

Career of Masayuki Inoue (井上 将行)



Total synthesis and functional analysis of biologically active natural products

- I. New synthetic methodologies for total synthesis
- II. Highly oxygenated polycyclic natural products
- III. Ion channel-forming molecules
- IV. Antimicrobial molecules

Ximing Li

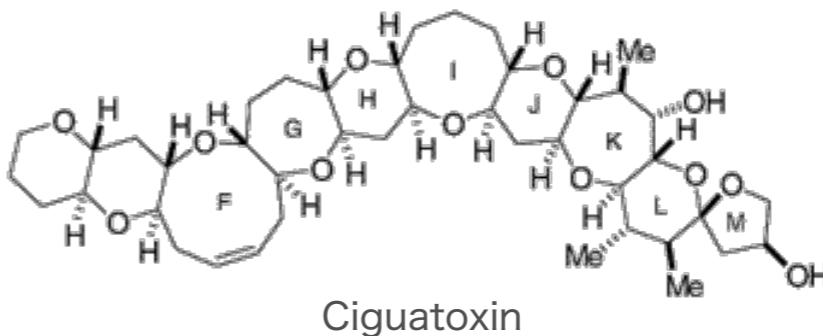
- I:** *Nature. Chem.* **2017**, 9, 207–212; *Org. Lett.* **2013**, 15, 5122–5125;
II: *Angew. Chem. Int. Ed.* **2019**, 58, 12159–12163; *J. Am. Chem. Soc.* **2017**, 139, 16420–16429;
J. Am. Chem. Soc. **2017**, 139, 1814–1817; *Chem. Sci.* **2015**, 6, 3383–3387; *J. Am. Chem. Soc.* **2014**, 136, 5916–5919
III: *J. Am. Chem. Soc.* **2012**, 134, 14011–14018; *Nature. Chem.* **2010**, 2, 280–285;
IV: *J. Org. Chem.* **2018**, 83, 6924–6935; *Angew. Chem. Int. Ed.* **2017**, 56, 11865–11869; *Angew. Chem. Int. Ed.* **2015**, 54, 1556–1560.



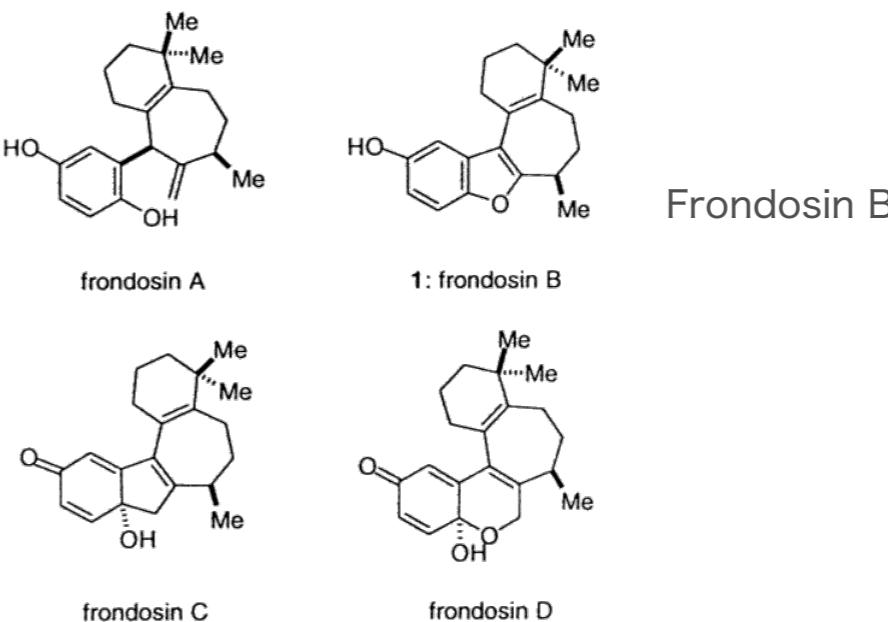
Masayuki Inoue (50)

Professor, Department of Medicinal Chemistry, The University of Tokyo

1989-1993 The University of Tokyo, B.S. in Chemistry,
1993-1998 The University of Tokyo, Ph.D. in Organic Chemistry,
Research advisor: Professor Kazuo Tachibana (橘 和夫)



1998-2000 Sloan-Kettering Institute for Cancer Research, Postdoctoral Fellow,
Research advisor: Professor Samuel J. Danishefsky



Associate Editor, The Journal of Organic Chemistry
Consulting Board of Editor, Tetrahedron/Tetrahedron Letters
Board of Editors, Organic Syntheses

1. Development of new synthetic methodologies for total synthesis

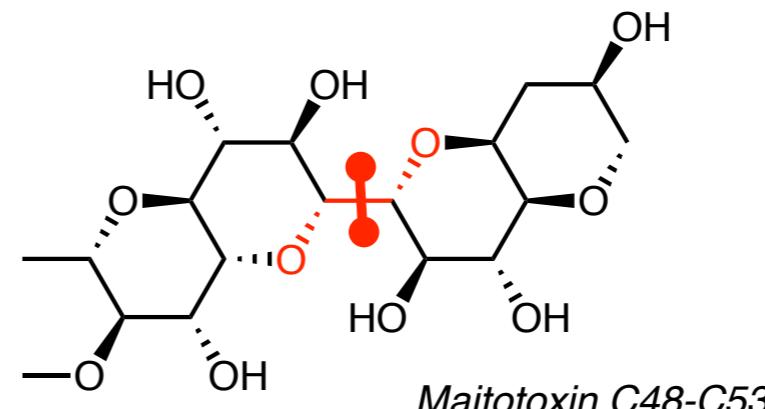
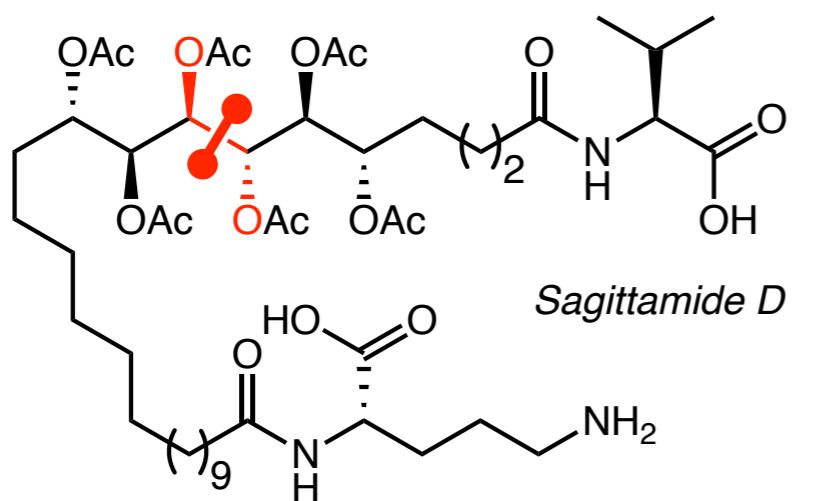
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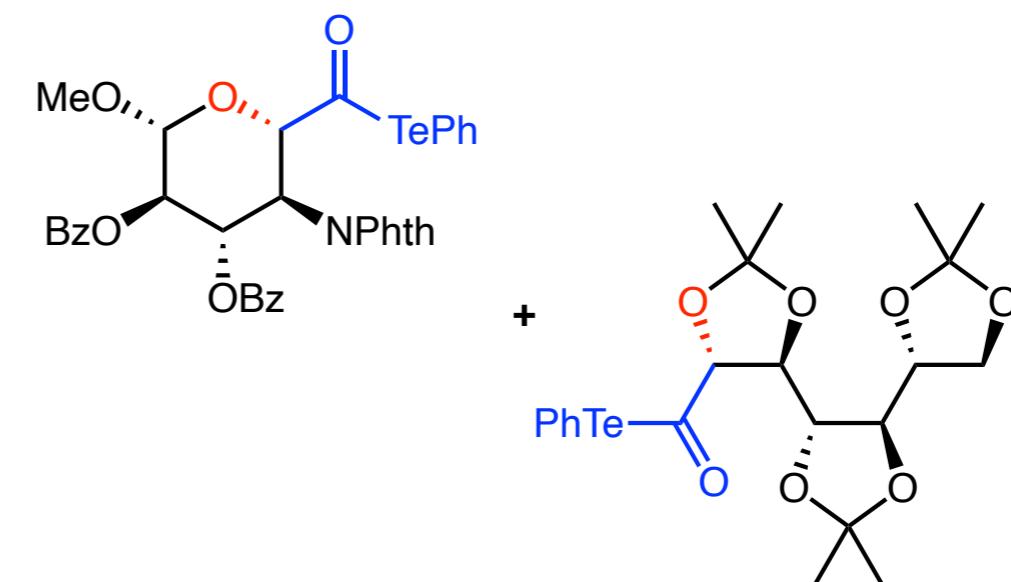
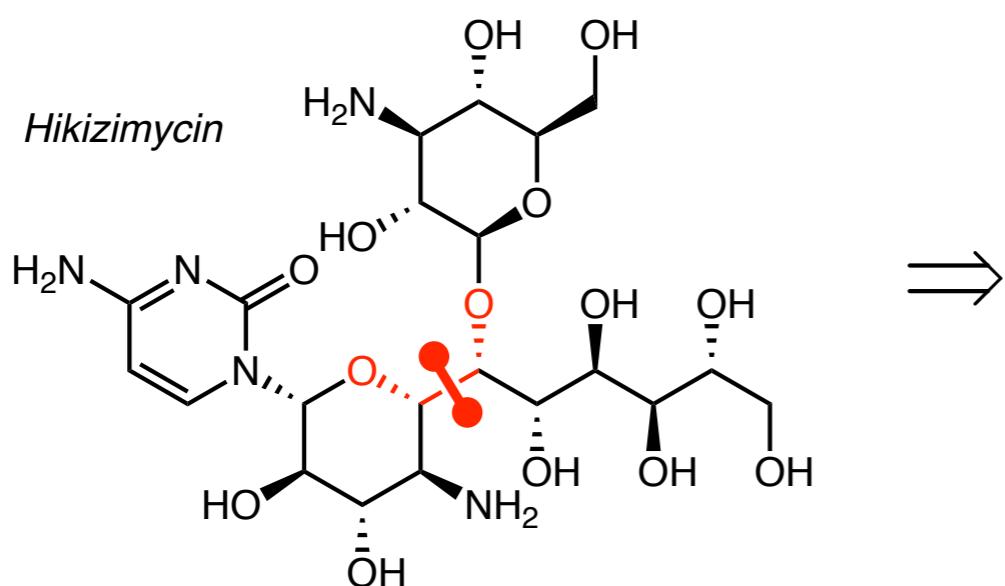
PUBLISHED ONLINE: 31 OCTOBER 2016 | DOI: 10.1038/NCHEM.2639

