

Curriculum Vitae

Kei Muto (武藤 慶)

Assistant Professor

Department of Applied Chemistry, School of Advanced Science,
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Website: <http://www.jyamaguchi-lab.com>



Date of Birth

April 22, 1988

Citizenship

Japanese

Education

- | | |
|-----------|---|
| 2007–2011 | B.S. in Chemistry, Nagoya University, Japan
(Prof. Kenichiro Itami), <i>March 2011</i> |
| 2011–2013 | M.S. Graduate Student in Chemistry, Nagoya University, Japan
(Prof. Kenichiro Itami), <i>March 2013</i> |
| 2013–2015 | Ph.D. Graduate Student in Chemistry, Nagoya University, Japan
(Prof. Kenichiro Itami), <i>September 2015</i> |
| 2013–2015 | JSPS Research Fellowship for Young Scientists (DC1) |
| 2012 | Visiting Student (May–August), Wuhan University, China (Prof. Aiwen Lei) |

Academic Career

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|--------------|--|
| 2015–2016 | Postdoctoral Researcher, Institute of Transformative Bio-molecules, Nagoya University, Japan (Prof. Kenichiro Itami) |
| 2016–present | Assistant Professor, Waseda University (with Prof. Junichiro Yamaguchi) |

Awards and Honor

1. Inoue Research Award for Young Scientists (2017)
2. Reaxys PhD Prize Finalist (2016)
3. JSPS Ikushi Prize (日本学術振興会育志賞, 2016)
4. Nagoya University, Gakujutsu-Shorei Award (名古屋大学学術奨励賞, 2016)
5. CSJ Oral Student Presentation Award (Chemical Society of Japan 2014, The 94th Annual Meeting)
6. Annual Research Awards (Nagoya University Program for Leading Graduate Schools Annual Meeting 2013)
7. The 4th Otsu Conference Fellow (October 2013)
8. JSPS Fellowship for Young Scientist (DC1: 2013–2016)
9. Distinguished Master's Thesis Award 2012 in Department of Chemistry, Nagoya University (March 2013)
10. Nagoya University Graduate School of Science Award (March 2013)
11. Poster Award (The 59th Symposium on Organometallic Chemistry, Japan, September 2012)
12. Poster Award (The 29th Seminar on Synthetic Organic Chemistry, Japan, September 2012)
13. Poster Award (The 100th Symposium on Organic Synthesis, Japan, November 2011)

Media

[Chem-Station Spotlight Research](#)

Publications

- (25) TBA
Toshimasa Okita, Kei Muto, Junichiro Yamaguchi
- (24) TBA (Accepted)
Ryota Isshiki, Toshimasa Okita, Kei Muto, Junichiro Yamaguchi
- (23) “Synthesis of Fully Arylated (Hetero) arenes by Coupling Reaction”
Takashi Asako, Kei Muto, Junichiro Yamaguchi
J. Synth. Org. Chem. Jpn. **2018**, *76*, 98-110. DOI: [10.5059/yukigoseikyokaishi.76.98](https://doi.org/10.5059/yukigoseikyokaishi.76.98) (Review, Japanese)
- (22) “Decarbonylative C–P Bond Formation using Aromatic Esters and Organophosphorus Compounds”
Ryota Isshiki, Kei Muto, Junichiro Yamaguchi
Org. Lett. **2018**, ASAP. DOI: [10.1021/acs.orglett.8b00080](https://doi.org/10.1021/acs.orglett.8b00080)
- (21) “Catalytic α -Arylation of Ketones with Heteroaromatic Esters”
Isshiki, R.; Takise, R.; Itami, K.; Muto, K.; Yamaguchi, J.
Synlett **2017**, e-First. DOI: [10.1055/s-0036-1589120](https://doi.org/10.1055/s-0036-1589120)
- (20) “Cross-coupling of aromatic esters and amides”
Ryosuke Takise, Kei Muto, Junichiro Yamaguchi
Chem. Soc. Rev. **2017**, *46*, 5864. (Review) DOI: [10.1039/C7CS00182G](https://doi.org/10.1039/C7CS00182G)
Inside Back Cover DOI: [10.1039/C7CS90100C](https://doi.org/10.1039/C7CS90100C)
- (19) “Synthesis of Multiply Arylated Pyridines”
Asako, T.; Hayashi, W.; Suzuki, S.; Amaike, K.; Itami, K.; Muto, K.; Yamaguchi, J.
Tetrahedron **2017**, *in press*, *Accepted Manuscript*, (Invited contribution). DOI: [10.1016/j.tet.2017.03.095](https://doi.org/10.1016/j.tet.2017.03.095)
- (18) “Decarbonylative Diaryl Ether Synthesis by Pd and Ni Catalysis”
Ryosuke Takise, Ryota Isshiki, Kei Muto, Kenichiro Itami, Junichiro Yamaguchi,
J. Am. Chem. Soc. **2017**, *139*, 3340. DOI: [10.1021/jacs.7b00049](https://doi.org/10.1021/jacs.7b00049)
- (17) “触媒的なアルケンのエナンチオ選択的ジハロゲン化反応” (Catalytic Enantioselective Dihalogenation Reaction of Alkene) (Review)
武藤慶
有機合成化学協会誌, 2016, *74*, 1225–1226. DOI: [10.5059/yukigoseikyokaishi.74.1225](https://doi.org/10.5059/yukigoseikyokaishi.74.1225)
- (16) “Palladium-Catalyzed Decarbonylative Alkynylation of Aromatic Esters”
Toshimasa Okita, Kazushi Kumazawa, Ryosuke Takise, Kei Muto, Kenichiro Itami, Junichiro Yamaguchi
Chem. Lett. **2016**, *46*, 218. DOI: [10.1246/cl.161001](https://doi.org/10.1246/cl.161001)
- (15) “Palladium-Catalyzed Decarbonylative Cross-Coupling of Azinecarboxylates with Arylboronic Acids”
Kei Muto, Taito Hatakeyama, Kenichiro Itami, Junichiro Yamaguchi
Org. Lett. **2016**, *18*, 5106. DOI: [10.1021/acs.orglett.6b02556](https://doi.org/10.1021/acs.orglett.6b02556)
- (14) “Nickel-Catalyzed Aromatic C–H Functionalization” (Review)
Junichiro Yamaguchi, Kei Muto, Kenichiro Itami
Top Curr Chem, **2016**, *374*, 55. DOI: [10.1007/s41061-016-0053-z](https://doi.org/10.1007/s41061-016-0053-z)
- (13) “C–H Arylation and Alkenylation of Imidazoles by Nickel Catalysis: Solvent accelerated Imidazole C–H Activation”

