

Curriculum Vitae with Publication List

update: June 17, 2023

Personal Data

Name: Tsuyoshi MITA (美多 剛)
Date of Birth: August 09, 1976
Place of Birth: Tokyo, Japan
Gender: Male
Citizenship: Japanese
Language: English and Japanese



Current Affiliation

Institute for Chemical Reaction Design and Discovery (WPI-ICReDD), Hokkaido University

Address: Kita 21, Nishi 10, Kita-ku, Sapporo 001-0021, Japan
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ORCID: 0000-0002-6655-3439
ResearcherID: D-7069-2012
Researchmap: <https://researchmap.jp/bbb/?lang=english>

Education and Working Experiences

1996.4-2000.3: Chemistry Department, Keio University, Supervisor: Prof. Tohru Yamada (BSc)
2000.4-2002.3: Graduate School of Science and Technology, Keio University
Supervisor: Prof. Tohru Yamada (MSc)
2002.4-2004.3: Ajinomoto Co., INC. (Process Research & Development, Pharmaceutical Research Laboratories in Pharmaceutical Company, Kawasaki, Japan)
2004.4-2007.3: Graduate School of Pharmaceutical Sciences, The University of Tokyo
Supervisor: Prof. Masakatsu Shibasaki (PhD)
2007.4-2009.3: Department of Chemistry & Chemical Biology, Harvard University
Supervisor: Prof. Eric N. Jacobsen (Postdoctoral Fellow (JSPS Fellowship_SPD))
2009.4-2019.3: Faculty of Pharmaceutical Sciences, Hokkaido University
(Assistant Professor in the Yoshihiro Sato's group)
2019.4-2023.3: Institute for Chemical Reaction Design and Discovery (WPI-ICReDD)
(Specially Appointed Associate Professor)
2019.10-present: JST, ERATO "MAEDA Artificial Intelligence in Chemical Reaction Design and Discovery Project" (Group leader in organic synthesis group)
2023.4-present: Institute for Chemical Reaction Design and Discovery (WPI-ICReDD)
(Professor)
2023.4-present: Graduate School of Science, Kyoto University, Part-time Lecturer

Membership

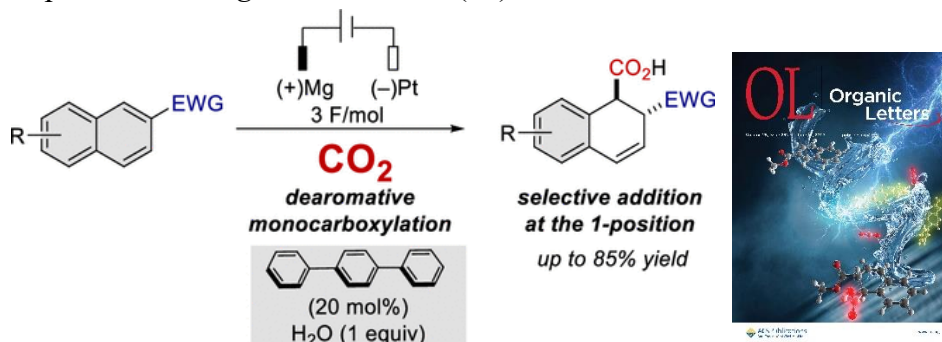
Pharmaceutical Society of Japan (PSJ), Chemical Society of Japan (CSJ), Society of Synthetic Organic Chemistry of Japan (SSOCJ), American Chemical Society (ACS), Kinka Chemical Society

Awards

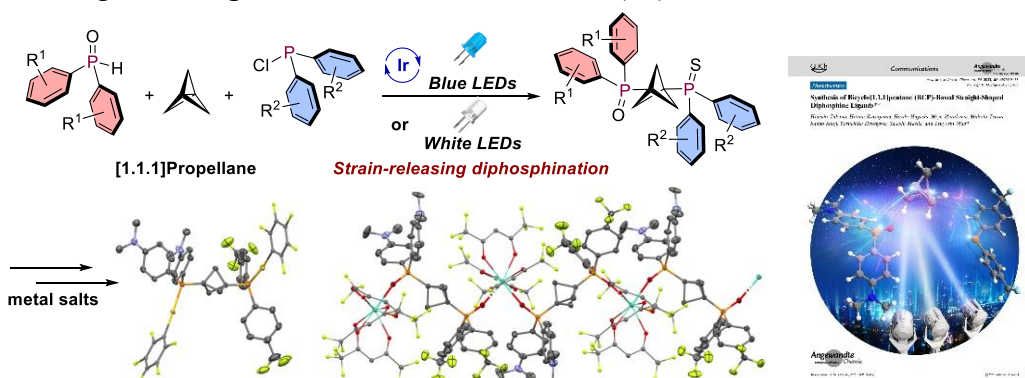
- 2007.3: The Representative of Graduating PhD Students, Faculty of Pharmaceutical Sciences
The University of Tokyo
- 2007: JSPS Postdoctoral Fellowship (Superlative Postdoctoral Fellow (SPD))
- 2009: Tosoh Corporation Award in Synthetic Organic Chemistry, Japan
- 2014: Incentive Award in Synthetic Organic Chemistry, Japan
- 2014: Hokkaido University President's Award for Research Excellence, Japan
- 2016: Chemist Award BCA in the MSD Life Science Foundation, Japan
- 2018: Lecture Award of ICPAC Langkawi 2018, Institut Kimia Malaysia
- 2019: Young Researcher's Award in the Ube Industries Foundation, Japan
- 2020: Hokkaido Science and Technology Incentive Award, Japan

Publications

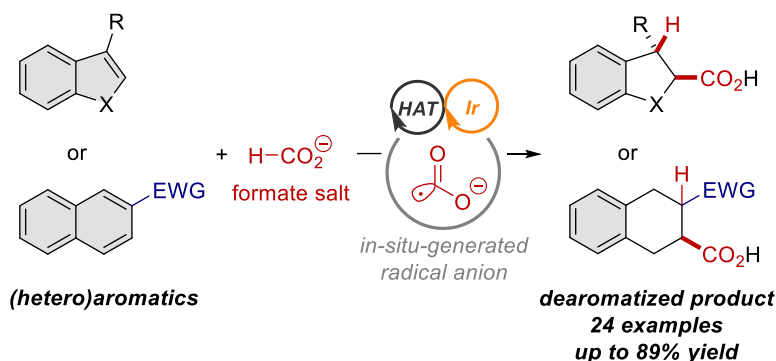
- 1) Rawat, V. K.; Hayashi, H.; Katsuyama, H.; Mangaonkar, S. R.; Mita, T.* "Revisiting the Electrochemical Carboxylation of Naphthalene with CO₂: Selective Monocarboxylation of 2-Substituted Naphthalenes" *Org. Lett.* **2023**, 25 (23), 4231-4235.



- 2) Takano, H.; Katsuyama, H.; Hayashi, H.; Harukawa, M.; Tsurui, M.; Shoji, S.; Hasegawa, Y.; Maeda, S.; Mita, T.* "Synthesis of Bicyclo[1.1.1]pentane (BCP)-Based Straight-Shaped Diphosphine Ligands" *Angew. Chem., Int. Ed.* **2023**, 62 (23), e202303435.

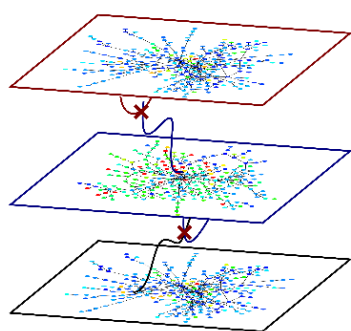


- 3) Mangaonkar, S. R.; Hayashi, H.; Takano, H.; Kanna, W.; Maeda, S.; Mita, T.* “Photoredox/HAT-Catalyzed Dearomative Nucleophilic Addition of the CO₂ Radical Anion to (Hetero)Aromatics” *ACS Catal.* **2023**, *13* (4), 2482-2488.

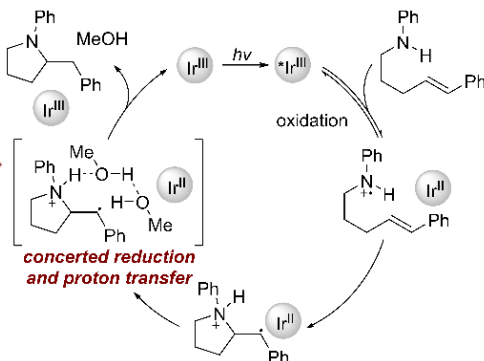


- 4) Harabuchi, Y.*; Hayashi, H.; Takano, H.; Mita, T.; Maeda, S.* “Oxidation and Reduction Pathways in the Knowles Hydroamination via a Photoredox-Catalyzed Radical Reaction” *Angew. Chem., Int. Ed.* **2023**, *62* (1), e202211936.