Direct assembly of multiply oxygenated carbon chains by decarbonylative radical-radical coupling reactions

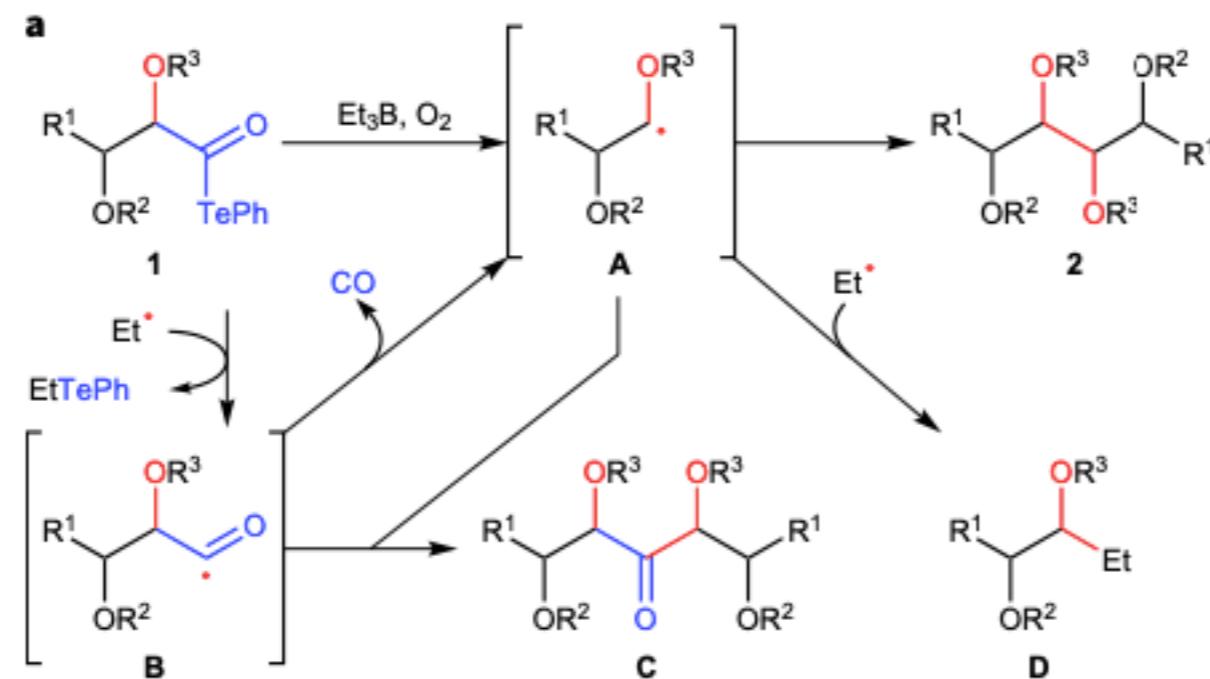
Kengo Masuda, Masanori Nagatomo and Masayuki Inoue*



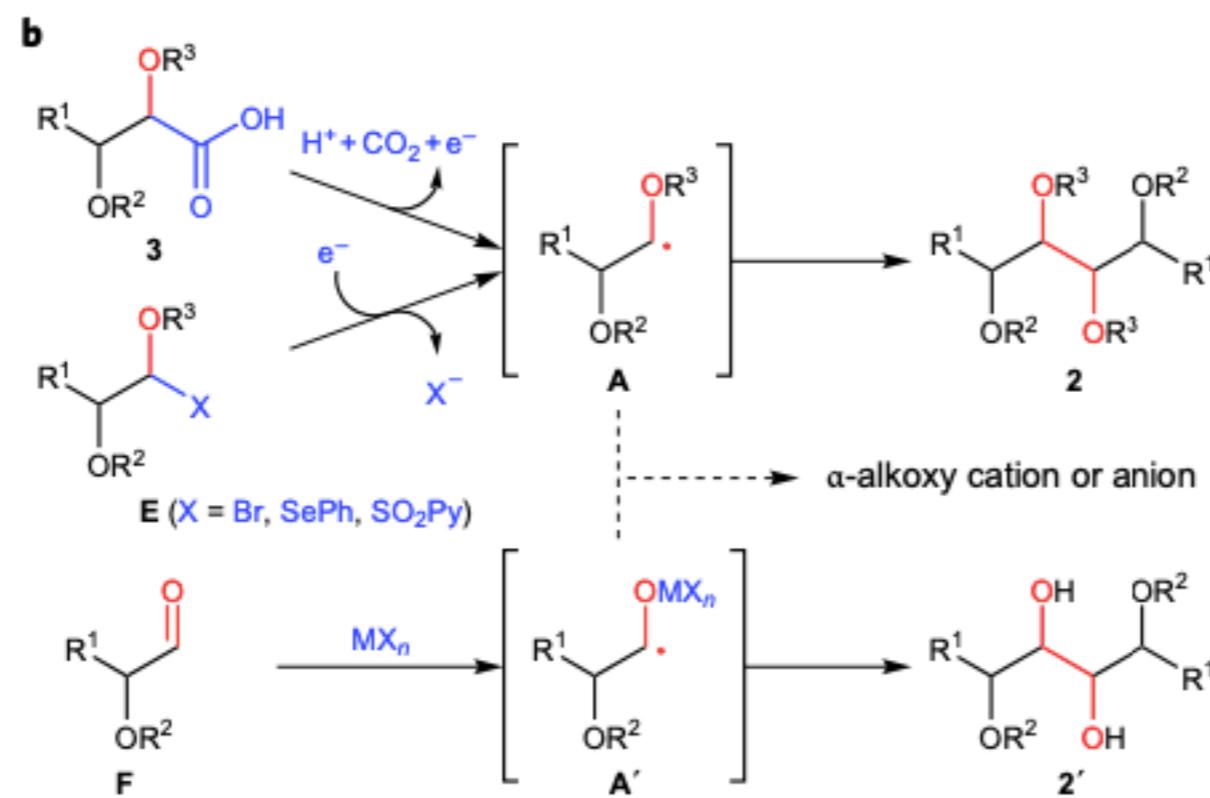
Representative examples
of multiply oxygenated
natural products and
retrosynthetic analysis of
hikizimycin.



1. Development of new synthetic methodologies for total synthesis

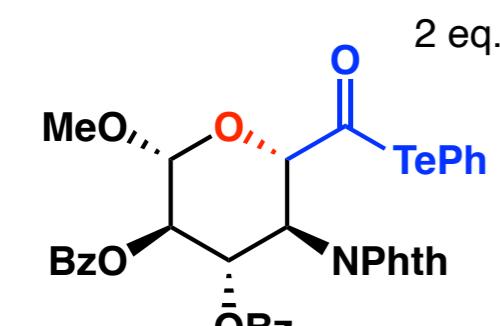


Radical-radical coupling strategies for the synthesis of contiguously substituted polyol structures.

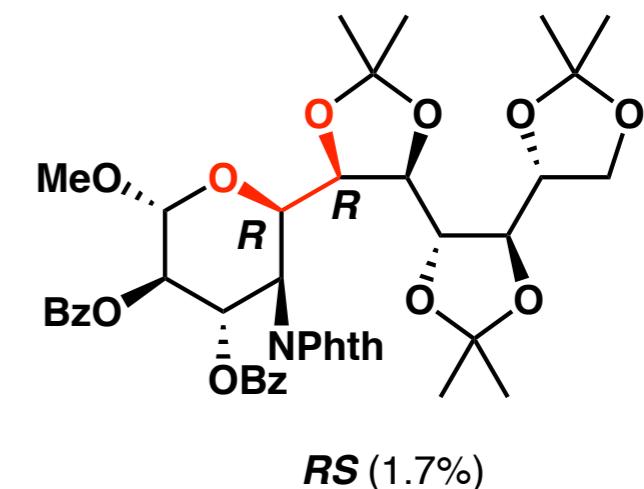
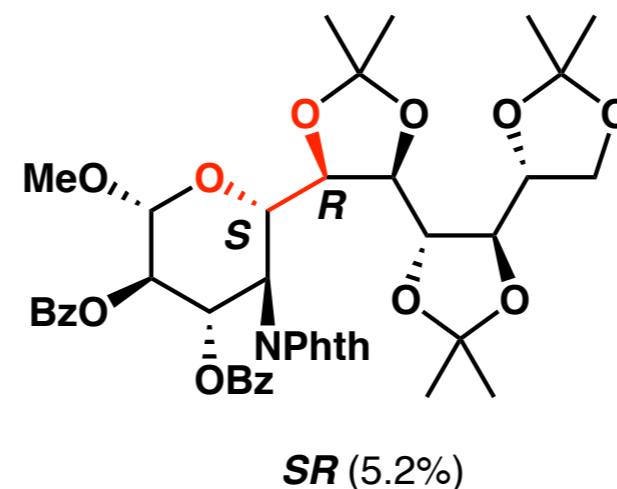
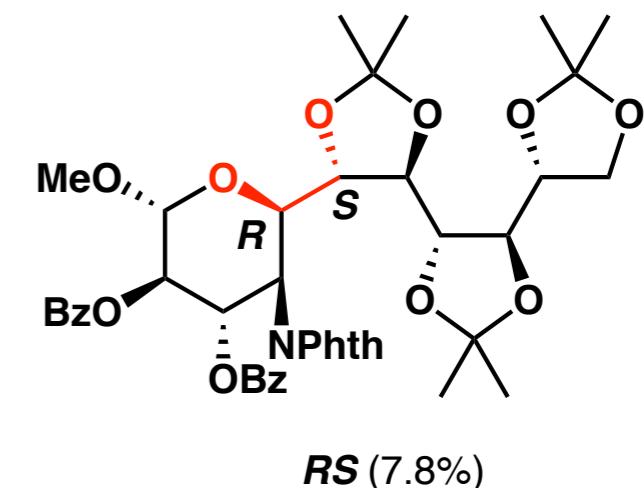
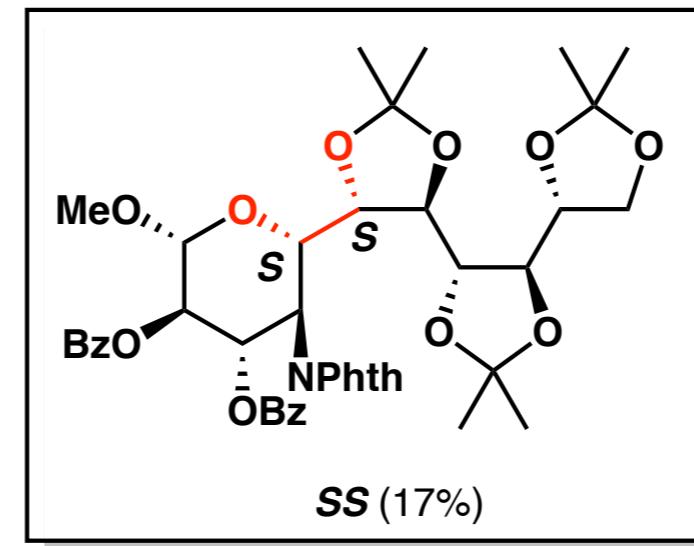
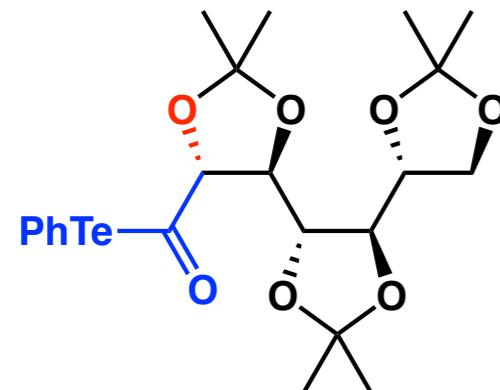


