Baran Group Meeting

JACS: 1987 A Year in Review

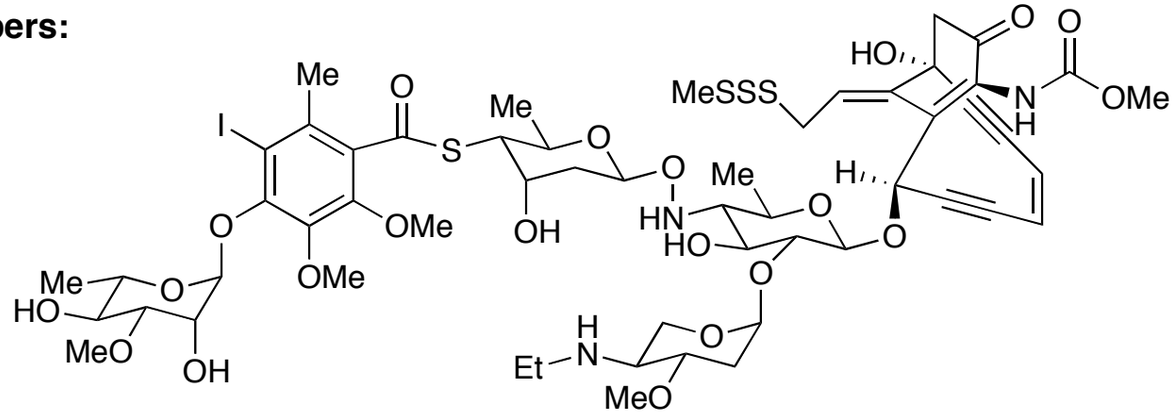
Dane Holte

Overview: 1987, vol. 109
– 8123 pages
– ~60 total synthesis papers

Publication record:

Barry Trost	13
E.J. Corey	10
Leo Paquette	8
Samuel Danishefsky	7
Phil Magnus	6
Clayton Heathcock	5
K.C. Nicolaou	5
Larry Overman	4
Stuart Schreiber	4
K. Barry Sharpless	4
Gilbert Stork	4

Notable Isolation Papers:



Calichemicins, a Novel Family of Antitumor Antibotics.
1. Chemistry and Partial Structure of Calichemicin γ_1^I.
2. Chemistry and Structure of Calichemicin γ_1^I.
M.D. Lee, T.S. Dunne, M.M. Siegel, C.C. Chang, G.O. Morton, and D.B. Borders, 3464–3466 and 3466–3468.

structurally related to:
Esperamicins, a Novel Class of Potent Antitumor Antibiotics.
2. Structure of Esperamicin X.
3. Structures of Esperamicins A_1, A_2, and A_{1a}.
J. Golik, J. Clardy, G. Dubay, G, Groenwold, H. Kawaguchi, M. Konishi, B. Krishnan, H. Ohkuma, K. Saitoh, and T.W. Doyle, 3461–3462 and 3462–3464.

Key methodologies developed and/or refined:

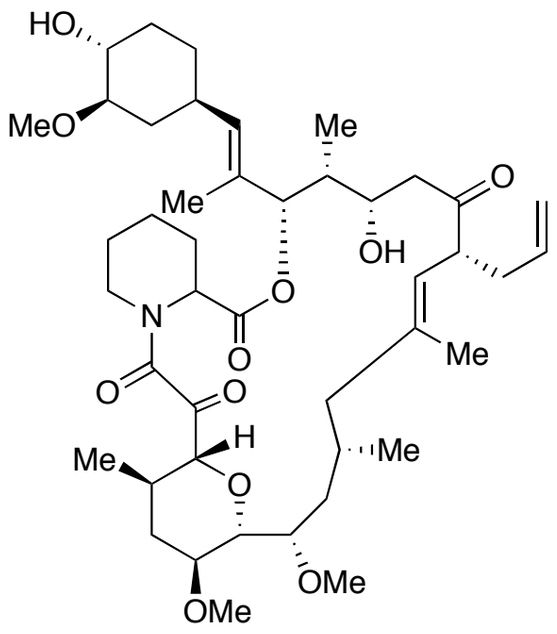
Stereospecific Cross-Coupling of Vinyl Halides with Vinyl Tin Reagents Catalyzed by Palladium. J.K. Stille and B.L. Groh, 813–817.

Palladium-Catalyzed Coupling of Aryl Triflates with Organostannanes. A.M. Echavarren and J.K. Stille, 5478–5486.

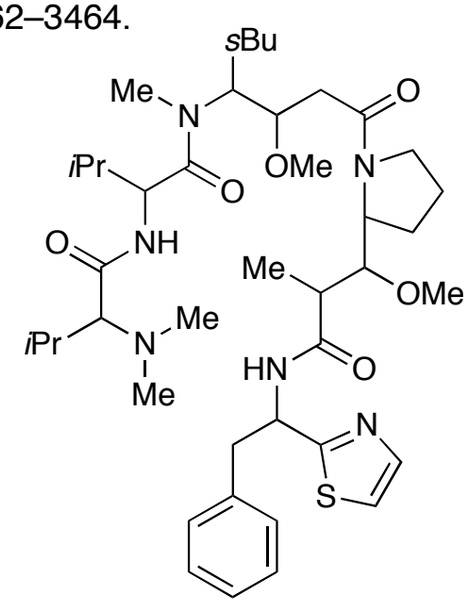
Highly Enantioselective Borane Reduction of Ketones Catalyzed by Chiral Oxazaborolidines. Mechanism and Synthetic Applications. E.J. Corey, R.K. Bakshi, and S. Shibata, 5551–5553.

Asymmetric Hydrogenation of β-Keto Carboxylic Esters. A Practical, Purely Chemical Access to β-Hydroxy Esters in High Enantiomeric Purity. R. Noyori, T. Ohkuma, M. Kitamura, H. Takaya, N. Sayo, H. Kumobayashi, and S. Akutagawa, 5856–5858.

A Stable and Easily Prepared Catalyst for the Enantioselective Reduction of Ketones. Applications to Multistep Syntheses. E.J. Corey, R.K. Bakshi, S. Shibata, C-P. Chen, and V.K. Singh, 7925–7926.



Structure of FK506: A Novel Immunosuppressant Isolated from *Streptomyces*. H. Tanaka, A. Kuroda, H. Marusawa, H. Hatanaka, T. Kino, T. Goto, and M. Hashimoto, 5031–5033.



The Isolation and Structure of a Remarkable Marine Animal Antineoplastic Constituent: Dolastatin 10. G.R. Pettit, Y. Kamano, C.L. Herald, A.A. Tuinman, F.E. Boettner, H. Kizu, J.M. Schmidt, L. Baczynskyj, K.B. Tomer, R.J. Bonttems,
6883–6885.

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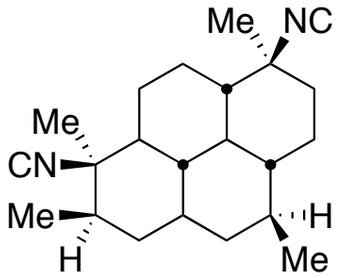
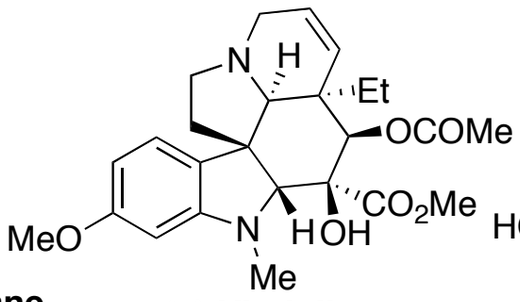
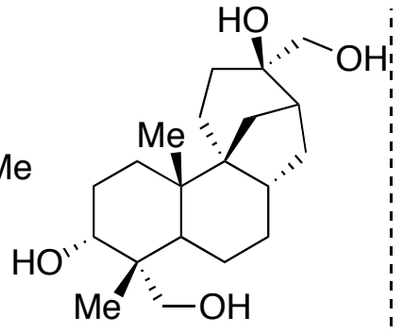
Syntheses that will be discussed today:



