

Curriculum Vitae

Education / Career

2006.3 **BS**

Department of Pharmaceutical Sciences, The University of Tokyo
Under the supervision of Prof. Masakatsu Shibasaki

2008.3 **Master**

Graduate School of Pharmaceutical Sciences, The University of Tokyo
Under the supervision of Prof. Masakatsu Shibasaki

2011.3 **Ph.D.**

Graduate School of Pharmaceutical Sciences, The University of Tokyo
Under the supervision of Prof. Masakatsu Shibasaki (2008.3-2010.3)
Under the supervision of Prof. Motomu Kanai (2010.4-2011.3)

2011.4-2017.12 **Assistant Professor**

Graduate School of Pharmaceutical Sciences, The University of Tokyo (Prof.
Motomu Kanai)

2012.7-2012.9 **Visiting Scientist**

Department of Chemistry, University of Cambridge
Under the supervision of Prof. Matthew J. Gaunt

2018.1-present **Lecturer**

Department of Chemistry, Faculty of Science, Hokkaido University (Prof.
Masaya Sawamura)

2019.4-present **Lecturer**

Institute for Chemical Reaction Design and Discovery (WPI-ICReDD),
Hokkaido University (Prof. Masaya Sawamura)

Membership

Pharmaceutical Society of Japan

Society of Synthetic Organic Chemistry of Japan

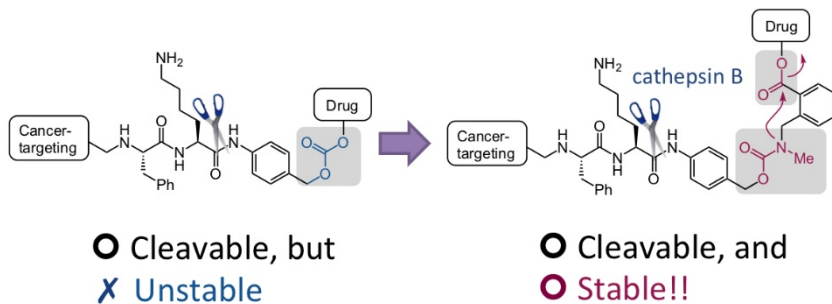
The Chemical Society of Japan

Awards

1. Best Poster Prize @ Frontiers in Chemistry, Armenia (ArmChemFront 2013)
2. TORAY Award in Synthetic Organic Chemistry, Japan (2015) 「ホウ素触媒と遷移金属触媒の協奏的効果によるカルボン酸の化学選択的修飾反応の開発」
3. 若い世代の特別講演証 (The Chemical Society of Japan Lecture Award) (日本化学会第 98 春季年会 (2018)) 「一価銅触媒の特性を活かした化学選択的反応の開発」
4. 日本薬学会 奨励賞 (the Pharmaceutical Society of Japan Award for Young Scientists) (2019.3.20) 「触媒の特性を活かした化学選択的反応の開発」
5. Thieme Chemistry Journals Award (2020)

Publication

1. Copper-Catalyzed Enantioselective Conjugate Reduction of α,β -Unsaturated Esters with Phenol-Carbene Chiral Ligand
S. Mimura, S. Mizushima, **Y. Shimizu**, M. Sawamura*
Beilstein J. Org. Chem. **2020**, xxx, xx–xx.
2. A Stable and Cleavable *O*-Linked Spacer for Drug Delivery Systems
K. Ito, T. Tatsumi, K. Takahashi, **Y. Shimizu**, K. Yamatsugu, M. Kanai*
Chem. Pharm. Bull. **2020**, 68, 212–215. DOI: 10.1248/cpb.c19-00376



3. Boron-Catalyzed α -Amination of Carboxylic Acids
T. Morisawa, M. Sawamura, * **Y. Shimizu***
Org. Lett. **2019**, 18, 7466–7469. DOI: 10.1021/acs.orglett.9b02769

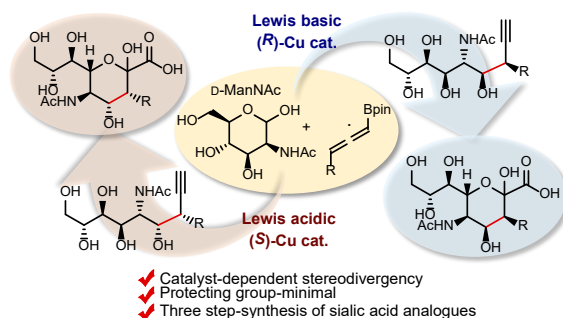


*Most read articles (1 month) (2019/Sep) of *Org. Lett.*

4. Copper(I)-Catalyzed Stereodivergent Propargylation of *N*-Acetyl Mannosamine for Protecting-Group-Minimal Synthesis of C3-Substituted Sialic Acids

