

Po-Lin Chiu, Ph.D.

School of Molecular Sciences | Biodesign Center for Applied Structural Discovery
Arizona State University
PO Box 871604
Tempe, AZ 85287
480 727 2058 | plchiu@asu.edu
<http://plchiulab.github.io/>

SCIENTIFIC INTERESTS

Membrane proteins, lipid-protein interaction, structural biophysics, electron imaging, electron diffraction, image processing, and electron microscopy.

EDUCATION

- Ph.D. Biophysics* 10/2004 – 07/2009
Biophysics Graduate Group, University of California, Davis, CA
Advisor: Dr. Henning Stahlberg
Dissertation title: *Structural studies of a prokaryotic potassium channel, MloK1, by transmission electron microscopy*
- M.S. Electrical Engineering* 09/1999 – 06/2001
Institute of Electrical Engineering, National Taiwan University, Taipei, Taiwan
Advisor: Dr. Jen-Ho Tsao
Thesis title: *Drug delivery through liposome using ultrasonic imaging and cavitation*
- B.S. Pharmacy* 09/1995 – 06/1999
School of Pharmacy, National Taiwan University, Taipei, Taiwan
Intern at the National Taiwan University Hospital, Taipei, Taiwan

APPOINTMENTS

- Assistant Professor* 08/2016 – present
School of Molecular Sciences, Arizona State University, Tempe, AZ
- Postdoctoral Fellow* 09/2010 – 07/2016
Department of Cell Biology, Harvard Medical School, Boston, MA
- Postdoctoral Researcher* 08/2009 – 08/2010
Section of Molecular and Cellular Biology, University of California, Davis, CA

FELLOWSHIPS AND AWARDS

- NVIDIA's GPU Grant Program, 2016
Taiwan National Science Foundation Scholarship, 1999-2001

Certified by National Qualification Examination for Medical Professionals, 1999
Taiwan Nan-Ya Incorporation Scholarship, 1995-1999

PUBLICATIONS

*List of publications after arriving to ASU (peer-reviewed) (**corresponding author)*

- Truong, C.D.**, Williams, D., Zhu, M., Wang, J.C.-H. and ****Chiu, P.-L.** Sample preparation using lipid monolayer for electron crystallographic studies. *J Vis Exp* (2021). (accepted)
- Baker, A.T., Boyd, R.J., Sarkar, D., Vant, J., **Truong, C.D.**, Crespo, A.T., Bates, E., Wilson, E., Chan, C.K., Lipka-Lloyd, M., Williams, D., Rizkallah, P.J., Nagalo, M.B., **Chiu, P.-L.**, Coughlan, L., Parker, A.L., Singharoy, A., and Borad, M.J. ChAdOx1 interacts with CAR and PF4 with implications for thrombosis with thrombocytopenia syndrome. *Sci Adv* (2021). (accepted)
- Zhang, X., Gui, L., Li, S., **Nandi, P.**, Columbres, R.C., Wong, D.E., Moen, D.R., Lin, H.J., ****Chiu, P.-L.**, and ****Chou, T.-F.** Conserved L464 in p97 D1-D2 linker is critical for p97 cofactor regulated ATPase activity. *Biochem J* **478**, 3185-3204 (2021). (doi: 10.1042/BCJ20210288) (**equal contributions)
- Nandi, P.**, Li, S., Columbres, R.C.A., Wang, F., Williams, D.R., **Poh, Y.-P.**, ****Chou, T.-F.**, and ****Chiu, P.-L.** Structural and functional analysis of disease-linked p97 ATPase mutant complexes. *Int J Mole Sci* **22**, 8079 (2021). (doi: 10.3390/ijms22158079) (**equal contributions)
- Truong, C.D.**, Craig, T.A., Cui, G., Botuyan, M.V., Serkasevich, R.A., **Chan, K.-Y.**, ****Mer, G.**, ****Chiu, P.-L.**, and ****Kumar, R.** Cryo-EM reveals conformational flexibility in apo DNA polymerase ζ . *J Biol Chem* **297**, 100912 (2021). (doi: 10.1016/j.jbc.2021.100912) (**equal contributions)
- March, K., Venkatraman, K., **Truong, C.D.**, Williams, D., **Chiu, P.-L.**, and Rez, P. Protein secondary structure signatures from energy loss spectra recorded in the electron microscopy. *J Microsc* **282**, 215-223 (2021).
- Godeshala, S., Miryala, B., Dutta, S., Christensen, M.D., **Nandi, P.**, **Chiu, P.-L.**, and Rege, K. A library of aminoglycoside-derived lipopolymer nanoparticles for delivery of small molecules and nucleic acids. *J Materials Chem B* **8**, 8558-8572 (2020).
- Yang, J.-H.**, Williams, D., Kandiah, E., ****Fromme, P.**, and ****Chiu, P.-L.** Structural basis of redox modulation on chloroplast ATP synthase. *Commun Biol* **3**, 482 (2020). (**equal contributions)
- Chang, S.L.Y., Reineck, P., Williams, D., Bryant, G., Opletal, G., El-Demrashed, S.A., **Chiu, P.-L.**, Ōsawa, E., Barnard, A.S., and Dwyer, C. Dynamic self-assembly of detonation nanodiamond in water. *Nanoscale* **12**, 5363-5367 (2020).
- Robertson, K.E., Craciunescu, F.M., **Truong, C.**, **Chiu, P.-L.**, Fromme, P., and Hansen, D.T. Membrane directed expression in *Escherichia coli* of virulence factors from the Lyme disease agent *Borrelia burgdorferi*. *Sci Rep* **9**, 1-15 (2019).
- Steber, H.S., Gallante, C., **Chiu, P.-L.**, and Mangone, M. The *C. elegans* 3'UTRome V2: an

