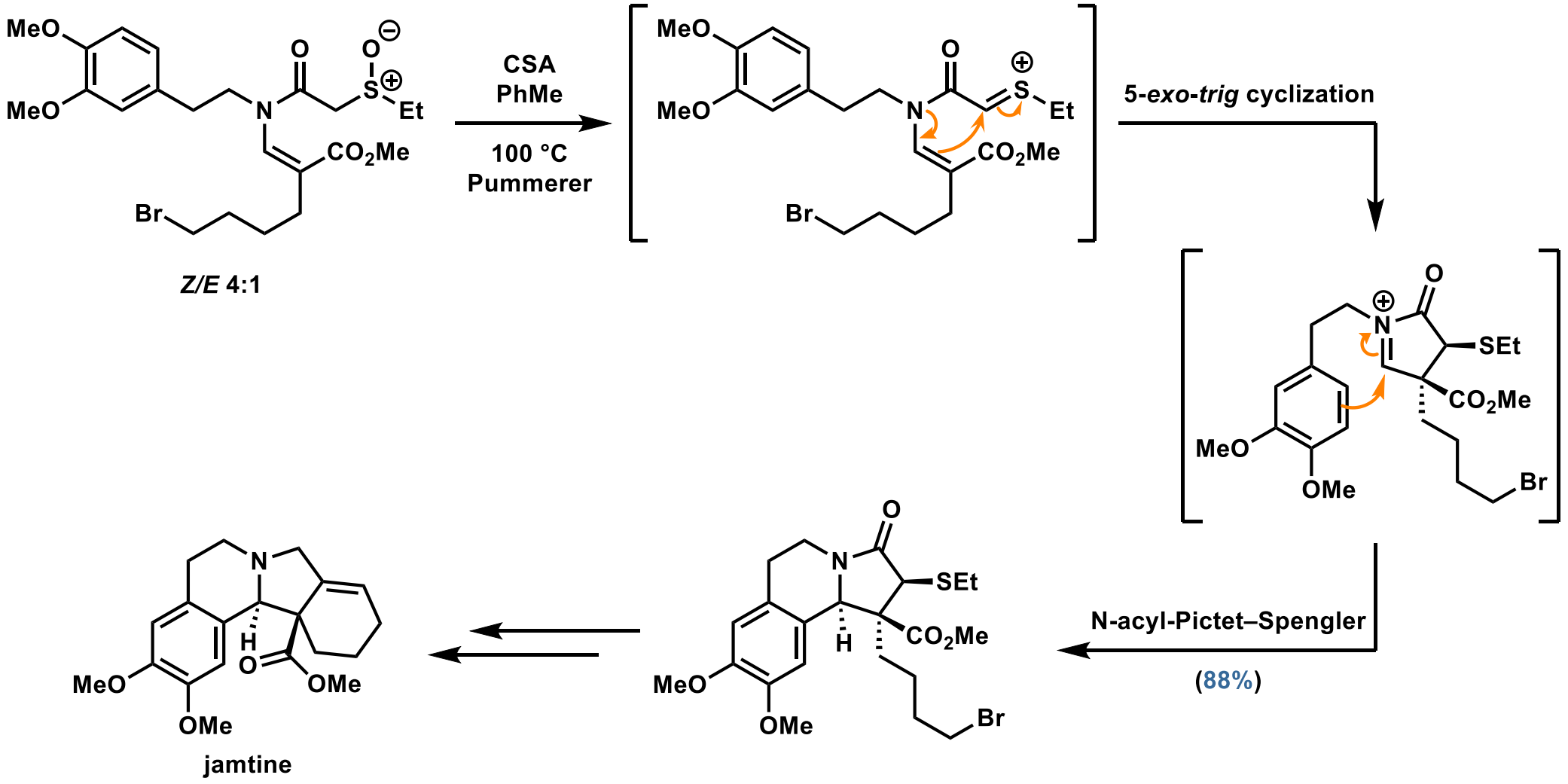


jamtine

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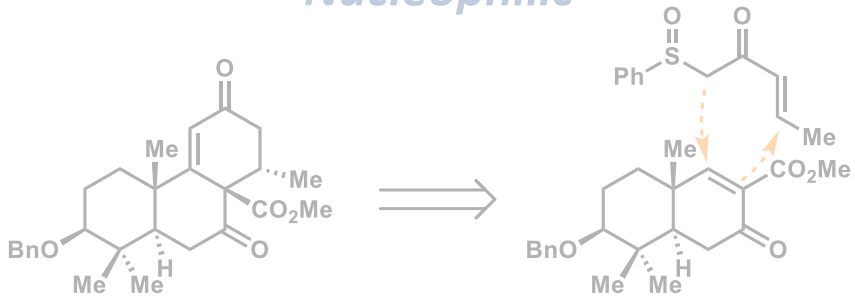
jamtine by Padwa and Danca: Pummerer/Pictet–Spengler cascade



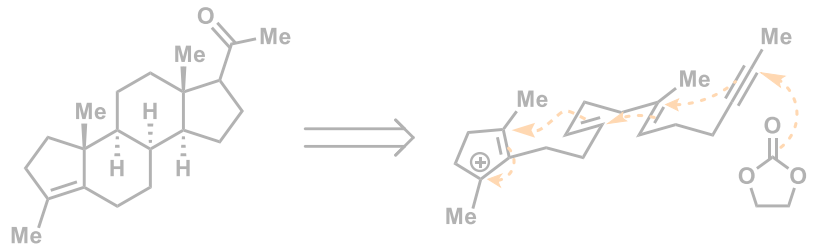
Padwa, A.; Danca, M. D. *Org. Lett.* **2002**, *4*, 715. Padwa, A.; Danca, M. D.; Hardcastle, K. I.; McClure, M. S. *J. Org. Chem.* **2003**, *68*, 929.

Cascades in Total Synthesis

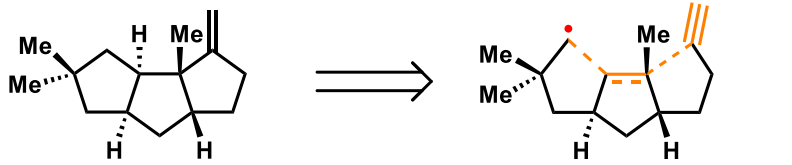
Nucleophilic



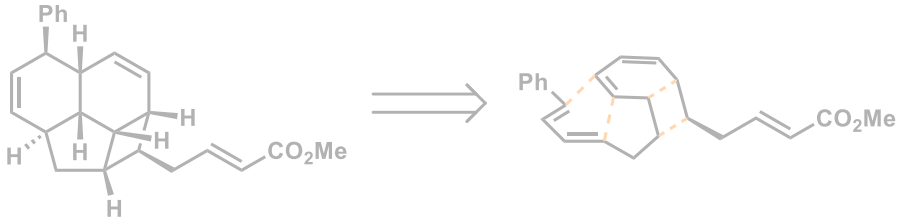
Electrophilic



Radical



Pericyclic

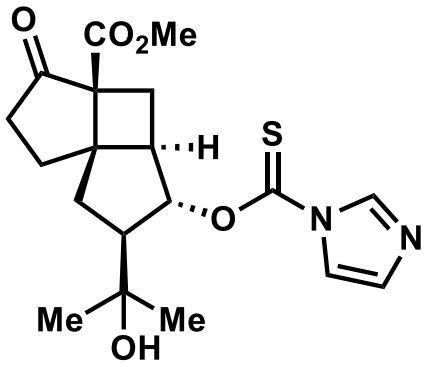


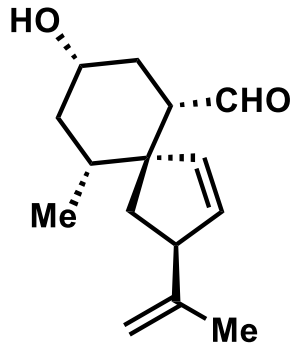
Transition Metal



Radical Cascades

lubiminol by Crimmins: deoxygenation/ring-expansion cascade



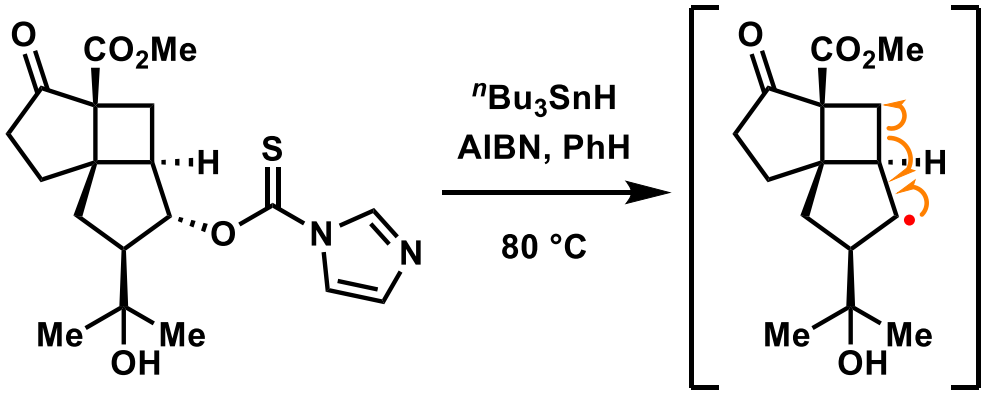


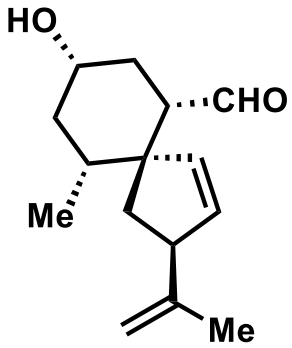
lubiminol

Crimmins, M. T.; Wang, Z.; McKerlie, L. A. *Tetrahedron Lett.* **1996**, *37*, 8703. Crimmins, M. T.; Wang, Z.; McKerlie, L. A. *J. Am. Chem. Soc.* **1998**, *120*, 1747.

Radical Cascades

lubiminol by Crimmins: deoxygenation/ring-expansion cascade



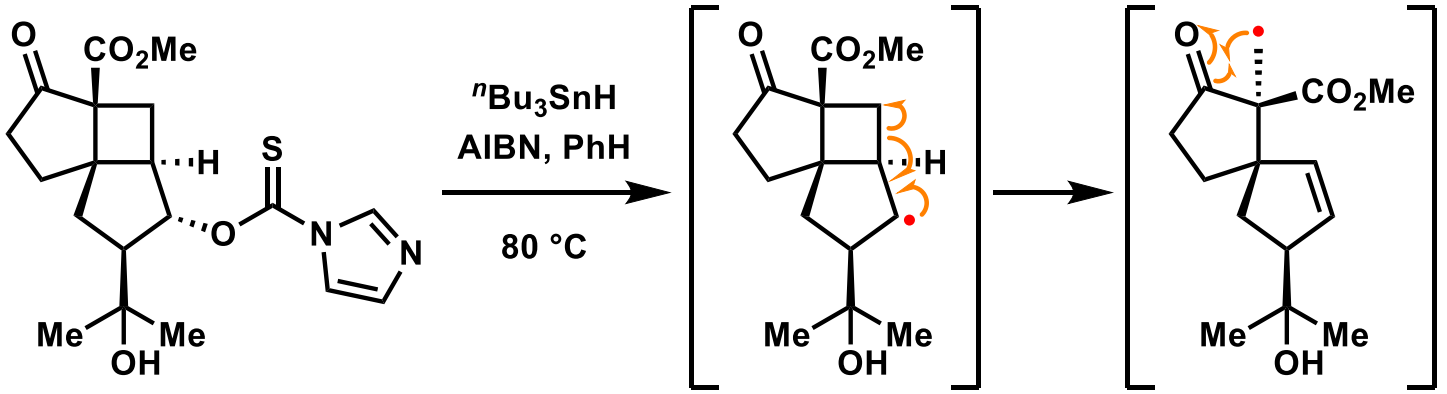


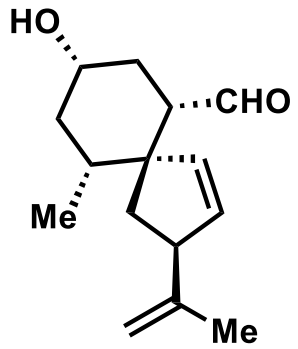
lubiminol

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Radical Cascades

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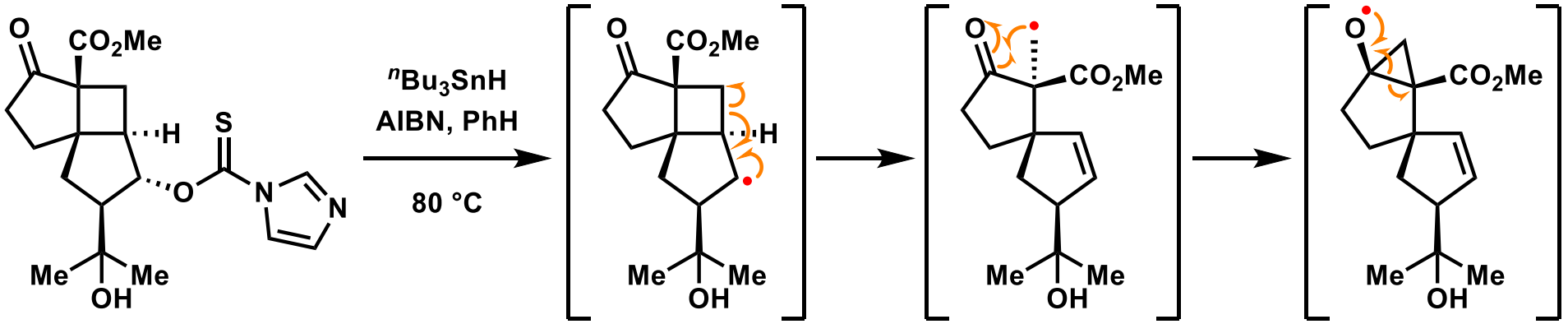


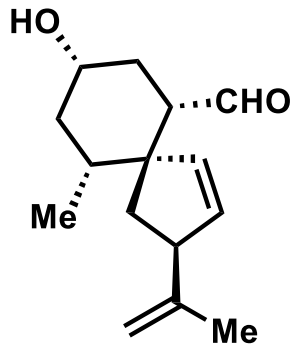
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Radical Cascades

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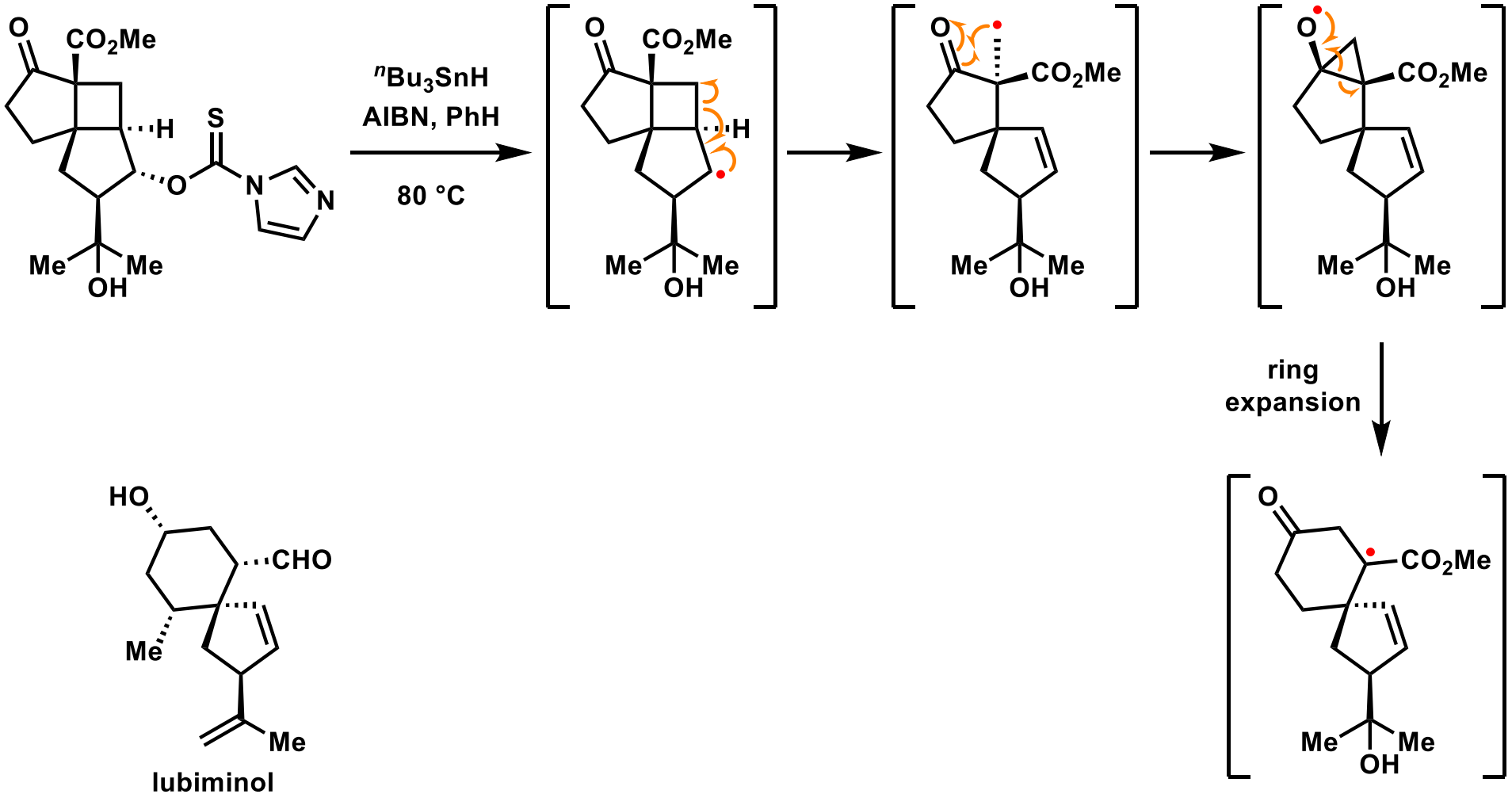


lubiminol

Crimmins, M. T.; Wang, Z.; McKerlie, L. A. *Tetrahedron Lett.* **1996**, *37*, 8703. Crimmins, M. T.; Wang, Z.; McKerlie, L. A. *J. Am. Chem. Soc.* **1998**, *120*, 1747.

Radical Cascades

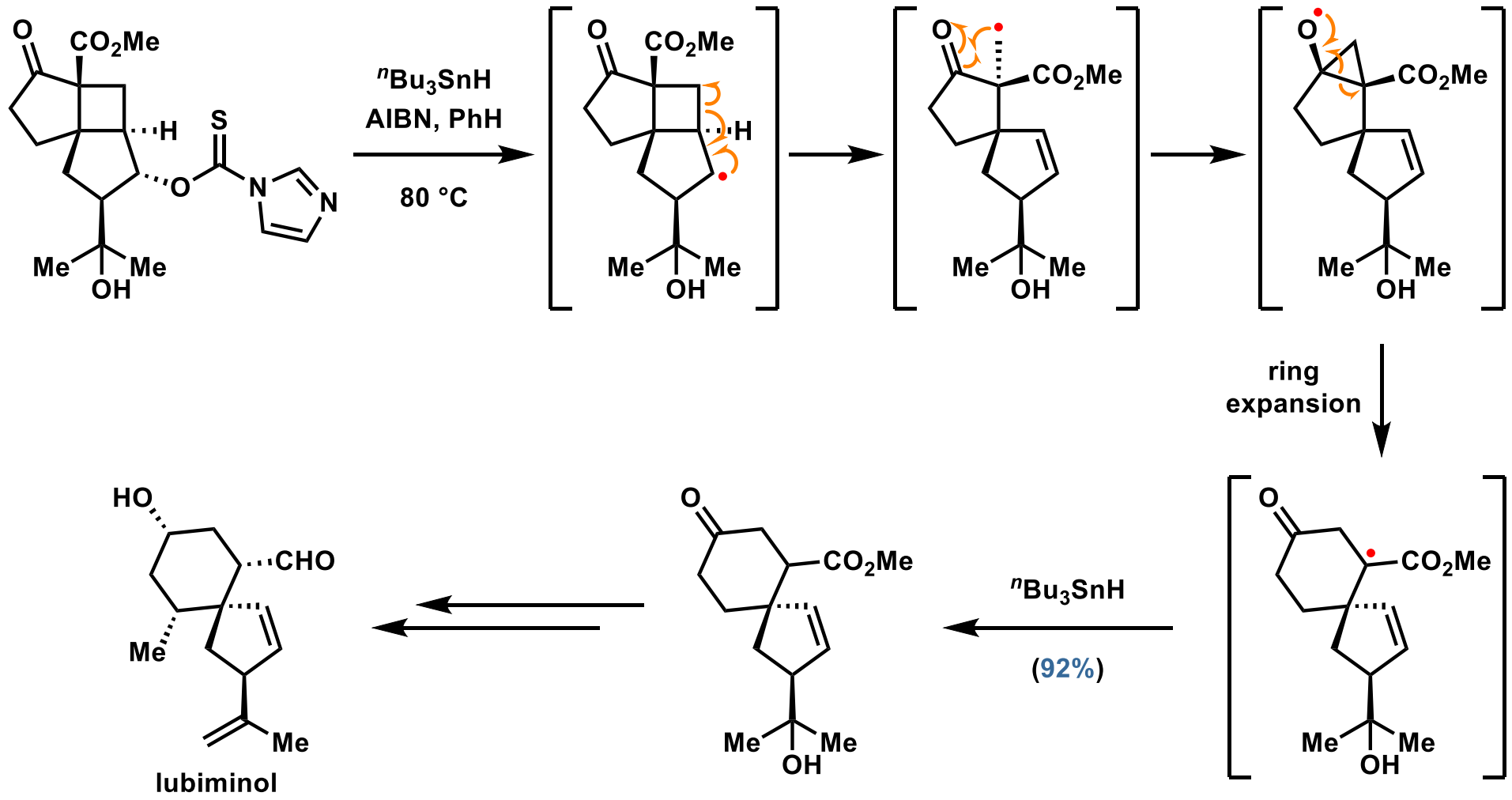
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Radical Cascades

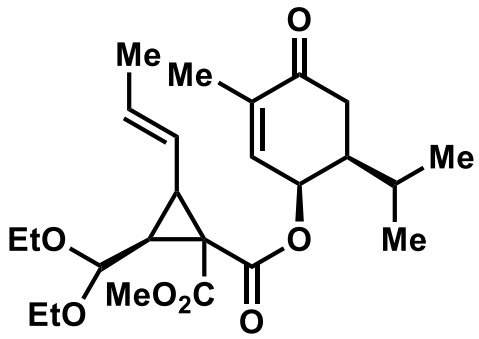
lubiminol by Crimmins: deoxygenation/ring-expansion cascade

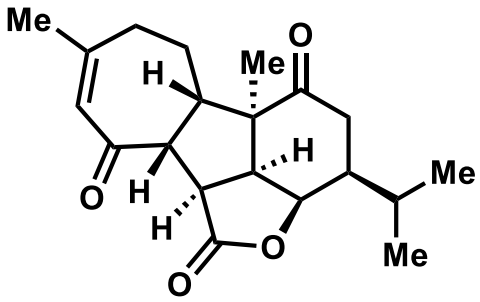


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Radical Cascades

pavidolide B by Gong and Yang: PhS• mediated cascade



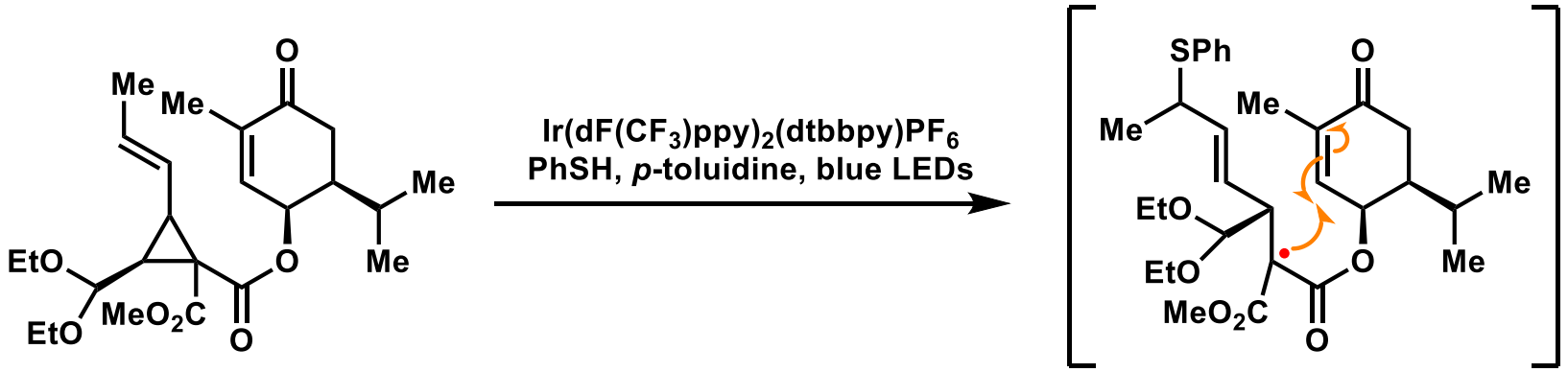


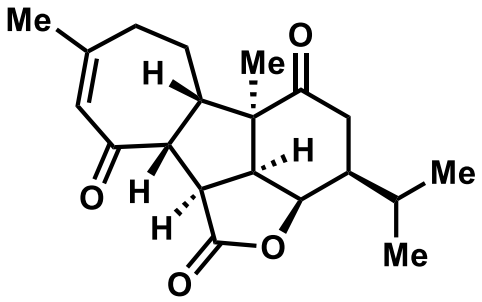
pavidolide B

Zhang, P.-P.; Yan, Z.-M.; Li, Y.-H.; Gong, J.-X.; Yang, Z. *J. Am. Chem. Soc.* **2017**, *139*, 13989.