1. Development of new synthetic methodologies for total synthesis

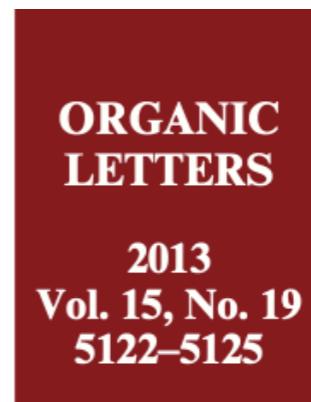
Radical-radical cross-coupling reaction for the synthesis of the hikizimycin carbon chain SS



Et₃B (15 eq.), air
Benzene/DCM, rt

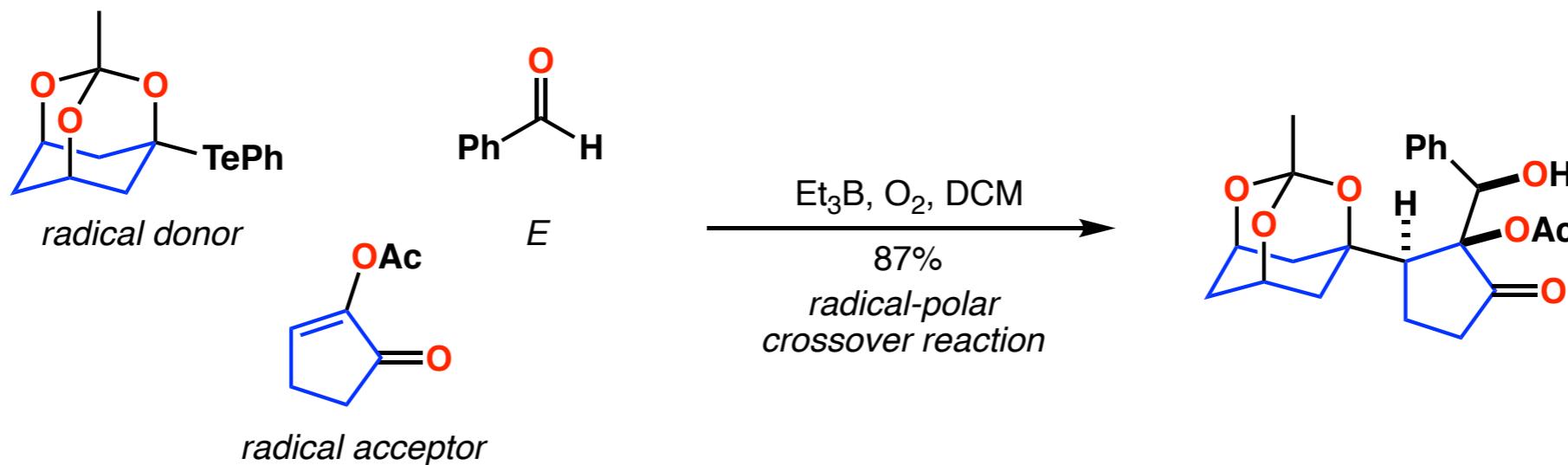


1. Development of new synthetic methodologies for total synthesis



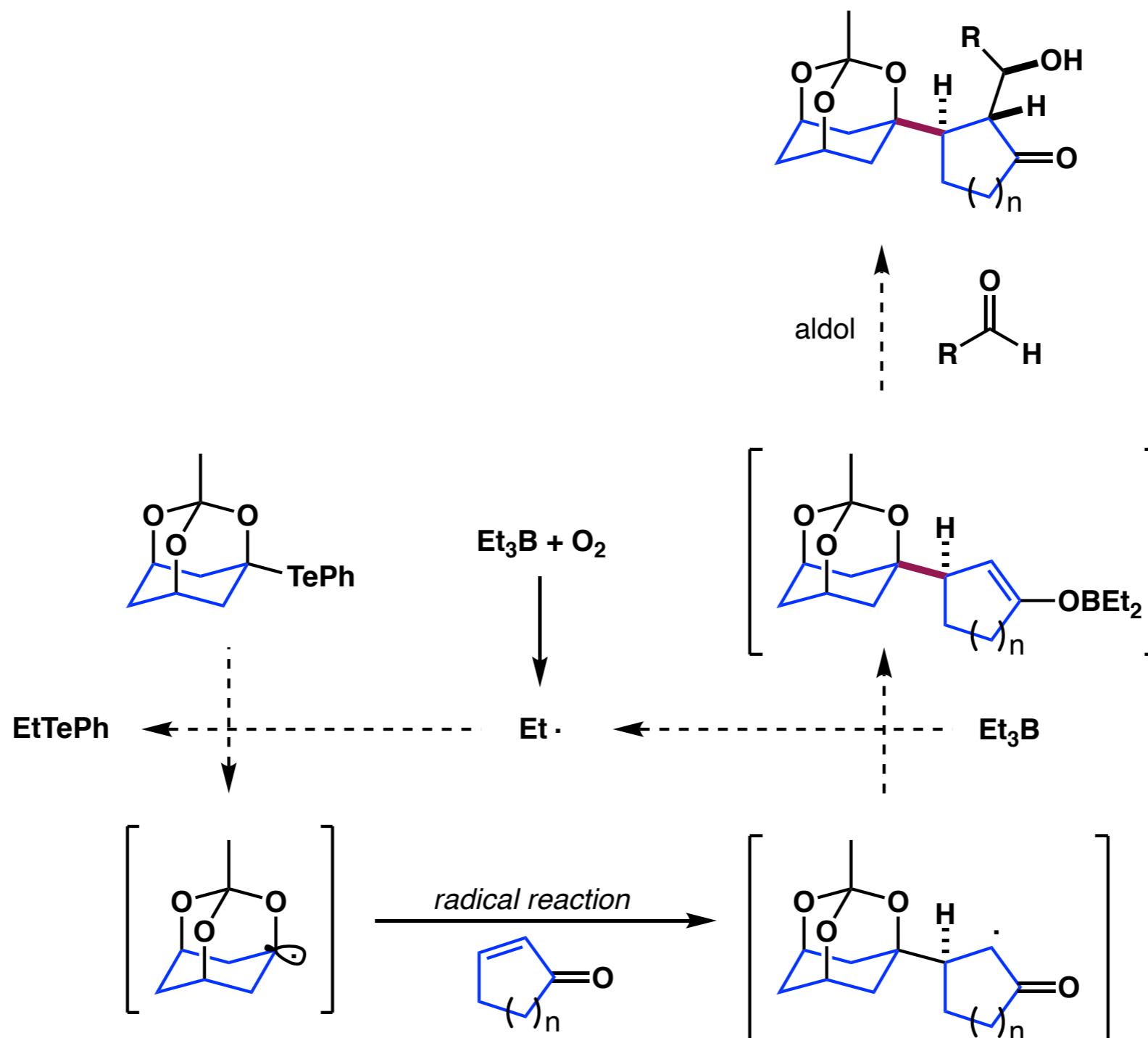
Et₃B-Mediated Radical-Polar Crossover Reaction for Single-Step Coupling of O, Te-Acetal, α,β -Unsaturated Ketones, and Aldehydes/Ketones

Daigo Kamimura, Daisuke Urabe, Masanori Nagatomo, and Masayuki Inoue*



Et₃B-mediated three-component coupling reaction between O,Te-acetal, α,β -unsaturated ketones, and aldehydes/ketones.

1. Development of new synthetic methodologies for total synthesis



Proposed mechanism.

