Eantioselective Total Synthesis of Ineleganolide

Literature seminar

王李瑶

2026.1.22

Content

Introduction of the David Sarlah

2002-2006 University of Ljubljana, Slovenia B.S. in Chemistry,

2006-2011 The Scripps Research Institute, CA

Research advisor: K.C.Nicolaou

2011-2014 ETH Zürich, Postdoctoral Fellow,

Research advisor: Erick M.Carreira

2014-2024 University of Illinois, Urbana-Champaign, Professor

2024-now Rice University, Professor

https://www.sarlahgroup.com/david-sarlah

Introduction of the Thomas Maimone

2000-2004 University of California Berkeley B.S. in Chemistry,

2004-2009 The Scripps Research Institute, CA

Research advisor: Phil S. Baran

2009-2012 Massachusetts Institute of Technology, Postdoctoral Fellow,

Research advisor: Stephen L. Buchwald

2012-2018 College of Chemistry, University of California Berkeley,

Assistant Professor

2018-now College of Chemistry, University of California Berkeley,

Professor

https://www.cchem.berkeley.edu/~tjm/publications.html

Introduction of Ineleganolide

Sinularia soft corals

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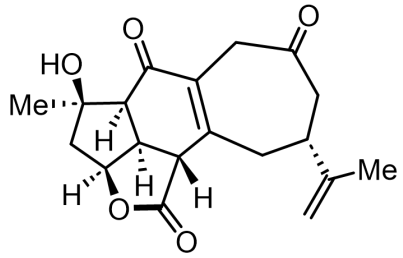
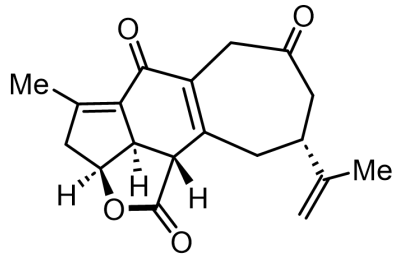
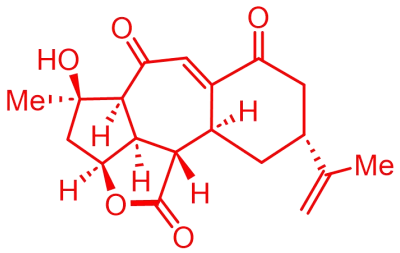


(-)-scabrolide A (5)

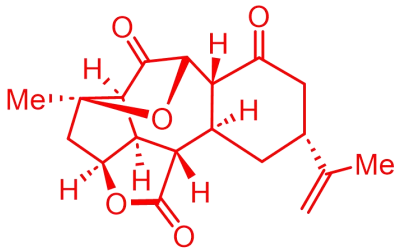


yonarolide (6)

复杂的杯状五环骨架
高氧化态
九个立体中心（八个连续的）
一个高度取代的七元环
一个远端异丙烯侧链



(-)-scabrolide B (2)



(+)-ineleganolide (1)

John L. Wood. *JACS* 2022

Brian M. Stoltz. *JACS* 2023

Alois Fürstner. *JACS* 2024

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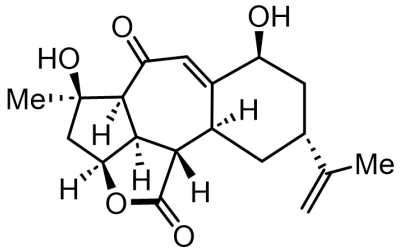
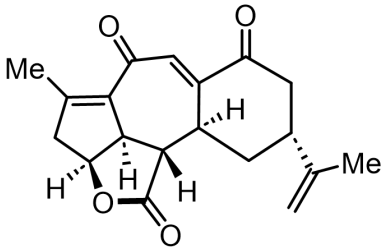


(+)-fragliolide A (4)

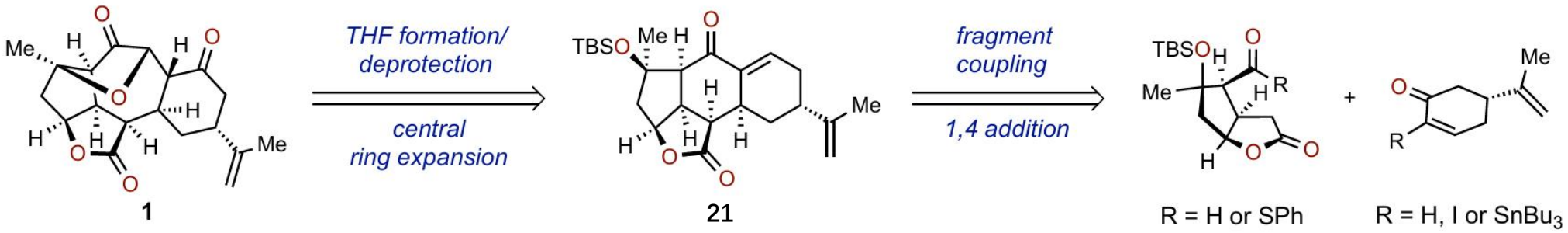


(-)-sinuscalide C (3)