K. Ishizawa, S. Majima, X.-F. Wei, H. Mitsunuma, **Y. Shimizu,*** M. Kanai*

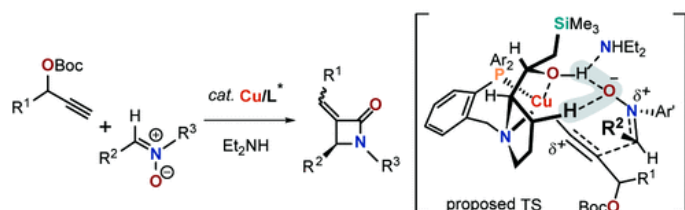
J. Org. Chem. **2019**, *84*, 10615–10628. DOI: 10.1021/acs.joc.9b00887



5. Asymmetric Synthesis of α -Alkylidene- β -Lactams through Copper Catalysis with a Prolinol-Phosphine Chiral Ligand

K. Imai, Y. Takayama, H. Murayama, H. Ohmiya, **Y. Shimizu,** M. Sawamura*

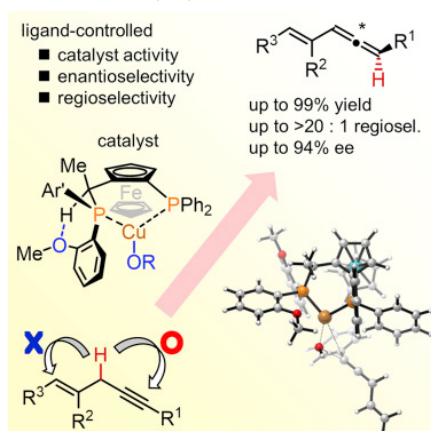
Org. Lett. **2019**, *21*, 1717–1721. DOI: 10.1021/acs.orglett.9b00276



6. Catalytic Regio- and Enantioselective Proton Migration from Skipped Enynes to Allenes

X.-F. Wei, T. Wakaki, T. Itoh, H.-L. Li, T. Yoshimura, A. Miyazaki, K. Oisaki, M. Hatanaka,* **Y. Shimizu,*** M. Kanai*

Chem **2019**, *5*, 585–599. DOI: 10.1016/j.chempr.2018.11.022



*Featured by Univ. of Tokyo/Hokkaido Univ./ NAIST press release

(https://www.hokudai.ac.jp/news/190111_pr.pdf)

7. Chemo- and Enantioselective Pd/B Hybrid Catalysis for the Construction of Acyclic Quaternary Carbons: Migratory Allylation of *O*-Allyl Esters to α -*C*-Allyl Carboxylic Acids

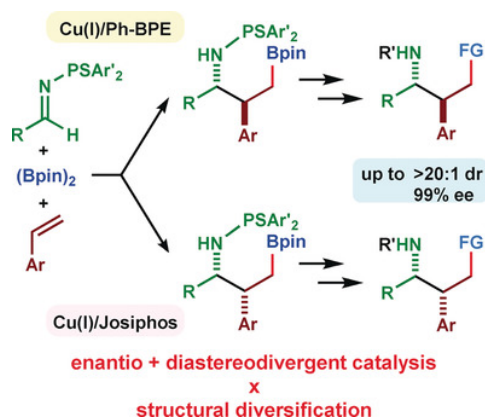
T. Fujita, T. Yamamoto, Y. Morita, H. Chen, **Y. Shimizu,*** M. Kanai*
J. Am. Chem. Soc. **2018**, *140*, 5899-5903. DOI: 10.1021/jacs.8b02783



