Gabriel C. Lander

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Education

The Scripps Research Institute's Kellogg School of Science and Technology, 2004-2009
Ph.D. in Biophysics
Thesis: *Structural Architecture of Bacteriophage Described via Streamlined Cryo-Electron Microscopy*
Advisors: John E. Johnson, Bridget Carragher, Clinton S. Potter

Binghamton University, 1997-2002
BS Biochemistry, Distinguished Independent Study, Magna cum Laude
Minor in Computer Science
Thesis: *Structural Relationships to Drug Binding Affinities in Tubulin*
Advisor: Dr. Susan L. Bane

Research/Work Experience

Professor, 2019-present
Associate Professor, 2017-2019
Assistant Professor, 2013-2017
Department of Integrative Structural and Computational Biology, The Scripps Research Institute
High-resolution structural studies of macromolecular machines by cryoEM

Postdoctoral Fellow, 2009-2013
Eva Nogales Lab, Ernest Orlando Lawrence Berkeley National Laboratory (LBNL)
Structural studies of the complex biological assemblies involved in cell division

Scientific Intern, 2003-2004
Jack Johnson Lab, The Scripps Research Institute
Study of the inter-subunit protein-protein interactions within viral capsids

Arabidopsis Genome Annotation Curator Assistant, 2002-2003
The Arabidopsis Genome Project, Stanford University
Automation of Arabidopsis genome annotation.

Awards Received

2019	Protein Science Young Investigator (Protein Society)
2018	Amgen Young Investigator Award
2017	Baxter Young Investigator Award
2014	NIH Director's New Innovator Award
2014	Pew Scholar Award
2014	Searle Scholar Award
2013	Dale F. Frey for Breakthrough Scientists (Damon Runyon Foundation)
2012	Merton R. Bernfield Memorial Award (American Society of Cell Biology)
2012	Director's Award for Exceptional Achievement (LBNL)
2012	George Palade Award (Microscopy Society of America)
2011	Outstanding Achievement Award (Lawrence Berkeley National Lab)
2010	Damon Runyon Cancer Research Foundation Fellowship
2008	ARCS fellowship
2007	Carl Storm Fellowship Award
2006	FASEB Young Investigator Award

Pre-prints of manuscripts currently under review:

Wu M, Lander GC, Herzik MA. *Sub-2 Å Resolution Structure Determination Using Single-Particle Cryo-EM at 200 keV*. **bioRxiv** 2019 November 20 (doi: 10.1101/855643)

Fribourgh JL, Srivastava A, Sandate CR, Michael AK, Hsu PL, Rakers C, Nguyen LT, Torgrimson MR, Parico GCG, Tripathi S, Zheng N, Lander GC, Hirota T, Tama F, Partch CL. *Protein dynamics regulate distinct biochemical properties of cryptochromes in mammalian circadian rhythms*. **bioRxiv** 2019 August 20 (doi: 10.1101/740464)

Shin M, Asmita A, Puchades C, Adjei E, Wiseman RL, Karzai W, Lander GC. *Distinct Structural Features of the Lon Protease Drive Conserved Hand-over-Hand Substrate Translocation*. **bioRxiv** 2019 April 24 (doi:10.1101/617159)

Peer-reviewed publications

Puchades C, Sandate C, Lander GC. *The molecular principles governing AAA+ activity and functional diversity*. **Nat Rev Mol Cell Biol** 21:43-58 (2020) PMID:31754261

Greene ER, Goodall EA, de la Peña AH, Matyskiela ME, Lander GC, Martin A. *Specific lid-base contacts in the 26S proteasome control the conformational switching required for substrate engagement and degradation*. **eLife** 8:e49806 (2019) PMID:31778111

Carragher B, Cheng Y, Frost A, Glaeser RM, Lander GC, Nogales E, Wang HW. *Current outcomes when optimizing "standard" sample preparation for single-particle cryo-em*. **J Microsc**. 276:39-45 (2019) PMID:31553060

Yin Y, Wu M, Hsu AL, Borschel WF, Borgnia MJ, Lander GC, Lee SY. *Visualizing structural transitions of ligand-dependent gating of the TRPM2 channel.* **Nat Commun** 10:3740 (2019) PMID:31431622

Puchades C, Ding B, Song A, Wiseman RL, Lander GC, Glynn SE. *Unique structural features of the mitochondrial AAA+ protease AFG3L2 reveal the molecular basis for activity in health and disease.* **Mol Cell** 75:1073-1085.e6 (2019) PMID:31327635