2. Total synthesis of highly oxygenated polycyclic natural products

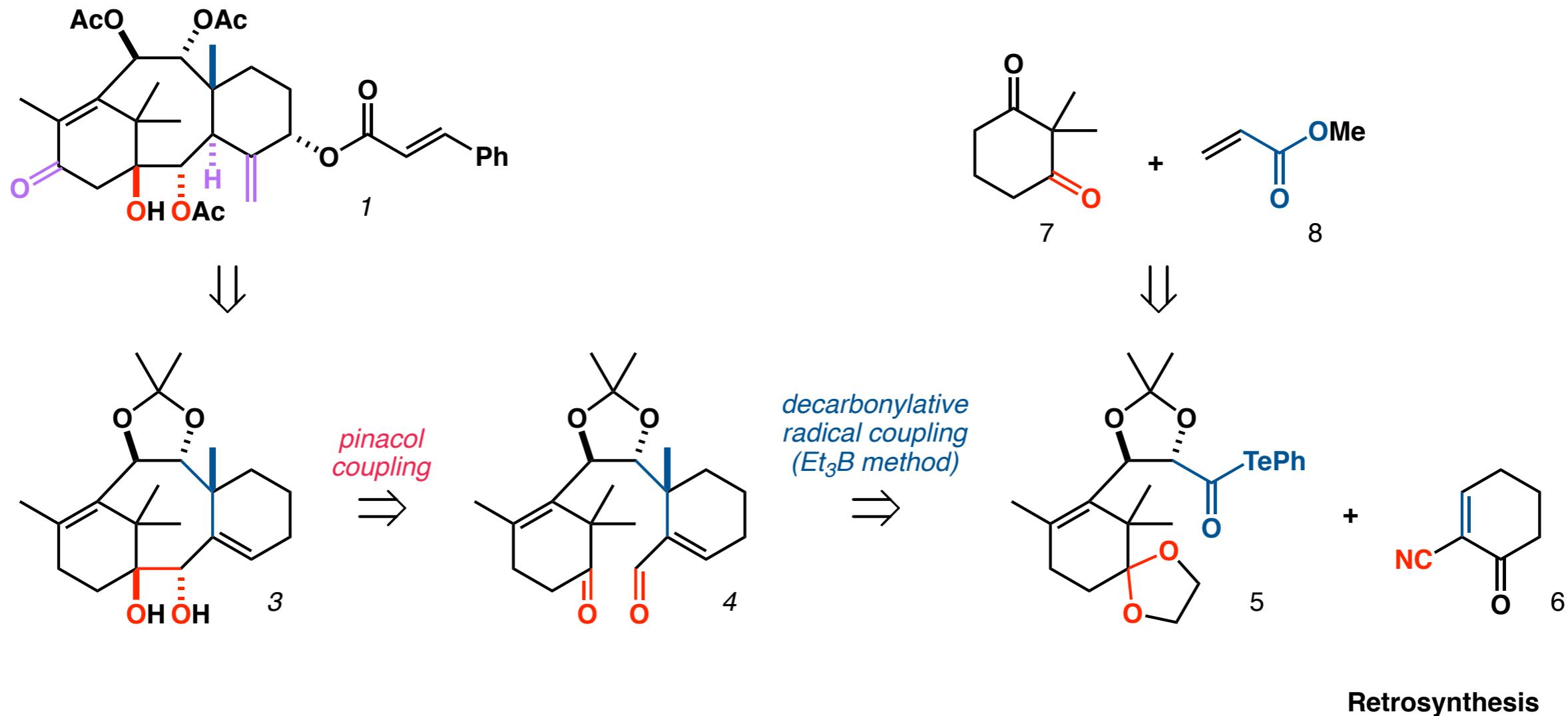


Natural Products Hot Paper

International Edition: DOI: 10.1002/anie.201906872
German Edition: DOI: 10.1002/ange.201906872

Total Synthesis of 1-Hydroxytaxinine

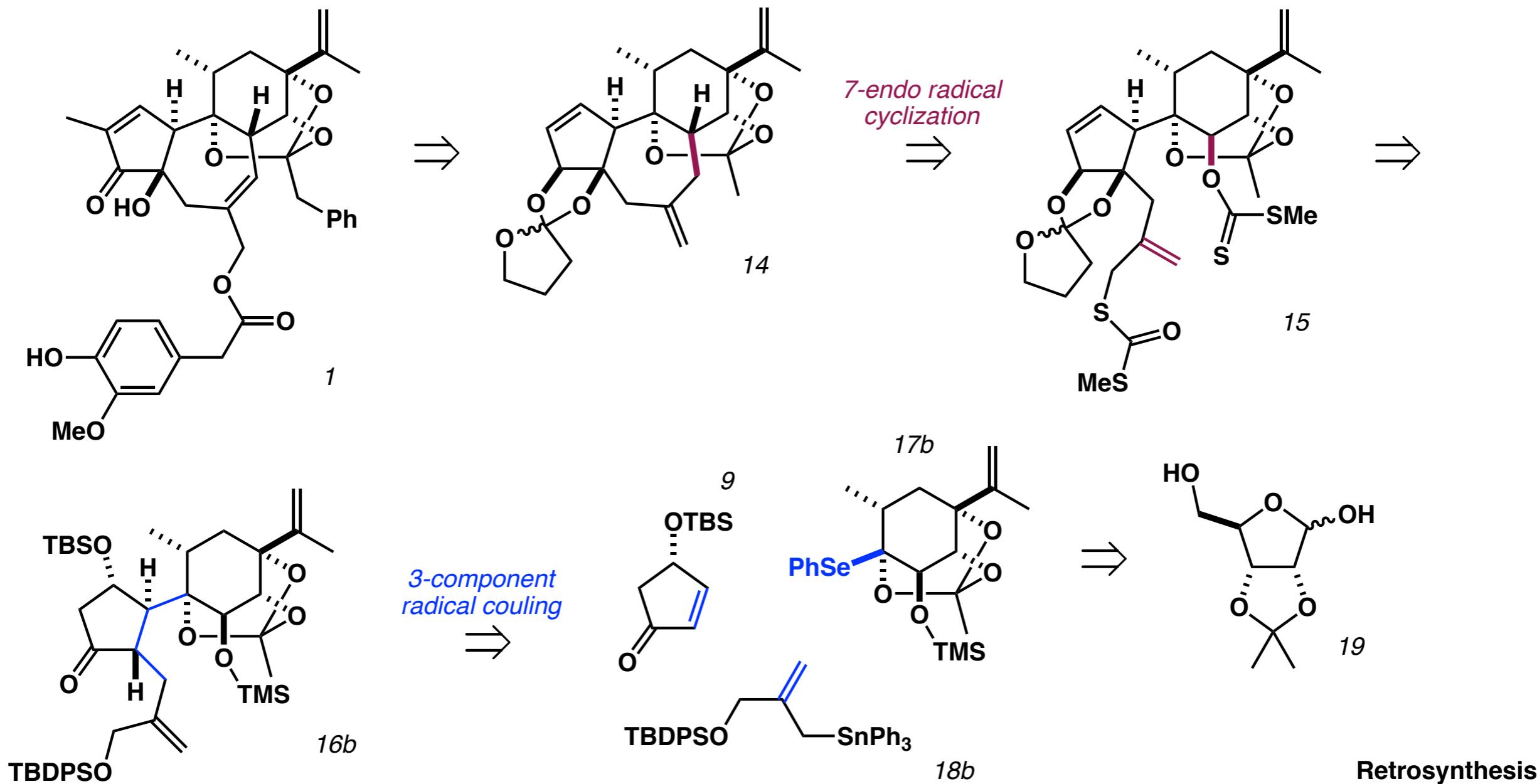
Yusuke Imamura⁺, Shun Yoshioka⁺, Masanori Nagatomo, and Masayuki Inoue*



2. Total synthesis of highly oxygenated polycyclic natural products

Total Synthesis of Resiniferatoxin Enabled by Radical-Mediated Three-Component Coupling and 7-*endo* Cyclization

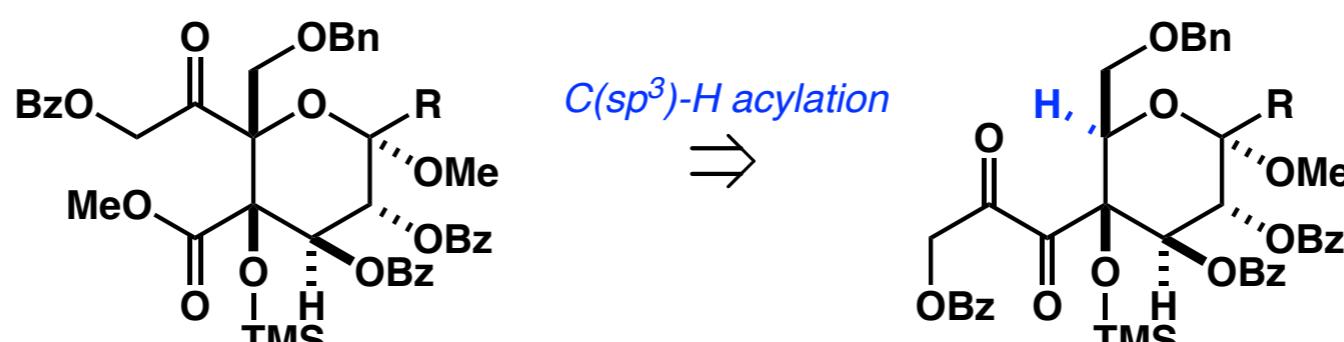
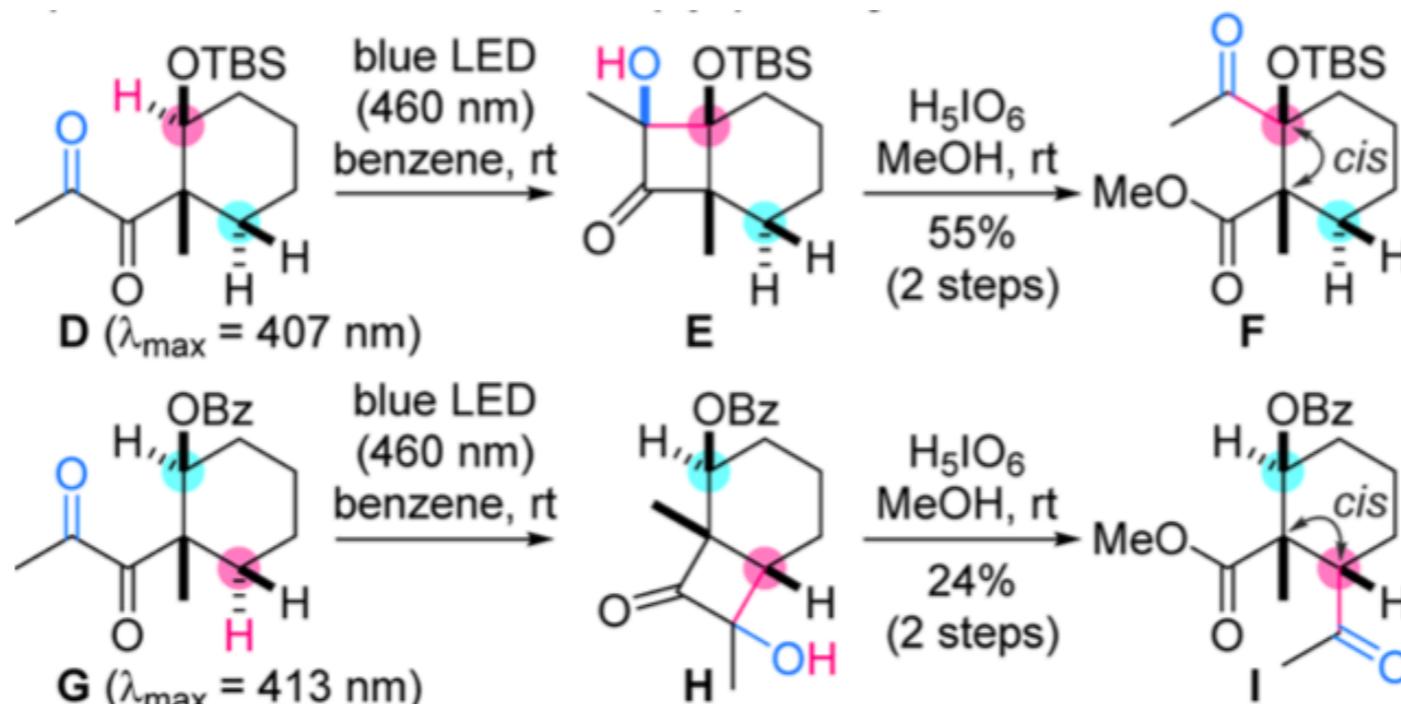
Satoshi Hashimoto, Shun-ichiro Katoh, Takehiro Kato, Daisuke Urabe,[†] and Masayuki Inoue*^{ID}