Radical Cascades

pavidolide B by Gong and Yang: PhS• mediated cascade



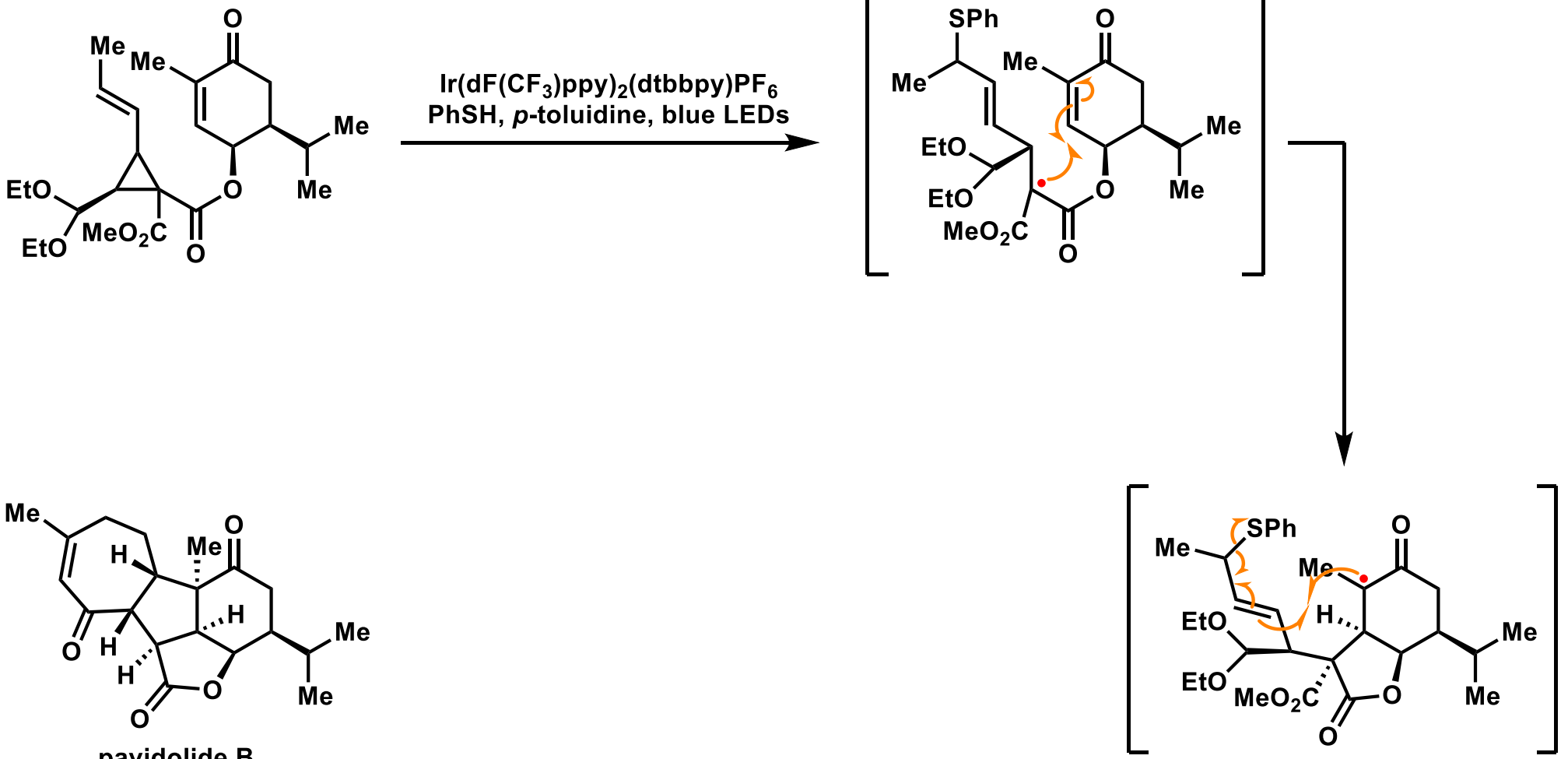


pavidolide B

Zhang, P.-P.; Yan, Z.-M.; Li, Y.-H.; Gong, J.-X.; Yang, Z. *J. Am. Chem. Soc.* **2017**, *139*, 13989.

Radical Cascades

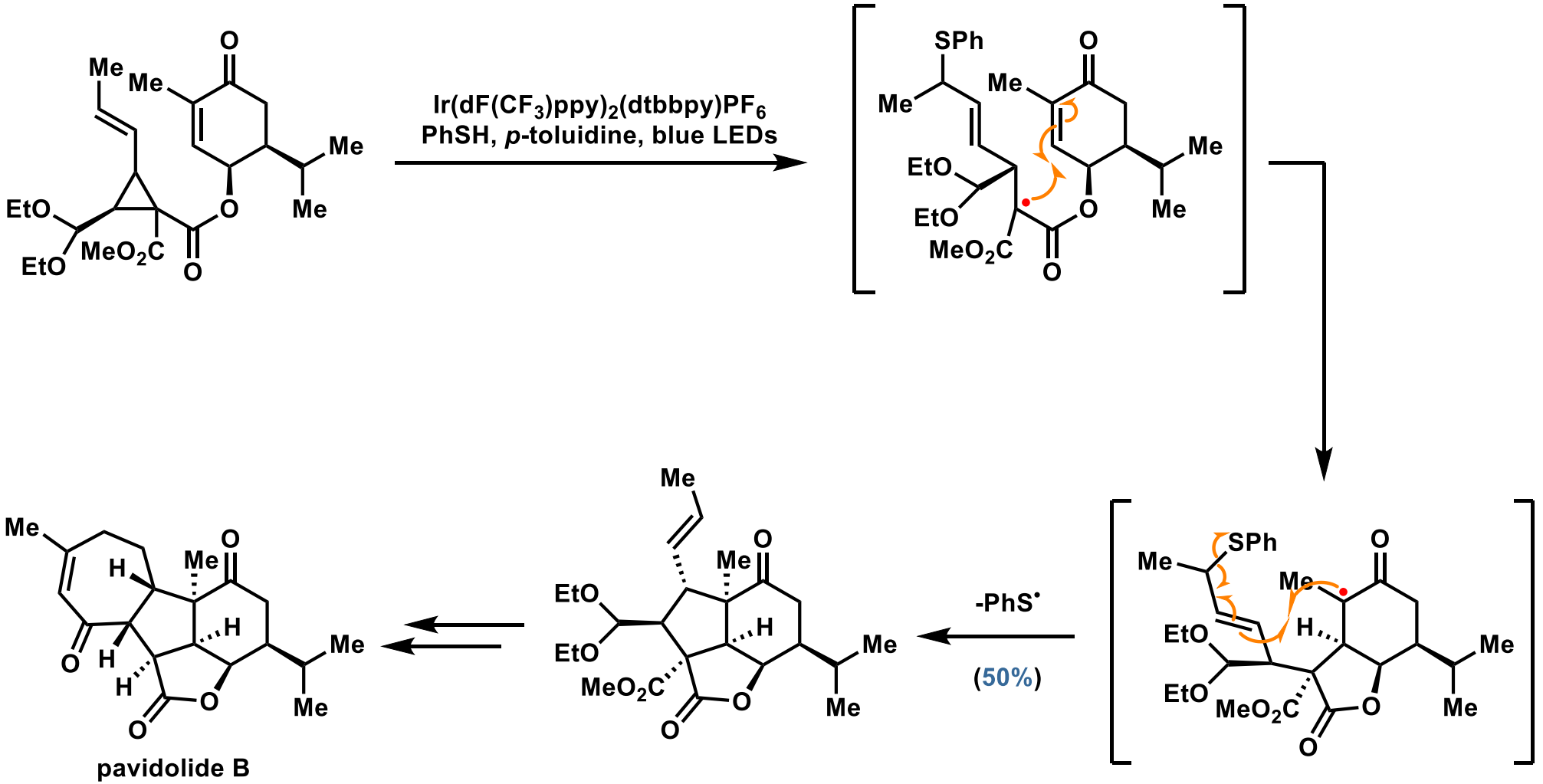
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Radical Cascades

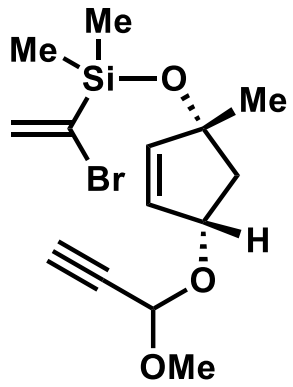
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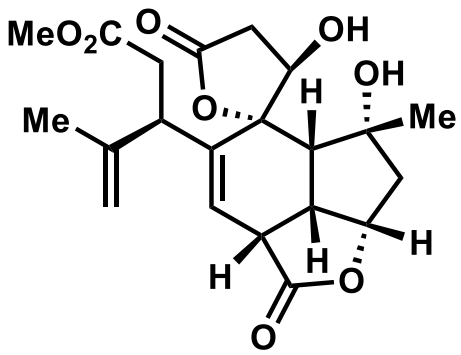


Zhang, P.-P.; Yan, Z.-M.; Li, Y.-H.; Gong, J.-X.; Yang, Z. *J. Am. Chem. Soc.* **2017**, *139*, 13989.

Radical Cascades

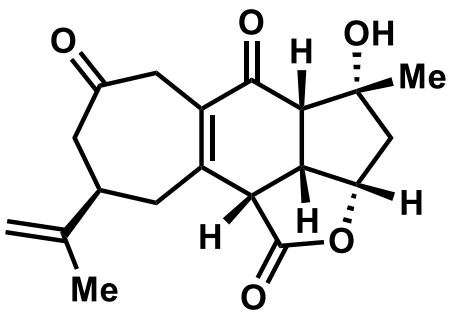
scabrolide A and havellockate by Hong and Hu: exo-exo-endo radical cascade





havellockate

&

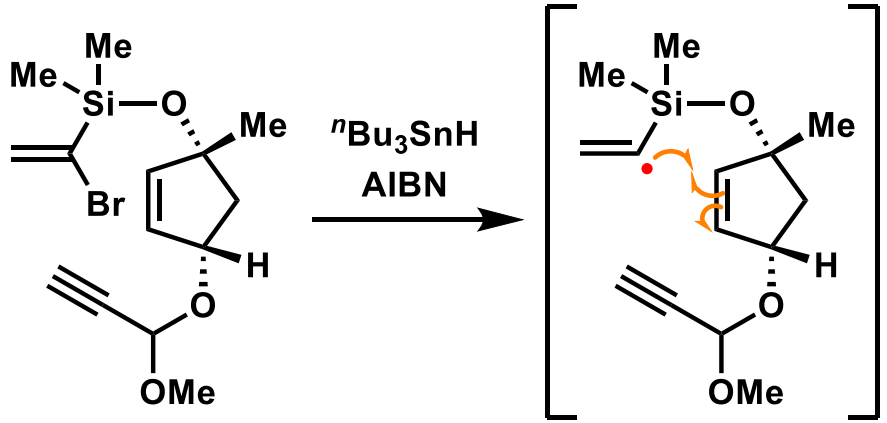


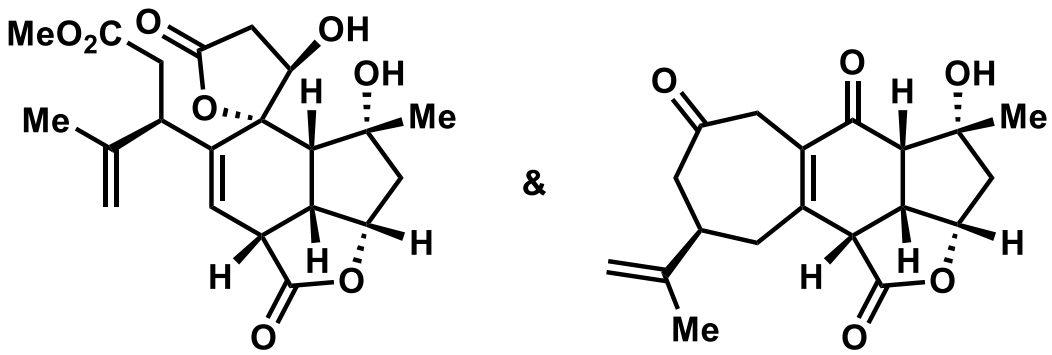
scabrolide A

Peng, C.; Guo, Q.; Xu, G.-X.; Huo, L.; Wu, W.; Chen, T.-Y.; Hong, X.; Hu, P. *J. Am. Chem. Soc.* **2024**, *146*, 14422.

Radical Cascades

scabrolide A and havellockate by Hong and Hu: exo-exo-endo radical cascade



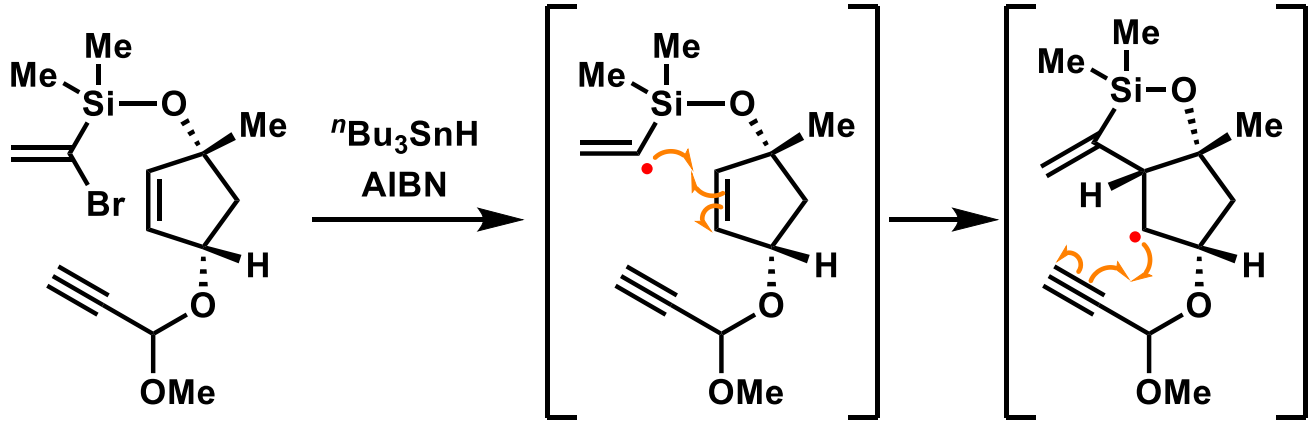


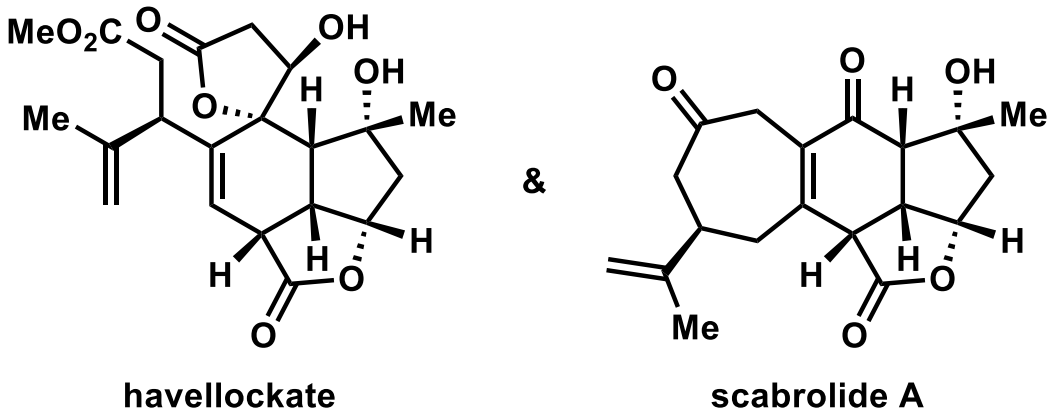
havellockate **scabrolide A**

Peng, C.; Guo, Q.; Xu, G.-X.; Huo, L.; Wu, W.; Chen, T.-Y.; Hong, X.; Hu, P. *J. Am. Chem. Soc.* **2024**, *146*, 14422.

Radical Cascades

scabrolide A and havellockate by Hong and Hu: exo-exo-endo radical cascade



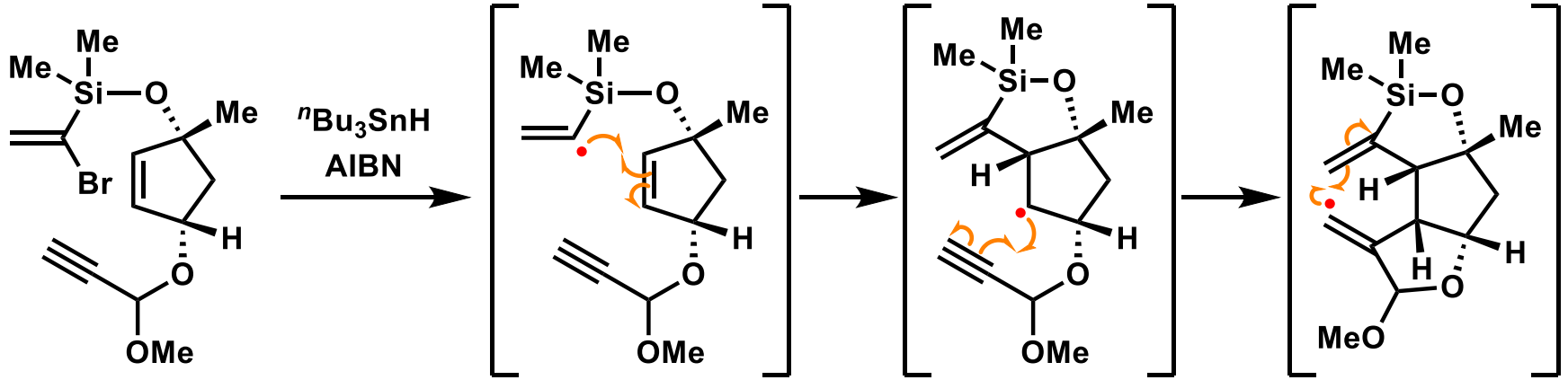


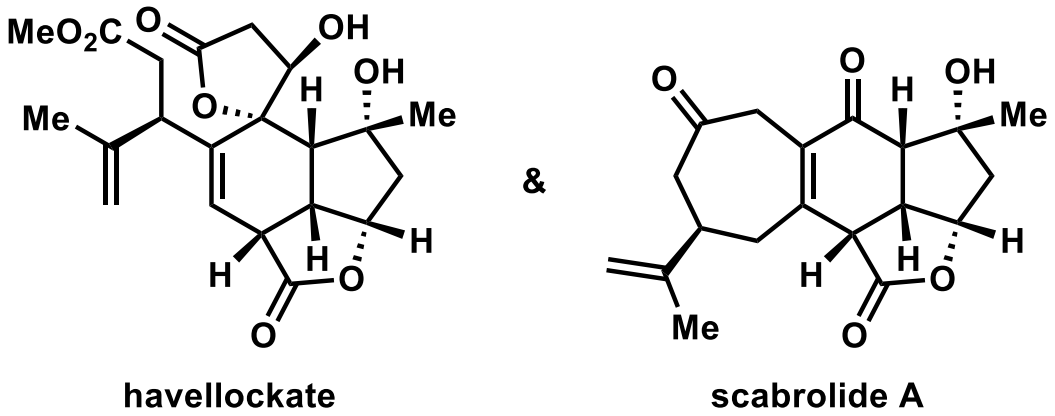
havellockate & **scabrolide A**

Peng, C.; Guo, Q.; Xu, G.-X.; Huo, L.; Wu, W.; Chen, T.-Y.; Hong, X.; Hu, P. *J. Am. Chem. Soc.* **2024**, *146*, 14422.

Radical Cascades

scabrolide A and havellockate by Hong and Hu: exo-exo-endo radical cascade



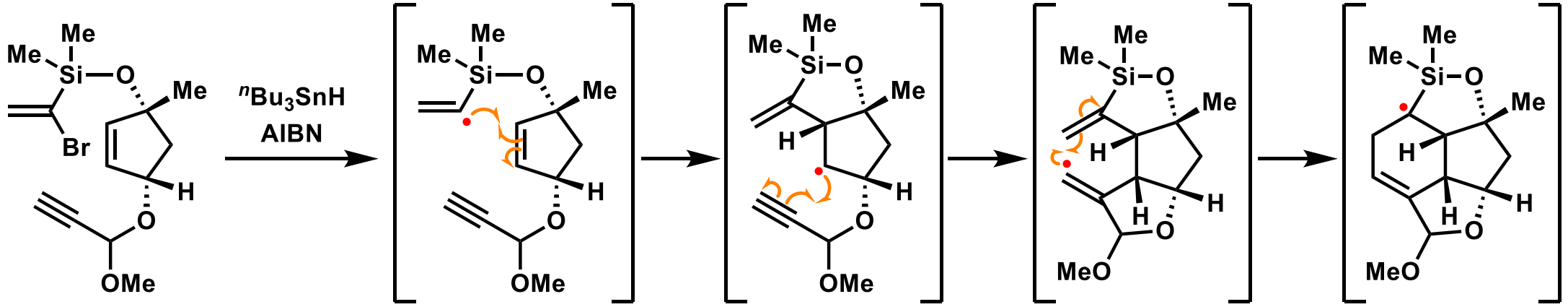


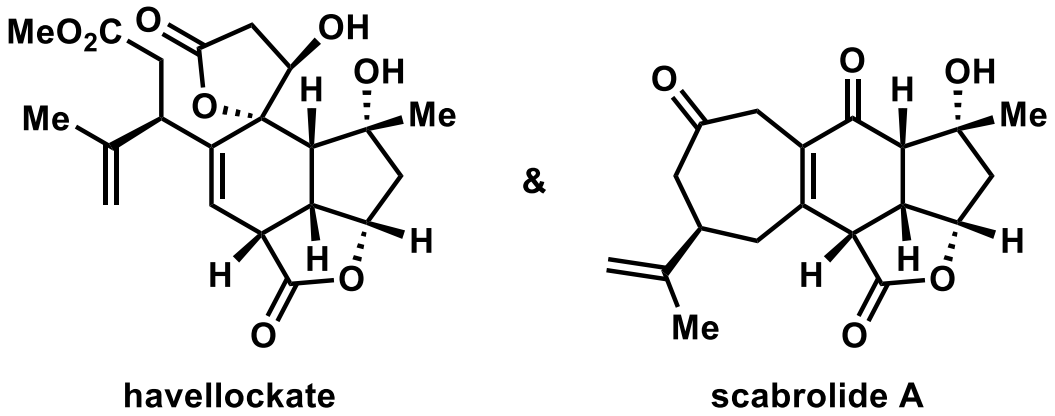
havellockate **scabrolide A**

Peng, C.; Guo, Q.; Xu, G.-X.; Huo, L.; Wu, W.; Chen, T.-Y.; Hong, X.; Hu, P. *J. Am. Chem. Soc.* **2024**, *146*, 14422.