Sandate CR, Szyk A, Zehr EA, Lander GC, Roll-Mecak A. *An allosteric network in spastin couples multiple activities required for microtubule severing.* **Nat Struct Mol Biol** 26:671-678 (2019) PMID:31285604

Grotjahn DA, Lander GC. *Setting the dynein motor in motion: New insights from electron tomography.* **J Biol Chem** 294:13202-13217 (2019) PMID:31285262

Rollins MF, Chowdhury S, Carter J, Golden SM, Miettinen HM, Santiago-Frangos A, Faith D, Lawrence CM, Lander GC, Wiedenheft B. *Structure Reveals a Mechanism of CRISPR-RNA-Guided Nuclease Recruitment and Anti-CRISPR Viral Mimicry*. **Mol Cell** 74:132-142.e5 (2019) PMID:30872121

Herzik MA Jr, Wu M, Lander GC. *High-resolution structure determination of sub-100 kDa complexes using conventional cryo-EM.* **Nat Commun.** 10:1032 (2019) PMID:30833564

Herzik MA Jr, Fraser JS, Lander GC. *A Multi-model Approach to Assessing Local and Global Cryo-EM Map Quality*. **Structure** 27:344-358.e3 (2019) PMID:30449687

Otomo T, Chowdhury S, Lander GC. *The rod-shaped ATG2A-WIPI4 complex tethers membranes in vitro.* **Contact** 1 (2019) PMID: 30766969

Zubcevic L, Herzik MA, Wu M, Borschel WF, Hirschi M, Song A, Lander GC, Lee S. *Conformational ensemble of the human TRPV3 ion channel*. **Nat Commun** 9:4773 (2018) PMID:30429472

de la Pena AH, Goodall EA, Gates SN, Lander GC, Martin A. *Substrate-engaged 26S proteasome structures reveal mechanisms for ATP-hydrolysis-driven translocation.* **Science** 362 (2018) PMID:30309908

Chowdhury S, Otomo C, Leitner A, Ohashi K, Aebersold R, Lander GC, Otomo T. *Insights into autophagosome biogenesis from structural and biochemical analyses of the ATG2A-WIPI4 complex.* **Proc Natl Acad Sci U S A** 115:E9792-E9801 (2018) PMID:30185561

Yoo J, Wu M, Yin Y, Herzik MA Jr, Lander GC, Lee SY. *Cryo-EM structure of a mitochondrial calcium uniporter.* **Science** 361:506-511 (2018) PMID:29954988

Bruggemann J, Lander GC, Su AI. *Exploring applications of crowdsourcing to cryo-EM.* **J Struct Biol** 203:37-45 (2018) PMID:29486249

Grotjahn DA, Chowdhury S, Xu Y, McKenney RJ, Schroer TA, Lander GC. *Cryo-electron tomography reveals that dynactin recruits a team of dyneins for processive motility.* **Nat Struct Mol Biol** 25:203-207 (2018) PMID:29416113

Gardner B, Castanzo D, Chowdhury S, Stjepanovic G, Stefely M, Hurley J, Lander GC, Martin A. *The peroxisomal AAA-ATPase Pex1/Pex6 unfolds substrates by processive threading*. **Nat Commun** 9:135 (2018) PMID:2932150

Ying Y, Wu M, Zubcevic L, Borschel WF, Lander GC, Lee S-Y. *Structure of the cold- and menthol-sensing ion channel TRPM8*. **Science** 359:237-241 (2018) PMID:29217583

Puchades C, Rampello AJ, Shin M, Giuliano CJ, Wiseman RL, Glynn SE, Lander GC. *Structure of the mitochondrial inner membrane AAA+ protease YME1 reveals the mechanism of substrate processing*. **Science** 358:6363 (2017) PMID:29097521

Hirschi M, Herzik MA, Wie J, Suo Y, Borschel W, Ren D, Lander GC, Lee SY. *Cryo-EM structure of the lysosomal Ca2+-permeable channel TRPML3*. **Nature** 550:411-414 (2017) PMID:29019979

Herzik MA, Wu M, Lander GC. *Achieving Better-Than-3-Å Resolution by Single-Particle Cryo-EM At 200 keV*. **Nat Methods** 14:1075-1078 (2017) PMID:28991891

Chen KC, Qu S, Chowdhury S, Noxon IC, Schonhoft JD, Plate L, Powers ET, Kelly JW, Lander GC, Wiseman RL. *The endoplasmic reticulum HSP40 co-chaperone ERdj3/DNAJB11 assembles and functions as a tetramer*. **EMBO J** 36:2296-2309 (2017) PMID:28655754