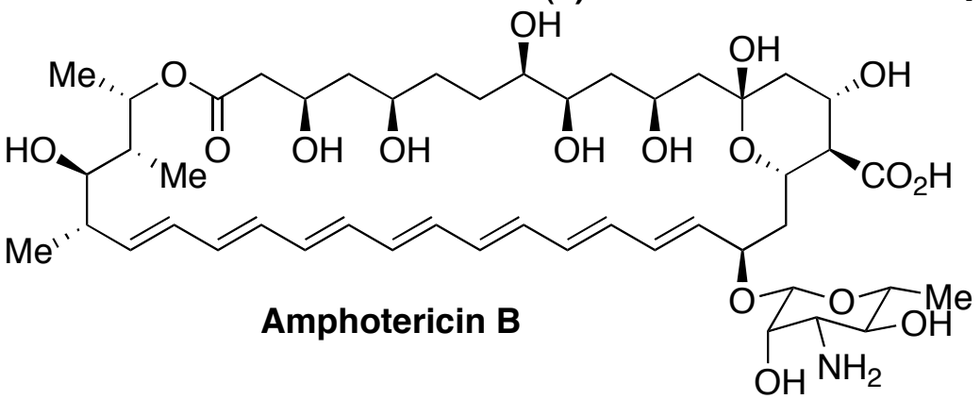
7,20-Diisocyanoadociane



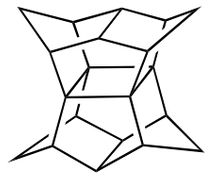
(–)-Vindoline



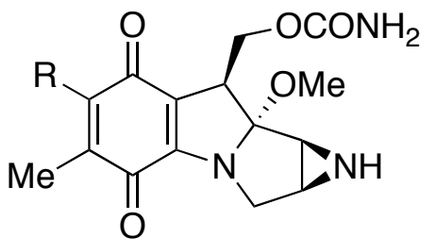
Aphidicolin



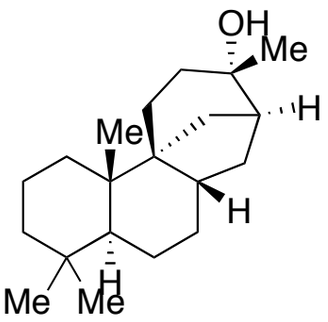
Amphotericin B



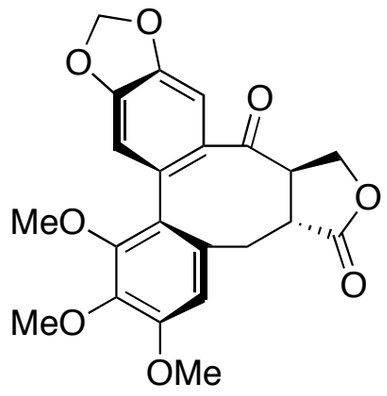
Pagodane



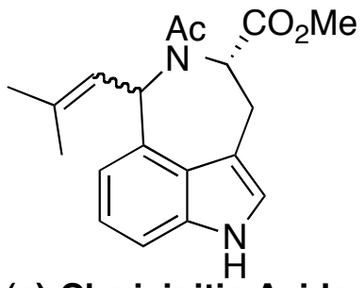
Mitomycins



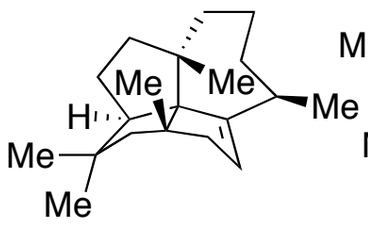
(±)-2-Desoxystemodinone



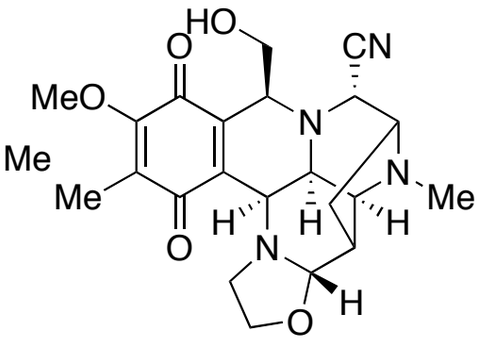
(–)-Steganone



(±)-Clavicipitic Acids

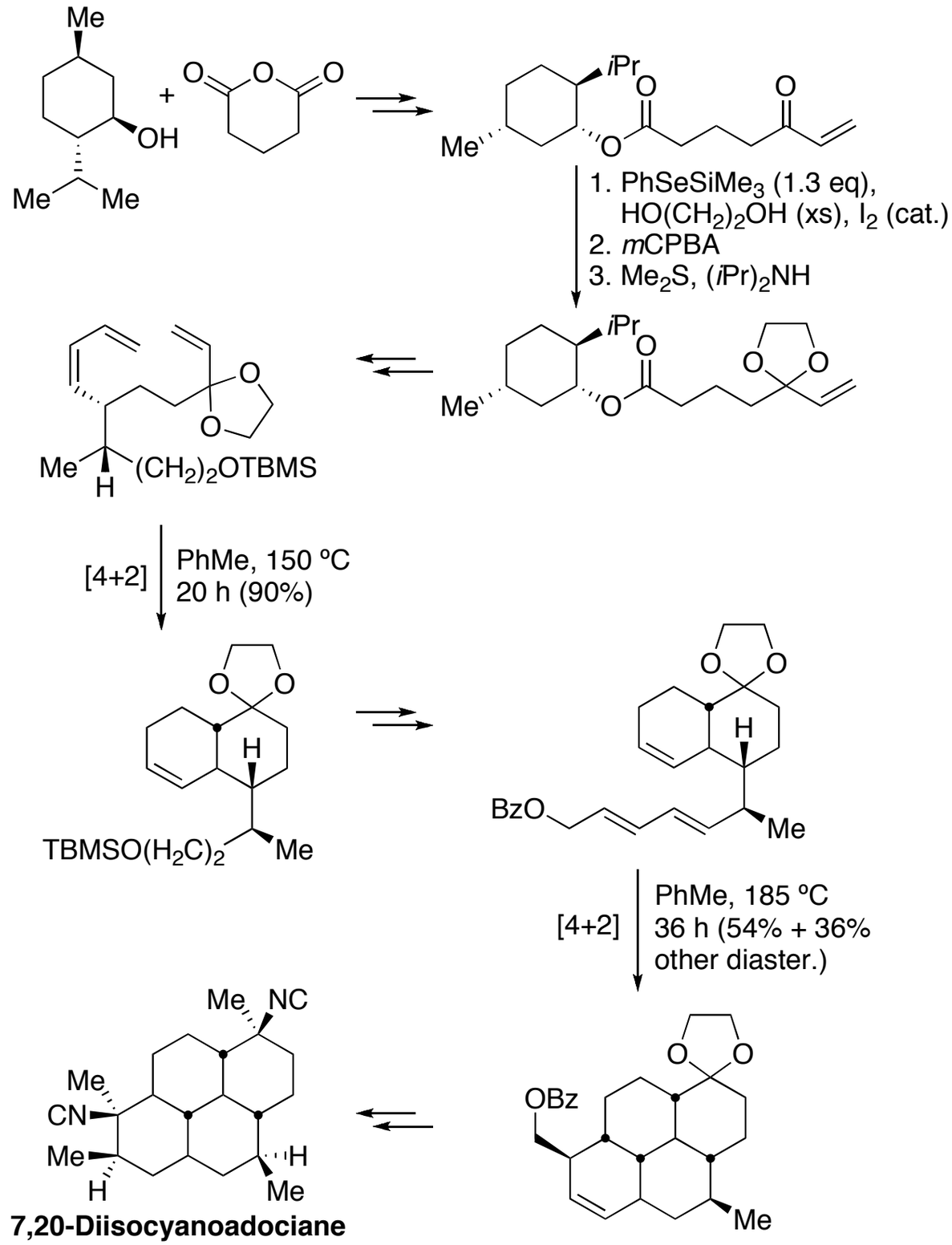


(±)-Laurenene



(±)-Cyanocycline A

Total Synthesis and Absolute Configuration of 7,20-Diisocyanoadociane.
E.J. Corey and P.A. Magriotis, 287–289.



7,20-Diisocyanoadociane

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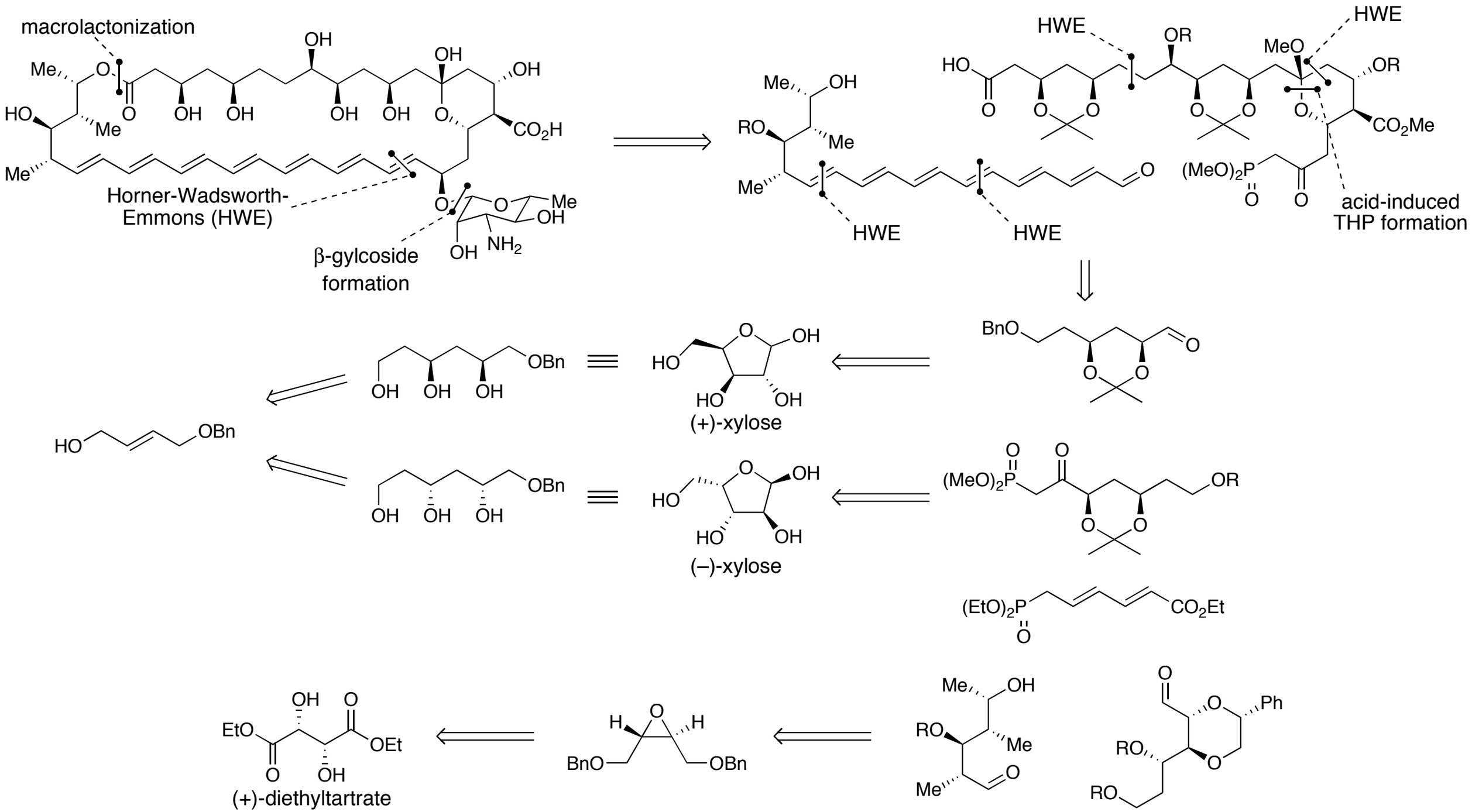
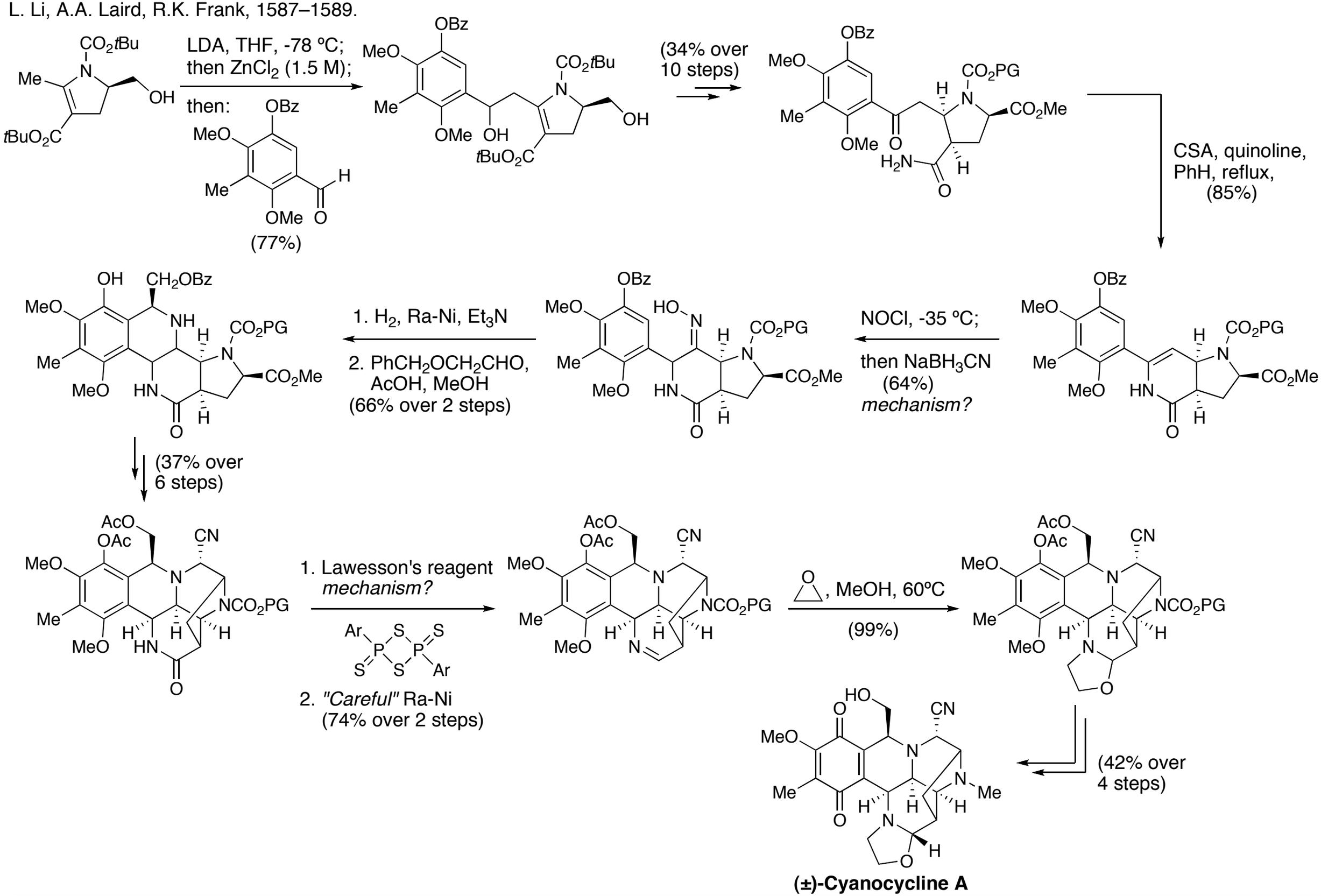
Stereocontrolled Construction of Key Building Blocks for the Total Synthesis of Amphoteronolide B and Amphotericin B. K.C. Nicolaou, R.A. Daines, J. Uenishi, W.S. Li, D.P. Papahatjis, and T.K. Chakraborty, 2205–2208.

