

Publication List of Prof. Dr. Shigeki Matsunaga (06/2022)

<原著論文>

- (1) Yuki Hirata, Daichi Sekine, Yoshimi Kato, Luqing Lin, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Cobalt(III)/Chiral Carboxylic Acid-Catalyzed Enantioselective Synthesis of Benzothiadiazine-1-Oxides via C–H Activation, *Angew. Chem., Int. Ed. published online* e202205341(2022).
- (2) Takumaru Kurihara, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Achiral Cp*Rh(III)/Chiral Lewis Base Cooperative Catalysis for Enantioselective Cyclization via C–H Activation, *J. Am. Chem. Soc.* **144**, 7058-7065 (2022).
- (3) Yuto Yamaguchi, Yusuke Seino, Akihiro Suzuki, Yudai Kamei, Tatsuhiko Yoshino, Masahiro Kojima* and **Shigeki Matsunaga***, Intramolecular Hydrogen Atom Transfer Hydroarylation of Alkenes toward δ -Lactams Using Cobalt-Photoredox Dual Catalysis, *Org. Lett.* **24**, 2441-2445 (2022).
- (4) Tomoyuki Sekino, Shunta Sato, Tatsuhiko Yoshino, Masahiro Kojima* and **Shigeki Matsunaga***, Regioselective Deaminative Allylation of Aliphatic Amines via Dual Cobalt and Organophotoredox Catalysis, *Org. Lett.* **24**, 2120-2124 (2022)
- (5) Kantaro Kawai, Kazuki Ikeda, Akane Sato, Akira Kabasawa, Masahiro Kojima, Kenta Kokado, Akira Kakugo, Kazuki Sada, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, 1,2-Disubstituted 1,2-Dihydro-1,2,4,5-tetrazine-3,6-dione as a Dynamic Covalent Bonding Unit at Room Temperature. *J. Am. Chem. Soc.* **144**, 1370-1379 (2022).
- (6) Jumpei Hirose, Takumi Wakikawa, Shun Satake, Masahiro Kojima, Manabu Hatano, Kazuaki Ishihara, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Cp*Rh^{III}/Chiral Disulfonate/CuOAc Catalyst System for the Enantioselective Intramolecular Oxyamination of Alkenes. *ACS Catal.* **11**, 15187–15193 (2021).
- (7) Ryo Tanaka, Yuki Hirata, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Cp*Rh(III)/Boron Hybrid Catalysis for Directed C–H Addition to β -Substituted α,β -Unsaturated Carboxylic Acids, *Chem. Commun.* **58**, 76–79 (2022).
- (8) Qi Mou, Ruyuan Zhao, Ruihan Niu, Seiya Fukagawa, Taiki Shigeno, Tatsuhiko Yoshino, **Shigeki Matsunaga*** and Bo Sun*, Cp*Ir(III)/Chiral Carboxylic Acid-Catalyzed Enantioselective C–H Alkylation of Ferrocene Carboxamides with Diazomalonates, *Org. Chem. Front.*, **8**, 6923–6930 (2021).
- (9) Long-Tao Huang, Yuki Hirata, Yoshimi Kato, Luqing Lin, Masahiro Kojima, Tatsuhiko Yoshino*, **Shigeki Matsunaga***, Ruthenium(II)/Chiral Carboxylic Acid Catalyzed Enantioselective C–H Functionalization of Sulfoximines. *Synthesis, published online.* <https://doi.org/10.1055/a-1588-0072> (2021).
- (10) Keitaro Matsuoka, Honoka Obata, Kotaro Nagatsu, Masahiro Kojima, Tatsuhiko Yoshino*, Mikako Ogawa* and **Shigeki Matsunaga***, Transition-metal-free Nucleophilic ²¹¹At-astatination of Spirocyclic Aryliodonium Ylides, *Org. Biomol. Chem.* **19**, 5525–5528 (2021).
- (11) Yoshimi Kato, Luqing Lin, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Development of Pseudo-C₂-symmetric Chiral Binaphthyl Monocarboxylic Acids for Enantioselective C(sp³)-H Functionalization Reactions under Rh(III) Catalysis, *ACS Catal.* **11**, 4271–4277 (2021).

- (12) Yuji Kamei, Yusuke Seino, Yuto Yamaguchi, Tatsuhiko Yoshino, Satoshi Maeda, Masahiro Kojima* and **Shigeki Matsunaga***, Silane- and Peroxide-Free Hydrogen Atom Transfer Hydrogenation Using Ascorbic Acid and Cobalt-Photoredox Dual Catalysis, *Nat. Commun.* **12**, 966 (2021).
- (13) Youka Bunno, Yuta Tsukimawashi, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Metal-Containing Schiff Base/Sulfoxide Ligands for Pd(II)-Catalyzed Asymmetric Allylic C–H Aminations, *ACS Catal.* **11**, 2663–2668 (2021).
- (14) Keitaro Matsuoka, Narumi Komami, Masahiro Kojima, Tsuyoshi Mita, Kimichi Suzuki, Satoshi Maeda, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Chemoselective Cleavage of Si–C(sp³) Bonds in Unactivated Tetraalkylsilanes Using Iodine Tris(trifluoroacetate), *J. Am. Chem. Soc.* **143**, 103–108 (2021).
- (15) Ayako Nakano, Yukino Okabe, Keitaro Matsuoka, Narumi Komami, Keito Watanabe, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Generation of Monoaryl-λ³-iodanes from Arylboron Compounds through *ipso*-Substitution, *HeteroCycles* **103**, 670–677 (2021).
- (16) Long-Tao Huang, Seiya Fukagawa, Masahiro, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Rhodium(III)/Chiral Carboxylic Acid Catalyzed Enantioselective C(sp³)–H Alkylation of 8-Ethylquinolines with α,β-Unsaturated Carbonyl Compounds, *Org. Lett.* **22**, 8256–8260 (2020).
- (17) Taku Miyazawa, Takuro Suzuki, Yuhei Kumagai, Koji Takizawa, Takashi Kikuchi, Shunsuke Kato, Akira Onoda, Takashi Hayashi, Yuji Kamei, Futa Kamiyama, Masahiro Anada, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Chiral Paddle-Wheel Diruthenium Complexes for Asymmetric Catalysis, *Nat. Catal.* **3**, 851–858 (2020).
- (18) Tomoyuki Sekino, Shunta, Sato, Kazuki Kuwabara, Koji Takizawa, Tatsuhiko Yoshino, Masahiro Kojima* and **Shigeki Matsunaga***, Allyl 4-Chlorophenyl Sulfone as a Versatile 1,1-Synthon for Sequential α-Alkylation/Cobalt-Catalyzed Allylic Substitution, *Synthesis* **52**, 1934–1946 (2020).
- (19) Eiki Tomita, Kodai Yamada, Yu Shibata, Ken Tanaka, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Iridium(III) Catalysts with an Amide-Pendant Cyclopentadienyl Ligand: Double Aromatic Homologation Reactions of Benzamides by Fourfold C–H Activation, *Angew. Chem., Int. Ed.* **59**, 10474–10478 (2020).
- (20) Takumaru Kurihara, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Cp*Co^{III}/Chiral Carboxylic Acid-Catalyzed Enantioselective 1,4-Addition Reactions of Indoles to Maleimides, *Asian J. Org. Chem.* **9**, 368–371 (2020).
- (21) Seiya Fukagawa, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Catalytic Enantioselective Methylene C(sp³)–H Amidation of 8-Alkylquinolines Using Cp*Rh^{III}/Chiral Carboxylic Acid System, *Angew. Chem. Int. Ed.* **58**, 18154–18158 (2019).
- (22) Ryo Tanaka, Iku Tanimoto, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Imidate as the Intact Directing Group for the Cobalt-Catalyzed C–H Allylation, *J. Org. Chem.* **84**, 13203–13210 (2019).
- (23) Daichi Sekine, Kazuki Ikeda, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Chiral 2-Aryl Ferrocene Carboxylic Acids for the Catalytic Asymmetric C(sp³)–H Activation of Thioamides, *Organometallics* **48**, 1046–1049 (2019).
- (24) Ryo Tanaka, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Cobalt-catalyzed Synthesis of Homoallylic Amines from Imines and Terminal Alkenes, *Chem. Lett.* **48**, 1046–1049 (2019).