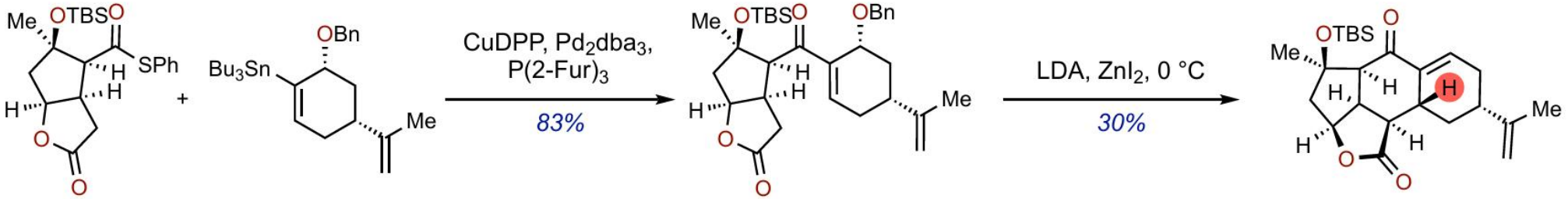
对P-388小鼠白细胞株具有细胞毒性

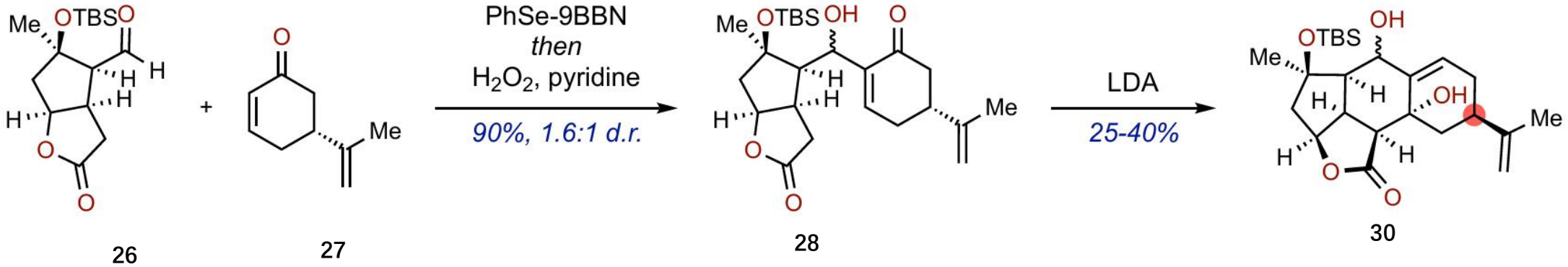
Content

David Sarlah's Early Synthetic Strategies



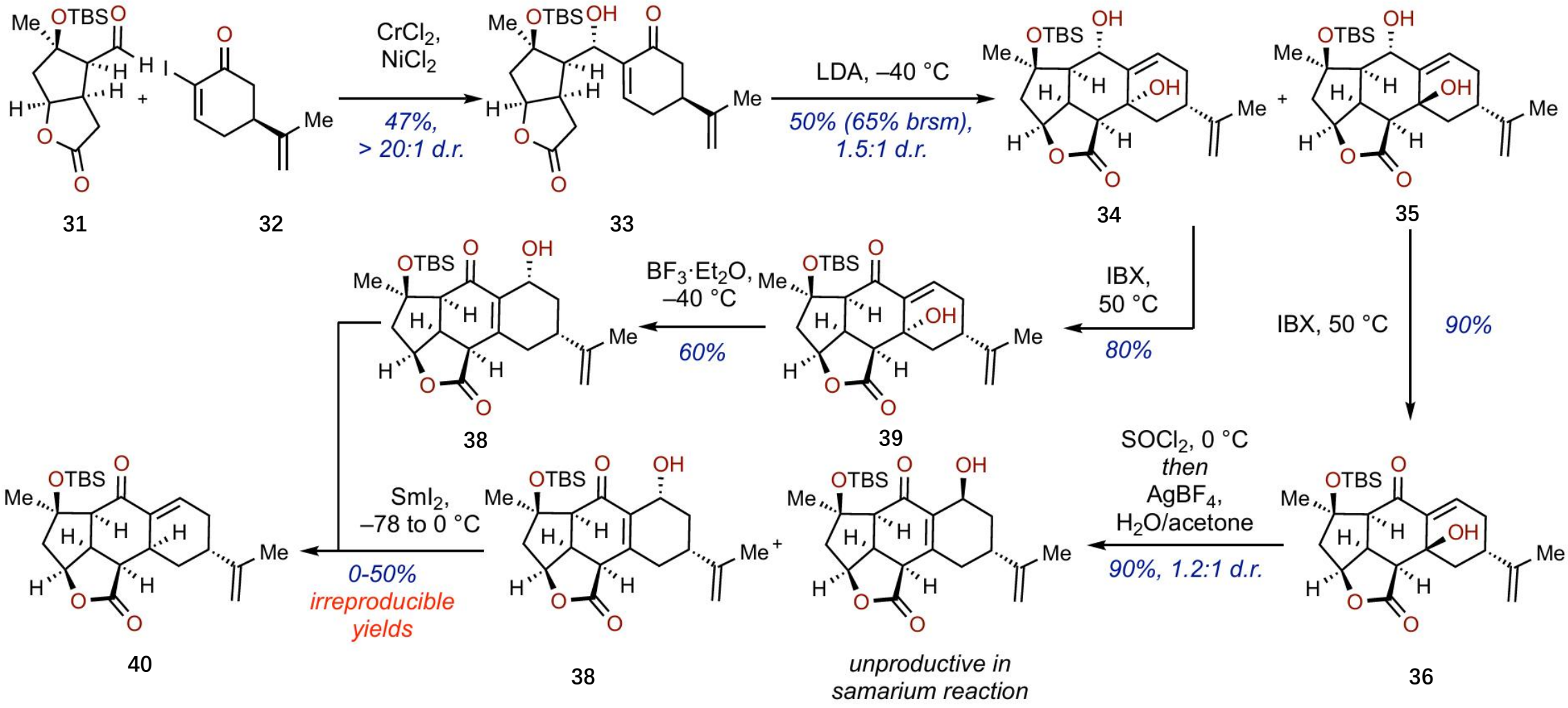
Cyclization Studies:



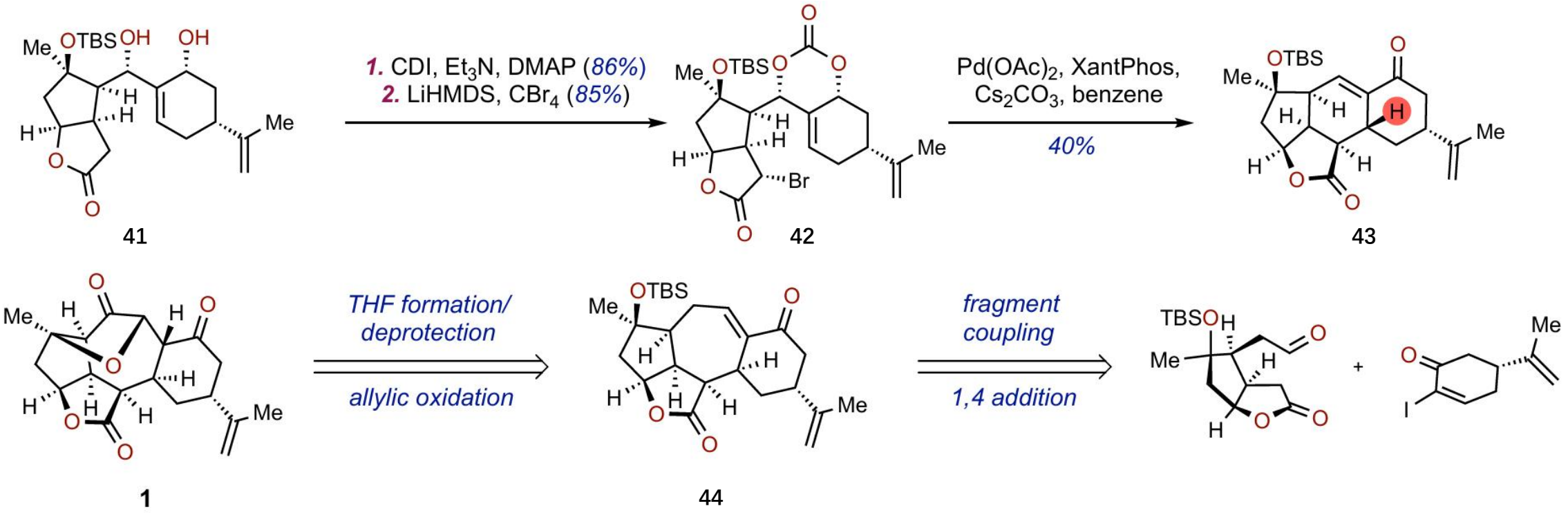


David Sarlah.; *et al. JACS.* **2025**, *147* (1), 130-135

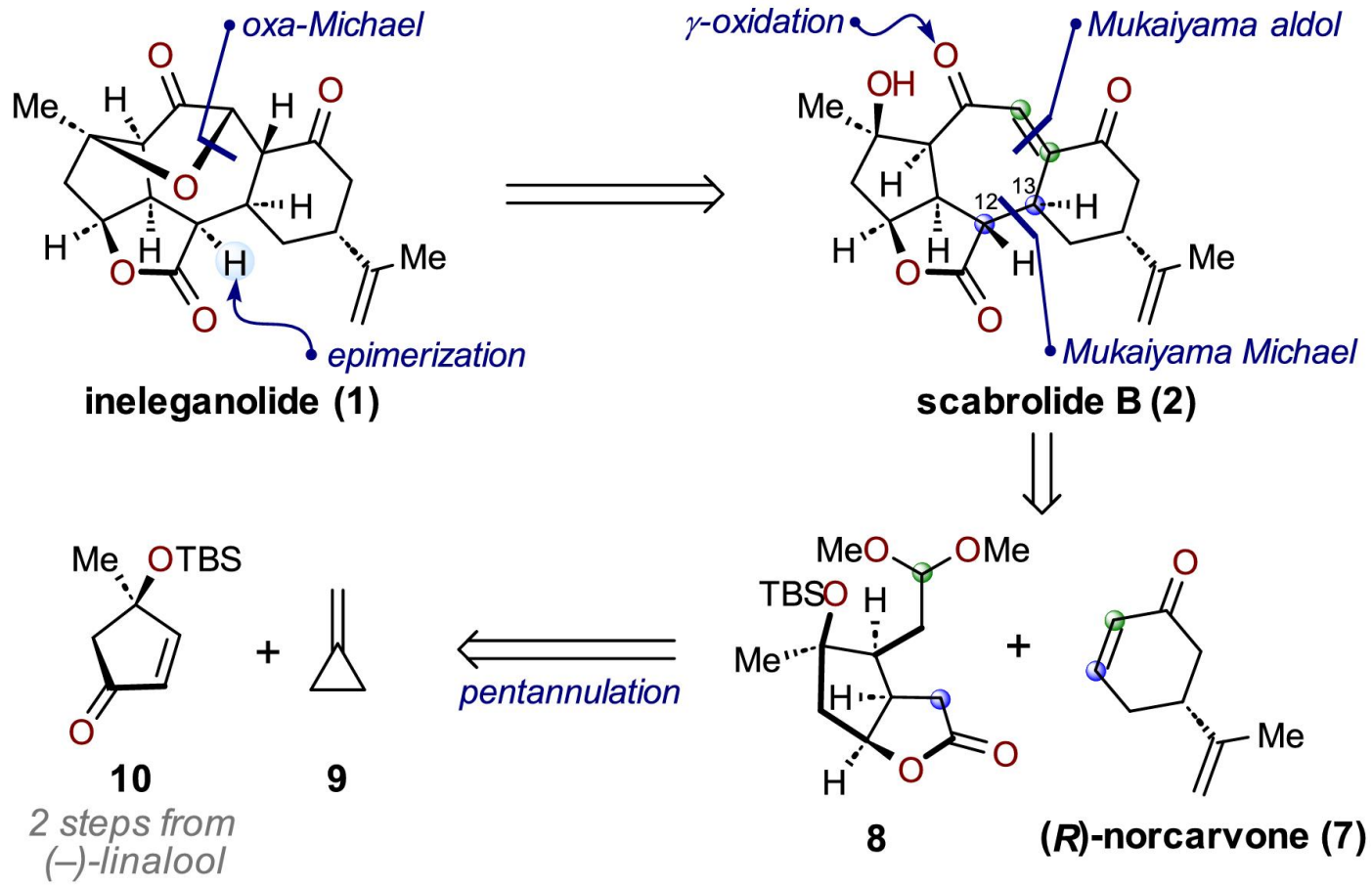
David Sarlah's Early Synthetic Strategies