Total Synthesis of Amphoteronolide B. K.C. Nicolaou, R.A. Daines, and T.K. Chakraborty, 2208–2210.

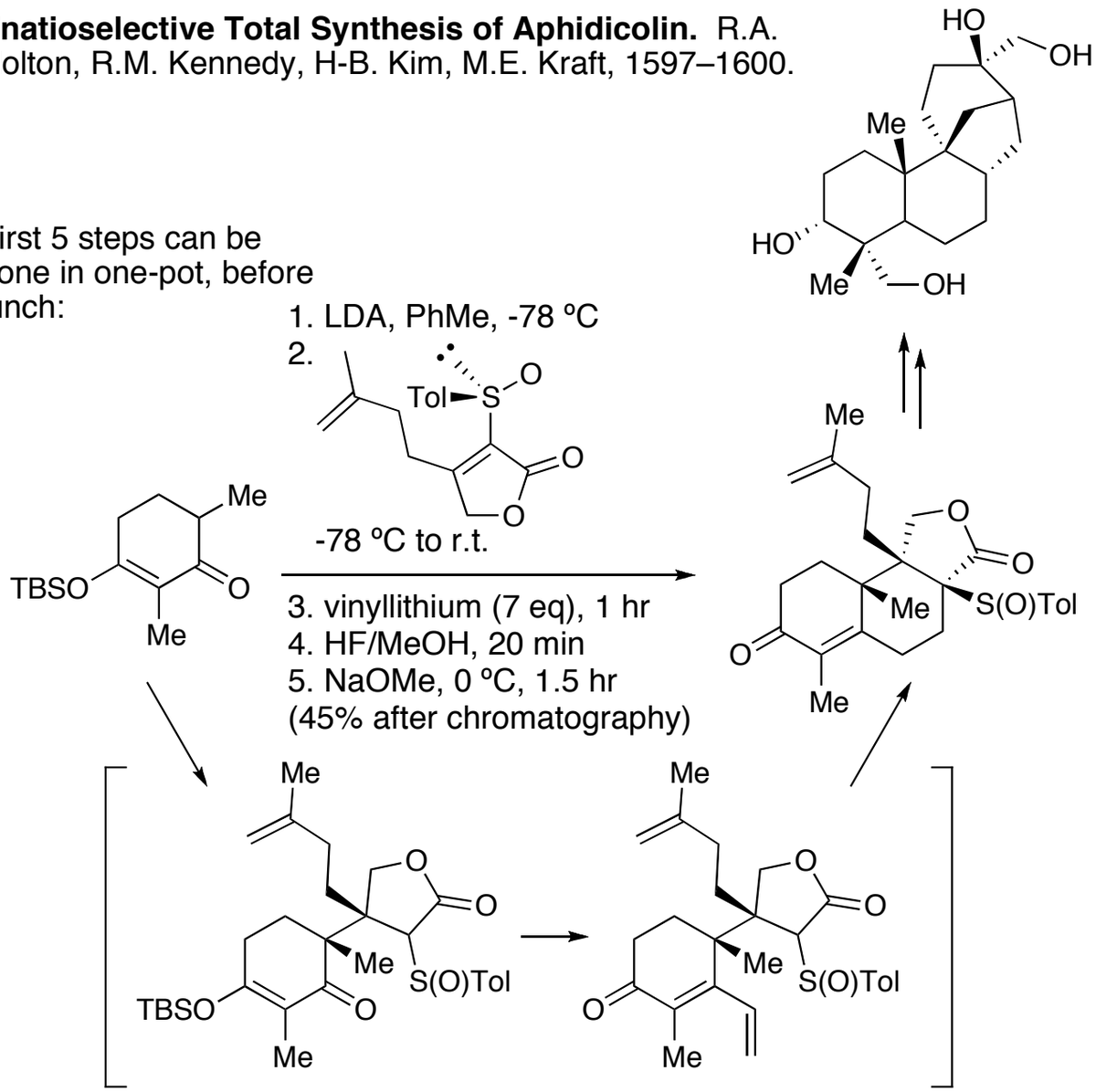
Total Synthesis of Amphotericin B. K.C. Nicolaou, R.A. Daines, T.K. Chakraborty, and Y. Ogawa, 2821–2822.



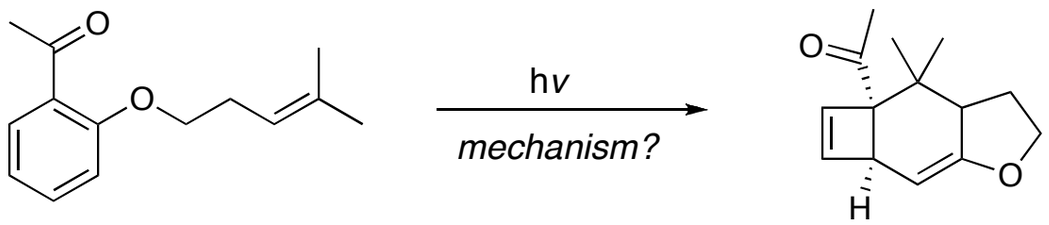
Stereocontrolled Total Synthesis of (±)-Cyanocycline A. T. Fukuyama, L. Li, A.A. Laird, R.K. Frank, 1587–1589.



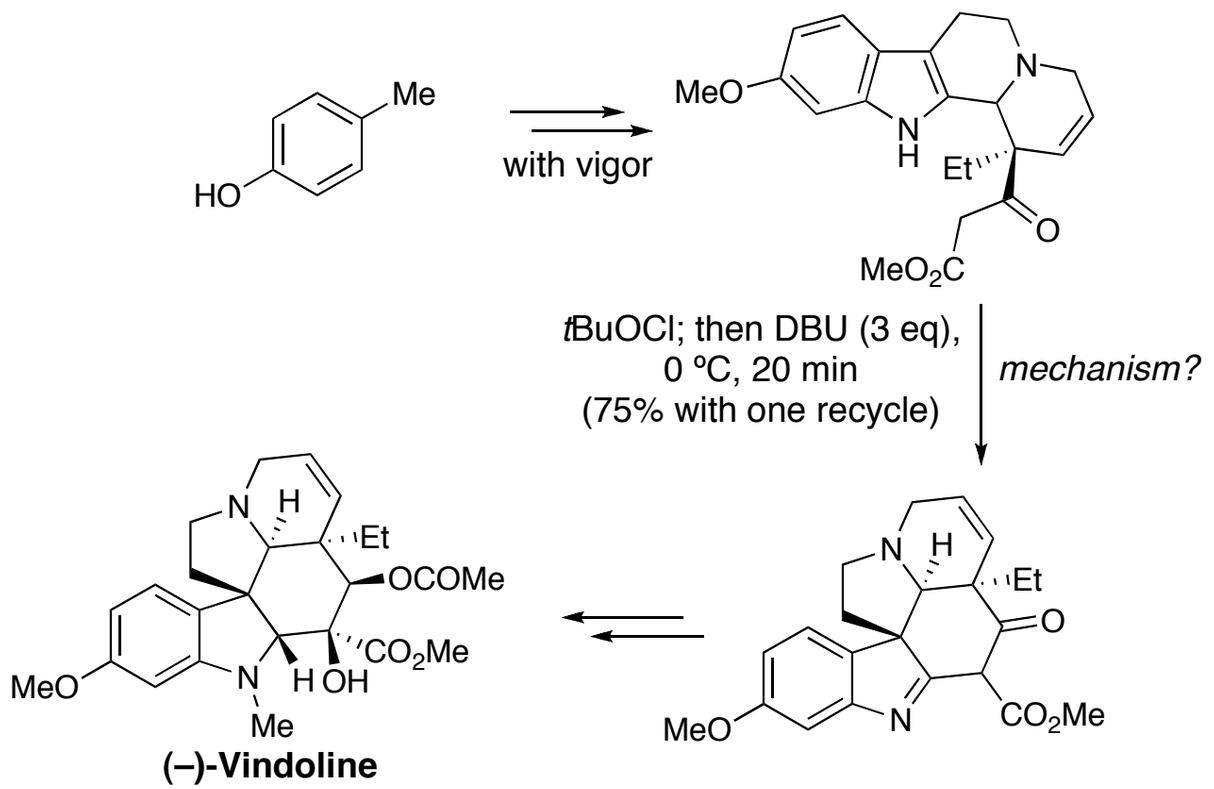
Enatioselective Total Synthesis of Aphidicolin. R.A. Holton, R.M. Kennedy, H-B. Kim, M.E. Kraft, 1597–1600.