Rollins MF, Chowdhury S, Carter J, Golden SM, Wilkinson RA, Bondy-Denomy J, Lander GC, Wiedenheft B. *Cas1 and the Csy complex are opposing regulators of Cas2/3 nuclease activity*. **Proc Natl Acad Sci USA** 36: 2296-2309 (2017) PMID:28438998

Chowdhury S, Carter J, Rollins MF, Golden SM, Jackson RN, Hoffmann C, Nosaka L, Bondy-Denomy J, Maxwell KL, Davidson AR, Fischer ER, Lander GC, Wiedenheft B. *Structure Reveals Mechanisms of Viral Suppressors that Intercept a CRISPR RNA-Guided Surveillance Complex.* **Cell** 169:47-57 (2017) PMID:28340349

de la Peña AH, Lander GC. *What's the Key to Unlocking the Proteasome's Gate?* **Structure** 24:2037-2038 (2016) PMID:27926830

Smirnova IA, Sjostrand D, Li F, Bjorck M, Schafer J, Ostbye H, Hogbom M, von Ballmoos C, Lander GC, Adelroth P, Brzezinski P. *Isolation of yeast complex IV in native lipid nanodiscs*. **Biochim Biophys Acta** 1858:2984-2992 (2016) PMID:27620332

Matyskiela M, Lu G, Ito T, Pagarigan B, Lu CC, Miller K, Fang W, Wang NY, Nguyen D, Houston J, Carmel G, Tran T, Riley M, Nosaka L, Lander GC, Gaidarova S, Xu S, Ruchelman AL, Handa H, Carmichael J, Daniel TO, Cathers BE, Lopez-Girona A, Chamberlain PP. *A Novel Cereblon Modulator Directs Recruitment of GSPT1 to the CRL4^{CRBN} Ubiquitin Ligase*. **Nature** 535:252-7 (2016) PMID:27338790

Zubcevic L, Herzik MA Jr, Chung BC, Liu Z, Lander GC, Lee SY. *Cryo-electron microscopy structure of the TRPV2 ion channel.* **Nat Struct Mol Biol** 23:180-6 (2016) PMID:26779611

Dambacher CM, Worden EJ, Herzik MA, Martin A, Lander GC. *Atomic structure of the 26S proteasome lid reveals the mechanism of deubiquitinase inhibition.* **eLife** 5:e13027 (2016) PMID:26744777

Yang TC, Ortiz D, Nosaka L, Lander GC, Catalano CE. *Thermodynamic Interrogation of the Assembly of a Viral Genome Packaging Motor Complex.* **Biophys J** 109:1663-75 (2015) PMID:26488657

Ciferri C, Lander GC, Nogales E. *Protein domain mapping by internal labeling and single particle electron microscopy.* **J Struct Biol** 192:159-62 (2015) PMID:26431894

Dambacher CM, Lander GC. Site-specific labeling of proteins for electron microscopy. **J Struct Biol** 192:159-62 (2015) PMID:26409249

Bashore C, Dambacher CM, Matyskiela M, Lander GC, Martin A. Ubp6 deubiquitinase controls conformational dynamics and substrate degradation of the 26S proteasome. **Nat Struc Mol Biol** 22:712-9 (2015) PMID:26301997

McNulty R, Lokareddy RK, Roy A, Yang Y, Lander GC, Heck AJ, Johnson JE, Cingolani G. *Architecture of the Complex Formed by Large and Small Terminase Subunits from Bacteriophage P22.* **J Mol Biol** 427:3285-99 (2015) PMID:26301600

Garnham CP, Vemu A, Wilson-Kubalek EM, Yu I, Szyk A, Lander GC, Milligan RA, Roll-Mecak A. Multivalent Microtubule Recognition by Tubulin Tyrosine Ligase-like Family Glutamylases. **Cell** 161:1112-23 (2015) PMID:25959773

Chowdhury S, Ketcham SA, Schroer TA, Lander GC. Structural organization of the dynein-dynactin complex bound to microtubules. **Nat Struct Mol Biol** 22:345-7 (2015) PMID:25751425

Gardner BM, Chowdhury S, Lander GC, Martin A. *The Pex1/Pex6 complex is a heterohexameric AAA+ motor with alternating and highly coordinated subunits.* **J Mol Biol** 427:1375-88 (2015) PMID:25659908