Radical Cascades

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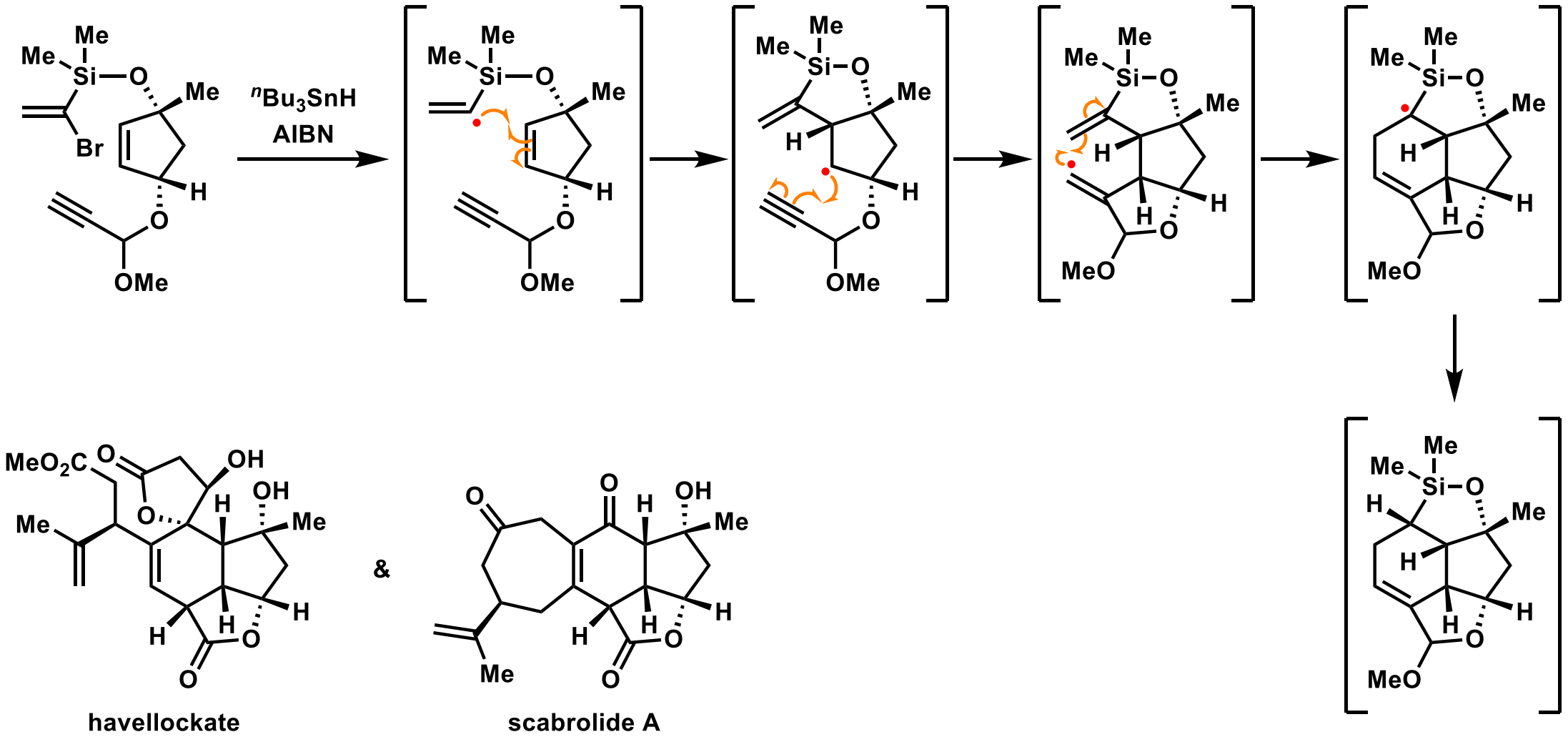


havellockate & **scabrolide A**

Peng, C.; Guo, Q.; Xu, G.-X.; Huo, L.; Wu, W.; Chen, T.-Y.; Hong, X.; Hu, P. *J. Am. Chem. Soc.* **2024**, *146*, 14422.

Radical Cascades

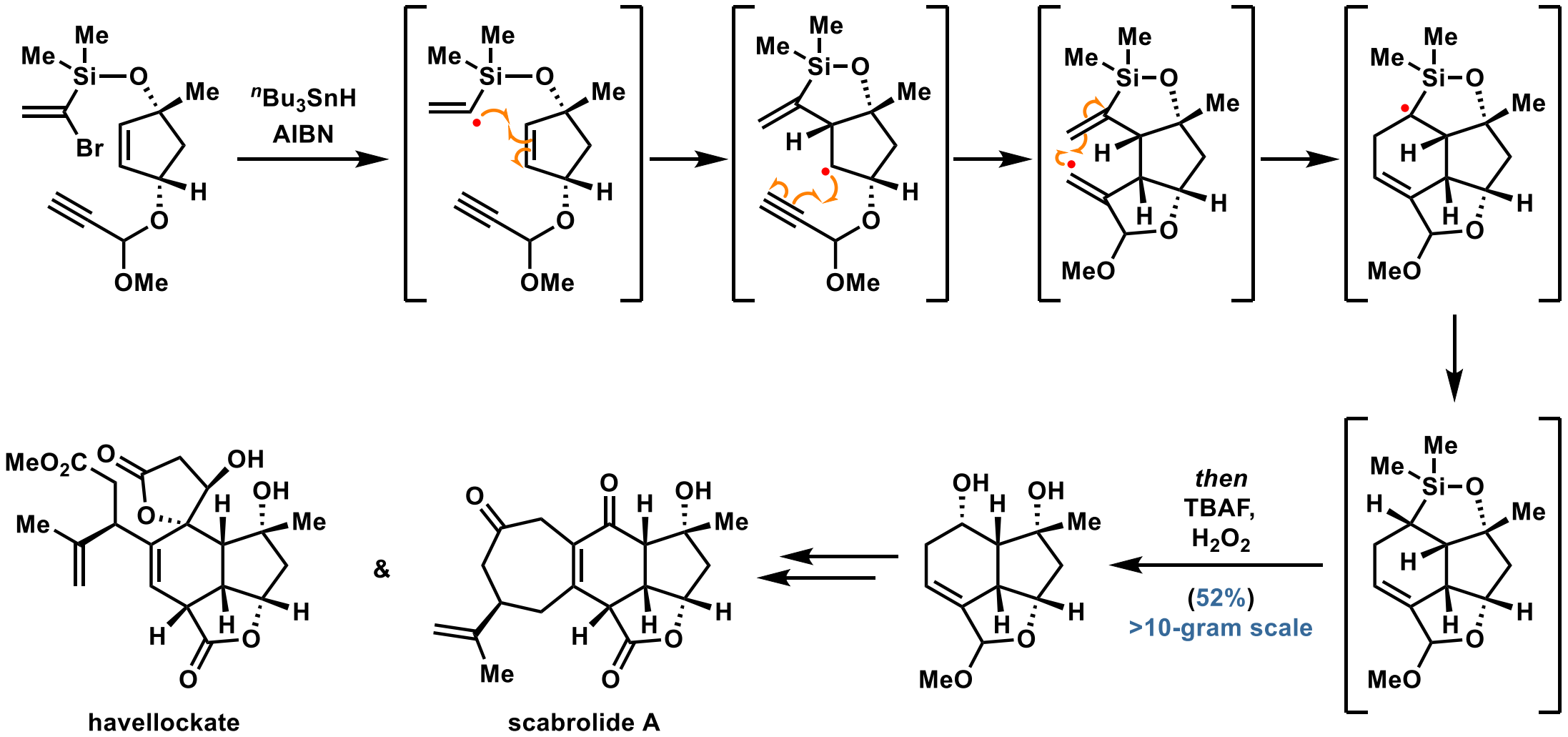
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Radical Cascades

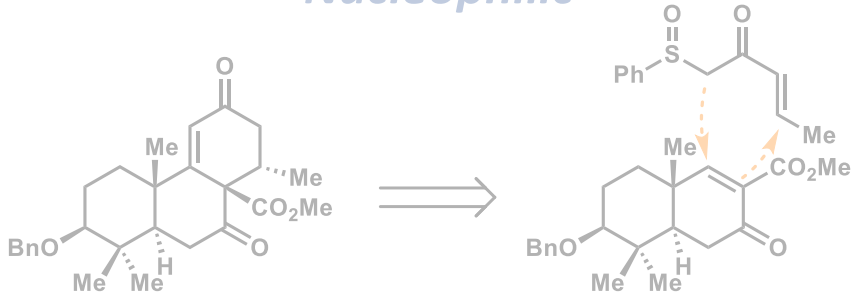
scabrolide A and havellockate by Hong and Hu: exo-exo-endo radical cascade



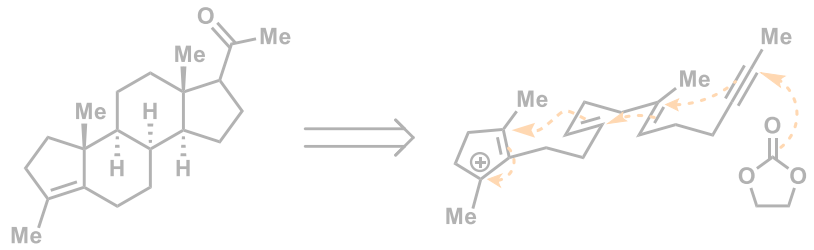
Peng, C.; Guo, Q.; Xu, G.-X.; Huo, L.; Wu, W.; Chen, T.-Y.; Hong, X.; Hu, P. *J. Am. Chem. Soc.* **2024**, *146*, 14422.

Cascades in Total Synthesis

Nucleophilic



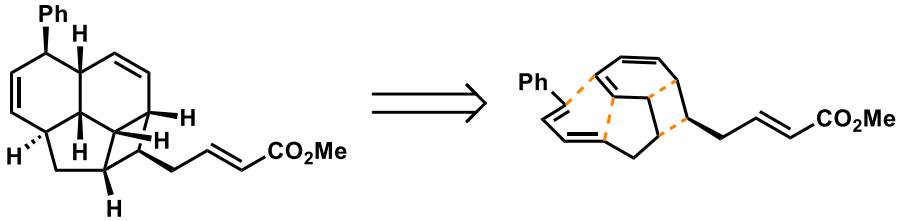
Electrophilic



Radical



Pericyclic

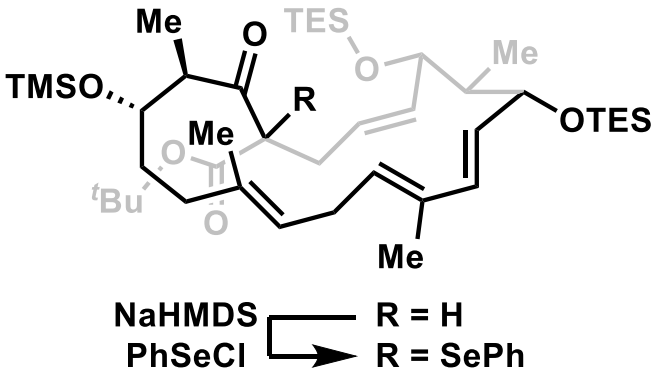


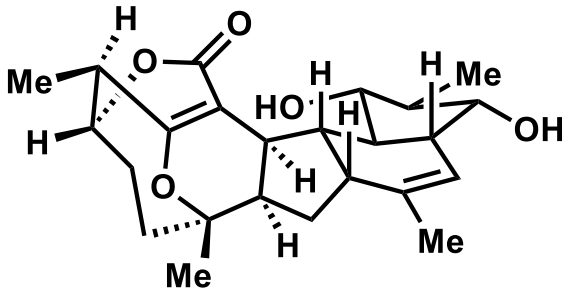
Transition Metal



Pericyclic Cascades

FR182877 by Sorensen: transannular DA/hetero-DA cascade



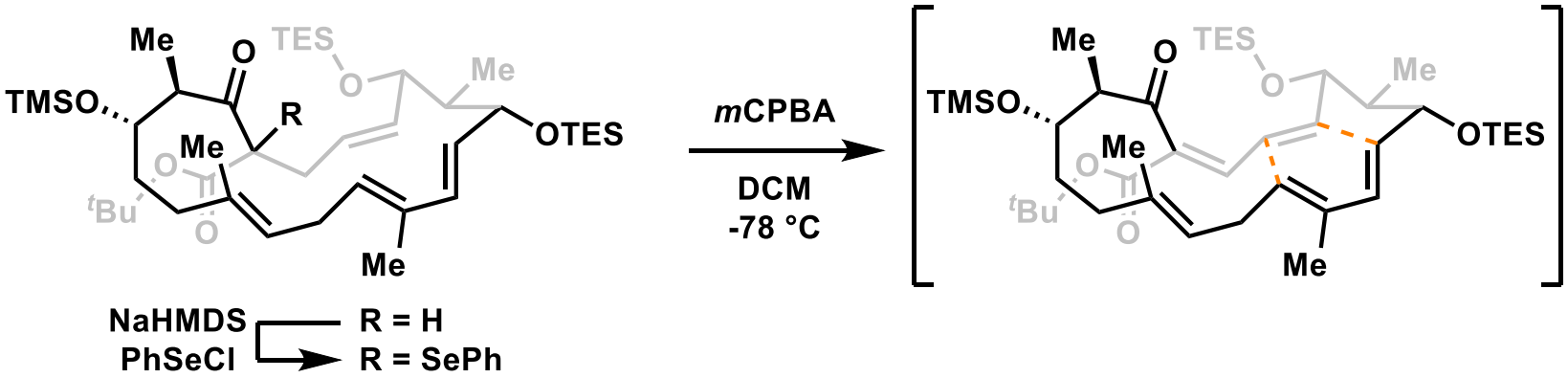


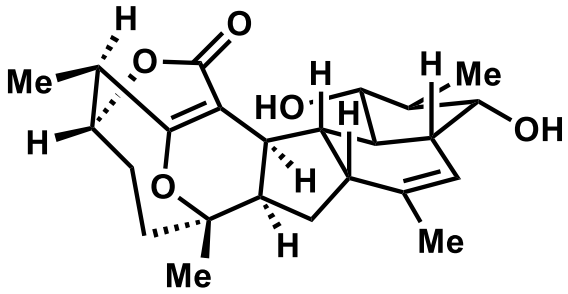
FR182877

Vanderwal, C. D.; Vosburg, D. A.; Weiler, S.; Sorensen, E. J. *J. Am. Chem. Soc.* **2003**, *125*, 5393.

Pericyclic Cascades

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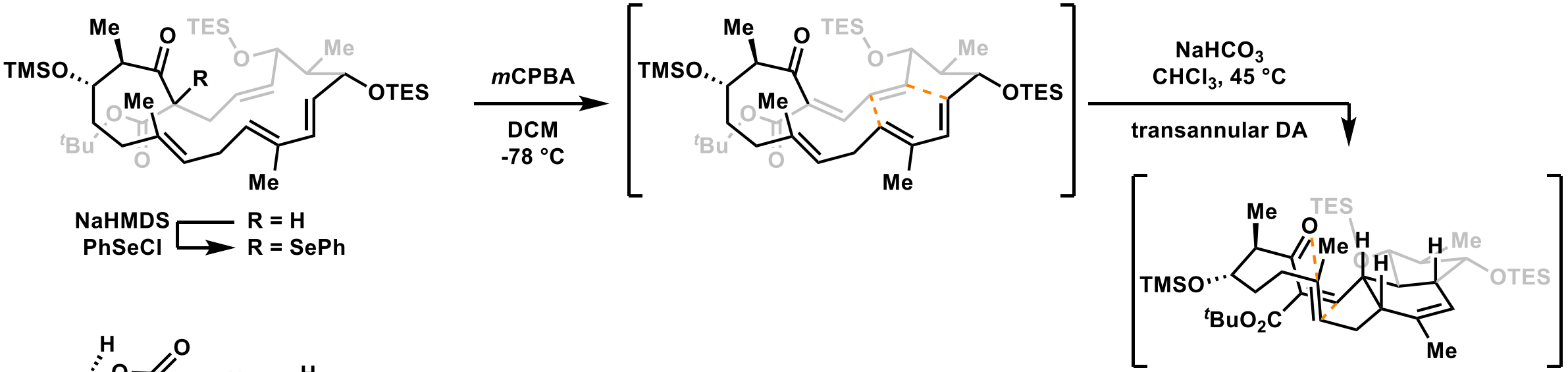


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Pericyclic Cascades

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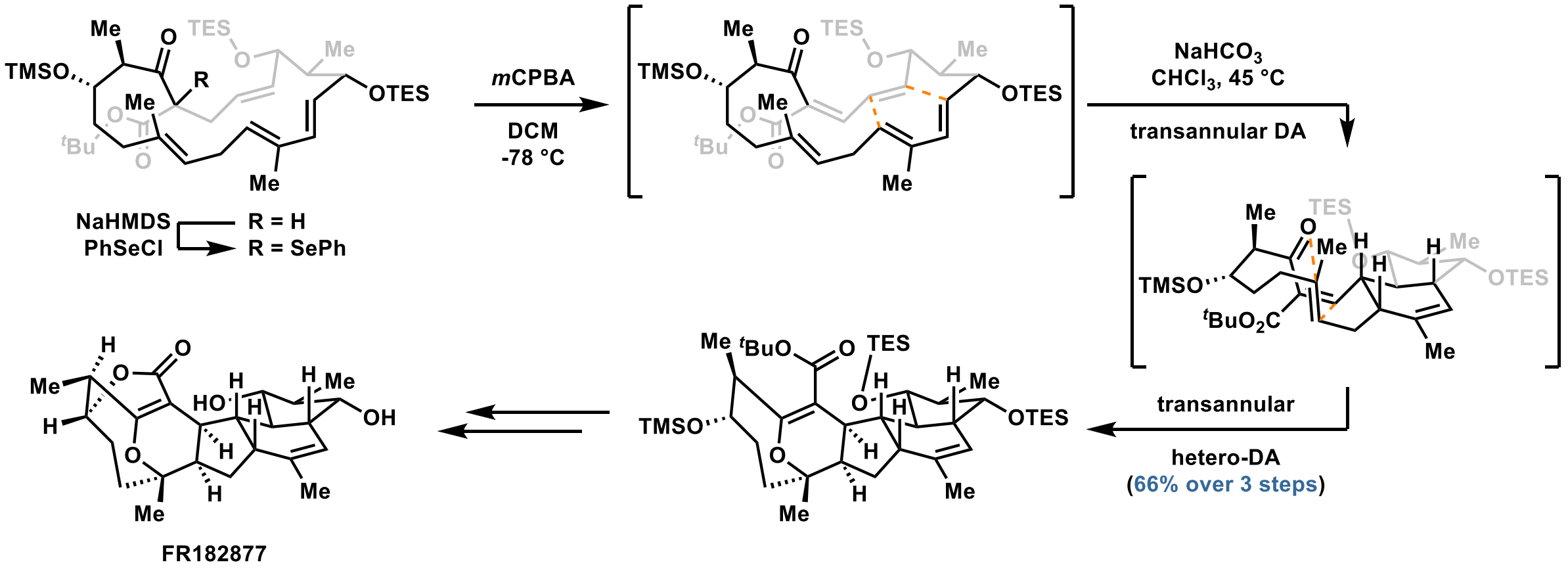


FR182877

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Pericyclic Cascades

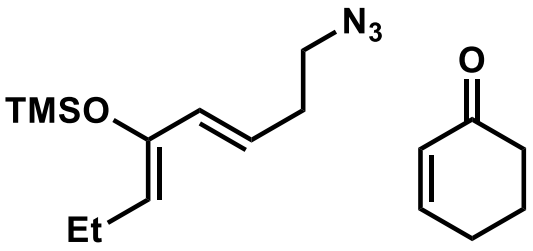
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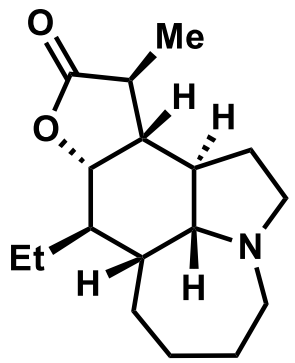


Vanderwal, C. D.; Vosburg, D. A.; Weiler, S.; Sorensen, E. J. *J. Am. Chem. Soc.* **2003**, *125*, 5393.

Pericyclic Cascades

stenine by Zeng and Aubé: exo-DA/Schmidt cascade



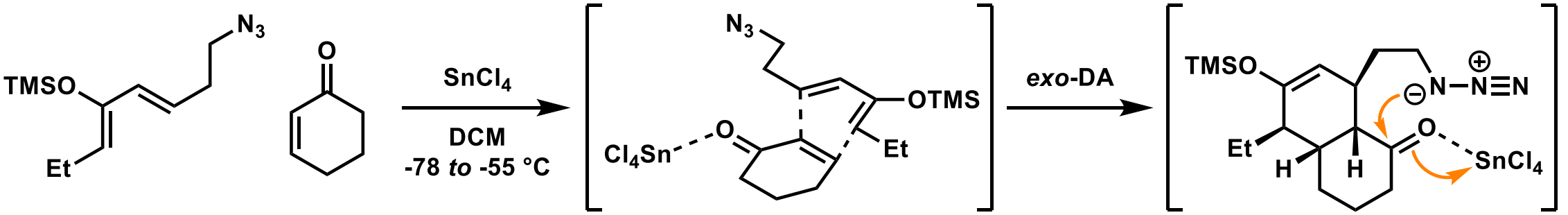


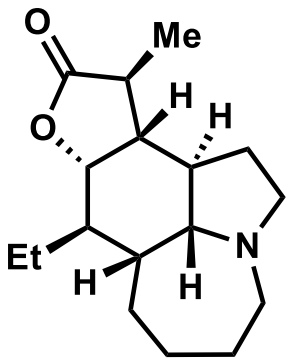
stenine

Zeng, Y.; Aubé, J. *J. Am. Chem. Soc.* **2005**, *127*, 15712.

Pericyclic Cascades

stenine by Zeng and Aubé: exo-DA/Schmidt cascade



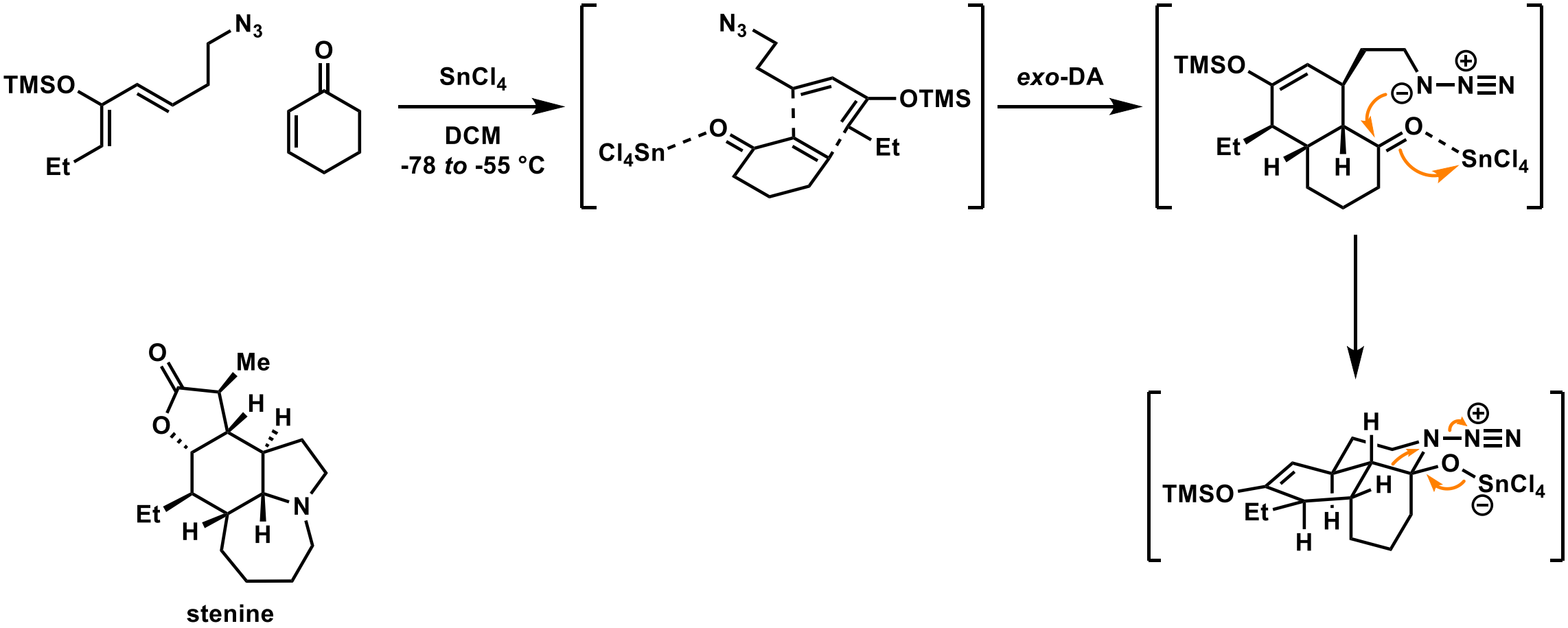


stenine

Zeng, Y.; Aubé, J. *J. Am. Chem. Soc.* **2005**, *127*, 15712.

