Alexander Tomoaki Taguchi

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Education

University of California at San Diego (2006-2010)
Undergraduate Degrees:

Biophysics (*Bachelor of Science*)

Japanese Studies (*Bachelor of Arts*)

University of Illinois Urbana-Champaign (2010-2014)
Graduate Student, Biophysics Department

Dissertation: *Pulsed EPR Investigation of the Quinone Sites in Reaction Centers from Rhodobacter Sphaeroides by Spectral Simulations*

Advisor: Professor Colin A. Wraight

Awards

Travel grant for 17th International Conference on Biological Inorganic Chemistry (2015)
Postdoctoral Fellowship from the Japan Society for the Promotion of Science (2014-2016)
NIH funded Molecular Biophysics Training Grant (2010-2013)
Travel grant for 6th Advanced EPR School at the Weizmann Institute in Israel (2013)
Invited to author 6th EFEPR conference summary in *EPR Newsletter* (2013, see publications)
Elected chairman of the student-run Molecular Biophysics Training Grant Symposium (2012)

Teaching Experience

High school outreach JSPS Science Dialogue lecture (2015, Kamaishi High school, Japan)
TA for two biochemistry laboratory courses (2015, Nippon Medical School, Japan)
TA for physical biochemistry course (2014, University of Illinois Urbana-Champaign)
TA for physical chemistry course (2013, University of Illinois Urbana-Champaign)
Illinois Researchers in Partnership with K-12 Science Educators Outreach Program (2011)
TA for three physics laboratory courses (2009-2010, University of California at San Diego)

Referee Contact Information

Sergei Dikanov (Ph.D.): dikanov@illinois.edu, Tel: 1-(217)300-2209
Toshio Iwasaki (Ph.D., current advisor): tiwasaki@nms.ac.jp, Fax: +81-(0)3-5685-3054

Publications

1. Sun, C., **Taguchi, A. T.**, Beal, N., O'Malley, P. J., Dikanov, S. A., and Wraight, C. A. Regulation of the Primary Quinone Binding Conformation by the H Subunit in Reaction Centers from *Rhodobacter sphaeroides*. ***J. Phys. Chem. Lett.*, Vol. 6,** No. 22, pp. 4541-4546, October, 2015.
2. Yi, S., **Taguchi, A. T.**, Samoilova, R. I., O'Malley, P. J., Gennis, R. B., and Dikanov, S. A. Plasticity in the High Affinity Menaquinone Binding Site of the Cytochrome aa_3-600 Menaquinol Oxidase from *Bacillus subtilis*. ***Biochemistry*, Vol. 54,** No. 32, pp. 5030-5044, July, 2015.
3. **Taguchi, A. T.**, O'Malley, P. J., Wraight, C. A., and Dikanov, S. A. Hydrogen Bond Network around the Semiquinone of the Secondary Quinone Acceptor Q_B in Bacterial Photosynthetic Reaction Centers. ***J. Phys. Chem. B*, Vol. 119,** No. 18, pp. 5805-5814, April, 2015.
4. Vermaas, J. V., **Taguchi, A. T.**, Dikanov, S. A., Wraight, C. A., and Tajkhorshid, E. Redox Potential Tuning through Differential Quinone Binding in the Photosynthetic Reaction Center of *Rhodobacter sphaeroides*. ***Biochemistry*, Vol. 54,** No. 12, pp. 2104-2116, March, 2015.
5. Hong, S., De Almeida, W., **Taguchi, A. T.**, Samoilova, R. I., Gennis, R. B., O'Malley P. J., Dikanov, S. A., and Crofts, A. R. The Semiquinone at the Q_i Site of the bc_1 Complex Explored Using HYSCORE Spectroscopy and Specific Isotopic Labeling of Ubiquinone in *Rhodobacter sphaeroides* via ^{13}C Methionine and Construction of a Methionine Auxotroph. ***Biochemistry*, Vol. 53,** No. 38, pp. 6022-6031, September, 2014.
6. Samoilova, R. I., **Taguchi, A. T.**, O'Malley P. J., Dikanov, S. A., and Lugtenburg, J. Hyperfine Interaction Tensors of ^{13}C Nuclei for Ring Carbons of Ubisemiquinone-10 Hydrogen Bonded in Alcohol Solvents. ***Appl. Magn. Reson.*, Vol. 45,** No. 9, pp. 941-953, September, 2014.
7. **Taguchi, A. T.**, O'Malley, P. J., Wraight, C. A., and Dikanov, S. A. Hyperfine and Nuclear Quadrupole Tensors of Nitrogen Donors in the Q_A Site of Bacterial Reaction Centers: Correlation of the Histidine N_δ Tensors with Hydrogen Bond Strength. ***J. Phys. Chem. B*, Vol. 118,** No. 31, pp. 9225-9237, July, 2014.
8. De Almeida, W., **Taguchi, A. T.**, Dikanov, S. A., Wraight, C. A., and O'Malley, P. J. The 2-Methoxy Group Orientation Regulates the Redox Potential Difference between the Primary (Q_A) and Secondary (Q_B) Quinones of Type II Bacterial Photosynthetic Reaction Centers. ***J. Phys. Chem. Lett.*, Vol. 5,** No. 15, pp. 2506-2509, June, 2014. (5 minute LiveSlides presentation narrated by **Taguchi, A. T.** available at http://pubs.acs.org/iapps/liveslides/pages/index.htm?mscNo=jz500967d)
9. **Taguchi, A. T.**, O'Malley, P. J., Wraight, C. A., and Dikanov, S. A. Nuclear hyperfine and quadrupole tensor characterization of the nitrogen hydrogen bond donors to the semiquinone of the Q_B site in bacterial reaction centers: A combined X- and S-band ^{14,15}N ESEEM and DFT study. ***J. Phys. Chem. B*, Vol. 118,** No. 6, pp. 1501-1509, February, 2014.
10. **Taguchi, A. T.**, Mattis, A. J., O'Malley, P. J., Dikanov, S. A., and Wraight, C. A. Tuning Cofactor Redox Potentials: The 2-Methoxy Dihedral Angle Generates a Redox Potential Difference of >160 mV between the Primary (Q_A) and Secondary (Q_B) Quinones of the Bacterial Photosynthetic Reaction Center. ***Biochemistry*, Vol. 52,** No. 41, pp. 7164-7166, September, 2013.
11. **Taguchi, A. T.**, O'Malley, P. J., Wraight, C. A., and Dikanov, S. A. Conformational Differences between the Methoxy Groups of Q_A and Q_B Site Ubisemiquinones in Bacterial Reaction Centers: A Key Role for Methoxy Group Orientation in Modulating Ubiquinone Redox Potential. ***Biochemistry*, Vol. 52,** No. 27, pp. 4648-4655, June, 2013.

