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Professional Experience

- 2018-Present **Research Scientist**, Molecular Biophysics & Integrated Bioimaging Division, Lawrence Berkeley National Laboratory, Berkeley, USA
- 2015-2018 **Postdoctoral Researcher**, Molecular Biophysics & Integrated Bioimaging Division, Lawrence Berkeley National Laboratory, Berkeley, USA
- 2012-2015 **Project Researcher**, Precursory Research for Embryonic Science and Technology, Japan Science and Technology Agency, Japan
- 2009-2012 **Special Postdoctoral Researcher**, Live Cell Molecular Imaging Research Team, RIKEN Advanced Science Institute, Japan

Education

- Ph.D. Life Science, 2009: Hokkaido University, Sapporo, Hokkaido, Japan
- M.S. Environmental Ecology, 2006: Hokkaido University, Sapporo, Hokkaido, Japan
- B.S. Botany, 2003: Humboldt State University, Arcata, CA, USA

Publications

*Corresponding author(s)

24. Onoa B*, Fukuda S, **Iwai M**, Bustamante C, Niyogi KK* (2020) Atomic force microscopy visualizes mobility of photosynthetic proteins in grana thylakoid membranes. *Biophysical Journal* 118: 1-11. DOI:10.1016/j.bpj.2020.02.029
23. Arsenault EA, Yoneda Y, **Iwai M**, Niyogi KK, Fleming GR* (2020) Vibronic mixing enables ultrafast energy flow in light-harvesting complex II. *Nature Communications* 11: 1460. DOI:10.1038/s41467-020-14970-1
22. Perlaza K, Toutkoushian H, Boone M, Lam M, **Iwai M**, Jonikas MC, Walter P*, Ramundo S* (2019) The Mars1 kinase confers photoprotection through signaling in the chloroplast unfolded protein response. *eLife* 8: e49577. DOI:10.7554/eLife.49577
21. Roth MS*, Westcott D, **Iwai M**, Niyogi KK* (2019) Hexokinase is necessary for glucose-mediated photosynthesis repression and lipid accumulation in a green alga. *Communications Biology* 2: 347-357. DOI:10.1038/s42003-019-0577-1
20. Yokono M*, Takabayashi A, Kishimoto J, Fujita T, **Iwai M**, Murakami A, Akimoto S, Tanaka A (2019) The PSI-PSII megacomplex in green plants. *Plant & Cell Physiology* 60: 1098-1108. DOI:10.1093/pcp/pcz026