updated genomic resource to study 3'UTR biology. *Genome Res* **29**, 2104-2116 (2019).
 Toporik, H., Li, J., Williams, D., **Chiu, P.-L.**, and Mazor, Y. The structure of the photosystem I IsiA super-complex. *Nat Struct Mole Biol* **26**, 443-449 (2019).

List of publications before ASU

- Aryal, R.P., Kwak, P.B., Tamayo, A.G., **Chiu, P.-L.**, Walz, T., and Weitz, C.J. Macromolecular assemblies of the mammalian circadian clock. *Mol Cell* **67**, 770-782 (2017).
- *Kalbermatter, D., ***Chiu, P.-L.**, Jeckelmann, J.-M., Ucurum, Z., Walz, T., and Fotiadis, D. Electron crystallography reveals that substrate release from the PTS IIC glucose transporter is coupled to a subtle conformational change. *J Struct Biol* **199**, 39-45 (2017). (*equal contributions)
- Leksa, N.C., **Chiu, P.-L.**, Bou-Assaf, G.M., Quan, C., Liu, Z., Goodman, A.B., Chambers, M.G., Tsutakawa, S.E., Hammel, M., Peters, R.T., Walz, T., and Kulman, J.D. The structural basis for the functional comparability of factor VIII and the long-acting variant rFVIIIc. *J Thromb Haemost* **15**, 1167-1179 (2017).
- Klara, S.S., Saboe, P.O., Sines, I.T., Babaei, M., **Chiu, P.-L.**, DeZorzi, R., Dayal, K., Walz, T., Kumar, M., and Mauter, M.S. Magnetically directed two-dimensional crystallization of OmpF membrane proteins in block copolymers. *J Am Chem Soc* **138**, 28-31 (2016).
- Chiu, P.-L.**, Li, X., Li, Z., Beckett, B., Brilot, A.F., Grigorieff, N., Agard, D.A., Cheng, Y., and Walz, T. Evaluation of super-resolution performance of the K2 electron counting camera using 2D crystals of aquaporin-0. *J Struct Biol* **192**, 163-173 (2015).
- Kalbermatter, D., Jeckelmann, J.-M., **Chiu, P.-L.**, Ucurum, Z., Walz, T., and Fotiadis, D. 2D and 3D crystallization of the wild-type IIC domain of the glucose PTS transporter from *Escherichia coli*. *J Struct Biol* **191**, 376-380 (2015).
- ***Chiu, P.-L.**, *Bou-Assaf, G., Chhabra, E.S., Chambers, M.G., Liu, L., Peters, R., Kulman, J.D., and Walz, T. Mapping the interaction between factor VIII and von Willebrand factor by electron microscopy and mass spectrometry. *Blood* **126**, 935-938 (2015). (*equal contributions)
- *Hite, R.K., ***Chiu, P.-L.**, Schuller, J., and Walz, T. Effect of lipid head groups on double-layered two-dimensional crystals formed by aquaporin-0. *PLoS One* **10**, e0117371 (2015). (*equal contributions)
- Kowal, J., Chami, M., Baumgartner, P., Arbeit, M., **Chiu, P.-L.**, Rangl, M., Scheuring, S., Nimigean, C.M., and Stahlberg, J. Ligand-induced structural changes in the cyclic nucleotide-modulated potassium channel MloK1. *Nat Commun* **5**, 3106-3115 (2014).
- Hopkins, L.E., Patchin, E.S., **Chiu, P.-L.**, Brandenberger, C., Smiley-Jewell, S., and Pinkerton, K.E. Nose-to-brain transport of aerosolized quantum dots following acute exposure. *Nanotoxicol* **8**, 885-893 (2014).
- Evans, J.E., Jungjohann, K.L., Wong, P.C.K., **Chiu, P.-L.**, Dutrow, G.H., Arslan, I., and Browning, N.D. Visualizing macromolecular complexes with *in situ* liquid scanning transmission electron microscopy. *Micron* **43**, 1085-1090 (2013).