Kei Muto, Taito Hatakeyama, Junichiro Yamaguchi, Kenichiro Itami
Chem. Sci. **2015**, *6*, 6792-6798. DOI: [10.1039/C5SC02942B](https://doi.org/10.1039/C5SC02942B)

- (12) “C–H Activation Generates Period Shortening Molecules Targeting Cryptochrome in the Mammalian Circadian Clock”
Tsuyoshi Oshima, Iori Yamanaka, Anupriya Kumar, Junichiro Yamaguchi, Taeko Nishiwaki-Ohkawa, Kei Muto, Rika Kawamura, Tsuyoshi Hirota, Kazuhiro Yagita, Stephan Irle, Steve A. Kay, Takashi Yoshimura, and Kenichiro Itami
Angew. Chem., Int. Ed. **2015**, *54*, 7193. DOI: [10.1002/anie.201502942](https://doi.org/10.1002/anie.201502942)
- (11) “Decarbonylative Organoboron Cross-coupling of Esters by Nickel Catalysis”
Kei Muto, Junichiro Yamaguchi, Djameladdin G. Musaev, and Kenichiro Itami
Nature Commun. **2015**, *6*, 7508. DOI: [10.1038/ncomms8508](https://doi.org/10.1038/ncomms8508)
Highlighted in Nature Asia.
- (10) “Key Mechanistic Features of Ni-catalyzed C-H/C-O Biaryl Coupling of Azoles and Naphthalen-2-yl Pivalates”
Huiying Xu, Kei Muto, Junichiro Yamaguchi, Cunyuan Zhao, Kenichiro Itami, and Djameladdin G. Musaev
J. Am. Chem. Soc. **2014**, *136*, 14834. DOI: [10.1021/ja5071174](https://doi.org/10.1021/ja5071174)
- (9) “Nickel-Catalyzed α -Arylation of Ketones with Phenol Derivatives”
Ryosuke Takise, Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
Angew. Chem., Int. Ed. **2014**, *53*, 6791. DOI: [10.1002/anie.201403823](https://doi.org/10.1002/anie.201403823)
- (8) “Isolation, Structure, and Reactivity of an Arylnickel(II) Pivalate Complex in Catalytic C-H/C-O Biaryl Coupling”
Kei Muto, Junichiro Yamaguchi, Aiwen Lei, and Kenichiro Itami
J. Am. Chem. Soc. **2013**, *135*, 16384. DOI: [10.1021/ja409803x](https://doi.org/10.1021/ja409803x)
- (7) “C–H Alkenylation of Azoles with Enols and Esters by Nickel Catalysis”
Lingkui Meng, Yuko Kamada, Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
Angew. Chem., Int. Ed. **2013**, *52*, 10048. DOI: [10.1002/anie.201304492](https://doi.org/10.1002/anie.201304492)
- (6) “Nickel-Catalyzed Direct Coupling of Heteroarenes”
Junichiro Yamaguchi, Kei Muto, Kazuma Amaike, Takuya Yamamoto, and Kenichiro Itami
J. Synth. Org. Chem. Jpn. **2013**, *71*, 576.
- (5) “New Cross-coupling Reactions through Nickel Catalysis”
Junichiro Yamaguchi, Kazuma Amaike, Kei Muto, and Kenichiro Itami
Catalysts and Catalysis **2013**, 624.
- (4) “Recent Progress in Nickel-Catalyzed Biaryl Coupling” (MicroReview)
Junichiro Yamaguchi, Kei Muto, and Kenichiro Itami
Eur. J. Org. Chem. **2013**, 19. DOI: [10.1002/ejoc.201200914](https://doi.org/10.1002/ejoc.201200914)
- (3) “Decarbonylative C–H Coupling of Azoles and Aryl Esters: Unprecedented Nickel Catalysis and Application to Synthesis of Muscoride A”
Kazuma Amaike, Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
J. Am. Chem. Soc. **2012**, *134*, 13573. DOI: [10.1021/ja306062c](https://doi.org/10.1021/ja306062c)
- (2) “Nickel-Catalyzed C–H/C–O coupling of Azoles with Phenol Derivatives”
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
J. Am. Chem. Soc. **2012**, *134*, 169. DOI: [10.1021/ja210249h](https://doi.org/10.1021/ja210249h)
Most Read Articles in JACS during December 2011
Highlighted as Synstory in Synform Highlighted in Newspapers (Chunichi, Yomiuri, Yahoo!)