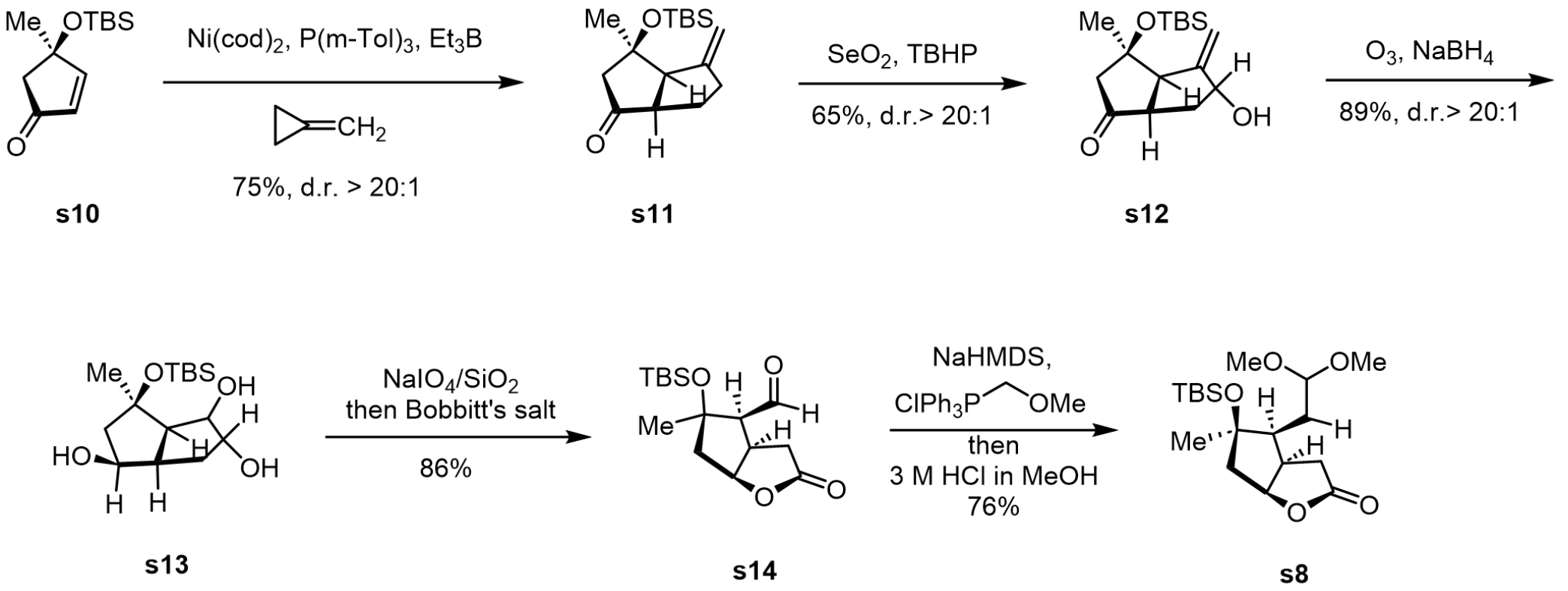
David Sarlah's Early Synthetic Strategies