- Chiu, P.-L.**, Kelly, D.F., and Walz, T. The use of trehalose in the preparation of specimens for electron microscopy. *Micron* **42**, 762-772 (2011).
- Paoli, E.-E., Kruse, D.E., Seo, J.W., Zhang, H., Kheirrolomoom, A., Watson, K.D., **Chiu, P.-L.**, Stahlberg, H., and Ferrara, K.W. An optical and microPET assessment of thermally sensitive liposome biodistribution in the Met-1 tumor model: importance of formulation. *J Control Release* **143**, 13-22 (2010).
- Chiu, P.-L.**, Pagel, M.D., Evans, J.E., Chou, H.-T., Zeng, X., Gipson, B., Stahlberg, H., and Nimigean, C.M. The structure of the prokaryotic cyclic nucleotide-modulated potassium channel MloK1 at 16 Å resolution. *Structure* **15**, 1053-1064 (2007).
- Renault, L., Chou, H.-T., **Chiu, P.-L.**, Hill, R.M., Zeng, X., Gipson, B., Zhang, Z.Y., Cheng, A., Unger, V., and Stahlberg, H. Milestones in electron crystallography. *J Comput Aided Mol Des* **20**, 519-527 (2006).
- Chiu, P.-L.**, Wu, C.-Y., Taso, J.-H., and Chang, F.-H. Drug delivery through liposome by ultrasonic cavitation. *Biomed Eng-App Basis & Comm* **13**, 47-52 (2001).

List of conference proceedings

- Orjuela, J.D., **Chiu, P.-L.**, Walz, T., de Groot, B.L., and Aponte-Santamaria, C.A. The interplay between cholesterol and aquaporin-0. *Biophys J* (2022).
- Chiu, P.-L.**, Yang, J.-H., Williams, D., Kandiah, E., Fromme, P. Redox modulation on chloroplast ATP synthase. *Acta Crystallographica Section A. Foundations and Advances* (2021).
- Nandi, P.**, Li, S., Columbres, R.C.A., Wang, F., Williams, D.R., Malyutin, A.G., **Poh, Y.-P.**, Chou, T.-F., and **Chiu, P.-L.** Structural and functional analysis of p47 cofactor binding on the p97 disease mutant. *Microsc & Microana* (2021).
- Nandi, P., Poh, Y.-P., and **Chiu, P.-L.** Structural studies of the neuronal apoptotic complex of proNGF-p75NTR-sortilin. *Biophys J* (2021).
- Yang, J.-H., Williams, D., Kandiah, E., Fromme, P., and **Chiu, P.-L.** Redox Modulation on Chloroplast ATP Synthase. *Microsc & Microana* (2020). doi: 10.1017/S1431927620013458.
- Nandi, P., and **Chiu, P.-L.** Structural studies using cryo-EM to unravel mechanistic details of p47 binding to p97. *Biophys J* **118**, 501a (2020). doi: 10.1016/j.bpj.2019.11.2765.
- Luu, D., **Chiu, P.-L.**, and Van Horn, W.D. Isolation of functional temperature activated transmembrane domain of human TRPM8. *Biophys J* (2020).
- Yang, J.-H., Fromme, P., and **Chiu, P.-L.** Mechanism of light regulation on chloroplast ATP synthase revealed by single-particle cryo-EM. *BBA-Bioenergetics* **1859**, e84-e85 (2018).

List of book chapters

- Chan, K.-Y.**, **Truong, C.D.**, **Poh, Y.-P.**, and **Chiu, P.-L.** Sample preparation and data collection for electron crystallographic studies on membrane protein structures and lipid-protein interaction. *Methods in Mole Biol* **2215**, 247-265 (2021).