- (1) "Nickel-Catalyzed C–H Arylation of Azoles with Haloarenes: Scope, Mechanism, and Application to the Synthesis of Bioactive Molecules"
Takuya Yamamoto, Kei Muto, Masato Komiyama, Jérôme Canivet, Junichiro Yamaguchi, and Kenichiro Itami
Chem. Eur. J. **2011**, *17*, 10113. DOI: 10.1002/chem.201101091

Others

- (1) Otsu Conference 2017 Reports 第8回大津会議 有機合成の夢を語る
Masaki Morita, Kouki Ikemoto, Kei Muto
J. Synth. Org. Chem. Jpn. **2018**

Presentations

International

- (8) "Development of Catalytic Decarbonylative Coupling of Aromatic Esters"
Kei Muto, Ryosuke Takise, Ryota Isshiki, Toshimasa Okita, Kazushi Kumazawa, Kenichiro Itami, Junichiro Yamaguchi
The 19th OMCOS (PP2-48) · ICC Jeju, Korea 6月28日
- (7) "Ni-Catalyzed C–H/C–O Couplings: Catalyst Development and Mechanistic Studies"
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
XXVI International Conference on Organometallic Chemistry (ICOMC 2014), Royton Sapporo, Hokkaido, Japan, July 17, 2014. (Poster)
- (6) "Ni-Catalyzed C–H/C–O Couplings: Development and Mechanistic Studies"
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
Core to Core/IRTG Meeting Programs on Elements Function for Transformative Catalysis and Materials
Nagoya University, Aichi, Japan, June 13, 2014. (Oral)
- (5) "Direct C–H Coupling through Nickel Catalysis"
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
4th Otsu Conference 2013
Otsu Prince Hotel, Shiga, Japan, October 23, 2013. (Oral)
- (4) "Ni-Catalyzed C–H/C–O Coupling of Azoles with Phenol Derivatives: Development, Mechanistic Studies, and Applications"
Kei Muto, Junichiro Yamaguchi, Aiwen Lei, and Kenichiro Itami
17th IUPAC International Symposium on Organometallic Chemistry Directed Towards Organic Synthesis
Lincoln Center, Colorado, USA, July 29, 2013. (Poster)
- (3) "Direct C–H Arylation of Heteroarenes by Nickel Catalyst"
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
3rd International Symposium on Molecular Activation
Sheraton Steamboat Resort, Colorado, USA, July 27, 2013. (Oral)
- (2) "Nickel-Catalyzed C–H Arylation of Azoles with Haloarenes"
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
The 10th Joint Seminar University of Münster
Nagoya University, Aichi, Japan, October 4, 2011. (Poster)
- (1) "Nickel-Catalyzed C–H/C–X Arylation of Heteroarenes"
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
The 4th Global COE in Chemistry Annual Symposium
Nagoya University, Aichi, Japan, June 15, 2011. (Poster)

Domestic

- (15) "Pd-catalyzed Dearomative C–C Bond Formation of Benzyl Alcohols"(ポスター)
武藤慶
第2回大津会議合同研究発表会・びわ湖大津プリンスホテル 9月11日