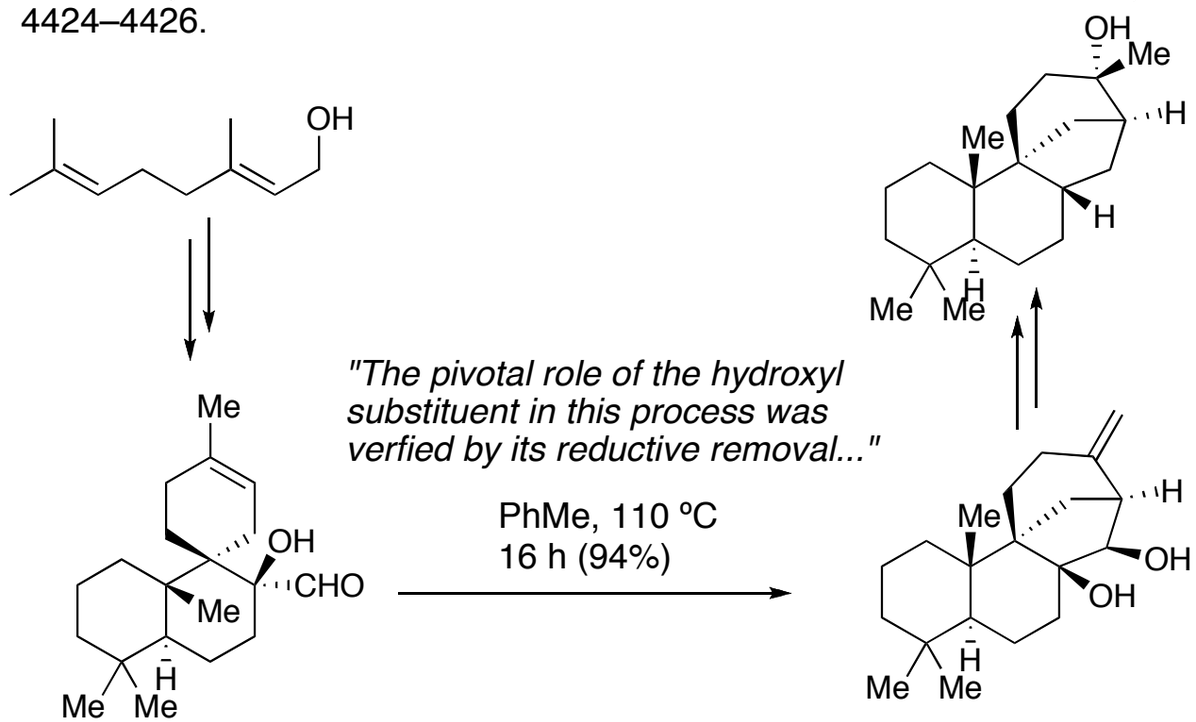
(Title withheld for your own good). P.J. Wagner and K. Nahm, 4404–4405.
(Title withheld for your own good). P.J. Wagner and K. Nahm, 6528–6530.



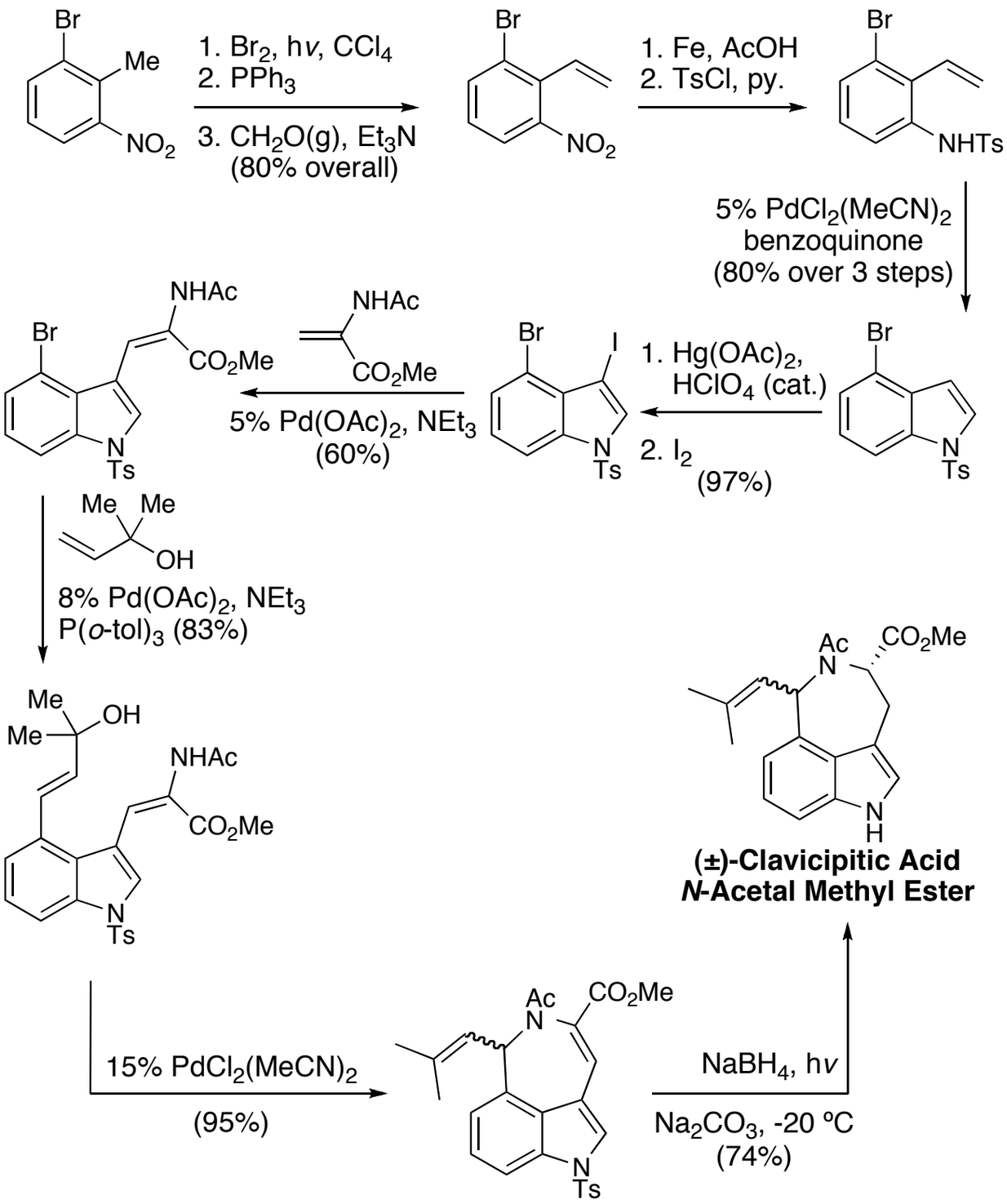
Synthesis of (–)-Vindoline. P.L. Feldman and H. Rapoport, 1603–1604.



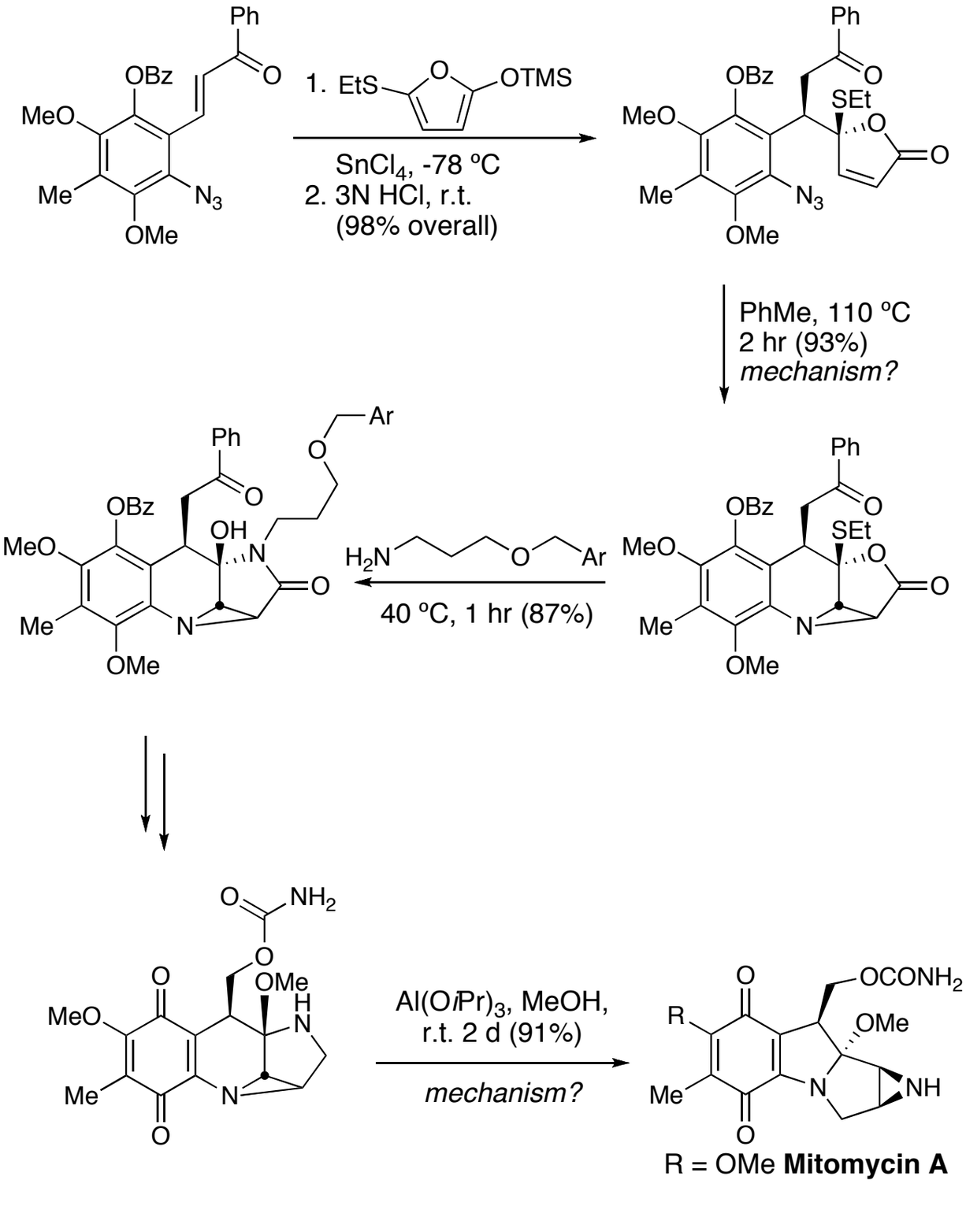
Total Synthesis of (±)-2-Desoxystemodinone. A Novel Hydroxyl-Assisted, Intramolecular Ene Reaction. J.D. White and T.C Somers, 4424–4426.