Crossings connect Reaction Path Networks



Proposed mechanism of Knowles hydroamination in this work



- 5) Maeda, S.*; Harabuchi, Y.; Hayashi, H.; Mita, T.* “Toward Ab Initio Reaction Discovery Using the Artificial Force Induced Reaction Method” *Annu. Rev. Phys. Chem.* **2023**, *74*, 287-311.
- 6) Mita, T.*; Takano, H.; Hayashi, H.; Kanna, W.; Harabuchi, Y.; Houk, K. N.; Maeda, S.* “Prediction of High-Yielding Single-Step or Cascade Pericyclic Reactions for the Synthesis of Complex Synthetic Targets” *J. Am. Chem. Soc.* **2022**, *144* (50), 22985-23000.

Automatic exploration for pericyclic reaction pathways:

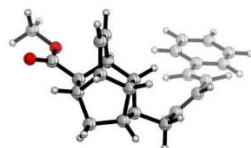
cycloadditions, ene reactions, group transfer reactions, cheletropic reactions, electrocyclic reactions, and sigmatropic rearrangements

Input:

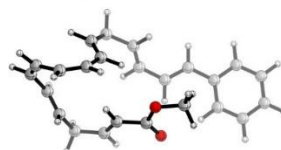
product in pericyclic reactions

Output:

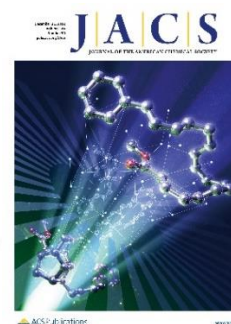
potential reaction pathways, $\Delta G^\ddagger$, potential substrates



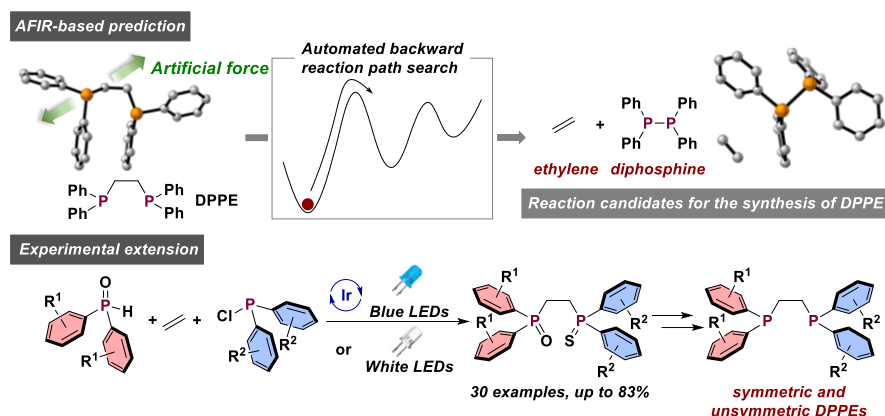
AFIR



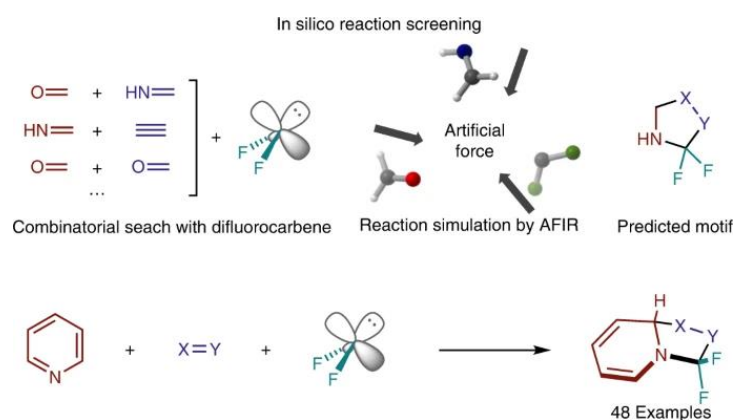
up to 52 atoms
precise stereochemistry
applicable to multi-step routes



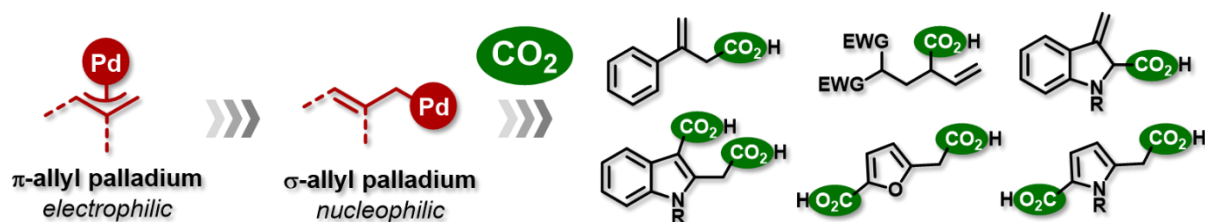
- 7) Takano, H.; Katsuyama, H.; Hayashi, H.; Kanna, W.; Harabuchi, Y.; Maeda, S.*; Mita, T.* “A Theory-driven Synthesis of Symmetric and Unsymmetric 1,2-Bis(diphenylphosphino)ethane Analogues via Radical Difunctionalization of Ethylene” *Nat. Commun.* **2022**, *13*, 7034.



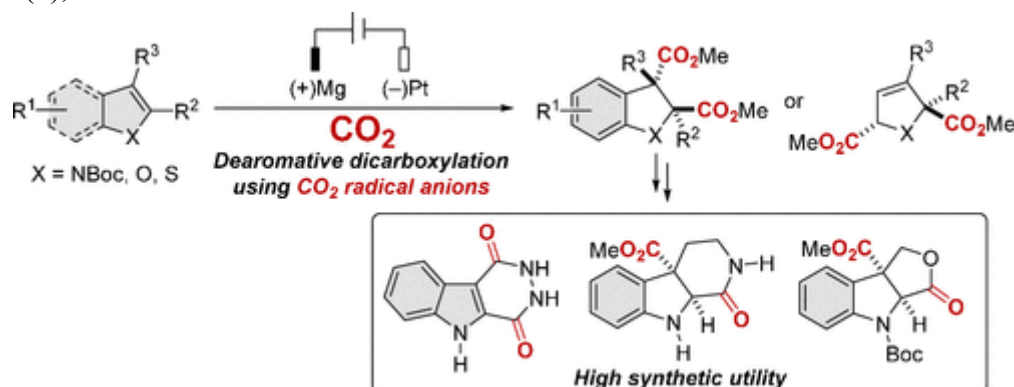
- 8) Hayashi, H.; Katsuyama, H.; Takano, H.; Harabuchi, Y.; Maeda, S.*; Mita, T.* “In Silico Reaction Screening with Difluorocarbene for *N*-Difluoroalkylative Dearomatization of Pyridines” *Nat. Synth.* **2022**, *1* (10), 804-814.



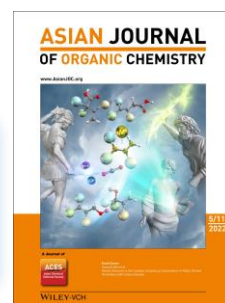
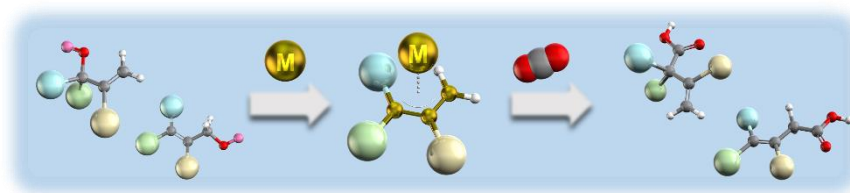
- 9) 美多 剛,* 樋口 裕紀, 佐藤 美洋* “ π -アリルパラジウムの極性転換による二酸化炭素を用いた触媒的カルボキシル化の開発” *有機合成化学協会誌* **2022**, *80* (9), 806-816 (written in Japanese).