- (25) Yuhei Kumagai, Nanami Murakami, Futa Kamiyama, Ryo Tanaka, Tatsuhiko Yoshino*, Masahiro Kojima* and **Shigeki Matsunaga***, C–H γ,γ,γ -Trifluoroalkylation of Quinolines via Visible-Light-Induced Sequential Radical Additions. *Org. Lett.* **21**, 3600–3605 (2019).
- (26) Keitaro Matsuoka, Narumi Komami, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Synthesis of Heteroaryl Iodanes(III) via *ipso*-Substitution Reactions Using Iodine Triacetate Assisted by HFIP. *Asian J. Org. Chem.* **8**, 1107–1110 (2019).
- (27) Koji Takizawa, Tomoyuki Sekino, Shunta Sato, Tatsuhiko Yoshino, Masahiro Kojima* and **Shigeki Matsunaga***, Cobalt-catalyzed Allylic Alkylation Enabled by Organophotoredox Catalysis. *Angew. Chem., Int. Ed.* **58**, 9199–9203 (2019).
- (28) Narumi Komami, Keitaro Matsuoka, Ayako Nakano, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Synthesis of Functionalized Monoaryl- λ^3 -iodanes through Chemo- and Site-selective *ipso*-Substitution Reactions. *Chem. Eur. J.* **25**, 1217–1220 (2019).
- (29) Seiya Fukagawa, Yoshimi Kato, Ryo Tanaka, Masahiro Kojima, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Enantioselective C(sp³)–H Amidation of Thioamides Catalyzed by a Cobalt^{III}/Chiral Carboxylic Acid Hybrid System. *Angew. Chem., Int. Ed.* **58**, 1153–1157 (2019).
- (30) Iku Tanimoto, Kentaro Kawai, Akane Sato, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, One-Step Synthesis of 4*H*-3,1-Benzoxazin-4-ones from Weinreb Amides and 1,4,2-Dioxazol-5-ones via Cobalt-Catalyzed C–H Bond Activation. *HeteroCycles* **99**, 118–125 (2019).
- (31) Luqing Lin*, Seiya Fukagawa, Daichi Sekine, Eiki Tomita, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Chiral Carboxylic Acid-Enabled Achiral Rhodium(III)-Catalyzed Enantioselective C–H Functionalization. *Angew. Chem., Int. Ed.* **57**, 12048–12052 (2018).
- (32) Shun Satake, Takumaru Kurihara, Keisuke Nishikawa, Takuya Mochizuki, Manabu Hatano, Kazuaki Ishihara, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Pentamethylcyclopentadienyl Rhodium(III)–Chiral Disulfonate Hybrid Catalysis for Enantioselective C–H Bond Functionalization. *Nat. Catal.* **1**, 585–591 (2018).
- (33) Takuro Suzuki, Seiya Fukagawa, Tatsuhiko Yoshino, Masahiro Anada, **Shigeki Matsunaga***, 5-((3-Bromoallyl)Sulfonyl)-*1H*-Tetrazoles for Bromodiene Synthesis. *HeteroCycles* **97**, 1304–1312 (2018).
- (34) Kentaro Kawai, Youka Bunno, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Weinreb Amide Directed Versatile C–H Bond Functionalization under (η^5 -Pentamethylcyclopentadienyl)cobalt(III) Catalysis. *Chem. Eur. J.* **24**, 10231–10237 (2018).
- (35) Takumaru Kurihara, Shun Satake, Manabu Hatano, Kazuaki Ishihara, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Synthesis of 1,1'-Spirobiindane-7,7'-Disulfonic Acid and Disulfonimide: Application for Catalytic Asymmetric Amination. *Chem. Asian J.* **13**, 2378–2381 (2018).
- (36) Narumi Komami, Keitaro Matsuoka, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Palladium-Catalyzed Germylation of Aryl Bromides and Aryl Triflates Using Hexamethyldigermane. *Synthesis*, **50**, 2067–2075 (2018).
- (37) Nanami Murakami, Misaki Yoshida, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Synthesis of Fluorine-Containing 6-Arylpurine Derivatives via Cp*Co(III)-Catalyzed C–H Bond Activation. *Chem. Pharm. Bull.* **66**, 51–54 (2018).

- (38) Takahiro Tomino, Hirotsada Tajiri, Takaaki Tatsuguchi, Takahiro Shirai, Kounosuke Oisaki, **Shigeki Matsunaga**, Fumiyouki Sanematsu, Daiji Sakata, Tomoharu Yoshizumi, Yoshihiko Maehara, Motomu Kanai, Jean-François Côté, Yoshinori Fukui and Takehito Uruno*, DOCK1 inhibition suppresses cancer cell invasion and macropinocytosis induced by self-activating Rac1P29S mutation. *Biochem. Biophys. Res. Commun.* **497**, 298-304 (2018).
- (39) Atsushi Furukawa, Kosuke Kakita, Tomoki Yamada, Mikihiro Ishizuka, Jiro Sakamoto, Nanao Hatori, Naoyoshi Maeda, Fumina Ohsaka, Takashi Saitoh, Takao Nomura, Kimiko Kuroki, Hisanori Nambu, Hisashi Arase, **Shigeki Matsunaga**, Masahiro Anada, Tomoyuki Ose, Shunichi Hashimoto and Katsumi Maenaka, Structural and thermodynamic analyses reveal critical features of glycopeptide recognition by the human PILR α immune cell receptor. *J. Biol. Chem.* **292**, 21128-21136 (2017).
- (40) Masahiro Anada, Taiki Hanari, Kosuke Kakita, Yasunobu Kurosaki, Kazuki Katsuse, Yuta Sunadoi, Yu Jinushi Koji Takeda, **Shigeki Matsunaga** and Shunichi Hashimoto, Total Synthesis of Brasilicardins A and C. *Org. Lett.* **19**, 19, 5581-5584 (2017).
- (41) Takumi Abe, Takuro Suzuki, Masahiro Anada, **Shigeki Matsunaga**, Koji Yamada, 2-Hydroxyindoline-3-triethylammonium Bromide: A Reagent for Formal C3-Electrophilic Reactions of Indoles. *Org. Lett.* **19**, 4275-4278 (2017).
- (42) Ken Sakata*, Masami Eda, Yuri Kitaoka, Tatsuhiko Yoshino and **Shigeki Matsunaga**, Cp*Co^{III}-Catalyzed C–H Alkenylation/Annulation Reactions of Indoles with Alkynes: A DFT Study. *J. Org. Chem.* **82**, 7379–7387 (2017).
- (43) Seiya Fukagawa, Yingjie Xu, Masahiro Anada, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Catalytic Enantioselective Desymmetrization of *meso*-Aziridines with Fluoromalونات. *HeteroCycles* **94**, 1337–1350 (2017).
- (44) Hideya Ikemoto, Ryo Tanaka, Ken Sakata, Motomu Kanai, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Stereoselective Synthesis of Tetrasubstituted Alkenes via a Cp*Co^{III}-Catalyzed C–H Alkenylation/Directing Group Migration Sequence. *Angew. Chem., Int. Ed.* **56**, 7156–7160 (2017).
- (45) Misaki Yoshida, Kentaro Kawai, Ryo Tanaka, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Cp*Co^{III}-Catalyzed Directed C–H Trifluoromethylthiolation of 2-Phenylpyridines and 6-Arylpyridines. *Chem. Commun.* **53**, 5974–5977 (2017).
- (46) Hirotsada Tajiri, Takehito Uruno, Takahiro Shirai, Daisuke Takaya, **Shigeki Matsunaga**, Daiki Setoyama, Mayuki Watanabe, Mutsuko Kukimoto-Niino, Kounosuke Oisaki, Miho Ushijima, Fumiki Sanematsu, Teruki Honma, Takaho Terada, Eiji Oki, Senji Shirasawa, Yoshihiko Maehara, Dongchon Kang, Jean-François Côté, Shigeyuki Yokoyama, S.; Motomu Kanai, and Yoshinori Fukui*, Targeting Ras-Driven Cancer Cell Survival and Invasion through Selective Inhibition of DOCK1. *Cell Reports* **19**, 969-980 (2017).
- (47) Atmika Paudel, Hiroshi Hamamoto, Suresh Panthee, Keiichi Kaneko, **Shigeki Matsunaga**, Motomu Kanai, Yutaka Suzuki and Kazuhisa Sekimizu*, A Novel Spiro-heterocyclic Compound Identified by the Silkworm Infection Model Inhibits Transcription in *Staphylococcus aureus*. *Front. Microbiol.* **7**, 712 (2017).
- (48) Shota Kato, Yutaka Saga, Masahiro Kojima, Hiromi Fuse, **Shigeki Matsunaga**, Arisa Fukatsu, Mio Kondo, Shigeyuki Masaoka, Motomu Kanai*, Hybrid Catalysis Enabling Room-Temperature Hydrogen Gas Release from N-Heterocycles and Tetrahydronaphthalenes. *J. Am. Chem. Soc.* **139**, 2204-2207 (2017).

