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148) **Catalytic Enantioselective Strecker Reaction of Isatin-Derived N-Unsubstituted Ketimines.** T. Kadota, M. Sawa, Y. Kondo, H. Morimoto, T. Ohshima, *Org. Lett.*, **23**, 4553–4558 (2021).

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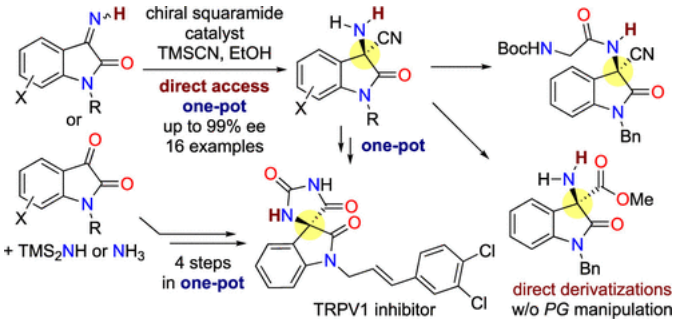

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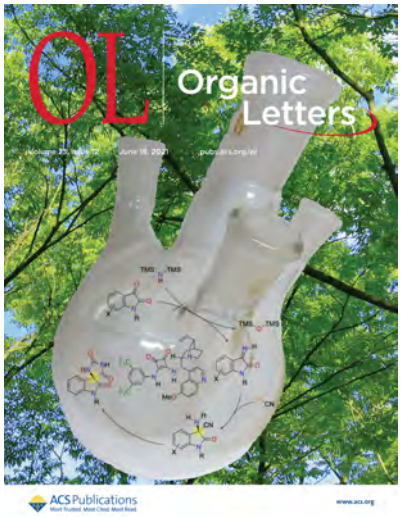

147) **C–C Bond Cleavage of Unactivated 2-Acylimidazoles.** H.-L. Xin, B. Pang, J. Choi, W. Akkad, H. Morimoto, T. Ohshima, *J. Org. Chem.*, **85**, 11592–11606 (2020).

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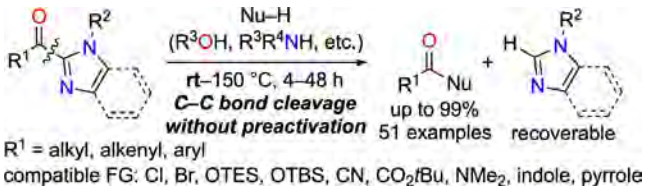

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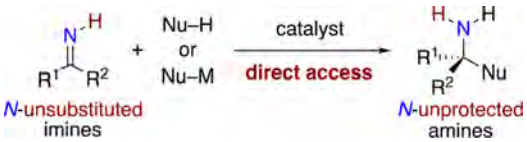

145) **Catalytic Aerobic Cross-Dehydrogenative Coupling of Azlactones en Route to α,α-Disubstituted α-Amino Acids.** T. Tsuji, T. Tanaka, T. Tanaka, R. Yazaki, T. Ohshima, *Org. Lett.*, **22**, 4164–4170 (2020)
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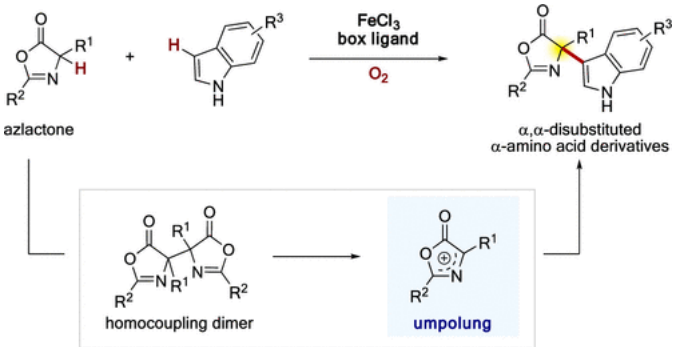

144) **Amino Acid Schiff Base Bearing Benzophenone Imine As a Platform for Highly Congested Unnatural α-Amino Acid Synthesis.** Y. Matsumoto, J. Sawamura, Y. Murata, T. Nishikata, R. Yazaki, T. Ohshima, *J. Am. Chem. Soc.*, **142**, 8498–8505 (2020).
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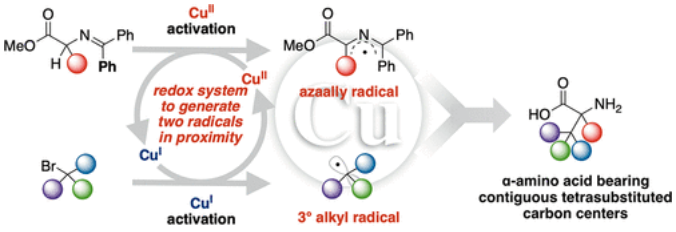

143) **Recent Progress towards the Use of Benzophenone Imines as an Ammonia Equivalent.** Y. Kondo, H. Morimoto, T. Ohshima, *Chem. Lett.*, **49**, 467–504 (2020).
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142) **Chemoselective Catalytic α-Oxidation of Carboxylic Acids: Iron/Alkali Metal Cooperative Redox Active Catalysis.** T. Tanaka, R. Yazaki, T. Ohshima, *J. Am. Chem. Soc.*, **142**, 4517–4524 (2020).
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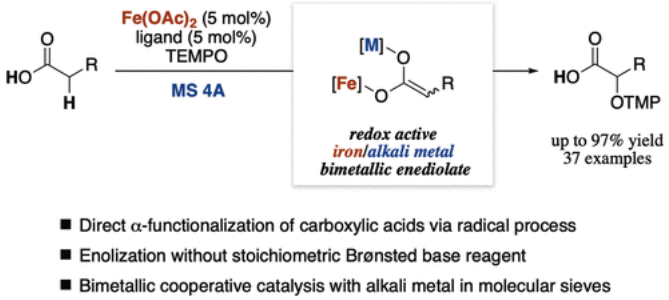

141) **Rhodium(I)/Chiral Diene-Catalyzed Enantioselective Addition of Boronic Acids to N-Unsubstituted Isatin-Derived Ketimines.** R. Yonesaki, I. Kusagawa, H. Morimoto, T. Hayashi, T. Ohshima, *Chem. Asian. J.*, **15**, 499–502 (2020).
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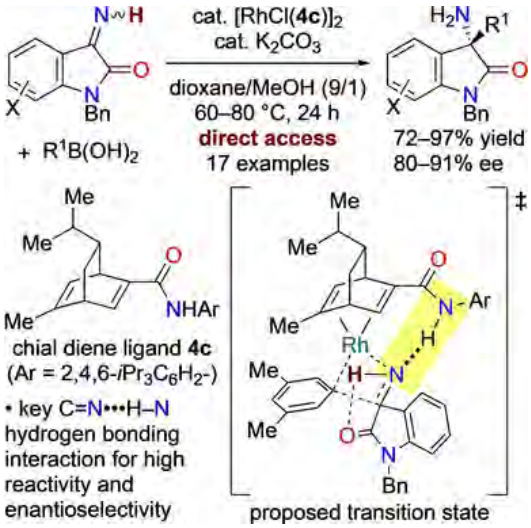

140) **Scandium(III) Triflate Catalyzed Direct Synthesis of *N*-Unprotected Ketimines.**

Y. Kondo, T. Kadota, Y. Hirazawa, K. Morisaki, H. Morimoto, T. Ohshima, *Org. Lett.*, **22**, 120–125 (2020).
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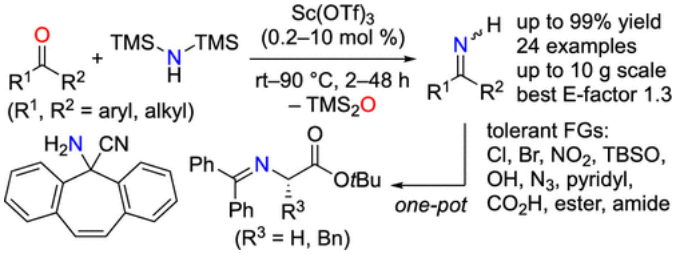

139) **Identification of candidate molecular targets of the novel antineoplastic antimitotic NP-10.** T. Yokoyama, M. Yukuhiro, Y. Iwasaki, C. Tanaka, K. Sankoda, R. Fujiwara, A. Shibuta, T. Higashi, K. Motoyama, H. Arima, K. Yoshida, N. Sugimoto, H. Morimoto, H. Kosako, T. Ohshima, M. Fujita, *Sci. Rep.*, *9*, 16825–16837 (2019).
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137) **Mechanistic Studies of Nickel(II)-Catalyzed Direct Alcoholysis of 8-Aminoquinoline Amides.** H. Morimoto, W. Akkad, T. Deguchi, T. Ohshima, *Heterocycles*, **101**, 471–485 (2020).
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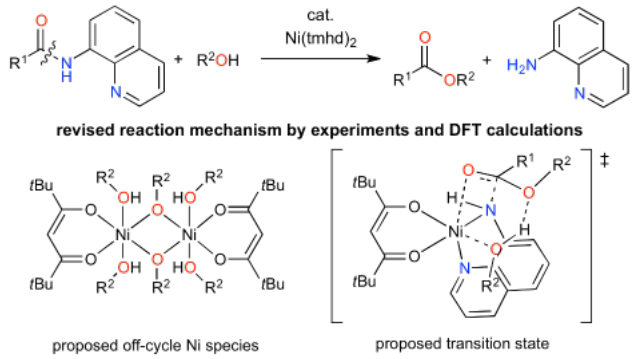

136) **A Convenient Preparation Method for Benzophenone Imine Catalyzed by Tetrabutylammonium Fluoride.** Y. Kondo, K. Morisaki, Y. Hirazawa, H. Morimoto, T. Ohshima, *Org. Process Res. Dev.*, **23**, 1718–1724 (2019).
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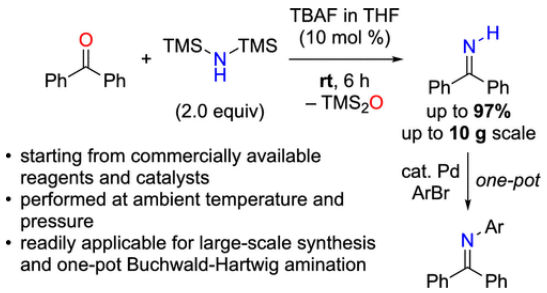

135) **Thionoesters as 1,2-Dipolarophiles for [4+2] Cycloaddition with Cyclobutanones.** Y. Matsumoto, T. Tsuji, D. Nakatake, R. Yazaki, T. Ohshima, *Asian J. Org. Chem.*, **8**, 1071–1074 (2019).
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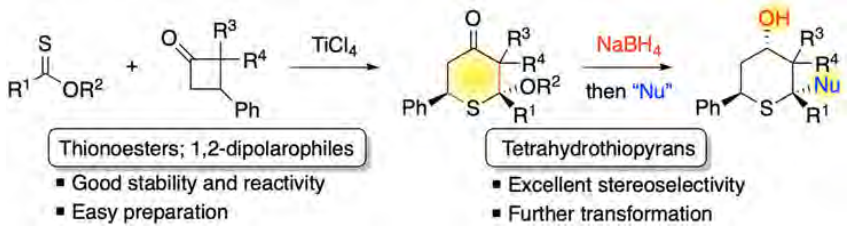

134) **Ammonium Salt-Accelerated Hydrazinolysis of Unactivated Amides: Mechanistic Investigation and Application to a Microwave Flow Process.** M. Noshita, Y. Shimizu, H. Morimoto, S. Akai, Y. Hamashima, N. Ohneda, H. Odajima, T. Ohshima, *Org. Process Res. Dev.*, **23**, 588–594 (2019).

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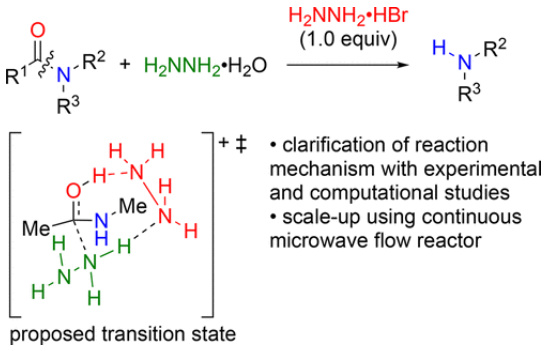

133) **MECHANISTIC INSIGHT INTO CATALYTIC AEROBIC CHEMOSELECTIVE α-OXIDATION OF ACYLPYRAZOLES.** S. Taninokuchi, R. Yazaki, T. Ohshima, *Heterocycles*, **99**, 906–918 (2019).

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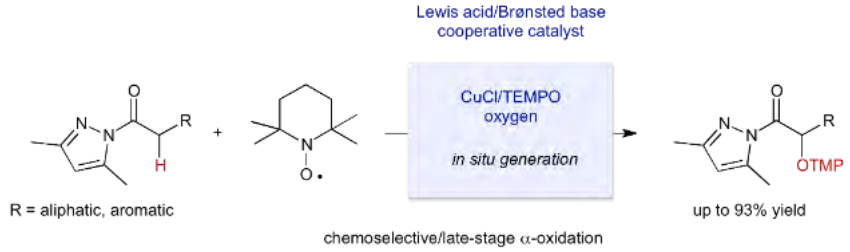

132) **Catalytic Enantioselective Decarboxylative Mannich-Type Reaction of N-Unprotected Isatin-Derived Ketimines.** M. Sawa, S. Miyazaki, R. Yonesaki, H. Morimoto, T. Ohshima, *Org. Lett.*, **20**, 5393–5397 (2018).

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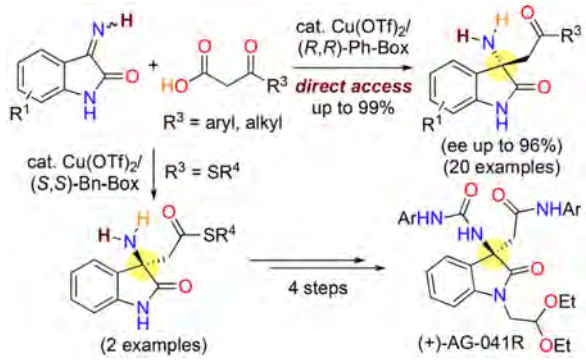

131) **3-Mono-Substituted BINOL Phosphoric Acids as Effective Organocatalysts in Direct Enantioselective Friedel-Crafts-Type Alkylation of N-Unprotected α-**

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130) **Chemoselective Catalytic Dehydrogenative Cross-Coupling of 2-Acylimidazoles: Mechanistic Investigations and Synthetic Scope.** T. Tanaka, K. Hashiguchi, T. Tanaka, R. Yazaki, T. Ohshima, *ACS Catal.*, **8**, 8430–8440 (2018).
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129) **Strategy for Catalytic Chemoselective Cross-Enolate Coupling Reaction via a Transient Homocoupling Dimer.** T. Tanaka, T. Tanaka, T. Tsuji, R. Yazaki, T. Ohshima, *Org. Lett.*, **20**, 3541–3544 (2018).
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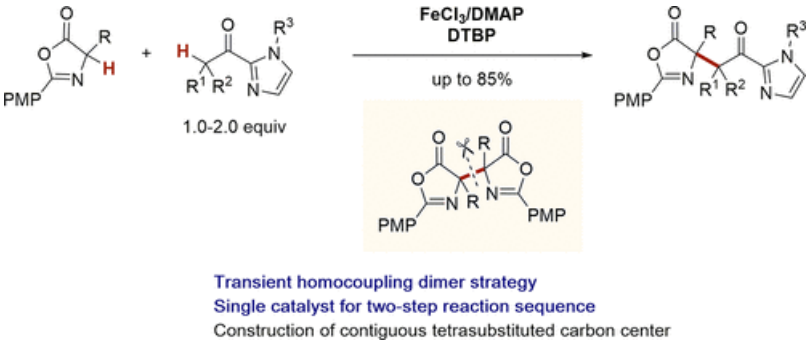

128) **Growth suppression of human colorectal cancer cells with mutated KRAS by 3-deaza-cytarabine in 3d floating culture.** H. Luo, K. Nishi, S. Ishikura, A. Swain, N. Morishige, R. Yazaki, T. Ohshima, S. Shirasawa, T. Tsunoda, *Anticancer research*, **38**,

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127) **An Expeditious Route to trans-Configured Tetrahydrothiophenes Enabled by $Fe(OTf)_3$-Catalyzed [3+2] Cycloaddition of Donor–Acceptor Cyclopropanes with Thionoesters.** Y. Matsumoto, D. Nakatake, R. Yazaki, T. Ohshima, *Chem. Eur. J.*, **24**, 6062–6066 (2018).

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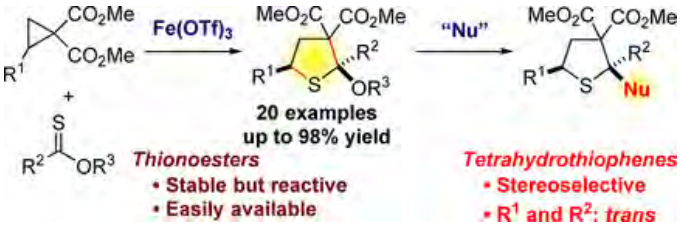

126) **Bioconjugation with Thiols by Benzylic Substitution.** K. Watanabe, T. Ohshima, *Chem. Eur. J.*, **24**, 3959–3964 (2018).