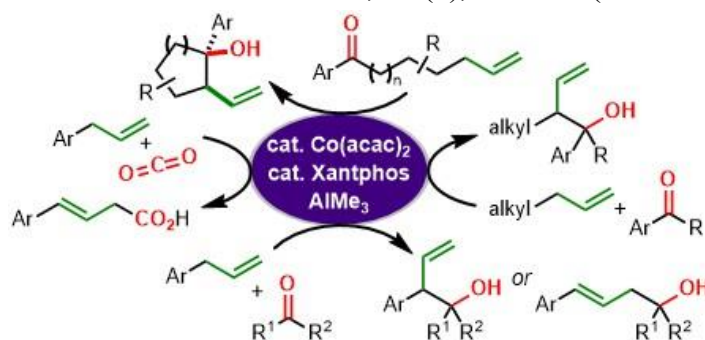
- 10) You, Y.; Kanna, W.; Takano, H.; Hayashi, H.; Maeda, S.*; Mita, T.* “Electrochemical Dearomative Dicarboxylation of Heterocycles with Highly Negative Reduction Potentials” *J. Am. Chem. Soc.* **2022**, *144* (8), 3685-3695.



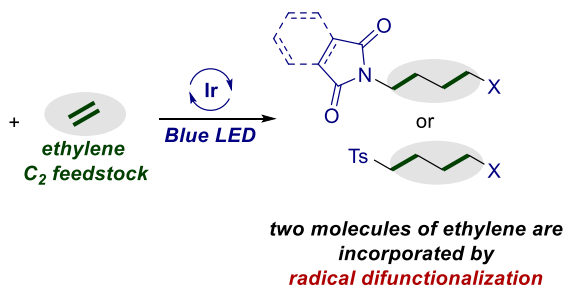
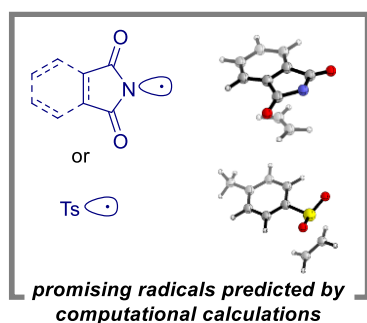
- 11) You, Y.; Mita, T.* “Recent Advances in the Catalytic Umpolung Carboxylation of Allylic Alcohol Derivatives with Carbon Dioxide” *Asian J. Org. Chem.* **2022**, *11* (5), e202200082.



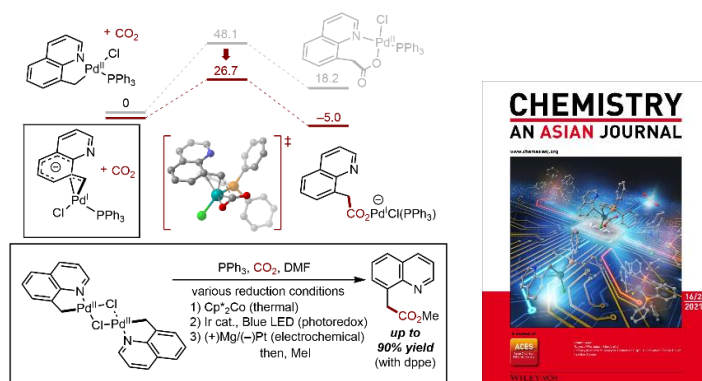
- 12) 道上 健一, 美多 剛,* 佐藤 美洋* “末端アルケンを求核剤とするカルボニル化合物の触媒的アリル化反応” *有機合成化学協会誌* **2022**, *80* (3), 210-221 (written in Japanese).



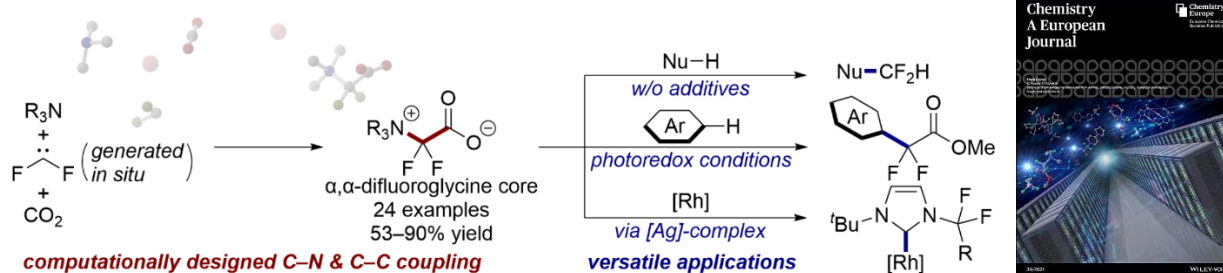
- 13) Maeda, S.*; Harabuchi, Y.; Hasegawa, T.; Suzuki, K.; Mita, T. “Reactivity Prediction through Quantum Chemical Calculations” *AsiaChem Magazine* **2021**, *2* (1), 56-63.
- 14) Takano, H.; You, Y.; Hayashi, H.; Harabuchi, Y.; Maeda, S.*; Mita, T.* “Radical Difunctionalization of Gaseous Ethylene Guided by Quantum Chemical Calculations: Selective Incorporation of Two Molecules of Ethylene” *ACS Omega* **2021**, *6* (49), 33846-33854.



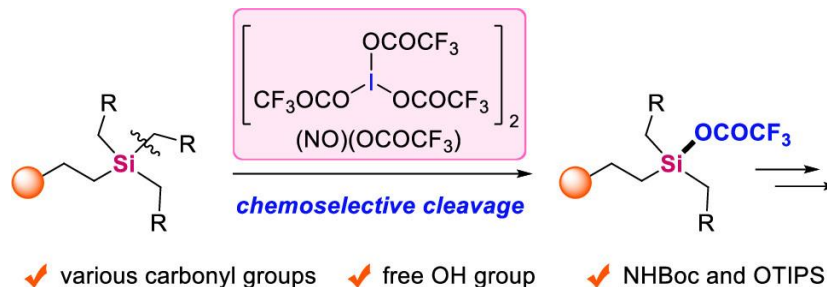
- 15) Kanna, W.; Harabuchi, Y.; Takano, H.; Hayashi, H.; Maeda, S.*; Mita, T.* “Carboxylation of a Palladacycle Formed via C(sp³)-H Activation: Theory-Driven Reaction Design” *Chem. Asian J.* **2021**, *16* (24), 4072-4080.



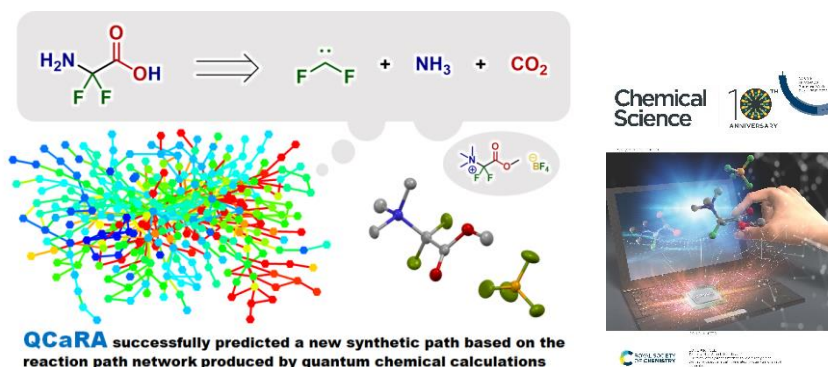
- 16) Hayashi, H.; Takano, H.; Katsuyama, H.; Harabuchi, Y.; Maeda, S.*; Mita, T.* “Synthesis of Difluoroglycine Derivatives from Amines, Difluorocarbene, and CO_2 : Computational Design, Scope, and Application” *Chem. Eur. J.* **2021**, 27 (39), 10040-10047.



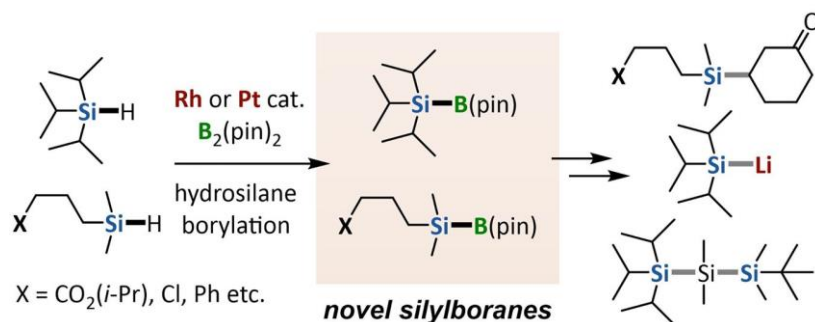
- 17) Matsuoka, K.; Komami, N.; Kojima, M.; Mita, T.; Suzuki, K.; Maeda, S.; Yoshino, T.*; Matsunaga, S.* “Chemoselective Cleavage of Si-C(sp³) Bonds in Unactivated Tetraalkylsilanes Using Iodine Tris(trifluoroacetate)” *J. Am. Chem. Soc.* **2021**, 143 (1), 103-108.