Liu T, Sae-Ueng U, Li D, Lander GC, Zuo X, Jonsson B, Rau D, Shefer I, Evilevitch A. *Solid-to-fluid-like DNA transition in viruses facilitates infection.* **Proc Natl Acad Sci USA** 111:14675-80 (2014) PMID:25271319

Alushin GM, Lander GC, Kellogg EH, Zhang R, Baker D, Nogales E. *High resolution microtubule structures reveal the structural transitions in αβ–tubulin upon GTP hydrolysis.* **Cell** 157(5):1117-29 (2014) PMID:24855948

Zhao Q, Potter CS, Carragher B, Lander G, Sworen J, Towne V, Abraham D, Duncan P, Washabaugh MW, Sitrin RD. *Characterization of virus-like particles in GARDASIL(R) by cryo transmission electron microscopy.* **Hum Vaccin Immunother** 10:734-9 (2014) PMID:24299977

Matyskiela ME, Lander GC, Martin A. Conformational switching of the 26S proteasome enables substrate degradation. **Nat Struct Mol Biol** 20(7): 781-8 (2013) PMID:23770819

Lander GC, Martin AM, Nogales E. *The proteasome under the microscope: Focusing on the regulatory particle*. **Current Opinion in Structural Biology** 23(2):243-51 (2013) PMID:23498601

Lander GC, Johnson JE, Rau DC, Potter CS, Carragher B, Evilevitch A. *DNA bending-induced phase transition of encapsidated genome in phage lambda.* **Nucleic Acids Res** 41:4518-4524 (2013) PMID:23449219

Ciferri C, Lander GC, Maiolica A, Herzog F, Aebersold R, Nogales E. *Molecular architecture of human polycomb repressive complex 2*. **Elife** 1:e00005 (2012). PMID:23110252

Lander GC, Saibil HR, Nogales E. *Go Hybrid: EM, Crystallography, and Beyond*. **Current Opinion in Structural Biology** 22(5):627-635 (2012) PMID:22835744

Roy A, Bhardwaj A, Datta P, Lander GC, Cingolani G. *Small terminase couples viral DNA binding to genome-packaging ATPase activity.* **Structure** 20:1403-13 (2012) PMID:22771211

Lander GC, Baudoux AC, Azam F, Potter CS, Carragher B, Johnson JE. *Capsomer Dynamics and Stabilization in the T = 12 Marine Bacteriophage SIO-2 and Its Procapsid Studied by CryoEM.* **Structure** 20:498-503 (2012) PMID:22405008

Lander GC, Estrin E, Matyskiela M**,** Bashore C, Nogales E, Martin A. *Complete subunit architecture of the proteasome regulatory particle*. **Nature**; 482(7384):186-91 (2012). PMID:22237024

Baudoux AC, Hendrix RW, Lander GC, Bailly X, Podell S, Paillard C, Johnson JE, Potter CS, Carragher B, Azam F. *Genomic and functional analysis of Vibrio phage SIO-2 reveals novel insights into ecology and evolution of marine siphoviruses.* **Environ Microbiol** 14:2071-86 (2012) PMID:22225728

Wiedenheft B, Lander GC, Zhou K, Jore MM, Brouns SJ, van der Oost J, Doudna JA, Nogales E. *Structures of the RNA-guided surveillance complex from a bacterial immune system*. **Nature** 477(7365):486-9 (2011). PMID:21938068

Tang J, Lander GC, Olia A, Li R, Casjens S, Prevelige P Jr, Cingolani G, Baker TS, Johnson JE. *Peering down the barrel of a bacteriophage portal: the genome packaging and release valve in p22.* **Structure** 19(4):496-502 (2011) PMID:21439834

Hornung P, Maier M, Alushin GM, Lander GC, Nogales E, Westermann S. *Molecular architecture and connectivity of the budding yeast Mtw1 kinetochore complex.* **J Mol Biol** 405:548-59 (2011) PMID:21075115

Huo Y, Hu Z, Zhang K, Wang L, Zhai Y, Zhou Q, Lander G, Zhu J, He Y, Pang X, Xu W, Bartlam M, Dong Z, Sun F. *Crystal structure of group II chaperonin in the open state.* **Structure** 18:1270-9 (2010) PMID:20947016

Matsui T, Lander GC, Khayat R, Johnson JE. *Subunits fold at position-dependent rates during maturation of a eukaryotic RNA virus.* **Proc Natl Acad Sci USA** 107:14111-5 (2010) PMID:20660783