- (14) 「分子触媒による新奇分子連結反応の開発」 (口頭)
武藤慶
平成 29 年度育志賞研究発表会・大阪大学中之島センター 9 月 5 日
- (13) 「エステル切断を軸とする新規カップリング反応の開発」
武藤慶
第三回中分子戦略若手シンポジウム・京都 3 月 7 日
- (12) “Decarbonylative Suzuki–Miyaura Coupling by Nickel Catalysis”
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
The Chemical Society of Japan 2015, 95th Annual Meeting
Nihon University, Chiba, Japan, March 27, 2015. (Oral)
- (11) “Decarbonylative Cross-Coupling of Phenyl Esters and Arylboronic Acids with Ni Catalyst”
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
IGER Annual Meeting
Nagoya University, Aichi, Japan, December 18, 2014. (Poster)
- (10) “Nickel-Catalyzed C–H/C–O Biaryl Coupling: Catalyst Developments and Mechanistic Studies”
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
The Chemical Society of Japan 2014, 94th Annual Meeting
Nagoya University, Aichi, Japan, March 27, 2014. (Oral)
- (9) “Ni-Catalyzed C–H coupling of Heteroarenes: Development, Mechanism, and Applications”
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
IGER Annual Meeting
Nagoya University, Aichi, Japan, January 8, 2014. (Oral)
- (8) “Nickel-Catalyzed C–H Arylation of Heteroarenes”
Kei Muto, Kazuma Amaike, Junichiro Yamaguchi, and Kenichiro Itami
The 46th Meeting for Young Scientists in Organometallic Chemistry
Zao Royal Hotel, Miyagi, Japan, July 9, 2013. (Poster)
- (7) “Nickel-Catalyzed Direct C–H Arylation of Heteroarenes”
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
The Improvement of Prominent Graduate School Meeting for Young Scientists
Kyoto University, Kyoto, Japan, March 14, 2013. (Poster)
- (6) “Nickel-Catalyzed Direct Arylation of Heteroarenes”
Kei Muto, Kazuma Amaike, Junichiro Yamaguchi, and Kenichiro Itami
59th Symposium on Organometallic Chemistry
Osaka University, Osaka, Japan, September 14, 2012. (Poster)
- (5) “Nickel-Catalyzed Direct Arylation of Heteroarenes”
Kei Muto, Kazuma Amaike, Junichiro Yamaguchi, and Kenichiro Itami
The 29th Seminar on Synthetic Organic Chemistry
Convention Arts Center, Shizuoka, Japan, September 6, 2012. (Poster)
- (4) “Ni-Catalyzed C–H/C–O Coupling of Azoles and Phenol Derivatives”
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
The Chemical Society of Japan 2012, 92th Annual Meeting
Keio University, Kanagawa, Japan, March 28, 2012. (Oral)
- (3) “Ni-Catalyzed Direct C–H Arylation of Heteroarenes”
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
The 100th Symposium on Organic Synthesis
Waseda University, Tokyo, Japan, November 11, 2011. (Oral)
- (2) “Ni-Catalyzed Direct C–H Arylation of Heteroarenes”
Kei Muto, Junichiro Yamaguchi, and Kenichiro Itami
The 100th Symposium on Organic Synthesis
Waseda University, Tokyo, Japan, November 11, 2011. (Poster)
- (1) “Ni-Catalyzed C–H/C–X Coupling of Heteroarenes”
Kei Muto, Takuya Yamamoto, Masato Komiyama, Junichiro Yamaguchi, and Kenichiro Itami
The Chemical Society of Japan 2011, 91th Annual Meeting
Kanagawa University, Kanagawa, Japan, March 28, 2011. (Oral)

Lecture in charge 担当講義

2017 (@Waseda Univ)

1. 理工基礎実験 1A (春)
2. 理工基礎実験 2B (秋)
3. 有機化学実験 (秋)
4. 応用化学基礎演習 C(有機化学) (春)
5. 応用化学基礎演習 D(物理化学) (春)
6. 上級有機化学 A (春)
7. 機器分析演習 (秋)
8. 応用化学総論 (春)
9. Introduction to Industrial Chemistry (国際コース) (春)
10. Introduction to Applied Chemistry (国際コース) (秋)
11. ナノスケール科学ジョイントセミナー (春)
12. マテリアルデザイン科学ジョイントセミナー (春)

2016 (@Waseda Univ)

1. 理工基礎実験 1A (春)
2. 理工基礎実験 2B (秋)
3. 有機化学実験 (秋)
4. 応用化学基礎演習 C(有機化学) (春)
5. 応用化学基礎演習 D(物理化学) (春)
6. 上級有機化学 A (春)
7. 機器分析演習 (秋)
8. 応用化学総論 (春)
9. Introduction to Industrial Chemistry (春)
10. Introduction to Applied Chemistry (秋)