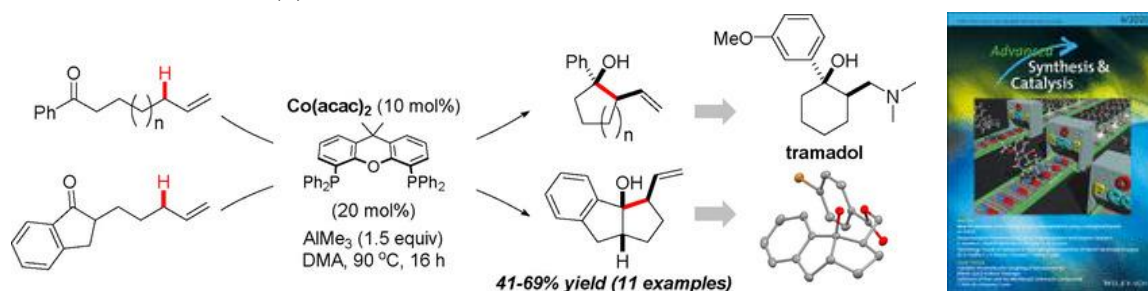
- 18) Mita, T.*; Harabuchi, Y.; Maeda, S.* “Discovery of a Synthesis Method for a Difluoroglycine Derivative Based on a Path Generated by Quantum Chemical Calculations” *Chem. Sci.* **2020**, 11 (29), 7569-7577.



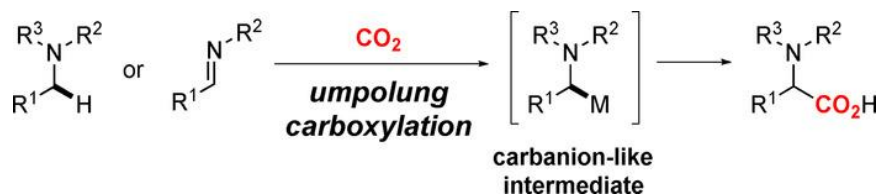
- 19) Shishido, R.; Uesugi, M.; Takahashi, R.; Mita, T.; Ishiyama, T.; Kubota, K.*; Ito, H.* “General Synthesis of Trialkyl- and Dialkylarylsilylboranes: Versatile Silicon Nucleophiles in Organic Synthesis” *J. Am. Chem. Soc.* **2020**, 142 (33), 14125-14133.



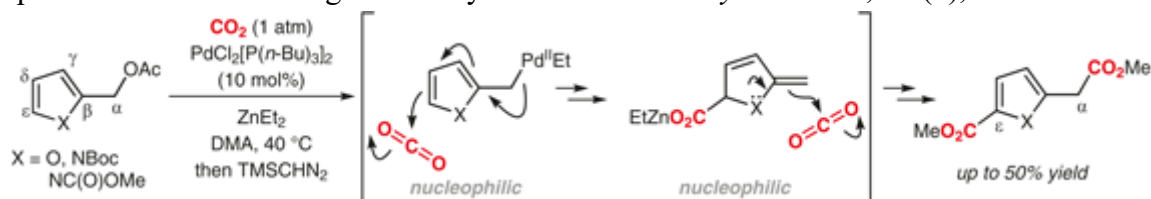
- 20) Mita, T.*; Uchiyama, M.; Sato, Y.* “Catalytic Intramolecular Coupling of Ketoalkenes by Allylic C(sp³)-H Bond Cleavage: Synthesis of Five- and Six-Membered Carbocyclic Compounds” *Adv. Synth. Catal.* **2020**, 362 (6), 1275-1280.



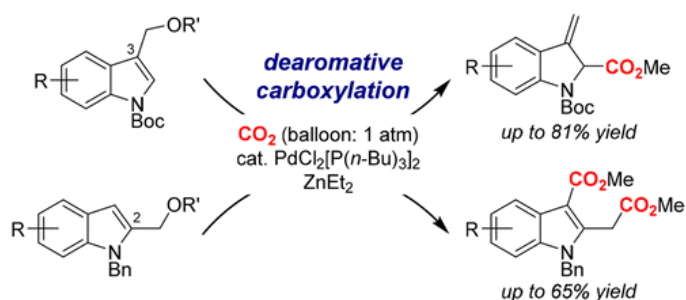
- 21) Mita, T.*; Sato, Y.* “Syntheses of α -Amino Acids by Using CO₂ as a C1 Source” *Chem. Asian J.* **2019**, 14 (12), 2038-2047.



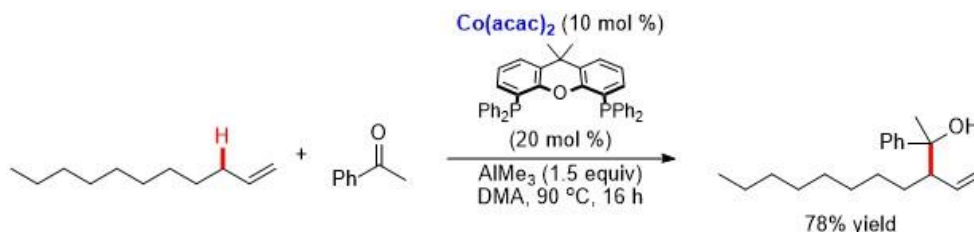
- 22) Mita, T.*; Masutani, H.; Ishii, S.; Sato, Y.* “Catalytic Carboxylation of Heteroaromatic Compounds: Double and Single Carboxylation with CO₂” *Synlett* **2019**, 30 (7), 841-844.



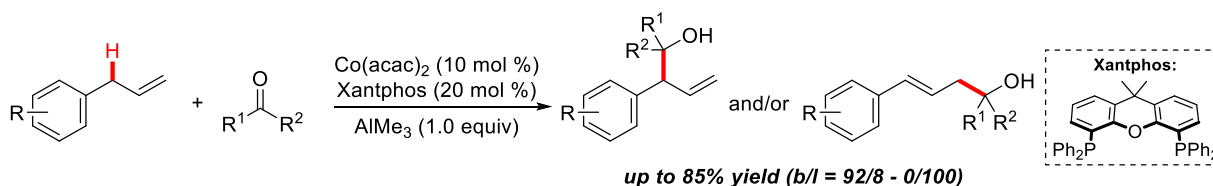
- 23) Mita, T.*; Ishii, S.; Higuchi, Y.; Sato, Y.* “Pd-Catalyzed Dearomative Carboxylation of Indolylmethanol Derivatives” *Org. Lett.* **2018**, 20 (23), 7603-7606.



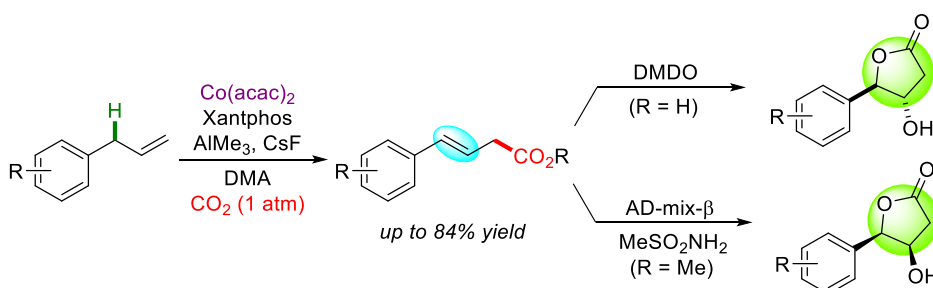
- 24) Mita, T.*; Uchiyama, M.; Michigami, K.; Sato, Y.* “Cobalt-Catalyzed Nucleophilic Addition of the Allylic C(sp³)-H Bond of Simple Alkenes to Ketones” *Beilstein J. Org. Chem.* **2018**, *14*, 2012-2017.