Submitted Manuscripts

Oral Presentations

1. 17th International Conference on Biological Inorganic Chemistry (ICBIC 17) at Beijing, China (July, 2015), Talk title: *Mapping the Electron Spin Distribution in [2Fe-2S] Proteins by $^{13}C_{\beta}$ Cysteine Labeling: Implications in Electron Transport Pathways*
2. 10th Illinois Biophysical Society Symposium at the University of Illinois at Urbana-Champaign (April, 2014), Talk title: *Structural Determination of Q_B^- by high frequency pulsed EPR*
3. Molecular Biophysics Training Grant Symposium at the University of Illinois at Urbana-Champaign (November, 2013), Talk title: *Pulsed EPR Investigation of the ^{13}C couplings in Q_A and Q_B*
4. Photosynthesis Congress Symposium at St. Louis, Missouri (August, 2013), Talk title: *Q_A and Q_B Methoxy Dihedral Angles determined by pulsed EPR*

Poster Abstracts and Other Publications

1. **Taguchi, A.** Investigation of the Quinone Sites in Reaction Centers from *Rhodobacter Sphaeroides* by Pulsed EPR and Spectral Simulations. Thesis. University of Illinois at Urbana-Champaign, 2014. Ann Arbor: ProQuest LLC, 2015. (*dissertation*)
2. **Taguchi, A.**, Nick, T., Doll, A., and Smith, G. Impressions from the 6th EF-EPR School in Rehovot. ***EPR Newsletter,* Vol. 22,** No. 4, pp. 17–19, 2013. (*invited article, non-refereed*)
3. **Taguchi, A. T.**, Mattis, A. J., O'Malley, P. J., Dikanov, S. A., and Wraight, C. A. Methoxy dihedral angles of Ubiquinone contribute more than 160 mV to the redox potential difference between the primary (Q_A) and secondary (Q_B) quinones of the photosynthetic reaction center. ***Biophysical Journal,* Vol. 106,** No. 2, pp. 370a, San Francisco, USA, January, 2014. (*conference abstract*)
4. Matsushita, S., Fukazawa, R., Iwasaki, T., **Taguchi, A. T.**, Baldansuren, A., Dikanov, S. A. 2D pulsed EPR analysis of histidine ligand residue(s) of the thermophile Rieske and mitoNEET type iron-sulfur proteins. ***16th International Conference on Biological Inorganic Chemistry (ICBIC 16),*** #1714640, Mz76, Grenoble, France, July, 2013. (*conference abstract*)
5. **Taguchi, A. T.**, Kokhan, O., and Wraight, C. A. Pyrazole Cytochrome C Complexes. ***Biophysical Journal,* Vol. 102,** No. 3, pp. 466a–467a, San Diego, USA, January, 2012. (*conference abstract*)