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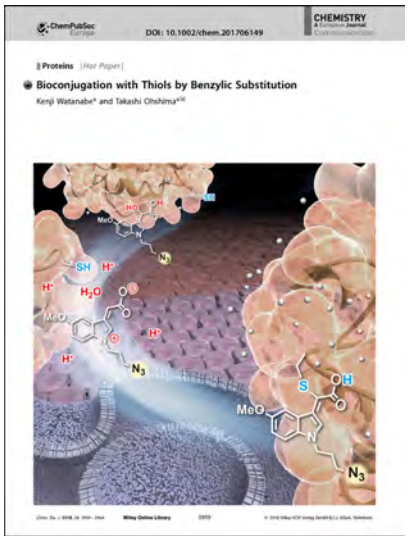
Benzylic substitution of alcohol



125) **Development of Direct Enantioselective Alkynylation of α-Ketoester and α-Ketiminoesters Catalyzed by Phenylbis(oxazoline)Rh(III) Complexes.** K. Morisaki, H. Morimoto, K. Mashima, T. Ohshima, *Journal of Synthetic Organic Chemistry, Japan*, **76**, 226–240 (2018).
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124) **Boronic Acid Accelerated Three-Component Reaction for the Synthesis of α-Sulfanyl-Substituted Indole-3-acetic Acids.** A. Das, K. Watanabe, H. Morimoto, T. Ohshima, *Org. Lett.*, **19**, 5794–5797 (2017).
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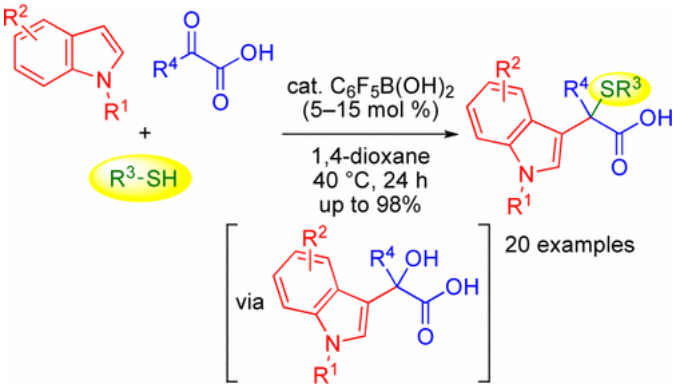

123) **Direct Access to N-Unprotected α- and/or β-Tetrasubstituted Amino Acid Esters via Direct Catalytic Mannich-Type Reactions Using N-Unprotected Trifluoromethyl Ketimines.** M. Sawa, K. Morisaki, Y. Kondo, H. Morimoto, T. Ohshima,

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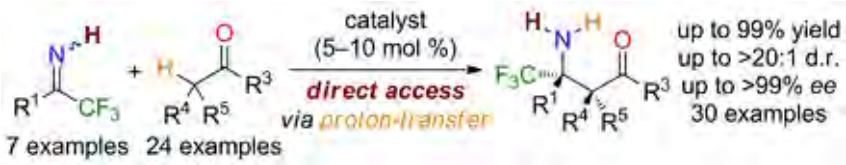

122) **Synthesis of 1-Tetrasubstituted 2,2,2-Trifluoroethylamine Derivatives via Palladium-Catalyzed Allylation of sp^3 C–H Bonds.** K. Morisaki, Y. Kondo, M. Sawa, H. Morimoto, T. Ohshima, *Chem. Phar. Bull.*, **65**, 1089–1092 (2017).

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121) **Catalytic Aerobic Chemoselective α-Oxidation of Acylpyrazoles en Route to α-Hydroxy Acid Derivatives.** S. Taninokuchi, R. Yazaki, T. Ohshima, *Org. Lett.*, **19**, 3187–3190 (2017).

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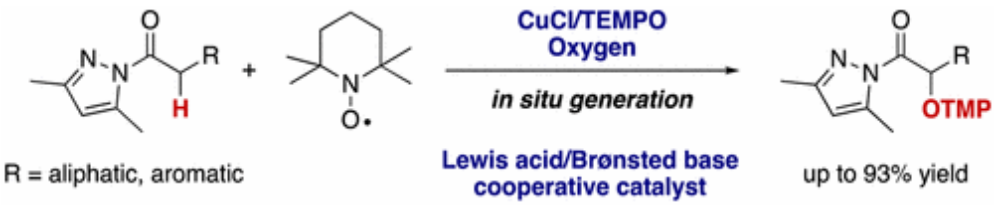

120) **Direct access to *N*-unprotected tetrasubstituted propargylamines via direct catalytic alkynylation of *N*-unprotected trifluoromethyl ketimines.** K. Morisaki, H. Morimoto, T. Ohshima, *Chem. Commun.*, **53**, 6319–6322 (2017).

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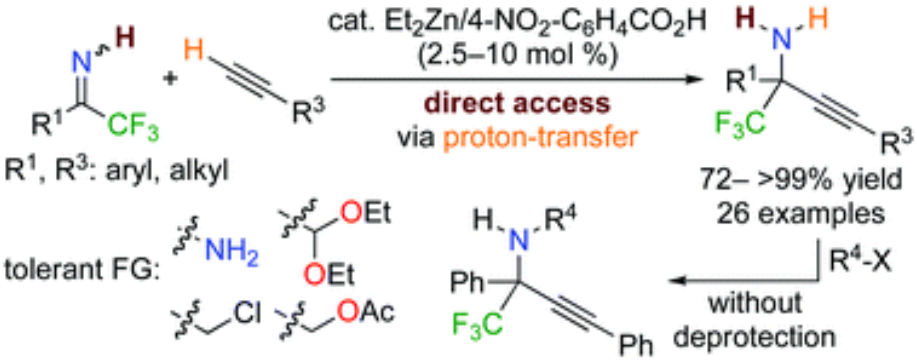

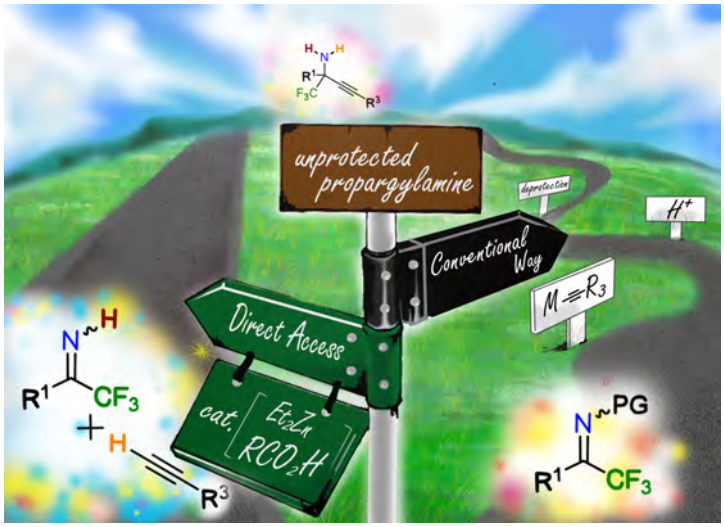

119) **Direct Catalytic Alcoholysis of Unactivated 8-Aminoquinoline Amides.** T. Deguchi, H.-L. Xin, H. Morimoto, T. Ohshima, *ACS Catal.*, **7**, 3157–3161 (2017).
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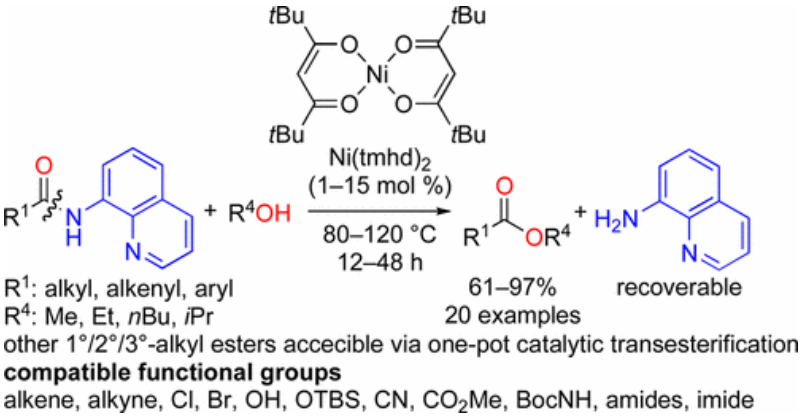

118) **DIRECT ENANTIOSELECTIVE ALKYNYLATION OF α-KETOESTERS AND α-KETIMINOESTERS CATALYZED BY [BIS(OXAZOLINE)PHENYL]RHODIUM(III) COMPLEXES.** K. Morisaki, H. Morimoto, K. Mashima, T. Ohshima, *Heterocycles*, **95**, 637–661 (2017).
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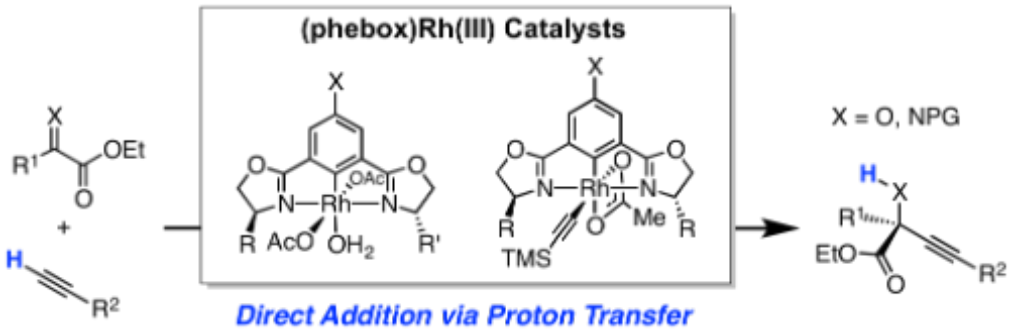

117) **Metabolomic profiling of brain tissues of mice chronically exposed to heroin.** R. Li, T. Takeda, T. Ohshima, H. Yamada, Y. Ishii, *Drug Metab. Pharmacokinet.*, **32**, 108–111 (2017).

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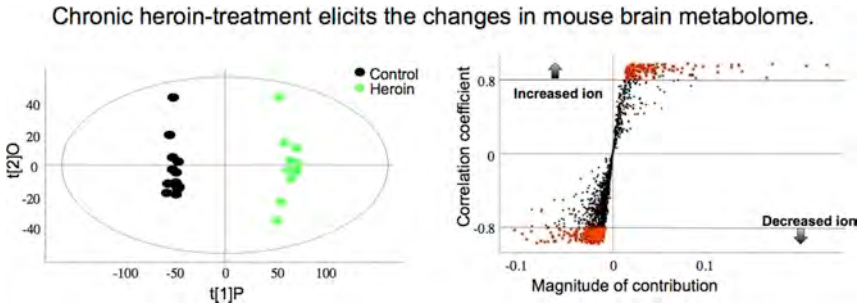

116) **Catalytic Chemoselective Conjugate Addition of Amino Alcohols to α,β-Unsaturated Ester: Hydroxy Group over Amino Group and Conjugate Addition over Transesterification.** Z. Li, M. Tamura, R. Yazaki, T. Ohshima, *Chem. Pharm. Bull.*, **65**, 19–21 (2017).

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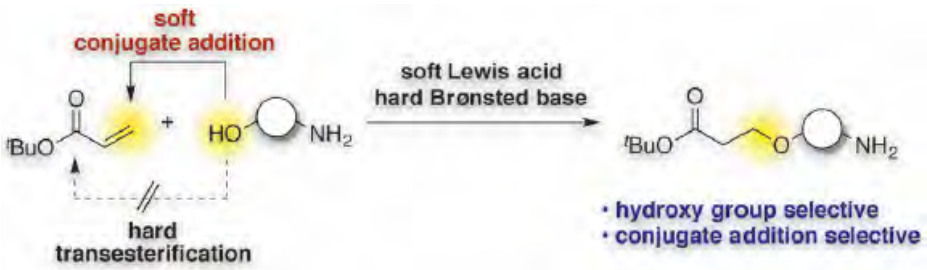

115) **Diethylenetriamine-Mediated Direct Cleavage of Unactivated Carbamates and Ureas.** M. Noshita, Y. Shimizu, H. Morimoto, T. Ohshima, *Org. Lett.*, **18**, 6062–6065 (2016).

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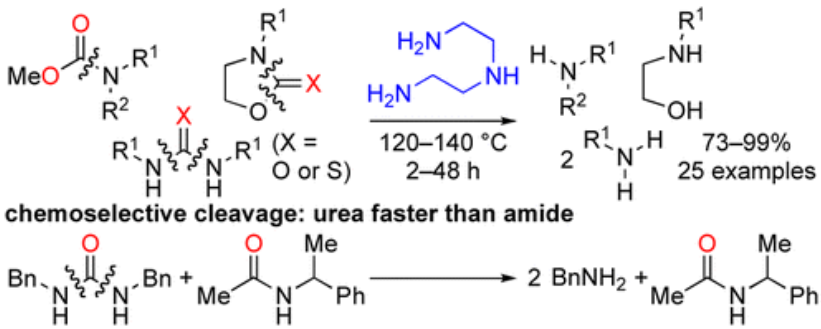

114) **Chemo- and Regioselective Direct Functional Group Installation through Catalytic Hydroxy Group Selective Conjugate Addition of Amino Alcohols to α,β-Unsaturated Sulfonyl Compounds.** Z. Li, R. Yazaki, T. Ohshima, *Org. Lett.*, **18**, 3350–3353 (2016).

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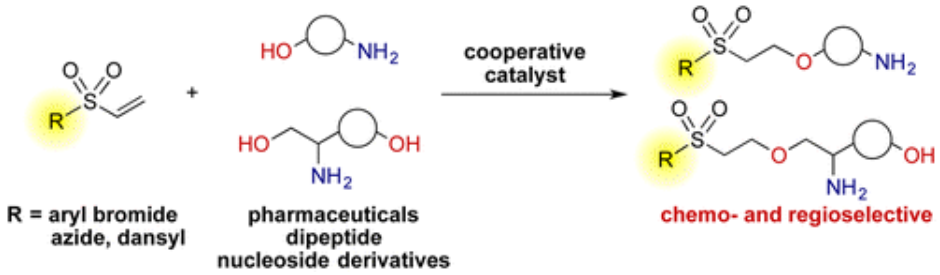

113) **Chemoselective Transesterification of Acrylate Derivatives for Functionalized Monomer Synthesis Using a Hard Zinc Alkoxide Generation Strategy**. D. Nakatake, R. Yazaki, T. Ohshima, *Eur. J. Org. Chem.*, 3696–3699 (2016).

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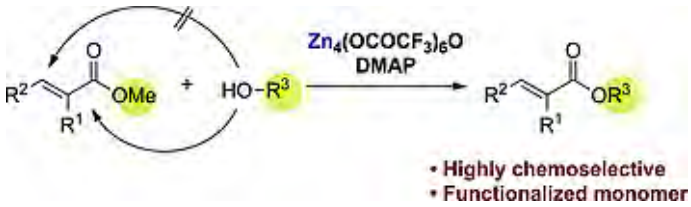

112) **μ-Oxo-Dinuclear-Iron(III)-Catalyzed O-Selective Acylation of Aliphatic and Aromatic Amino Alcohols and Transesterification of Tertiary Alcohols.** R. Horikawa, C. Fujimoto, R. Yazaki, T. Ohshima, *Chem. Eur. J.*, **22**, 12278–12281 (2016).
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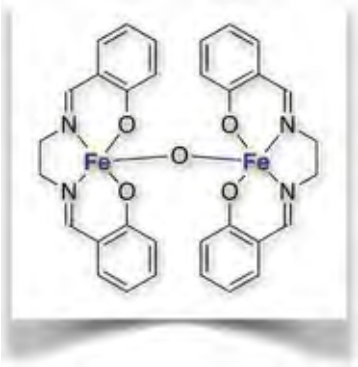

111) **Isomeric iodinated analogs of nimesulide: synthesis, physicochemical characterization, cyclooxygenase-2 inhibitory activity, and transport across Caco-2 cells.** Y. Yamamoto, J. Arai, T. Hisa, Y. Saito, T. Mukai, T. Ohshima, M. Maeda, F. Yamamoto, *Bioorg. Med. Chem.*, **24**, 3727–3733 (2016).
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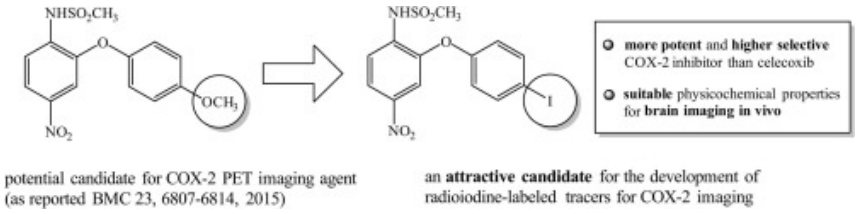

110) **Mechanistic Studies and Expansion of the Substrate Scope of Direct Enantioselective Alkynylation of α-Ketiminoesters Catalyzed by Adaptable (Phebox)Rh(III) Complexes.** K. Morisaki, M. Sawa, R. Yonesaki, H. Morimoto, K.

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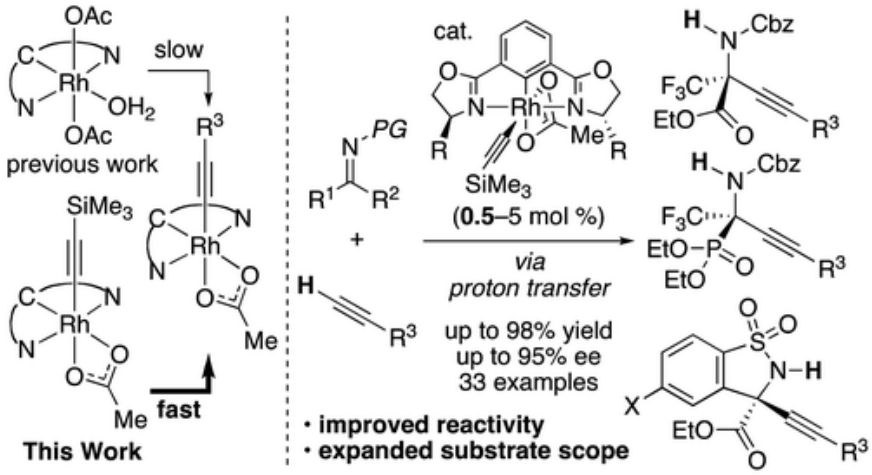

109) **Transesterification Reaction Catalyzed by Recyclable Heterogeneous Zinc/Imidazole Catalyst.** D. Nakatake, R. Yazaki, Y. Matsushima, T. Ohshima, *Adv. Synth. Catal.*, **358**, 2569–2574 (2016).