19. Park S, Steen C, Lyska D, Fischer AL, Endelman B, **Iwai M**, Niyogi KK, Fleming GR* (2019) Chlorophyll-carotenoid excitation energy transfer and charge transfer in *Nannochloropsis oceanica* for the regulation of photosynthesis. **Proceedings of the National Academy of Sciences of the United States of America** 116: 3385-3390. DOI:10.1073/pnas.1819011116
18. Roth MS*, Gallaher SD, Westcott DJ, **Iwai M**, Louie KB, Mueller M, Walter A, Foflonker F, Bowen BP, Ataii NN, Song J, Chen J-H, Blaby-Haas CE, Larabell C, Auer M, Northen TR, Merchant SS, Niyogi KK* (2019) Regulation of oxygenic photosynthesis during trophic transitions in the green alga *Chromochloris zofingiensis*. **The Plant Cell** 31: 579-601. DOI: 10.1105/tpc.18.00742
17. **Iwai M**†*, Grob P†, Iavarone AT, Nogales E, Niyogi KK* (2018) A unique supramolecular organization of photosystem I in the moss *Physcomitrella patens*. **Nature Plants** 4: 904-909. †Authors contributed equally. DOI:10.1038/s41477-018-0271-1
16. Park S, Fischer AL, Steen C, **Iwai M**, Morris JM, Walla PJ, Niyogi KK, Fleming GR* (2018) Chlorophyll-carotenoid excitation energy transfer in high-light-acclimating thylakoid membranes investigated by snapshot transient absorption spectroscopy. **Journal of the American Chemical Society** 140, 11965-11973. DOI:10.1021/jacs.8b04844
15. **Iwai M***, Roth MS, Niyogi KK* (2018) Subdiffraction-resolution live-cell imaging for visualizing thylakoid dynamics. **The Plant Journal** 96, 233-243. DOI:10.1111/tpj.14021.
14. **Iwai M***, Yokono M (2017) Light-harvesting antenna complexes in the moss *Physcomitrella patens*: implications for the evolutionary transition from green algae to land plants. **Current Opinion in Plant Biology** 37, 94-101. DOI:10.1016/j.pbi.2017.04.002
13. Kromdijk J, Glowacka K, Leonelli L, Gabilly S, **Iwai M**, Niyogi KK*, Long SP* (2016) Improving photosynthesis and crop productivity by accelerating recovery from photoprotection. **Science** 354, 857-861. DOI:10.1126/science.aai8878
12. **Iwai M***, Yokono M, Kurokawa K, Ichihara A, Nakano A (2016) Live-cell visualization of excitation energy dynamics in chloroplast thylakoid structures. **Scientific Reports** 6, 29940. DOI:10.1038/srep29940
11. **Iwai M***, Yokono M, Nakano A (2015) Toward understanding the multiple spatiotemporal dynamics of chlorophyll fluorescence. **Plant Signaling & Behavior** 10:6, e1022014. DOI:10.1080/15592324.2015.1022014
10. **Iwai M***, Yokono M, Kono M, Noguchi K, Akimoto S, Nakano A (2015) Light-harvesting complex Lhcb9 confers a green alga-type photosystem I supercomplex to the moss *Physcomitrella patens*. **Nature Plants** 1, 34-40. DOI:10.1038/nplants.2014.8
9. **Iwai M***, Yokono M, Nakano A (2014) Visualizing structural dynamics of thylakoid membranes. **Scientific Reports** 4, 3768. DOI:10.1038/srep03768
8. **Iwai M***, Pack C-G, Takenaka Y, Sako Y, Nakano A (2013) Photosystem II antenna phosphorylation-dependent protein diffusion determined by fluorescence correlation spectroscopy. **Scientific Reports** 3, 2833. DOI:10.1038/srep02833
7. **Iwai M**†, Takizawa K†, Tokutsu R, Okamuro A, Takahashi Y, Minagawa J* (2010) Isolation of the elusive supercomplex that drives cyclic electron flow in photosynthesis. **Nature** 464: 1210-1213. †Authors contributed equally. DOI:10.1038/nature08885
6. **Iwai M**, Yokono M, Inada N, Minagawa J* (2010) Live-cell imaging of photosystem II antenna dissociation during state transitions. **Proceedings of the National Academy of Sciences of the United States of America** 107: 2337-2342. DOI:10.1073/pnas.0908808107
5. Swingley WD, **Iwai M**, Chen Y, Ozawa S, Takizawa K, Takahashi Y, Minagawa, J* (2010) Characterization of photosystem I antenna proteins in the prasinophyte *Ostreococcus tauri*. **Biochimica et Biophysica Acta** 1797: 1458-1464. DOI:10.1016/j.bbabi.2010.04.017

4. Tokutsu R, **Iwai M**, Minagawa J* (2009) CP29, a monomeric light-harvesting complex II protein, is essential for state transitions in *Chlamydomonas reinhardtii*. **The Journal of Biological Chemistry** 284: 7777–7782. DOI:10.1074/jbc.m809360200
3. **Iwai M**, Takahashi Y, Minagawa J* (2008) Molecular remodeling of photosystem II during state transitions in *Chlamydomonas reinhardtii*. **The Plant Cell** 20: 2177–2189. DOI:10.1105/tpc.108.059352
2. **Iwai M**, Kato N, Minagawa J* (2007) Distinct physiological responses to a high light and low CO₂ environment revealed by fluorescence quenching in phototrophically grown *Chlamydomonas reinhardtii*. **Photosynthesis Research** 94: 307–314. DOI:10.1007/s11120-007-9220-y
1. Takahashi H†, **Iwai M**†, Takahashi Y, Minagawa J* (2006) Identification of the mobile light-harvesting complex II polypeptides for state transitions in *Chlamydomonas reinhardtii*. **Proceedings of the National Academy of Sciences of the United States of America** 103: 477–482. †Authors contributed equally. DOI:10.1073/pnas.0509952103