Pericyclic Cascades

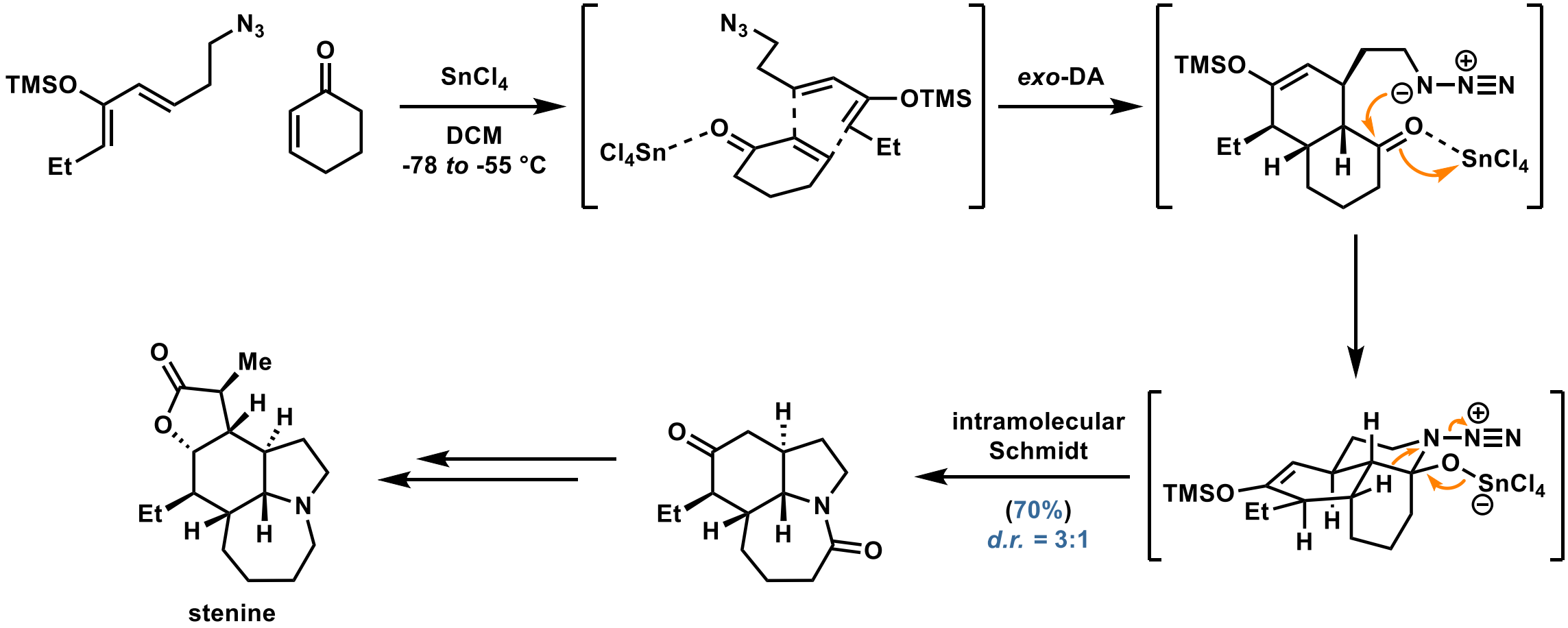
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Pericyclic Cascades

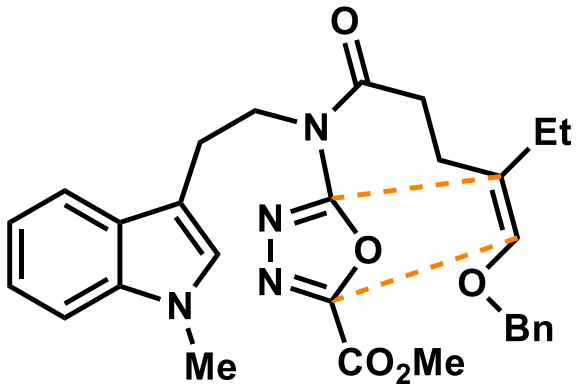
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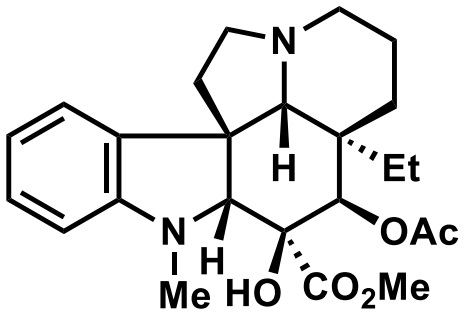


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Pericyclic Cascades

vindorosine by Boger: IMDA/[3+2] cascade



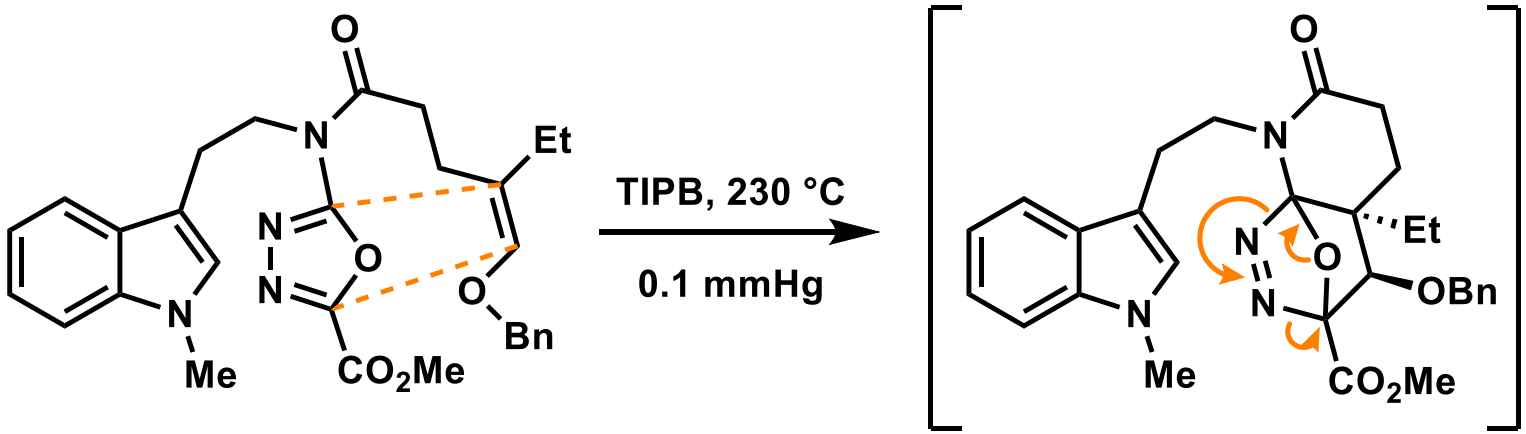


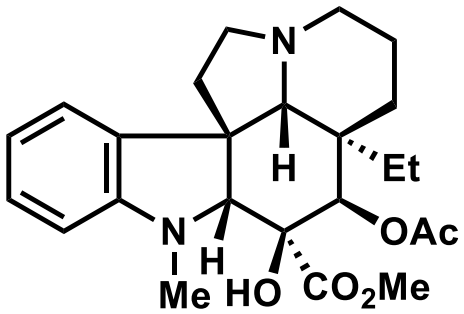
vindorosine

Elliott, G. I.; Velcicky, J.; Ishikawa, H.; Li, Y.; Boger, D. L. *Angew. Chem. Int. Ed* **2006**, *45*, 620.

Pericyclic Cascades

vindorosine by Boger: IMDA/[3+2] cascade



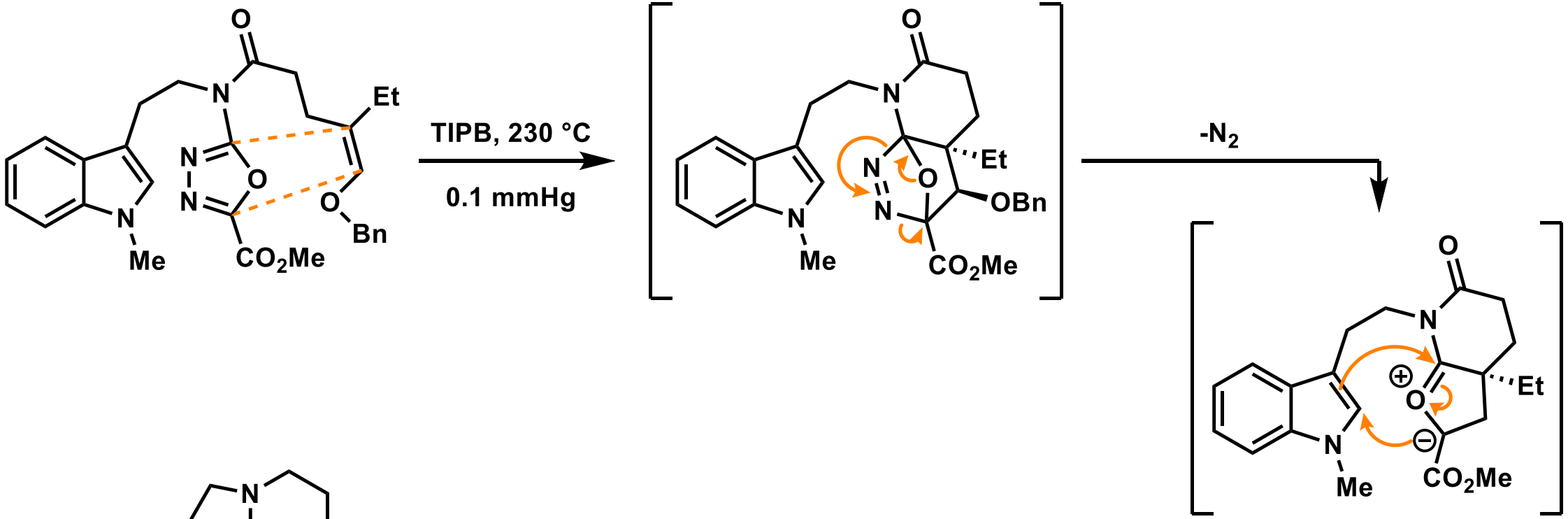


vindorosine

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Pericyclic Cascades

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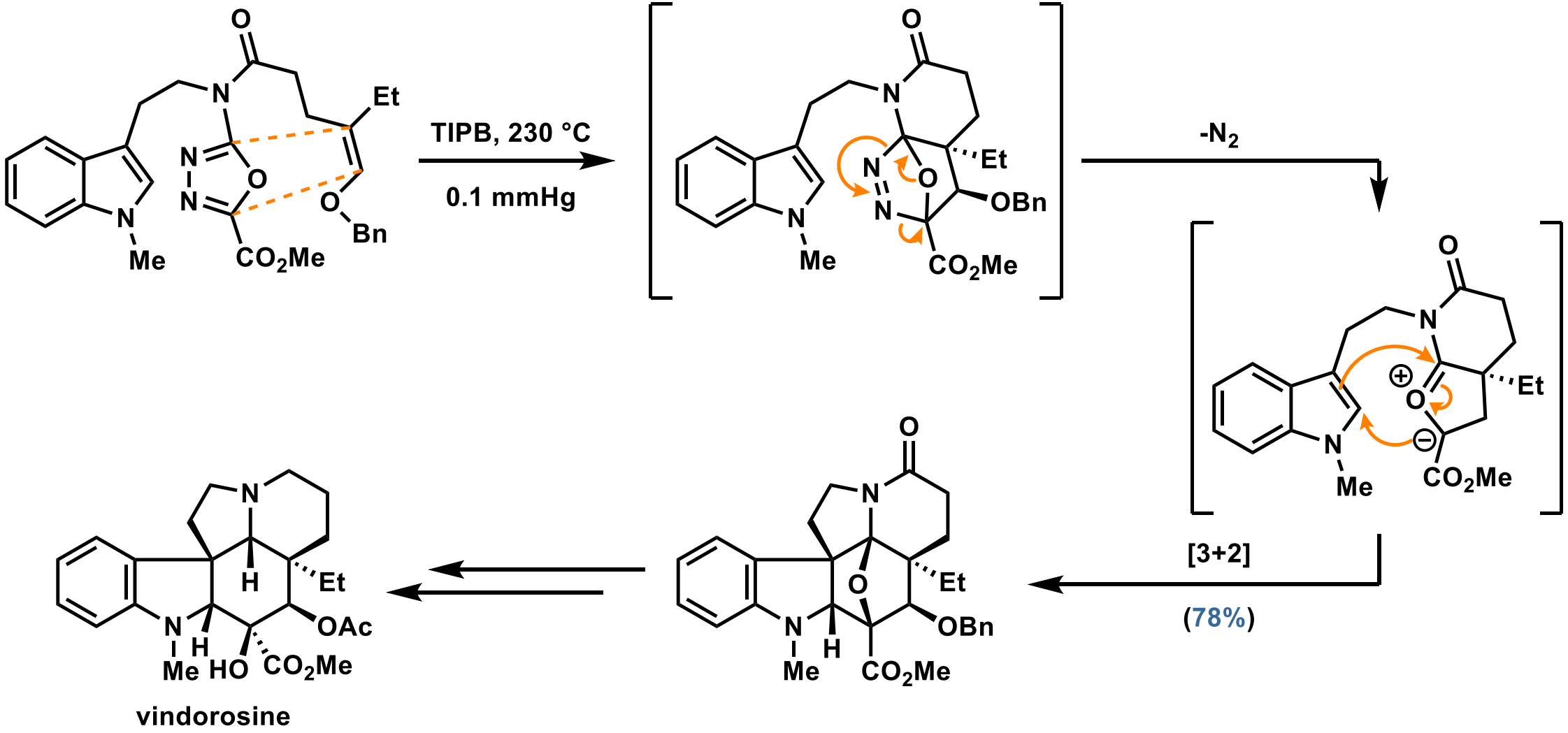


vindorosine

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Pericyclic Cascades

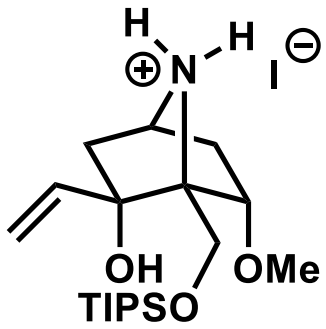
vindorosine by Boger: IMDA/[3+2] cascade

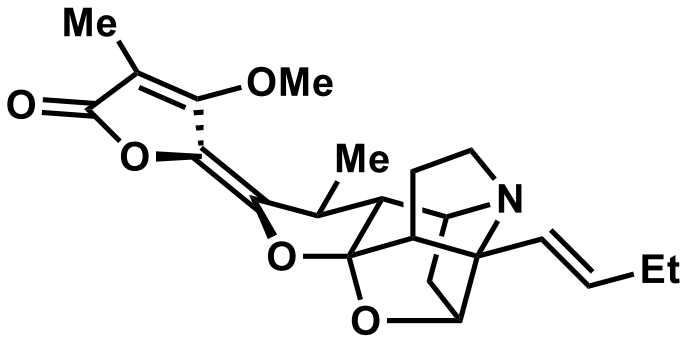


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Pericyclic Cascades

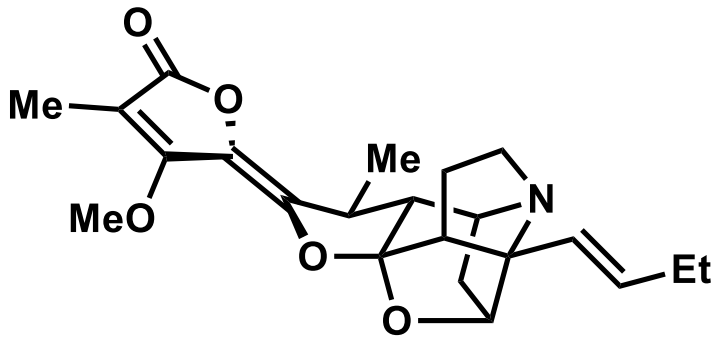
didehydrostemofoline by Overman: aza-Cope/Mannich cascade





didehydrostemofoline

&

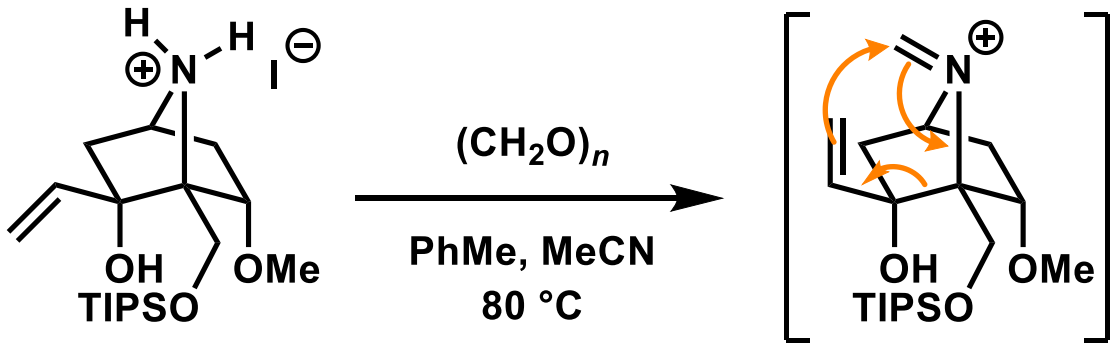


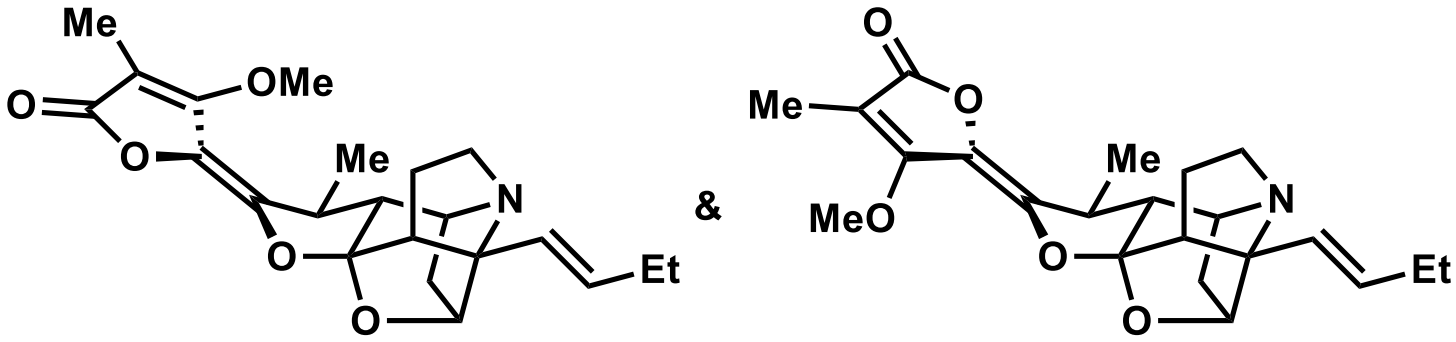
isodidehydrostemofoline

Brüggemann, M.; McDonald, A. I.; Overman, L. E.; Rosen, M. D.; Schwink, L.; Scott, J. P. *J. Am. Chem. Soc.* **2003**, *125*, 15284.

Pericyclic Cascades

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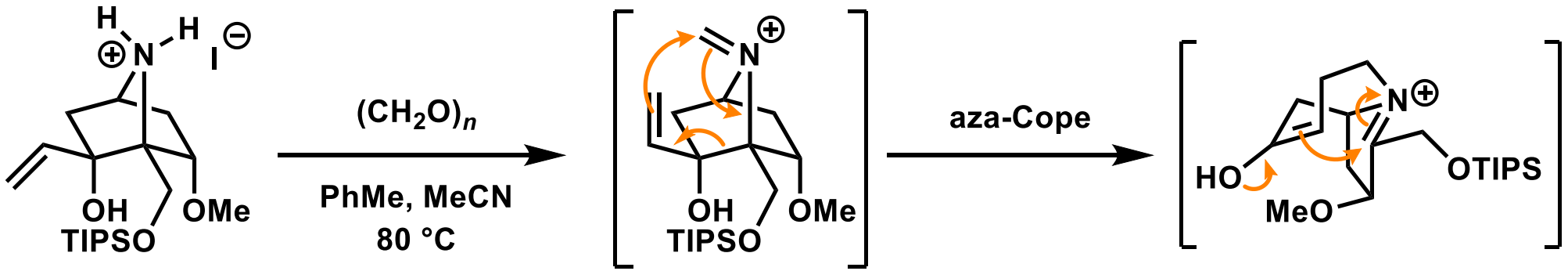


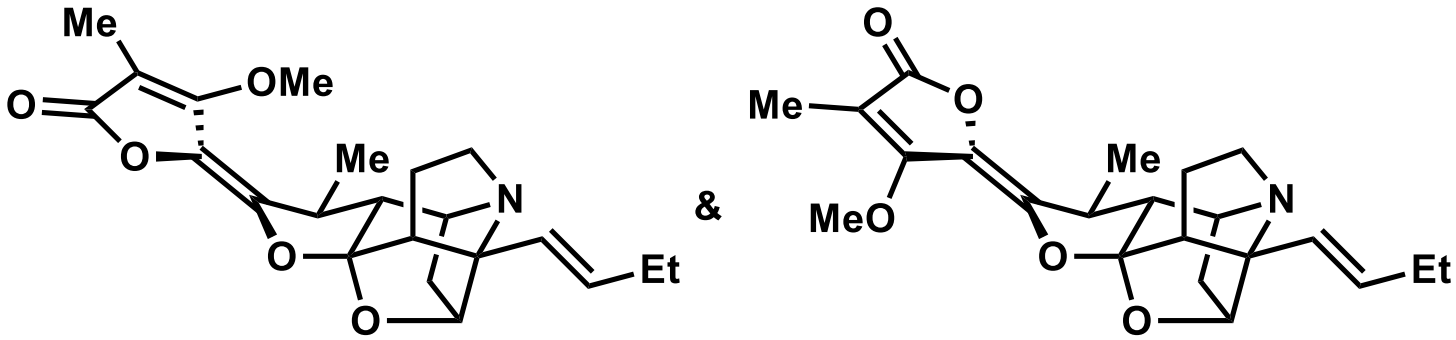
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Pericyclic Cascades

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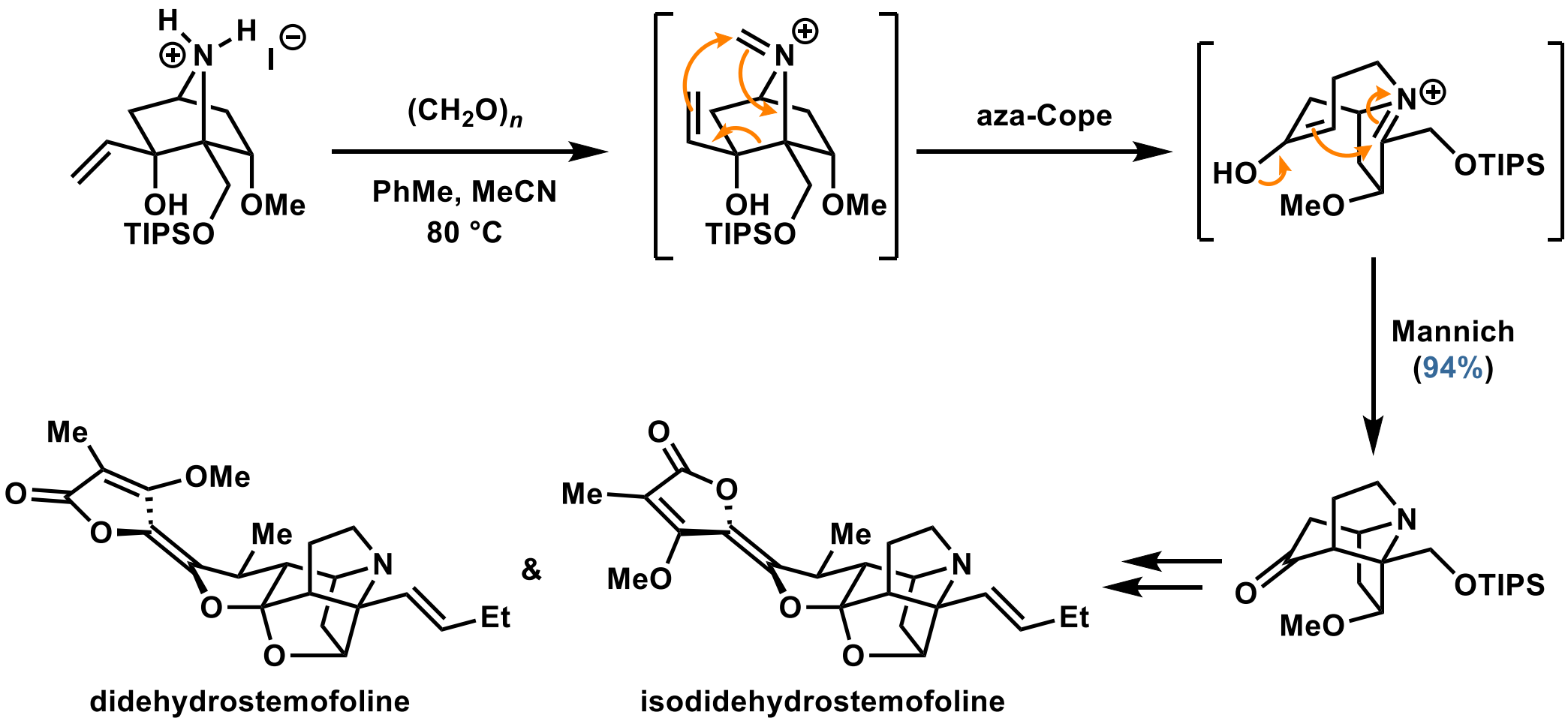


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Pericyclic Cascades

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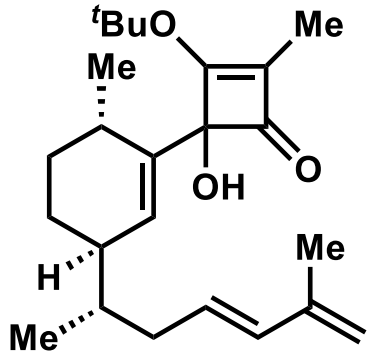
didehydrostemofoline

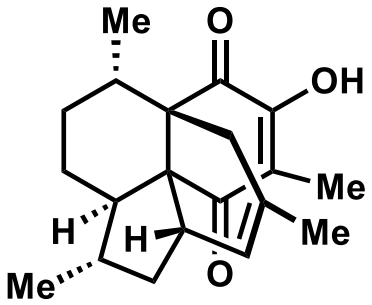
isodidehydrostemofoline

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Pericyclic Cascades

colombiasin A by Harrowven: electrocycloreversion/electrocyclization cascade



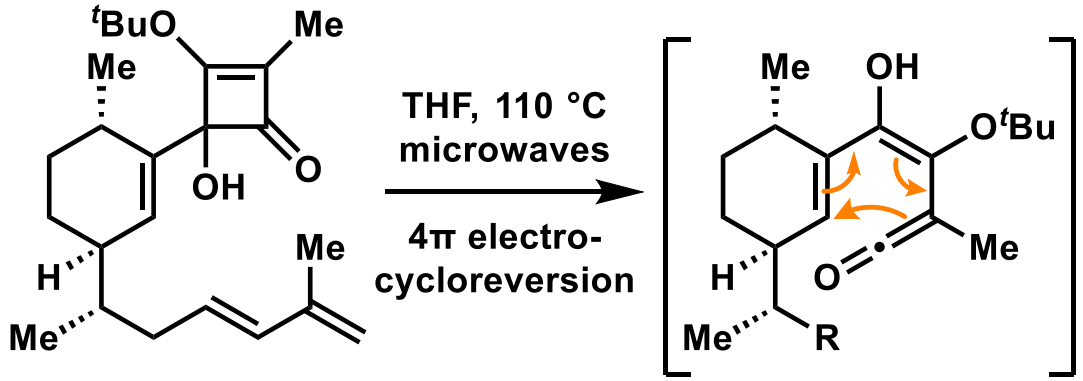


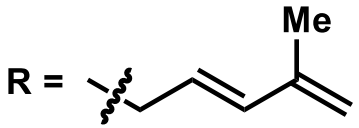
colombiasin A

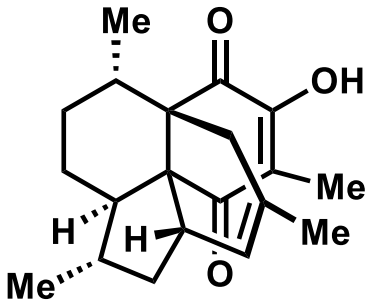
Harrowven, D. C.; Pascoe, D. D.; Demurtas, D.; Bourne, H. O. *Angew. Chem. Int. Ed* **2005**, *44*, 1221.