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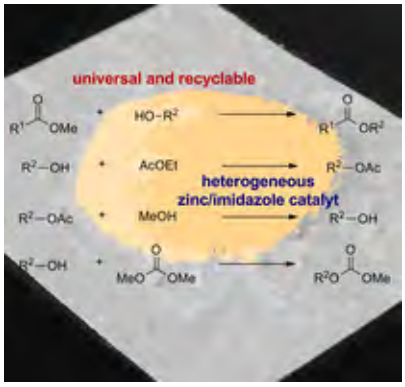

108) **Synthesis of radioiodinated probes to evaluate the biodistribution of a potent**

TRPC3 inhibitor. M. Hagimori, T. Murakami, K. Shimizu, M. Nishida, T. Ohshima, T. Mukai, *MedChemComm*, **7**, 1003–1006 (2016).
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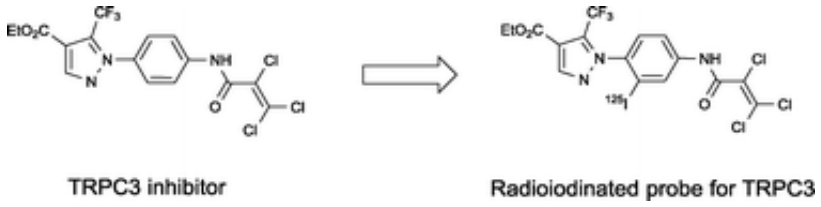

107) **Development of Tetranuclear Zinc Cluster-Catalyzed Environmentally Friendly Reactions and Mechanistic Studies.** T. Ohshima, *Chem. Pharm. Bull.*, **64**, 523–539 (2016).
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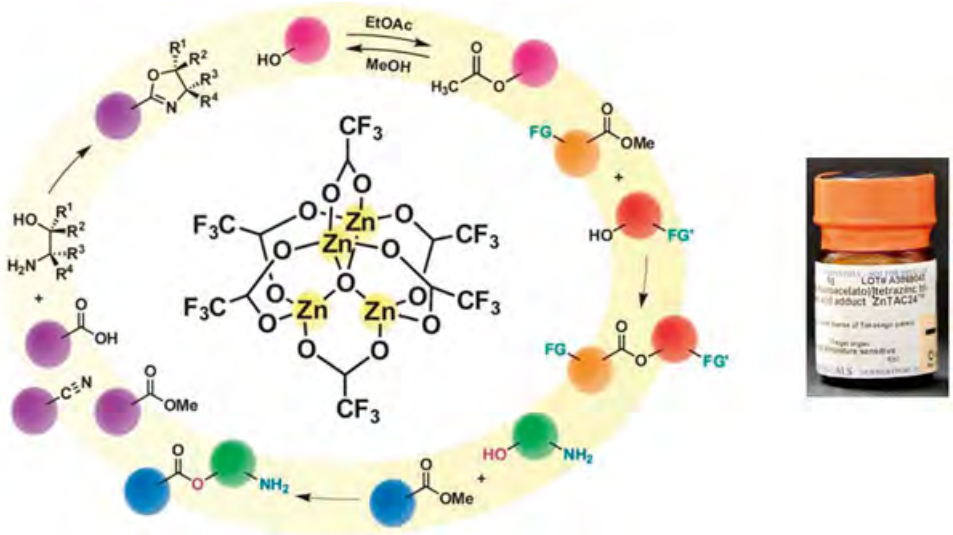

106) **Studies of the Electronic Effects of Zinc Cluster Catalysts and Their Application to the Transesterification of β-Keto Esters**. K. Agura, Y. Hayashi, M. Wada, D. Nakatake, K. Mashima, T. Ohshima, *Chem. Asian J.*, **11**, 1548–1554 (2016).
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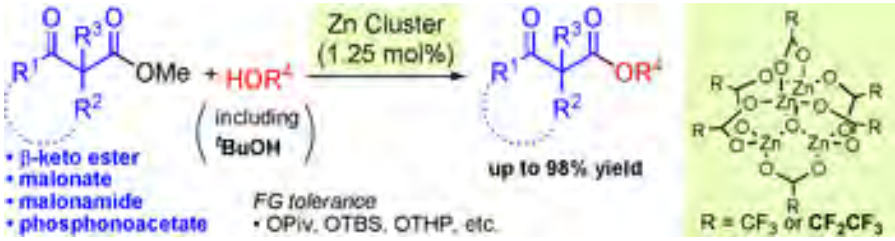

105) **Direct Catalytic Chemoselective α-Amination of Acylpyrazoles: A Concise Route to Unnatural α-Amino Acid Derivatives**. K. Tokumasu, R. Yazaki, T. Ohshima, *J. Am. Chem. Soc.*, **138**, 2664–2669 (2016).

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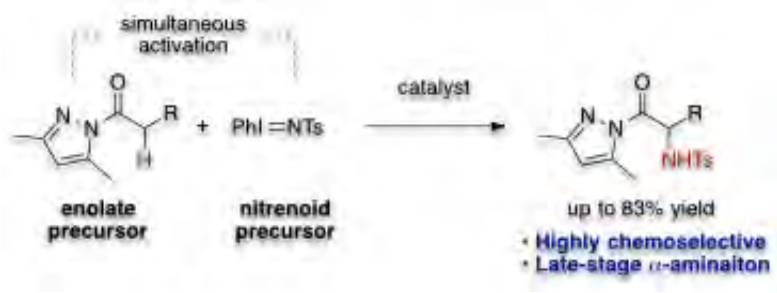

104) **A Highly Stable but Highly Reactive Zinc Catalyst for Transesterification Supported by Bis(imidazole) Ligand.** D. Nakatake, Y. Yokote, Y. Matsushima, R. Yazakia, T. Ohshima, *Green. Chem.*, **18**, 1524–1530 (2016).

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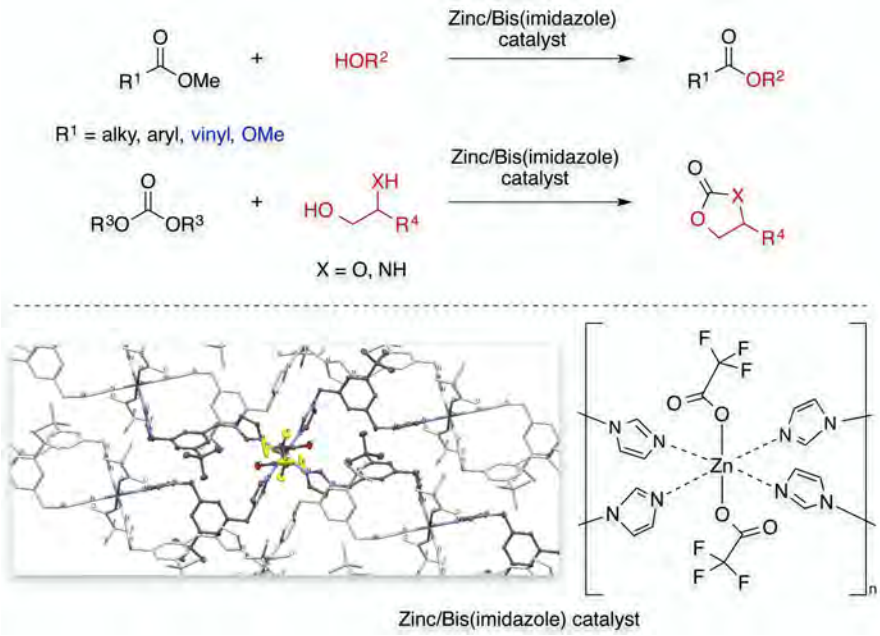

103) **Isomeric Methoxy Analogs of Nimesulide for Development of Brain**

Cyclooxygense-2 (COX-2) -targeted Imaging Agents: Synthesis, in Vitro COX-2-Inhibitory Potency, and Cellular Transport Properties. Y. Yamamoto, T. Hisa, Takuya. J. Arai, Y. Saito, Y. Yamamoto, T. Mukai, T. Ohshima, M. Maeda, Y. Ohkubo, *Bioorg. Med. Chem.*, **23**, 6807–6814 (2015).
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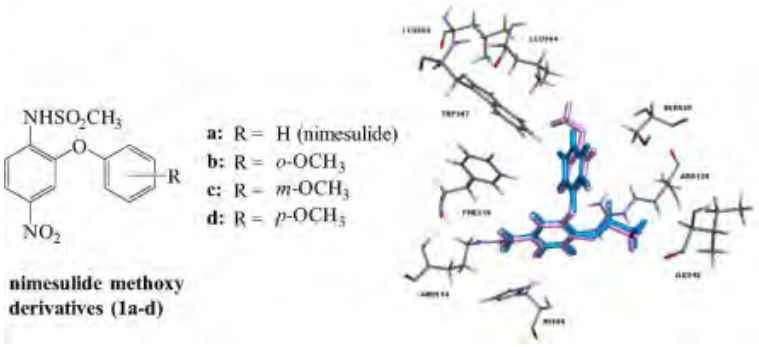

102) **A novel anti-microtubule agent with carbazole and benzohydrazide structures suppresses tumor cell growth in vivo.** M. Ohira, Y. Iwasaki, C. Tanaka, M. Kuroki, N. Matsuo, T. Kitamura, M. Yukuhiro, H. Morimoto, N. Pang, B. Liu, T. Kiyono, M. Amemiya, K. Tanaka, K. Yoshida, N. Sugimoto, T. Ohshima, M. Fujita, *Biochimica et Biophysica Acta (BBA) - General Subjects*, **1850**, 1676–1684 (2015).
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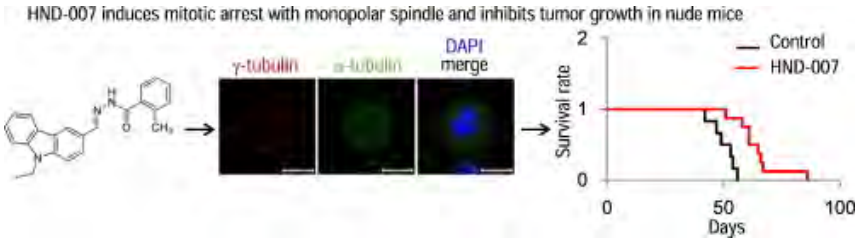

101) **Radiolabeled γ-polyglutamic acid complex as a nano-platform for sentinel lymph node imaging.** K. Sano, Y. Iwamiya, T. Kurosaki, M. Ogawa, Y. Magata, H. Sasaki, T. Ohshima, M. Maeda, T. Mukai, *Journal of Controlled Release*, **194**, 310–315 (2014).
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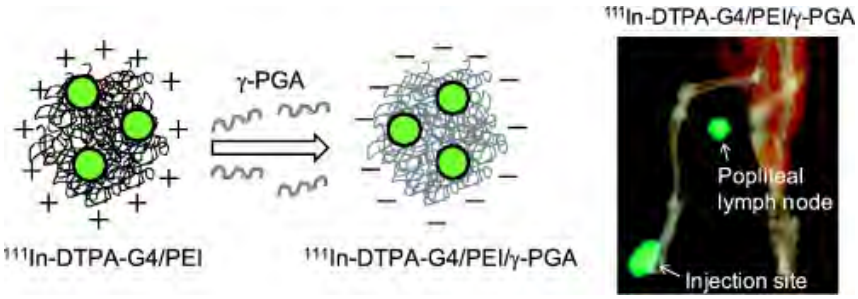

100) **A Short Scalable Route to (–)-α-Kainic Acid Using Pt-Catalyzed Direct Allylic Amination.** M. Zhang, K. Watanabe, M. Tsukamoto, R. Shibuya, H. Morimoto, T. Ohshima, *Chem. Eur. J.*, **21**, 3937–3941 (2015).
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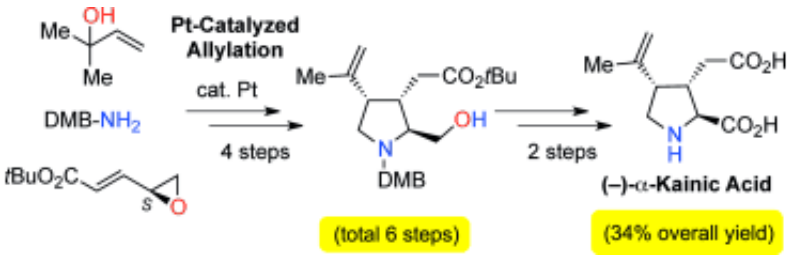

99) **Sodium Methoxide-Catalyzed Direct Amidation of Esters.** K. Agura, T. Ohshima, Y. Hayashi, K. Mashima, *Org. Synth.*, **91**, 201–210 (2014).
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98) **Cleavage of unactivated amide bonds by ammonium salt-accelerated hydrazinolysis.** Y. Shimizu, M. Noshita, Y. Mukai, H. Morimoto, T. Ohshima, *Chem. Commun.*, **50**, 12623–12625 (2014).
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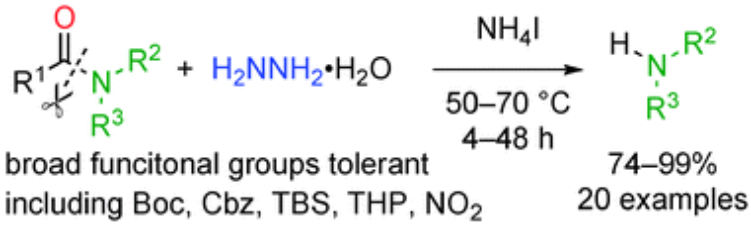

97) **Lanthanum(III) Triflate-Catalyzed Direct Amidation of Esters.** H. Morimoto, R. Fujiwara, Y. Shimizu, K. Morisaki, T. Ohshima, *Org. Lett.*, **16**, 2018-2021 (2014).
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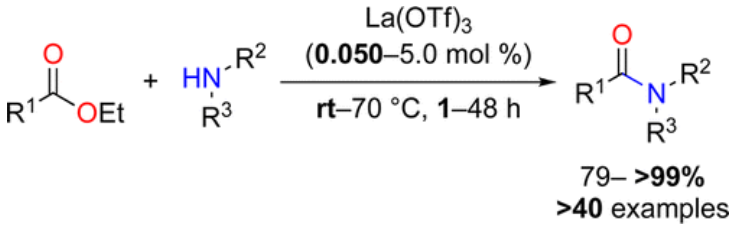

96) **Dual Platinum and Pyrrolidine Catalysis in the Direct Alkylation of Allylic Alcohols: Selective Synthesis of Monoallylation Products.** R. Shibuya, L. Lin, Y. Nakahara, K. Mashima, T. Ohshima, *Angew. Chem. Int. Ed.*, **53**, 4377–4381 (2014).
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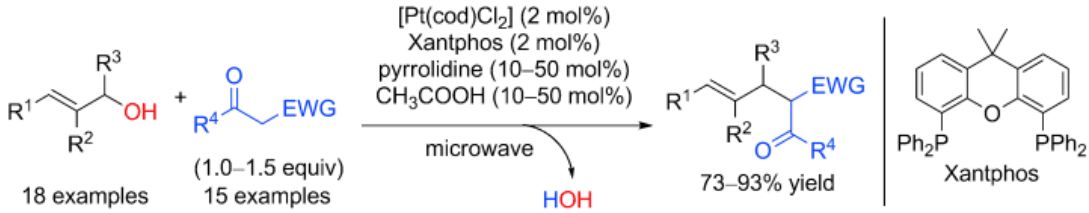

95) **Chemoselective Catalytic Conjugate Addition of Alcohols over Amines.** S. Uesugi, Z. Li, R. Yazaki, T. Ohshima, *Angew. Chem. Int. Ed.*, **53**, 1611–1615 (2014).
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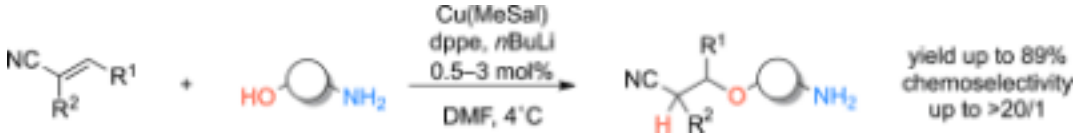

94) **Transition Metal Clusters As Catalysts for Chemoselective Transesterification of Alcohols in the Presence of Amines.** K. Mashima, Y. Hayashi, K. Agura, T. Ohshima, *Pure Appl. Chem.*, **86**, 335–343 (2014).
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93) **Rh-Catalyzed Direct Enantioselective Alkynylation of α-Ketiminoesters.** K. Morisaki, M. Sawa, J.-y. Nomaguchi, H. Morimoto, Y. Takeuchi, K. Mashima, T. Ohshima, *Chem. Eur. J.*, **19**, 8417-8420 (2013).

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92) **Enzyme-like Catalysis via Ternary-Complex Mechanism: Alkoxy-bridged Dinuclear Cobalt Complex Mediates Chemoselective *O*-Esterification over *N*-Amidation.** Y. Hayashi, S. Santoro, Y. Azuma, F. Himo, T. Ohshima, K. Mashima, *J. Am. Chem. Soc.*, **135**, 6192-6199 (2013).

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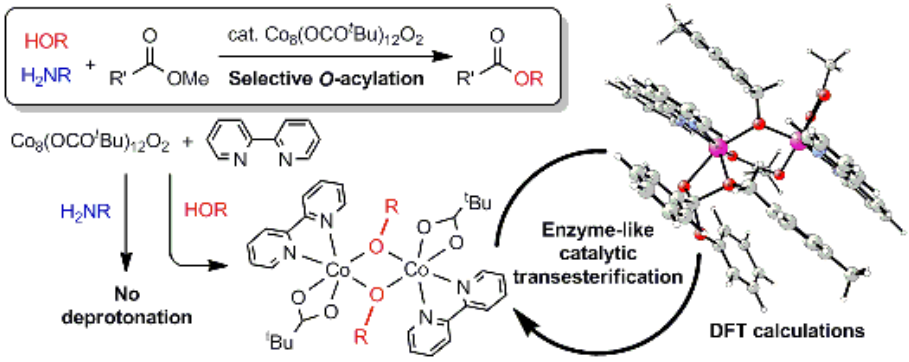

91) **Platinum-Catalyzed Direct Amination of Allylic Alcohols.** T. Ohshima, K. Mashima, *Journal of Synthetic Organic Chemistry, Japan*, **70**, 1145–1156 (2012).

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90) **Aluminum Triflate as a Powerful Catalyst for Direct Amination of Alcohols, Including Electron-Withdrawing Group-Substituted Benzhydrols.** T. Ohshima, J. Ipposhi, Y. Nakahara, R. Shibuya, K. Mashima, *Adv. Synth. Catal.*, **354**, 2447–2452 (2012).