Fellowships & Awards

2019	Talk Award - 28th Western Photosynthesis Conference 2019: The role of Lhcb9 in the unique photosystem I supercomplex formation in the moss <i>Physcomitrella patens</i>
2014-2015	Grant-in-Aid for Challenging Exploratory Research - Japan Society for the Promotion of Science: Development of proteoliposome reconstitution imaging of thylakoid membrane proteins
2012-2015	Precursory Research for Embryonic Science and Technology - Japan Science and Technology Agency: Study of plant photoadaptation mechanisms by using live cell imaging techniques
2011-2013	Grant-in-Aid for Young Scientists (A) - Japan Society for the Promotion of Science: Investigation of light energy redistribution mechanisms under stress environments in the moss <i>Physcomitrella patens</i>
2011	Individual Collaborative Research Projects - National Institute of Basic Biology: Spectroscopy analysis of photoacclimation mechanisms in <i>Physcomitrella patens</i>
2010	Grant-in-Aid for Young Scientists (B) - Japan Society for the Promotion of Science: Visualization of photosynthetic protein complex network during photoacclimation mechanisms (Withdrawn)
2010	Individual Collaborative Research Grant - Institute of Low Temperature Science, Hokkaido University: The study of photosynthetic activities of giant chloroplasts in <i>Physcomitrella patens</i>
2010	Collaboration Seed Fund - RIKEN: Nano-scale analysis of chloroplast thylakoid membranes using atomic force microscopy
2009-2010	Grant-in-Aid for Young Scientists (Start-up) - Japan Society for the Promotion of Science: Development of live-cell imaging for photosystem proteins by using the <i>Physcomitrella patens</i> giant chloroplasts
2009-2011	Grant for Special Postdoctoral Researchers - RIKEN: Visualization of thylakoid membrane dynamics during photoacclimation
2006-2009	Grant-in-Aid for JSPS Fellows (DC1) - Japan Society for the Promotion of Science: Investigation of photoacclimation mechanisms of light-harvesting complex proteins using the green alga <i>Chlamydomonas reinhardtii</i>
2005-2006	Nara Institute of Science and Technology "Plant Science Education Project" - The Ministry of Education, Culture, Sports, Science and Technology: Proteomics and visualization of photosynthetic proteins during state transitions
2004	Institute of Low Temperature Science, Hokkaido University: Director Leadership Fund (by Prof. Takeo Hondoh) - Travel award for The 13th International Conference on Photosynthesis, Montreal, Canada