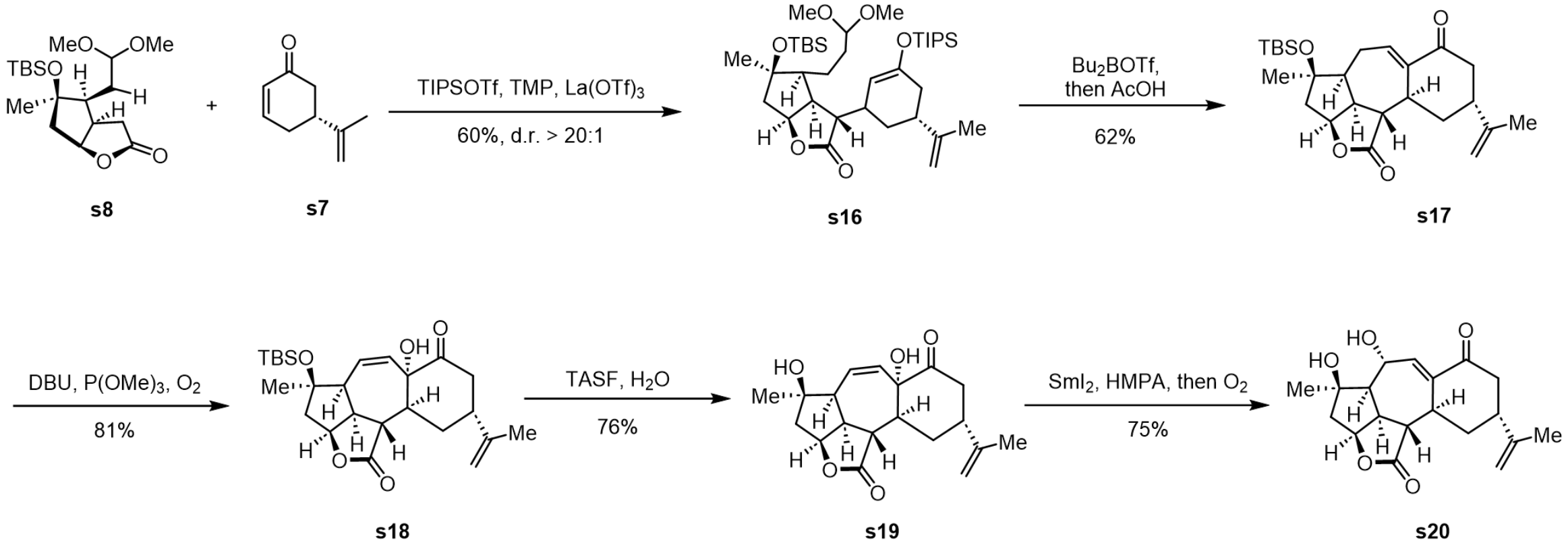
David Sarlah's Retrosynthetic Analysis



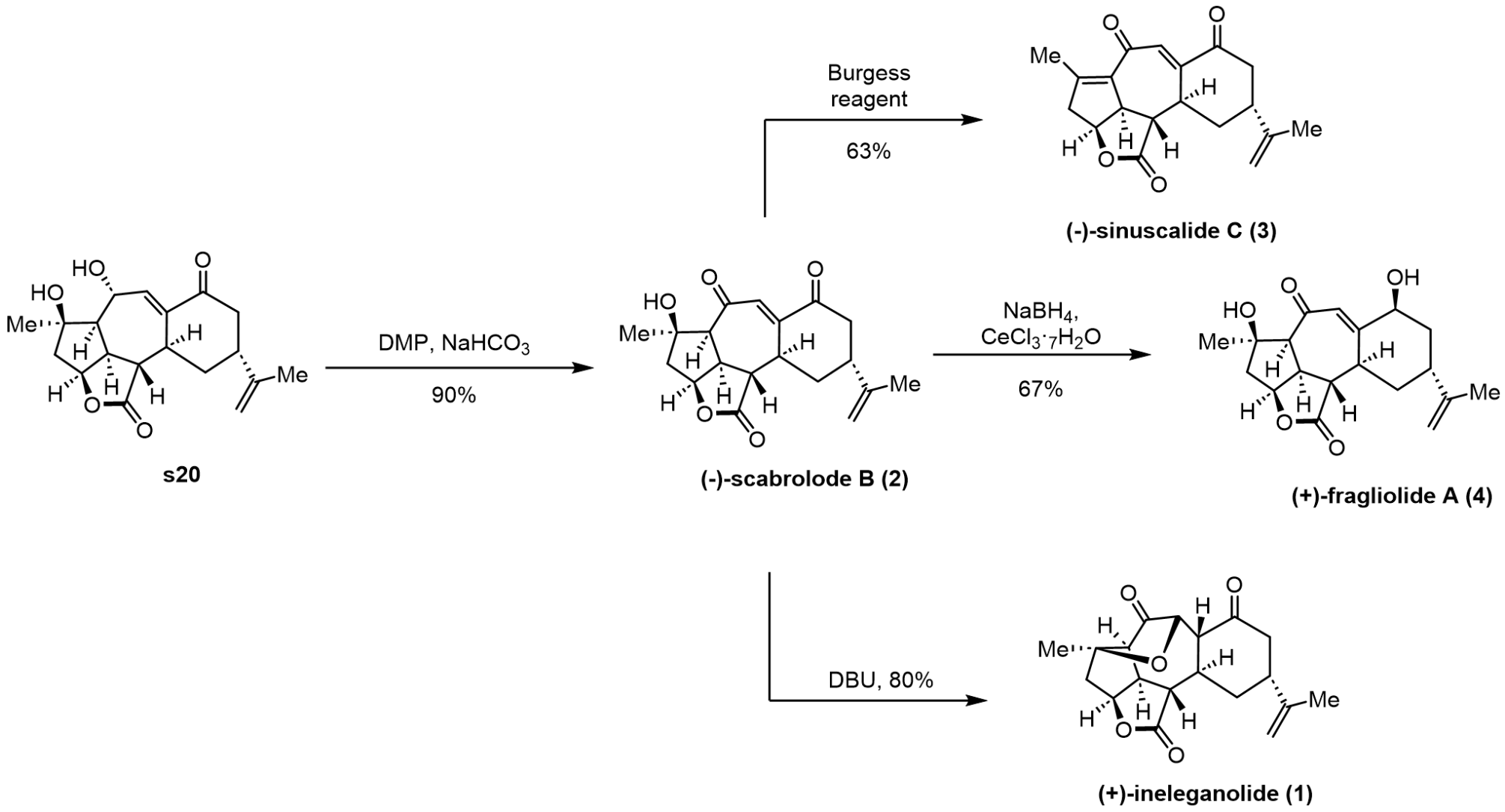
David Sarlah's Synthetic Route



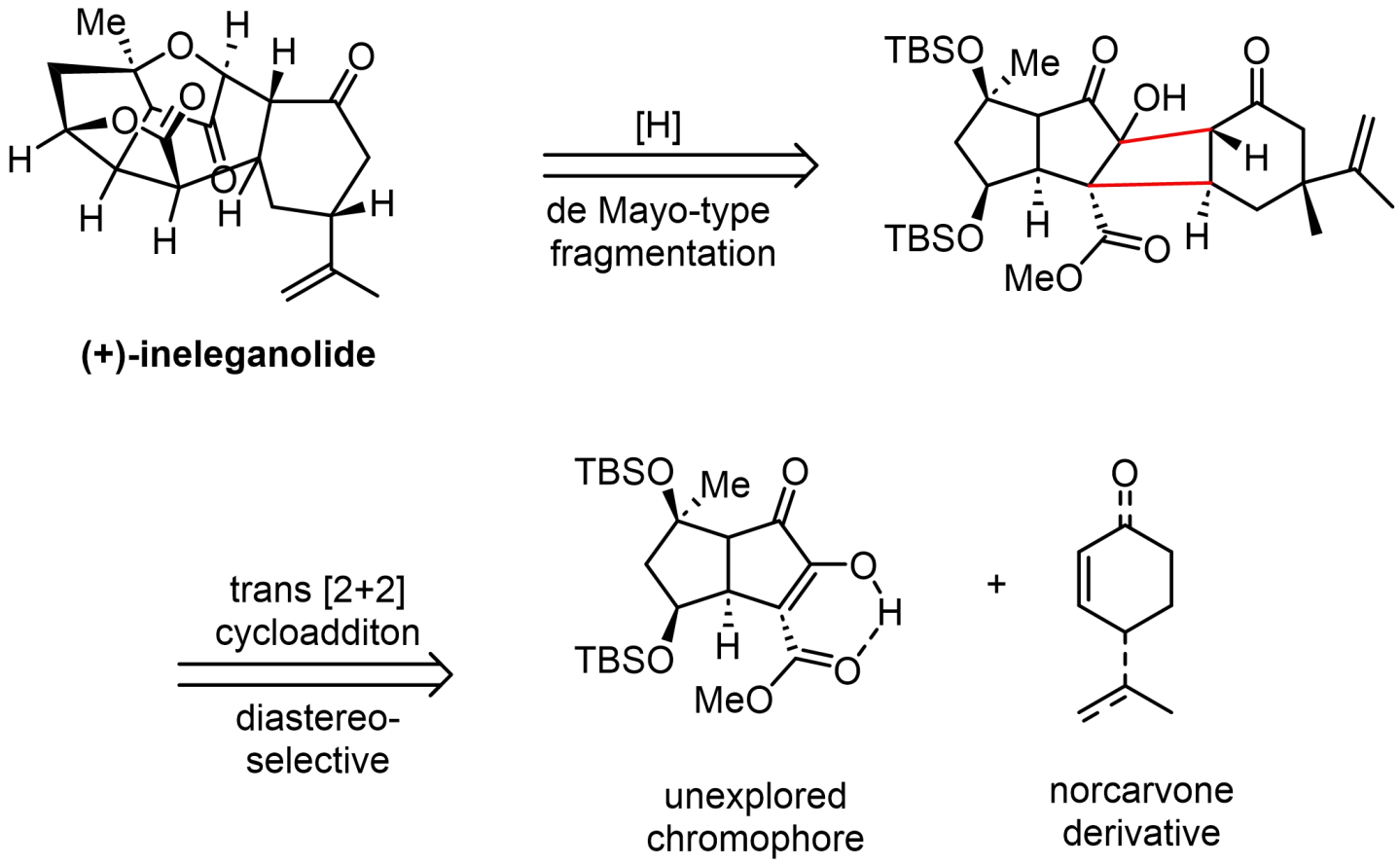
David Sarlah's Synthetic Route



David Sarlah's Synthetic Route

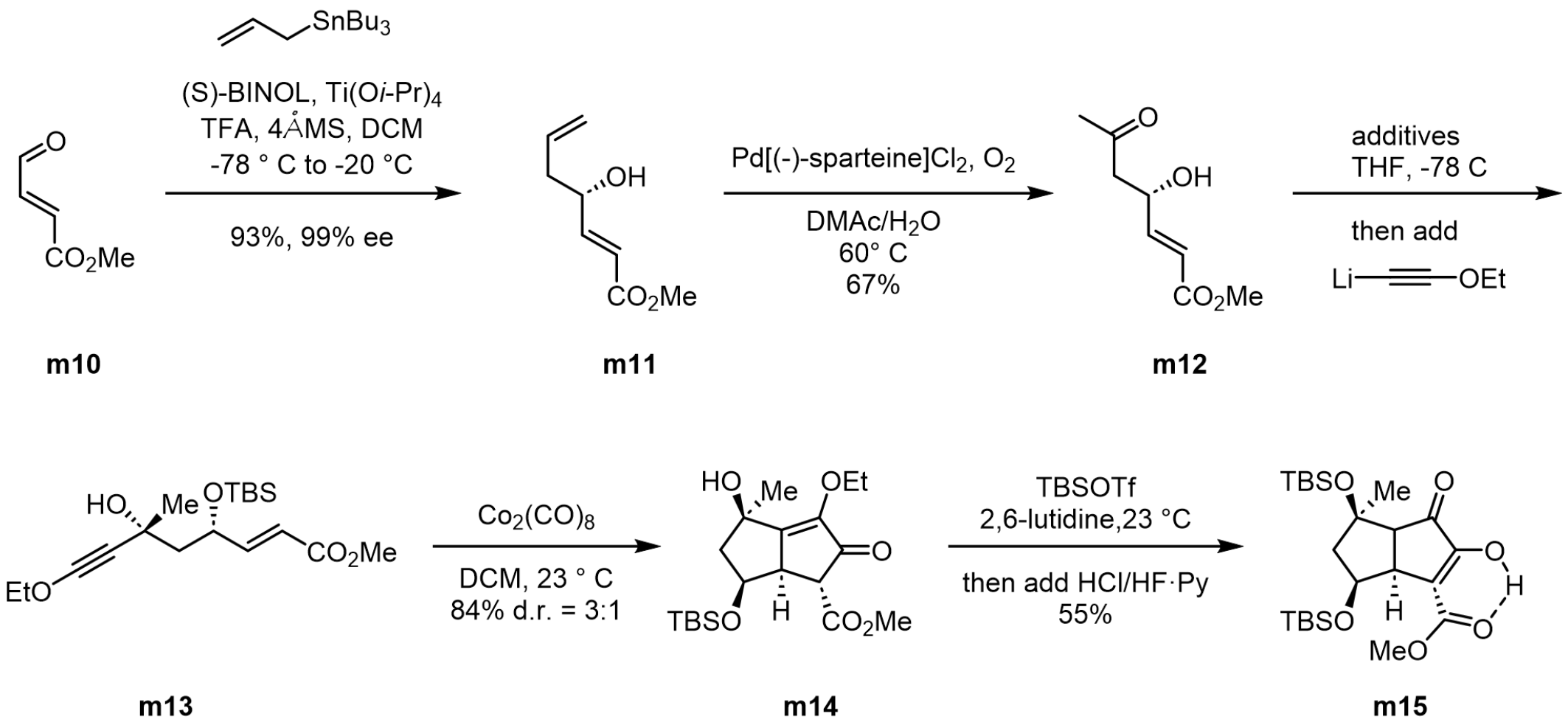


Thomas Maimone's Synthetic Route

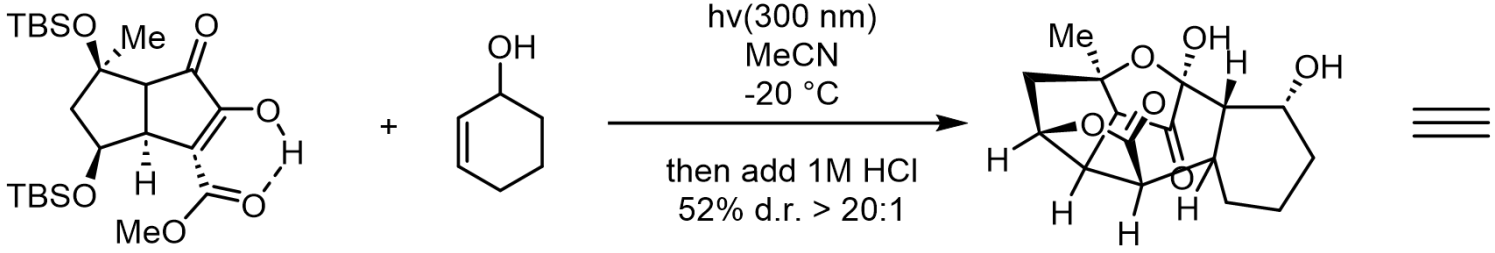


Thomas Maimone .; *et al*. *JACS.* **2025**, *147* (49), 44727-44732

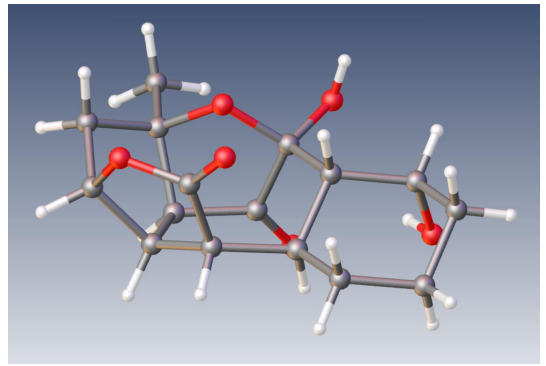
Thomas Maimone ’s Synthetic Route