- (49) Diastereo- and Enantioselective Construction of 6,7-Dioxabicyclo[2.2.1]heptane Derivatives by a Dirhodium(II)-Catalyzed Intramolecular C–H Insertion Reaction. Taku Miyazawa, Kozue Imai, Motoki Ito, Koji Takeda, Masahiro Anada*, **Shigeki Matsunaga** and Shunichi Hashimoto*, *HeteroCycles* **95**, 1211-1229 (2017).
- (50) Naoyoshi Maeda, Atsushi Furukawa, Kosuke Kakita, Masahiro Anada, Shunichi Hashimoto, **Shigeki Matsunaga**, Kimiko Kuroki, Toyoyuki Ose, Akihisa Kato, Jun Arii, Yasushi Kawaguchi, Hisashi Arase, Katsumi Maenaka*, Rapid Screening by Cell-Based Fusion Assay for Identifying Novel Antivirals of Glycoprotein B-Mediated Herpes Simplex Virus Type 1 Infection. *Biol. Pharm. Bull.* **39**, 1897-1902 (2016).
- (51) Taku Miyazawa, Kazushi Minami, Motoki Ito, Masahiro Anada*, **Shigeki Matsunaga** and Shunichi Hashimoto, Enantio- and diastereoselective desymmetrization of α -alkyl- α -diazoesters by dirhodium(II)-catalyzed intramolecular C–H insertion. *Tetrahedron* **72**, 3939-3947 (2016).
- (52) Ryo Tanaka, Hideya Ikemoto, Motomu Kanai, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Site- and Regioselective Monoalkenylation of Pyrroles with Alkynes via Cp*Co^{III} Catalysis. *Org. Lett.* **18**, 18, 5732–5735 (2016).
- (53) Youka Bunno, Nanami Murakami, Yudai Suzuki, Motomu Kanai, Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Cp*Co^{III}-Catalyzed Dehydrative C–H Allylation of 6-Arylpyrimidines and Aromatic Amides Using Allyl Alcohols in Fluorinated Alcohols. *Org. Lett.* **18**, 2216–2219 (2016).
- (54) Luqing Lin, Kumiko Yamamoto, Harunobu Mitsunuma, Yamato Kanzaki, **Shigeki Matsunaga*** and Motomu Kanai*, Catalytic Asymmetric Iterative/Domino Aldehyde Cross-Aldol Reactions for the Rapid and Flexible Synthesis of 1,3-Polyols. *J. Am. Chem. Soc.* **137**, 137, 15418-15421 (2015).
- (55) Bo Sun, Tatsuhiko Yoshino, Motomu Kanai* and **Shigeki Matsunaga***, Cp*Co^{III} Catalyzed Site-Selective C–H Activation of Unsymmetrical O-Acyl Oximes: Synthesis of Multisubstituted Isoquinolines from Terminal and Internal Alkynes. *Angew. Chem. Int. Ed.* **54**, 54, 12968–12972 (2015).
- (56) Yudai Suzuki, Bo Sun, Ken Sakata, Tatsuhiko Yoshino, **Shigeki Matsunaga*** and Motomu Kanai*, Dehydrative Direct C–H Allylation with Allylic Alcohols under [Cp*Co^{III}] Catalysis. *Angew. Chem. Int. Ed.* **54**, 9944–9947 (2015).
- (57) Bo Sun, Tatsuhiko Yoshino, **Shigeki Matsunaga*** and Motomu Kanai*, Cp*CoI₂-dimer as a precursor for cationic Co(III)-catalysis: application to C-H phosphoramidation of indoles. *Chem. Commun.* **51**, 4659-4661 (2015).
- (58) Yudai Suzuki, Bo Sun, Tatsuhiko Yoshino, Motomu Kanai* and **Shigeki Matsunaga***, Cp*Co(III)-catalyzed oxidative C-H alkenylation of benzamides with ethyl acrylate. *Tetrahedron* **71**, 4552-4556 (2015).
- (59) Yingjie Xu, Keiichi Kaneko, Motomu Kanai, Masakatsu Shibasaki* and **Shigeki Matsunaga***, Regiodivergent Kinetic Resolution of Terminal and Internal *rac*-Aziridines with Malonates under Dinuclear Schiff Base Catalysis. *J. Am. Chem. Soc.* **136**, 9190-9194 (2014).
- (60) Shohei Yamamoto, **Shigeki Matsunaga*** and Motomu Kanai*, COBALT-CATALYZED C5-SELECTIVE C-H FUNCTIONALIZATION OF 4-Me-QUINOLINES WITH STYRENES: AN APPROACH TO 5,6-DIHYDRO-4H-BENZO[de]QUINOLINES. *Heterocycles* **90**, 89-96 (2015).
- (61) Hideya Ikemoto, Tatsuhiko Yoshino, Ken Sakata, **Shigeki Matsunaga*** and Motomu Kanai *, Pyrroloindolone Synthesis via a Cp*Co^{III}-Catalyzed Redox-Neutral Directed C-H

Alkenylation/Annulation Sequence. *J. Am. Chem. Soc.* **136**, 5424-5431 (2014).

- (62) Sun Bo, Tatsuhiko Yoshino, **Shigeki Matsunaga*** and Motomu Kanai *, Air-Stable Cp*Co(CO)₂ Complex as a Precursor for Cationic Cp*Co^{III} Catalysis: Application for Directed C2-Selective C-H Amidation of Indoles. *Adv. Synth. Catal.* **356**, 1491-1495 (2014).
- (63) Shohei Yamamoto, Yutaka Saga, Takashi Andou, **Shigeki Matsunaga*** and Motomu Kanai*, Cobalt-Catalyzed C-4 Selective Alkylation of Quinolines. *Adv. Synth. Catal.* **356**, 401-405 (2014).
- (64) Shota Kato, Motomu Kanai and **Shigeki Matsunaga***, ENANTIOSELECTIVE SYNTHESIS OF SPIROOXINDOLES VIA DIRECT CATALYTIC ASYMMETRIC ALDOL-TYPE REACTION OF ISOTHIOCYANATO OXINDOLES. *Heterocycles* **88**, 475-491 (2014).
- (65) Luqing Lin, Kumiko Yamamoto, **Shigeki Matsunaga*** and Motomu Kanai *, Rh-Catalyzed Aldehyde-Aldehyde Cross-Aldol Reaction under Base-free Conditions: In Situ Aldehyde-derived Enolate Formation via Orthogonal Activation. *Chem. Asian J.* **8**, 2974-2983 (2013).
- (66) Keiichi Kaneko, **Shigeki Matsunaga*** and Motomu Kanai *, Sultam Synthesis via Cu-Catalyzed Intermolecular Carboamination of Alkenes with *N*-Fluorobenzenesulfonimide. *Org. Lett.* **15**, 2502-2505 (2013).
- (67) Tatsuhiko Yoshino, Hideya Ikemoto, **Shigeki Matsunaga*** and Motomu Kanai *, Cp*Co^{III}-Catalyzed C2-Selective Addition of Indoles to Imines. *Chem. Eur J.* **19**, 9142-9146 (2013).
- (68) Atmika Paudel, Keiichi Kaneko, Ayako Watanabe, **Shigeki Matsunaga**, Motomu Kanai, and Hiroshi Hamamoto, Kazuhisa Sekimizu, Structure-activity relationship study of novel iminothiadiazolo-1 pyrimidinone antimicrobial agents. *J. Antibiotics* **66**, 663-667 (2013).
- (69) Shota Kato, Motomu Kanai* and **Shigeki Matsunaga***, Catalytic Asymmetric Synthesis of Spirooxindoles via Addition of Isothiocyanato Oxindoles to Aldehydes Under Dinuclear Nickel Schiff Base Catalysis. *Chem. Asian J.* **8**, 1768-1771 (2013).
- (70) Tatsuhiko Yoshino, Hideya Ikemoto, **Shigeki Matsunaga*** and Motomu Kanai *, A Cationic High-Valent Cp*Co^{III} Complex for Catalytic Generation of Nucleophilic Organometallic Species: Directed C-H Bond Activation. *Angew. Chem. Int. Ed.* **52**, 2207-2211 (2013).
- (71) Takashi Andou, Yutaka Saga, Hiroto Komai, **Shigeki Matsunaga*** and Motomu Kanai *, Cobalt-Catalyzed C-4 Selective Direct Alkylation of Pyridines. *Angew. Chem. Int. Ed.* **52**, 3213-3216 (2013).
- (72) Luqing Lin, Kumiko Yamamoto, **Shigeki Matsunaga*** and Motomu Kanai *, Rh-Catalyzed Cross-Aldol Reaction via in situ Aldehyde-Enolate Formation from Allyloxy-Boranes and Primary Allylic Alcohols. *Angew. Chem. Int. Ed.* **51**, 10275-10279 (2012).
- (73) Hirooki Tanabe, Yingjie Xu, Bo Sun, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Direct Catalytic Asymmetric Vinylogous Michael Reaction of α,β -unsaturated γ -butyrolactam under dinuclear nickel Schiff base catalysis. *Heterocycles* **86**, 611-622 (2012).
- (74) Shota Kato, Tatsuhiko Yoshino, Masakatsu Shibasaki, Motomu Kanai* and **Shigeki Matsunaga***, Catalytic Asymmetric Synthesis of Spirooxindoles via Mannich-type Reaction of Isothiocyanato Oxindoles. *Angew. Chem. Int. Ed.* **51**, 7007-7010 (2012).
- (75) Hiroto Komai, Tatsuhiko Yoshino, **Shigeki Matsunaga*** and Motomu Kanai*, Lewis acid-catalyzed Benzylic C-H Bond Functionalization of Azaarenes: Addition to Imines and Enones. *Synthesis*, **44**, 2185-2194 (2012).