Professional Presentations

- 2020** 29th Western Photosynthesis Conference, Bodega Bay, CA, USA (Talk)
- 2019** 28th Western Photosynthesis Conference, Friday Harbor, WA, USA (Talk & Poster)
- 2018** Molecular Biophysics & Integrated Bioimaging Division Annual Meeting, Berkeley, CA, USA (Invited Talk)
- 2016** Bioenergetics Seminar, Berkeley, CA, USA (Talk)
- 2016** The 13th Annual Advanced Imaging Methods Workshop, Berkeley, CA, USA (Poster)
- 2015** Plant & Microbial Biology Department Student & Postdoc Seminar, Berkeley, CA, USA (Talk)
- 2015** The 56th Annual Meeting of Japan Society of Plant Physiologists, Tokyo, Japan (Talk)
- 2015** The 17th Plant Organelle Workshop, Tokyo, Japan (Invited Talk)
- 2015** Precursory Research for Embryonic Science and Technology Project Research Seminar, Tokyo, Japan (Talk)
- 2015** RIKEN 4D Symposium, Saitama, Japan (Poster)
- 2014** Core Research for Evolutionary Science and Technology/Precursory Research for Embryonic Science and Technology Joint Project Meeting, Tokyo, Japan (Talk)
- 2014** RIKEN Symposium for Advanced Photonics, Saitama, Japan (Poster)
- 2014** The 40th Annual Meeting of the Japan Society for Laser Microscopy, Saitama, Japan (Talk)
- 2014** Precursory Research for Embryonic Science and Technology Project Meeting, Shizuoka, Japan (Talk)
- 2014** RIKEN Symposium for Advanced Photonics, Saitama, Japan (Poster)
- 2014** Japan Society for the Promotion of Science Project Seminar (Invited Talk)
- 2013** Core Research for Evolutionary Science and Technology/Precursory Research for Embryonic Science and Technology Joint Project Meeting, Tokyo, Japan (Talk)
- 2013** RIKEN Symposium for Advanced Photonics, Saitama, Japan (Poster)
- 2013** Precursory Research for Embryonic Science and Technology Project Meeting, Kyoto, Japan (Talk)
- 2013** The 4th Annual Symposium of The Japanese Society of Photosynthesis Research, Nagoya, Japan (Invited Talk)
- 2013** The 54th Annual Meeting of Japan Society of Plant Physiologists, Okayama, Japan (Talk)
- 2013** RIKEN Kibo Symposium, Saitama, Japan (Invited Talk)
- 2012** RIKEN Extreme Photonics Research Symposium, Saitama, Japan (Poster)
- 2012** Precursory Research for Embryonic Science and Technology Project Meeting, Tokyo, Japan (Talk)
- 2012** RIKEN Symposium, Saitama, Japan (Invited Talk)
- 2012** Okayama University International Symposium, Okayama, Japan (Poster)
- 2012** The 50th Annual Meeting of the Biophysical Society of Japan, Nagoya, Japan (Poster)
- 2012** Japanese-Finnish Photosynthesis Research Conference, Turku, Finland (Invited Talk)
- 2012** Core Research for Evolutionary Science and Technology/Precursory Research for Embryonic Science and Technology Joint Project Meeting, Hokkaido, Japan (Invited Talk)
- 2012** Precursory Research for Embryonic Science and Technology Project Meeting, Shizuoka, Japan (Talk)
- 2012** Gordon Research Conference, Davidson, NC, USA (Poster)
- 2012** The 15th Annual Moss International Conference, The Bronx, NY, USA (Poster)
- 2012** The 53rd Annual Meeting of Japan Society of Plant Physiologists, Kyoto, Japan (Talk)
- 2012** Kyoto University Research Seminar, Kyoto, Japan (Invited Talk)
- 2012** Precursory Research for Embryonic Science and Technology Kick-Off Meeting, Kyoto, Japan (Talk)
- 2011** The 8th Chlamydomonas Workshop, Tokyo, Japan (Talk)
- 2011** The 24th Japanese Association of Plant Lipid Researchers Annual Symposium, Tokyo, Japan (Poster)
- 2011** RIKEN Extreme Photonics Research Seminar, Saitama, Japan (Poster)
- 2011** The 52nd Annual Meeting of Japan Society of Plant Physiologists, Sendai, Japan (Talk)
- 2011** Institute for Protein Research Seminar, Osaka, Japan (Poster)