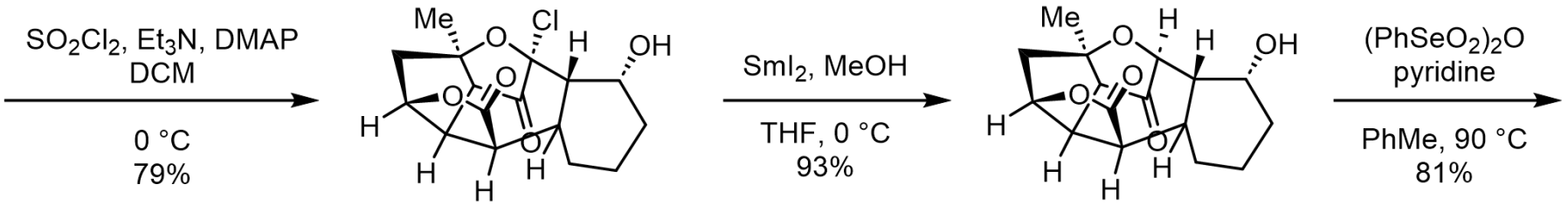


Thomas Maimone ’s Synthetic Route

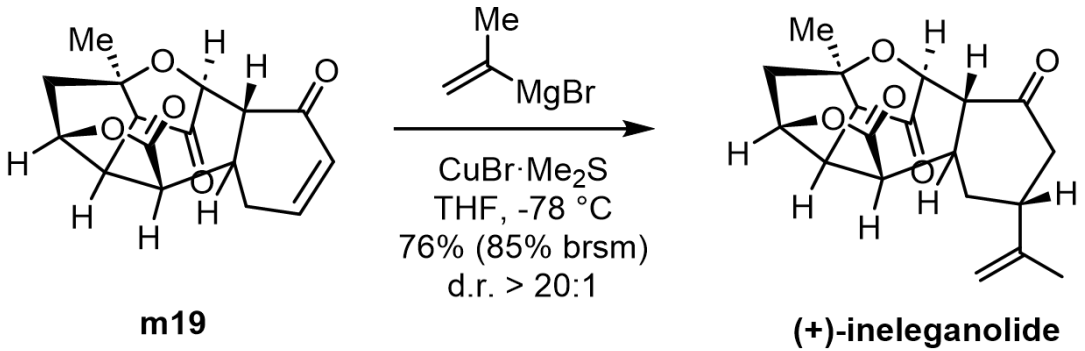


m15 **m16**



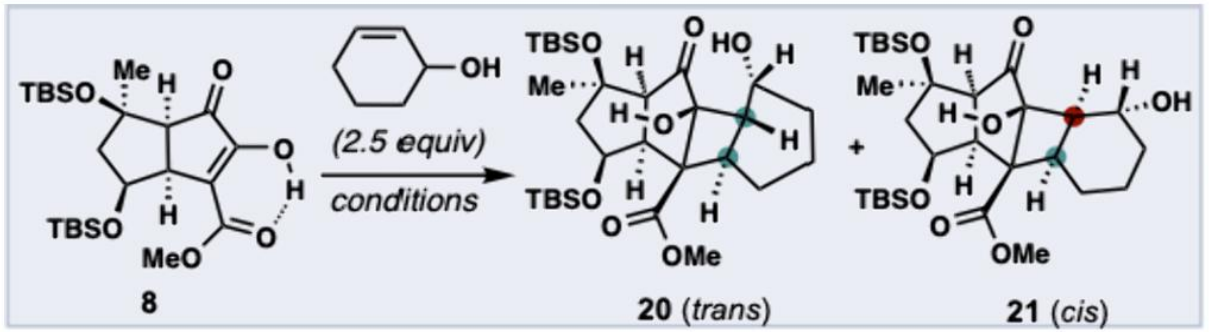


m17 **m18**



m19 **(+)-ineleganolide**

Thomas Maimone 's Retrosynthetic Analysis

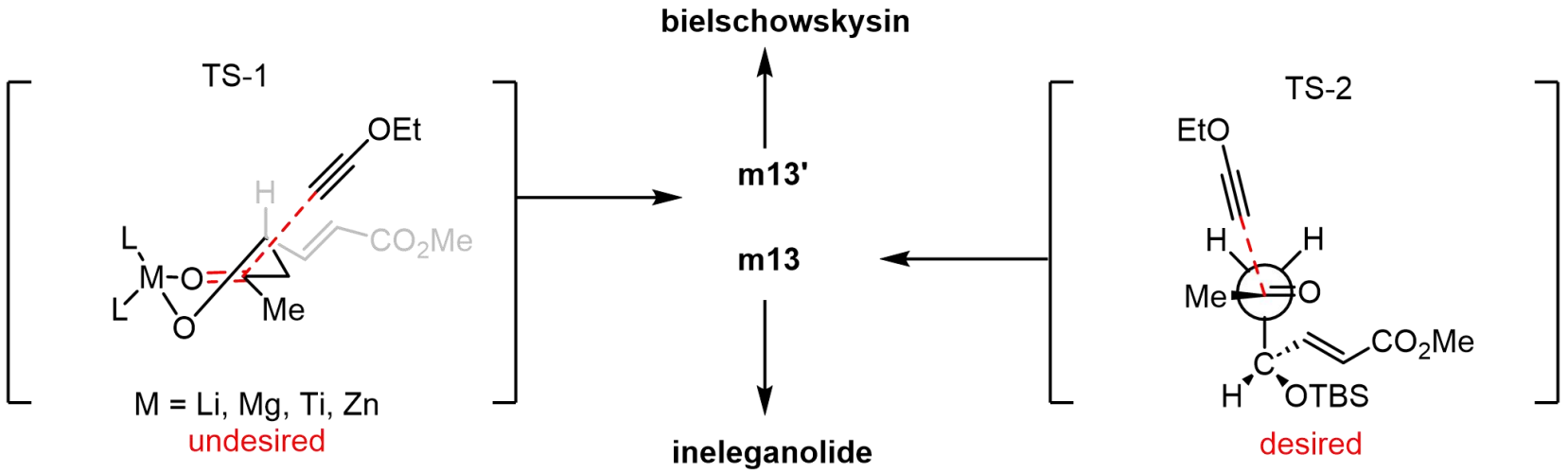


8 **20** (*trans*) **21** (*cis*)

Entry	*Conditions*	*Yields (%)*[b]	**20**	**21**
1[c]	$Ir[dF(CF_3)ppy]_2(dtbbpy)PF_6$, $Sc(OTf)_3$, terpy, imidazole 427 nm, CH_2Cl_2, 0.05 M, 23 °C, 15 h		0	0
2[c]	$ZrCl_4$, 440 nm, CH_2Cl_2, 0.1 M, 23 °C, 14 h		0	0
3[c]	4CzIPN, n-Bu_2PO_4NMe(n-Bu)$_3$, 455 nm, CH_3CN, 0.1 M, 23 °C, 24 h		0	0
4[d]	Hg (450 W), benzene, 0.02 M or 0.1 M, 40 °C, 5 h		<10	<10
5[c]	390 nm, benzene, 0.02 M, 45 °C, 24 h		0	0
6	350 nm, benzene, 0.02 M, 45 °C, 16 h		25	25
7[e]	350 nm, CH_2Cl_2, 0.02 M, 0 °C, 15 h		<5	<5
8	300 nm, CH_2Cl_2, 0.02 M, –78 °C, 18 h		43	29
9[e]	254 nm, CH_2Cl_2, 0.02 M, –78 °C, 24 h		<5	<5
10[d]	300 nm, Et_2O or EtOAc or acetone, 0.02 M, –78 °C, 16-24 h		<5	<5
11	300 nm, MeCN, 0.02 M, –20 °C, 9 h (20 h)[f]		67 (56)[f]	0
12[c]	300 nm, MeOH, 0.02 M, –78 °C, 24 h		0	0