- (76) Yudai Suzuki, Motomu Kanai* and **Shigeki Matsunaga***, Mg-catalyzed Enantioselective Benzylic C-H Bond Functionalization of Isoindolinones: Addition to Imines. *Chem. Eur. J.* **18**, 7654-7657 (2012).
- (77) Harunobu Mitsunuma, Masakatsu Shibasaki, Motomu Kanai* and **Shigeki Matsunaga***, Catalytic Asymmetric Total Synthesis of Chimonanthine, Folicanthine, and Calycanthine via Double Michael Reaction of Bisoxindole. *Angew. Chem. Int. Ed.* **51**, 5217-5221(2012).
- (78) Toshihiko Sone, Akitake Yamaguchi, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Enantioselective Synthesis of 2,2-Disubstituted Terminal Epoxides via Catalytic Asymmetric Corey-Chaykovsky Epoxidation of Ketones, *Molecules* **17**, 1617-1634 (2012).
- (79) Shinsuke Mouri, Zhihua Chen, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Amination of Oxindoles Under Dinuclear Nickel Schiff Base Catalysis. *Heterocycles* **84**, 879-892 (2012).
- (80) Yingjie Xu, Luqing Lin, Motomu Kanai, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Ring-Opening of *meso*-Aziridines with Malonates Under Heterodinuclear Rare Earth Metal Schiff Base Catalysis. *J. Am. Chem. Soc.* **133**, 5791-5793 (2011).
- (81) Hiroto Komai, Tatsuhiko Yoshino, **Shigeki Matsunaga*** and Motomu Kanai*, Lewis acid-catalyzed Benzylic C-H Bond Functionalization of Azaarenes: Addition to Enones. *Org. Lett.* **13**, 1706-1709 (2011).
- (82) Gang Lu, Tatsuhiko Yoshino, Hiroyuki Morimoto, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Stereodivergent Direct Catalytic Asymmetric Mannich-type Reaction of α -Isothiocyanato Ester with Ketimines. *Angew. Chem. Int. Ed.* **50**, 4382-4385 (2011).
- (83) Harunobu Mitsunuma and **Shigeki Matsunaga***, Dinuclear Ni₂-Schiff base complex-catalyzed asymmetric 1,4-addition of β -keto esters to nitroethylene toward $\gamma^{2,2}$ -amino acid synthesis. *Chem. Commun.* **47**, 469-471 (2011).
- (84) Makoto Furutachi, Shinsuke Mouri, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, A Heterobimetallic Ni/La-salan Complex for Catalytic Asymmetric Decarboxylative 1,4-Addition of Malonic Acid Half-Thioester. *Chem. Asian J.* **5**, 2351-2354 (2010).
- (85) Yingjie Xu, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, *syn*-Selective Catalytic Asymmetric 1,4-Addition of α -Ketoanilides to Nitroalkenes under Dinuclear Nickel Catalysis. *Org. Lett.* **12**, 3246-3249 (2010).
- (86) Takafumi Yukawa, Bianca Seelig, Hiroyuki Morimoto, **Shigeki Matsunaga***, Albrecht Berkessel* and Masakatsu Shibasaki*, Catalytic Asymmetric aza-Morita-Baylis-Hillman Reaction of Methyl Acrylate Promoted by a La-linked-BINOL Complex Combined with DABCO. *J. Am. Chem. Soc.* **132**, 11988-11992 (2010).
- (87) Shinya Handa, Vijay Gnanadesikan, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Heterobimetallic Transition Metal/Rare Earth Metal Bifunctional Catalysis: a Cu-Sm-Schiff Base Complex for *syn*-Selective Catalytic Asymmetric Nitro-Mannich Reaction. *J. Am. Chem. Soc.* **132**, 4925-4934 (2010).
- (88) Nicholas E. Shepherd, Hirooki Tanabe, Yingjie Xu, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Direct Catalytic Asymmetric Vinylogous Mannich-type and Michael Reactions of an α,β -Unsaturated γ -Butyrolactam Under Dinuclear Nickel Catalysis. *J. Am. Chem. Soc.* **132**, 3666-3667

(2010).

- (89) Makoto Furutachi, Zihua Chen, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric 1,4-Additions of β -Keto Esters to Nitroalkenes Promoted by a Bifunctional Homobimetallic Co_2 -Schiff Base Complex. *Molecules* **15**, 532-544 (2010).
- (90) Shinsuke Mouri, Zihua Chen, Harunobu Mitsunuma, Makoto Furutachi, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Synthesis of 3-Aminooxindoles: Enantiofacial Selectivity Switch in Bimetallic vs Monometallic Schiff Base Catalysis. *J. Am. Chem. Soc.* **132**, 1255-1257 (2010).
- (91) Tatsuhiko Yoshino, Hiroyuki Morimoto, Gang Lu, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Construction of Contiguous Tetrasubstituted Chiral Carbon Stereocenters via Direct Catalytic Asymmetric Aldol Reaction of α -Isothiocyanato Esters to Ketones. *J. Am. Chem. Soc.* **131**, 17068-17069 (2009).
- (92) Shinsuke Mouri, Zihua Chen, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Direct Catalytic Asymmetric Aldol Reaction of β -Keto Esters with Formaldehyde Promoted by a Dinuclear Ni_2 -Schiff Base Complex. *Chem. Commun.* 5138-5140 (2009).
- (93) Akitake Yamaguchi, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Synthesis of α -Alkylidene- β -hydroxy Esters via Dynamic Kinetic Asymmetric Transformation Involving Ba-Catalyzed Direct Aldol Reaction. *J. Am. Chem. Soc.* **131**, 10842-10843 (2009).
- (94) Yuko Kato, Makoto Furutachi, Zihua Chen, Harunobu Mitsunuma, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, A Homodinuclear Mn(III)_2 -Schiff Base Complex for Catalytic Asymmetric 1,4-Additions of Oxindoles to Nitroalkenes. *J. Am. Chem. Soc.* **131**, 9168-9169 (2009).
- (95) Hisashi Mihara, Yingjie Xu, Nicholas E. Shepherd, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, A Heterobimetallic Ga/Yb-Schiff Base Complex for Catalytic Asymmetric α -Addition of Isocyanides to Aldehydes. *J. Am. Chem. Soc.* **131**, 8384-8385 (2009).
- (96) Yingjie Xu, Gang Lu, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Direct *anti*-Selective Catalytic Asymmetric Mannich-type Reactions of α -Ketoanilides for γ -Amino Amides and Azetidine-2-amides Synthesis. *Angew. Chem. Int. Ed.* **48**, 3353-3356 (2009).
- (97) Yuko Kato, Zihua Chen, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Synthesis of Nitrogen-containing *gem*-Bisphosphonates Using a Dinuclear Ni_2 -Schiff Base Complex. *Synlett* 1635-1638 (2009).
- (98) Keiichi Hara, Shin-ya Tosaki, Vijay Gnanadesikan, Hiroyuki Morimoto, Shinji Harada, Mari Sugita, Noriyuki Yamagiwa, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Mixed La-Li Heterobimetallic Complexes for Tertiary Nitroaldol Resolution. *Tetrahedron*, **65**, 5030-5036 (2009).
- (99) Toshihiko Sone, Gang Lu, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Synthesis of 2,2-Disubstituted Oxetanes from Ketones via One-pot Sequential Addition of Sulfur Ylide. *Angew. Chem. Int. Ed.* **48**, 1677-1680 (2009).
- (100) Zihua Chen, Makoto Furutachi, Yuko Kato, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, A Stable Homodinuclear Biscobalt(III)-Schiff Base Complex for Catalytic Asymmetric 1,4-Additions of β -Keto Esters to Alkynones. *Angew. Chem. Int. Ed.* **48**, 2218-2220 (2009).
- (101) Hidetoshi Noda, Sean H. Wiedemann, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, A DyI_3 -Catalyzed Mannich-type Reaction of α -Methylcyclopropanecarboxylate-type Donors for the

Stereoselective Synthesis of Pyrrolidines with Quaternary Stereocenters. *Chem. Lett.* **37**, 1180-1181 (2008).