*Most read articles (1 month) (2018/May) of *J. Am. Chem. Soc.*

8. Copper-Catalyzed Enantio- and Diastereodivergent Borylative Coupling of Styrenes and Imines

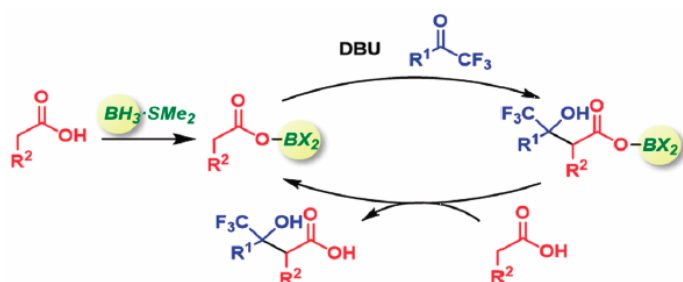
T. Itoh, Y. Kanzaki, **Y. Shimizu,*** M. Kanai*
Angew. Chem. Int. Ed. **2018**, *57*, 8265-8269. DOI: 10.1002/anie.201804117



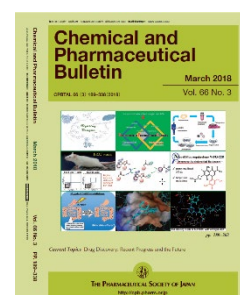
*Featured by SYNFACTS: Synfacts **2018**, *14*, 953. DOI:10.1055/s-0037-1610587

9. Boron-Catalyzed Carboxylic Acid-Selective Aldol Reaction with Trifluoromethyl Ketones

K. Ishizawa, H. Nagai, **Y. Shimizu,*** M. Kanai*
Chem. Pharm. Bull. **2018**, *66*, 231-234. DOI: 10.1248/cpb.c17-00545



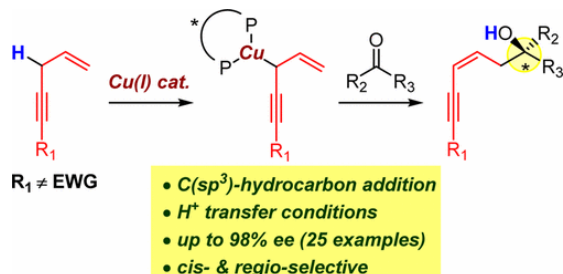
*Selected as one of the cover pictures.



10. Copper(I)-Catalyzed Enantioselective Addition of Enynes to Ketones

X.-F. Wei, X.-W. Xie, **Y. Shimizu,*** M. Kanai*

J. Am Chem. Soc. **2017**, *139*, 4647-4650. DOI: 10.1021/jacs.7b01254

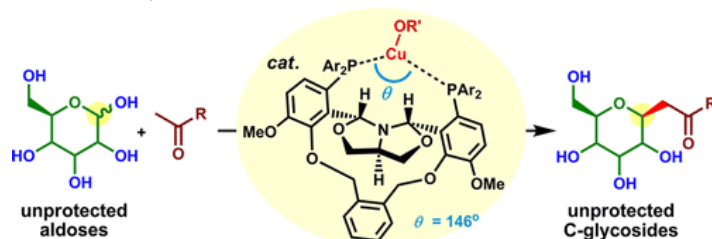


*Most read articles (1 month) (2017/April) of *J. Am. Chem. Soc.*

11. Copper(I)-Catalyzed Dehydrative C-Glycosidation of Unprotected Pyranoses with Ketones

X.-F. Wei, S.-L. Shi, X.-W. Xie, **Y. Shimizu,*** M. Kanai*

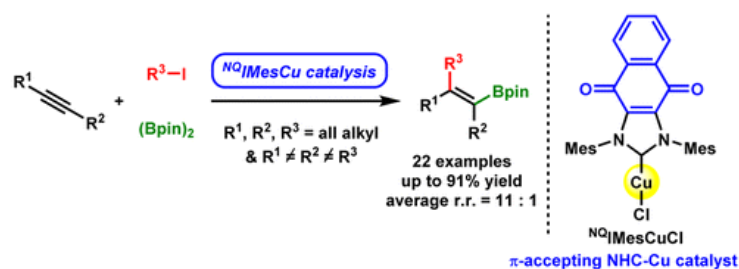
ACS Catalysis **2016**, *6*, 6718-6722. DOI: 10.1021/acscatal.6b02106



12. Ligand-Enabled, Copper-Catalyzed Regio- and Stereoselective Synthesis of Trialkylsubstituted Alkenylboronates from Unactivated Internal Alkynes