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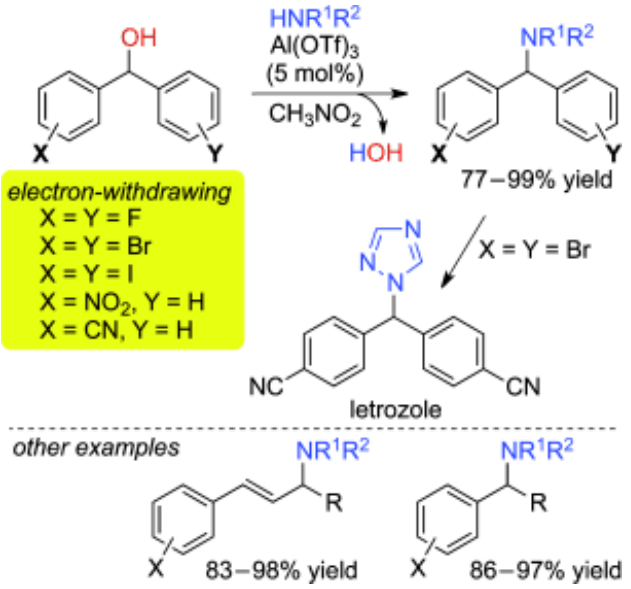

89) **Microwave-Assisted Deacylation of Unactivated Amides to Amines Using Ammonium Salt-Accelerated Transamidation.** Y. Shimizu, H. Morimoto, M. Zhang, T. Ohshima, *Angew. Chem. Int. Ed.*, **51**, 8564–8567 (2012).
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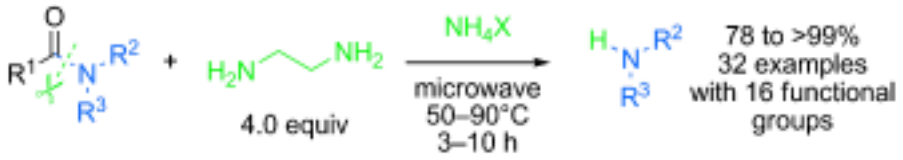

88) **Asymmetric Autoinduction in Hydrogenation of 2-Substituted Quinoxalines Catalyzed by Iridium Complexes bearing Chiral Diphosphine Ligand.** T. Nagano A. Iimuro, T. Ohshima, Y. Kita, K. Mashima, *Chem. Eur. J.*, **18**, 11578–11592 (2012).
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87) **Highly Efficient and General Asymmetric Hydrogenation of 2-Alkyl- and 2-Aryl-Substituted Quinoxaline Derivatives Catalyzed by Iridium-Difluorphos: Halide Effect and Synthetic Application.** D. Cartigny, F. Berhal, T. Nagano, P. Phansavath, T. Ayad, J.-P., Genêt, T. Ohshima, K. Mashima, V. Ratovelomanana-Vidal, *J. Org. Chem.*, **77**, 4544–4556 (2012).
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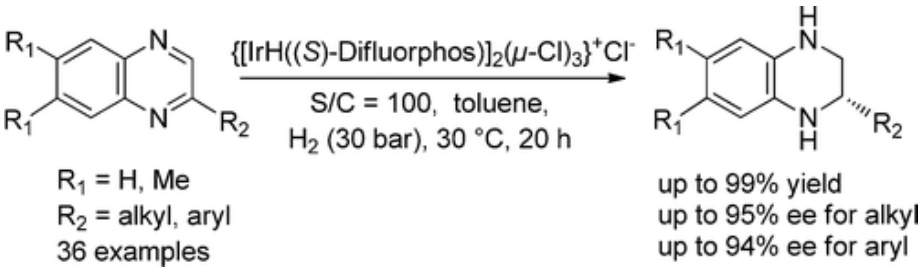

86) **Sodium methoxide: a simple but highly efficient catalyst for the direct amidation of esters.** T. Ohshima, Y. Hayashi, K. Agura, Y. Fujii, A. Yoshiyama, K. Mashima,

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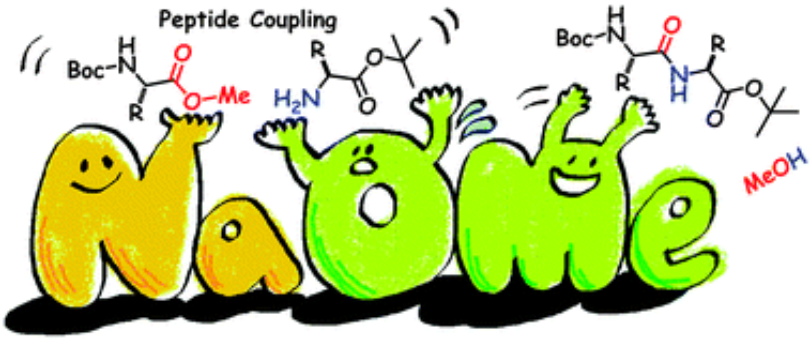

85) **Efficient cyclic carbonate synthesis catalyzed by zinc cluster systems under mild conditions.** Y. Yang, Y. Hayashi, Y. Fujii, T. Nagano, Y. Kita, T. Ohshima, J. Okuda, K. Mashima, *Catal. Sci. Tech.*, **2**, 509–513 (2012).

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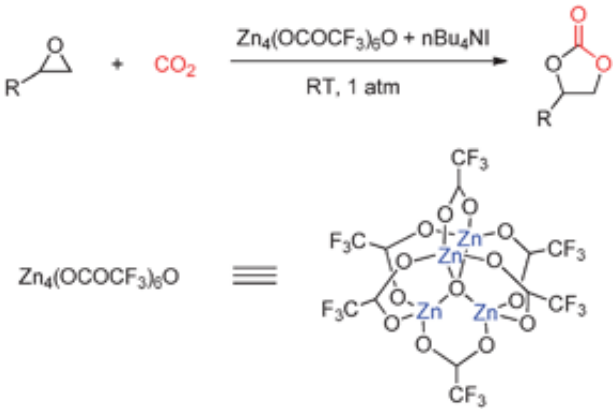

84) **Platinum-Catalyzed Direct Amination of Allylic Alcohols with Aqueous Ammonia for Selective Synthesis of Primary Allylamines.** K. Das, R. Shibuya, Y. Nakahara, N. Germain, T. Ohshima, K. Mashima, *Angew. Chem. Int. Ed.*, **51**, 150–154 (2012).

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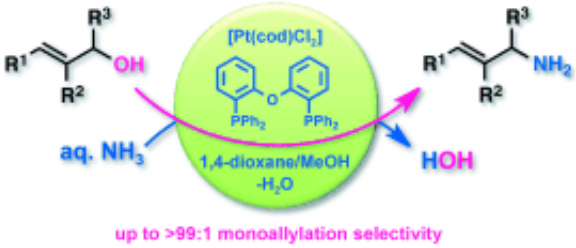

83) **Transesterification of α-Amino Esters Catalyzed by a Tetranuclear Zinc Custer, $Zn_4(OCOCF_3)_6O$.** Y. Maegawa, K. Agura, Y. Hayashi, T. Ohshima, K. Mashima, *Synlett*, **23**, 137–141 (2012).

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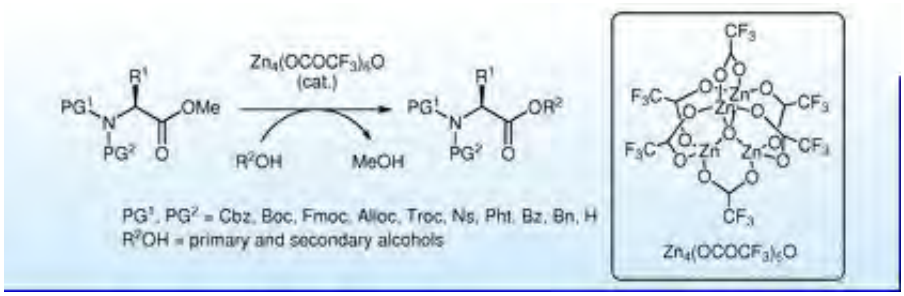

82) **Additive Effect of *N*-Heteroaromatics on Transesterification Catalyzed by Tetranuclear Zinc Cluster.** Y. Maegawa, T. Ohshima, Y. Hayashi, K. Agura, T. Iwasaki, K. Mashima, *ACS Catal.*, **1**, 1178–1182 (2011).

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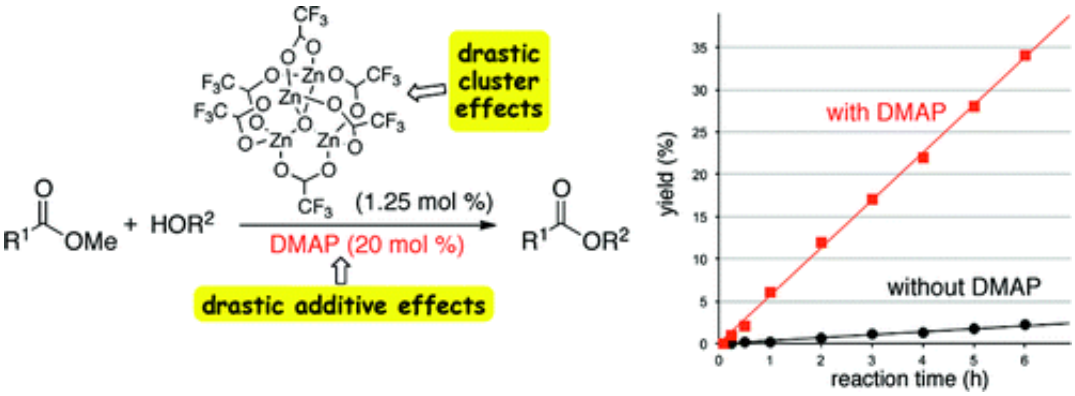

81) **Direct substitution of the hydroxy group with highly functionalized nitrogen nucleophiles catalyzed by Au(III).** T. Ohshima, Y. Nakahara, J. Ipposhi, Y. Miyamoto, K. Mashima, *Chem. Commun.*, **47**, 8322–8324 (2011).

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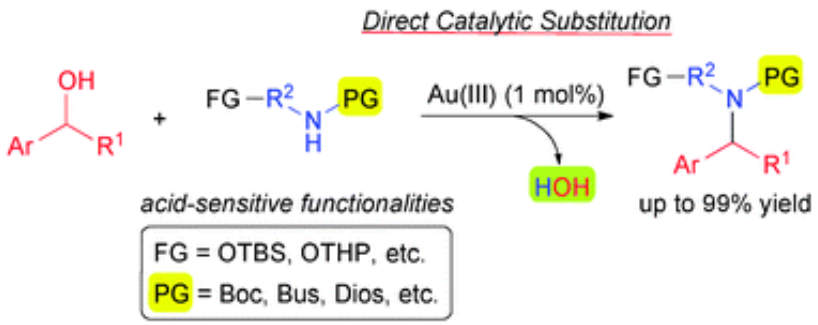

80) ***C*$_1$-Symmetric Rh-Phebox-Catalyzed Asymmetric Alkynylation of α-Keto Ester.** T. Ohshima, T. Kawabata, Y. Takeuchi, T. Kakinuma, T. Iwasaki, T. Yonezawa, H. Murakami, H. Nishiyama, K. Mashima, *Angew. Chem. Int. Ed.* **50**, 6296-6300 (2011). DOI: 10.1002/anie.201100252

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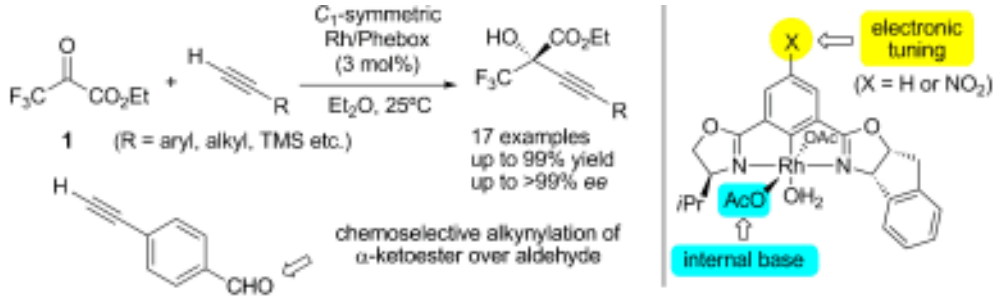
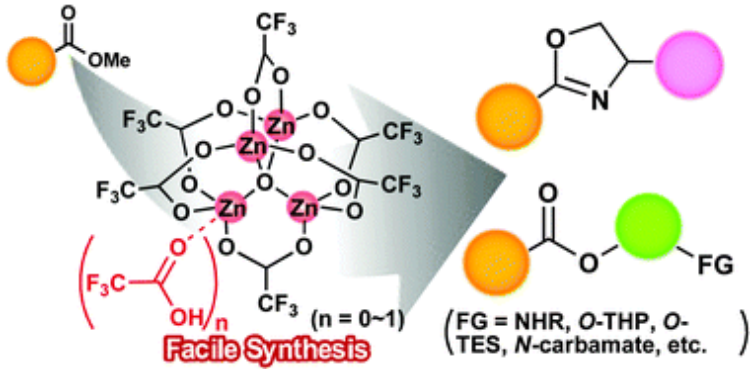


79) **Trifluoroacetic Acid Adduct of Trifluoroacetate-Bridged μ$_4$-Oxo-Tetranuclear Zinc Cluster, $Zn_4(OCOCF_3)_6O{\bullet}CF_3CO_2H$: Synthesis under Mild Conditions and Catalytic Transesterification and Oxazoline Formation.** Y. Hayashi, T. Ohshima, Y. Fujii, Y. Matsushima, K. Mashima, *Catal. Sci. Tech.* **1**, 230-233 (2011). DOI: 10.1039/c0cy00048e



78) **A Tetranuclear Zinc Cluster-Catalyzed Practical and Versatile Deprotection of**

Acetates and Benzoates. T. Iwasaki, K. Agura, Y. Maegawa, Y. Hayashi, T. Ohshima, K. Mashima, *Chem. Eur. J.*, **16**, 11567-11571 (2010).
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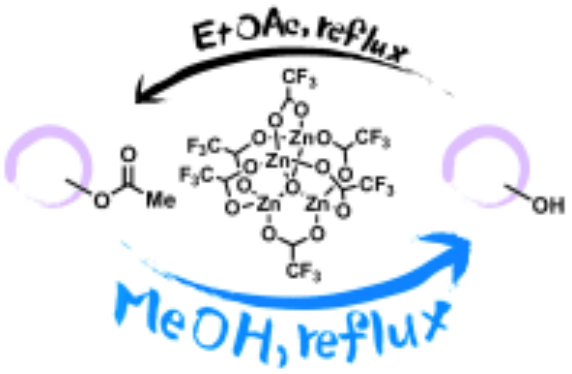

77) **Iridium-Difluorphos Catalyzed Asymmetric Hydrogenation of 2-Alkyl and 2-Aryl-Substituted Quinoxalines: A General and Efficient Route into Tetrahydroquinoxalines.** D. Cartigny, T. Nagano, T. Ayad, J.-P. Genêt, T. Ohshima, K. Mashima, V. Ratovelomanana-Vidal, *Adv. Synth. Catal.*, **352**, 1886-1891 (2010).
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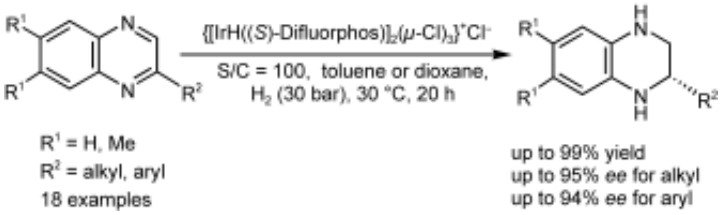

76) **Asymmetric Hydrogenation of Heteroaromatic Ketones and Cyclic and Acyclic Enones Mediated by Cu(I)–Chiral Diphosphine Catalysts.** H. Shimizu, T. Nagano, N. Sayo, T. Saito, T. Ohshima, K. Mashima, *Synlett*, 3143-3146 (2009).
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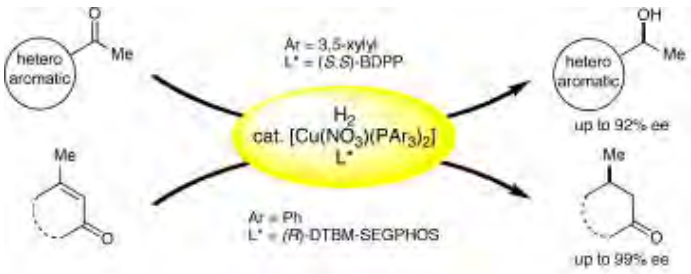

75) **Platinum-Catalyzed Direct Amination of Allylic Alcohols under Mild**

Conditions: Ligand and Microwave Effects, Substrate Scope, and Mechanistic Study. T. Ohshima, Y. Miyamoto, J. Ipposhi, Y. Nakahara, M. Utsunomiya, K. Mashima, *J. Am. Chem. Soc.*, **131**, 14317-14328 (2009).
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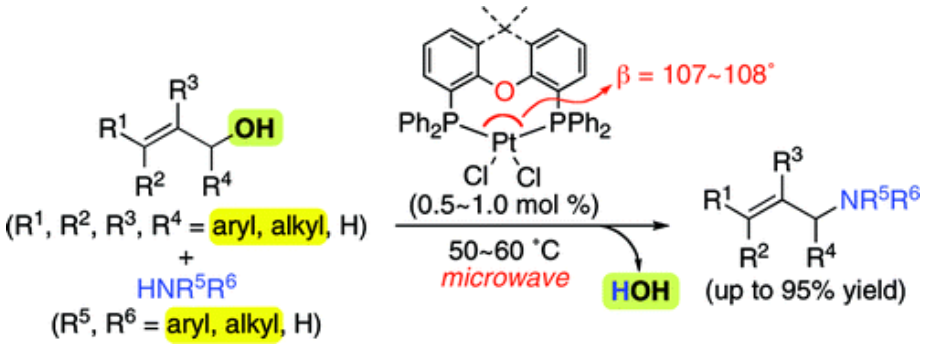

74) **Unprecedented Halide Dependence on Catalytic Asymmetric Hydrogenation of 2-Aryl- and 2-Alkyl-substituted Quinolinium Salts Using Ir–DIFLUORPHOS Halide Complexes.** H. Tadaoka, D. Cartigny, T. Nagano, T. Gosavi, T. Ayad, J.-P. Genêt, T. Ohshima, V. Ratovelomanana-Vidal, K. Mashima, *Chem. Eur. J.*, **15**, 9990-9994 (2009).
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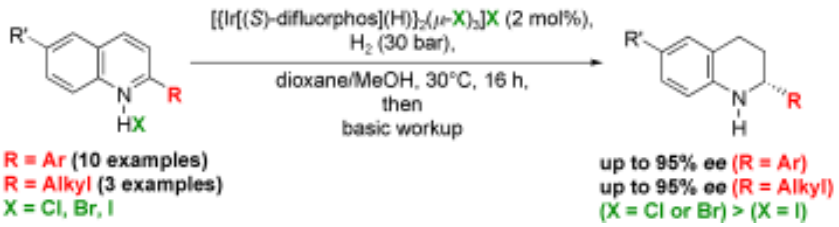

73) **Theoretical Study of Al(III)-Catalyzed Conversion of Glyoxal to Glycolic Acid: Dual Activated 1,2-Hydride Shift Mechanism by Protonated $Al(OH)_3$ Species.** T. Ohshima, Y. Yamamoto, U. Takaki, Y. Inoue, T. Saeki, K. Itou, Y. Maegawa, T. Iwasaki, K. Mashima, *Chem. Commun.*, 2688-2690 (2009).
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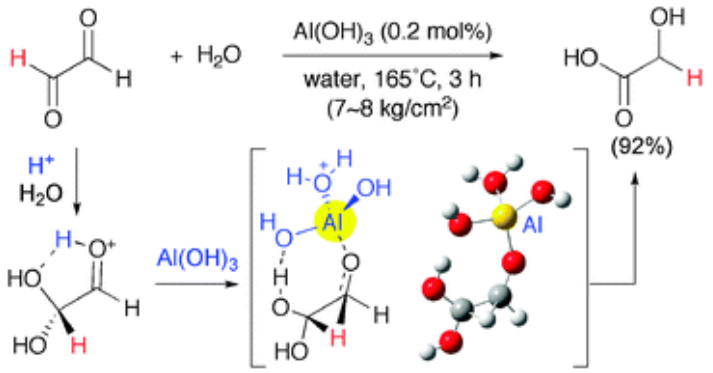

72) **Development of Environmentally Benign Catalytic Reactions Using Tetranuclear Zinc Clusters.** T. Ohshima, T. Iwasaki, K. Mashima, *Journal of Synthetic Organic Chemistry, Japan*, **67**, 491-506 (2009).
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71) **A Simple, General, and Highly Chemoselective Acetylation of Alcohols Using Ethyl Acetate as the Acetyl Donor Catalyzed by a Tetranuclear Zinc Cluster.** T. Iwasaki, Y. Maegawa, Y. Hayashi, T. Ohshima, K. Mashima, *Synlett*, 1659-1663 (2009).
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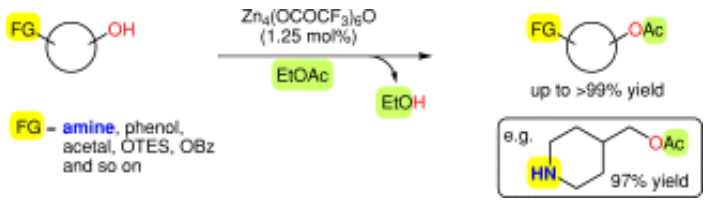

70) **Zinc-Catalyzed Cycloisomerizations. Synthesis of Substituted Furans and Furopyrimidine Nucleosides.** A. Sniady, A. Durham, M. S. Morreale, A. Marcinek, S. Szafert, T. Lis, K. R. Brzezinska, T. Iwasaki, T. Ohshima, K. Mashima, R. Dembinski, *J. Org. Chem.*, **73**, 5881-5889 (2008).
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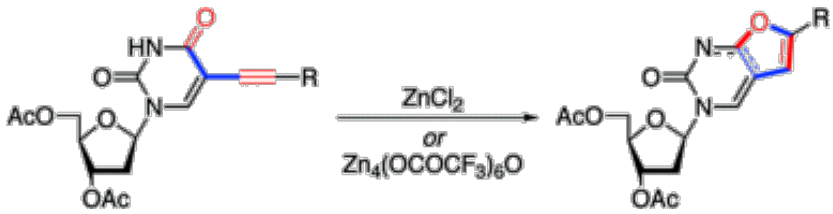

69) **Transesterification of Various Methyl Esters Under Mild Conditions Catalyzed by Tetranuclear Zinc Cluster.** T. Iwasaki, Y. Maegawa, Y. Hayashi, T. Ohshima, K. Mashima, *J. Org. Chem.*, **73**, 5147-5150 (2008).