- (102) Hiroyuki Morimoto, Tatsuhiko Yoshino, Takafumi Yukawa, Gang Lu, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Lewis Base-Assisted-Brønsted Base Catalysis: Bidentate Phosphine Oxides as Activators and Modulators of Brønsted Basic Lanthanum-Aryloxide. *Angew. Chem. Int. Ed.* **47**, 9125-9129 (2008).
- (103) Toshihiko Sone, Akitake Yamaguchi, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Synthesis of 2,2-Disubstituted Terminal Epoxides via Dimethyloxosulfonium Methylide Addition to Ketones. *J. Am. Chem. Soc.* **130**, 10078-10079 (2008).
- (104) Zhihua Chen, Kenichiro Yakura, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Direct Catalytic Asymmetric Mannich-type Reaction of β -Keto Phosphonate Using a Dinuclear Ni_2 -Schiff Base Complex. *Org. Lett.* **10**, 3239-3242 (2008).
- (105) Gang Lu, Hiroyuki Morimoto, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Chiral γ -Amino Amide Synthesis via Heterobimetallic La/Li/pybox-Catalyzed Direct Asymmetric Mannich-type Reactions of α -Keto Anilides. *Angew. Chem. Int. Ed.* **47**, 6847-6850 (2008).
- (106) Akitake Yamaguchi, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Direct Catalytic Asymmetric Mannich-type Reactions of γ -Butenolides: Effectiveness of Brønsted Acid in Chiral Metal Catalysis. *Org. Lett.* **10**, 2319-2322 (2008).
- (107) Yoshihiro Sohtome, Yuko Kato, Shinya Handa, Naohiro Aoyama, Keita Nagawa, **Shigeki Matsunaga** and Masakatsu Shibasaki*, Stereodivergent Catalytic Doubly Diastereoselective Nitroaldol Reactions Using Heterobimetallic Complexes. *Org. Lett.* **10**, 2231-2234 (2008).
- (108) Sean H. Wiedemann, Hidetoshi Noda, Shinji Harada, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Sc^{3+} -Catalyzed Aldol-type Additions of *N*-Benzoylcyclopropanecarboxamides via Iodide-Mediated Ring-Opening: Stereoselective Synthesis of γ -Lactams. *Org. Lett.* **10**, 1661-1664 (2008).
- (109) Keiichi Hara, So-Young Park, Noriyuki Yamagiwa, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Epoxidation of α,β -Unsaturated Phosphine Oxides with a $\text{Y}(\text{O}-i\text{Pr})_3$ /Biphenyldiol Complex. *Chem. Asian, J.* **3**, 1500-1504 (2008).
- (110) Shinya Handa, Keita Nagawa, Yoshihiro Sohtome, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, A Heterobimetallic Pd-La-Schiff Base Complex for *anti*-Selective Catalytic Asymmetric Nitroaldol Reactions and Applications to Short Syntheses of β -Adrenoceptor Agonists. *Angew. Chem. Int. Ed.* **47**, 3230-3233 (2008).
- (111) Zhihua Chen, Hiroyuki Morimoto, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, A Bench-stable Homodinuclear Ni_2 -Schiff Base Complex for Catalytic Asymmetric Synthesis of α -Tetrasubstituted *anti*- α,β -Diamino Acid Surrogates. *J. Am. Chem. Soc.* **130**, 2170-2171 (2008).
- (112) Masataka Morita, Toshihiko Sone, Kenzo Yamatsugu, Yoshihiro Sohtome, **Shigeki Matsunaga**, Motomu Kanai,* Yasuyoshi Watanabe and Masakatsu Shibasaki*, A method for the synthesis of an oseltamivir PET tracer. *Bioorg. Med. Chem. Lett.* **18**, 600-602 (2008).
- (113) Hisashi Mihara, Yoshihiro Sohtome, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Chiral Catalyst-based Convergent Synthesis of HIV Protease Inhibitor GRL-06579A. *Chem. Asian, J.* **3**, 359-366 (2008).

- (114) Ryo Takita, Shinji Harada, Takashi Ohshima, **Shigeki Matsunaga** and Masakatsu Shibasaki*, Catalytic Enantioselective Addition of Terminal Alkynes to Aldehydes: Preparation of (*S*)-(-)-1,3-Diphenyl-2-Propyn-1-ol and (*S*)-(-)-4-Methyl-1-Phenyl-2-Pentyn-1,4-Diol. *Org. Synth.* **85**, 118-130 (2008).
- (115) Hiroyuki Kakei, Toshihiko Sone, Yoshihiro Sohtome, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Cyclopropanation of Enones with Dimethyloxosulfonium Methylide Promoted by a La-Li₃-(Biphenyldiolate)₃ + NaI Complex. *J. Am. Chem. Soc.* **129**, 13410-13411 (2007).
- (116) Akitake Yamaguchi, Naohiro Aoyama, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Bimetallic Catalyzed Direct Mannich-type Reactions of a β,γ -Unsaturated Ester Providing β -Methyl *aza*-Morita-Baylis-Hillman-type Products. *Org. Lett.* **9**, 3387-3390 (2007).
- (117) Hiroyuki Morimoto, Gang Lu, Naohiro Aoyama, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Lanthanum Aryloxide/Pybox-Catalyzed Direct Asymmetric Mannich-Type Reactions Using a Trichloromethyl Ketone as a Propionate Equivalent Donor. *J. Am. Chem. Soc.* **129**, 9588-9589 (2007).
- (118) Naoya Kumagai, **Shigeki Matsunaga**, and Masakatsu Shibasaki*, Catalytic nucleophilic activation of acetonitrile via a cooperative catalysis of cationic Ru complex, DBU, and Na salt. *Tetrahedron*, **63**, 8598-8608 (2007).
- (119) So-Young Park, Hiroyuki Morimoto, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Michael Reactions of Malonate to α,β -Unsaturated *N*-Acylpyrroles Using a La(O-*i*Pr)₃/*Ph*-linked-BINOL Complex. *Tetrahedron Lett.* **48**, 2815-2818 (2007).
- (120) Shinya Handa, Vijay Gnanadesikan, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, *syn*-Selective Catalytic Asymmetric Nitro-Mannich Reactions Using a Heterobimetallic Cu-Sm-Schiff Base Complex. *J. Am. Chem. Soc.* **129**, 4900-4901 (2007).
- (121) Shinji Harada, Ryo Takita, Takashi Ohshima, **Shigeki Matsunaga** and Masakatsu Shibasaki*, Ligand Accelerated Indium(III)-Catalyzed Asymmetric Alkynylation of Aldehydes with 2-Methyl-3-butyn-2-ol as an Ethyne Equivalent Donor. *Chem. Commun.* 948-950 (2007).
- (122) Hiroyuki Kakei, Riichiro Tsuji, Takashi Ohshima, Hiroyuki Morimoto, **Shigeki Matsunaga**, and Masakatsu Shibasaki*, Catalytic Asymmetric Epoxidation of α,β -Unsaturated Esters Using Chiral Yttrium-Biaryldiol Complexes. *Chem. Asian, J.* **2**, 257-264 (2007).
- (123) Hongbo Qin, Noriyuki Yamagiwa, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Bismuth- and Hafnium-catalyzed Hydroamination of Vinyl Arenes with Sulfonamides, Carbamates, and Carboxamides. *Chem. Asian, J.* **2**, 150-154 (2007).
- (124) Hongbo Qin, Noriyuki Yamagiwa, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Bismuth-Catalyzed Direct Substitution of the Hydroxyl Group in Alcohols with Sulfonamides, Carbamates, and Carboxamides. *Angew. Chem. Int. Ed.* **46**, 409-413 (2007).
- (125) Zhihua Chen, Hiroyuki Morimoto, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Epoxidation of α -Methyl α,β -Unsaturated Anilides as Ester Surrogates. *Synlett* 3529-3532 (2006).
- (126) Shin-ya Tosaki, Keiichi Hara, Vijay Gnanadesikan, Hiroyuki Morimoto, Shinji Harada, Mari Sugita, Noriyuki Yamagiwa, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Mixed La-Li Heterobimetallic Complexes for Tertiary Nitroaldol Resolution. *J. Am. Chem. Soc.* **128**, 11776-

11777 (2006).