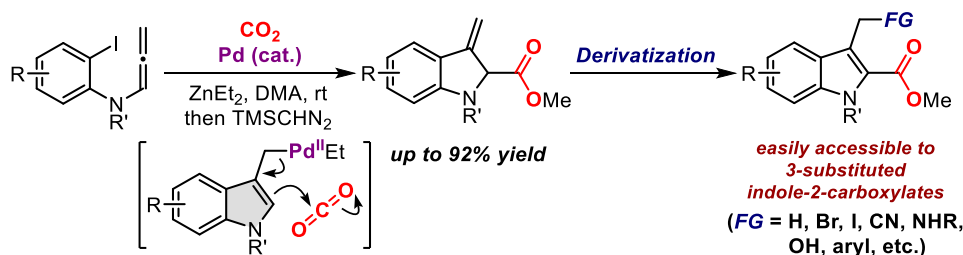
- 25) Mita, T.*; Hanagata, S.; Michigami, K.; Sato, Y.* “Co-Catalyzed Direct Addition of Allylic C(sp³)-H Bonds to Ketones” *Org. Lett.* **2017**, *19* (21), 5876-5879. [highlighted by *Synfacts* **2018**, *14*, 74.]



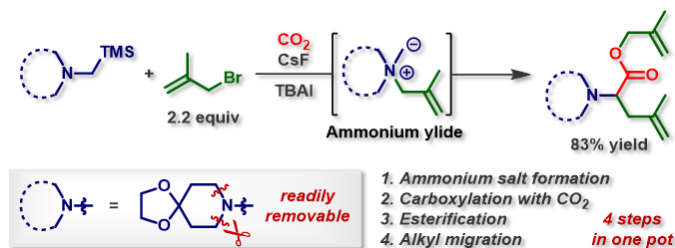
- 26) Michigami, K.; Mita, T.*; Sato, Y.* “Cobalt-Catalyzed Allylic C(sp³)-H Carboxylation with CO₂” *J. Am. Chem. Soc.* **2017**, *139* (17), 6094-6097.



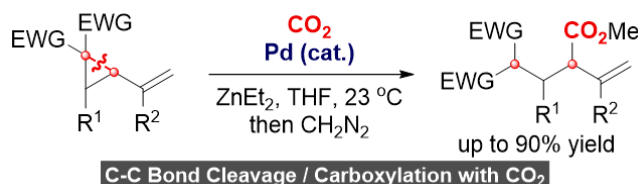
- 27) Higuchi, Y.; Mita, T.*; Sato, Y.* “Palladium-Catalyzed Intramolecular Arylative Carboxylation of Allenes with CO₂ for the Construction of 3-Substituted Indole-2-Carboxylic Acids” *Org. Lett.* **2017**, *19* (10), 2710-2713.



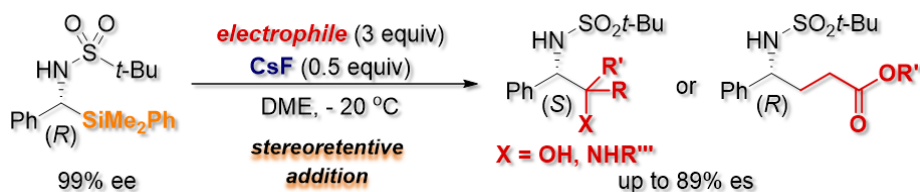
- 28) Mita, T.*; Sugawara, M.; Sato, Y.* “One-Pot Synthesis of α -Amino Acids through Carboxylation of Ammonium Ylides with CO₂ Followed by Alkyl Migration” *J. Org. Chem.* **2016**, *81* (12), 5236-5243.



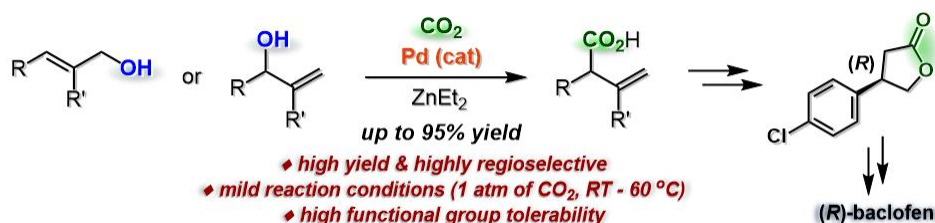
29) Mita, T.*; Tanaka, H.; Higuchi, Y.; Sato, Y.* “Palladium-Catalyzed Carboxylation of Activated Vinylcyclopropanes with CO₂” *Org. Lett.* **2016**, 18 (11), 2754-2757.



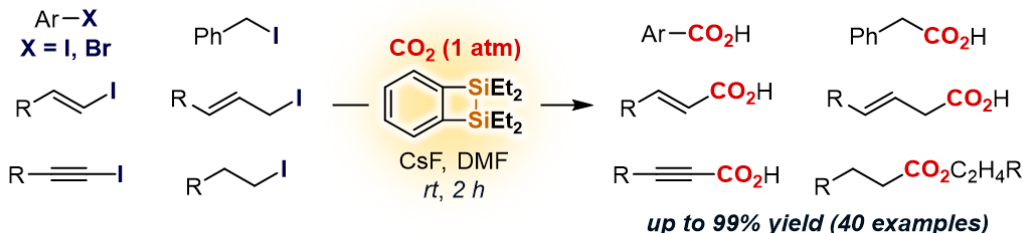
30) Mita, T.*; Saito, K.; Sugawara, M.; Sato, Y.* “Stereoretentive Addition of *N*-*tert*-Butylsulfonyl- α -Amido Silanes to Aldehydes, Ketones, α,β -Unsaturated Esters, and Imines” *Chem. Asian. J.* **2016**, 11 (10), 1528-1531.



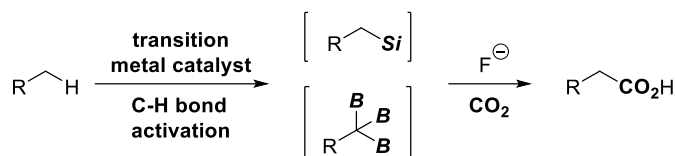
31) Mita, T.*; Higuchi, Y.; Sato, Y.* “Highly Regioselective Palladium-Catalyzed Carboxylation of Allylic Alcohols with CO₂” *Chem. Eur. J.* **2015**, 21 (46), 16391-16394.



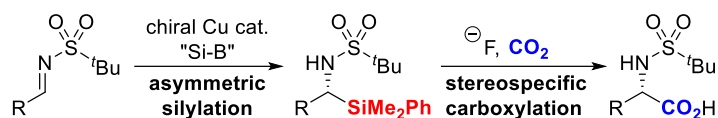
32) Mita, T.*; Suga, K.; Sato, K.; Sato, Y.* “A Strained Disilane-Promoted Carboxylation of Organic Halides with CO₂ under Transition-Metal-Free Conditions” *Org. Lett.* **2015**, 17 (21), 5276-5279.



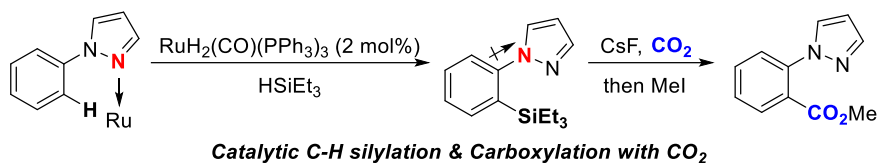
33) 美多 剛* “C(sp³)-H 結合のシリル化およびトリホウ素化、続く二酸化炭素によるカルボキシ化の開発” *有機合成化学協会誌* **2015**, 73 (8), 810-820 (written in Japanese).



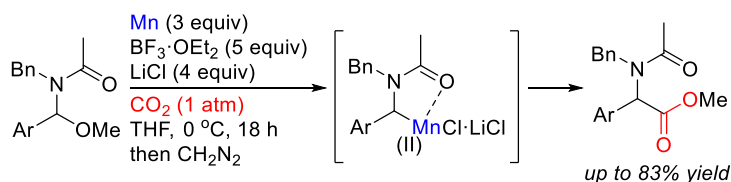
- 34) Mita, T.*; Sugawara, M.; Saito, K.; Sato, Y.* “Catalytic Enantioselective Silylation of *N*-Sulfonylimines: Asymmetric Synthesis of α -Amino Acids from CO₂ via Stereospecific Carboxylation of α -Amino Silanes” *Org. Lett.* **2014**, 16 (11), 3028-3031. 【highlighted by *Synfacts* **2014**, 10, 839.】



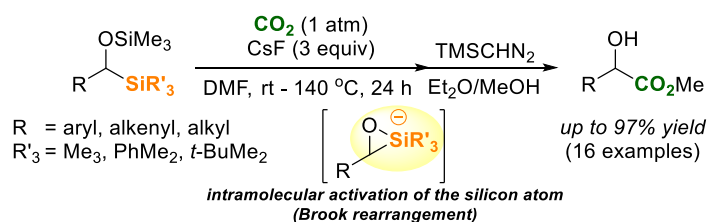
- 35) Mita, T.*; Tanaka, H.; Michigami, K.; Sato, Y.* “Ruthenium-Catalyzed C-H Silylation of 1-Arylpyrazole Derivatives and Fluoride-Mediated Carboxylation: Use of Two Nitrogen Atoms of the Pyrazole Group” *Synlett* **2014**, 25 (9), 1291-1294.