T. Itoh, **Y. Shimizu,** M. Kanai*

J. Am Chem. Soc. **2016**, *138*, 7528-7531. DOI: 10.1021/jacs.6b04646



*Featured by Department News

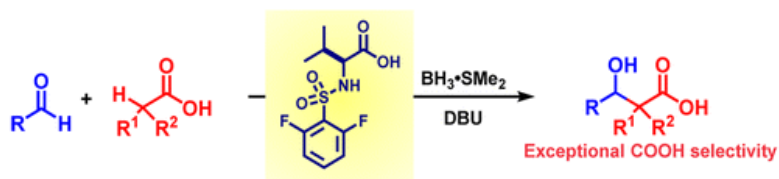
(<http://www.f.u-tokyo.ac.jp/news.html?key=1465524032>)

*Most read articles (1 month) (2016/June) of *J. Am. Chem. Soc.*

13. Ligand Promoted, Boron Mediated Chemoselective Carboxylic Acid Aldol Reaction

H. Nagai, Y. Morita, **Y. Shimizu,*** M. Kanai*

Org. Lett. **2016**, *18*, 2276-2279. DOI: 10.1021/acs.orglett.6b00914

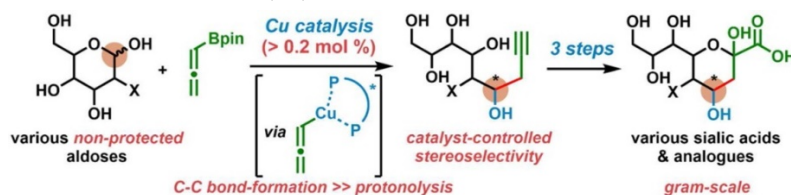


*Featured by SYNFACTS: Synfacts **2016**, *12*, 734. DOI:10.1055/s-0035-1562319

14. An Expedient Synthesis of Sialic Acid Derivatives by Copper(I)-Catalyzed Stereodivergent Propargylation of Unprotected Aldoses

X.-F. Wei, **Y. Shimizu**,* M. Kanai*

ACS Cent. Sci. **2016**, *2*, 21-26. DOI: 10.1021/acscentsci.5b00360



*Selected as cover picture.

*Highlighted on *ACS Central Science* (First Reactions) S. Hong, M. J. Krische *ACS Cent. Sci.* **2016**, *2*, 12-13. DOI:10.1021/acscentsci.6b00002

*Most read articles (1 month) (2016/January) of *ACS Central Science*

*Most read articles (12 months) (2016/May-Sep) of *ACS Central Science*

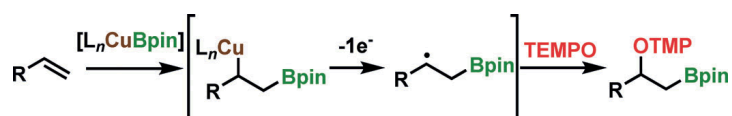
*Featured by Univ. of Tokyo press release

(http://www.f.u-tokyo.ac.jp/~kanai/news/wei_press.pdf)

15. Cu-Catalyzed Oxyboration of Unactivated Alkenes

T. Itoh, T. Matsueda, **Y. Shimizu**,* M. Kanai*

Chem. Eur. J. **2015**, *21*, 15955-15959. DOI:10.1002/chem.201503329

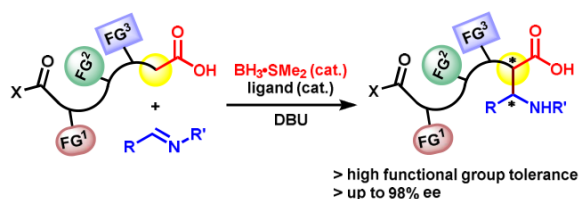


*Featured by SYNFACTS: Synfacts **2016**, *12*, 79. DOI: 10.1055/s-0035-1561019

16. Chemoselective Boron-Catalyzed Nucleophilic Activation of Carboxylic Acids for Mannich-Type Reactions

Y. Morita, T. Yamamoto, H. Nagai, **Y. Shimizu**,* M. Kanai *

J. Am. Chem. Soc. **2015**, *137*, 7075-7078. DOI:10.1021/jacs.5b04175



*Featured by UTokyo Research

(<http://www.u-tokyo.ac.jp/ja/utokyo-research/research-news/new-carboxylic-acid-selective-carbon-carbon-bond-forming-reactions.html>,

<http://www.u-tokyo.ac.jp/en/utokyo-research/research-news/new-carboxylic-acid-selective-carbon-carbon-bond-forming-reactions.html>), Department News