2. Total synthesis of highly oxygenated polycyclic natural products

Total Synthesis of Zaragozic Acid C: Implementation of Photochemical C(sp³)–H Acylation

Takahiro Kawamata, Masanori Nagatomo,^{id} and Masayuki Inoue^{*id}



Key step of retrosynthesis

2. Total synthesis of highly oxygenated polycyclic natural products

Chemical
Science



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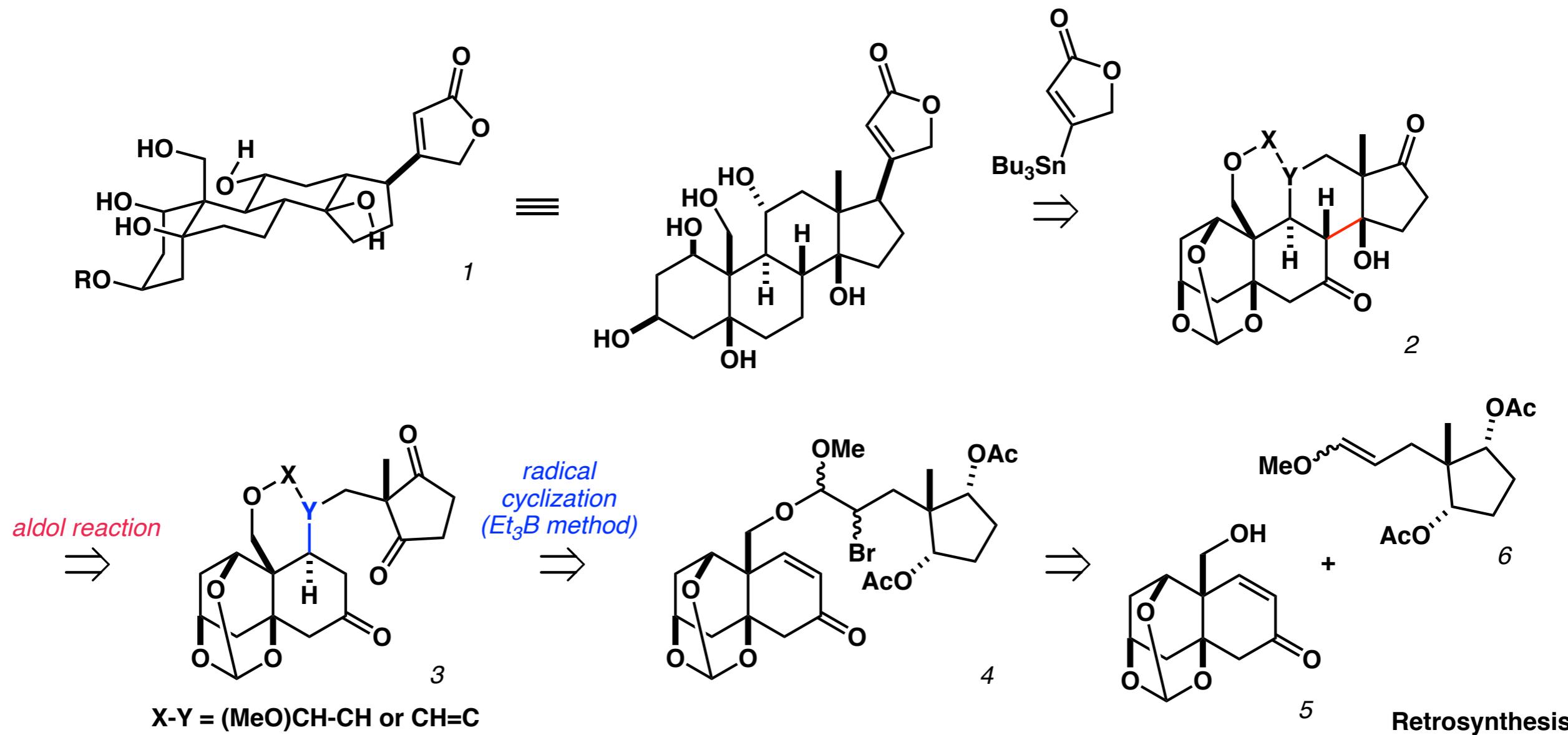
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Cite this: *Chem. Sci.*, 2015, **6**, 3383

A convergent total synthesis of ouabagenin†

Ken Mukai, Satoshi Kasuya, Yuki Nakagawa, Daisuke Urabe and Masayuki Inoue*



2. Total synthesis of highly oxygenated polycyclic natural products



Contents lists available at ScienceDirect

Tetrahedron Letters

journal homepage: www.elsevier.com/locate/tetlet



A concise route to the C_2 -symmetric tricyclic skeleton of ryanodine

Koji Hagiwara^{a,b}, Masafumi Himuro^b, Masahiro Hirama^b, Masayuki Inoue^{a,*}

Chemical Science

RSC Publishing

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Symmetry-driven synthesis of 9-demethyl-10,15-dideoxyryanodolt

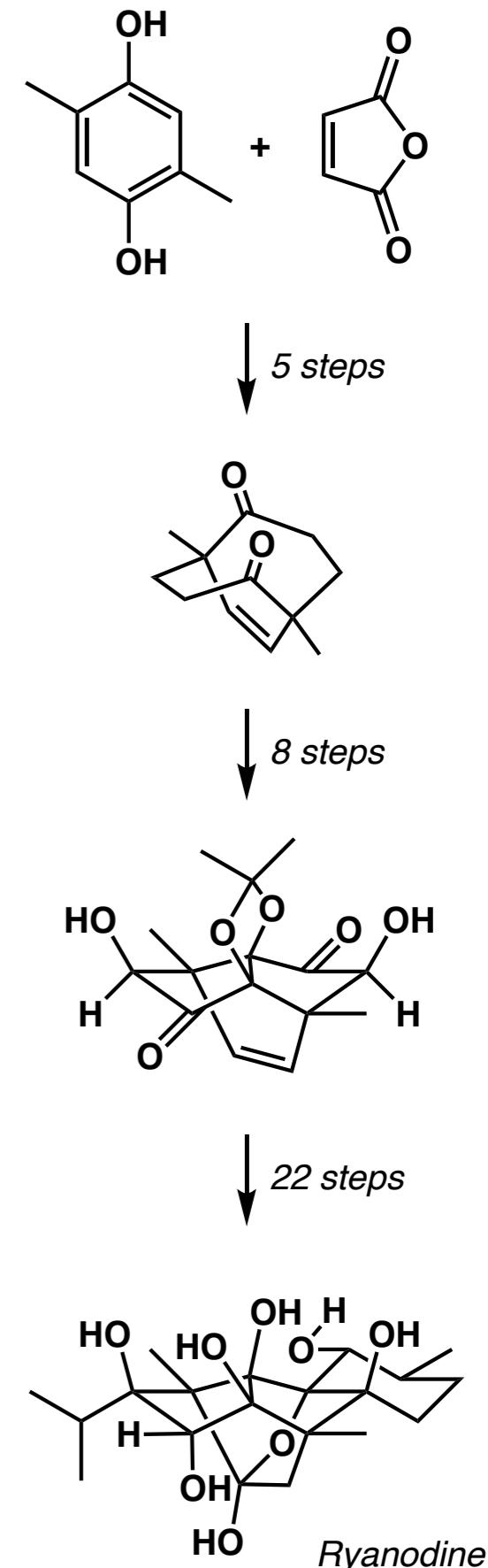
Cite this: *Chem. Sci.*, 2013, 4, 1615

Daisuke Urabe, Masanori Nagatomo, Koji Hagiwara, Kengo Masuda
and Masayuki Inoue*