PRESENTATIONS

- Pharmacological Sciences Seminar: “Structural and functional characterization of p97 disease mutant complexes”, Stonybrook University, Stonybrook, NY. (November 2021)
- 2021 VCP Scientific Conference, “Structural and functional analysis of disease-linked p97 ATPase mutant complexes”, Main Stage speaker in virtual format. (September 2021)
- American Crystallography Association (ACA) Annual Meeting – Redox Enzymes session: “Redox modulation of chloroplast ATP synthase” in virtual format. (August 2021)
- BMB Seminar: “Structural and functional analysis of disease-linked p97 ATPase mutant complexes”, University of Texas Health Science Center at Houston, TX. (April 2021)
- 2020 Microscopy and Microanalysis Society (M&M): “Redox Modulation on Chloroplast ATP Synthase” in virtual format. (August 2020)
- ASU Biodesign Retreat FUSION 2019, Phoenix, AZ. (March 2019)
- EMSL Integration Meeting 2018: “Molecular Structure and Dynamics in Biology and the Environment”, Richland, WA. (August 2018)
- Chalk Talk Series, Biodesign Institute, Tempe, AZ. (January 2018)
- Cryo-EM Workshop of ASU Winter School, Tempe, AZ. (January 2018)
- University of California, Los Angeles Harbor Medical School, Torrance, CA. (December 2017)
- Biophysical Seminar Series, Department of Physics, Tempe, AZ. (September 2017)
- 10th International Conference on Computational Physics, Macau, China. (January 2017)
- Cryo-EM Workshop of ASU Winter School, Tempe, AZ. (January 2017)
- Department of Biological Sciences, Purdue University, West Lafayette, IN. (April 2016)
- Institute of Biomedical Sciences, Academia Sinica, Taipei, Taiwan. (February 2016)
- Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan. (February 2016)
- EITC 2015, Massachusetts Institute of Technology, Cambridge, MA. (August 2015)
- “Pizza Talk” Series, Department of Cell Biology, Harvard Medical School, Boston, MA. (March 2014)
- Institute of Chemistry, Academia Sinica, Taipei, Taiwan. (June 2012)
- Department of Life Sciences, National Yang-Ming University, Taipei, Taiwan. (June 2012)
- Center for Structures of Membrane Proteins, UCSF, San Francisco, CA. (August 2007)
- Bay Area Cryo-EM Meeting, Davis, CA. (May 2007)

TEACHING

List of courses taught at ASU

Course	Year(s)	Semester	Credit hours	Enrollment
Research (BCH 392)	2021	Fall	3	3
Current Topics in Biochemistry (CHM 501)	2021	Fall	N/A	N/A

Research (BCH 492)	2021	Fall	3	1
Biophysical Chemistry (BCH 463)	2021	Spring	3	110
Introduction to Research Techniques (BCH 392)	2021	Spring	2/3	2
Biophysical Chemistry (BCH 463)	2020	Fall	3	32
Current Topics in Biochemistry (CHM 501)	2020	Fall	N/A	N/A
Biophysical Chemistry (BCH 463)	2020	Spring	3	93
Research	2020	Spring	3	1
Elementary Biochemistry Laboratory (BCH 367)	2019	Fall	1	205
Elementary Biochemistry Laboratory (BCH 367)	2019	Spring	1	
Structural Discovery in Biophysical Chemistry (BCH 494 & BCH 598)	2018	Fall	3	14
Current Topics in Biochemistry (CHM 501)	2018	Fall	1	24
Elementary Biochemistry Laboratory (BCH 367)	2018	Spring	1	147
Electron Microscopy of Biological Macromolecules (BCH 598)	2017	Fall	3	14
Current Topics in Chemistry (CHM 501)	2017	Fall	N/A	N/A
Electron Microscopy of Biological Macromolecules (BCH 598) ^a	2016	Fall	3	5
Current Topics in Chemistry (CHM 501)	2016	Fall	N/A	N/A

^aNewly developed at ASU.