(<http://www.f.u-tokyo.ac.jp/news.html?key=1433120385>), Chem-Station

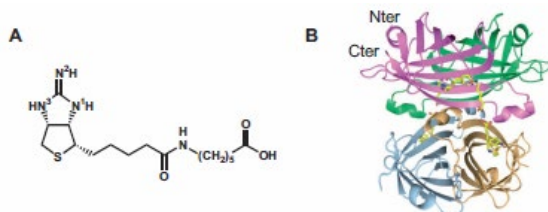
(<http://www.chem-station.com/blog/2015/07/activationcarboxylicacid.html>),

SYNFORM: Synform **2015/10**, A140–A143. DOI: 10.1055/s-0035-1560166

17. Structure-based design of a streptavidin mutant specific for an artificial biotin analogue

T. Kawato,^a E. Mizohata,^a **Y. Shimizu,^a** T. Meshizuka, T. Yamamoto, N. Takasu, M. Matsuoka, H. Matsumura, T. Kodama, M. Kanai, H. Doi,* T. Inoue,* A. Sugiyama*
J. Biol. Chem. **2015**, *6*, 467-475. DOI:10.1093/jb/mvv004

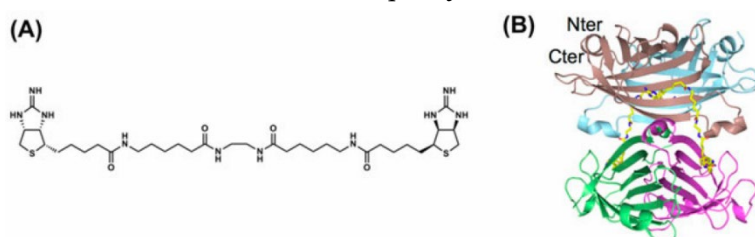
^aThese authors contributed equally to this work.



18. Structure-based design and synthesis of a bivalent iminobiotin analog showing strong affinity toward a low immunogenic streptavidin mutant

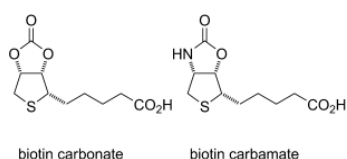
T. Kawato,^a E. Mizohata,^a **Y. Shimizu,^a** T. Meshizuka, T. Yamamoto, N. Takasu, M. Matsuoka, H. Matsumura, T. Kodama, M. Kanai, H. Doi,* T. Inoue,* A. Sugiyama*
Biosci. Biotechnol. Biochem. **2015**, *79*, 640-642. DOI:10.1080/09168451.2014.991692

^aThese authors contributed equally to this work.



19. Design and Synthesis of biotin analogues reversibly binding with streptavidin

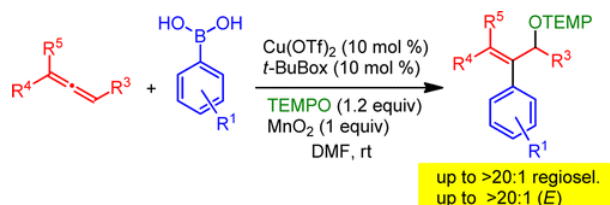
T. Yamamoto, K. Aoki, A. Sugiyama, H. Doi, T. Kodama, **Y. Shimizu,*** M. Kanai*
Chem. Asian J. **2015**, *10*, 1071-1078. DOI: 10.1002/asia.201500120



20. Copper-Catalyzed Regio- and Stereoselective Intermolecular Three-Component Oxyarylation of Allenes

T. Itoh, **Y. Shimizu**,* M. Kanai*

Org. Lett. **2014**, *16*, 2736-2739. DOI: 10.1021/ol501022d

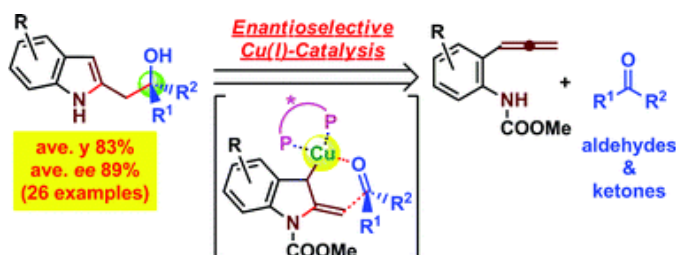


*Featured by SYNFACTS: Synfacts **2014**, *10*, 733. DOI: 10.1055/s-0034-1378287

21. Catalytic enantioselective synthesis of 2-(2-hydroxyethyl)indole scaffolds via consecutive intramolecular amido-cupration of allenes and asymmetric addition of carbonyl compounds

