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Takashi Niwa, Ph.D.

Laboratory for Chemical Biology

RIKEN Center for Biosystems Dynamics Research (BDR)

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Appointment

Deputy Team Leader, Laboratory for Chemical Biology, RIKEN Center for Biosystems Dynamics Research (BDR), Kobe, Japan

Education

Mar. 2009 Ph.D. Department of Material Chemistry, Graduate School of Engineering, Kyoto University, Japan

Mar. 2006 M.S. Department of Chemistry, Graduate School of Science, The University of Tokyo, Japan

Mar. 2004 B.S. Department of Chemistry, Faculty of Science, The University of Tokyo, Japan

Recent Research Interests

Organic Chemistry: development of organic reactions and new synthetic methods mainly by utilizing unique properties of atoms, creation of molecular tools that promote life science researches and drug discovery, improvement of utility of positron emission tomography (PET) techniques by developing chemistries.

Experience

RIKEN Center for Biosystems Dynamics Research (BDR): Kobe, Japan

Apr. 2018–present Deputy Team Leader, Laboratory for Chemical Biology

PI: Dr. Takamitsu Hosoya (Team Leader, Professor of Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University)

RIKEN Center for Life Science Technologies (CLST): Kobe, Japan

Apr. 2016–Mar. 2018 Deputy Team Leader, Chemical Biology Team

Apr. 2013–Mar. 2016 Research Scientist, Chemical Biology Team

PI: Dr. Takamitsu Hosoya (Team Leader, Professor of Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University)

RIKEN Center for Molecular Imaging Science (CMIS): Kobe, Japan

Aug. 2012–Mar. 2013 Visiting Research Scientist, Molecular Probe Dynamics Laboratory

PI: Dr. Yasuyoshi Watanabe (Team Leader, Director of CMIS)

Waseda University: Tokyo, Japan

Apr. 2010–Mar. 2013 Assistant Professor of Department of Chemistry and Biochemistry

PI: Prof. Masahisa Nakada (Professor)

Harvard University: Cambridge, MA, USA

Apr. 2009–Mar. 2010 Post-Doctoral Fellow of Department of Chemistry and Chemical Biology

Adviser: Prof. Tobias Ritter (Assistant Professor)

Kyoto University: Kyoto, Japan

Apr. 2006–Mar. 2009 Ph.D. Candidate of Department of Material Chemistry

Adviser: Prof Koichiro Oshima (Professor)

Title of Ph.D. Thesis: Studies on Palladium-Catalyzed Benzylic Arylation

The University of Tokyo: Tokyo, Japan

Apr. 2004–Mar. 2006 Graduate Student in Master Course of Department of Chemistry

Apr. 2002–Mar. 2004 Undergraduate Student of Department of Chemistry

Adviser: Prof. Koichi Narasaka (Professor)

Apr. 2000–Mar. 2002 Undergraduate Student of College of Arts and Sciences (Science-I)

Awards and Fellowships

2018 The Chemical Society of Japan Award for Young Chemists for 2017

2017 Young Scientist's Research Award in Natural Product Chemistry

2016 RIKEN CLST Research Incentive Award in 2015

2016 RIKEN Research Incentive Award in 2015

2015 Best Poster Presentation Award in Workshop on Fluorine Chemistry for Young Researchers

2015 CSJ Presentation Award 2018

2013 Best Poster Award in the 4th Symposium on Chiral Science & Technology

2013 Ube Industries, Ltd. Award in Synthetic Organic Chemistry, japan

2009 Research Fellowship on Excellent Young Researcher Overseas Visit Program (JSPS)

2008 Research Fellowship for Young Scientist (JSPS, DC2 & PD)

2007 CSJ Student Presentation Award 2007

Award Lecture and Invited Lectures

2018 Asian International Symposium –Medicinal Chemistry– in the 98th CSJ Annual Meeting, Funabashi, Chiba, Japan

2018 Award Lecture for the CSJ Award for Young Chemists for 2017 in the 98th CSJ Annual Meeting, Funabashi, Chiba, Japan

2018 International Congress on Pure & Applied Chemistry (ICPAC) 2018, Siem Reap, Cambodia

2018 27th PET Chemistry Workshop 2018, Miura, Kanagawa, Japan

2018 Okayama University, Okayama, Japan

2018 JSPS 155th Committee for Fluorine Chemistry at Gunma University, Kiryu, Gunma, Japan

2017 Research Center of Asahi Glass Co., Ltd., Yokohama, japan

2017 Waseda University, Tokyo, Japan

2017 14th Sagami Fluorine Seminar at Sagami Chemical Research Center, Ayase, Kanagawa, Japan

2017 Hokkaido University, Sapporo, Japan

2017 February Seminar–New Trend on Organic Chemistry, Osaka, Japan

2017 Welcome to the PET and Psychoneuroendocrinology Symposium at Uppsala Biomedical Centre, Uppsala University, Uppsala, Sweden

2016 2016 (18th) Northeastern Asia Symposium “Molecular Imaging-based Precision Medicine”, Hangzhou, China