Khayat R, Lander GC, Johnson JE. *An automated procedure for detecting protein folds from sub-nanometer resolution electron density.* **J Struct Biol** 170:513-21 (2010) PMID:20026407

Voss NR, Lyumkis D, Cheng A, Lau PW, Mulder A, Lander GC, Brignole EJ, Fellmann D, Irving C, Jacovetty EL, Leung A, Pulokas J, Quispe JD, Winkler H, Yoshioka C, Carragher B, Potter CS. *A toolbox for ab initio 3-D reconstructions in single-particle electron microscopy.* **J Struct Biol** 169:389-98 (2010) PMID:20018246

Lander GC, Khayat R, Li R, Prevelige PE, Potter CS, Carragher B, Johnson JE. *The P22 tail machine at sub nanometer resolution reveals the architecture of an infection conduit*. **Structure** 17(6):789-99 (2009) PMID:19523897

Ambrose RL, Lander GC, Maaty WS, Bothner B, Johnson JE, Johnson KN. *Drosophila A virus is an unusual RNA virus with a T=3 icosahedral core and permuted RNA-dependent RNA polymerase.* **J Gen Virol** 90:2191-200 (2009) PMID:19474243

Prust CJ, Doerschuk PC, Lander GC, Johnson JE. *Ab initio maximum likelihood reconstruction from cryo electron microscopy images of an infectious virion of the tailed bacteriophage P22 and maximum likelihood versions of Fourier Shell Correlation appropriate for measuring resolution of spherical or cylindrical objects.* **J Struct Biol** 167:185-99 (2009) PMID:19457456

Lander GC, Stagg SM, Voss NR, Cheng A, Fellmann D, Pulokas J, Yoshioka C, Irving C, Mulder A, Lau P, Lyumkis D, Potter CS, Carragher B. *Appion: an integrated, database-driven pipeline to facilitate EM image processing.* **J Struct Biol** 166(1):95-102 (2009) PMID:19263523

Matsui T, Lander G, Johnson JE. *Characterization of large conformational changes and autoproteolysis in the maturation of a T=4 virus capsid.* **J Virol** 83:1126-34 (2009) PMID:18987141

Lander GC, Evilevitch A, Jeembaeva M, Potter CS, Carragher B, Johnson JE. *Bacteriophage lambda stabilization by auxiliary protein gpD: timing, location and mechanism of attachment determined by cryoEM*. **Structure** 16(9):1399-1406 (2008) PMID:18786402

Nemecek D, Lander GC, Johnson JE, Casjens SR, Thomas GJ Jr. *Assembly architecture and DNA binding of the bacteriophage P22 terminase small subunit.* **J Mol Biol** 383:494-501 (2008) PMID:18775728

Stagg SM, Lander GC, Quispe J, Voss NR, Cheng A, Bradlow H, Bradlow S, Carragher B, Potter CS. *A test-bed for optimizing high-resolution single particle reconstructions.* **J Struct Biol** 163:29-39 (2008) PMID:18534866

Prasuhn DE Jr, Kuzelka J, Strable E, Udit AK, Cho SH, Lander GC, Quispe JD, Diers JR, Bocian DF, Potter C, Carragher B, Finn MG. *Polyvalent display of heme on hepatitis B virus capsid protein through coordination to hexahistidine tags.* **Chem Biol** 15:513-9 (2008) PMID:18482703

Strable E, Prasuhn DE Jr, Udit AK, Brown S, Link AJ, Ngo JT, Lander G, Quispe J, Potter CS, Carragher B, Tirrell DA, Finn MG. *Unnatural amino acid incorporation into virus-like particles.* **Bioconjug Chem** 19:866-75 (2008) PMID:18318461

Kang S, Lander GC, Johnson JE, Prevelige PE. *Development of bacteriophage p22 as a platform for molecular display: genetic and chemical modifications of the procapsid exterior surface.* **Chembiochem** 9:514-8 (2008) PMID:18213564

Gan L, Speir JA, Conway JF, Lander G, Cheng N, Firek BA, Hendrix RW, Duda RL, Liljas L, Johnson JE. *Capsid conformational sampling in HK97 maturation visualized by X-ray crystallography and cryo-EM.* **Structure** 14:1655-65 (2006) PMID:17098191

Poliakov A, van Duijn E, Lander G, Fu CY, Johnson JE, Prevelige PE Jr, Heck AJ. *Macromolecular mass spectrometry and electron microscopy as complementary tools for investigation of the heterogeneity of*

bacteriophage portal assemblies. **J Struct Biol** 157:371-83 (2007) PMID:17064935