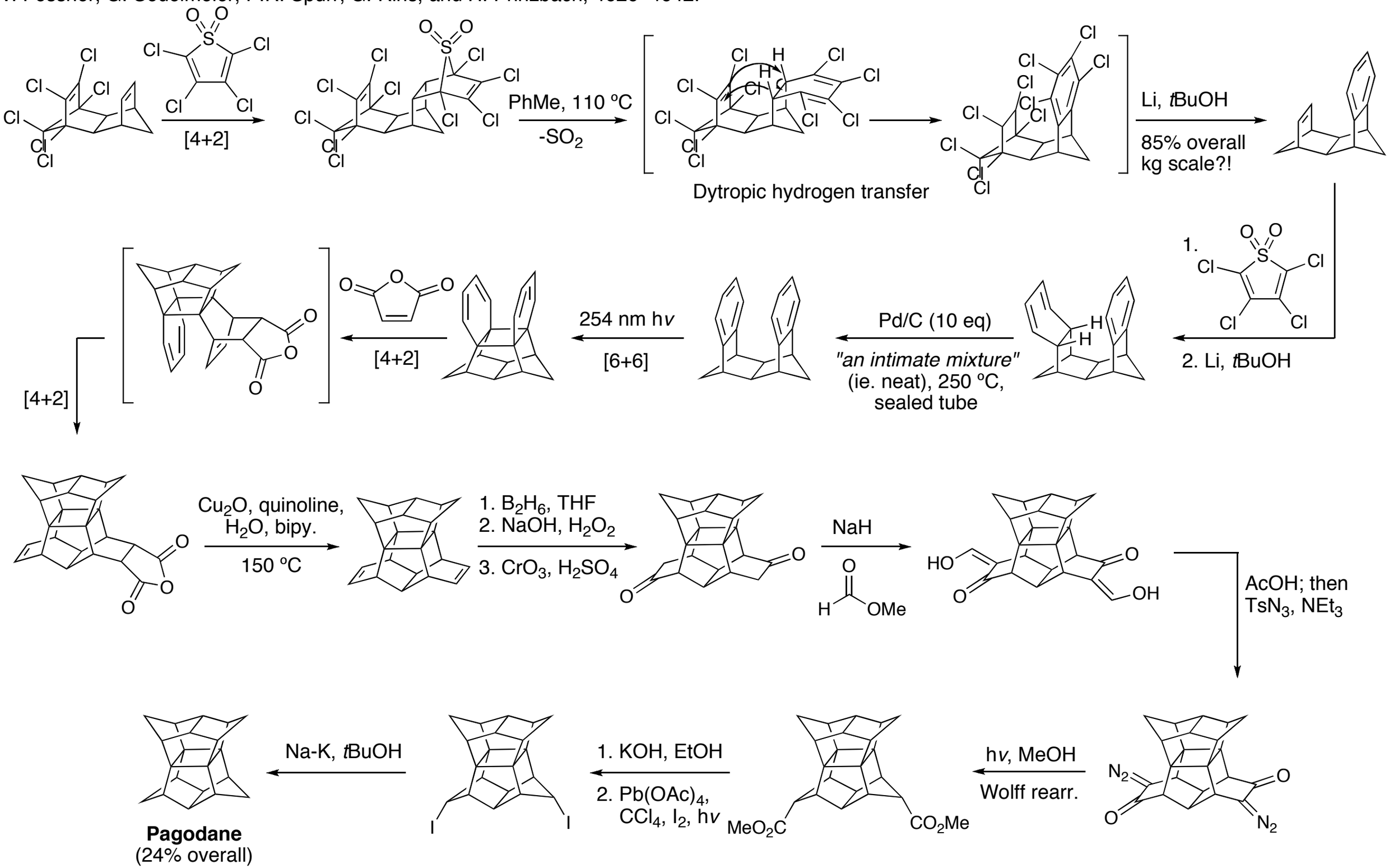
Palladium-Catalyzed Reactions in the Synthesis of 3- and 4-substituted Indoles. 2. Total Synthesis of *N*-Acetal Methyl Ester of (±)-Clavicipitic Acids. P.J. Harrington, L.S. Hegedus, and K.F. McDaniel, 4335–4336.



Total Synthesis of (±)-Mitomycins via Isomitomycin A. T. Fukuyama and L. Yang, 7881–7882.

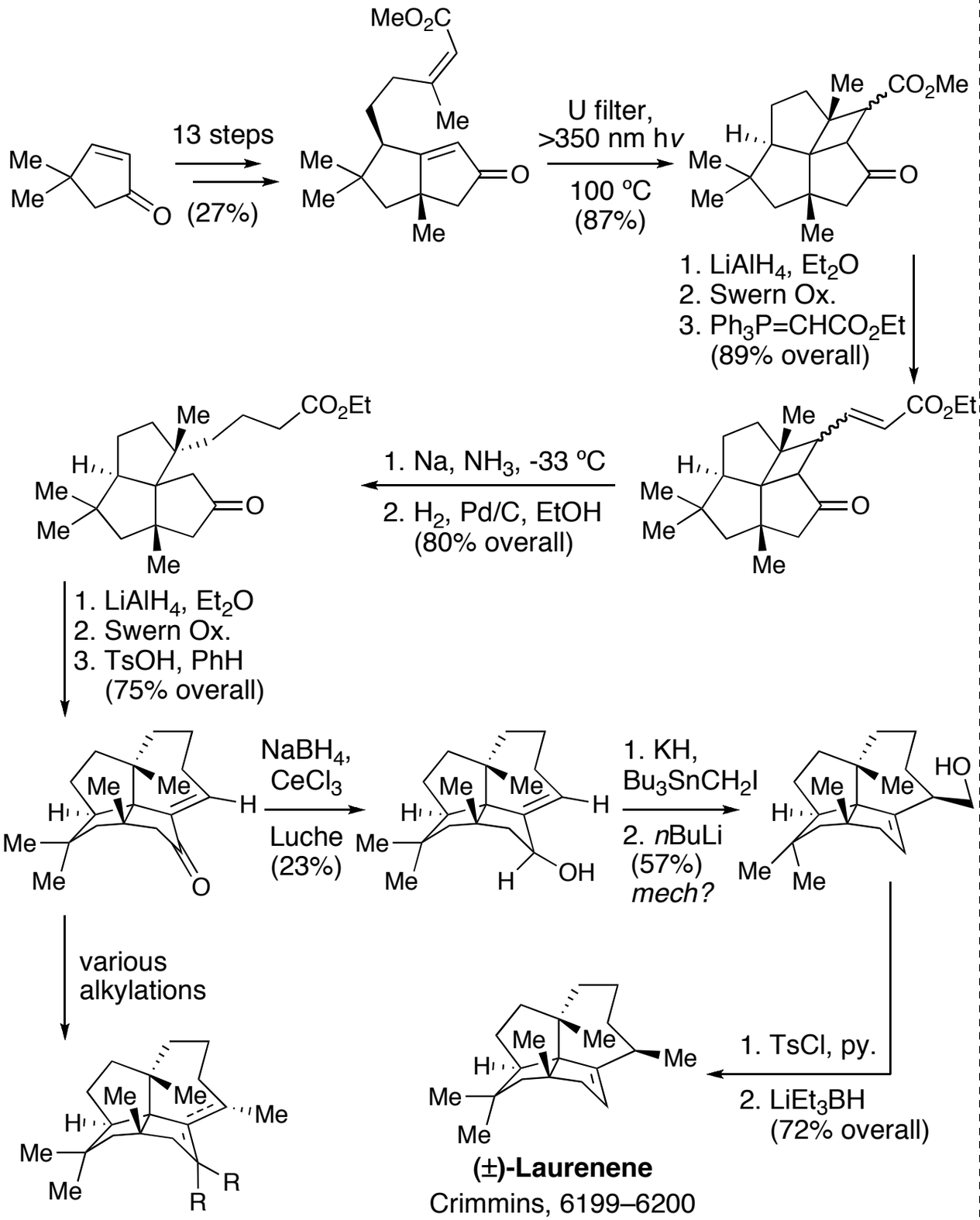


"Pagodane": The Efficient Synthesis of a Novel, Versatile Molecular Framework.
W. Fessner, G. Sedelmeier, P.R. Spurr, G. Rihs, and H. Prinzbach, 4626–4642.

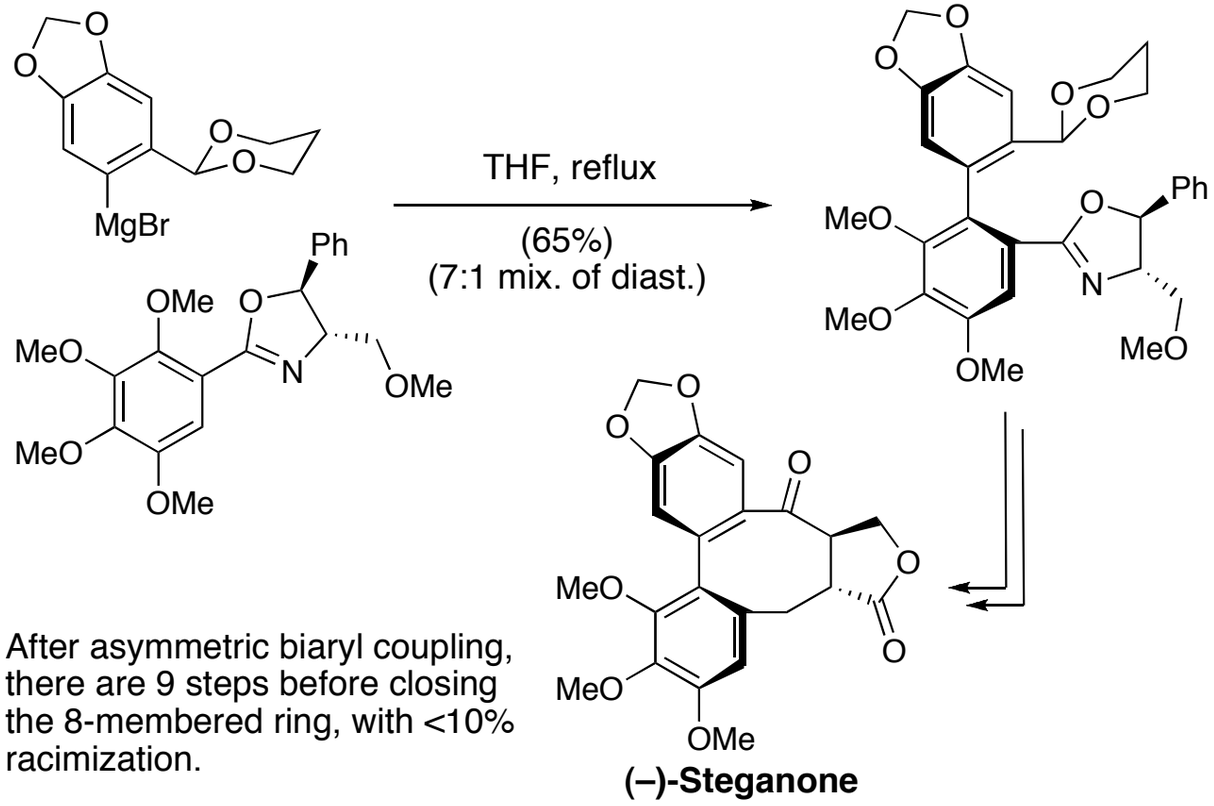


See also, **Platonic Hydrocarbons** group meeting (Shenvi, 2006)

Intramolecular Photocycloaddition. Cyclobutane Fragmentation: Total Synthesis of (±)-Laurenene. M.T. Crimmins, and L.D. Gould, 6199–6200.