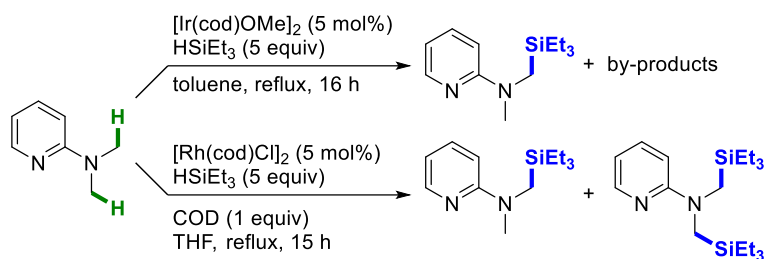
- 36) Mita, T.*; Chen, J.; Sato, Y.* “Synthesis of Arylglycines from CO₂ through α -Amino Organomanganese Species” *Org. Lett.* **2014**, 16 (8), 2200-2203. 【highlighted by *Synfacts* **2014**, 10, 742.】



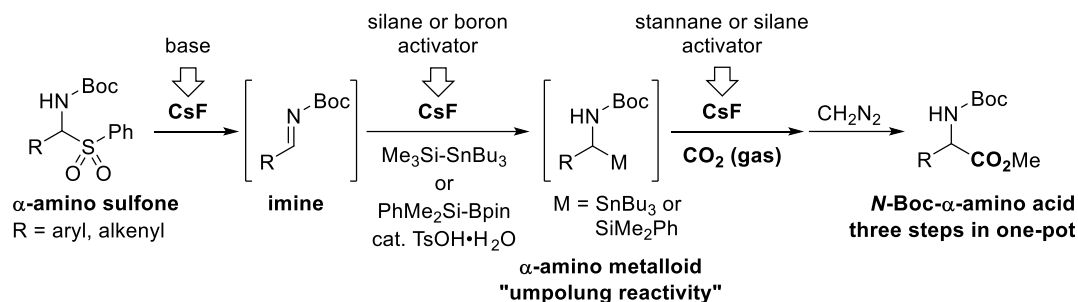
- 37) Mita, T.*; Higuchi, Y.; Sato, Y.* “Carboxylation with CO₂ via Brook Rearrangement: Preparation of α -Hydroxy Acid Derivatives” *Org. Lett.* **2014**, 16 (1), 14-17.



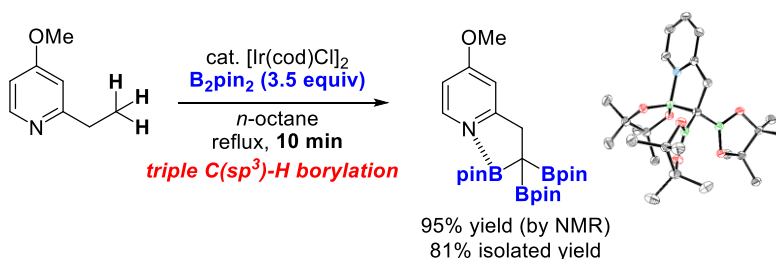
- 38) Mita, T.*; Michigami, K.; Sato, Y.* “Iridium- and Rhodium-Catalyzed Dehydrogenative Silylations of C(sp³)-H Bonds Adjacent to a Nitrogen Atom Using Hydrosilanes” *Chem. Asian. J.* **2013**, 8 (12), 2970-2973.



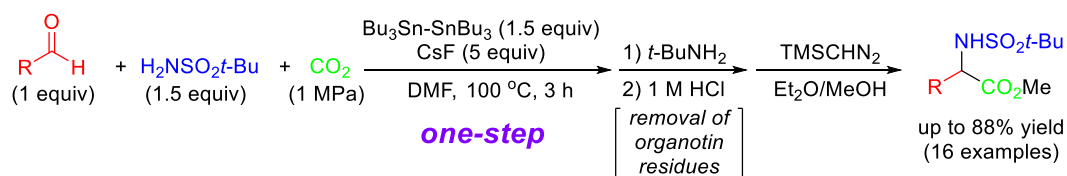
39) Mita, T.; Sato, Y.* “One-Pot Synthesis of α -Amino Acids from CO₂ Using Bismetal Reagents” *J. Synth. Org. Chem., Jpn.* **2013**, 71 (11), 1163-1171.



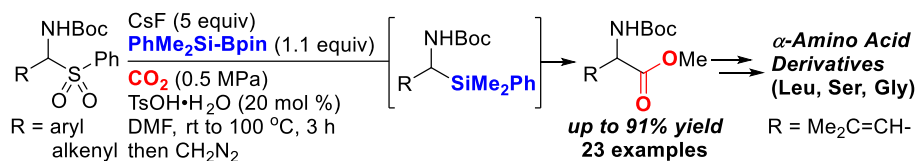
40) Mita, T.*; Ikeda, Y.; Michigami, K.; Sato, Y.* “Iridium-Catalyzed Triple C(sp³)-H Borylations: Construction of Triborylated Sp³-Carbon Centers” *Chem. Commun.* **2013**, 49 (49), 5601-5603.



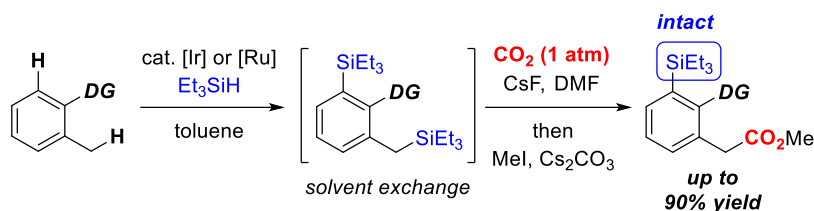
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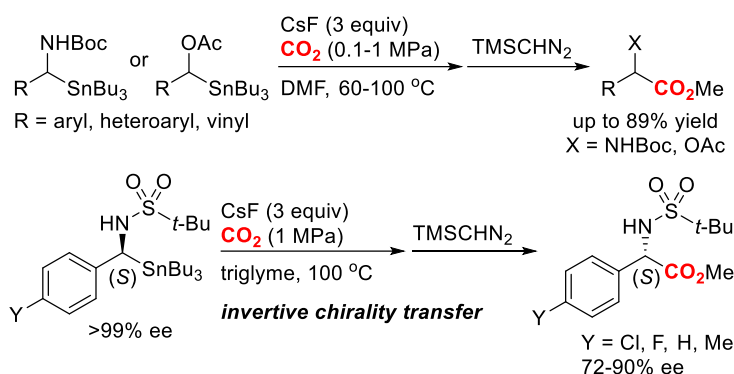
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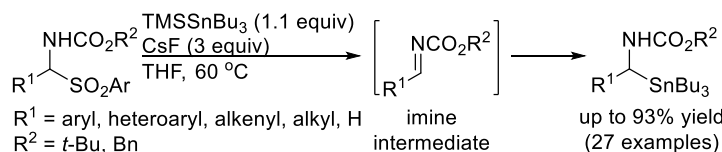
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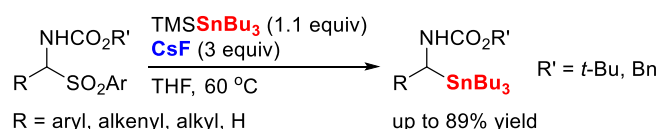
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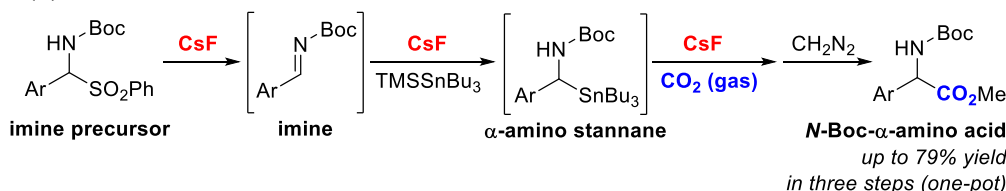
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Design, Synthesis, and Evaluation of New Chiral Ligands for Catalytic Asymmetric Cyanation Reactions" *Tetrahedron* **2007**, 63 (26), 5820-5831.