MENTORING ACTIVITIES

Mentoring postdoctoral researchers

Yu-Ping Poh 08/2016 – 10/2020

Biochemical characterization of neurotrophin receptor complex

Jay-How Yang 03/2017 – 07/2019

Structural study of chloroplast ATP synthase

Co-mentored with Dr. Petra Fromme

Mentoring graduate students

Currently enrolled

Purbasha Nandi 2016 enrolled/Biochemistry

Structural study of human pro-NGF-p75^{NTR}-sortilin complex

2021 Gordon Research Conference – Three-Dimensional Electron Microscopy: poster
2021 Cell Symposium: Biological Assemblies: Phase Transitions and More: poster
2021 6th Southern California Cryo-EM Symposium: poster presentation
2021 VCP Scientific Conference: poster presentation
2021 Arizona Alzheimer’s Consortium Scientific Conference: poster presentation
2021 Alzheimer’s Association International Conference 2021: oral presentation
2021 M&M Annual Conference: oral presentation
2021 GPSA and ASU Graduate College Graduate Research and Support Program
2021 AIMS: Poster presentation (EM Microscopy Division Poster Award)
2020 Biophysics Society Meeting: poster presentation
2020 ASU Graduate College Online/Remote Travel Award for the Biophysical Society
Annual Meeting
2020 Outstanding Graduate Research Assistant Award
2020 Biophysics Society Meeting: oral presentation
2019 Graduate College Travel Award
2019 Southern California Cryo-EM Symposium: poster presentation

Ka-Yi Tina Chan 2018 enrolled/Biochemistry

Structural study of the proteolytic mechanism of γ -secretase

2021 Arizona Alzheimer’s Consortium Scientific Conference: poster presentation

2021 Alzheimer’s Association International Conference 2021: poster presentation

Ryan Puskar 2020 enrolled/Biochemistry

Structural study of the photosynthetic RC-FMO complex

Kazi Waheeda 2018 enrolled/Biochemistry

Structural study of the rubisco-Rca complex

2021 DOE PI Meetings: poster presentation

Kira Devore 2021 enrolled/Biochemistry

Structural study of p97-mediated membrane reassembly

Saborni Chowdhury 2021 enrolled/Biochemistry

Structural study of human pro-NGF-p75^{NTR}-sortilin complex

Graduated

Chloe Du Truong 2017 enrolled/Biochemistry/2021 graduated

Structural study of human Nogo receptor complex

2021 SMS Distinguished Teaching Assistant Award

2021 AIMS: poster presentation

2020 Vice President of the SMS Graduate Student Council

2020 Outstanding Graduate Research Assistant Award

2020 Biophysics Society Meeting: poster presentation

Isabella Breen 2019 enrolled/Biochemistry/2020 graduated

Structural study of Rubisco activase

Co-mentored with Dr. Rebekka Wachter

Mentoring undergraduate or co-mentoring other graduate students

Yuxiao Ma	2021-present	Undergrad research (SoLS)
Alexander Ono	2021-present	Undergrad research
Edgar Ferrer	2021-present	Undergrad research credits
Raneel Farid Shukar Maqdisi	2021-present	4+1 program committee member (co-mentored with Dr. Yuval Mazor)
Hayden Hart	2021-present	Barrett Honor Thesis – Structural study of Rubisco-Rca
Nicholas Heeres	2021-present	Barret Honors Thesis Prospectus – The Structure of Mars1 Kinase (co-mentored with Dr. Yuval Mazor)
Kira Devore	2021-2021	Undergrad research credits
Alan Nisanov	2021-2021	Undergrad research credits
Elizabeth Rapacz	2020-present	Undergrad research credits
Andrew Poweleit	2020-2021	Thesis reader/co-mentored with Dr. Neal Woodbury
Ryan Puskar	2019-2020	Undergrad research credits
Suiping Zheng	2019-2020	Undergrad researcher
Maya Street	2018-2020	Undergrad researcher/co-mentored with Dr. Charles Austen Angell (now a graduate student at OIST)
David Flesher	2018-2019	Undergrad researcher/co-mentored with Dr. Petra Fromme
Sanna Naveed	2017-2018	Undergrad researcher
Puskar Desaraju	2017-2018	Graduate researcher in Computer Sciences
Victoria Hernandez	2017-2018	The Barrett Honors Thesis Program/co-mentored with Dr. Rebekka Wachter (now a graduate student at MIT)

PROFESSIONAL SERVICES

Peer-review services

Editor board of “*Membranes*” 2021

NSF Reviewer 2021, 2022

UK MRC grant review

Alzheimer’s Association Research Fellowship review, 2018 – present.

User Review Committee (URC) of the National Center for Cryo-EM Access and Training (NCCAT), 2019 – present.