P. K. Chikkade, **Y. Shimizu**, M. Kanai*

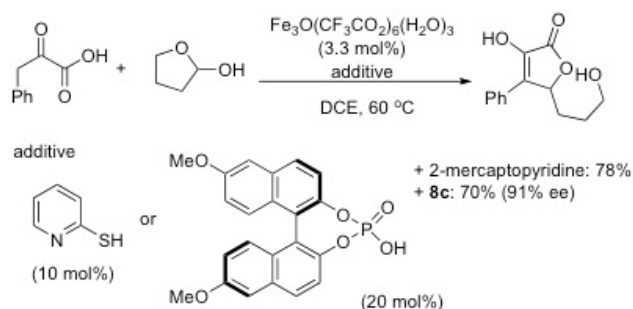
Chem. Sci. **2014**, *5*, 1585-1590. DOI: 10.1039/C3SC52803K



22. A Catalytic C-C Bond-Formation with Minimal Use of Protecting Groups: Construction of Functionalized Isotetronic Acid Derivatives

Y. Shimizu,* K. Yasuda, M. Kanai*

HETEROCYCLES **2014**, *88*, 919-927. DOI: 10.3987/COM-13-S(S)81



23. Catalytic Anomeric Aminoalkynylation of Unprotected Aldoses

Y. Kimura, S. Ito, **Y. Shimizu**, M. Kanai*

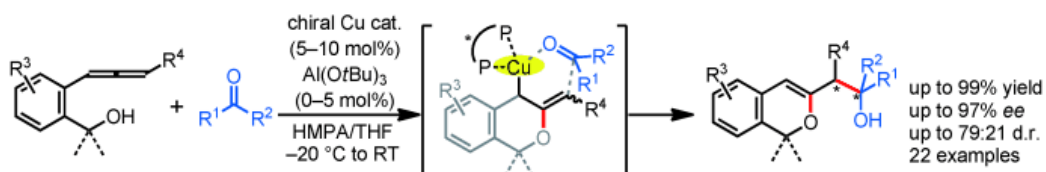
Org. Lett. **2013**, *15*, 4130-4133. DOI: 10.1021/ol401810b



24. *In situ* Catalytic Generation of Allylcopper Species for Asymmetric Allylation: Toward 1H-Isochromene Skeletons

J. Kawai, P. K. Chikkade, **Y. Shimizu,*** M. Kanai*

Angew. Chem. Int. Ed. **2013**, *52*, 7177-7180. DOI: 10.1002/anie.201302027

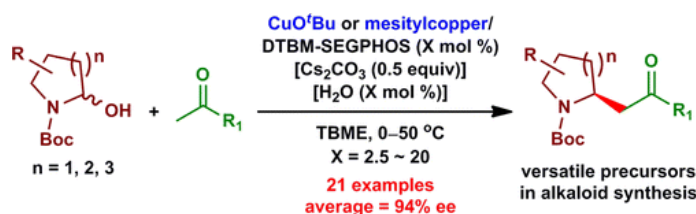


*Featured by SYNFACTS: Synfacts **2013**, *9*, 1080. DOI: 10.1055/s-0033-1339830

25. Copper(I)-Catalyzed Enantioselective Incorporation of Ketones to Cyclic Hemiaminals for the Synthesis of Versatile Alkaloid Precursors

S. -L. Shi, X. -F. Wei, **Y. Shimizu,** M. Kanai*

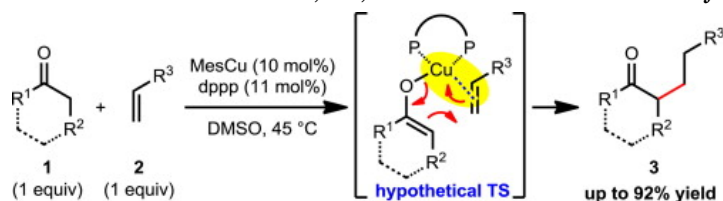
J. Am. Chem. Soc. **2012**, *134*, 17019-17022. DOI: 10.1021/ja308872z



26. Cu(I)-catalyzed α -alkylation of ketones with styrene derivatives

S. Majima, **Y. Shimizu,*** M. Kanai*

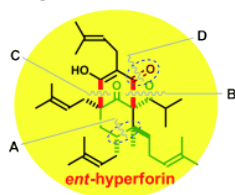
Tetrahedron Lett. **2012**, *53*, 4381-4384. DOI: 10.1016/j.tetlet.2012.06.019