Pericyclic Cascades

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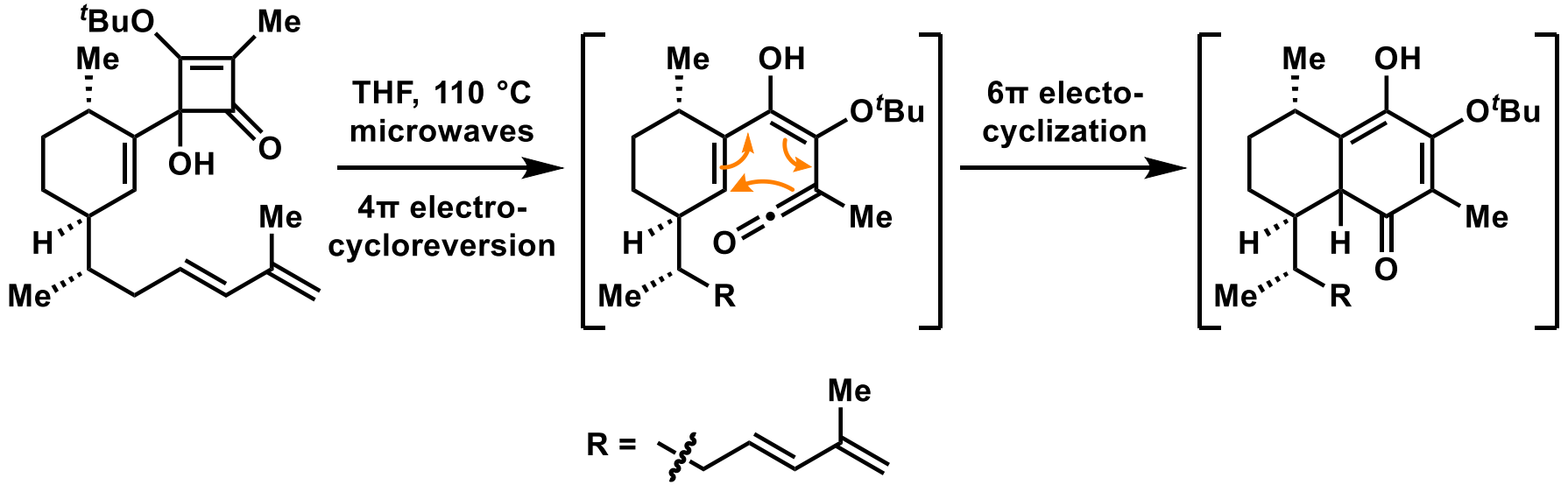


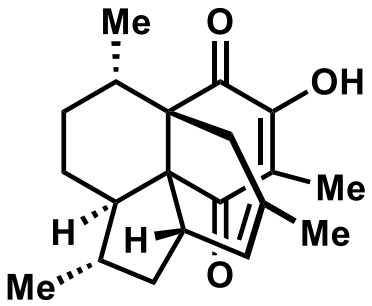
colombiasin A

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Pericyclic Cascades

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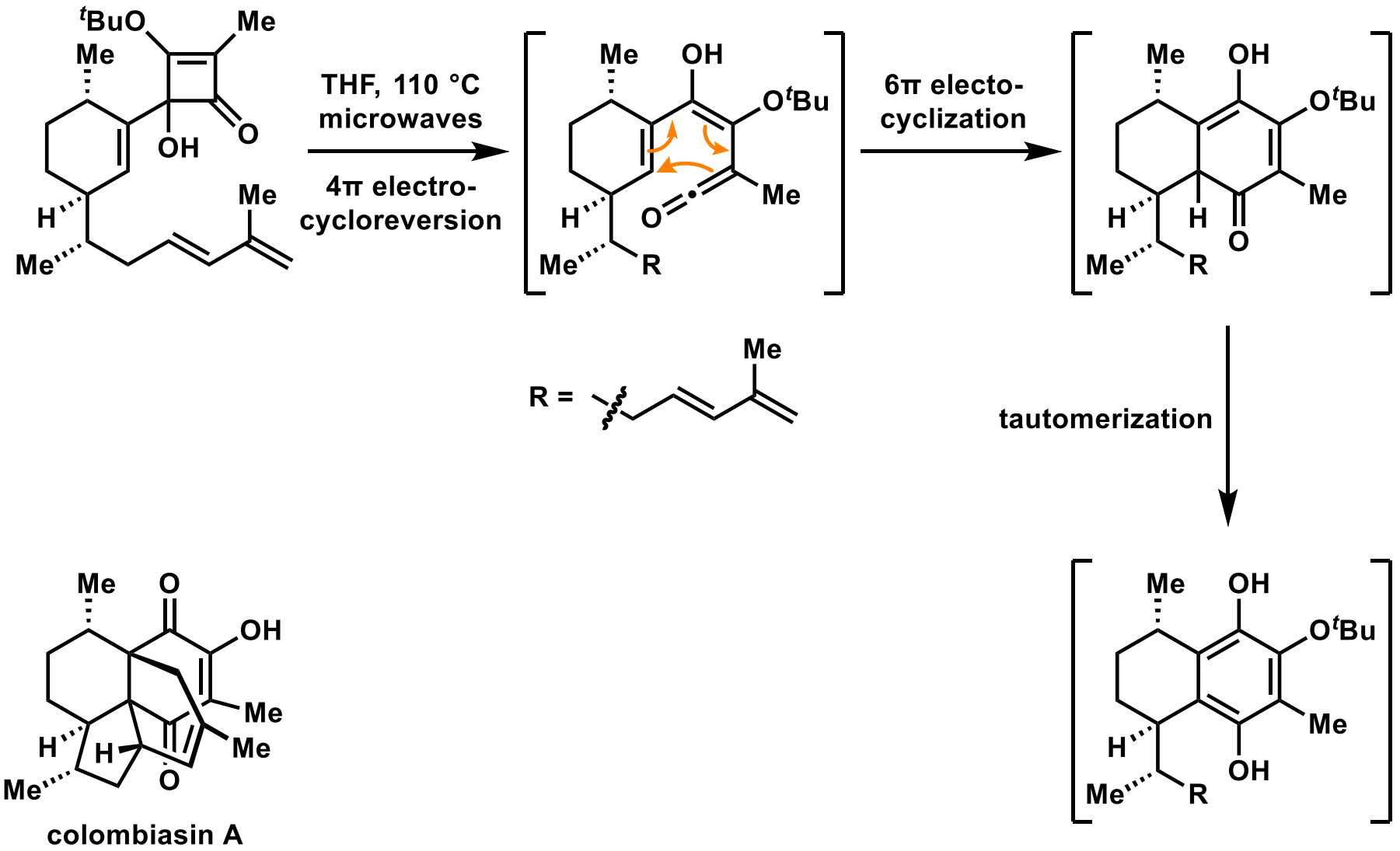


colombiasin A

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Pericyclic Cascades

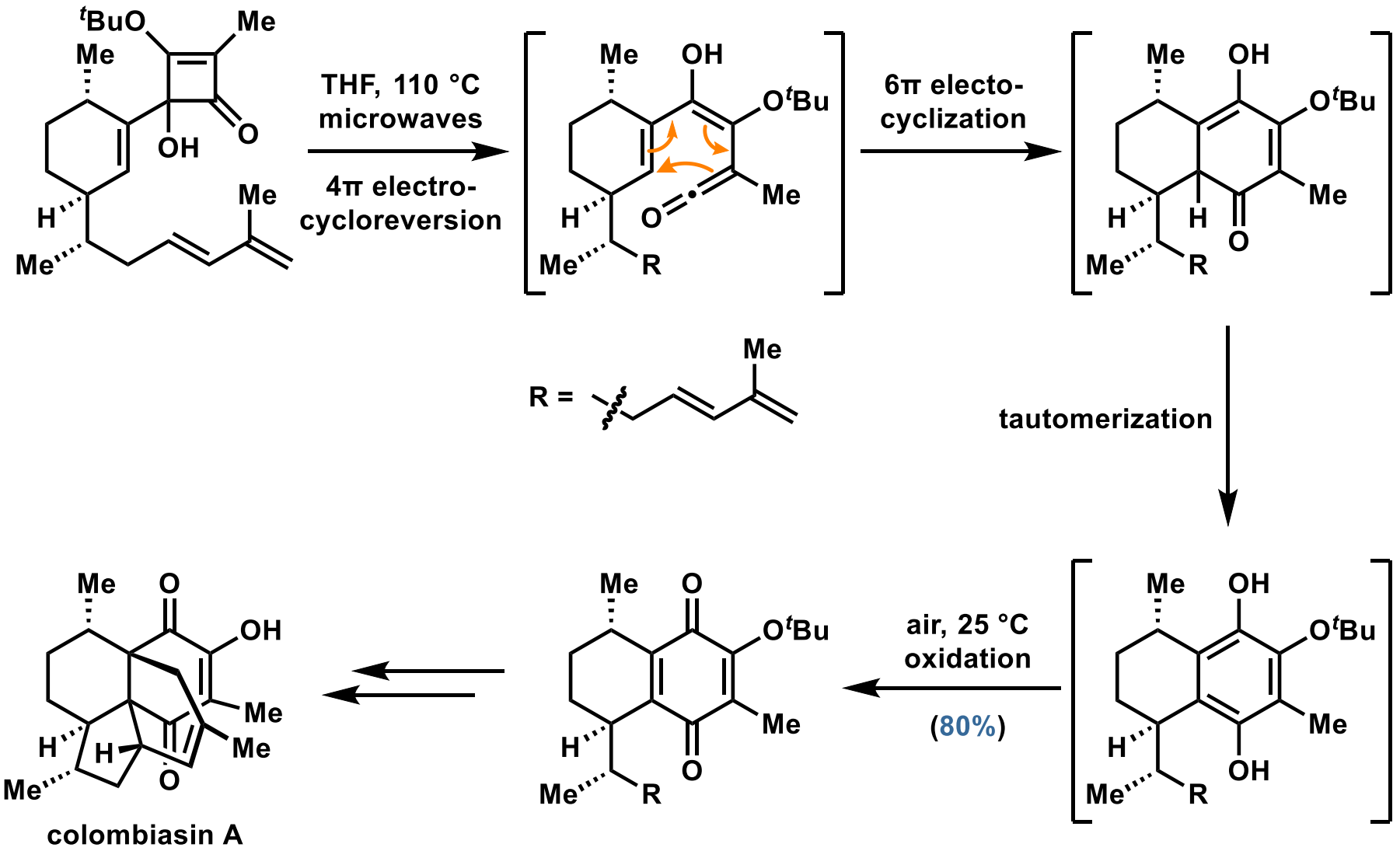
colombiasin A by Harrowven: electrocycloreversion/electrocyclization cascade



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Pericyclic Cascades

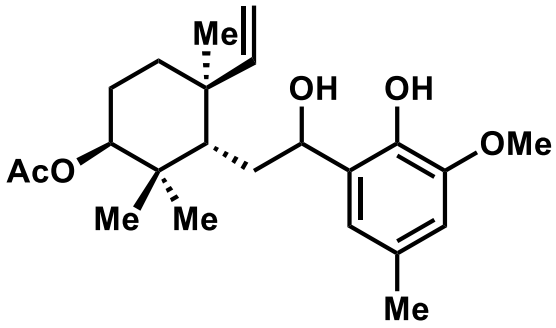
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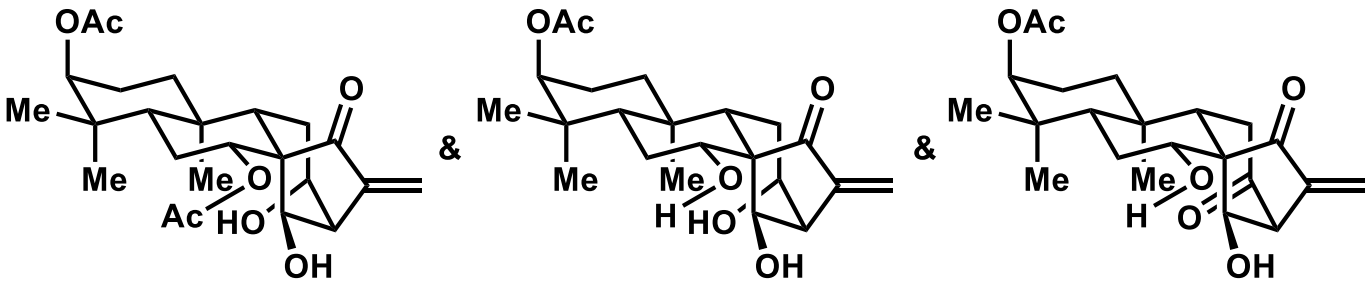


Harrowven, D. C.; Pascoe, D. D.; Demurtas, D.; Bourne, H. O. *Angew. Chem. Int. Ed* **2005**, *44*, 1221.

Pericyclic Cascades

pharicins by Ding: oxidative dearomatization-induced [5+2]/pinacol cascade



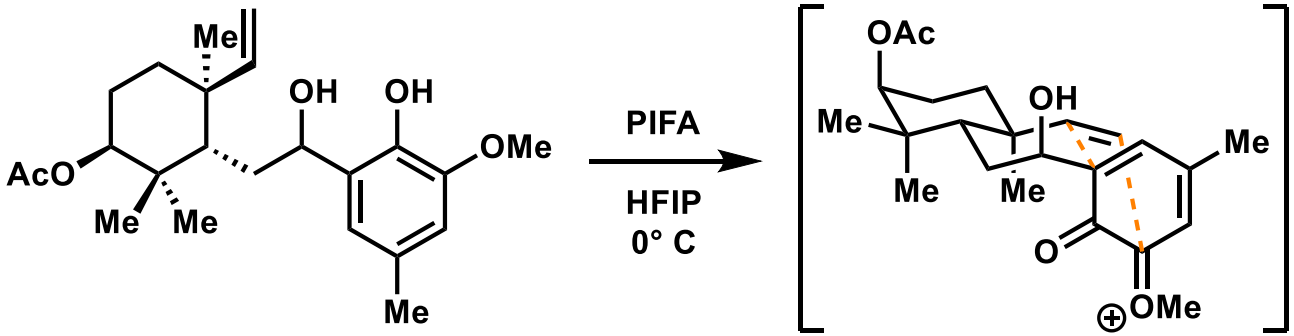


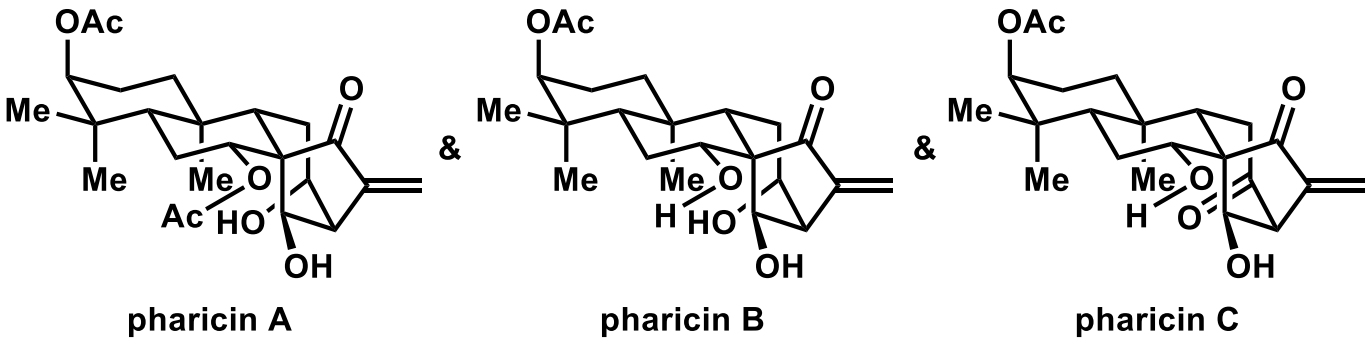
pharicin A pharicin B pharicin C

He, C.; Hu, J.; Wu, Y.; Ding, H. *J. Am. Chem. Soc.* **2017**, *139*, 6098.

Pericyclic Cascades

pharicins by Ding: oxidative dearomatization-induced [5+2]/pinacol cascade



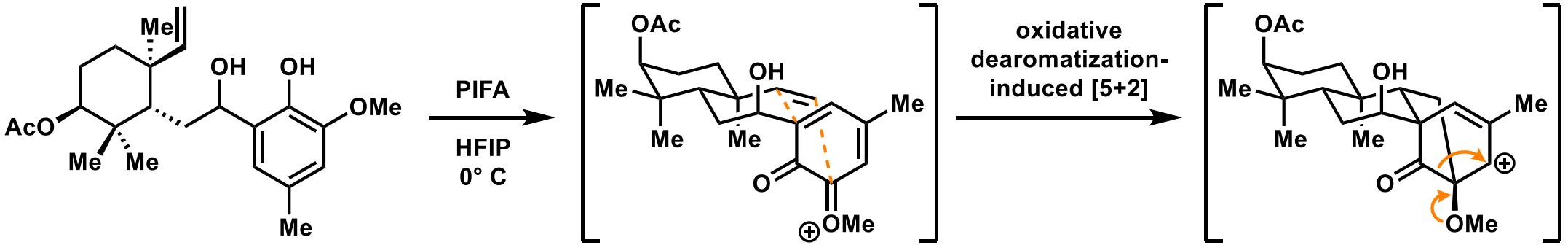


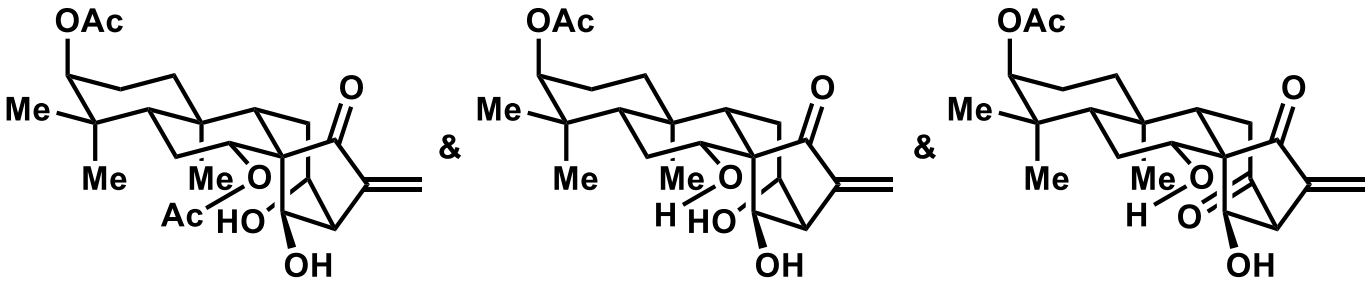
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Pericyclic Cascades

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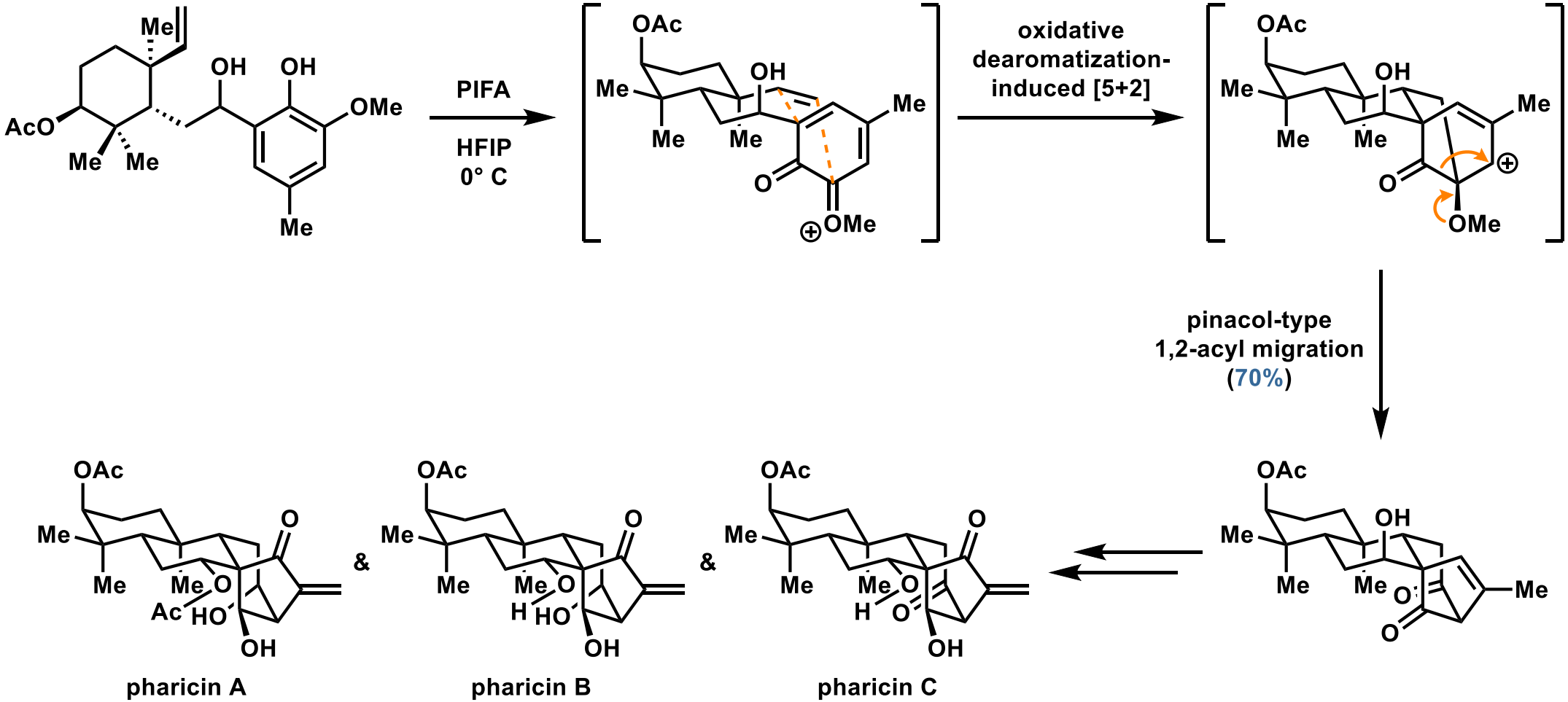


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Pericyclic Cascades

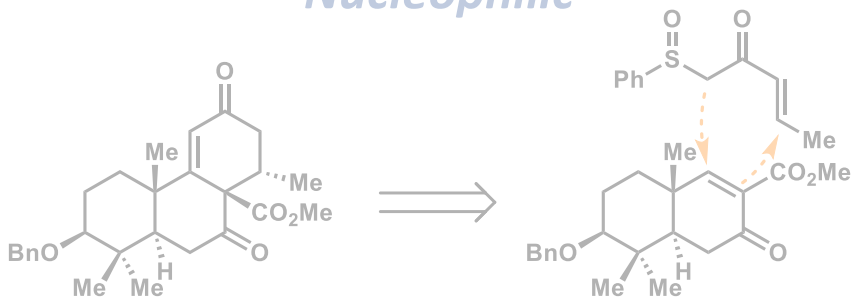
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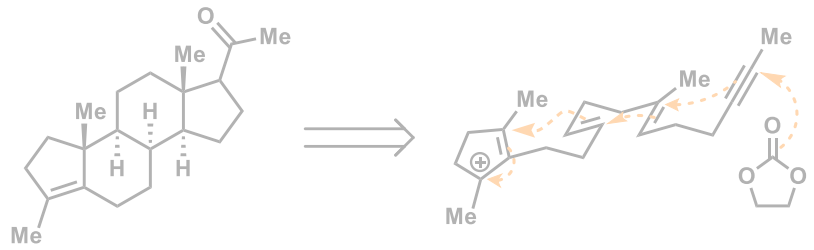
He, C.; Hu, J.; Wu, Y.; Ding, H. *J. Am. Chem. Soc.* **2017**, *139*, 6098.

