

牛丸 理一郎 Richiro Ushimaru, Ph.D.

1988年8月13日生



学歴・職歴

2011年3月	名古屋大学理学部化学科卒業 野依 良治 教授
2013年3月	名古屋大学大学院理学研究科物質理学専攻（化学系）修士課程修了 野依 良治 教授
2019年12月	Ph. D., Department of Chemistry, The University of Texas at Austin Prof. Hung-wen (Ben) Liu
2020年1月	東京大学大学院薬学系研究科・助教、現在に至る
2020年10月	JST 戰略的創造研究推進事業 ACT-X「生命と化学」研究者（兼任）
2022年11月	令和4年度 東京大学卓越研究員

受賞歴

2018年9月	Research Excellence Award (The University of Texas at Austin)
2018年9月	Leon O. Morgan Fellowship (The University of Texas at Austin)
2020年7月	日本薬学会 生薬天然物部会奨励賞
2022年3月	日本化学会 第35回 若い世代の特別講演証
2023年6月	第24回 酵素応用シンポジウム 研究奨励賞
2023年6月	日本生薬学会 学術奨励賞
2023年7月	第22回 天然物化学談話会 奨励賞
2024年3月	日本薬学会 奨励賞

学術論文リスト

1. Ushimaru, R., et al., "TBA." **Nature Catalysis**, in revision (2024)
2. Awakawa, T., Ushimaru, R., et al., "TBA." **Nature Catalysis**, in revision (2024)
3. Zhou, L., Awakawa, T., Ushimaru, R., Kanaida, M., Abe, I., "Characterization of aziridine-forming α -ketoglutarate-dependent oxygenase in L-isovaline biosynthesis." **Org. Lett.** 26, 724-727 (2024)
4. Ushimaru, R.,* Cha, L., Shimo, S., Li, X., Paris, J., Mori, T., Miyamoto, K., Coffer, L., Uchiyama, M., Guo, Y.,* Chang, W-c.,* Abe, I.* "Mechanistic analysis of the stereodivergent nitroalkane cyclopropanation catalyzed by nonheme iron enzymes." **J. Am. Chem. Soc.** 145, 24210-24217 (2023)
***co-corresponding author**

5. **Ushimaru, R.**, * Ding, Y., Mori, T., Miyamoto, K., Uchiyama, M., Abe, I.* “Structural and mechanistic insights into the C–C bond forming rearrangement reaction catalyzed by heterodimeric hinokiresinol synthase.” *J. Am. Chem. Soc.* 145, 21966-21973 (2023)
*co-corresponding author
6. **Ushimaru, R.**, * Lyu, J., Ling, M., Abe, I.* “Multiple C–C bond cleavage reactions catalyzed by tolyporphin tetrapyrrole biosynthetic enzymes.” *J. Am. Chem. Soc.* 145, 9834-9839 (2023)
*co-corresponding author
7. Ueno, K., **Ushimaru, R.**, * Abe, I.* “Photoinduced reductive dehalogenation of phenacyl bromides with pyridoxal-5'-phosphate.” *Chem. Pharm. Bull.* 71, 675-677 (2023)
*co-corresponding author
8. Tao, H.,[†] **Ushimaru, R.**,^{†,*} Awakawa, T., Mori, T., Uchiyama, M., Abe, I.* “Stereoselectivity and substrate specificity of the Fe(II)/α-ketoglutarate-dependent oxygenase TqaL.” *J. Am. Chem. Soc.* 144, 21512-21520 (2022)
†co-first author, *co-corresponding author
9. Li, X., Chen, H.-P., Zhou, L., Fan, J., Awakawa, T., Mori, T., **Ushimaru, R.**, * Abe, I., * Liu, J.-K.* “Cordycicadins A–D, antifeedant polyketides from the entomopathogenic fungus *Cordyceps cicadae* JXCH1.” *Org. Lett.* 23, 8627–8632 (2022)
*co-corresponding author
10. Lyu, J., **Ushimaru, R.**, * Abe, I.* “Characterization of enzymes catalyzing the initial steps of the β-lactam tabtoxin biosynthesis.” *Org. Lett.* 24, 3337-3341 (2022)
*co-corresponding author
11. Shimo, S.,[†] **Ushimaru, R.**,^{†,*} Engelbrecht, A., Harada, M., Miyamoto, K., Andreas, K., Uchiyama, M., Kaysser, L., * Abe, I.* “Stereodivergent nitrocyclopropane formation during biosynthesis of belactosins and hormaomycins.” *J. Am. Chem. Soc.* 143, 18413-18418 (2021)
†co-first author, *co-corresponding author
12. Mori, T., Zhai, R., **Ushimaru, R.**, Matsuda, Y., Abe, I. “Molecular insights into the endoperoxide formation by Fe(II)/α-KG-dependent oxygenase Nvfl.” *Nature Commun.* 12, Article number: 4417 (2021)
13. **Ushimaru, R.**, Chen, Z., Zhao, H., Fan, P.-h., Liu, H.-w. “The enzymes mediating maturation of the seryl-tRNA synthetase inhibitor SB-217452 during biosynthesis of albomycins.” *Angew. Chem. Int. Ed.* 59, 3558-3562 (2020)
14. Wang, S. A., Lin, C. I., Zhang, J., **Ushimaru, R.**, Sasaki, E., Liu, H.-w. “Studies of lincosamide formation complete the biosynthetic pathway for lincomycin A.” *Proc. Natl. Acad. Sci. USA* 116, 24794-24801 (2020)
15. **Ushimaru, R.**, Liu, H.-w. “Biosynthetic origin of the atypical stereochemistry in the thioheptose core of albomycin nucleoside antibiotics.” *J. Am. Chem. Soc.* 141, 2211-2214 (2019)