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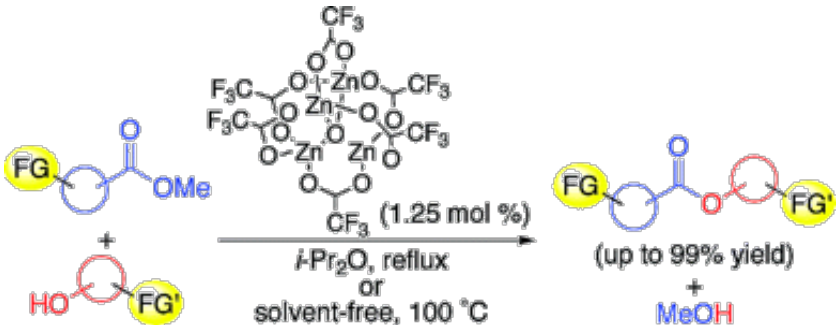

68) **Catalytic Enantioselective Addition of Terminal Alkynes to Aldehydes: Preparation of (*S*)-(–)-1,3-Diphenyl-2-Propyn-1-ol and (*S*)-(–)-4-Methyl-1-Phenyl-2-Pentyn-1,4-Diol.** R. Takita, S. Harada, T. Ohshima, S. Matsunaga, M. Shibasaki, *Org. Synth.*, **85**, 118-130 (2008).

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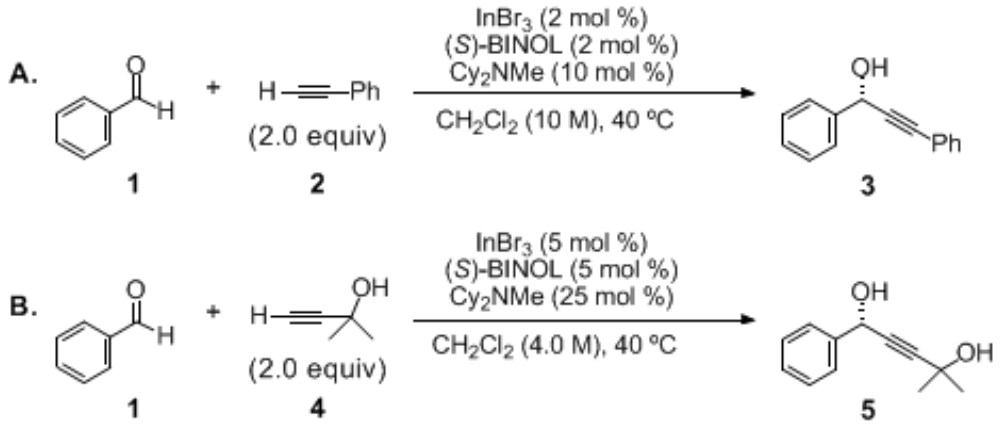

67) **Enzyme-like Chemoselective Acylation of Alcohols in the presence of Amines Catalyzed by a Tetranuclear Zinc Cluster.** T. Ohshima, T. Iwasaki, Y. Maegawa, A. Yoshiyama, K. Mashima, *J. Am. Chem. Soc.*, **130**, 2944-2945 (2008).

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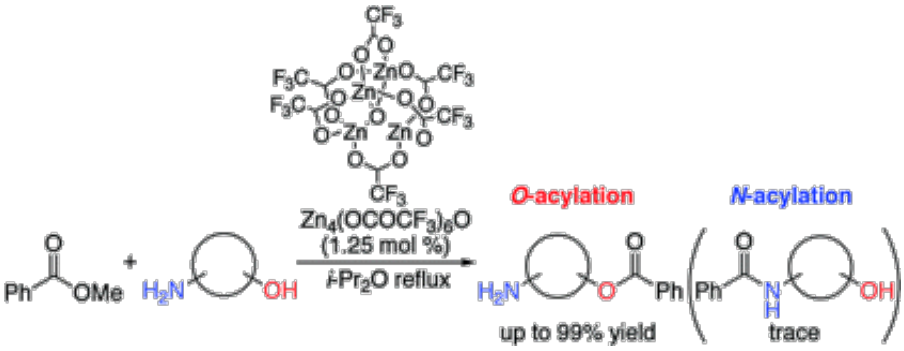

66) **Highly Enantio- and *s-trans* C–C Double Bond Selective Catalytic Hydrogenation of Cyclic Enones: Alternative Synthesis of (–)-Menthol.** T. Ohshima, H. Tadaoka, K. Hori, N. Sayo, K. Mashima, *Chem. Eur. J.*, **14**, 2060-2066 (2008).

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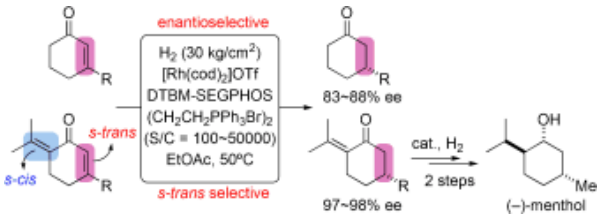

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65) **Novel Ir–SYNPHOS® and Ir–DIFLUORPHOS® Catalysts for Asymmetric Hydrogenation of Quinolines.** C. Deport, M. Buchotte, K. Abecassis, H. Tadaoka, T. Ayad, T. Ohshima, J.-P. Genet, K. Mashima, V. Ratovelomanana-Vidal, *Synlett*, 2743-2747 (2007).

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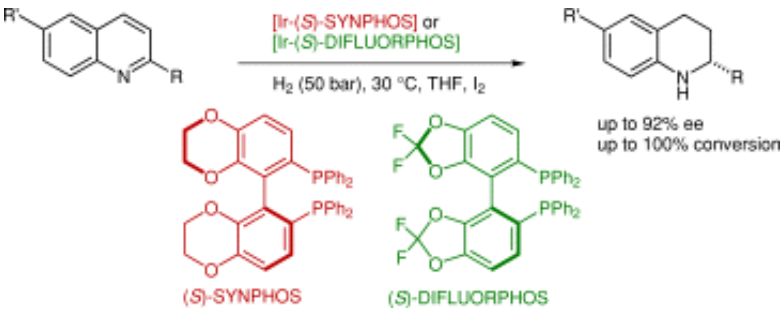

64) **Direct Use of Allylic Alcohols for Platinum-Catalyzed Monoallylation of Amines.** M. Utsunomiya, Y. Miyamoto, J. Ipposhi, T. Ohshima, K. Mashima, *Org. Lett.*, **9**, 3371-3374 (2007).

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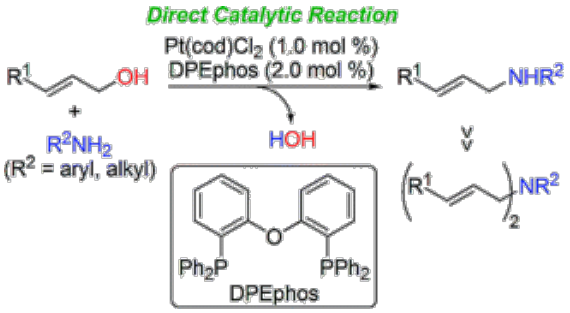

63) **Catalytic Asymmetric Phase-Transfer Michael reaction and Mannich-type Reaction of Glycine Schiff Base with Chiral Two-Center Organocatalyst.** T. Shibuguchi, A. Kuramochi, T. Ohshima, M. Shibasaki, *Chem. Asia. J.*, **2**, 794-801 (2007).

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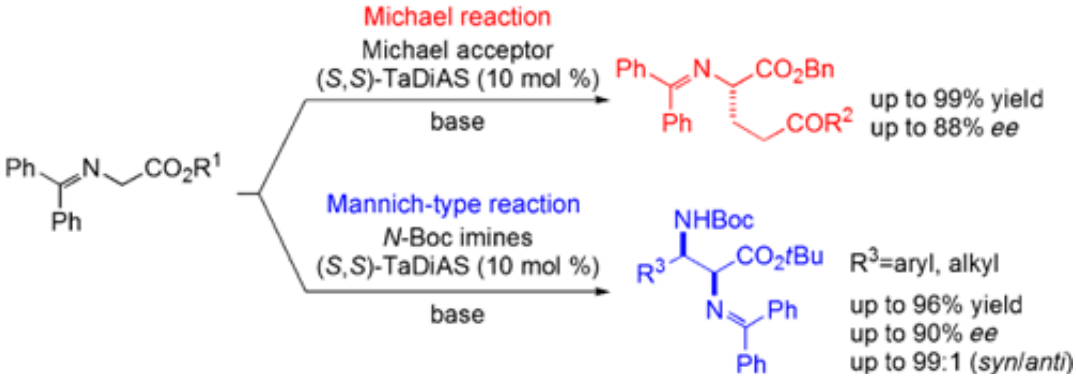

62) **Short Synthesis of (+)-Cylindricine C and Formal Total Synthesis of (–)-Lepadiformine.** H. Mihara, T. Shibuguchi, A. Kuramochi, T. Ohshima, M. Shibasaki, *Heterocycles*, **72**, 421-438 (2007).

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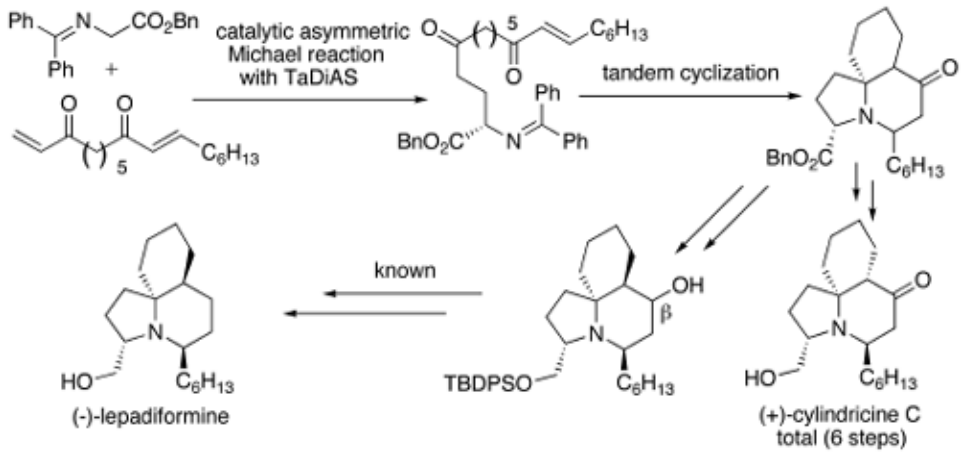

61) **Ligand accelerated indium(III)-catalyzed asymmetric alkynylation of aldehydes with 2-methyl-3-butyn-2-ol as an ethyne equivalent donor.** S. Harada, R. Takita, T. Ohshima, S. Matsunaga, M. Shibasaki, *Chem. Commun.*, 948-950 (2007).
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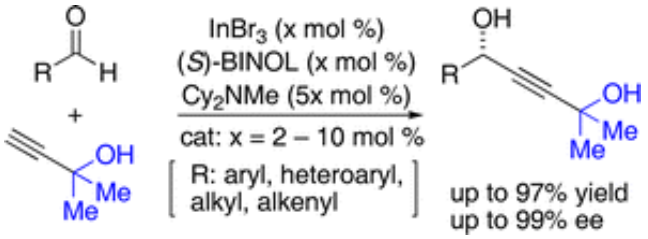

60) **Catalytic Asymmetric Epoxidation of α,β-Unsaturated Esters Using Chiral Yttrium-Biaryldiol Complexes.** H. Kakei, R. Tsuji, T. Ohshima, H. Morimoto, S. Matsunaga, M. Shibasaki, *Chem. Asian. J.*, **2**, 257-264 (2007).
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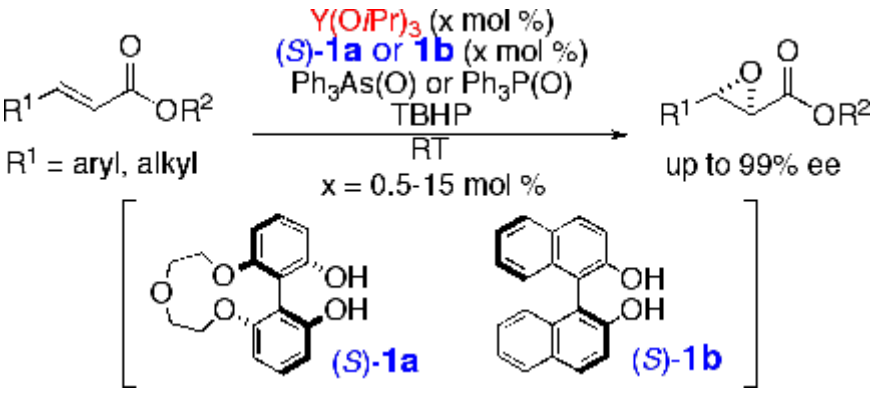

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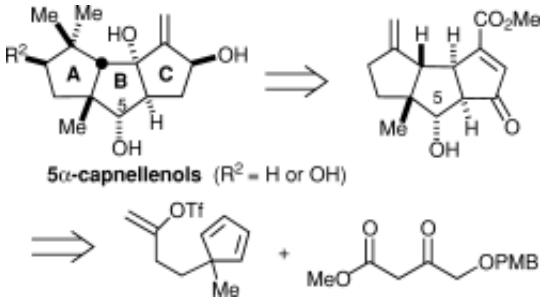

58) **Hexapalladium cluster: Unique cluster construction reaction of cyclic $Pd_3(CNC_6H_3Me_2\text{-}2,6)_6$ and linear $[Pd_3(CNC_6H_3Me_2\text{-}2,6)_8]^{2+}$.** M. Ohashi, J. Yi, D. Shimizu, T. Yamagata, T. Ohshima, K. Mashima, *J. Organomet. Chem.*, **691**, 2457-2464 (2006).

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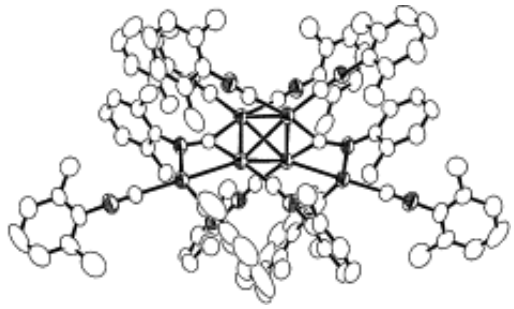

57) **Short Synthesis of (+)-Cylindricine C Using Catalytic Asymmetric Michael Reaction with a Newly Designed Two-Center Organocatalyst.** T. Shibuguchi, H. Mihara, A. Kuramochi, S. Sakuraba, T. Ohshima, M. Shibasaki, *Angew. Chem. Int. Ed.*, **45**, 4635-4637 (2006).

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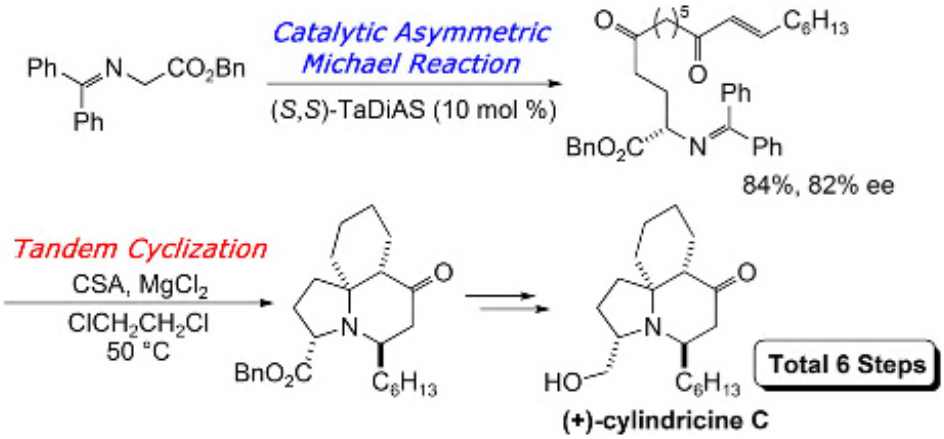

56) **Direct Conversion of Esters, Lactones, and Carboxylic Acids to Oxazolines Catalyzed by Tetranuclear Zinc Cluster.** T. Ohshima, T. Iwasaki, K. Mashima, *Chem. Commun.*, 2711-2713 (2006).

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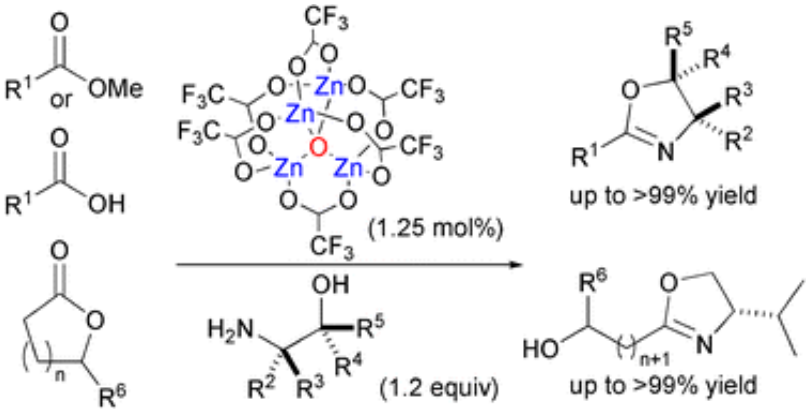

55) **Asymmetric Alkynylation of Aldehydes Catalyzed by an In(III)/BINOL Complex.** R. Takita, K. Yakura, T. Ohshima, M. Shibasaki, *J. Am. Chem. Soc.*, **127**, 13760-13761 (2005).