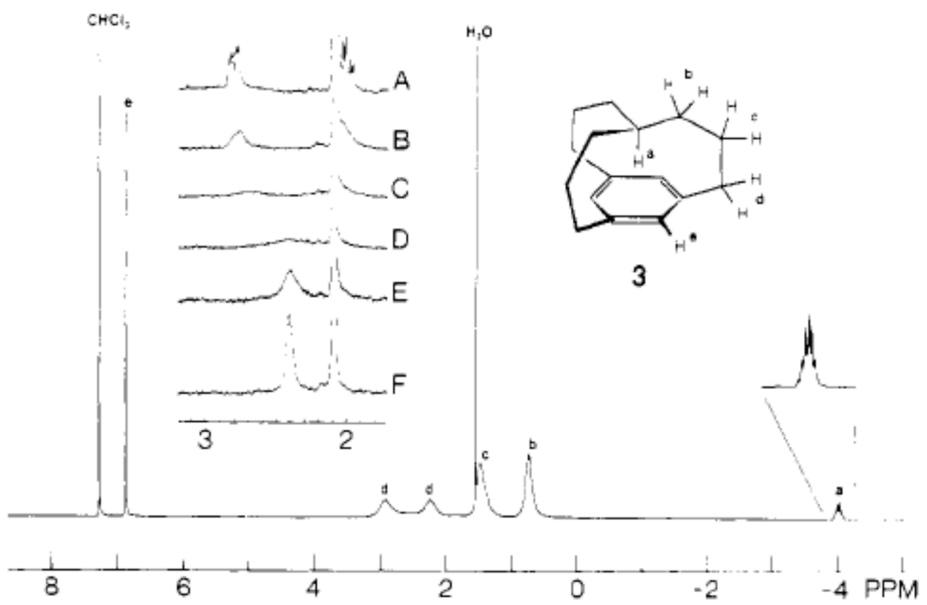
An Asymmetric Synthesis of (–)-Steganone. Further Application of Chiral Biaryl Synthesis. A. I. Meyers, J.R. Flisak, and R.A. Aitken, 5445–5452.



After asymmetric biaryl coupling, there are 9 steps before closing the 8-membered ring, with <10% racimization.

(–)-Steganone

Synthesis of *in*-[3^{4,10}][7]Metacyclophane: Projection of an Aliphatic Hydrogen toward the Center of an Aromatic Ring. R.A. Pascal, R.B. Grossman, and D. Van Engen, 6878–6880.



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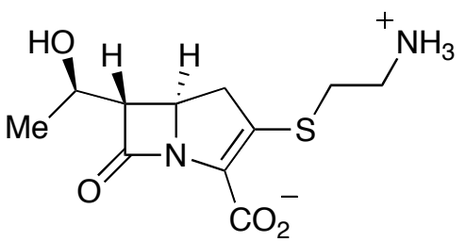
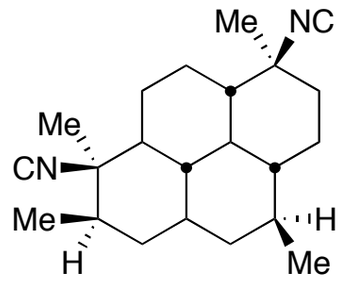
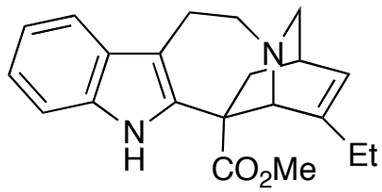
Comprehensive list of all total syntheses (*formal):



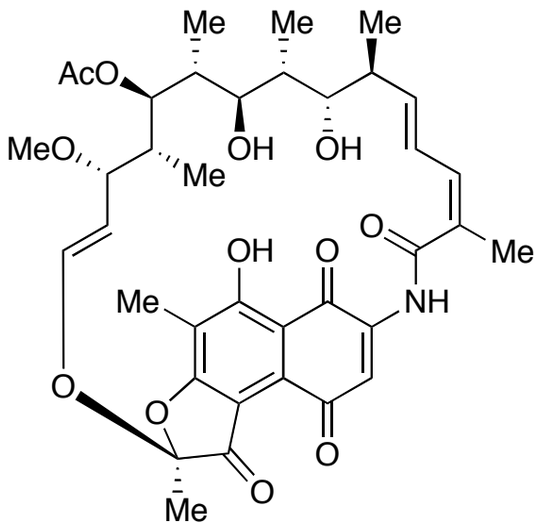
(+)-Thienamycin
Georg, 1129–1135



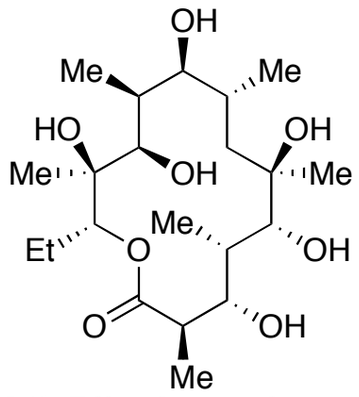
7,20-Diisocyanoadociane
Corey, 287–289



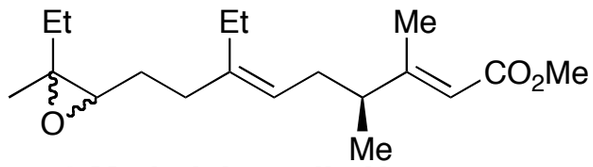
(±)-Catharanthine
Raucher, 442–446



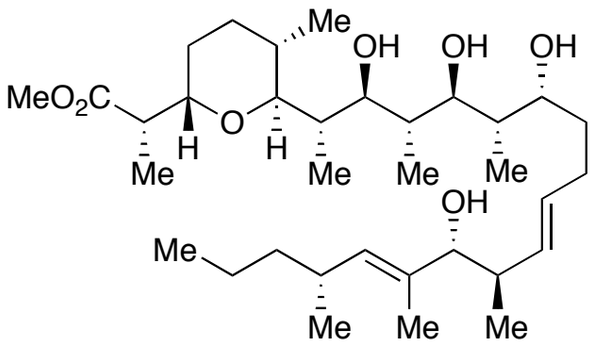
***Rifamycin S**
Danishefsky, 862–867
Roush, 953–955



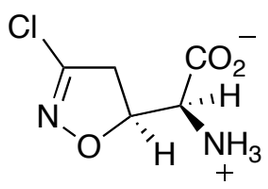
(+)-(9*S*)-Dihydroerythronolide
Stork, 1565–1567



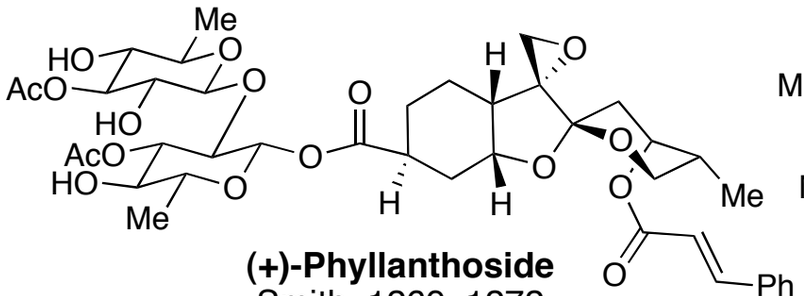
4-Methyl Juvenile Horomone
Ogura, 2853–2854



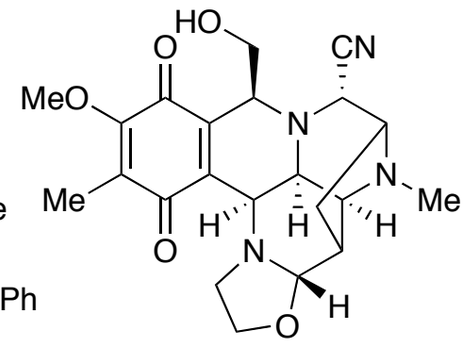
Zincophorin
Danishefsky, 1572–1574



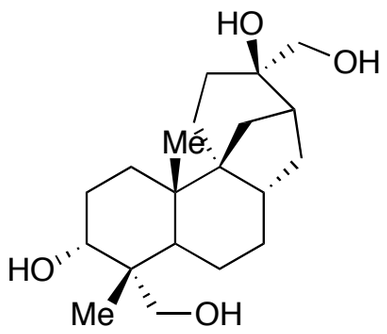
Acivicin
Whitney, 276–277



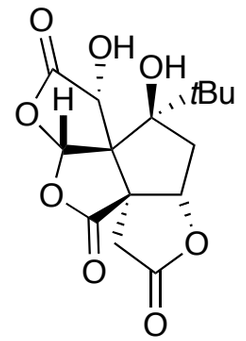
(+)-Phyllanthoside
Smith, 1269–1272
Smith, 1272–1274



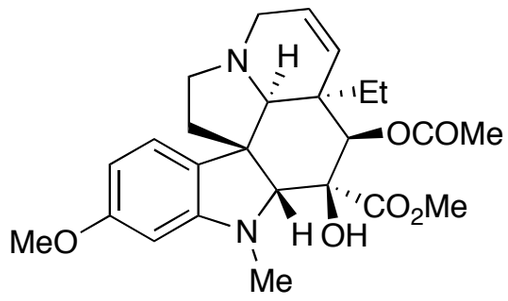
(±)-Cyanocycline A
Fukuyama, 1587–1589



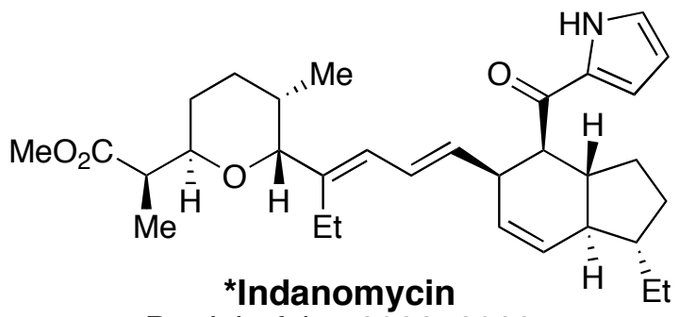
Aphidicolin
Holton, 1597–1600



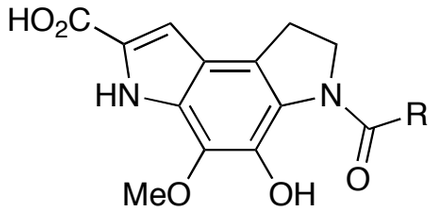
(±)-Bilobalide
Corey, 7534–7536



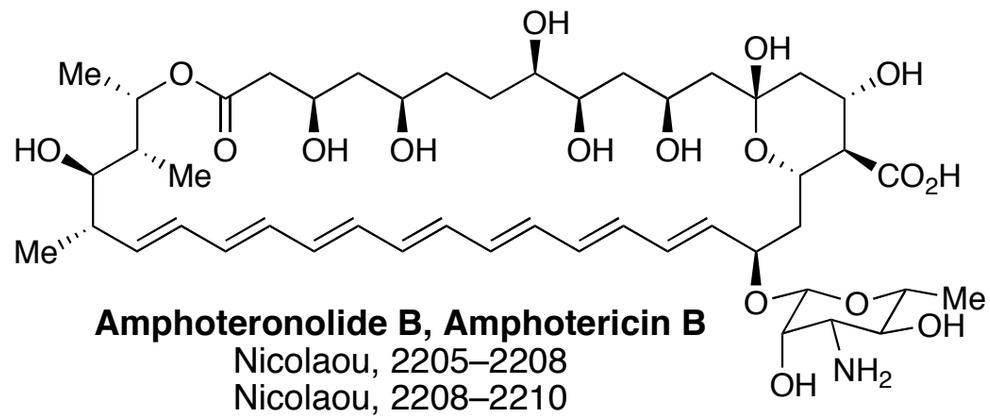
(–)-Vindoline
Rapoport, 1603–1604



***Indanomycin**
Danishefsky, 2082–2089



R = NH_2 **PDEI**
R = Me **PDEII**
Magnus, 2711–2717
Boger, 2717–2727



Amphoteronolide B, Amphotericin B
Nicolaou, 2205–2208
Nicolaou, 2208–2210
NIcolaou, 2821–2822