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Book Chapters

- 1) 美多 剛, 佐藤 美洋 “第 7 節 二酸化炭素を一炭素源として用いる α -アミノ酸の化学合成” *二酸化炭素を用いた化学品製造技術* **2016**, pp 132-145, Ed. 杉本 裕, S&T 出版.
- 2) Shibasaki, M.; Kanai, M.; Mita, T. “Chapter 1 The Catalytic Asymmetric Strecker Reaction” *Organic Reactions* **2008**, 70, pp 1-119, Ed. Larry E. Overman, John Wiley & Sons.
- 3) 美多 剛 “合格体験記 大学院でもう一度研究を！” *医歯薬農学系のための大学院の歩き方* **2006**, pp.170-171, Ed. 東京図書編集部, 東京図書.

Commentaries

- 1) 原 祐, 林 裕樹, 高野 秀明, 美多 剛 “量子化学計算に基づく反応経路ネットワークの構築と有機合成反応開発への展開” *アンサンブル* **2023**, 25 (1), 34-40.
- 2) 美多 剛 “極性転換” *十字路 有機合成化学協会誌* **2022**, 80 (9), 871.
- 3) 美多 剛, “合成化学実験のように反応条件を自在に変えて計算できる日を夢見て！” *フォーラム, 量子化学探索研究所 (IQCE)*, 2021 年 4 月号.
- 4) 美多 剛, “計算科学による α -アミノ酸の合成経路予測と実験科学による具現化” *月刊 機能材料* **2020**, 40 (11), 23-32.
- 5) 美多 剛, 佐藤 美洋 “二酸化炭素を炭素資源とした有機合成 -アリル遷移金属種を用いた触媒的カルボキシル化-” *現代化学* **2019**, 578 (5), 64-69.
- 6) Mita, T. “Transition Metal-Promoted Carboxylation of Terminal Alkynes with CO₂” *Mini-Reviews in Organic Chemistry* **2019**, 16 (5), 406-409.
- 7) 美多 剛, 佐藤 美洋 “二酸化炭素固定化反応の新手法の開発 -反応性の低い C(sp³)-H 結合の切断を伴う触媒的カルボキシル化-” *今日の話題 化学と生物* **2018**, 56 (6), 381-383.
- 8) 美多 剛 “二酸化炭素から飽和脂肪酸を合成 遠隔カルボキシル化による新手法” *注目の論文 月刊 化学* **2017**, 72 (8), 62-63.
- 9) 美多 剛 “ビスメタル化合物” *十字路 有機合成化学協会誌* **2015**, 73 (8), 850.
- 10) 美多 剛 “有機合成化学に用いるスズ試薬 -比較的安定で反応性に富む金属。有機スズ(IV)には毒性あり。-” *講座: 身近な元素の世界 化学と教育* **2014**, 62 (8), 400-403.
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- 12) 柴崎 正勝, 金井 求, 福田 展久, 美多 剛 “タミフルの新合成法ができた！不斉触媒が拓く安定供給の道” *月刊 化学* **2006**, 61 (7), 12-17.

Patents

- 1) 美多 剛, 前田 理, 高野 秀明 “化合物の新規製造方法、新規化合物および金属触媒” PCT/JP2022/ 30598, 2022 年 8 月 10 日 PCT 出願.
- 2) 美多 剛, 前田 理, 高野 秀明 “化合物の新規製造方法、新規化合物および金属触媒” 特願 2021-131481, 2021 年 8 月 11 日出願.

- 3) Sato, Y.; Mita, T.; Miyaji, N. “Method for Producing α -Amino Acid Salt” No. 5794569, 2011 年 9 月 13 日出願.
- 4) Sato, Y.; Mita, T.; Miyaji, N. “Manufacturing Method for α -Hydroxy Acid Salt” No. 5747740, 2011 年 8 月 30 日出願.
- 5) Haga, K.; Mita, T.; Hirasawa, S.; Tatara, A.; Yamanaka, N.; Yamanaka, J.; Okado, K.; Niwa, S. “Method for Producing Lactam Compound and Production Intermediate Thereof” WO2008139576 (A1), 2007 年 4 月 27 日国際出願.
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- 7) Shibasaki, M.; Kanai, M.; Mita, T. “Method for Enantioselectively Preparing β -Cyanocarboxylic Acid Derivative from α,β -Unsaturated Carboxylic Acid Derivative and Catalyst Used in the Method” JP2006151839 (A), 2004 年 11 月 26 日出願.

Invited Lectures

- 1) 美多 剛 “反応経路自動探索法を用いた新反応の設計とその実現—挑戦と今後の課題” 第 35 回万有札幌シンポジウム, 札幌, 2023 年 7 月 1 日.
- 2) Mita, T. “Transition-Metal-Catalyzed C(sp³)-H Carboxylation of CO₂” The 7th International Symposium on Catalysis and Chemical Engineering (CCE-2023), オンライン, 2023 年 2 月 20 日-23 日.
- 3) Mita, T. “Theory-Driven Organic Synthesis” The 5th ICRDD International Symposium, オンライン, 2023 年 1 月 10 日.
- 4) 美多 剛 “計算化学主導の新反応開発” 徳島大学特別講演会, 徳島大学, 徳島, 2022 年 10 月 24 日.
- 5) Mita, T. “Calculation-Based Reaction Design: Three-Component Reactions Using Difluorocarbene” Joint Symposium of S-Membrane Project and F-Material Project at Gunma University, 群馬大学, 桐生, 2022 年 10 月 21 日.
- 6) Mita, T. “Electrochemical Dearomative Carboxylations of Heteroaromatics with Highly Negative Reduction Potentials” Carbon Chemistry and Materials (CCM-2022), オンライン, 2022 年 10 月 10 日-12 日.
- 7) 美多 剛 “Transition-Metal-Catalyzed Carboxylation of C(sp³)-H bonds with CO₂” 錯体化学会 第 72 回討論会, 九州大学伊都キャンパス, 福岡, 2022 年 9 月 26 日-28 日.
- 8) 美多 剛 “量子化学計算を使った新しい分子変換反応のみつけれ方 - 挑戦と今後の課題” 化学反応経路探索のニューフロンティア 2021, オンライン, 札幌, 2021 年 9 月 22 日.
- 9) 美多 剛 “計算科学を活用した有機合成” 日本質量分析学会 第 30 回北海道談話会・講演会, オンライン, 2021 年 8 月 3 日.
- 10) Mita, T. “Theory-Driven Approach to Chemical Synthesis of Difluoroglycine Derivatives and Its Application” Joint Symposium of Engineering & Information Science & WPI-ICReDD in Hokkaido University, On line, 2021 年 4 月 26 日.
- 11) 美多 剛 “ α,α -ジフルオログリシン誘導体の化学合成とその応用” 第 6 回北大・部局横断

シンポジウム 若手研究者による生命と物質の融合を目指して！, オンライン, 2020 年 10 月 19 日.