2016 1st Workshop for Young Organic Chemists at Kyoto University, Kyoto, Japan

2016 2016 (3rd) Hiroshima Symposium on Organic Chemistry of Next Generation at Hiroshima University, Hiroshima, Japan

2016 Kyoto University, Kyoto, Japan

2016 Osaka University, Osaka, Japan

2015 9th Science Café Takatsuki, Takatsuki, Osaka, Japan

2014 9th Symposium at National Institute for Radiological Sciences (NIRS), Chiba, Japan

2014 23th PET Chemistry Workshop 2014, Maiko, Hyogo, Japan

2014 3rd Meeting in FY2014 sponsored by Division of Heteroatom Chemistry in Kinka Chemical Society, Osaka, Japan

2013 5th FBT symposium at Waseda University, Tokyo, Japan

2013 The University of Tokyo, Tokyo, Japan

2012 Tokyo Medical and Dental University, Tokyo, Japan

Membership of Scientific Society

The Chemical Society of Japan, The Society of Synthetic Chemistry of Japan, Kinka Chemical Society (Division of Organometallic Chemistry), Japanese Society for Chemical Biology, Japanese Society for Molecular Imaging, The Pharmaceutical Society of Japan.

Publications

22. “Quantification of receptor activation by oxytocin and vasopressin in endocytosis-coupled bioluminescence reduction assay using nanKAZ” *Isao Kii, Shino Hirahara-Owada, Masataka Yamaguchi, Takashi Niwa, Yuka Koike, Rie Sonamoto, Harumi Ito, Kayo Takahashi, Chihiro Yokoyama, Takuya Hayashi, Takamitsu Hosoya, Yasuyoshi Watanabe, *Anal. Biochem.* **2018**, accepted, doi: 10.1016/j.ab.2018.04.001.

21. “Copper-Catalyzed Regioselective Monodefluoroborylation of Polyfluoroalkenes en Route to Diverse Fluoroalkenes” Hironobu Sakaguchi,[§] Yuta Uetake,[§] Masato Ohashi, *Takashi Niwa, *Sensuke Ogoshi, *Takamitsu Hosoya, *J. Am. Chem. Soc.* **2017**, *139*, 12855–12862. ([§]H.S. and Y.U. contributed equally)

20. “Facile Transformation of α,β-Unsaturated Carboxylic Acids to Alkenylboronic Esters via Rhodium-Catalyzed Decarboxylative Borylation of α,β-Unsaturated Thioesters” *Takashi Niwa, Hidenori Ochiai, Motoyuki Isoda, *Takamitsu Hosoya, *Chem. Lett.* **2017**, *46*, 1315–1318. [Selected as Editor’s Choice]

19. “Copper-Catalyzed *ipso*-Borylation of Fluoroarenes” *Takashi Niwa, Hidenori Ochiai, *Takamitsu Hosoya, *ACS Catal.* **2017**, *7*, 4535–4541. [Most Read Article in Jun.–Jul., 2017, highest ranking: 2nd at Jul. 3, 2017.]

18. “Rhodium-Catalyzed Decarbonylative Borylation of Aromatic Thioesters for Facile Diversification of Aromatic Carboxylic Acids” Hidenori Ochiai, Yuta Uetake, *Takashi Niwa, *Takamitsu Hosoya, *Angew. Chem., Int. Ed.* **2017**, *56*, 2482–2486. [Highlited in Synfact 2017, 13, 407.]

17. “Stereoinversion of Stereocongested Carbocyclic Alcohols via Triflylation and Subsequent Treatment of Aqueous *N*,*N*-Dimethylformamide” Hidenori Ochiai, Takashi Niwa, *Takamitsu Hosoya, *Org. Lett.* **2016**, *18*, 5982–5985.

16. “Rhodium-Catalyzed *ipso*-Borylation of Alkylthioarenes via C–S Bond Cleavage” Yuta Uetake, Takashi Niwa, *Takamitsu Hosoya, *Org. Lett.* **2016**, *18*, 2758–2761.

15. “Ni/Cu-Catalyzed Defluoroborylation of Fluoroarenes for Diverse C–F Bond Functionalizations” *Takashi Niwa, Hidenori Ochiai, Yasuyoshi Watanabe, *Takamitsu Hosoya, *J. Am. Chem. Soc.* **2015**, *137*, 14313–14318. [Most Read Article in Nov.–Dec., 2015, highest ranking: 6th at Dec. 2, 2105.]

14. “Highly enantioselective catalytic asymmetric Mukaiyama–Michael reactions of cyclic α-alkylidene β-oxo imides” Harufumi Oyama, Kohei Orimoto, Takashi Niwa, *Masahisa Nakada, *Tetrahedron Asymmetry* **2015**, *26*, 262–270.

13. “Synthesis and characterization of a new C2-symmetric chiral tridentate NHC-ligand-coordinated Cr(III) complex” Yuta Uetake, Takashi Niwa, *Masahisa Nakada, *Tetrahedron Asymmetry* **2015**, *26*, 158–162.