- 2010** RIKEN Extreme Photonics Research Seminar, Saitama, Japan (Poster)
- 2010** Tokyo University Research Seminar, Tokyo, Japan (Invited Talk)
- 2010** The 51st Annual Meeting of Japan Society of Plant Physiologists, Kumamoto, Japan (Talk)
- 2010** RIKEN Advanced Science Institute-Yokohama Joint Research Forum, Yokohama, Japan (Poster)
- 2009** RIKEN Advanced Science Institute- BioResource Research Center Joint Research Forum, Saitama, Japan (Poster)
- 2009** RIKEN Extreme Photonics Research Seminar, Saitama, Japan (Poster)
- 2009** RIKEN Seminar, Saitama, Japan (Talk)
- 2009** Nara Institute of Science and Technology Symposium, Nara, Japan (Invited Talk)
- 2009** The 50th Annual Meeting of Japan Society of Plant Physiologists, Nagoya, Japan (Talk)
- 2008** Nara Institute of Science and Technology Symposium, Nara, Japan (Invited Talk)
- 2008** The 49th Annual Meeting of Japan Society of Plant Physiologists, Sapporo, Japan (Talk)
- 2007** The Hokkaido Branch meeting for Botanical Society of Japan, Sapporo, Japan (Invited Talk)
- 2007** Satellite Meeting of the 14th International Congress on Photosynthesis "State Transitions", London, UK (Invited Talk)
- 2007** The 14th International Congress on Photosynthesis, Glasgow, Scotland (Poster)
- 2007** Nara Institute of Science and Technology Workshop, Nara, Japan (Talk)
- 2006** Japanese-Finnish Seminar, Nara, Japan (Talk & Poster)
- 2006** The 47th Annual Meeting of Japan Society of Plant Physiologists, Tsukuba, Japan (Talk)
- 2006** Nara Institute of Science and Technology Workshop, Nara, Japan (Talk)
- 2005** The 5th Chlamydomonas Workshop, Tsukuba, Japan (Talk)
- 2005** The 46th Annual Meeting of Japan Society of Plant Physiologists, Niigata, Japan (Talk)
- 2004** The 13th International Congress on Photosynthesis Research, Montreal, Canada (Poster)

Peer Review Services

Algal Research, Biochimica et Biophysica Acta, Botany Letters, Current Opinion in Plant Biology, Environmental and Experimental Botany, French National Research Agency, Journal of Visualized Experiments, Langmuir, Nature Plants, Photochemical & Photobiological Sciences, Planta, The Plant Cell, Plant Cell Physiology, Plant Methods, Plant Physiology, Plant Production Science, Proceedings of the National Academy of Sciences of the USA, Scientific Reports

Outreach

- 2020 Online Science & Career Talk at NIC International College in Japan, Tokyo, Japan
- 2019-Present Science Supervisor, Hanazono Junior/High School, Kyoto, Japan
- 2017 Career Talk at Diablo Valley College, Pleasant Hill, CA, USA
- 2016 Invited Lecture, Sonoma State University, CA, USA
- 2014 Science Seminar at Seishin High School and Junior High School, Ibaraki, Japan
- 2012 'Aesthetic' Panel Science Exhibition 2012, Tokyo, Japan
- 2011 A column in In-Cube (Leave a Nest), No. 14, June 2011
- 2011 A column in The Business & Technology Daily News (Feb. 1st, 2011)
- 2010-2014 Biannual Science Talk at NIC International College in Japan, Tokyo, Japan (every Fall and Spring semester during the 5-year period)
- 2010 Invited Science Presentation Contest in Science Agora 2010 at National Museum of Emerging Science and Innovation, Tokyo, Japan
- 2010 Editing Adviser, White Paper on Science and Technology for Children 2010, JST.
- 2010 A column in RIKEN News, Sept. 2010
- 2010 Science Talk at National Museum of Emerging Science and Innovation, Tokyo, Japan
- 2009 Science Presentation Contest in Science Agora 2009 at National Museum of Emerging Science and Innovation, Tokyo, Japan (The 1st place winner)

Mentorship

Kylie Ren, Undergraduate Researcher, UC Berkeley (2020-Present)
Maddy Chapman, Undergraduate Researcher, UC Berkeley (2020-Present)
Victoria Kim, Undergraduate Researcher, UC Berkeley (2019-Present)
Valerie Lam, Undergraduate Researcher, Lab Technician, UC Berkeley (2019-Present)
Christine Pagotan, Undergraduate Researcher, UC Berkeley (2019-2020)
Veronica Wong, Undergraduate Researcher, UC Berkeley (2019-Present)
Kumiko Yanagihara, Undergraduate Researcher, UC Berkeley (2018-2019)
Mimi Broderson, Lab Technician, UC Berkeley (2017-2020)
Arnold Chan, Undergraduate Researcher, UC Berkeley (2017-2018)
Winnie Wong, Lab Technician, UC Berkeley (2015-2016)
Hiroe Watanabe, Lab Technician, RIKEN (2012-2015)
Kaoru Kotoshiba, Lab Technician, RIKEN (2012-2015)