Peer reviews in *Biomolecules*, *Journal of Visualized Experiments (JoVE)*, *Nature Communications*, *Micron*, *Scientific Reports*, *Journal of Experimental Microbiology and Immunology (JEMI+)* and *Bio-protocols*

Membership

American Chemical Society (ACS), 2021 – present.
American Crystallographic Association (ACA), 2021 – present.
Arizona Imaging and Microanalysis Society (AIMS), 2016 – present.
The American Association for the Advancement of Science (AAAS), 2014-2015.
Biophysical Society Member, 2009-2011, 2017 – present.
Microscopy Society of America (MSA), 2020 – present.
Sigma Xi, 2020 – 2021.

Conference and workshop activities

2021 Biophysical Society SRAA Virtual Platform Judge – 2021 Biophysical Annual Meeting.
2018 ASU Winter School – Cryo-EM Workshop – Organizer and instructor.
2017 ASU Winter School – Cryo-EM Workshop – Organizer and instructor.

UNIVERSITY SERVICES AND OUTREACH ACTIVITIES

University services

ASU SMS Committee on Undergraduate Student Research, 2021 – present.
ASU Eyring Materials Characterization & Synthesis Governance Board, 2018 – 2021.
ASU Biodesign Laboratory Safety Committee member, 2018 – present.
ASU SMS Committee on Graduate Recruitment, 2018 – 2021.
John M. Cowley Center for High-Resolution Electron Microscopy (JCCHREM) Steering Committee Member, 2016 – present.
ASU SMS Lecturer Search Committee, 2020-2021.

Outreach activities

02/2020 – The Open Door by the ASU Biodesign Institute
12/2017 – “Life and Technology Talk Show”, the Radio Golden Vintage, Los Angeles, CA
Using electron microscopy to understand structures of biological molecules
02/2017 – The Night of the Open Door by the ASU Biodesign Institute

CURRENT COLLABORATORS

Collaboration on ASU campus

Dr. Karen Anderson (Biodesign) – *Structural study of T-cell receptor complex*
Dr. Chad Borges (SMS) – *Structural study of the osteocalcin*
Dr. Julian Chen (SMS) – *Structural study of the telomeric complex*
Dr. Wayne Frasch (SoLS) – *Structural studies of ATP synthase molecular motor*

Dr. Petra Fromme (SMS) – *Structural studies of chloroplast ATP synthase*
Dr. Wei Liu (SMS) – *Structural study of GPCR complex*
Dr. Michael Lynch – *Evolutionary study on the structure of ribosomes*
Dr. Marco Mangone (SoLS) – *Structural studies of the genomic transcriptional control*
Dr. Yuval Mazor (SMS) – *Structural studies of photosystem antennas*
Dr. John McCutcheon (SoLS) – *Evolutionary study on the structure of ribosomes*
Dr. Brent Nannenga (SEMTE) – *Structural study of FMO complex*
Dr. Peter Rez (Physics) – *Method development of electron tomography*
Dr. Abhishek Shrivastava (SoLS) – *Structural study of bacterial secretion system*
Dr. Abhishek Singharoy (SMS) – *Mechanism of voltage activation of ATP synthase motor*
Dr. John Spence (Physics) – *Quantum biology by TEM*
Dr. Nicholas Stephanopoulos (SMS) – *Structural studies of DNA origami*
Dr. Wade Van Horn (SMS) – *Structural study of TRPM8 channel*
Dr. Xu Wang (SMS) – *Structural study of the integrin complex*
Dr. Jeremy Wideman (SoLS) – *Evolution of the ATP synthase membrane c-ring*

External collaborators

Dr. Adam Braunschweig, The City University of New York, NY
Dr. Tsui-Fen Chou, California Institute of Technology, Pasadena, CA
Dr. Khanh Dao Duc, The University of British Columbia, Vancouver, Canada
Dr. James Evans, Pacific Northwest National Laboratory, Richland, WA
Dr. Elias Fernandez, The University of Tennessee, Knoxville, TN
Dr. Chialin Hsu, National Yang-Ming University, Taipei, Taiwan
Dr. Eaazhisai Kandiah, European Synchrotron Radiation Facility, Grenoble, France
Dr. Rajiv Kumar, Mayo Clinic
Dr. Mateusz Marianski, The City University of New York, NY
Dr. George Mer, Mayo Clinic
Dr. Frederic Poitevin, Stanford University, Palo Alto, CA
Dr. Joseph Che-Yen Wang, Penn State University College of Medicine, Hershey, PA
Dr. Yanzhuang Wang, University of Michigan, Ann Arbor, MI

NIH - NCATS

Morphic Therapeutics Inc.