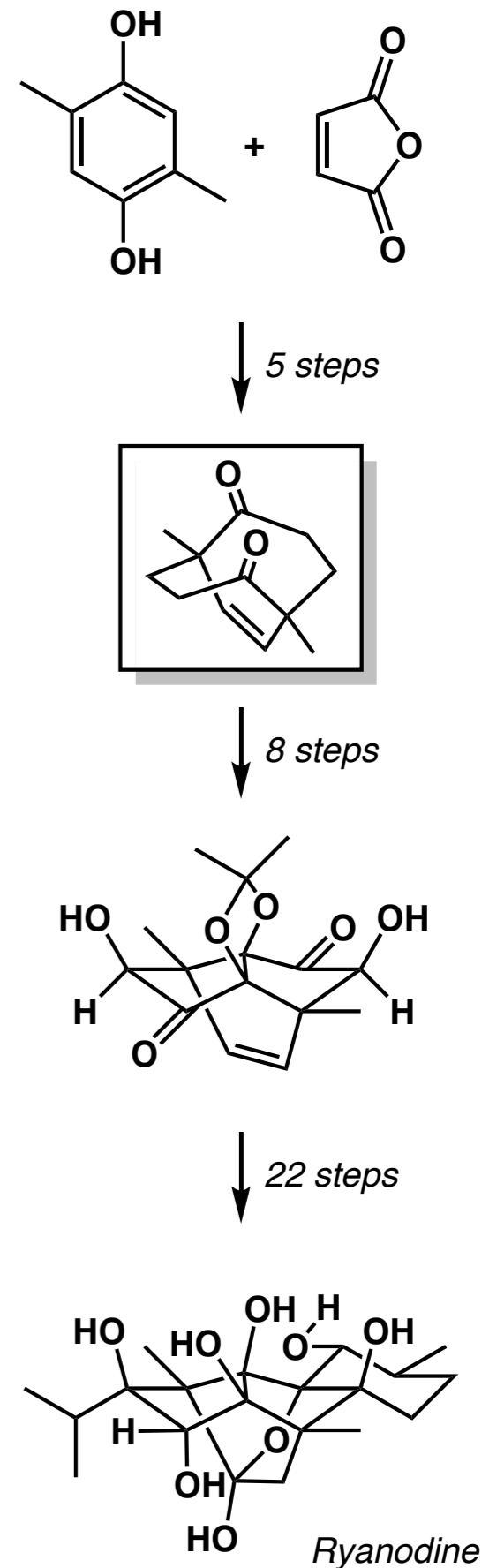
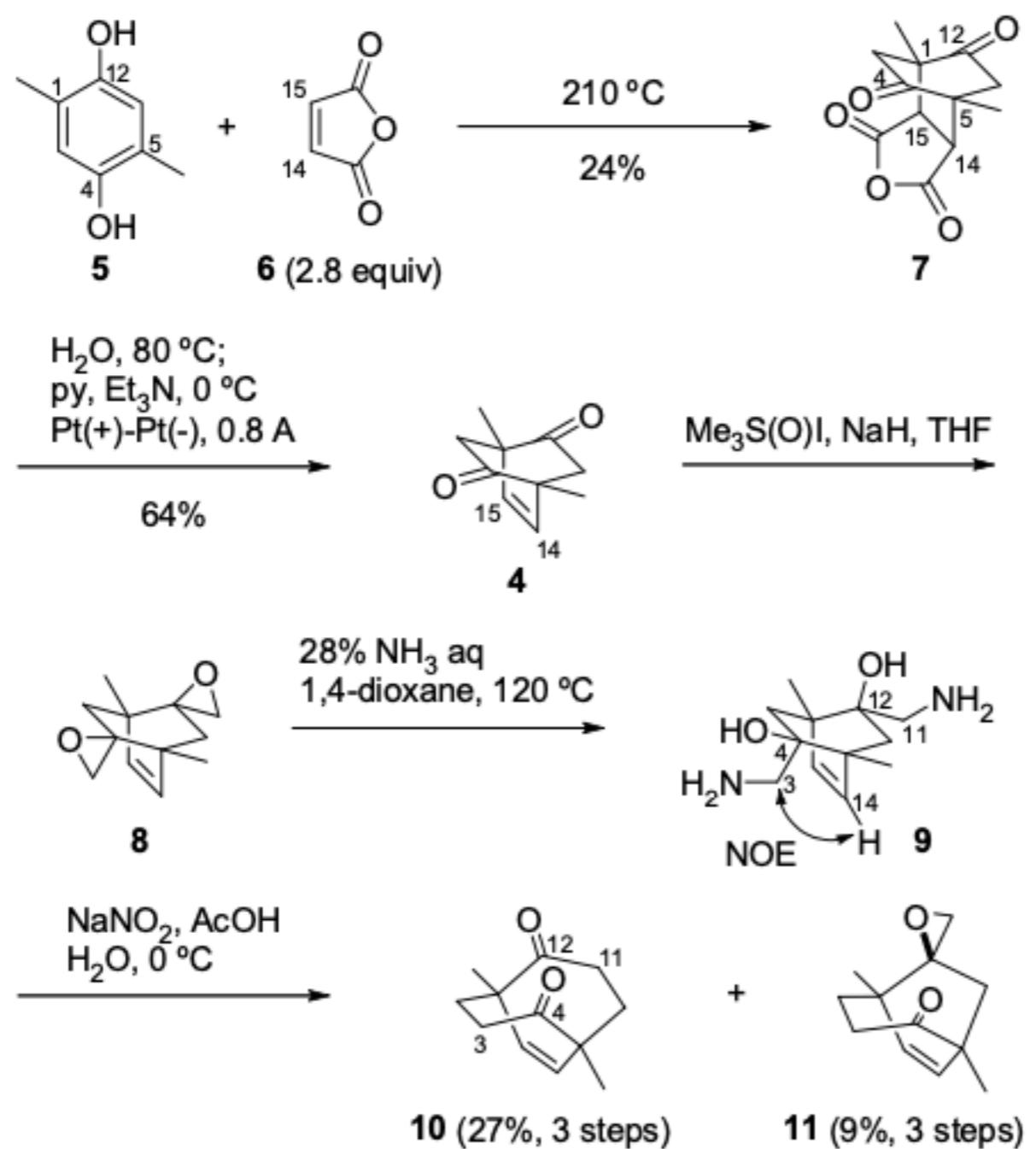
J|A|C|S
JOURNAL OF THE AMERICAN CHEMICAL SOCIETY

Total Synthesis of Ryanodol

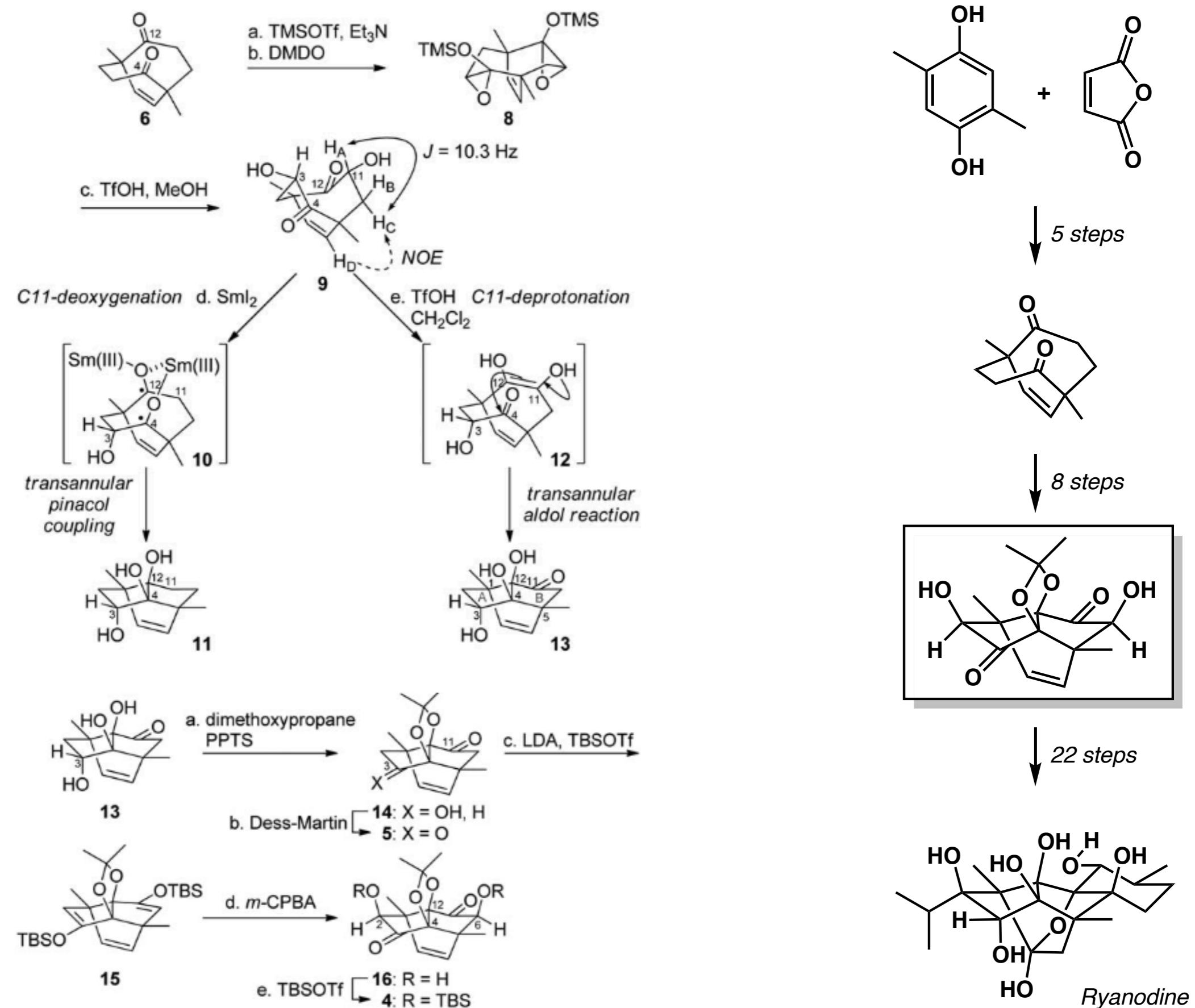
Masanori Nagatomo, Masaki Koshimizu, Kengo Masuda, Toshiki Tabuchi, Daisuke Urabe,
and Masayuki Inoue*