27. Catalytic Asymmetric Total Synthesis of *ent*-Hyperforin

Y. Shimizu, S.-L. Shi, H. Usuda, M. Kanai,* M. Shibasaki*

Angew. Chem. Int. Ed. **2010**, *49*, 1103-1106. DOI: 10.1002/anie.200906678

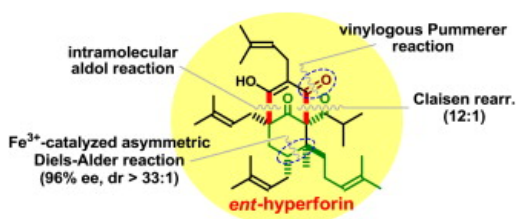


*Featured by SYNFACTS: Synfacts **2010**, *5*, 510. DOI: 10.1002/anie.200906678

28. The First Catalytic Asymmetric Total Synthesis of *ent*-Hyperforin

Y. Shimizu, S.-L. Shi, H. Usuda, M. Kanai, M.* Shibasaki*

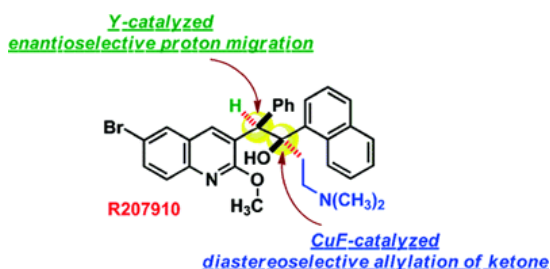
Tetrahedron **2010**, *66*, 6569-6584. DOI: 10.1016/j.tet.2010.05.086



29. Catalytic Asymmetric Synthesis of R207910

Y. Saga, R. Motoki, S. Makino, Y. Shimizu, M. Kanai,* M. Shibasaki*

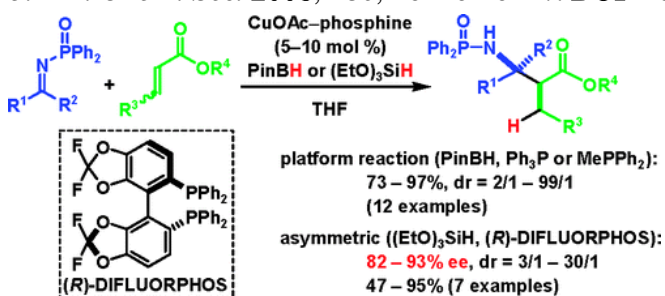
J. Am. Chem. Soc. **2010**, *132*, 7905-7907. DOI: 10.1021/ja103183r



30. Asymmetric Reductive Mannich Reaction to Ketimines Catalyzed by a Cu(I) Complex

Y. Du, L. W. Xu, Y. Shimizu, K. Oisaki, M. Kanai,* M. Shibasaki*

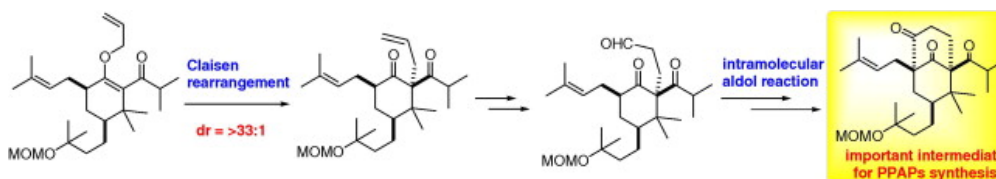
J. Am. Chem. Soc. **2008**, *130*, 16146-16147. DOI: 10.1021/ja8069727



31. A new approach for the construction of a highly congested bicyclic system in polycyclic polyprenylated acylphloroglucinols (PPAPs)