Cascades in Total Synthesis

Nucleophilic



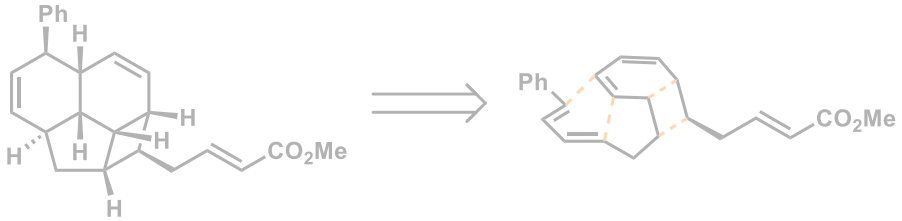
Electrophilic



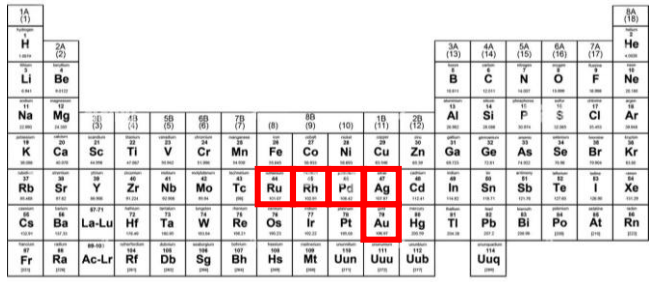
Radical



Pericyclic

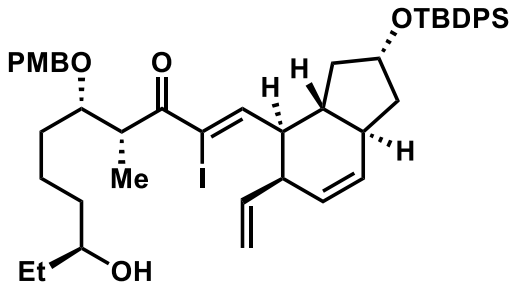


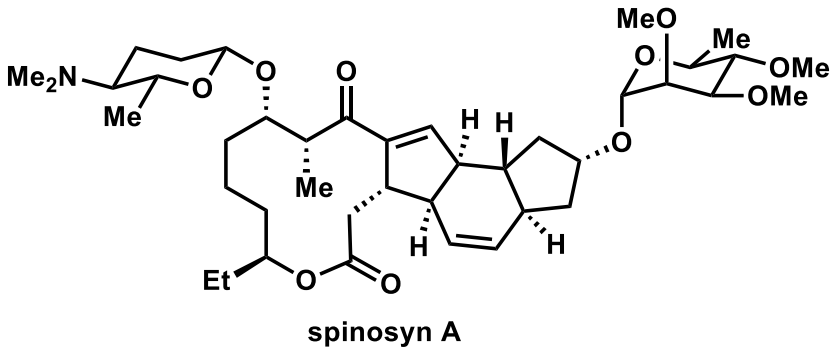
Transition Metal



Transition-Metal-Catalyzed Cascades

spinosyn A by Dai: Pd-catalyzed carbonylative Heck macrolactonization



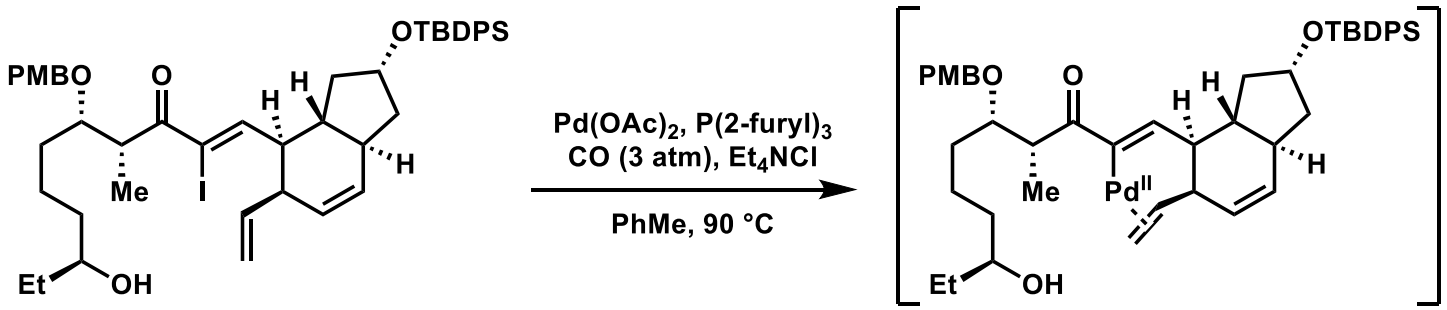


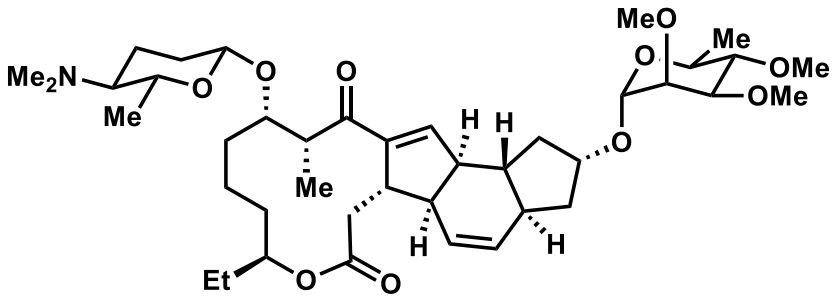
spinosyn A

Bai, Y.; Shen, X.; Li, Y.; Dai, M. *J. Am. Chem. Soc.* **2016**, *138*, 10838.

Transition-Metal-Catalyzed Cascades

spinosyn A by Dai: Pd-catalyzed carbonylative Heck macrolactonization



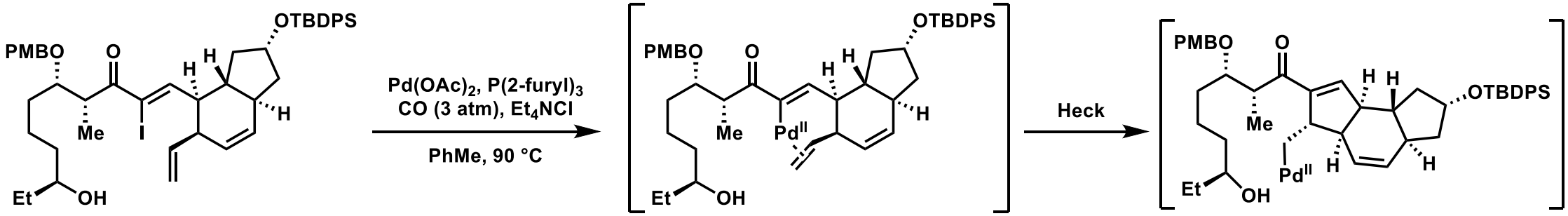


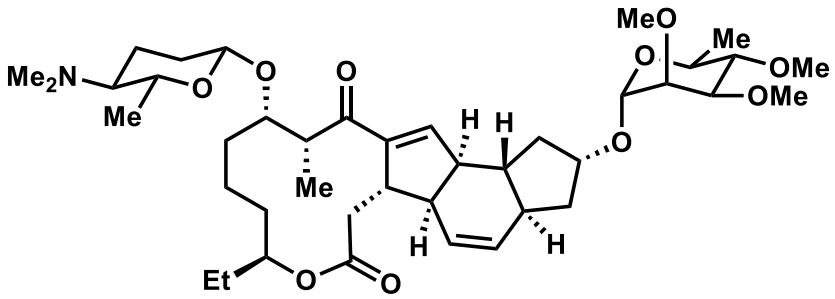
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Transition-Metal-Catalyzed Cascades

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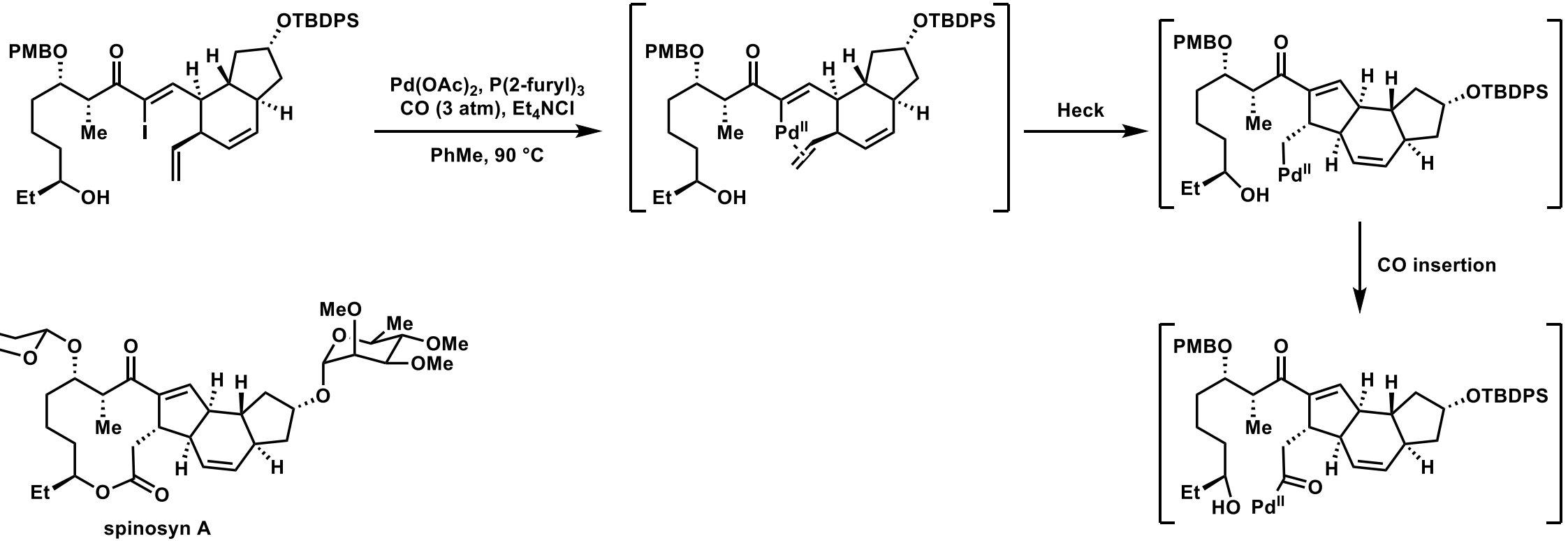


spinosyn A

Bai, Y.; Shen, X.; Li, Y.; Dai, M. *J. Am. Chem. Soc.* **2016**, *138*, 10838.

Transition-Metal-Catalyzed Cascades

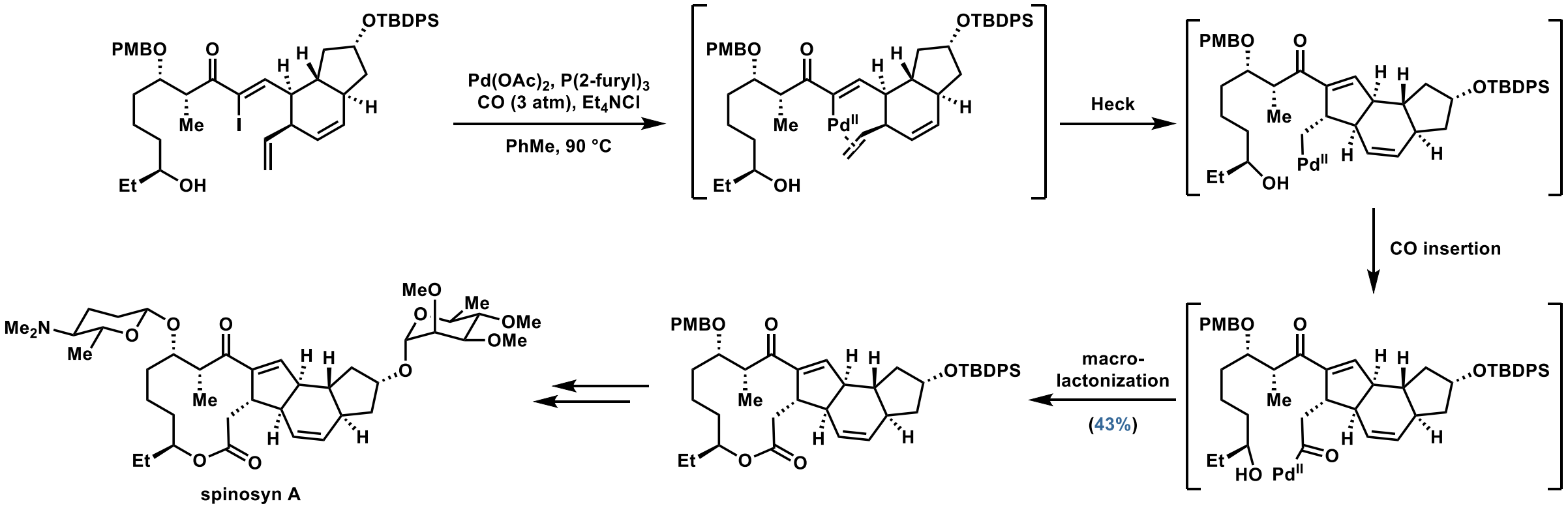
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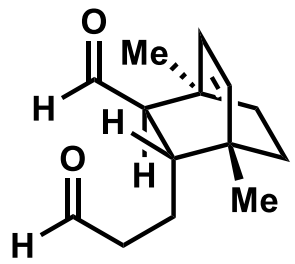
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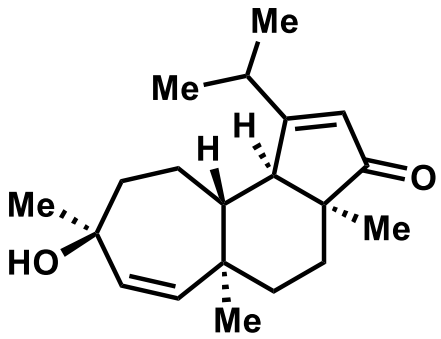


Bai, Y.; Shen, X.; Li, Y.; Dai, M. *J. Am. Chem. Soc.* **2016**, *138*, 10838.

Transition-Metal-Catalyzed Cascades

cyanthiwigin U by Pfeiffer and Phillips: ROM/RCM cascade



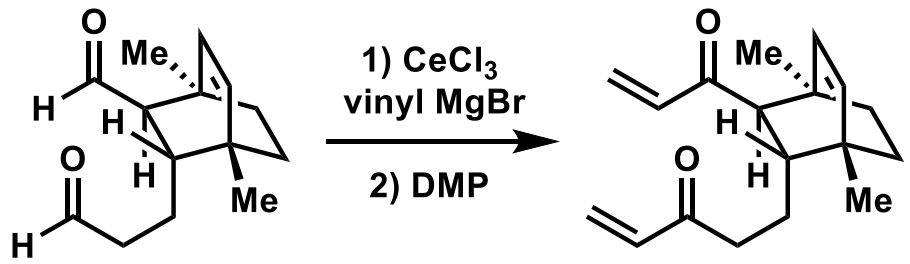


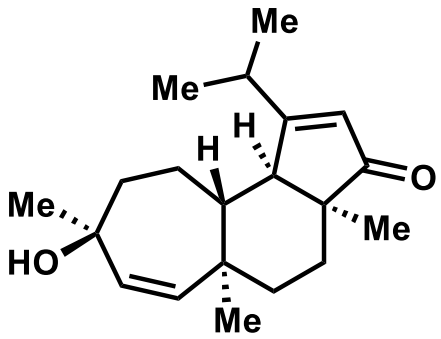
cyanthiwigin U

Pfeiffer, M. W. B.; Phillips, A. J. *J. Am. Chem. Soc.* **2005**, *127*, 5334.

Transition-Metal-Catalyzed Cascades

cyanthiwigin U by Pfeiffer and Phillips: ROM/RCM cascade



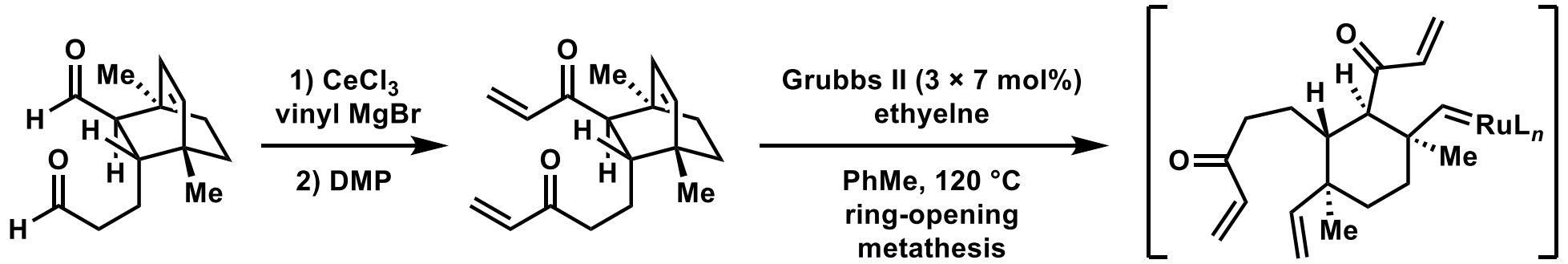


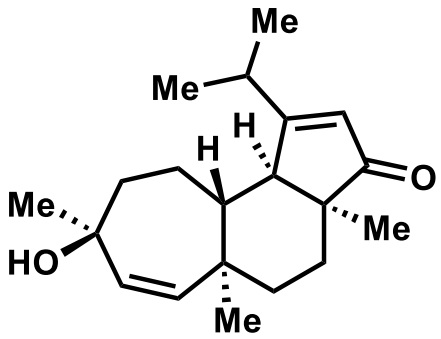
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Transition-Metal-Catalyzed Cascades

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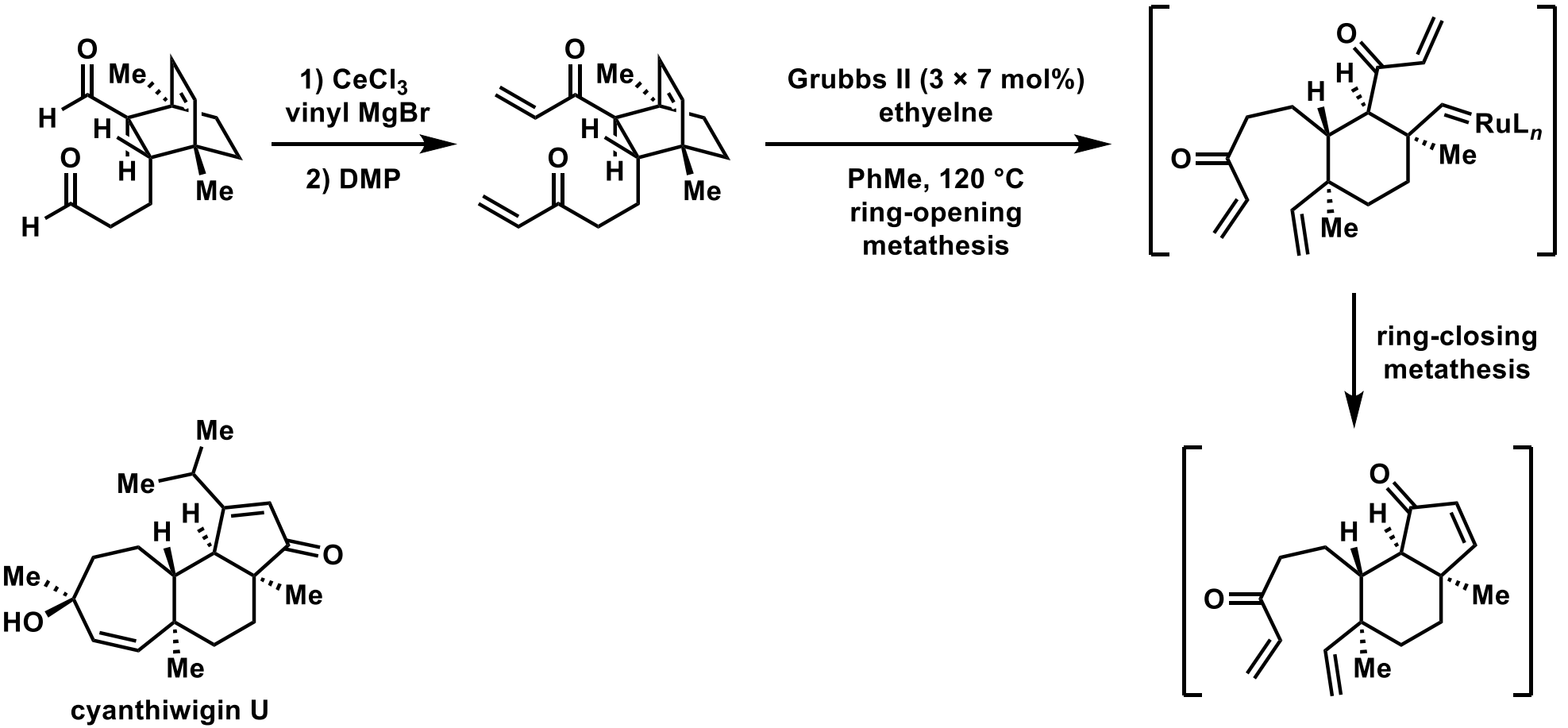


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Transition-Metal-Catalyzed Cascades

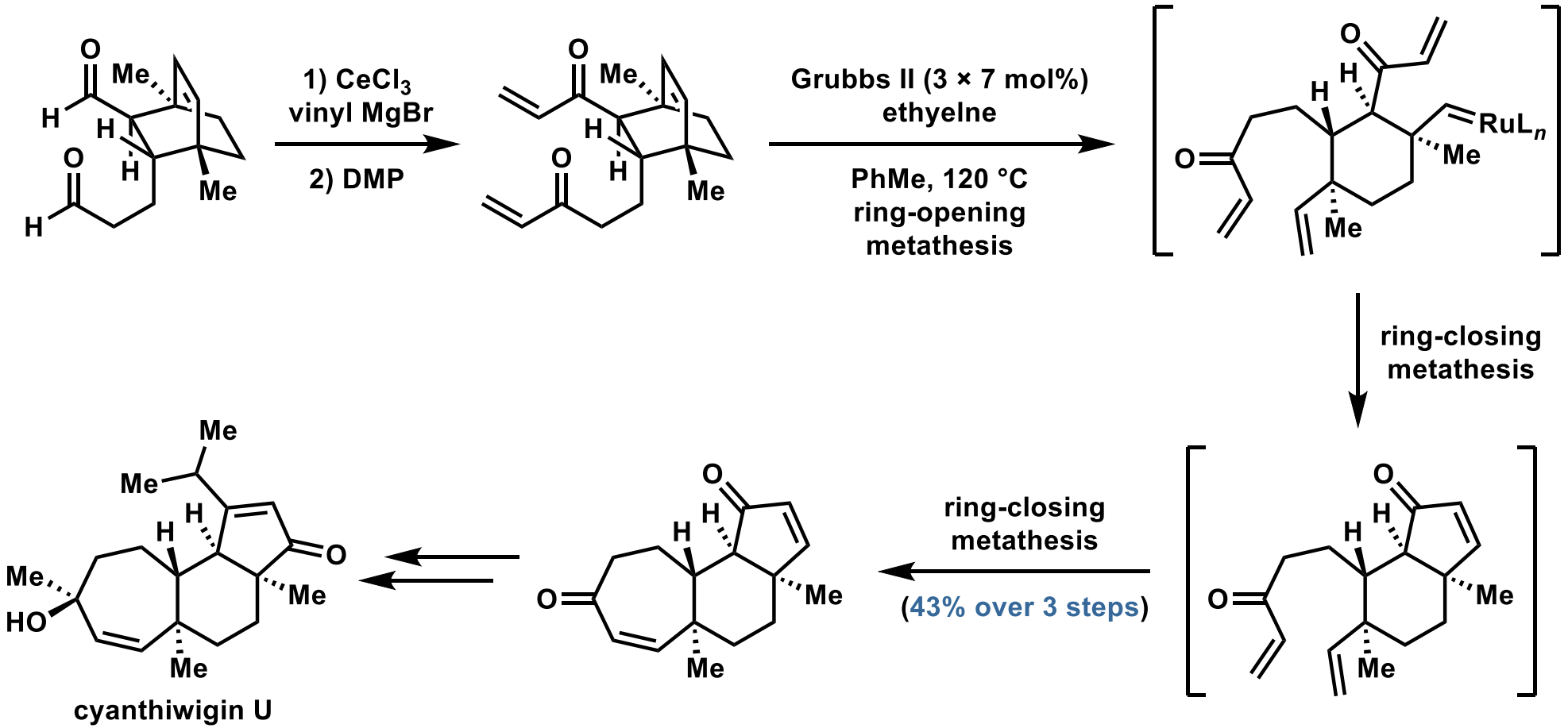
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Pfeiffer, M. W. B.; Phillips, A. J. *J. Am. Chem. Soc.* **2005**, *127*, 5334.