- (127) **Shigeki Matsunaga*** Mari Sugita, Noriyuki Yamagiwa, Shinya Handa, Akitake Yamaguchi and Masakatsu Shibasaki*, *Syn-Selective Direct Catalytic Asymmetric Mannich-type Reactions of Aromatic and Heteroaromatic Hydroxyketones Promoted by Y[N(SiMe₃)₂]₃/linked-BINOL Complexes. *Bull. Chem. Soc. Jpn.* **79**, 1906-1912 (2006).*
- (128) Akitake Yamaguchi, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Direct catalytic asymmetric Mannich-type reaction of isomerizable aliphatic imines: chemoselective enolate formation from a hydroxyketone by a Zn catalyst. *Tetrahedron Lett.* **47**, 3985-3989 (2006).
- (129) Hiroyuki Morimoto, Sean H. Wiedemann, Akitake Yamaguchi, Shinji Harada, Zhihua Chen, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Trichloromethyl Ketones as Synthetically Versatile Donors: Application in Direct Catalytic Mannich-type Reactions and Stereoselective Synthesis of Azetidines. *Angew. Chem. Int. Ed.* **45**, 3146-3150 (2006).
- (130) Noriyuki Yamagiwa, Yumi Abiko, Mari Sugita, Jun Tian, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Cyano-phosphorylation of Aldehydes Using a YLi₃tris(binaphthoxide) Complex (YLB). *Tetrahedron: Asymmetry*, **17**, 566-573 (2006).
- (131) **Shigeki Matsunaga***, Hongbo Qin, Mari Sugita, Shigemitsu Okada, Tomofumi Kinoshita, Noriyuki Yamagiwa and Masakatsu Shibasaki*, Catalytic Asymmetric Epoxidation of α,β -Unsaturated *N*-Acylpyrroles as Monodentate and Activated Ester Equivalent Acceptors. *Tetrahedron*, **62**, 6630-6639 (2006).
- (132) Hongbo Qin, Noriyuki Yamagiwa, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Bismuth-Catalyzed Intermolecular Hydroamination of 1,3-Dienes with Carbamates, Sulfonamides, and Carboxamides. *J. Am. Chem. Soc.* **128**, 1611-1614 (2006).
- (133) Mari Sugita, Akitake Yamaguchi, Noriyuki Yamagiwa, Shinya Handa, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, *Syn-Selective Direct Catalytic Asymmetric Mannich-type Reactions of Hydroxyketones Using Y{N(SiMe₃)₂}₃/linked-BINOL Complexes. *Org. Lett.* **7**, 5339-5342 (2005).*
- (134) Noriyuki Yamagiwa, Hongbo Qin, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Lewis Acid-Lewis Acid Heterobimetallic Cooperative Catalysis: Mechanistic Studies and Application in Enantioselective *Aza*-Michael Reaction. *J. Am. Chem. Soc.* **127**, 13419-13427 (2005).
- (135) Naoya Kumagai, **Shigeki Matsunaga** and Masakatsu Shibasaki*, Catalytic chemoselective addition of acetonitrile to enolizable aldehydes with cationic Ru complex/DBU combination. *Chem. Commun.* 3600-3602 (2005).
- (136) Shinji Harada, Shinya Handa, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Direct Catalytic Asymmetric Mannich-type Reaction of *N*-(2-Hydroxyacetyl)pyrrole as an Ester Equivalent Donor. *Angew. Chem. Int. Ed.* **44**, 4365-4368 (2005).
- (137) Takasasa Yoshida, Hiroyuki Morimoto, Naoya Kumagai, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Non-C₂-Symmetric, Chirally Economical, and Readily Tunable Linked-BINOLs: Design and Application in Direct Catalytic Asymmetric Mannich-type Reaction. *Angew. Chem. Int. Ed.* **44**, 3470-3474 (2005).
- (138) Noriyuki Yamagiwa, Jun Tian, **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Catalytic Asymmetric Cyano-ethoxycarbonylation Reaction of Aldehydes Using a YLi₃tris(binaphthoxide) (YLB) Complex: Mechanism and Roles of Achiral Additives. *J. Am. Chem. Soc.* **127**, 3413-3422 (2005).

- (139) Naoya Kumagai, **Shigeki Matsunaga** and Masakatsu Shibasaki*, Cooperative Catalysis of a Cationic Ruthenium, Amine Base, and Na Salt: Catalytic Activation of Acetonitrile as a Nucleophile. *J. Am. Chem. Soc.* **126**, 13632-13633 (2004).
- (140) Yumi Abiko, Noriyuki Yamagiwa, Mari Sugita, Jun Tian, **Shigeki Matsunaga** and Masakatsu Shibasaki*, Catalytic Asymmetric Cyano-phosphorylation of Aldehydes Promoted by Heterobimetallic YLi₃tris(binaphthoxide) (YLB) Complex. *Synlett* 2434-2436 (2004).
- (141) **Shigeki Matsunaga**, Takamasa Yoshida, Hiroyuki Morimoto, Naoya Kumagai and Masakatsu Shibasaki*, Direct Catalytic Asymmetric Mannich-type Reaction of Hydroxyketone Using a Et₂Zn/linked-BINOL Complex: Synthesis of either *anti*- or *syn*-β-Amino Alcohols. *J. Am. Chem. Soc.* **126**, 8777-8785 (2004).
- (142) **Shigeki Matsunaga**, Tomofumi Kinoshita, Shigemitsu Okada, Shinji Harada and Masakatsu Shibasaki*, Catalytic Asymmetric 1,4-Addition Reactions Using α, β-Unsaturated *N*-Acylpyrrole as a Highly Reactive Monodentate α,β-Unsaturated Ester Surrogate. *J. Am. Chem. Soc.* **126**, 7559-7570 (2004).
- (143) Noriyuki Yamagiwa, **Shigeki Matsunaga** and Masakatsu Shibasaki*, Mechanistic Studies of a Reaction Promoted by the YLi₃tris(binaphthoxide) Complex: Are Three 1,1'-Bi-2-naphthol Units in a Rare Earth-Alkali Metal Heterobimetallic Complex Necessary? *Angew. Chem. Int. Ed.* **43**, 4493-4497 (2004).
- (144) Naoya Kumagai, **Shigeki Matsunaga** and Masakatsu Shibasaki*, An Efficient Synthesis of Bicyclic Amidines via Intramolecular Cyclization of Azide to Lactam. *Angew. Chem. Int. Ed.* **43**, 478-482 (2004).
- (145) Noriyuki Yamagiwa, **Shigeki Matsunaga** and Masakatsu Shibasaki*, Heterobimetallic Catalysis in Asymmetric 1,4-Addition of *O*-Alkylhydroxylamine to Enones. *J. Am. Chem. Soc.* **125**, 16178-16179 (2003).
- (146) Tomofumi Kinoshita, Shigemitsu Okada, Sun-Ryung, Park, **Shigeki Matsunaga** and Masakatsu Shibasaki*, Sequential Wittig-Catalytic Asymmetric Epoxidation Reaction Reusing Waste Ph₃P(O): Application of α,β-Unsaturated *N*-Acylpyrrole as Ester Surrogate. *Angew. Chem. Int. Ed.* **42**, 4680-4684 (2003).
- (147) Yutaka Suto, Naoya Kumagai, **Shigeki Matsunaga** and Motomu Kanai, Masakatsu Shibasaki*, Direct Catalytic Aldol-type Reactions Using RCH₂CN. *Org. Lett.* **5**, 3147-3150 (2003).
- (148) Jun Tian, Noriyuki Yamagiwa, **Shigeki Matsunaga** and Masakatsu Shibasaki*, Efficient Two-step Conversion of α,β-Unsaturated Aldehyde to Optically Active γ-Oxy-α,β-Unsaturated Nitriles and its Application to Total Synthesis of (+)-Patulolide C. *Org. Lett.* **5**, 3021-3024 (2003).
- (149) **Shigeki Matsunaga**, Naoya Kumagai, Shinji Harada and Masakatsu Shibasaki*, *Anti*-Selective Direct Catalytic Asymmetric Mannich-type Reaction of Hydroxyketone Providing *anti*-β-Amino Alcohols. *J. Am. Chem. Soc.* **125**, 4712-4713 (2003).
- (150) Shinji Harada, Naoya Kumagai, Tomofumi Kinoshita, **Shigeki Matsunaga** and Masakatsu Shibasaki*, Direct Catalytic Asymmetric Michael Reaction of Hydroxyketones: Asymmetric Zinc Catalysis with Et₂Zn/Linked-BINOL Complex. *J. Am. Chem. Soc.* **125**, 2582-2590 (2003).
- (151) Naoya Kumagai, **Shigeki Matsunaga**, Tomofumi Kinoshita, Shinji Harada, Shigemitsu Okada, Shigeru Sakamoto, Kentaro Yamaguchi and Masakatsu Shibasaki*, Direct Catalytic Asymmetric

Aldol Reaction of Hydroxyketones: Asymmetric Zinc Catalysis with Et₂Zn/Linked-BINOL Complex. *J. Am. Chem. Soc.* **125**, 2169-2178 (2003).