Y. Shimizu, A. Kuramochi, H. Usuda, M. Kanai,* M. Shibasaki*

Tetrahedron Lett. **2007**, *48*, 4173-4177. DOI: 10.1016/j.tetlet.2007.04.080



Accounts and Review

1. Carbon–Carbon Bond-Formations Promoted by Redox-Active Metal Catalysts
M. Kanai,* S. Matsunaga, K. Oisaki, Y. Shimizu
J. Synth. Org. Chem. Jpn. 2013, *71*, 433-442. DOI: 10.5059/yukigoseikyokaishi.71.433
2. 有機触媒の力 カルボニル - オレフィンメタセシス
清水洋平
ファルマシア **2013**, *49*, 695. DOI: 10.10.14894/faruawpsj.49.7_695
3. Recent progress in copper-catalyzed difunctionalization of unactivated carbon-carbon multiple bonds
Y. Shimizu*, M. Kanai*
Tetrahedron Lett. **2014**, *55*, 3727-3737. DOI: 10.1016/j.tetlet.2014.05.077
4. Catalytic Asymmetric Addition Reactions of Cu(I)-Conjugated Soft Carbon Nucleophiles
X.-F. Wei, Y. Shimizu, M. Kanai*
Topics in Organometallic Chemistry **2015**, *58*, 169-182. DOI: 10.1007/3418_2015_163
5. カルボン酸選択的求核的活性化法の開発—単純な試薬の新しい利用法
清水洋平
化学と工業（飛翔する若手） **2018**, *71*, 871-872.
(<http://www.chemistry.or.jp/journal/ci1810.pdf>)
6. Development of Copper-Catalyzed Chemoselective Reactions
Yohei Shimizu
Chem. Pharm. Bull. **2019**, *xx*, xx-xx. 奨励賞受賞記念 review
7. Cupid and Psyche system for the diagnosis and treatment of advanced cancer
A. Sugiyama, T. Kawamura, T. Tanaka, H. Doi, T. Yamashita, K. Shinoda, H. Fujitani, K. Yamatsugu, Y. Shimizu, T. Tatsumi, K. Takahashi, M. Kanai, E. Mizohata, T. Kawato, T. Doi, T. Inoue, T. Kodama
Proc. Jpn. Acad., Ser. B **2019**, *95*, 602–611.

Lectures

1. *ent*-Hyperforin の触媒的不斉全合成
10.09.25 @ 若手研究者のためのセミナー(2010) (依頼公演)
千葉大学
2. Copper-Catalyzed C-C Bond Forming Reactions Utilizing Its “Soft” Characteristics
14.07.14 @ University of Alberta, Edmonton, Canada
Hosted by Professor Dennis Hall
3. 保護基フリー合成を目指した化学選択的反応の開発

- 15.10.04 @ 有機触媒若手セミナー (名古屋) (依頼公演)
4. 触媒の特性を活かした化学選択的反応の開発
16.11.05 @ Hoshi University
第 40 回 星薬科大学大学院研究科助手会・大学院自治会 合同公開セミナー (invited)
5. ホウ素触媒によるカルボン酸の化学選択的求核的活性化法の開発
17.03.25 @ 有機合成化学の若い力
日本薬学会 第 137 年会 (仙台) (invited)
6. Chemoselective C-C Bond Forming Reactions
17.04.06 @ Chalmers University of Technology, Göteborg, Sweden
Hosted by Professor Sture Lindegren
7. Chemoselective C-C Bond Forming Reactions
17.06.30 @ UCSB, California, USA
Hosted by Professor Armen Zakarian
8. 触媒の特性を活かした化学選択的反応の開発
17.07.08 @平成 29 年度若手研究者のためのセミナー (invited)
東京大学薬学系総合研究棟 2 階講堂
9. 触媒の特性を活かした化学選択的反応の開発
17.11.28 @第 12 回神戸大学有機反応化学研究会 (invited)
神戸大学理学部
Hosted by Associate Prof. Ryosuke Matsubara
10. 一価銅触媒の特性を活かした化学選択的反応の開発
17.11.29 @第二回有機若手ワークショップ (invited)
京都大学理学研究科セミナーハウス
11. 一価銅触媒の特性を活かした化学選択的反応の開発
18.3.21 @日本化学会 第 98 春季年会 若い世代の特別講演会 (受賞講演)
日本大学船橋キャンパス
12. 触媒の特性を活かした化学選択的反応の開発
18.11.08 @若手研究者のための有機化学札幌セミナー (invited)
北海道大学薬学部臨床薬学講義室
13. 触媒の特性を活かした化学選択的反応の開発
19.03.21@日本薬学会第 139 年会 (受賞講演)
ホテルニューオータニ幕張
14. Carboxylic Acid-Selective Enolate Formation
19.07.02@ Hokkaido Summer Symposium 2019 on Catalysis for Organic Synthesis
(invited)
Hokkaido University Conference Hall, Sapporo, Japan

15. Boron-Catalyzed α -Functionalization of Carboxylic Acids

19.11.15@ Hokkaido mini-Symposium by Young Generations in Asia (invited)

Hokkaido University, Sapporo, Japan