16. **Ushimaru, R.**, Ruszczycky, M. W., Liu, H.-w. "Changes in regioselectivity of H atom abstraction during the hydroxylation and cyclization reactions catalyzed by hyoscyamine 6 β -hydroxylase." *J. Am. Chem. Soc.* 141, 1062-1066 (2019)
17. **Ushimaru, R.**, Ruszczycky, M. W., Chang, W.-c., Yan, F., Liu, Y.-n., Liu, H.-w. "Substrate conformation correlates with the outcome of hyoscyamine 6 β -hydroxylase catalyzed oxidation reactions." *J. Am. Chem. Soc.* 140, 7433-7436 (2018)
18. **Ushimaru, R.**, Nishimura, T., Iwatsuki, T., Naka, H. "A fluorinated cobalt(III) porphyrin complex for hydroalkoxylation of alkynes." *Chem. Pharm. Bull.* 65, 1000-1003 (2017)
19. **Ushimaru, R.**, Lin, C.-I., Sasaki, E., Liu, H.-w. "Characterization of enzymes catalyzing transformations of cysteine S-conjugated intermediates in the lincosamide biosynthetic pathway." *ChemBioChem*. 17, 1606-1611 (2016)
20. Tsarev, V. N., Morioka, Y., Caner, J., Wang, Q., **Ushimaru, R.**, Kudo, A., Naka, H., Saito, S. "N-Methylation of amines with methanol at room temperature." *Org. Lett.* 17, 2530-2533 (2015)
21. Tachinami, T., Nishimura, T., **Ushimaru, R.**, Noyori, R., Naka, H. "Hydration of terminal alkynes catalyzed by water-soluble cobalt porphyrin complexes." *J. Am. Chem. Soc.* 135, 50-53 (2013)

著書・総説

1. **Ushimaru, R.*** "Functions and mechanisms of enzymes assembling lignans and norlignans." *Curr. Op. Chem. Biol.*, submitted (2024)
2. **Ushimaru, R.*** "Three-membered ring formation catalyzed by α -ketoglutarate-dependent nonheme iron enzymes." *J. Nat. Med.* 78, 21-32 (2024)
3. **Ushimaru, R.*** "Characterization of enzymes catalyzing unusual C–C bond formation and cleavage reactions during natural product biosynthesis." *Chem. Pharm. Bull.* 72, submitted (2023)
4. **Ushimaru, R.,*** Abe, I.* "Back-to-back cycloadditions in nature." *Nature Chemistry* 15, 1056-1057 (2023)
***co-corresponding author**
5. **Ushimaru, R.,*** Abe, I.* "Assembling neuroactive alkaloids." *Nature Plants* 9, 1946-1947 (2023)
***co-corresponding author**
6. **Ushimaru, R.,*** Abe, I.* "Unusual dioxygen-dependent reactions catalyzed by nonheme iron enzymes in natural product biosynthesis." *ACS Catalysis* 13, 1045-1076 (2023)
***co-corresponding author**

7. **Ushimaru, R.**, * Abe, I.* “C–N and C–S bond formation by cytochrome P450 enzymes.” *Trends in Chemistry* 5, 526-536 (2023)
*co-corresponding author
8. **Ushimaru, R.**, * Lyu, J., Abe, I.* “Diverse enzymatic chemistry for propionate side chain cleavages in tetrapyrrole biosynthesis.” *J. Ind. Microbiol. Biotechnol.* 50, Article number: kuad016 (2023)
*co-corresponding author
9. Awakawa, T., Mori, T., **Ushimaru, R.**, Abe, I. “Structure-based engineering of α-ketoglutarate dependent oxygenases in fungal meroterpenoid biosynthesis.” *Nat. Prod. Rep.* 40, 46-61 (2023)
10. 森貴裕, 牛丸理一郎, 「これからの天然物化学に向けて」*月刊ファインケミカル*, 51, 5-10 (2023)
11. 牛丸理一郎, 「飛翔する若手研究者：天然物の三員環構造をつくる鉄酵素の機能解析」*化学と工業*, 75, 820 (2022)
12. 牛丸理一郎, 「期待の若手」*ファルマシア*, 57, 665 (2021)