- (152) Jun Tian, Noriyuki Yamagiwa, **Shigeki Matsunaga** and Masakatsu Shibasaki*, An Asymmetric Cyanation Reaction and Sequential Asymmetric Cyanation-Nitroaldol Reaction Using a [YLi₃{tris(binaphthoxide)}] Single Catalyst Component: Catalyst Tuning with Achiral Additives. *Angew. Chem. Int. Ed.* **41**, 3636-3638 (2002).
- (153) Naoya Kumagai, **Shigeki Matsunaga** and Masakatsu Shibasaki*, Enantioselective 1,4-Addition of Unmodified Ketone Catalyzed by a Bimetallic Zn-Zn-linked-BINOL Complex. *Org. Lett.* **3**, 4251-4254 (2001).
- (154) Naoya Kumagai, **Shigeki Matsunaga**, Naoki Yoshikawa, Takashi Ohshima and Masakatsu Shibasaki*, Direct Catalytic Enantio- and Diastereoselective Aldol Reaction Using a Zn-Zn-linked-BINOL Complex: A Practical Synthesis of syn-1,2-Diols. *Org. Lett.* **3**, 1539-1542 (2001).
- (155) Naoki Yoshikawa, Naoya Kumagai, **Shigeki Matsunaga**, Guido Moll, Takashi Ohshima, Takeyuki Suzuki and Masakatsu Shibasaki*, Direct Catalytic Asymmetric Aldol Reaction: Synthesis of Either syn- or anti- α,β -Dihydroxy Ketones. *J. Am. Chem. Soc.* **123**, 2466-2467 (2001).
- (156) Hiroyuki Nogami, **Shigeki Matsunaga**, Motomu Kanai and Masakatsu Shibasaki*, Enantioselective Strecker-type reaction promoted by polymer-supported bifunctional catalyst. *Tetrahedron Lett.* **42**, 279-283 (2001).
- (157) **Shigeki Matsunaga**, Takashi Ohshima and Masakatsu Shibasaki*, Immobilization of asymmetric multifunctional catalysts on an insoluble polymer. *Tetrahedron Lett.* **41**, 8473-8478 (2000).
- (158) Yun Sik Kim, **Shigeki Matsunaga**, Jagattaran Das, Akihiro Sekine, Takashi Ohshima and Masakatsu Shibasaki*, Stable, Storable, and Reusable Asymmetric Catalyst: A Novel La-linked-BINOL Complex for the Catalytic Asymmetric Michael Reaction. *J. Am. Chem. Soc.* **122**, 6506-6507 (2000).
- (159) **Shigeki Matsunaga**, Jagattaran Das, Jochen. Roels, Erasmus M. Vogl, Noriyoshi Yamamoto, Takehiko Iida, Kentaro Yamaguchi and Masakatsu Shibasaki*, Catalytic Enantioselective meso-Epoxide Ring Opening Reaction with Phenolic Oxygen Nucleophile Promoted by Gallium Heterobimetallic Multifunctional Complexes. *J. Am. Chem. Soc.* **122**, 2252-2260 (2000).
- (160) Erasmus M. Vogl, **Shigeki Matsunaga**, Motomu Kanai, Takehiko Iida and Masakatsu Shibasaki*, Linking BINOL: C₂-Symmetric Ligands for Investigations on Asymmetric Catalysis. *Tetrahedron Lett.* **39**, 7917-7920 (1998).
- (161) Takehiko Iida, Noriyoshi Yamamoto, **Shigeki Matsunaga**, Hee-Gweon Woo and Masakatsu Shibasaki*, Enantioselective Ring Opening of Epoxides with 4-Methoxyphenol Catalyzed by Gallium Heterobimetallic Complexes: An Efficient Method for the Synthesis of Optically Active 1,2-Diol Monoethers. *Angew. Chem. Int. Ed.* **37**, 2223-2226 (1998).

<Account および総説>

- (162) Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Chiral Carboxylic Acid Assisted Enantioselective C–H Activation with Achiral Cp^xM^{III} (M = Co, Rh, Ir) Catalysts, *ACS Catal.* **11**, 6455–6466 (2021).
- (163) Masahiro Kojima* and **Shigeki Matsunaga***, The Merger of Photoredox and Cobalt Catalysis, *Trends Chem.* **2**, 410-426 (2020).
- (164) Tatsuhiko Yoshino*, Shun Satake, and **Shigeki Matsunaga***, Diverse Approaches for Enantioselective C–H Functionalization Reactions Using Group 9 Cp^xM^{III} Catalysts, *Chem. Eur. J.* **26**, 7346-7357 (2020).
- (165) Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Unique Reactivity of High-valent Cobalt Catalysis in C–H Functionalization and Development of Catalytic Asymmetric C–H Functionalization Reactions. *J. Synth. Org. Chem. Jpn.* **77**, 330–340 (2019).
- (166) Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Cp*Co^{III}-catalyzed C–H Functionalization and Asymmetric Reactions Using External Chiral Sources. *Synlett* **30**, 1384–1400 (2019).
- (167) Tatsuhiko Yoshino* and **Shigeki Matsunaga***, Cobalt-catalyzed C(sp³)–H Bond Functionalization Reactions. *Asian J. Org. Chem.* **7**, 1193–1205 (2018).
- (168) Tatsuhiko Yoshino* and **Shigeki Matsunaga***, High-Valent Cobalt-Catalyzed C–H Bond Functionalization. *Advances in Organometallic Chemistry*, **68**, 197-247 (2017).
- (169) Tatsuhiko Yoshino* and **Shigeki Matsunaga***, (Pentamethylcyclopentadienyl)cobalt(III)-Catalyzed C–H Bond Functionalization: From Discovery to Unique Reactivity and Selectivity. *Adv. Synth. Catal.* **359**, 1245–1262 (2017).
- (170) **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Recent Advances in Cooperative Bimetallic Asymmetric Catalysis: Dinuclear Schiff Base Complexes. *Chem. Commun.* **50**, 1044-1057 (2014).
- (171) Motomu Kanai,* **Shigeki Matsunaga**, Kounosuke Oisaki and Yohei Shimizu, Carbon–Carbon Bond-Formations Promoted by Redox-Active Metal Catalysts. *J. Synth. Org. Chem. Jpn.* **71**, 433-442 (2013).
- (172) **Shigeki Matsunaga*** and Masakatsu Shibasaki *, Multimetallic Schiff Base Complexes as Cooperative Asymmetric Catalysts. *Synthesis*, **45**, 421-437 (2013).
- (173) **Shigeki Matsunaga*** and Tatsuhiko Yoshino, Construction of Contiguous Tetrasubstituted Chiral Carbon Stereocenters via Direct Catalytic Asymmetric Aldol and Mannich-type Reactions. *the Chemical Record*, **11**, 260-268 (2011).
- (174) Masakatsu Shibasaki* and **Shigeki Matsunaga***, Bifunctional Asymmetric Catalysis Based on Dinuclear Schiff Base Complexes. *J. Synth. Org. Chem. Jpn.* **68**, 1142-1149 (2010).
- (175) Masakatsu Shibasaki,* Motomu Kanai, **Shigeki Matsunaga** and Naoya Kumagai, Recent Progress in Asymmetric Bifunctional Catalysis Using a Multimetallic System. *Acc. Chem. Res.* **42**, 1117-1127 (2009).