12. “Synthesis of cycloalkanone-fused cyclopropanes by Au(I)-catalyzed oxidative ene-yne cyclization” Yuta Uetake, Takashi Niwa, *Masahisa Nakada, *Tetrahedron Lett.* **2014**, *55*, 6847–6850.

11. “Preparations of Imides via the Palladium-Catalyzed Coupling Reaction of Organostannanes with Methyl N-[Methoxy(methylthio)methylene]carbamate” Kohei Orimoto, Takuhei Tomizawa, Yuki Namera, Harufumi Oyama, Takashi Niwa, *Masahisa Nakada, *Heterocycles* **2013**, *87*, 827–840.

10. “Catalytic Asymmetric [4+2] Cycloadditions and Hosomi–Sakurai Reactions of α-Alkylidene β-Keto Imides” Kohei Orimoto, Harufumi Oyama, Yuki Namera, Takashi Niwa, *Masahisa Nakada, *Org. Lett.* **2013**, *15*, 768–771.

9. “Preparation of Imides via the Palladium-Catalyzed Coupling Reaction of Organoborons with Methyl *N*-[Methoxy(methylthio)methylene]carbamate as a One-Carbon Elongation Reaction” Takuhei Tomizawa, Kohei Orimoto, Takashi Niwa, *Masahisa Nakada, *Org. Lett.* **2012**, *14*, 6294–6297.

8. “A Non-Heme Iron(III) Complex with Porphyrin-like Properties That Catalyzes Asymmetric Epoxidation” *Takashi Niwa, *Masahisa Nakada, *J. Am. Chem. Soc.* **2012**, *134*, 13538–13541. [Most Read Article in Aug., 2012. Highlighted in SYNFACTS 2012, 8, 1219.]

7. “Pd-Catalyzed reductive cleavage of alkyl aryl sulfides with triethylsilane that is accelerated by trialkylsilyl chloride” Takehiko Matsumura, Takashi Niwa, *Masahisa Nakada, *Tetrahedron Lett.* **2012**, *53*, 4313–4316.

6. “Palladium-Catalyzed (*N*-Oxido-2-pyridinyl)methyl Transfer from 2-(2-Hydroxyalkyl)pyridine *N*-Oxide to Aryl Halides by β-Carbon Elimination” Takafumi Suehiro, Takashi Niwa, *Hideki Yorimitsu, *Koichiro Oshima, *Chem. Asian J.* **2009**, *4*, 1217–1220.

5. “Carbon–Carbon Bond Formations at the Benzylic Positions of *N*-Benzylxanthone and *N*-Benzyldi-1-naphthyl Ketone Imine” Takashi Niwa, Takafumi Suehiro, *Hideki Yorimitsu, *Koichiro Oshima, *Tetrahedron* 2009, *65*, 5125–5131.

4. “Palladium-Catalyzed Benzylic Direct Arylation of Benzyl Sulfone” Takashi Niwa, *Hideki Yorimitsu, *Koichiro Oshima, *Tetrahedron* 2009, *65*, 1971–1976.

3. “Palladium-Catalyzed Benzylic Arylation of *N*-Benzylxanthone Imine” Takashi Niwa, *Hideki Yorimitsu, *Koichiro Oshima, *Org. Lett.* 2008, *10*, 4689–4691.

2. “Palladium-Catalyzed Direct Arylation of Aryl(azaaryl)methanes with Aryl Halides Providing Triarylmethanes” Takashi Niwa, *Hideki Yorimitsu, *Koichiro Oshima, *Org. Lett.* 2007, *9*, 2373–2375.

1. “Palladium-Catalyzed 2-Pyridylmethyl Transfer from 2-(2-Pyridyl)ethanol Derivatives to Organic Halides by Chelation-Assisted Cleavage of Unstrained sp^3C–sp^3C Bonds” Takashi Niwa, *Hideki Yorimitsu, *Koichiro Oshima, *Angew. Chem., Int. Ed.* 2007, *46*, 2643–2645.

Teaching Experience

Waseda University: Tokyo, Japan

Apr. 2010–Mar. 2013 Teacher in Laboratory Work in Organic Chemistry

Laboratory work in organic chemistry for approximately 70 students was conducted with two teachers and 4 teaching assistants. Lectures involving safety announcements and principle of chemistry was performed before the laboratory work.

Apr. 2010–Mar. 2013 Basic Chemistry (C)

Fundamental principle and recent social topics in chemistry, involving understanding atoms and molecules, basic thermodynamics, introduction of kinetics, chemical bondings, and basic organic chemistry. This class was conducted by lecture with approximately 140 students, and evaluated by exams.

Apr. 2010–Mar. 2013 Practice in Organic Chemistry

Practice to understand and present reaction mechanism of organic reactions learned in other classes for basic organic chemistry. This class was conducted by short lectures, daily exams and its explanation. Results of the exams were followed up by correction and adding comments. The number of students was approximately 70. Evaluation depends on a total result of the daily exams and a final exam.