Transition-Metal-Catalyzed Cascades

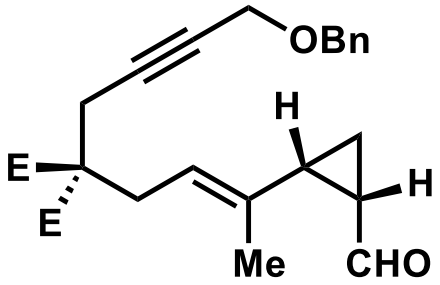
cyanthiwigin U by Pfeiffer and Phillips: ROM/RCM cascade



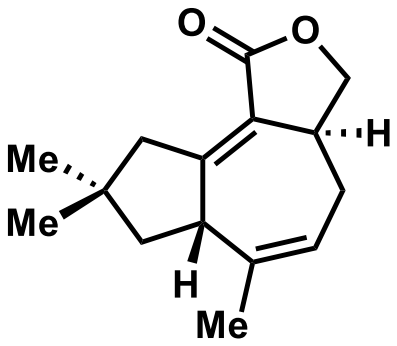
Pfeiffer, M. W. B.; Phillips, A. J. *J. Am. Chem. Soc.* **2005**, *127*, 5334.

Transition-Metal-Catalyzed Cascades

tremulenolide A by Martin and Ashfeld: Rh-catalyzed [5+2]



E = CO_2Me

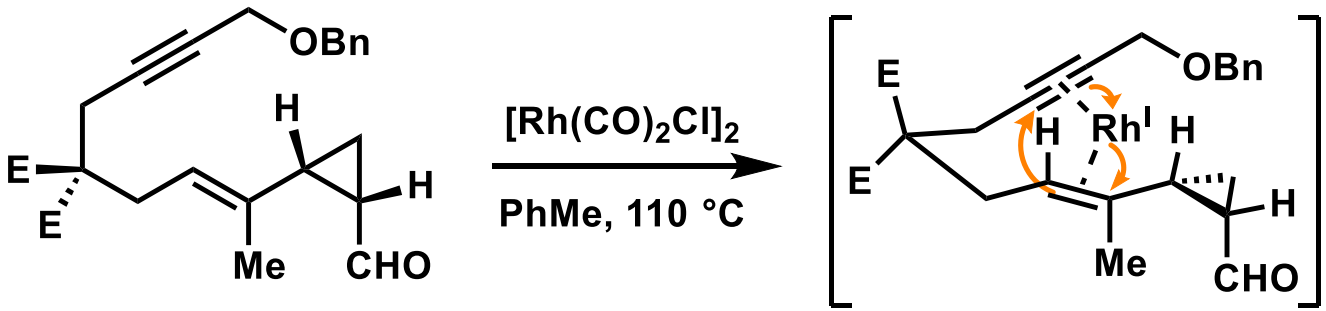


tremulenolide A

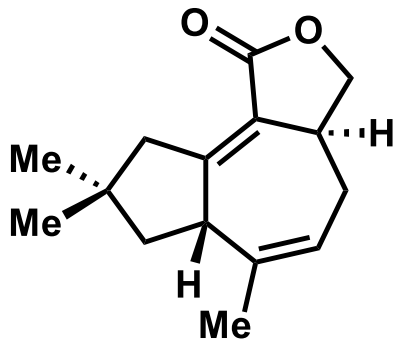
Ashfeld, B. L.; Martin, S. F. *Org. Lett.* **2005**, *7*, 4535.

Transition-Metal-Catalyzed Cascades

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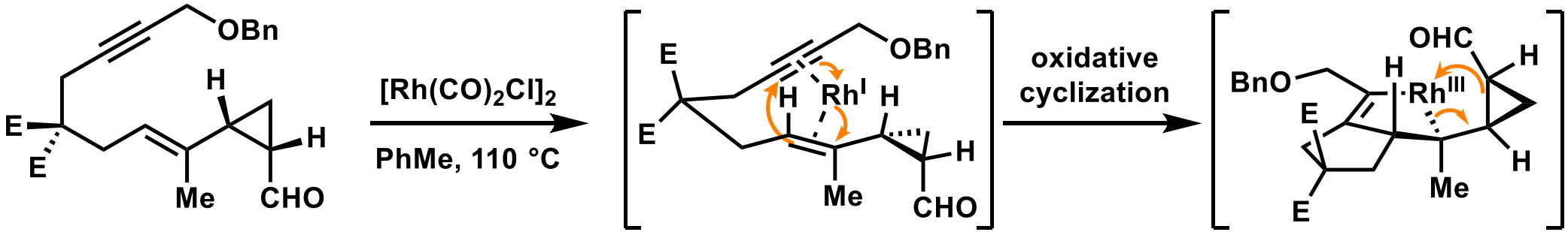


tremulenolide A

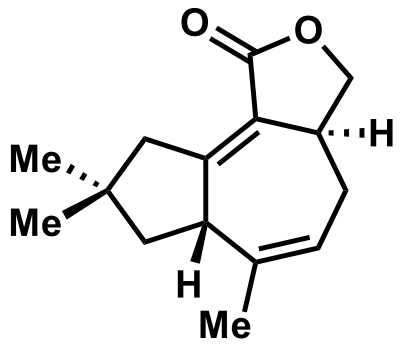
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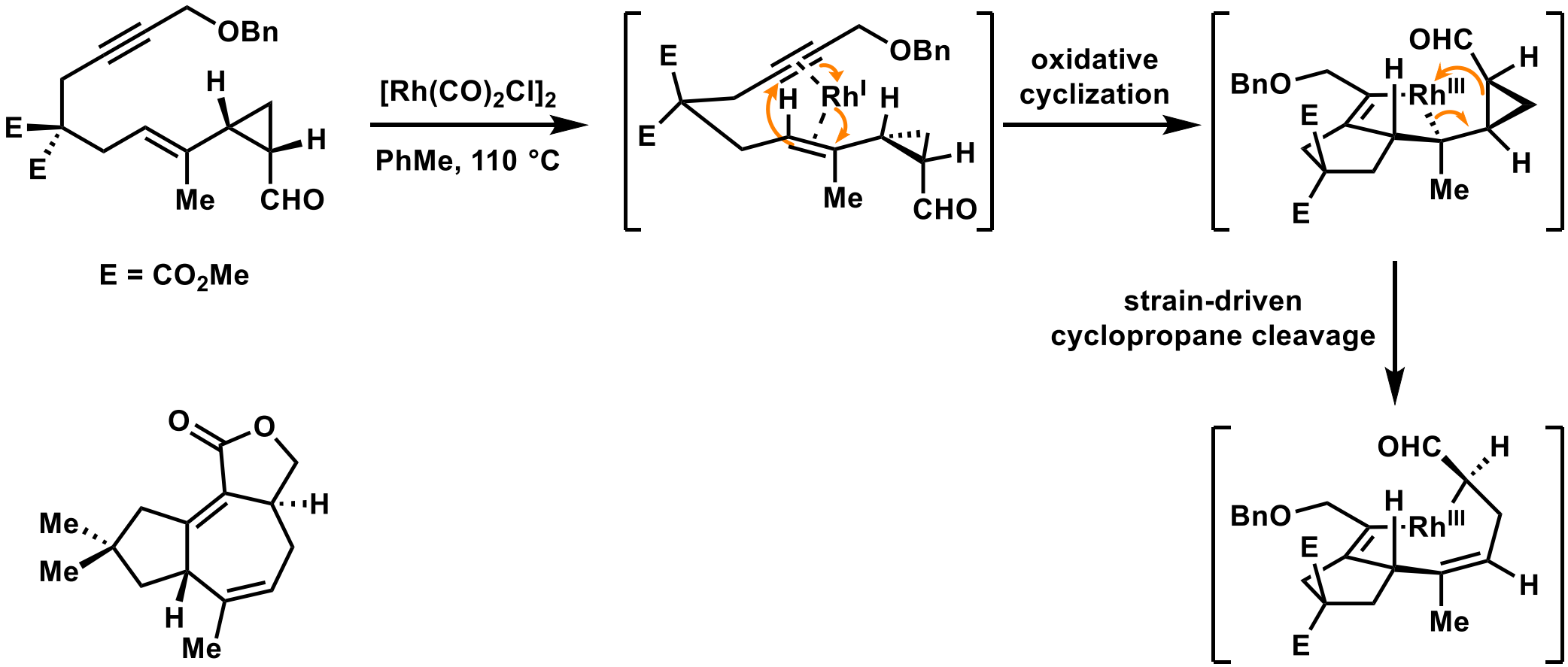


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Transition-Metal-Catalyzed Cascades

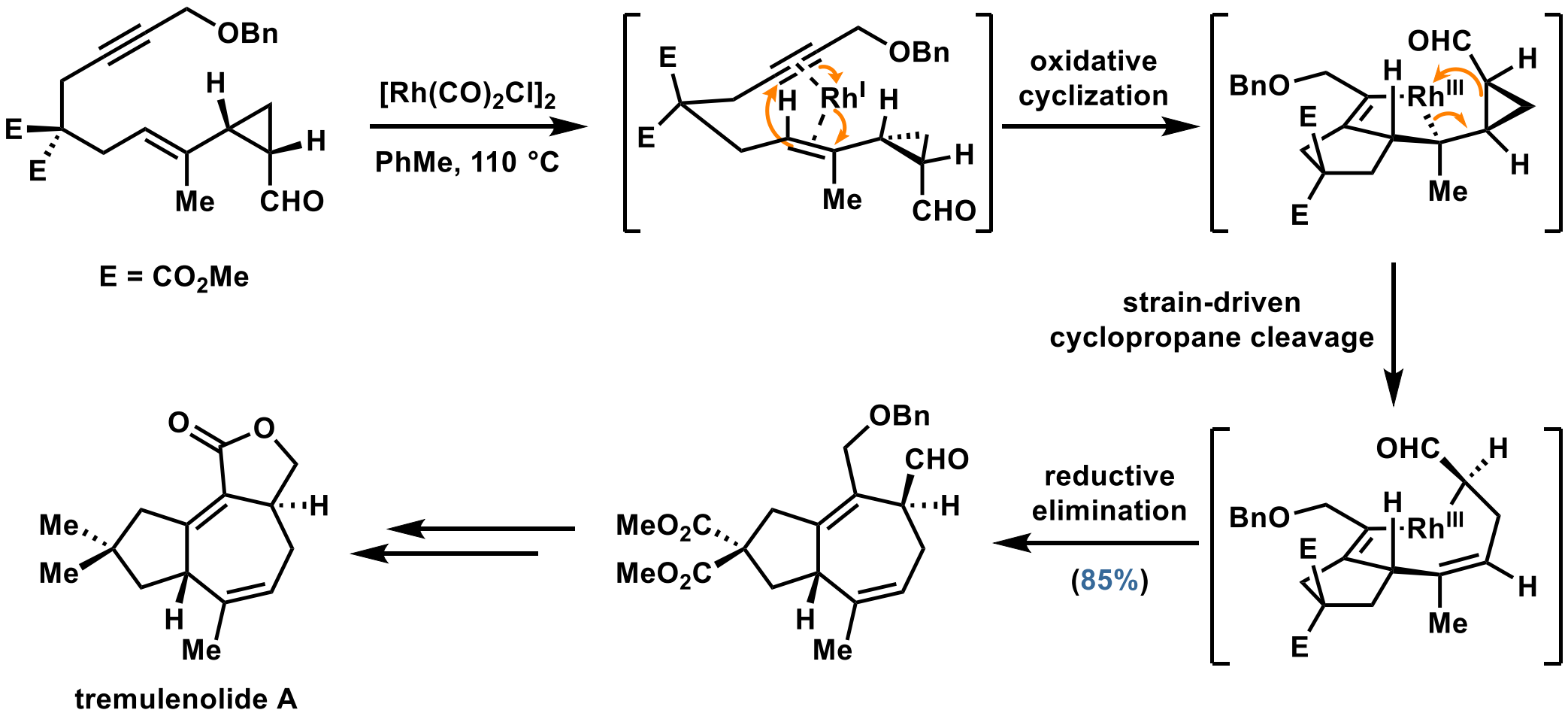
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Ashfeld, B. L.; Martin, S. F. *Org. Lett.* **2005**, *7*, 4535.

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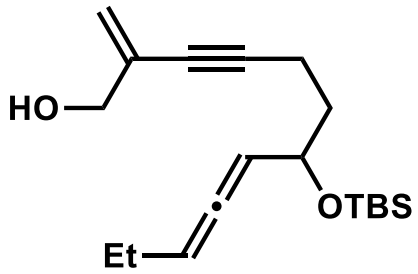
tremulenolide A by Martin and Ashfeld: Rh-catalyzed [5+2]

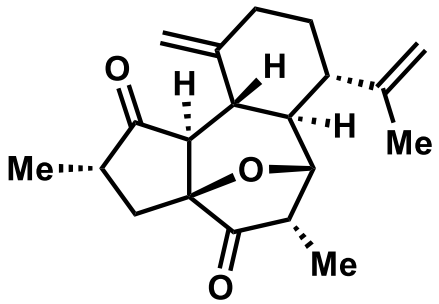


Ashfeld, B. L.; Martin, S. F. *Org. Lett.* **2005**, *7*, 4535.

Transition-Metal-Catalyzed Cascades

curcusone I by Li and Dai: Au-catalyzed furan-formation/[4+3] cascade



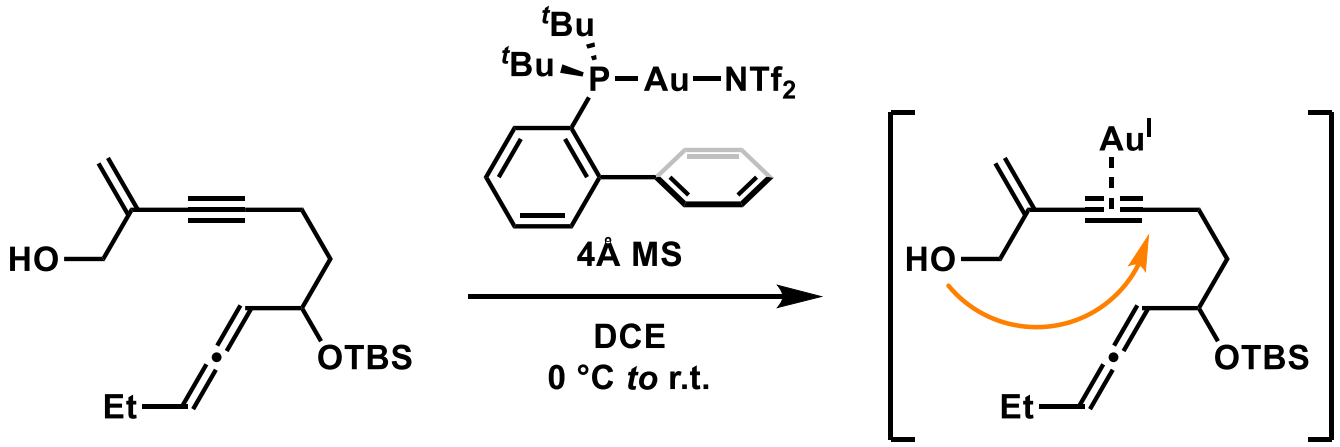


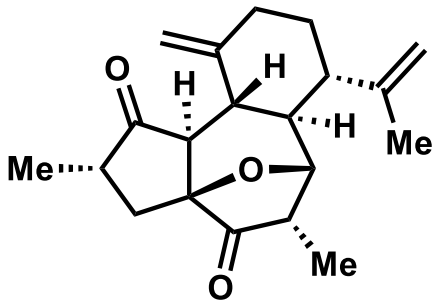
curcusone I
(reported structure)

Li, Y.; Dai, M. *Angew. Chem. Int. Ed* **2017**, *129*, 11624.

Transition-Metal-Catalyzed Cascades

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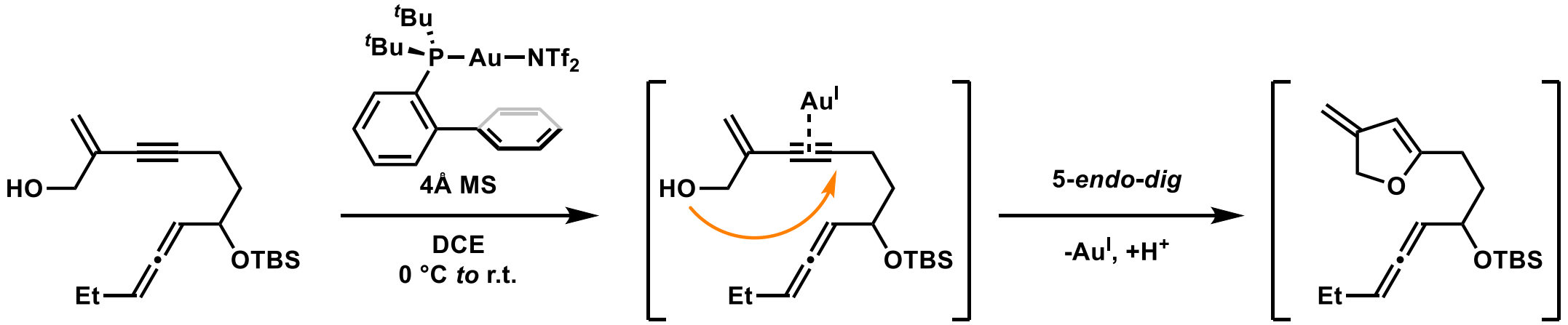


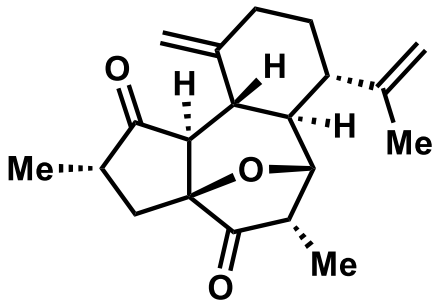
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Transition-Metal-Catalyzed Cascades

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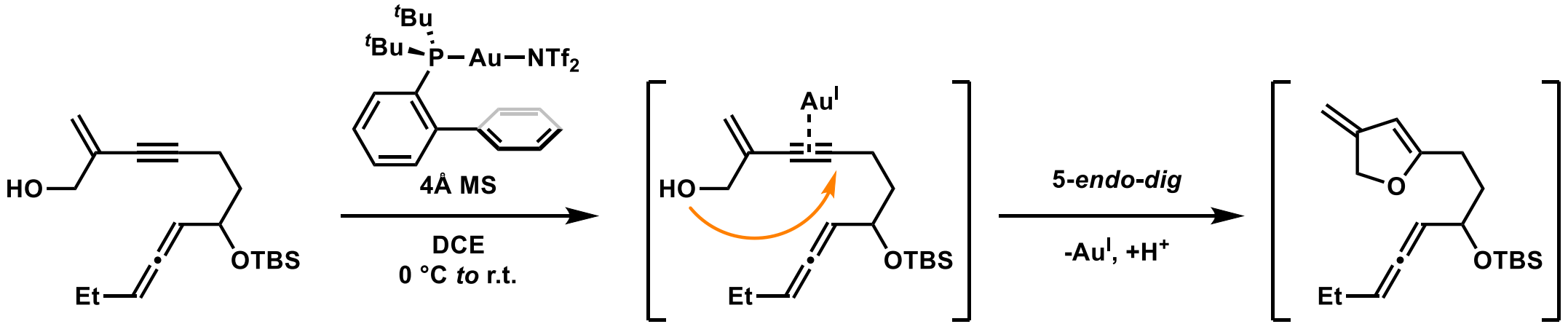


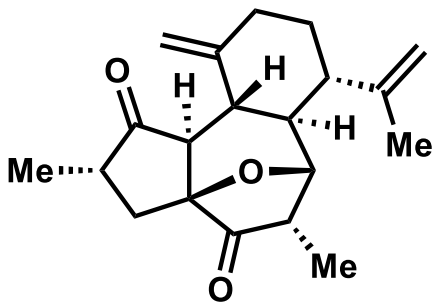
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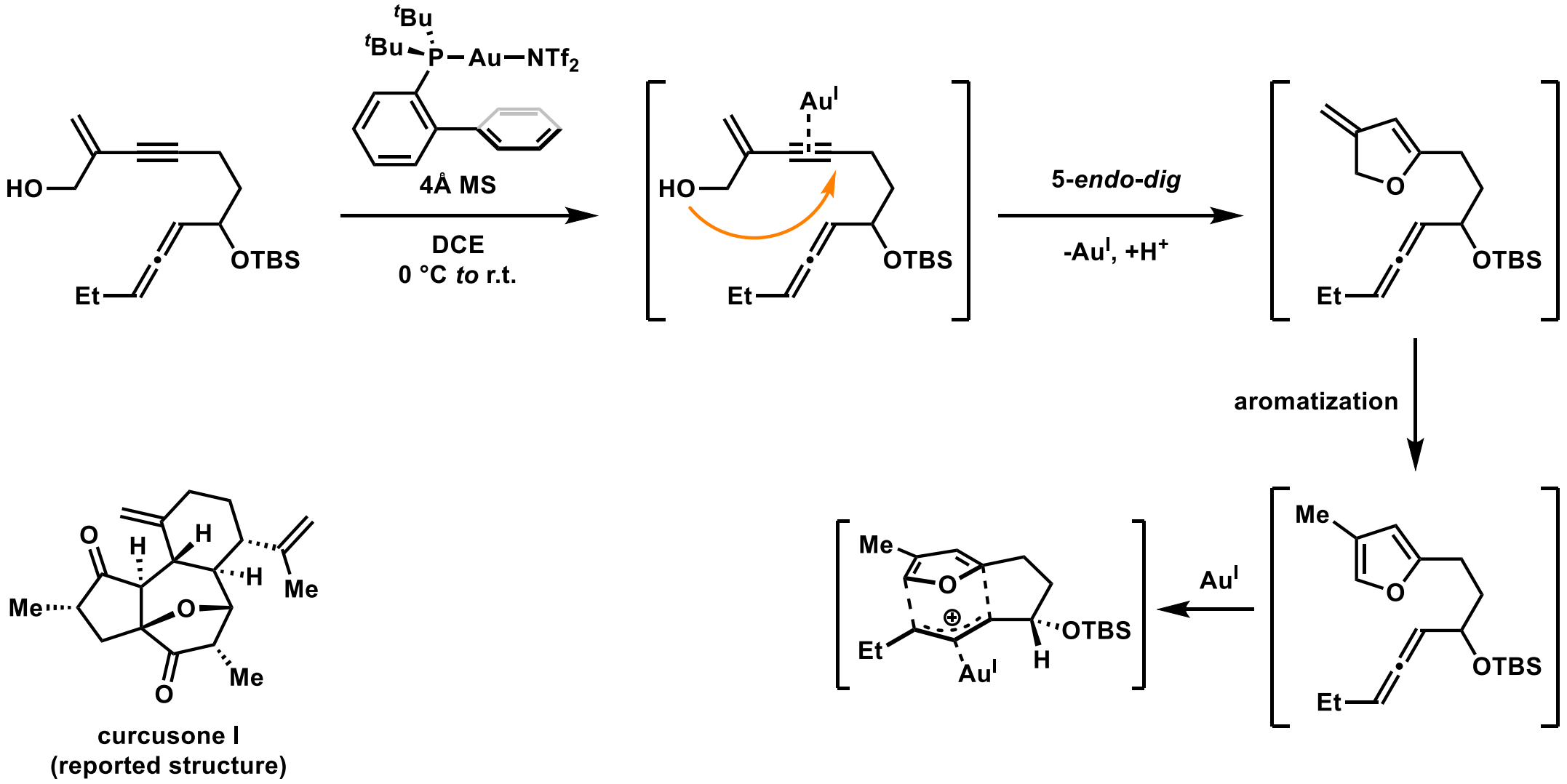