- (176) Masakatsu Shibasaki,* **Shigeki Matsunaga** and Naoya Kumagai, Strategies for Constructing Diverse Chiral Environments in Multimetallic Bifunctional Asymmetric Catalysis. *Synlett* 1583-1602 (2008).
- (177) **Shigeki Matsunaga*** and Masakatsu Shibasaki*, Multimetallic Bifunctional Asymmetric Catalysis Based on Proximity-Effect-Control. *Bull. Chem. Soc. Jpn.* **81**, 60-75 (2008).
- (178) **Shigeki Matsunaga***, Recent Progress in Catalytic Intermolecular Hydroamination. *J. Synth. Org. Chem. Jpn.* **64**, 778-779 (2006).
- (179) Masakatsu Shibasaki* and **Shigeki Matsunaga***, Design and Application of Linked-BINOL Chiral Ligands in Bifunctional Asymmetric Catalysis. *Chem. Soc. Rev.* **35**, 269-279 (2006).
- (180) Masakatsu Shibasaki,* Motomu Kanai and **Shigeki Matsunaga**, Chiral Poly-Rare Earth Metal Complexes in Asymmetric Catalysis. *Aldrichimica Acta.* 31-39 (2006).
- (181) Masakatsu Shibasaki* and **Shigeki Matsunaga***, Metal/linked-BINOL complexes: Applications in direct catalytic asymmetric Mannich-type reactions. *J. Organomet. Chem.* **691**, 2089-2100 (2006).
- (182) **Shigeki Matsunaga**, Takashi Ohshima and Masakatsu Shibasaki*, Linked-BINOL — an Approach towards Practical Asymmetric Multifunctional Catalysis— *Adv. Synth. Catal.* **344**, 3-15 (2002).

<著書>

- (183) Tatsuhiko Yoshino, Shigeki Matsunaga, “Cp*Co(III)-Catalyzed C-H Functionalization”, in Base Metal Catalysis; Science of Synthesis, Ed by Naohiko Yoshikai, Thieme, in press (2022).
- (184) 吉野達彦、松永茂樹 有機合成化学協会 編「有機合成のための新触媒反応 101」東京化学同人、2021 年（炭素-水素結合の酸化、炭素-水素結合のアミノ化を執筆）
- (185) **Shigeki Matsunaga** “Desymmetrization *meso* epoxide” In: Carreira E.M. and Yamamoto H. (eds.) Comprehensive Chirality, Volume 4, pp. 534-580. Amsterdam: Elsevier, 2012.
- (186) **Shigeki Matsunaga** “Direct C-C Bond Formation (Michael, Aldol, and Mannich)” In: Carreira E.M. and Yamamoto H. (eds.) Comprehensive Chirality, Volume 5, pp. 243-292. Amsterdam: Elsevier, 2012.
- (187) Masakatsu Shibasaki, Motomu Kanai, **Shigeki Matsunaga**, Naoya Kumagai, “Multimetallic Multifunctional Catalysts for Asymmetric Reactions” In *Topics in Organometallic Chemistry: Chemistry of Bifunctional Molecular Catalysis*; Ikariya, T.; Shibasaki, M. Eds.; Springer-Verlag: Berlin Heidelberg, 2011; vol 37, pp 1-30.
- (188) Masakatsu Shibasaki, **Shigeki Matsunaga**, “BINOL” in Privileged Chiral Ligands and Catalysts, Ed. by Zhou, Q.-L. Wiley-VCH, Weinheim, **2011**, pp295-322.
- (189) **Shigeki Matsunaga**, Masakatsu Shibasaki, “Cationic Bismuth-Catalyzed Hydroamination and Direct Substitution of the Hydroxy Group in Alcohols with Amides” in *Topics in Current Organic*

Synthesis: Organic Synthesis Using Bismuth, Ed. by T. Ollevier, Springer, 2010.

- (190) Masakatsu Shibasaki, **Shigeki Matsunaga**, Naoya Kumagai, “Lanthanide Lewis Acid”, in *Acid Catalysis in Modern Organic Synthesis*, Eds. by Yamamoto, H.; Ishihara, K. Wiley-VCH, Weinheim, 2008, pp635-720.
- (191) **Shigeki Matsunaga**, Masakatsu Shibasaki, 500995-67-5 Lithium tris[(*IS*)-1,1'-binaphthyl-2,2'-diolato]yttrate (e-EROS: Encyclopedia of Reagents for Organic Synthesis).
- (192) 柴崎正勝、金井 求、**松永茂樹**、”有機合成触媒 触媒の合成法と使用例: 希土類不斉触媒 (ビナフトール類) の合成法” in 希土類の材料技術, エヌ ティー エス 2008 年
- (193) **Shigeki Matsunaga**, “tris[1,1,1-trimethyl-N-(trimethylsilyl)silanamino]-Yttrium” (e-EROS: Encyclopedia of Reagents for Organic Synthesis)
- (194) Masakatsu Shibasaki, **Shigeki Matsunaga**, “Metal-Catalyzed Asymmetric Synthesis” in *Asymmetric Synthesis–The Essentials*, Wiley, Ed by S. Bräse, 2006, pp 47-51.
- (195) Masakatsu Shibasaki, Hiroyuki Kakei and **Shigeki Matsunaga**, “Catalytic Asymmetric Epoxidation of α,β -Unsaturated Esters Promoted by an Yttrium-Biphenyldiol Complex” in *Catalysts for the Fine Chemical Synthesis*, Wiley, Eds by S. M. Roberts, J. Xiao, J. Whittall, T. E. Pickett, 2007, volume 5, pp 239-248.
- (196) 柴崎正勝、**松永茂樹**、山際教之『有機金属反応剤ハンドブック』, 玉尾 皓平編著, 化学同人(2003)
- (197) Masakatsu Shibasaki, Naoki Yoshikawa, **Shigeki Matsunaga**, “Direct Catalytic Asymmetric Aldol Reaction”, in *Comprehensive Asymmetric Catalysis*, Supplement I, Chapter 29.4, pp135-142. Eds by Jacobsen, E. N.; Pfaltz, A.; Yamamoto, H.
- (198) Masakatsu Shibasaki, **Shigeki Matsunaga**, Naoya Kumagai, “Direct Catalytic Asymmetric Michael Reaction of α -Hydroxyketone Promoted by a Et_2Zn /linked-BINOL Complex” in *Catalysts for the Fine Chemical Synthesis*, Wiley, Eds by S. M. Roberts, J. Xiao, J. Whittall, T. E. Pickett, 2004, volume 3, pp 210-216.
- (199) Masakatsu Shibasaki, **Shigeki Matsunaga**, Naoya Kumagai, “Direct Catalytic Asymmetric Aldol Reaction of α -Hydroxyketone Promoted by a Et_2Zn /linked-BINOL Complex” in *Catalysts for the Fine Chemical Synthesis*, Wiley, Eds by S. M. Roberts, J. Xiao, J. Whittall, T. E. Pickett, 2004, volume 3, pp 202-208.
- (200) Masakatsu Shibasaki, **Shigeki Matsunaga**, Naoya Kumagai, “Direct Catalytic Asymmetric Aldol Reaction Using Chiral Metal Complexes”, *Modern Aldol Reactions*, Wiley-VCH, Ed by Mahrwald, R., 2004, chapter 6, pp197-227.
- (201) **Shigeki Matsunaga**, Masakatsu Shibasaki, “Gallium Trichloride” (e-EROS: Encyclopedia of Reagents for Organic Synthesis)
- (202) **Shigeki Matsunaga**, Masakatsu Shibasaki, “Rare Earth-Alkali Metal Heterobimetallic Asymmetric

Catalyses” in *Multimetallic Catalysts in Organic Synthesis*, Wiley-VCH, 2004, Eds by M. Shibasaki, and Y. Yamamoto, chapter 5, pp121-142.

<解説記事>

- (203) 松永茂樹、「キラル外輪型 2 核ルテニウム触媒の創出」、化学 2 月号、2021
- (204) 吉野達彦、松永茂樹「高原子価コバルト触媒による C-H 活性化」化学と教育 **69** (8), 344–347 (2021).
- (205) 松永茂樹、“院生時代の漠然とした不安を克服するには”、有機合成化学協会誌、Message from Young Principal Researcher (MyPR), 2019, 77, pp 75-77.
- (206) 柴崎正勝、松永茂樹、希土類を基盤とする不斉触媒の創製と医薬合成への展開, Development of Asymmetric Catalysts Based on Rare Earth Metals and their Applications to Biologically Active Compounds Synthesis in 月刊 化学工業 10 月号 2007 年, pp 36-42 [780-786].
- (207) 柴崎正勝、金井 求、松永茂樹、“多点認識型キラル希土類金属錯体による触媒的不斉反応の創製”TCI-mail 2006. 7 Number 131, pp 2 (ISSN 1349-4856)
- (208) 松永茂樹，“多点認識概念に基づく触媒的不斉アルドール反応:原子効率 100%をめざして”ファルマシア 2005, 41, pp 669-673.
- (209) 松永茂樹，“不斉アルドール”，ファルマシア 2003, 39, pp 662-663.