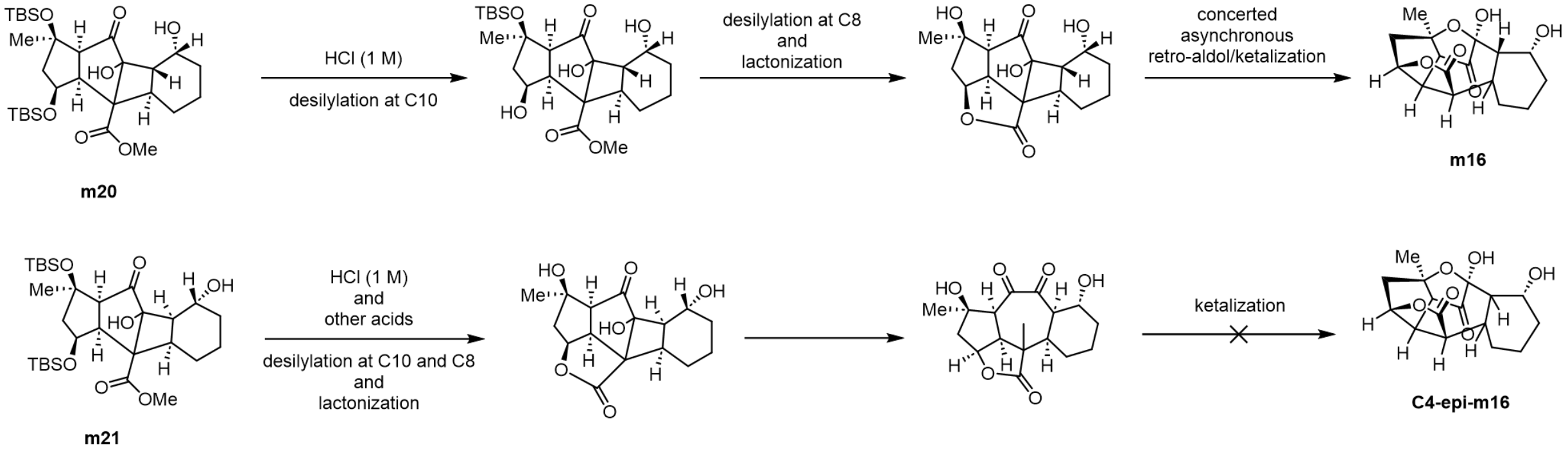
Content

Thomas Maimone ’s Retrosynthetic Analysis

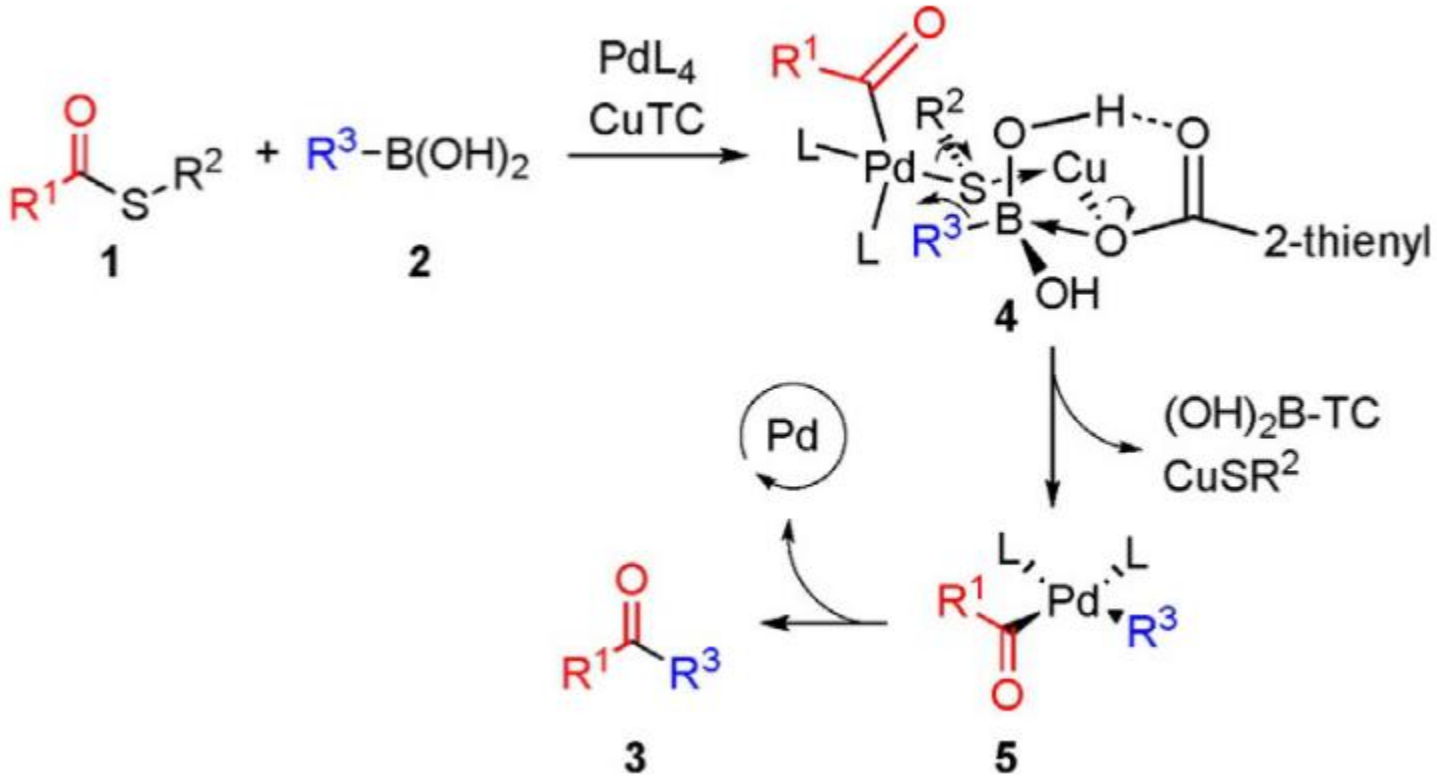


additive	Yield [d.r. (m13’ : m13)]
none	75% [1.5:1]
$TiCl_4$	92% [9:1]
$MgBr_2$	70% [2:1]
LiBr	75% [1.5:1]
$ZnBr_2$	34% [1:1]
TBSCl/LiHMDS	88% [1:3]

Proposed fragmentation process for m20.&Proposed decomposition process for m21.



Liebeskind-Srogl Coupling Reaction



Mayo Reaction