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Transition-Metal-Catalyzed Cascades

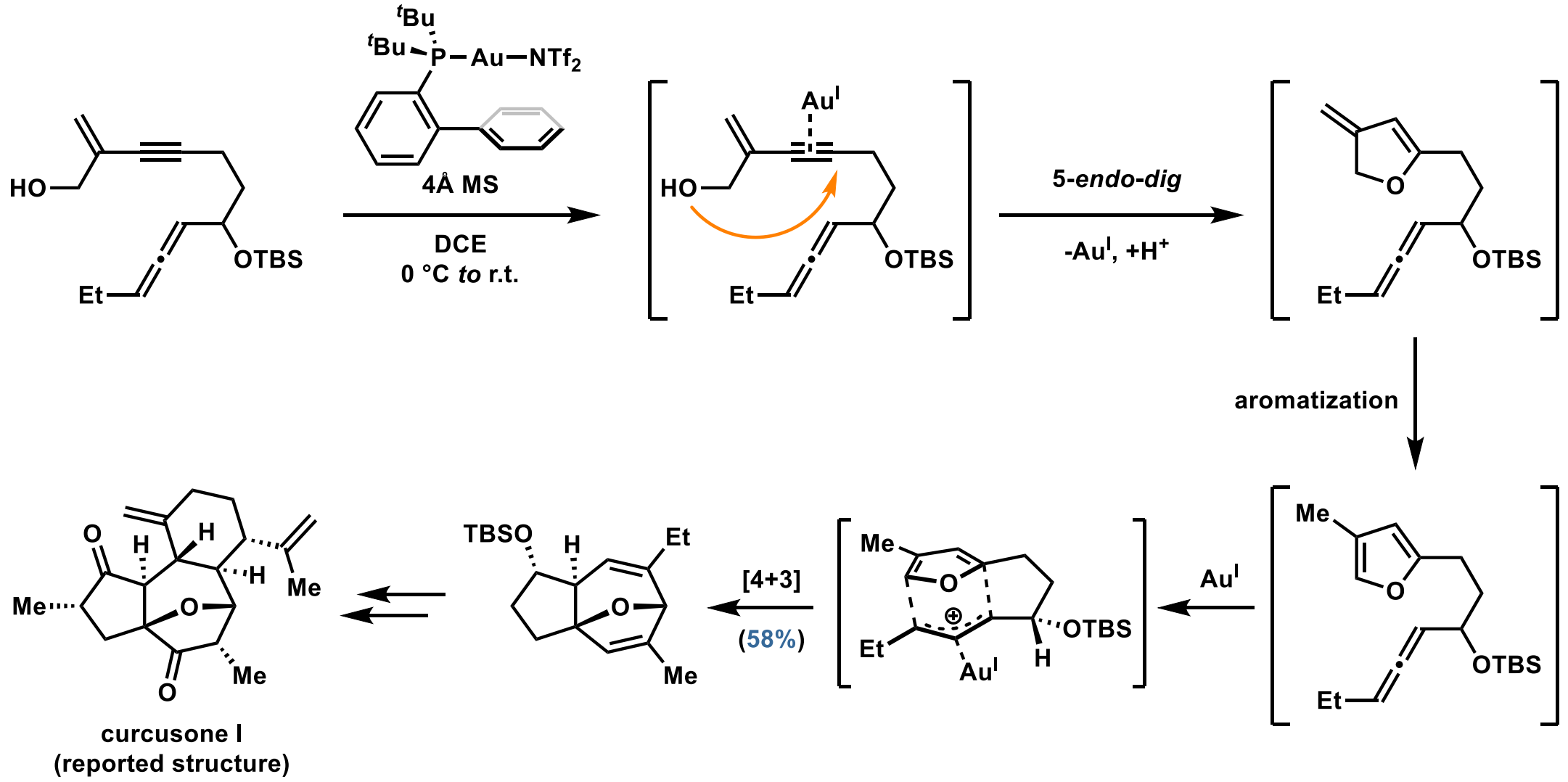
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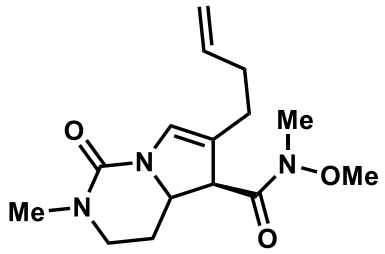
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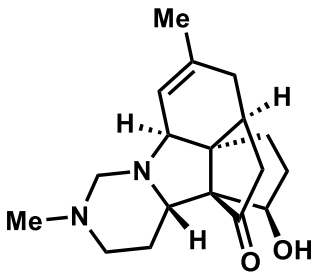


Li, Y.; Dai, M. *Angew. Chem. Int. Ed* **2017**, *129*, 11624.

Transition-Metal-Catalyzed Cascades

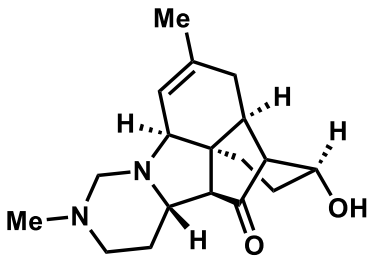
lycojapomines by Gross and Stoltz: Ag-initiated 5-endo-dig/aza-silyl-Prins cascade





lycojapomine A

&

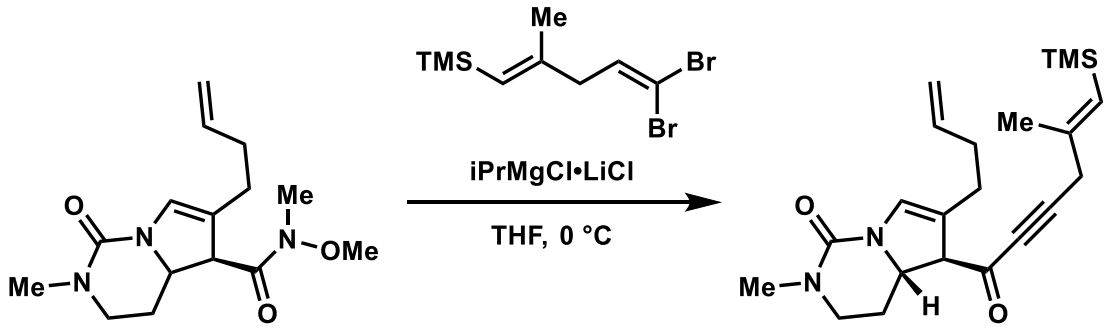


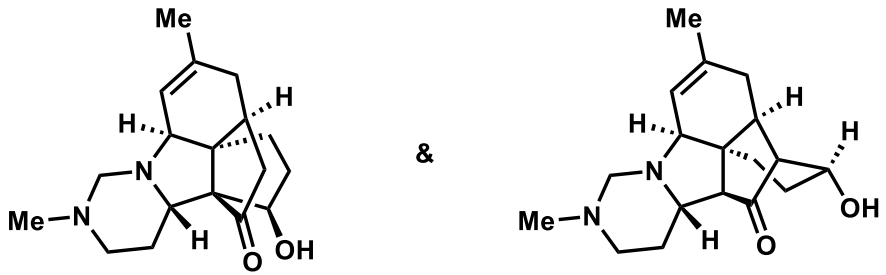
lycojapomine B

Gross, B. M.; Stoltz, B. M. *J. Am. Chem. Soc.* **2025**, *147*, 20200.

Transition-Metal-Catalyzed Cascades

lycojapomines by Gross and Stoltz: Ag-initiated 5-endo-dig/aza-silyl-Prins cascade





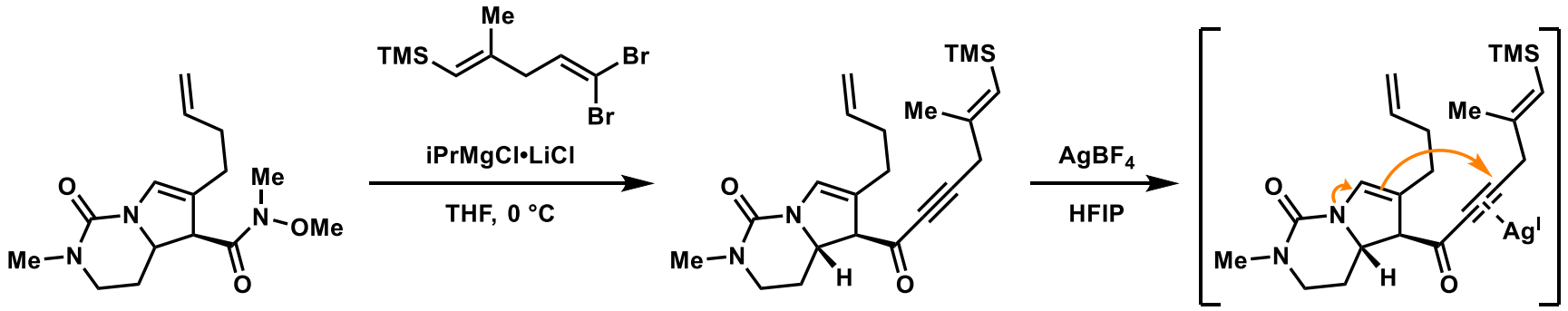
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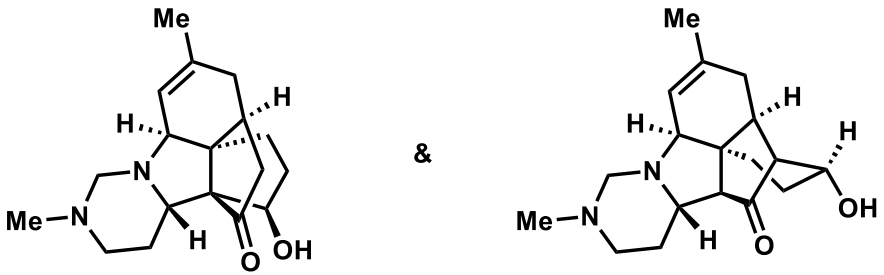
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lycojapomine A

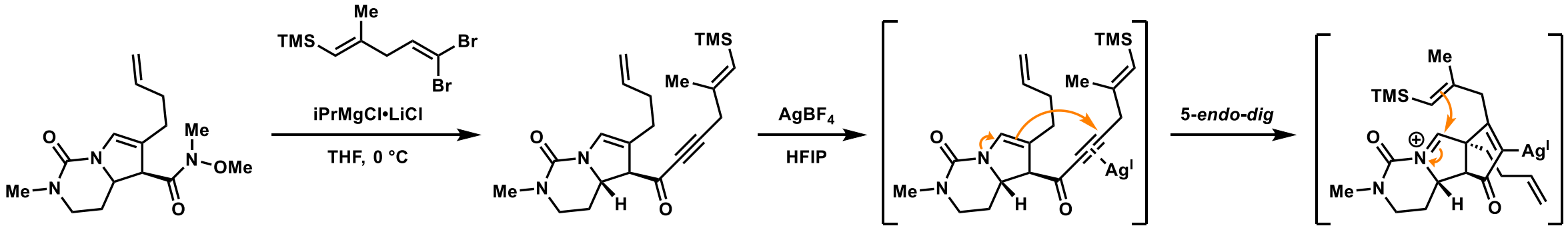
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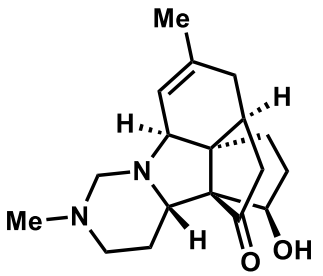
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Transition-Metal-Catalyzed Cascades

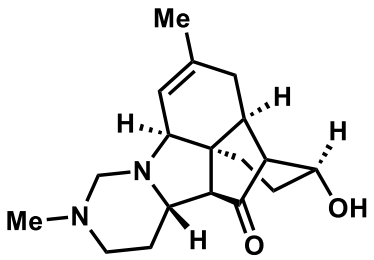
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lycojapomine A

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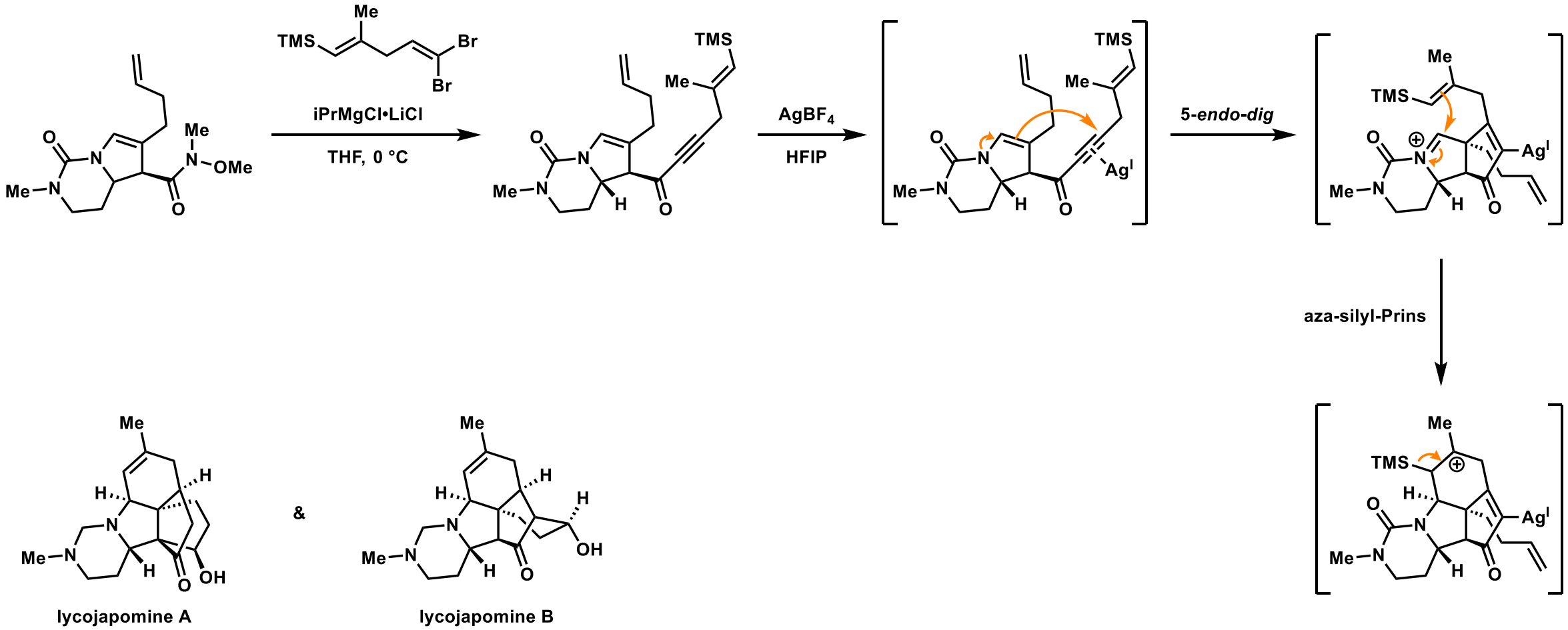


lycojapomine B

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Transition-Metal-Catalyzed Cascades

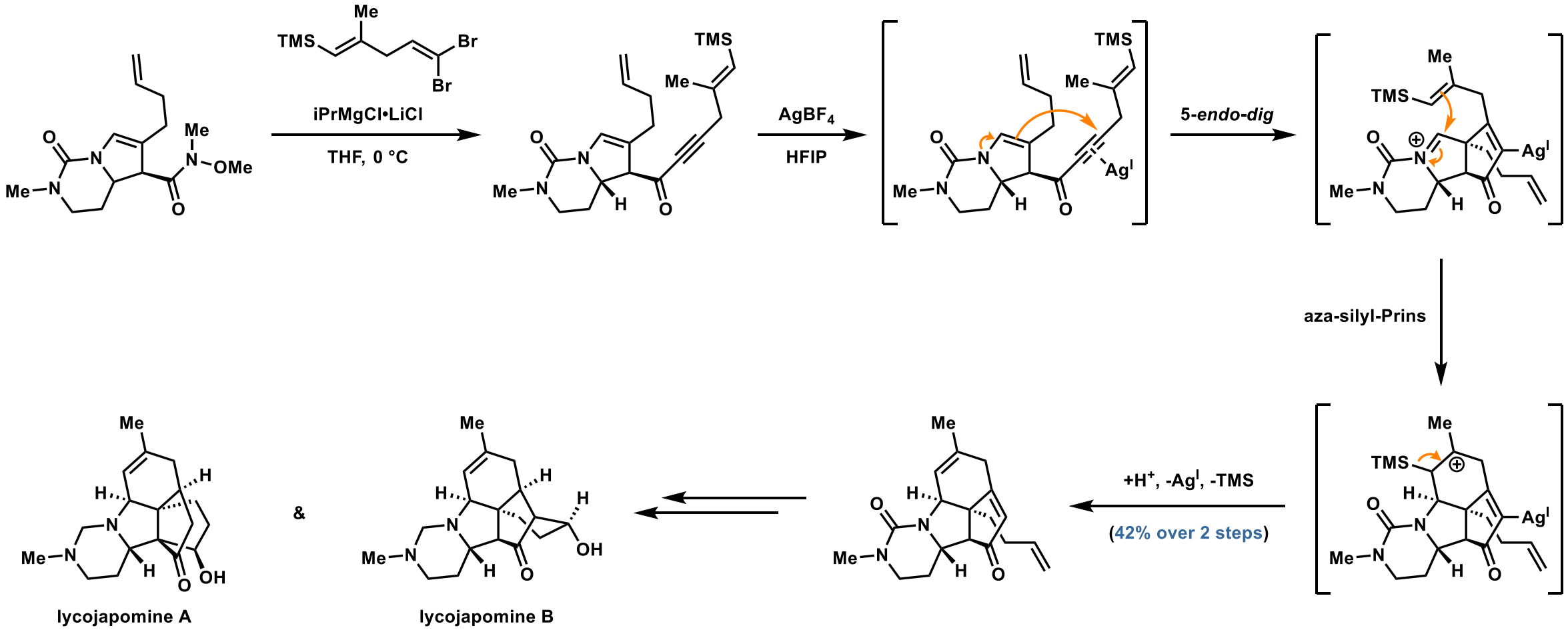
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Transition-Metal-Catalyzed Cascades

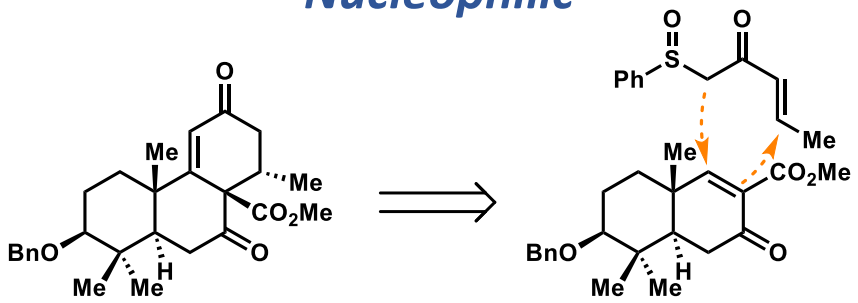
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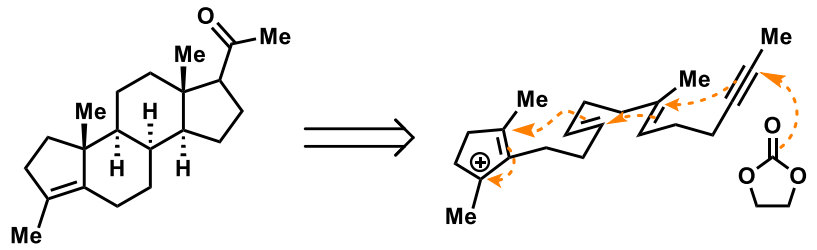
Gross, B. M.; Stoltz, B. M. *J. Am. Chem. Soc.* **2025**, *147*, 20200.

Cascades in Total Synthesis

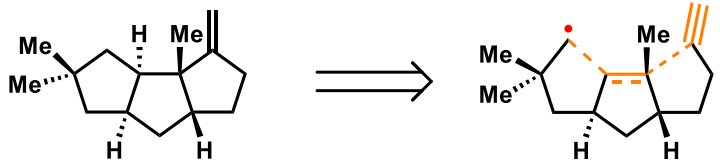
Nucleophilic



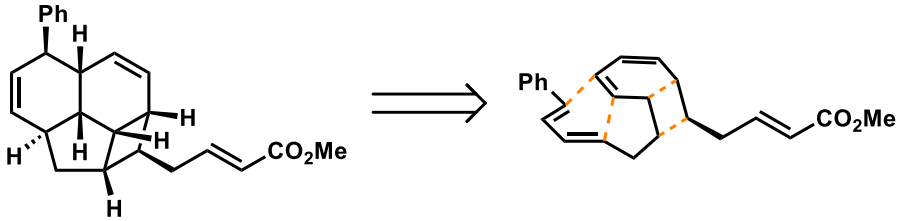
Electrophilic



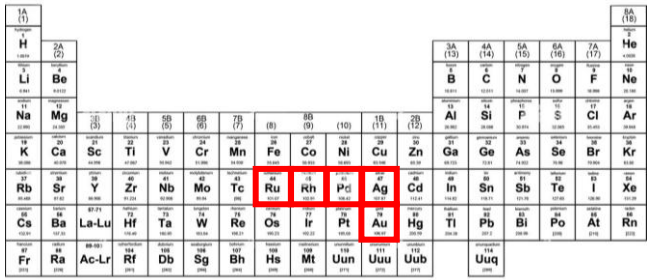
Radical



Pericyclic

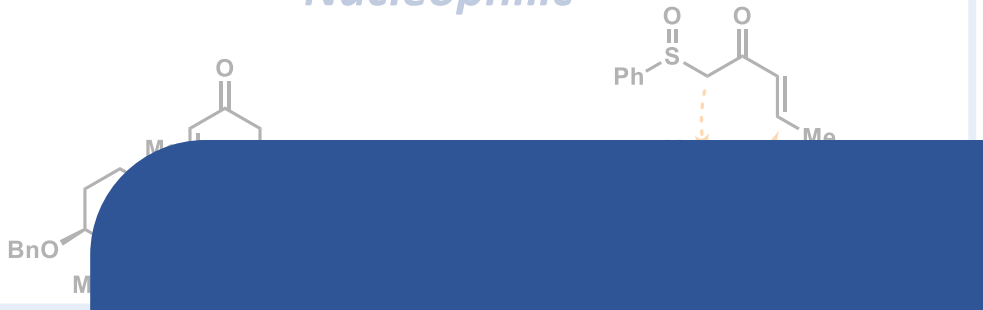


Transition Metal



Cascades in Total Synthesis

Nucleophilic



Electrophilic



TO DISCOVER POTENTIAL CASCADE STRATEGIES
(ASIDE FROM BIOMIMIC PATHWAYS) IN RETROSYNTHETIC PLANNING

- Reinforce detailed understanding of reaction mechanisms down to each elementary step
  - Draw out not only stable intermediates but also mechanisms of each planned step
    - Seek connections among steps that are planned discontinuously