2. Total synthesis of highly oxygenated polycyclic natural products



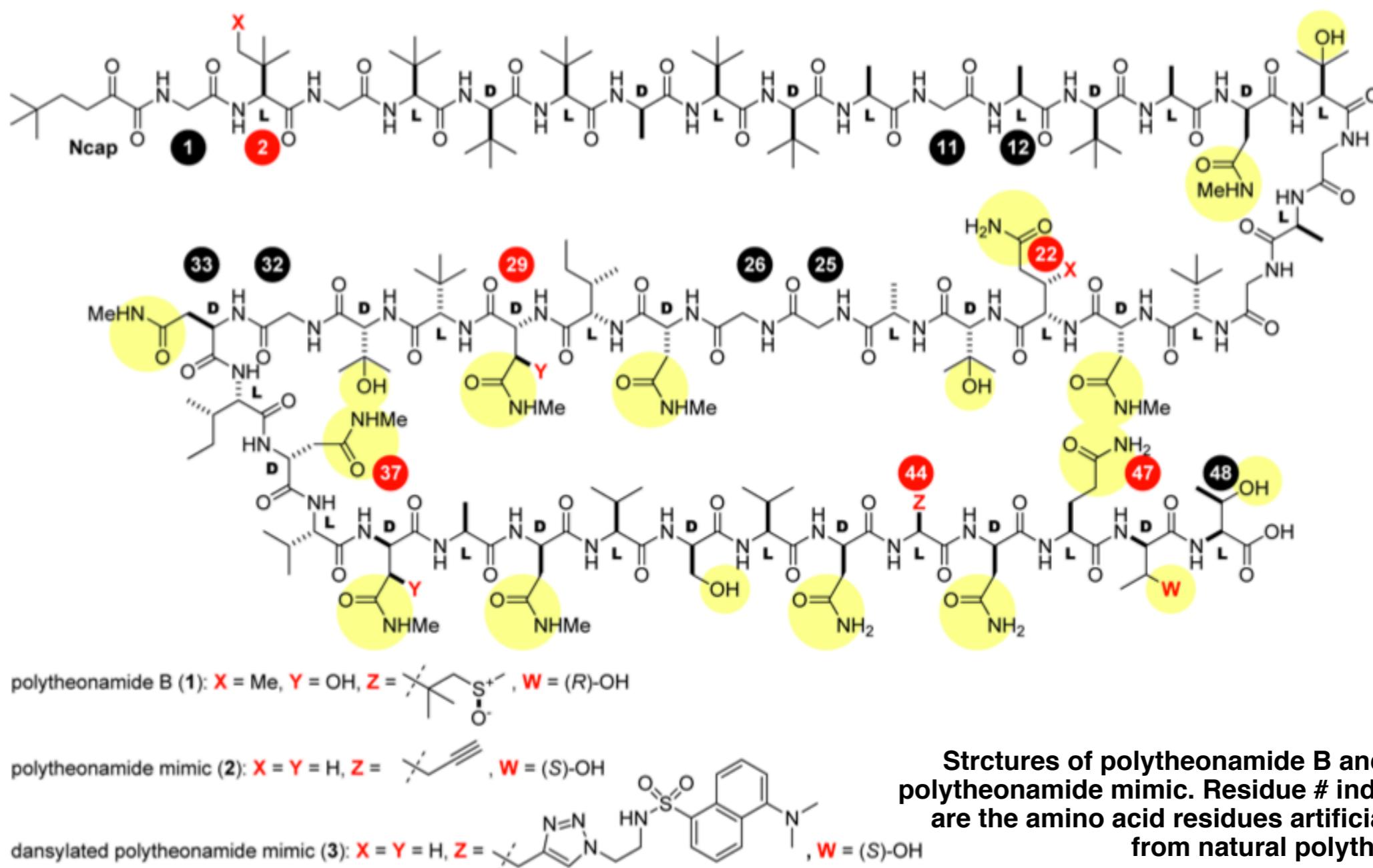
2. Total synthesis of highly oxygenated polycyclic natural products



3. Total synthesis and functional analysis of ion channel-forming molecules

Design, Synthesis and Functional Analysis of Dansylated Polytheonamide Mimic: An Artificial Peptide Ion Channel

Hiroaki Itoh,[†] Shigeru Matsuoka,[†] Mohamed Kreir,[‡] and Masayuki Inoue^{*,†}



3. Total synthesis and functional analysis of ion channel-forming molecules

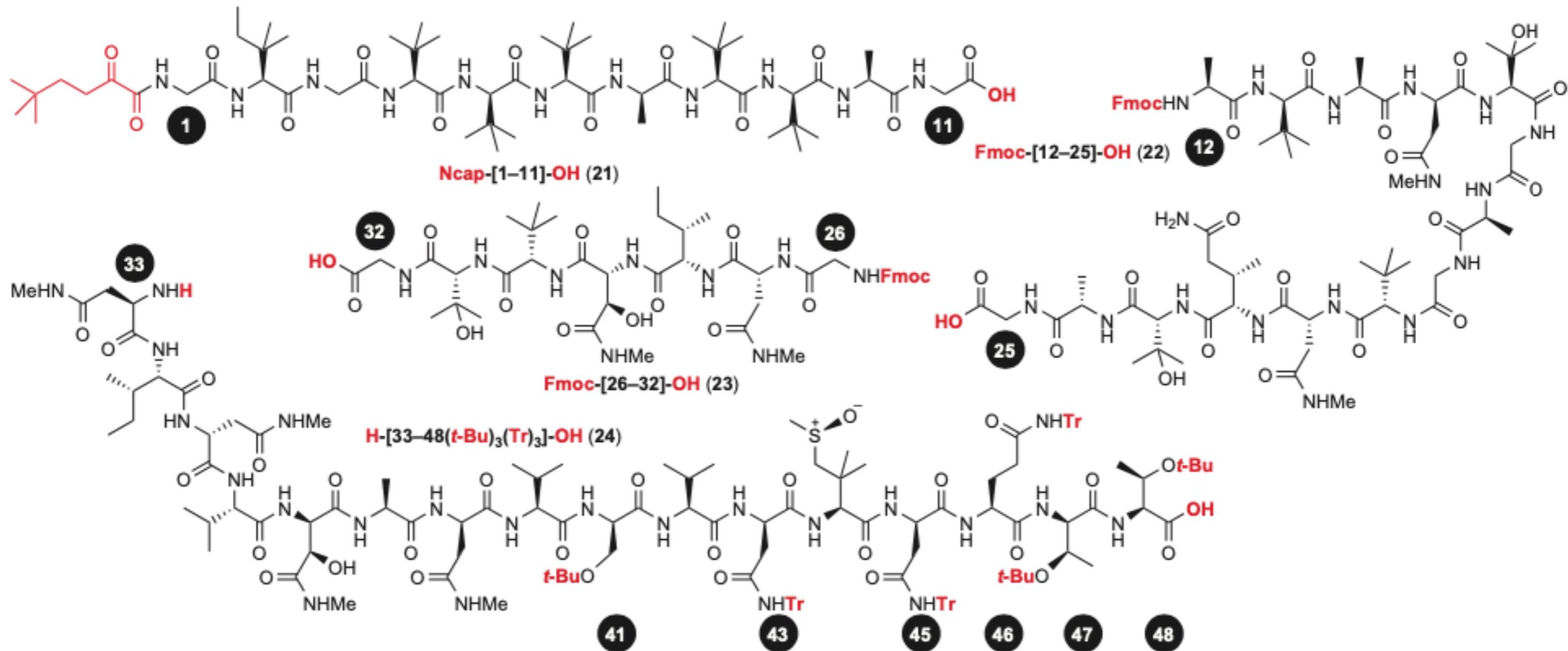
ARTICLES

PUBLISHED ONLINE: 21 FEBRUARY 2010 | DOI: 10.1038/NCHEM.554

nature
chemistry

Total synthesis of the large non-ribosomal peptide polytheonamide B

Masayuki Inoue*, Naoki Shinohara, Shintaro Tanabe, Tomoaki Takahashi, Ken Okura, Hiroaki Itoh,
Yuki Mizoguchi, Maiko Iida, Nayoung Lee and Shigeru Matsuoka