- 12) 美多 剛 “二酸化炭素を炭素資源とした有機合成： α -アミノ酸の化学合成およびアリル金属種のカルボキシル化” 第 7 回柴崎セミナー, 微生物化学研究所, 東京都品川区, 2019 年 9 月 21 日.
- 13) Mita, T. “Palladium-Catalyzed Allylic Carboxylation with Carbon Dioxide” Asia Pacific Society for Materials Research 2019 Annual Meeting, Sapporo Convention Center, Sapporo, 2019 年 7 月 26 日-29 日.
- 14) Mita, T. “Cobalt(I)-Catalyzed Direct Addition of Allylic C(sp³)-H Bonds to Carbonyl Electrophiles” Hokkaido Summer Symposium 2019 on Catalysis for Organic Synthesis, 北海道大学学術交流会館, 札幌, 2019 年 7 月 1 日-2 日.
- 15) 美多 剛 “二酸化炭素を用いた有機合成： α -アミノ酸の化学合成および遷移金属を駆使した触媒的カルボキシル化” 早稲田大学先進理工学部化学・生命化学科, 東京都新宿区, 2018 年 12 月 21 日.
- 16) Mita, T. “New Strategies for Carbon Dioxide Incorporation through C-C Bond Forming Process” 南洋理工大学理学院化学生物化学科, Singapore, 2018 年 11 月 5 日.
- 17) Mita, T. “Palladium-Catalyzed Dearomative Carboxylation of Indole Derivatives” International Congress on Pure & Applied Chemistry (ICPAC) Langkawi 2018, Langkawi, Malaysia, 2018 年 10 月 30 日-11 月 2 日.
- 18) 美多 剛 “コバルト触媒によるアリル位 C(sp³)-H 結合の切断と求電子剤との反応” 第 5 回辰巳午会化学シンポジウム, 北海道大学大学院地球環境科学研究院, 札幌, 2018 年 8 月 18 日-19 日.
- 19) Mita, T. “Development of Novel Carboxylation Reactions with Carbon Dioxide through C-C Bond Formation” 国立中山大学化学科, 高雄, 台湾, 2018 年 4 月 2 日.
- 20) Mita, T. “Cobalt-Catalyzed Allylic C(sp³)-H Additions to Low Reactive Carbonyl Compounds, CO₂ and Ketones” International Congress on Pure & Applied Chemistry (ICPAC) 2018, Sakhalay Angkor Resort & Spa, Siem Reap, Cambodia, 2018 年 3 月 7-10 日.
- 21) 美多 剛 “C(sp³)-H 結合切断による求核的アリルコバルト種の生成と求電子剤との反応” 第 50 回有機金属若手の会夏の学校, 定山溪万世閣ホテルミリオネ, 札幌, 2017 年 8 月 7 日-9 日.
- 22) 美多 剛 “Synthesis of α -Amino Acids from Carbon Dioxide” The 19th HU-SNU Joint Symposium, 北海道大学薬学部, 札幌, 2016 年 11 月 24 日.
- 23) 美多 剛 “二酸化炭素を用いた α -アミノ酸の化学合成” 第 10 回プロセス化学ラウンジ, 和光純薬工業(株)湯河原研修所, 静岡, 2015 年 12 月 4-5 日.
- 24) 美多 剛 “二酸化炭素を一炭素源として用いた新規カルボキシル化反応の開発” 第 32 回有機合成化学セミナー奨励賞受賞講演, ニューウェルシティ湯河原, 静岡, 2015 年 9 月 15-17 日.
- 25) Mita, T.; Sugawara, M.; Chen, J.; Higuchi, Y.; Sato, Y. “One-Pot Synthesis of α -Amino Acids from CO₂ and Imine Equivalents” Symposium on Organic Chemistry-Royal Society of Chemistry Roadshow, 東北大学青葉山キャンパス, 仙台, 2015 年 6 月 1 日.

- 26) 美多 剛 “二酸化炭素ガス、フッ化セシウム、および Sn、Si、B を用いる有機合成: α -アミノ酸のワンポット合成、並びに触媒的 C-H カルボキシル化の開発” 若手研究者のための有機化学札幌セミナー, 北海道大学農学部, 札幌, 2012 年 11 月 26 日.
- 27) 美多 剛 “ハーバード大学での生活” 特別講演会, 慶應義塾大学理工学部, 横浜, 2008 年 8 月 23 日.

Research Grant

Grants-in Aid for Scientific Research (KAKENHI) (Researcher Number: 00548183)

1) Grant-in-Aid for Scientific Research B

Research theme: Expansion of MHAT/RPC Chemistry

Person in charge: Hiroki Shigehisa

Duration of research: 2023-2027

Budget distribution: 1,500,000 yen

2) Grant-in-Aid for Transformative Research Areas A (Digitalization-driven Transformative Organic Synthesis (Digi-TOS))

Research theme: Selective and High-Yielding Carboxylations Based on Information Science

Person in charge: Tsuyoshi MITA

Duration of research: 2022-2023

Budget distribution: 6,200,000 yen

3) Grant-in-Aid for Scientific Research B

Research theme: Development of Novel CO₂ Fixation Reactions Guided by Quantum Chemical Calculations

Person in charge: Tsuyoshi MITA

Duration of research: 2022-2025

Budget distribution: 13,400,000 yen

4) Grant-in-Aid for Challenging Research (Exploratory)

Research theme: Proposing the Reaction Pathway of a New Radical Transformation and Validation by Synthetic Organic Chemistry

Person in charge: Tsuyoshi MITA

Duration of research: 2021-2022

Budget distribution: 5,000,000 yen

5) Grant-in-Aid for Scientific Research C

Research theme: Catalytic Multi-Carboxylation Using CO₂

Person in charge: Tsuyoshi MITA

Duration of research: 2018-2020

Budget distribution: 3,400,000 yen

6) Grant-in-Aid for Scientific Research C

Research theme: Catalytic and Direct Carboxylation of C(sp³)-H Bonds with CO₂

Person in charge: Tsuyoshi MITA

Duration of research: 2014-2016

Budget distribution: 4,000,000 yen

7) Grant-in-Aid for Young Scientist B

Research theme: Catalytic and Asymmetric Synthesis of α -Amino Acids from Imines and CO₂

Person in charge: Tsuyoshi MITA

Duration of research: 2012-2013

Budget distribution: 3,600,000 yen

8) Grant-in-Aid for Young Scientist B

Research theme: Synthesis of α -Amino Acids Using CO₂ as a C1 Source

Person in charge: Tsuyoshi MITA

Duration of research: 2010-2011

Budget distribution: 3,100,000 yen

9) Grant-in-Aid for Research Activity Start-Up

Research theme: Synthesis of α -Amino Acids from CO₂ Using a Nickel Catalyst

Person in charge: Tsuyoshi MITA

Duration of research: 2009

Budget distribution: 1,070,000 yen

Other Funds

10) The Naito Foundation

Research theme: Computational-Chemistry-Guided Chemical Synthesis of Fluorinated Amino Acids

Person in charge: Tsuyoshi MITA

Duration of research: 2021

Budget distribution: 3,000,000 yen

11) The Fugaku Trust for Medical Research

Research theme: Synthesis of Fluorinated *N*-Heterocycles towards the Development of Pharmaceutical Substances

Person in charge: Tsuyoshi MITA

Duration of research: 2021

Budget distribution: 2,000,000 yen

12) The Uehara Memorial Foundation

Research theme: Chemical Synthesis of Pharmaceutical Ingredients by Quantum Chemical Calculations

Person in charge: Tsuyoshi MITA

Duration of research: 2020

Budget distribution: 5,000,000 yen

13) The Akiyama Life Science Foundation

Research theme: Chemical Synthesis of Fluorinated Amino Acids Guided by Quantum Chemical Calculations

Person in charge: Tsuyoshi MITA

Duration of research: 2020

Budget distribution: 1,000,000 yen

14) Young Researcher's Award in the Ube Industries Foundation

Research theme: Development of Novel Chemical Reactions Based on Quantum Chemical Calculations

Person in charge: Tsuyoshi MITA

Duration of research: 2020

Budget distribution: 1,000,000 yen

15) Astellas Foundation for Research on Metabolic Disorders

Research theme: Synthesis of Pharmaceutical Resources Based on Calculation

Person in charge: Tsuyoshi MITA

Duration of research: 2019

Budget distribution: 2,000,000 yen

16) The Sumitomo Foundation

Research theme: Instant Carboxylation with CO₂ for the Synthesis of PET Tracers

Person in charge: Tsuyoshi MITA

Duration of research: 2018

Budget distribution: 1,100,000 yen

17) The Takeda Science Foundation

Research theme: Carboxylation Triggered by the Cleavage of Heteroaromatics

Person in charge: Tsuyoshi MITA

Duration of research: 2018

Budget distribution: 2,000,000 yen

18) The Naito Foundation

Research theme: Development of Novel C(sp³)-H Activation Reactions and their Applications

Person in charge: Tsuyoshi MITA

Duration of research: 2017

Budget distribution: 3,000,000 yen

19) Grant-in-Aid for Regional R&D Proposal-Based Program from Northern Advancement Center for Science & Technology of Hokkaido

Research theme: Synthesis of Biological Active Molecules via C(sp³)-H Activation

Person in charge: Tsuyoshi MITA

Duration of research: 2016

Budget distribution: 400,000 yen

20) The Uehara Memorial Foundation

Research theme: Amino Acid Synthesis via C-H Activation

Person in charge: Tsuyoshi MITA

Duration of research: 2010

Budget distribution: 2,000,000 yen

21) Corporation Award in Synthetic Organic Chemistry, Japan

Research theme: Amino Acid Synthesis from Carbon Dioxide

Person in charge: Tsuyoshi MITA

Duration of research: 2009

Budget distribution: 500,000 yen