Baran Group Meeting

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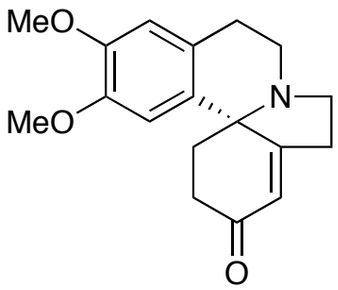
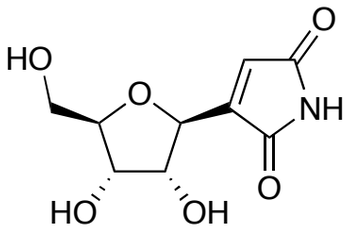
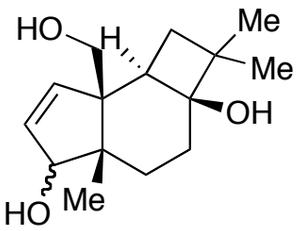
Comprehensive list of all total syntheses (Cont'd):



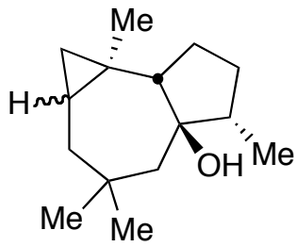
(±)-3-Demethoxyerythratidinone
Danishefsky, 917–918



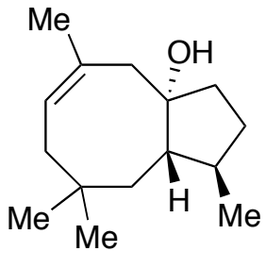
***(+)-Showdomycin**



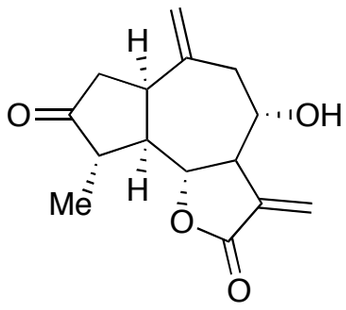
(–)-Punctatin A,
(+)-Punctatin D
Paquette, 3017–3024



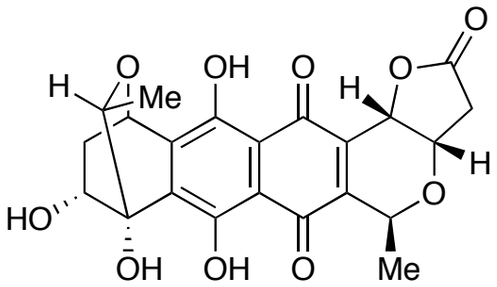
Africanol
Paquette, 3025–3036



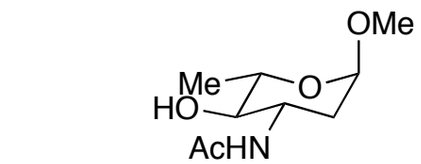
Dactylol
Paquette, 3025–3036



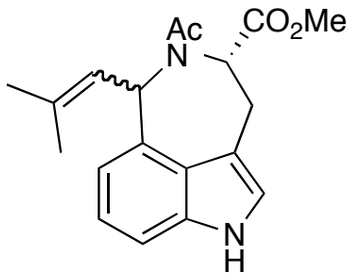
(±)-Grosshemin
Rigby, 3147–3149



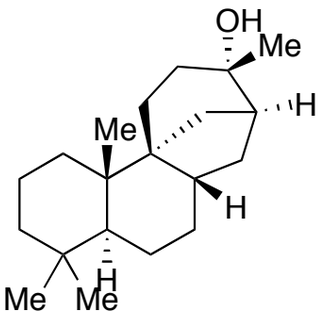
(±)-Granaticin
Yoshii, 3402–3408



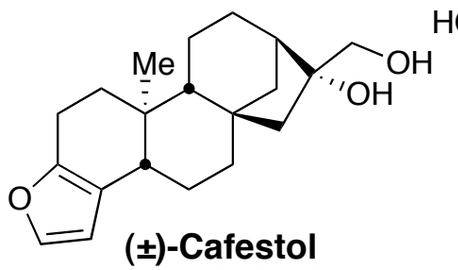
(—)-*N*-Acetal-*O*-methylacosamine
Trost, 3792–3794



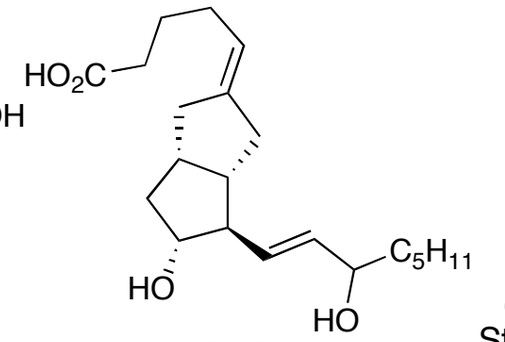
(±)-Clavicipitic Acid derivatives
Hegedus, 4335–4338



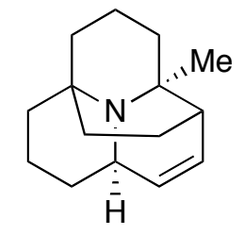
(±)-2-Desoxystemodinone
White, 4424–4426



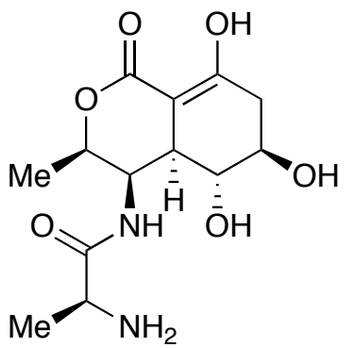
(±)-Cafestol
Corey, 4717–4718



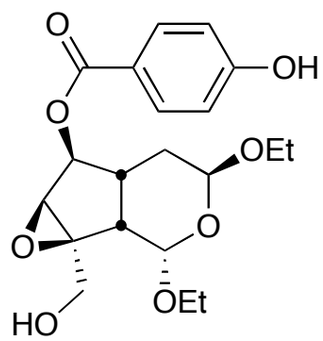
***d*-(+)-Carbacyclin**
Fuchs, 4755–4756



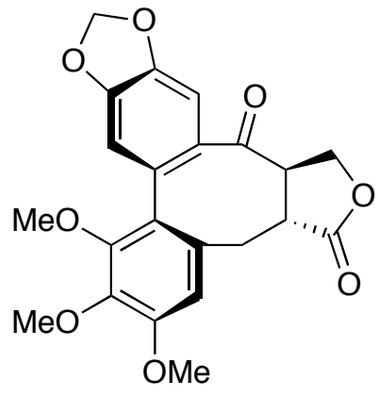
(±)-Porantherine
Stevens, 4940–4948



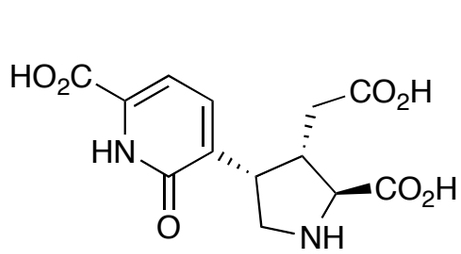
(+)-Actinobolin
Kozikowski, 5167–5175



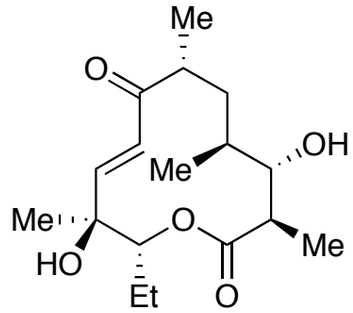
(–)-Specionin
Curran, 5280–5282



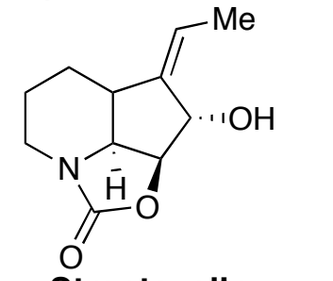
(–)-Steganone
Meyers, 5446–5452



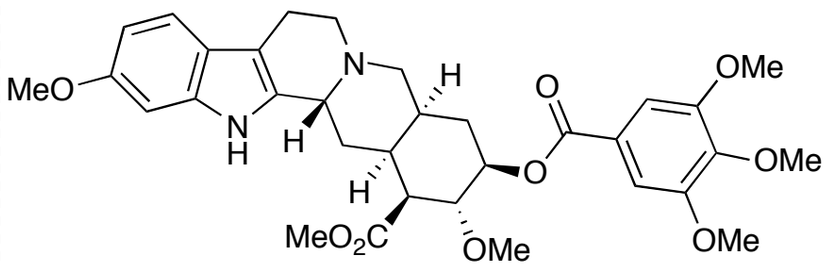
Acromelic Acid A
Takano, 5523–5524



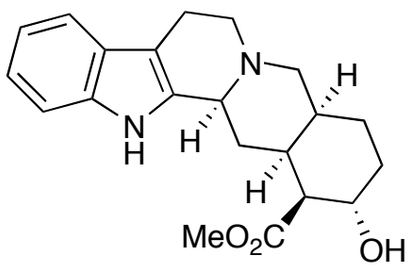
***d,l*-Methynolide**
Vedejs, 5878–5880



Streptazolin
Overman, 6097–6107
Overman, 6017–6114
Overman, 6115–6118



(±)- Reserpine
Martin, 6124–6134



(±)-α-Yohimbine
Martin, 6124–6134

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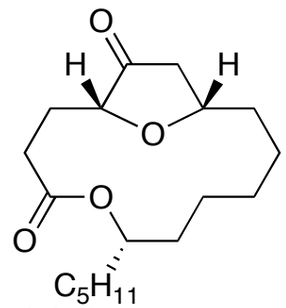
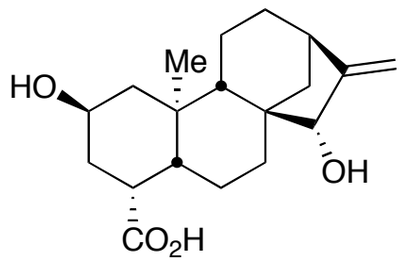
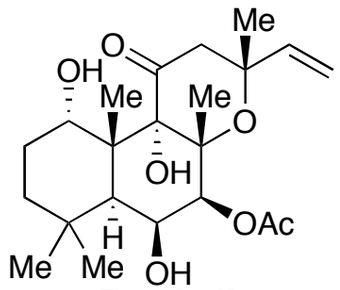
Comprehensive list of all total syntheses (Cont'd):