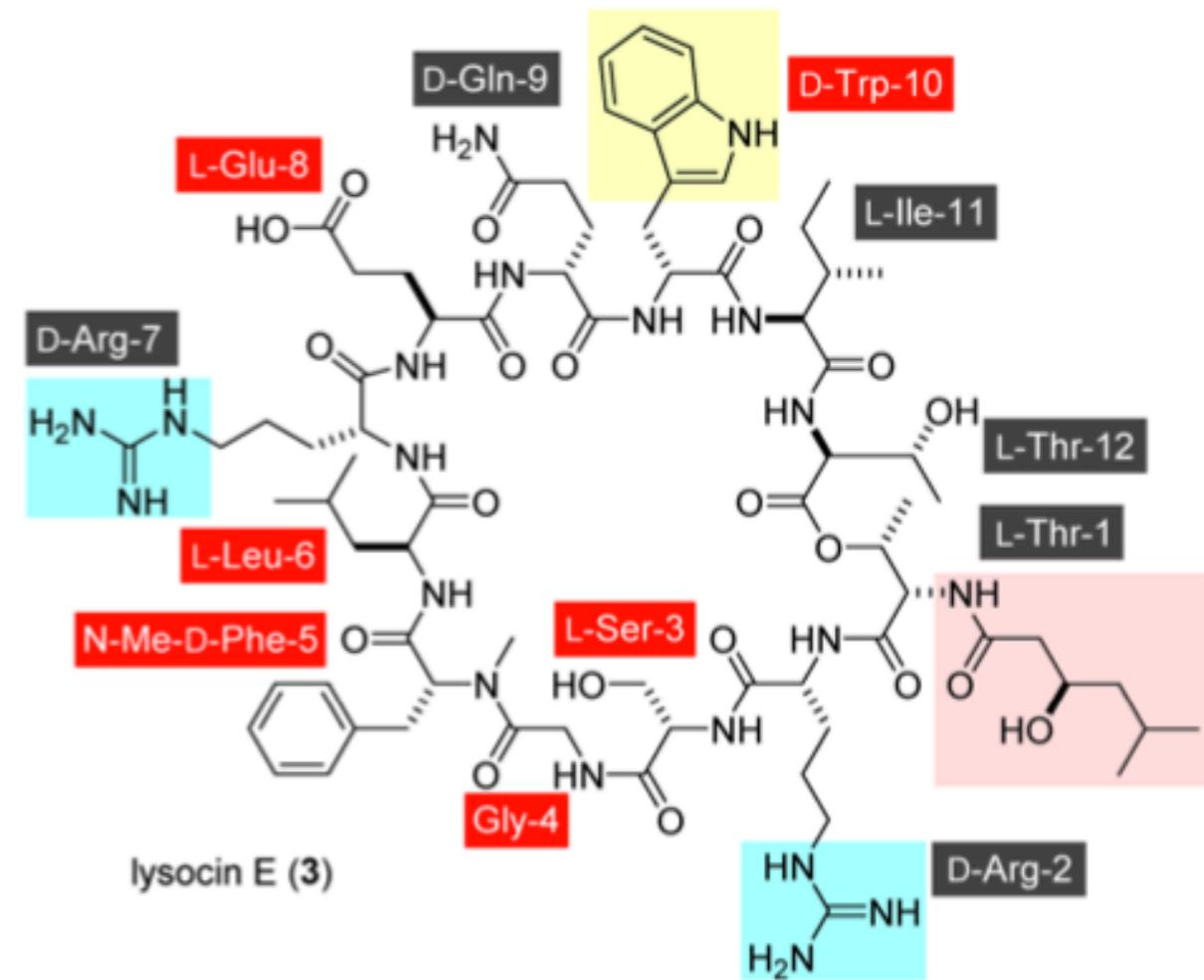
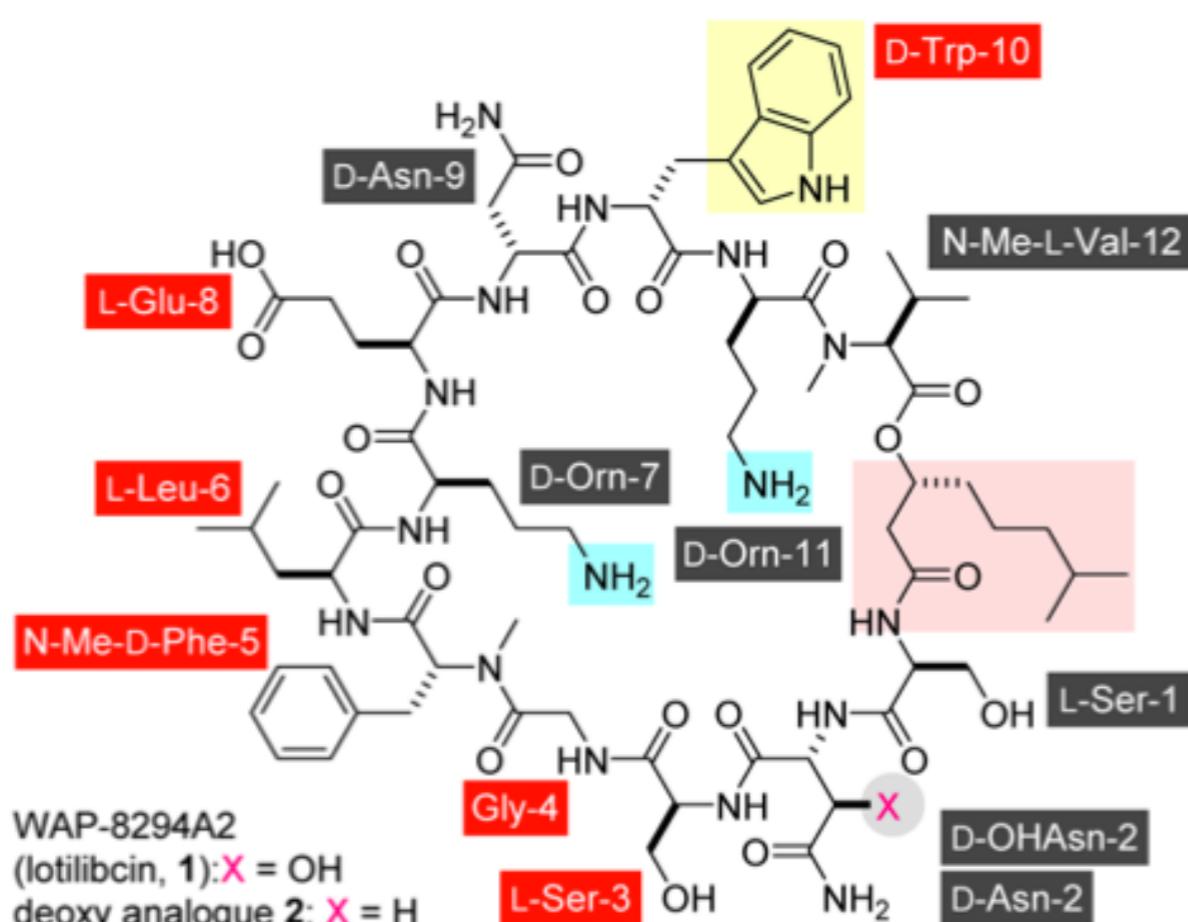


Four peptide segments for the total synthesis of polytheonamide

4. Total synthesis and functional analysis of antimicrobial molecules

Total Synthesis and Biological Mode of Action of WAP-8294A2: A Menaquinone-Targeting Antibiotic

Hiroaki Itoh,[†] Kotaro Tokumoto,[†] Takuya Kaji,[†] Atmika Paudel,[‡] Suresh Panthee,[‡] Hiroshi Hamamoto,[‡] Kazuhisa Sekimizu,[‡] and Masayuki Inoue^{*,†}



■ hydrophobic acyl chain ■ cationic functional group ■ indole ring

Structures of WAP-8294A2(botilicin, 1), deoxy analogue (2), and lysocin E (3).

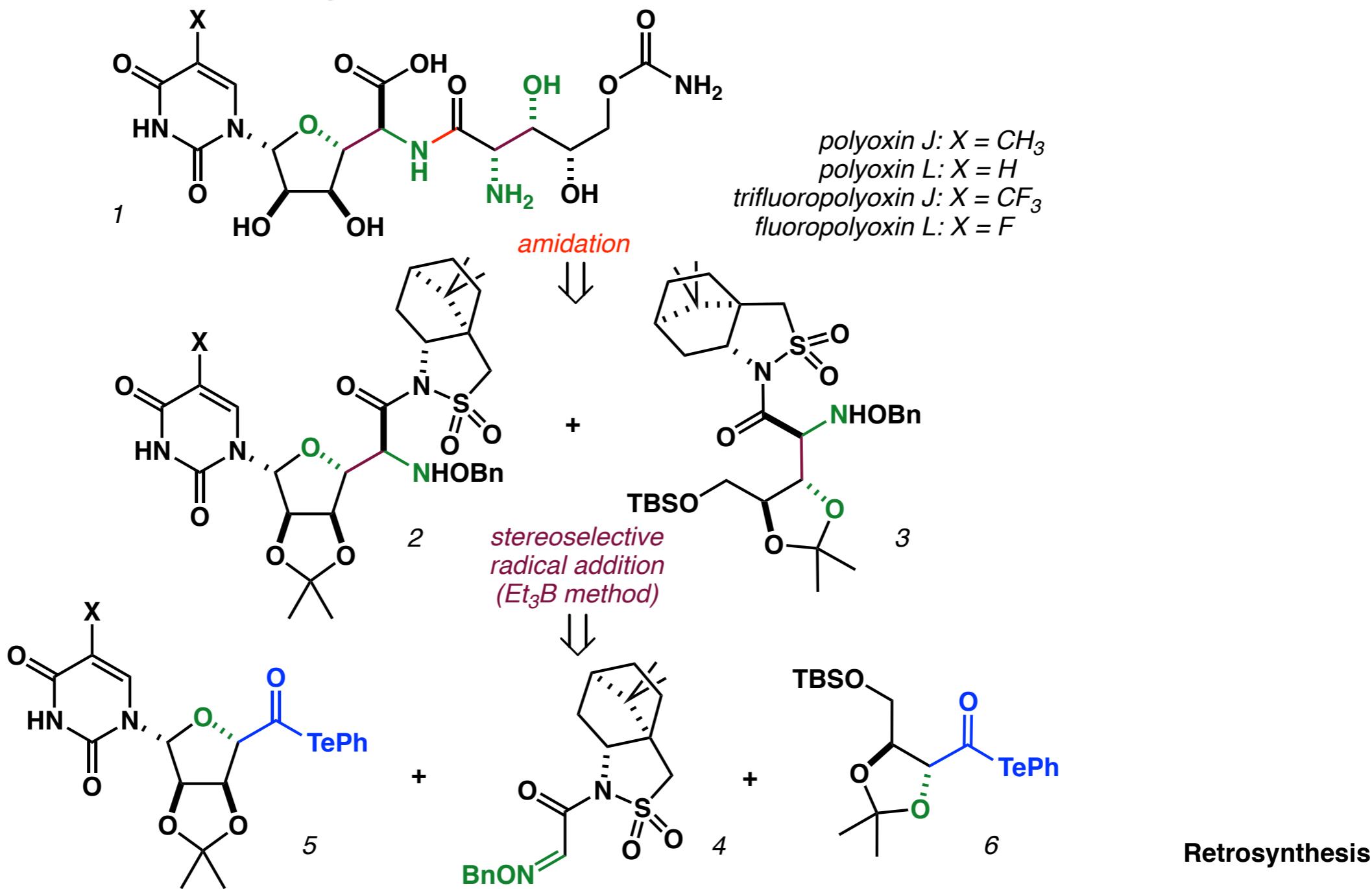
4. Total synthesis and functional analysis of antimicrobial molecules

Total Synthesis

International Edition: DOI: 10.1002/anie.201706671
 German Edition: DOI: 10.1002/ange.201706671

Unified Total Synthesis of Polyoxins J, L, and Fluorinated Analogues on the Basis of Decarbonylative Radical Coupling Reactions

Haruka Fujino, Masanori Nagatomo, Atmika Paudel, Suresh Panthee, Hiroshi Hamamoto, Kazuhisa Sekimizu, and Masayuki Inoue*



Questions?