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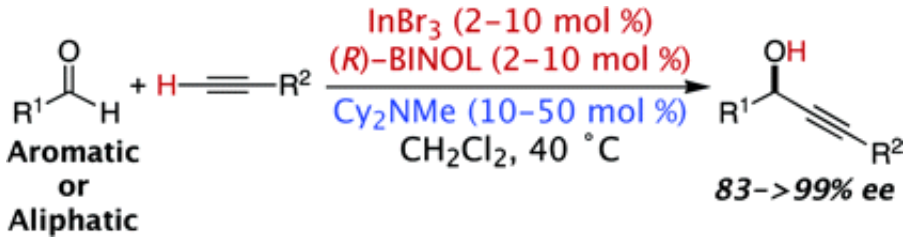

54) **A Topological Isomer of Ferrocene: Theoretical Approach for Transition Metal Complexes with Conjugated All Trans Cyclodecapentaene.** A. Nakamura, T. Ohshima, K. Mashima, *J. Organomet. Chem.*, **690**, 4373-4375 (2005).
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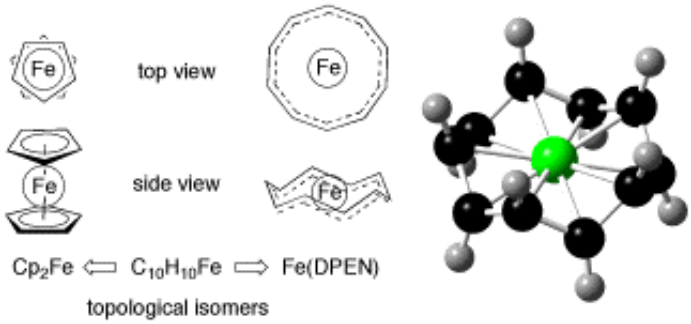

53) **Enantio- and diastereoselective construction of vicinal quaternary and tertiary carbon centers by catalytic Michael reaction of α-substituted β-keto esters to cyclic enones.** K. Majima, S.-y. Tosaki, T. Ohshima, M. Shibasaki, *Tetrahedron Lett.*, **43**, 5377-5381 (2005).
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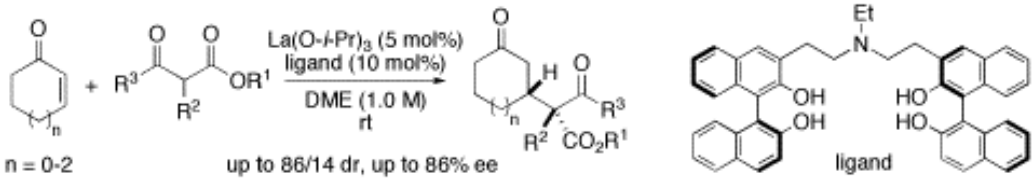

52) **Dynamic Structural Change of the Self-Assembled Lanthanum Complex Induced by Lithium Triflate for Direct Catalytic Asymmetric Aldol-Tishchenko Reaction.** Y. Horiuchi, V. Gnanadesikan, T. Ohshima, H. Masu, K. Katagiri, Y. Sei, K. Yamaguchi, M. Shibasaki, *Chem. Eur. J.*, **11**, 5195-5204 (2005).
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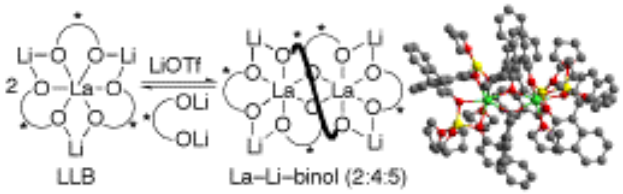

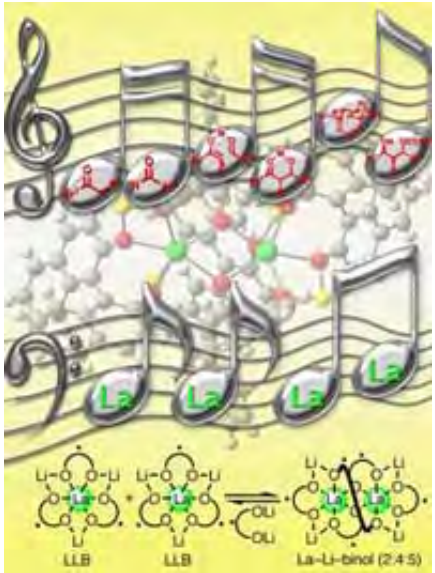

51) **Catalytic Asymmetric Epoxidation of α,β-Unsaturated Esters Using an Yttrium-Biphenyldiol Complex.** H. Kakei, R. Tsuji, T. Ohshima, M. Shibasaki, *J. Am. Chem. Soc.*, **127**, 8962-8963 (2005).

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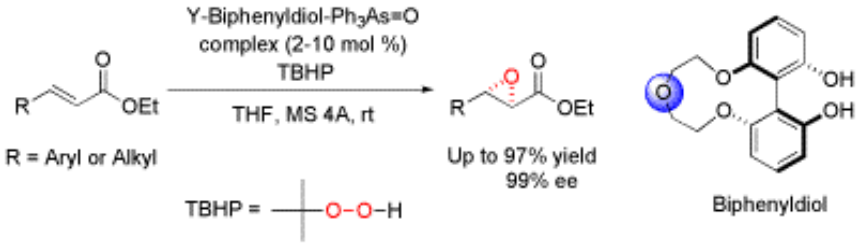

50) **Formal Total Synthesis of (+)-Wortmannin Using Catalytic Asymmetric Intramolecular Aldol Condensation Reaction.** H. Shigehisa, T. Mizutani, S.-y. Tosaki, T. Ohshima, M. Shibasaki, *Tetrahedron*, **61**, 5057-5065 (2005).

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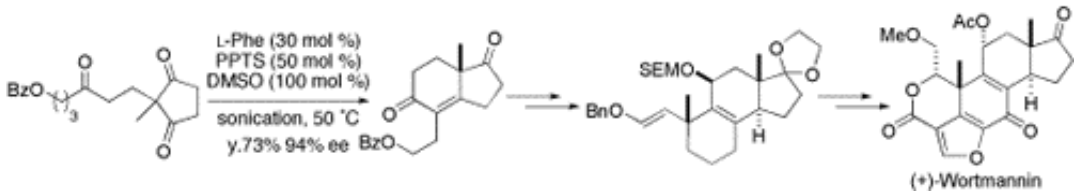

49) **A New Entry in Catalytic Alkynylation of Aldehydes and Ketones: Dual Activation of Soft Nucleophiles and Hard Electrophiles by an Indium(III) Catalyst.** R. Takita, Y. Fukuta, R. Tsuji, T. Ohshima, M. Shibasaki, *Org. Lett.*, **7**, 1363-1366 (2005).
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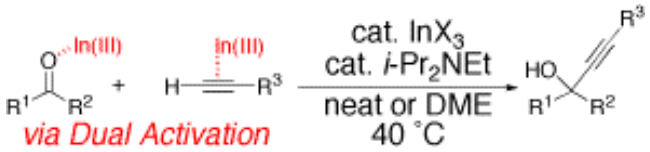

48) **Enantio- and Diastereoselective Catalytic Mannich-Type Reaction of a Glycine Schiff Base Using a Chiral Two-Center Phase-Transfer Catalyst.** A. Okada, T. Shibuguchi, T. Ohshima, H. Masu, K. Yamaguchi, M. Shibasaki, *Angew. Chem. Int. Ed.*, **44**, 4564-4567 (2005).
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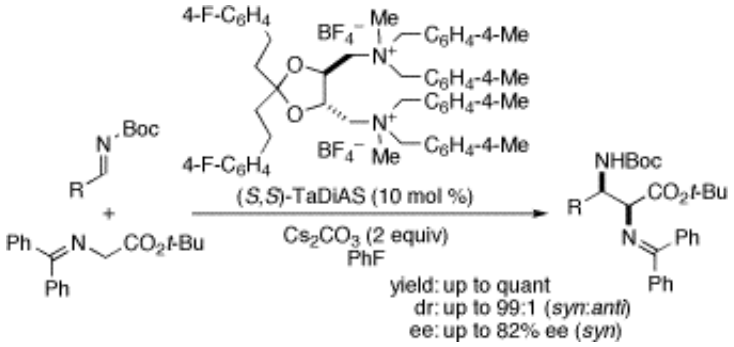

47) **Dynamic Ligand Exchange of the Lanthanide Complex Leading to the Structural and Functional Transformation: One-Pot Sequential Catalytic Asymmetric Epoxidation-Regioselective Epoxide Opening Process.** S.-y. Tosaki, R. Tsuji, T. Ohshima, M. Shibasaki, *J. Am. Chem. Soc.*, **127**, 2147-2155 (2005).
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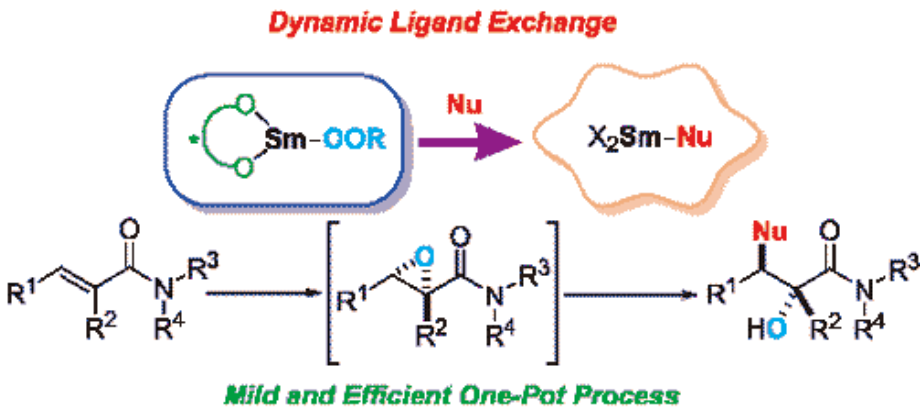

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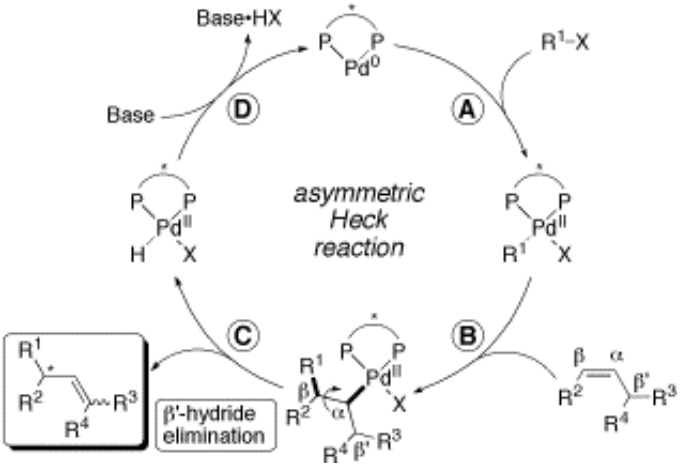

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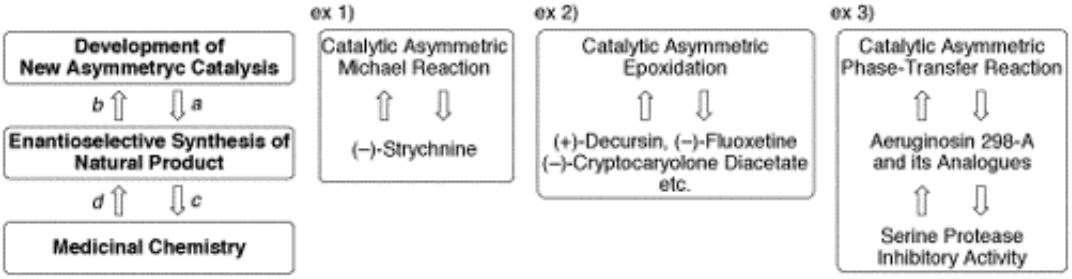

44) **Enantioselective total synthesis of (–)-strychnine: development of a highly practical catalytic asymmetric carbon–carbon bond formation and domino cyclization.** T. Ohshima, Y. Xu, R. Takita, M. Shibasaki, *Tetrahedron*, **60**, 9569-9588 (2004).

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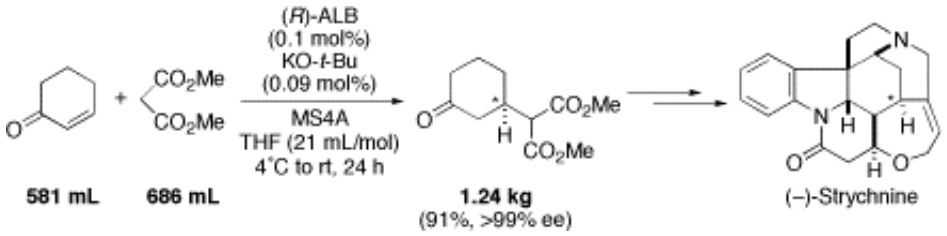

43) **Direct Catalytic Asymmetric Aldol-Tishchenko Reaction.** V. Gnanadesikan, Y. Horiuchi, T. Ohshima, M. Shibasaki, *J. Am. Chem. Soc.*, **126**, 7782-7783 (2004).

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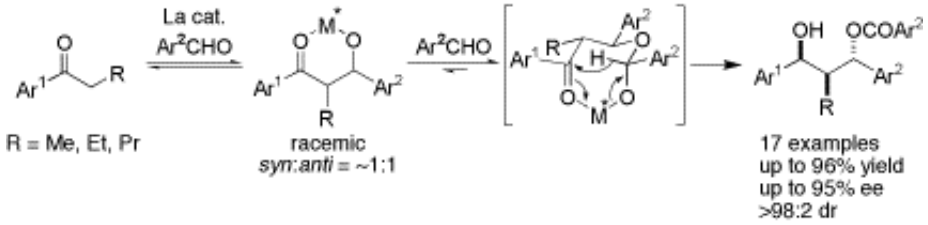

42) **Catalytic asymmetric phase-transfer reactions using tartrate-derived asymmetric two-center organocatalysts.** T. Ohshima, T. Shibuguchi, Y. Fukuta, M. Shibasaki, *Tetrahedron*, **60**, 7743-7754 (2004).

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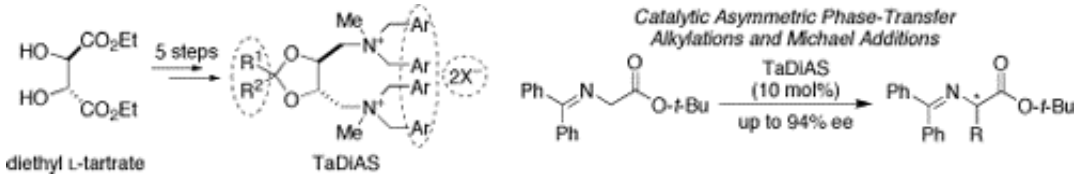

41) **Enantioselective Syntheses and Biological Studies of Aeruginosin 298-A and its Analogues: Application of Catalytic Asymmetric Phase-Transfer Reaction.** Y. Fukuta,

T. Ohshima, V. Gnanadesikan, T. Shibuguchi, T. Nemoto, T. Kisugi, T. Okino, M. Shibasaki, *Proc. Natl. Acad. Sci. USA*, **101**, 5433-5438 (2004).

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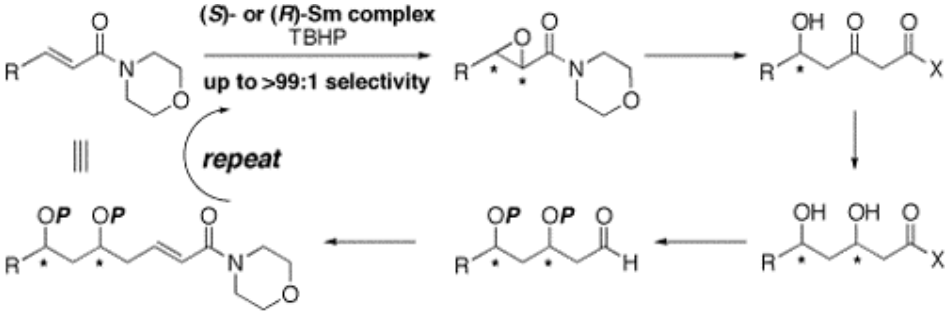

40) **Strategy for Enantio- and Diastereoselective Syntheses of All Possible Stereoisomers of 1,3-Polyol Arrays Based on a Highly Catalyst-Controlled Epoxidation of α,β-Unsaturated Morpholinyl Amides: Application to Natural Product Synthesis.** S.-y. Tosaki, Y. Horiuchi, N. Nemoto, T. Ohshima, M. Shibasaki, *Chem. Eur. J.*, **10**, 1527-1544 (2004).