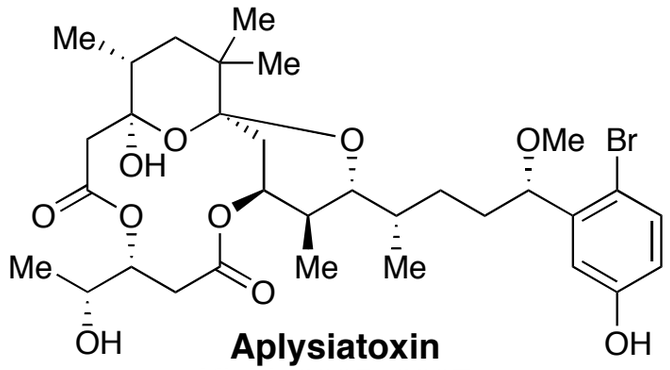
(+)-Gloesprone
Seebach, 6176–6177



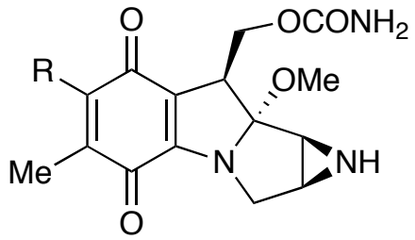
(±)-Atractyligenin
Corey, 6187–6189



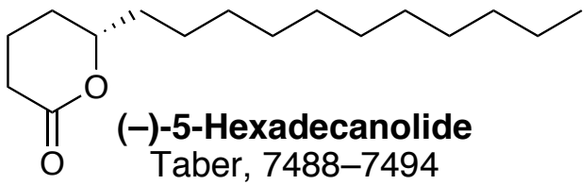
***Forskolin**
Ziegler, 8115–8116



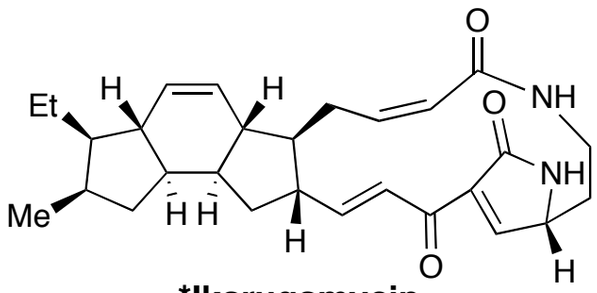
Aplysiatoxin
Kishi, 6205–6207



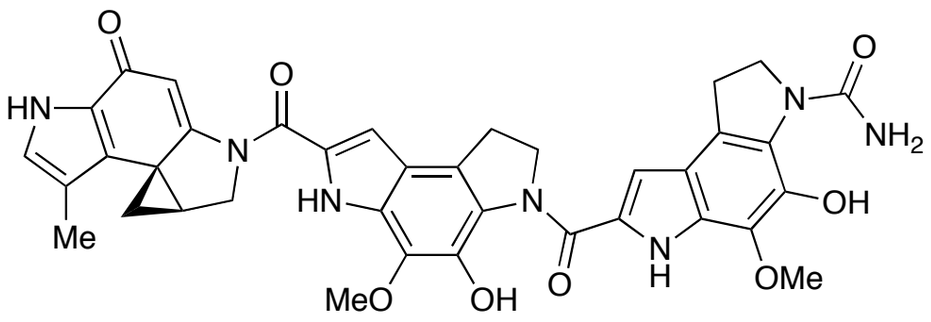
R = OMe **Mitomycin A**
R = NH_2 **Mitomycin C**
Fukuyama, 7881–7882



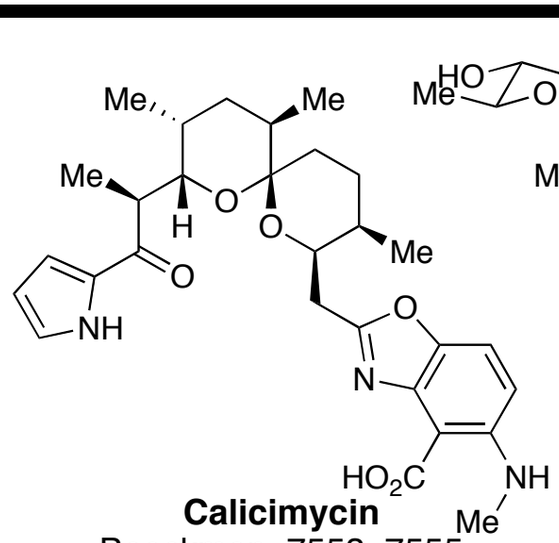
(–)-5-Hexadecanolide
Taber, 7488–7494



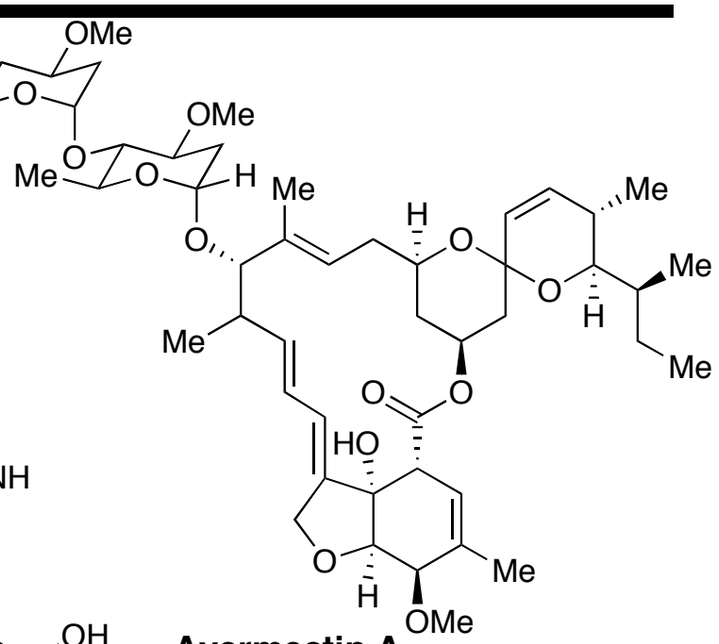
***Ikarugamycin**
Whitesell, 6403–6408



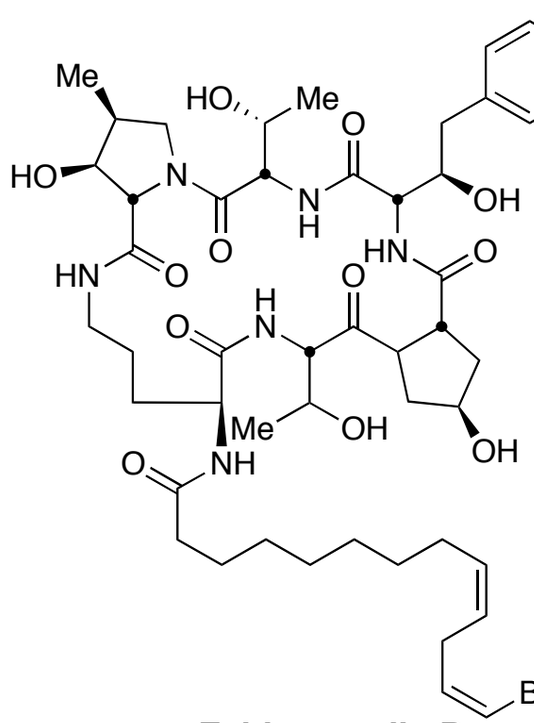
CC-1065
Kelly, 6837–6838



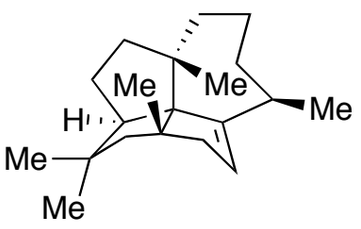
Calicimycin
Boeckman, 7553–7555



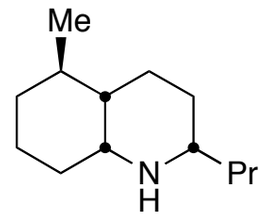
Avermectin A_{1a}
Danishefsky 8117–8119
Danishefsky 8119–8120



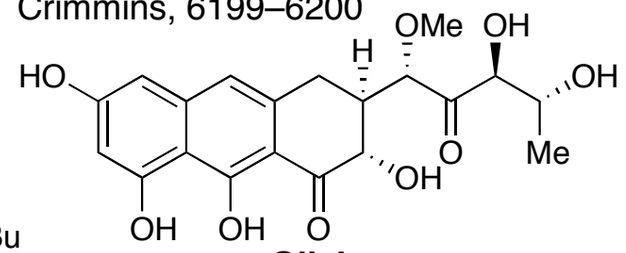
Echinocandin D
Evans, 7151–7157



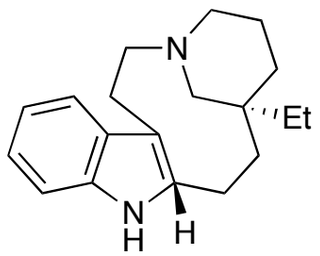
(±)-Laurenene
Crimmins, 6199–6200



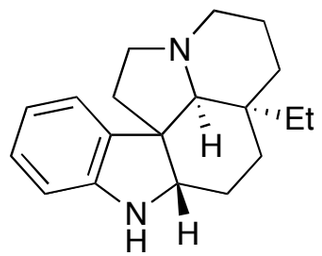
(+)-Pulmiliotoxin
Schultz, 6493–6502



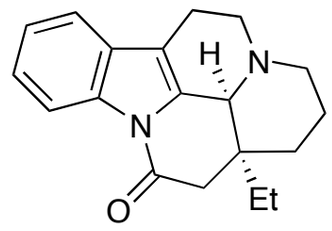
Olivin
Roush, 7575–7577



(+)-Quebrachamine
Fuji, 7901–7903



(–)-Aspidospermidine
Fuji, 7901–7903



(–)-Eburnamonine
Fuji, 7901–7903