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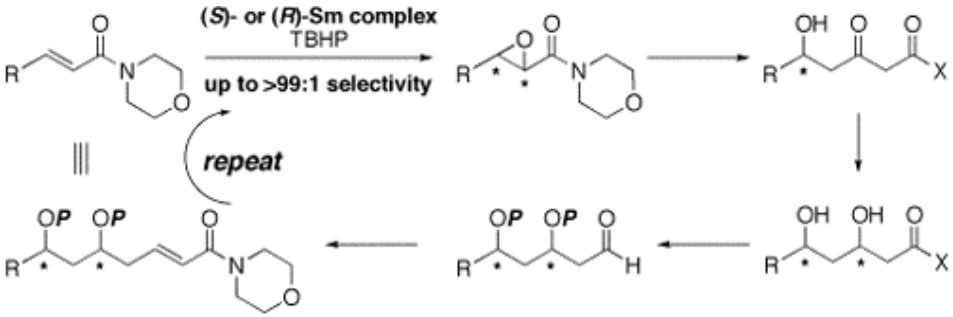

39) **Efficient Synthesis of Chiral α- and β-Hydroxy Amides: Application to Catalytic Asymmetric Synthesis of (*R*)-Fluoxetine.** H. Kakei, T. Nemoto, T. Ohshima, M. Shibasaki, *Angew. Chem., Int. Ed.*, **43**, 317-420 (2004).
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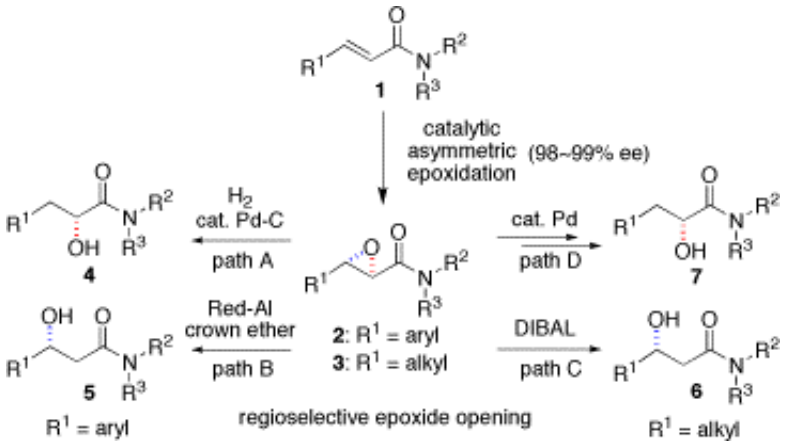

38) **Catalytic Asymmetric Michael Reaction of β-Keto Esters: Effects of the Linker Heteroatom in Linked-BINOL.** K. Majima, R. Takita, A. Okada, T. Ohshima, M. Shibasaki, *J. Am. Chem. Soc.*, **125**, 15837-15845 (2003).
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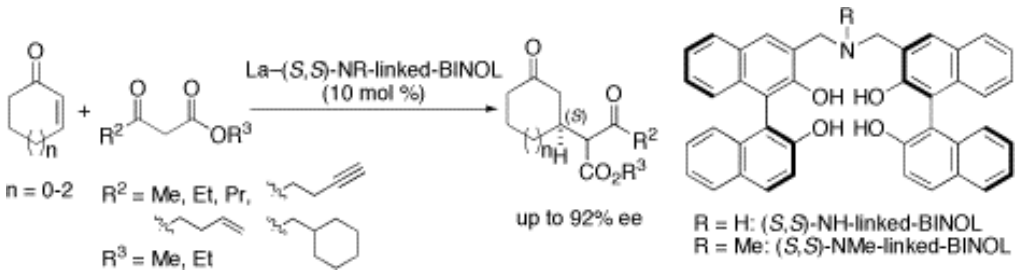

37) **Enantioselective Syntheses of Aeruginosin 298-A and its Analogs Using Catalytic Asymmetric Phase-Transfer Reaction and Epoxidation.** T. Ohshima, V. Gnanadesikan, T. Shibuguchi, Y. Fukuta, T. Nemoto, M. Shibasaki, *J. Am. Chem. Soc.*, **125**, 11206-11207 (2003).
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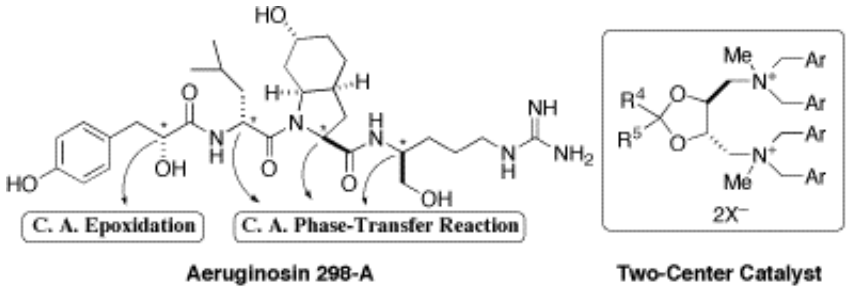

36) **Catalytic asymmetric epoxidation of α,β-unsaturated carboxylic acid imidazolides and amides by lanthanide-BINOL complexes.** T. Ohshima, T. Nemoto, S.-y. Tosaki, H. Kakei, V. Gnanadesikan, M. Shibasaki, *Tetrahedron*, **59**, 10485-10497 (2003).

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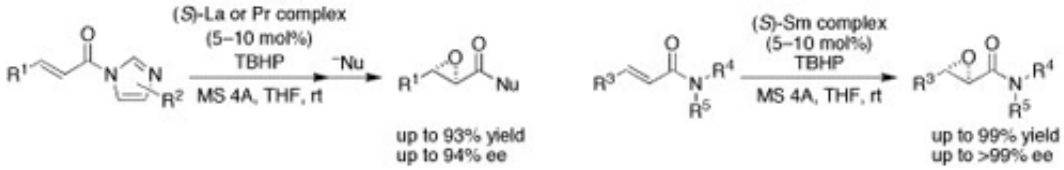

35) **Enantioselective total syntheses of (+)-decursin and related natural compounds using catalytic asymmetric epoxidation of an enone.** T. Nemoto, T. Ohshima, M. Shibasaki, *Tetrahedoron*, **59**, 6889-6897 (2003).

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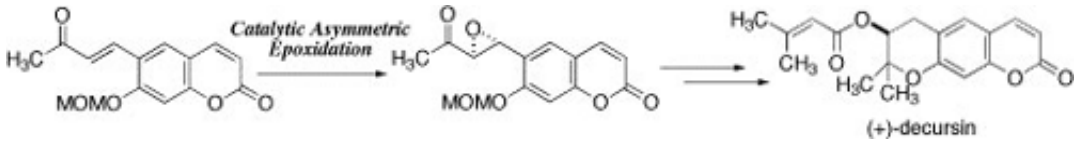

34) **Catalytic Asymmetric Synthesis of Both *syn*- and *anti*-3,5-Dihydroxy Esters: Application to 1,3-Polyol/α-Pyrone Natural Product Synthesis.** S.-y. Tosaki, T. Nemoto, T. Ohshima, M. Shibasaki, *Org. Lett.*, **5**, 495-498 (2003).

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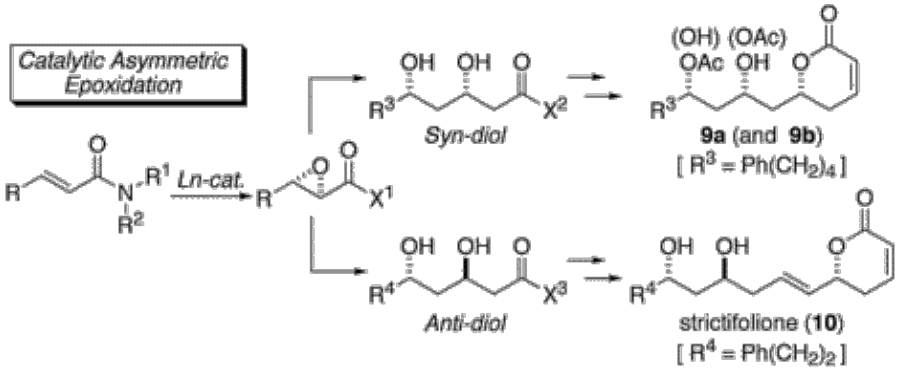

33) **Unique Reactivity of α,β-Unsaturated Carboxylic Acid Imidazolides: Catalytic Asymmetric Synthesis of α,β-Epoxy Esters and α,β–Epoxy Carboxylic Acid Derivatives.** T. Nemoto, S.-y. Tosaki, T. Ohshima, M. Shibasaki, *Chirality*, ***15***, 306-311 (2003).

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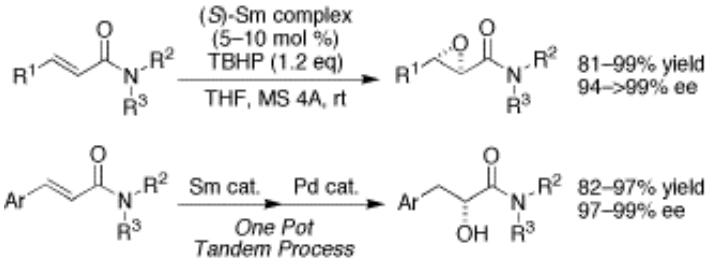

32) **Development of new asymmetric two-center catalysts in phase-transfer reactions.** T. Shibuguchi, Y. Fukuta, Y. Akachi, A. Sekine, T. Ohshima, M. Shibasaki, *Tetrahedoron Lett*., **43**, 9539-9543 (2002).

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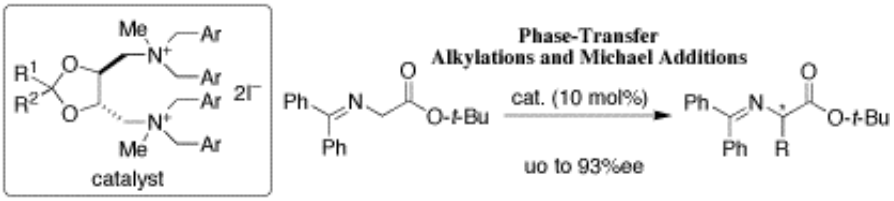

31) **Enantioselective Total Synthesis of (–)-Strychnine Using the Catalytic Asymmetric Michael Reaction and Tandem Cyclization.** T. Ohshima, Y. Xu, R. Takita, S. Shimizu, D. Zhong, M. Shibasaki, *J. Am. Chem. Soc*., **124**, 14546-14547 (2002).

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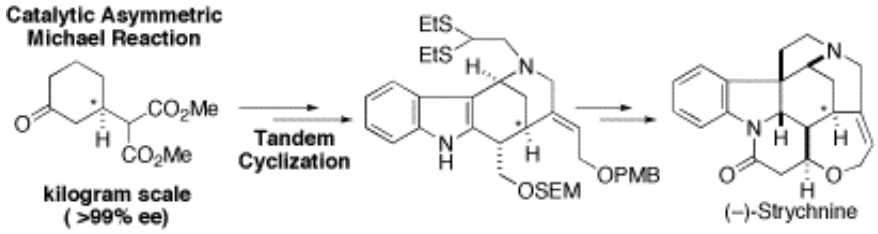

30) **Catalytic Asymmetric Epoxidation of α,β-Unsaturated Amides: Efficient Synthesis of β-Aryl α-Hydroxy Amides Using a One Pot Tandem Catalytic Asymmetric Epoxidation–Pd-Catalyzed Epoxide Opening Process.** T. Nemoto, H. Kakei, V. Gnanadesikan, S.-y. Tosaki, T. Ohshima, M. Shibasaki, *J. Am. Chem. Soc.*, **124**, 14544-14545 (2002).
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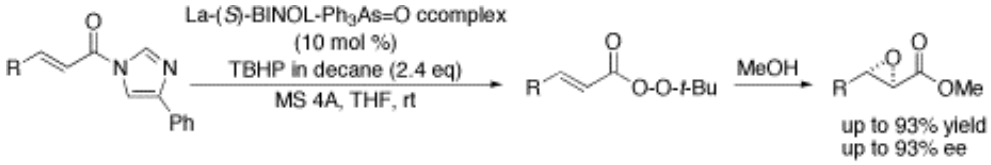

29) **Development of New Asymmetric Reactions Using Rare Earths Containing Asymmetric Catalysts.** M. Shibasaki, M. Kanai, T. Ohshima, T. Nemoto, *RARE EARTHS*, **41**, 37-42 (2002).

28) **Highly enantioselective catalytic Michael reaction of α-substituted malonates using La-linked-BINOL complex in the presence of HFIP (1,1,1,3,3,3-hexafluoroisopropanol).** R. Takita, T. Ohshima, M. Shibasaki, *Tetrahedoron Lett.*, **43**, 4661-4665 (2002).
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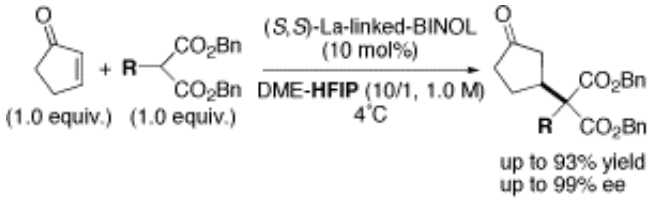

27) **A practical large-scale synthesis of enantiomerically pure 3-[bis(methoxycarbonyl)methyl]cyclohexanone via catalytic asymmetric michael**

reaction. Y. Xu, K. Ohori, T. Ohshima, M. Shibasaki, *Tetrahedoron*, **58**, 2585-2588 (2002).

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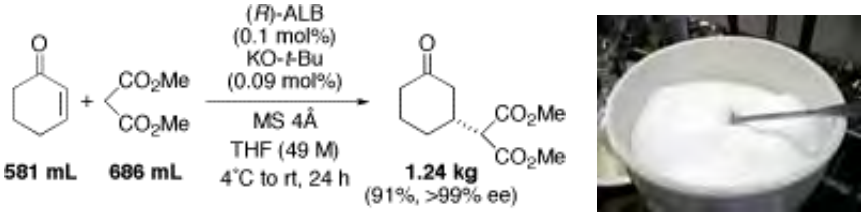

26) **An enantioselective formal synthesis of 4-demethoxydaunomycin using the catalytic asymmetric ring opening reaction of *meso*-epoxide with *p*-anisidine.** A. Sekine, T. Ohshima, M. Shibasaki, *Tetrahedoron*, **58**, 75-82 (2002).

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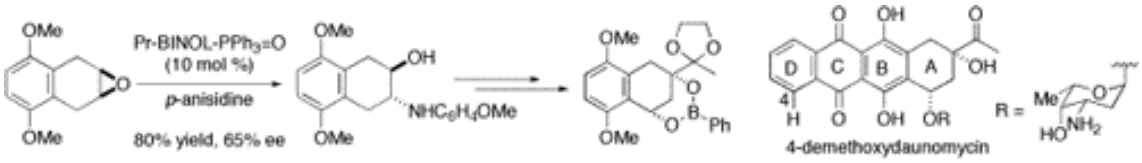

25) **Catalytic Asymmetric Epoxidation of α,β-Unsaturated Carbonyl Compounds.** T. Nemoto, T. Ohshima, M. Shibasaki, *Journal of Synthetic Organic Chemistry, Japan*, **60**, 94-105 (2002).

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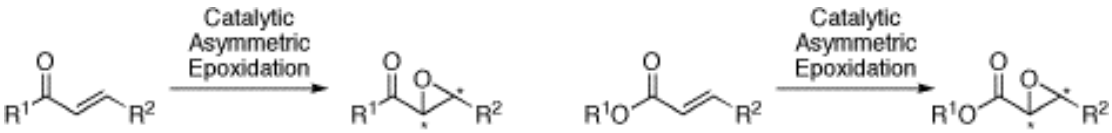

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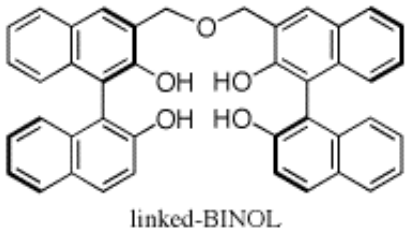

23) **Highly regioselective synthesis of cyclic enol silyl ethers using ring-closing metathesis.** A. Okada, T. Ohshima, M. Shibasaki, *Tetrahedoron Lett.*, **42**, 8023-8027 (2001).
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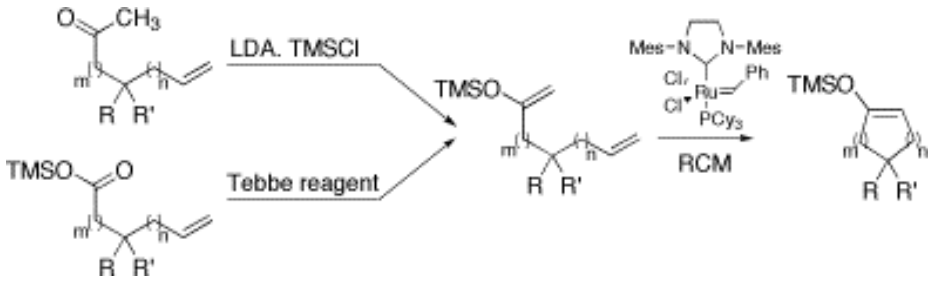

22) **Catalytic Asymmetric Synthesis of α,β-Epoxy Esters, Aldehydes, Amides, and γ,δ-Epoxy β-Keto Esters: Unique Reactivity of α,β-Unsaturated Carboxylic Acid Imidazolides.** T. Nemoto, T. Ohshima, M. Shibasaki, *J. Am. Chem. Soc.*, **123**, 9474-9475 (2001).
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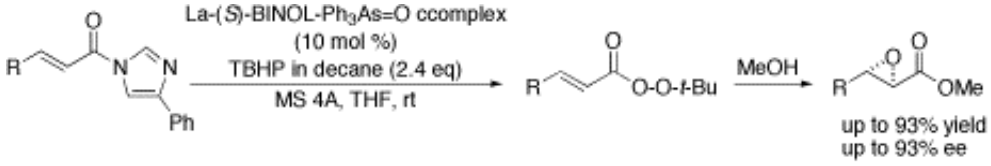

21) **Direct Catalytic Enantio- and Diastereoselective Aldol Reaction Using a Zn-Zn-linked-BINOL Complex: a Practical Synthesis of *syn*-1,2-Diols.** N. Kumagai, S. Matsunaga, N. Yoshikawa, T. Ohshima, M. Shibasaki, *Org. Lett.*, **3**, 1539-1542 (2001).
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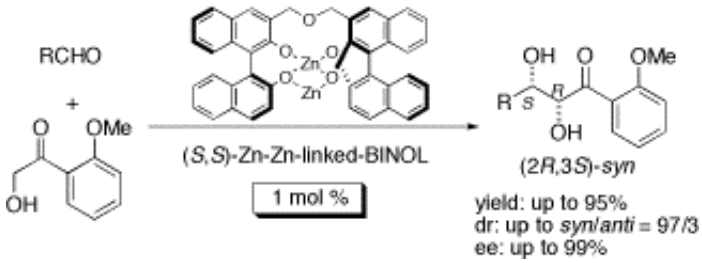

20) **Direct Catalytic Asymmetric Aldol Reaction: Synthesis of either *syn*- or *anti*-α,β-Dihydroxy Ketones.** N. Yoshikawa, N. Kumagai, S. Matsunaga, G. Moll, T.

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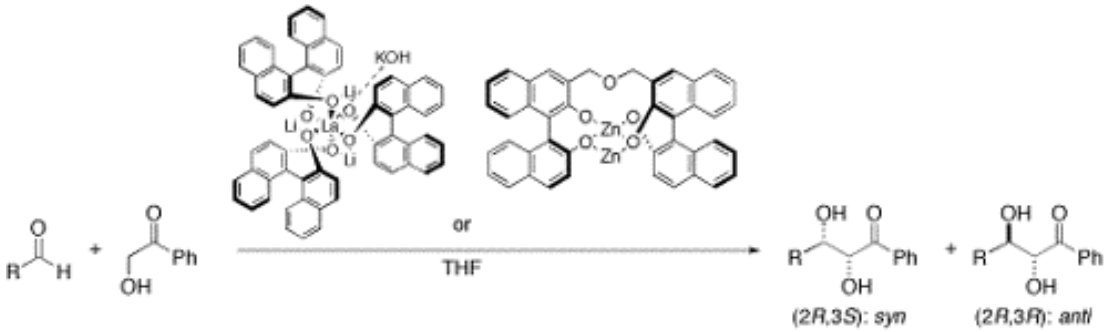

19) **Catalytic Asymmetric Epoxidation of Enones Using La-BINOL-Triphenylarsine Oxide Complex: Structural Determination of the Asymmetric Catalyst.** T. Nemoto, T. Ohshima, K. Yamaguchi, M. Shibasaki, *J. Am. Chem. Soc.*, **123**, 2725-2732 (2001).
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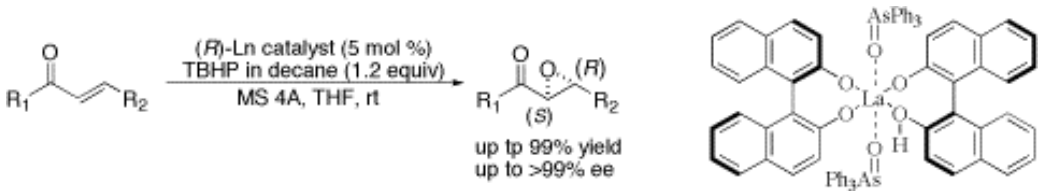

18) **Enantioselective total syntheses of novel PKC activator (+)-decursin and its derivatives using catalytic asymmetric epoxidation of an enone.** T. Nemoto, T. Ohshima, M. Shibasaki, *Tetrahedoron Lett.*, **41**, 9569-9574 (2000).
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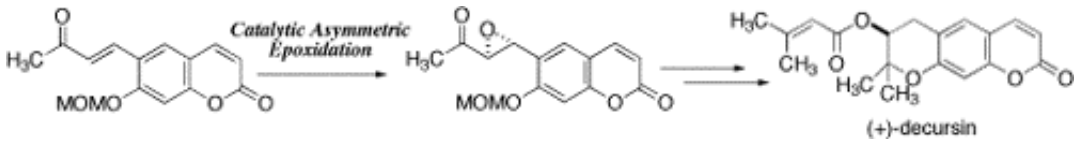

17) **Immobilization of asymmetric multifunctional catalysts on an insoluble polymer.** S. Matsunaga, T. Ohshima, M. Shibasaki, *Tetrahedoron Lett.*, **41**, 8473-8478 (2000).
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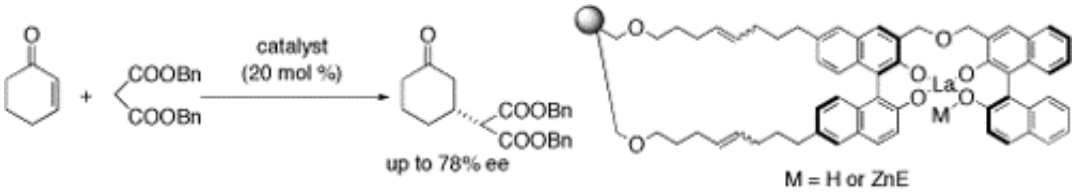

16) **Stable, Storable and Reusable Asymmetric Catalyst: a Novel La-linked-BINOL Complex for Catalytic Asymmetric Michael Reaction.** Y. S. Kim, S. Matsunaga, J. Das, A. Sekine, T. Ohshima, M. Shibasaki, *J. Am. Chem. Soc.*, **122**, 6506-6507 (2000).
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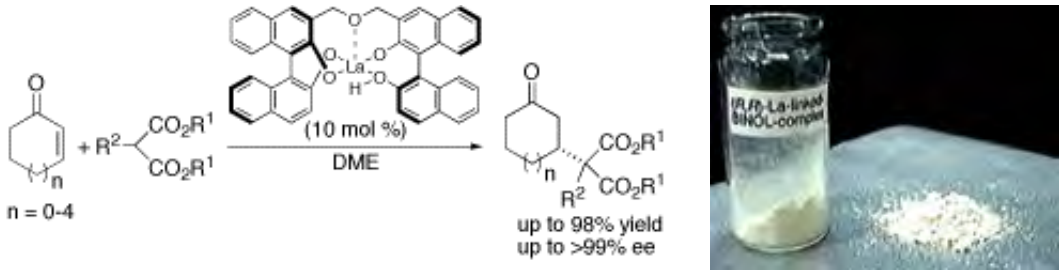

15) **Total Synthesis of the Immunosuppressant Sanglifehrin A.** K. C. Nicolaou, F. Murphy, S. Barluenga, T. Ohshima, H. Wei, J.-Y. Xu, D. L. F. Gray, O. Baudoin, *J. Am. Chem. Soc.*, **122**, 3830-3838 (2000).
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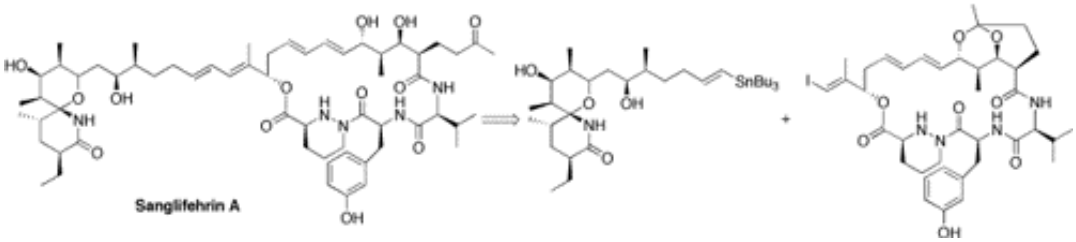

14) **Catalytic Asymmetric Synthesis of 19,20-Dihydroakuammicine.** K. Ohori, S. Shimizu, T. Ohshima, M. Shibasaki, *Chirality*, **12**, 400-403 (2000).
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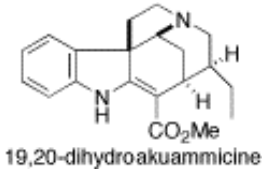

13) **An Efficient Method for the Synthesis of Versatile Intermediates Leading to 13-Deoxy- and 9,13-Dideoxyphorbols.** A. Sekine, N. Kumagai, K. Uotsu, T. Ohshima, M. Shibasaki, *Tetrahedron Lett*., **41**, 509-513 (2000).
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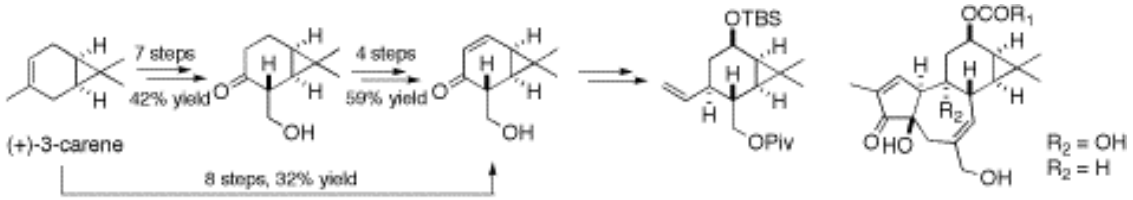

12) **Total synthesis and Chemical Biology of the Sarcodictyins.** K. C. Nicolaou, J. Pfefferkorn, J.-Y. Xu, N. Winssinger, T. Ohshima, S. Kim, S. Hosokawa, D. Vourloumis, F. van Delft, T. Li, *Chem. Pharm. Bull*., **47**, 1199-1213 (1999).
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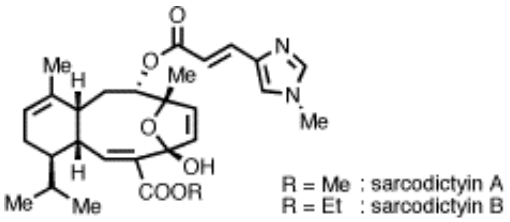

11) **Total Snthesis of Sanglifehrin A.** K. C. Nicolaou, J.-Y. Xu, F. Murphy, S. Barluenga, B. Olivier, H.-x. Wei, D. L. F. Gray, T. Ohshima, *Angew. Chem., Int. Ed*., **38**, 2447-2451 (1999).
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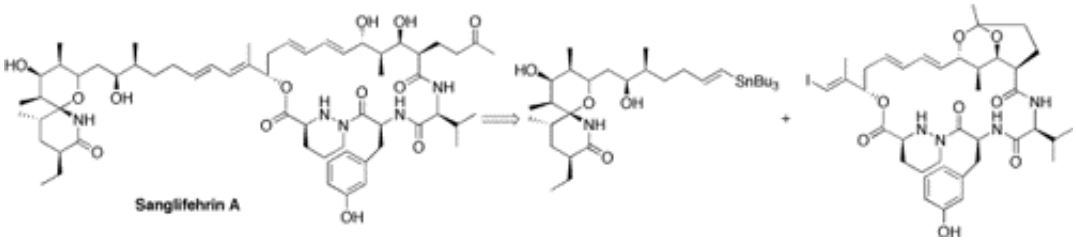

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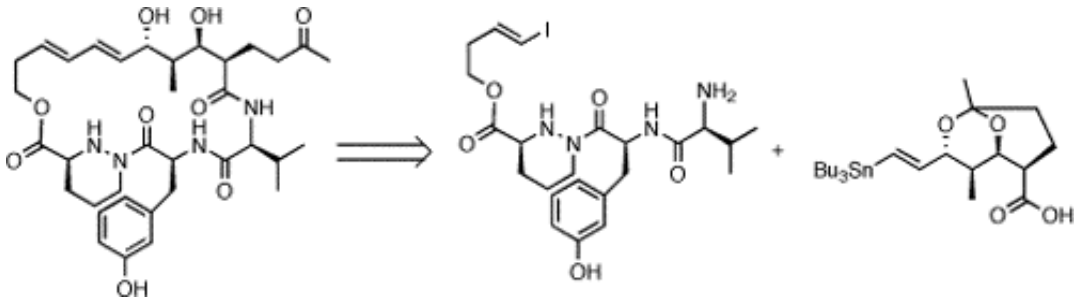
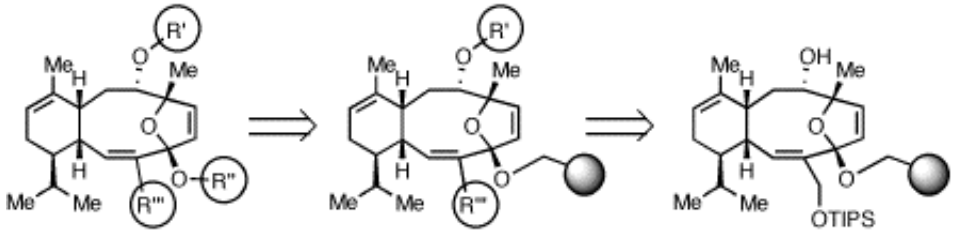


9) **Solid and Solution Phase Synthesis and Biological Evaluation of Combinatorial Sarcodictyin Libraries.** K. C. Nicolaou, N. Winssinger, D. Vourloumis, T. Ohshima, S. Kim, J. Pfefferkorn, J.-Y.; Xu, T. Li, *J. Am. Chem. Soc.*, **120**, 10814-1082652 (1998). DOI: 10.1021/ja9823870



8) **Total Synthesis of Eleutherobin and Eleuthosides A and B.** K. C. Nicolaou, T. Ohshima, T.; S. Hosokawa, F. L. van Delft, D. Vourloumis, J.-Y. Xu, J. Pfefferkorn, S. Kim, *J. Am. Chem. Soc.*, **120**, 8674-8680 (1998).
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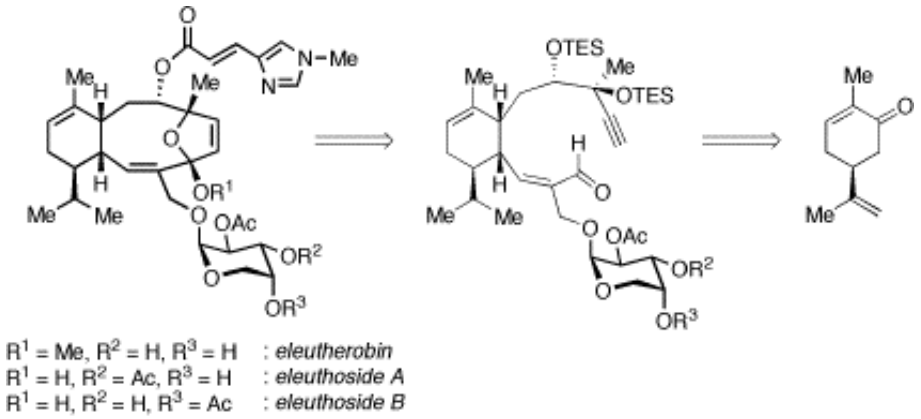

7) **Total Synthesis of Sarcodictyins A and B.** K. C. Nicolaou, J.-Y. Xu, S. Kim, J. Pfefferkorn, T. Ohshima, D. Vourloumis, S. Hosokawa, *J. Am. Chem. Soc.*, **120**, 8661-8673 (1998).

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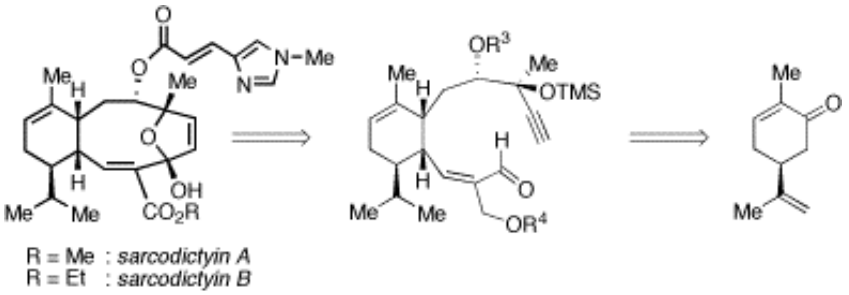

6) **Synthesis and biological activity of sarcodictyins.** K. C. Nicolaou, S. Kim, J. Pfefferkron, J.-Y. Xu, T. Ohshima, S. Hosokawa, D. Vourloumis, T. Li, *Angew. Chem., Int. Ed.*, **37**, 1418-1421 (1998).
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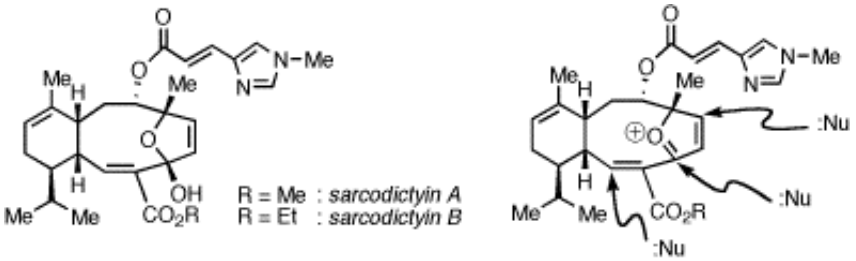

5) **Total synthesis of eleutherobin.** K. C. Nicolaou, F. van Delft, T. Ohshima, D. Vourloumis, J.-Y. Xu, S. Hosokawa, J. Pfefferkorn, S. Kim, T. Li, *Angew. Chem., Int. Ed. Engl.*, **36**, 2520-2524 (1997).
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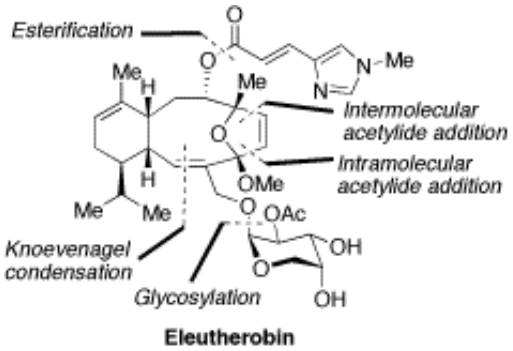

4) **Synthesis of the Tricyclic Core of Eleutherobin and Sarcodictyins and Total Synthesis of Sarcodictyin A.** K. C. Nicolaou, J.-Y. Xu, S. Kim, T. Ohshima, S. Hosokawa,

J. Pfefferkorn, *J. Am. Chem. Soc.*, **119**, 11353-11354 (1997).
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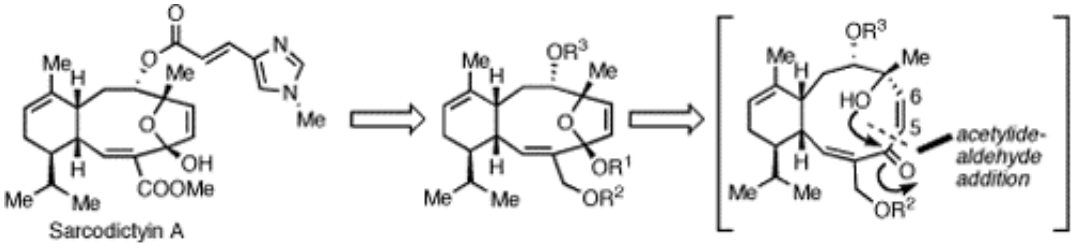

3) **Asymmetric Heck Reaction-Carbanion Capture Process. Catalytic Asymmetric Total Synthesis of (–)-$\Delta^{9(12)}$-Capnellene.** T. Ohshima, K. Kagechika, M. Adachi, M. Sodeoka, M. Shibasaki, *J. Am. Chem. Soc.*, **118**, 7108-7116 (1996).
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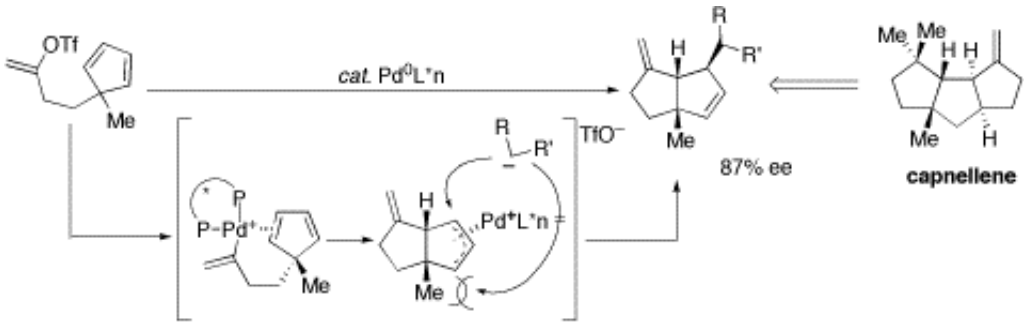

2) **Manganese(III)-based oxidative free-radical reaction of α-allyl-β-keto ester with molecular oxygen.** T. Ohshima, M. Sodeoka, M. Shibasaki, *Tetrahedron Lett.*, **34**, 8509-8512 (1993).
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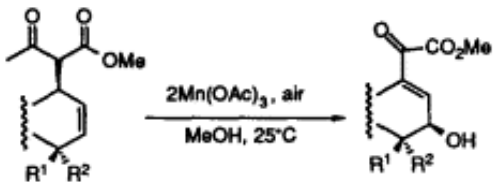
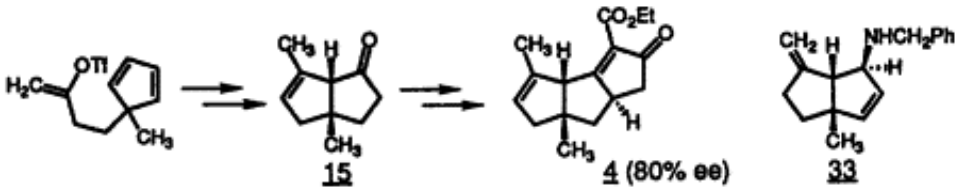


1) **Asymmetric Heck reaction-anion capture process. A catalytic asymmetric synthesis of the key intermediates for the capnellenols.** K. Kagechika, T. Ohshima, M. Shibasaki, *Tetrahedron*, **49**, 1773-1782 (1993).
DOI:10.1016/S0040-4020(01)80534-2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H2C
CH3
CH3 H
O
CH3
15
CO2Et
CH3 H
O
H
CH3
4 (80% ee)
CH2 H
NHCH2Ph
H
CH3
33