Stagg SM, Lander GC, Pulokas J, Fellmann D, Cheng A, Quispe JD, Mallick SP, Avila RM, Carragher B, Potter CS. *Automated cryoEM data acquisition and analysis of 284742 particles of GroEL.* **J Struct Biol** 155:470-81 (2006) PMID:16762565

Lander GC, Tang L, Casjens SR, Gilcrease EB, Prevelige P, Poliakov A, Potter CS, Carragher B, Johnson JE. *The structure of an infectious P22 virion shows the signal for headful DNA packaging.* **Science** 312:1791-5 (2006) PMID:16709746

Shepherd CM, Borelli IA, Lander G, Natarajan P, Siddavanahalli V, Bajaj C, Johnson JE, Brooks CL 3rd, Reddy VS. *VIPERdb: a relational database for structural virology.* **Nucleic Acids Res** 34:D386-9 (2006) PMID:16381893

Natarajan P, Lander G, Shepherd C, Reddy VS, Brooks III CL, Johnson JE. *Exploring Icosahedral Virus Structures with VIPER* **Nature Reviews Microbiology** 3(10):809-817 (2005) PMID:16205712

Reddy V, Natarajan P, Lander G, Qu C, Brooks III C, Johnson JE. *Virus Particle Explorer (Viper): A repository of Virus Capsid Structures* **Conformational Proteomics of Macromolecular Structure** RH Cheng and L Hammer, World Scientific Pub Co., Singapore, 403-412 (Book Chapter) (2004)

Berardini TZ, Mundodi S, Reiser L, Huala E, Garcia-Hernandez M, Zhang P, Mueller LA, Yoon J, Doyle A, Lander G, Moseyko N, Yoo D, Xu I, Zoeckler B, Montoya M, Miller N, Weems D, Rhee SY. *Functional annotation of the Arabidopsis genome using controlled vocabularies.* **Plant Physiol** 135:745-55 (2004) PMID:15173566

Rhee SY, Beavis W, Berardini TZ, Chen G, Dixon D, Doyle A, Garcia-Hernandez M, Huala E, Lander G, Montoya M, Miller N, Mueller LA, Mundodi S, Reiser L, Tacklind J, Weems DC, Wu Y, Xu I, Yoo D, Yoon J, Zhang P. *The Arabidopsis Information Resource (TAIR): a model organism database providing a centralized, curated gateway to Arabidopsis biology, research materials and community.* **Nucleic Acids Res** 31:224-8 (2003) PMID:12519987

Invited Lectures

Jan 22-23, 2019	*wwPDB Single Particle EM Data Management Workshop*, EMBL-EBI, Hinxton, UK
Jan 15-18, 2020	*Gumpoldskirchen Meeting: "Mechanisms of intracellular proteolysis and their potential for therapeutic applications"*, Vienna, Austria
Dec 7-11, 2019	*American Society for Cell Biology Annual Meeting*, Washington DC
Dec 5, 2019	*Seminar – Molecular Biology Institute*, Univ. California at Los Angeles, Los Angeles, CA
Oct 23, 2019	*Postdoc-invited Seminar – Dept. of Biophys and Biophys Chem*, Johns Hopkins Univ., Baltimore, MD
Oct 8, 2019	*Dept of Biochemistry & Biophysics Seminar*, Univ. of North Carolina, Chapel Hill, NC
Oct 2-3, 2019	*American Chemical Society - Pharma Leader's Symposium*, San Diego, CA
Sep 30, 2019	*Seminar – Institute for Bioscience and Biotechnology Research*, University of Maryland, Rockville, MD
Sep 11, 2019	*Seminar – Dept. of Structural Biology*, Tsinghua Univ., Beijing, China
Sep 10, 2019	*Seminar – Institute of Biophysics*, Chinese Academy of Sciences, Beijing, China
Aug 23, 2019	*Molecular Biosciences Symposium*, University of Texas, Austin, TX
Jul 29-31, 2019	*2nd Conference on Biomotors, Virus Assembly, and Nanobiotechnology Applications*, Columbus, OH
Jul 18-21, 2019	*Biophysical Society Thematic Meeting: Revisiting the Central Dogma of Molecular Biology at the Single-Molecule Level*, Lima, Peru
Jun 30-Jul 3, 2019	*Protein Society Annual Symposium*, Seattle, WA
Jun 9-14, 2019	*Session Chair/Discussion Leader, 3DEM Gordon Research Conference*, Hong Kong, China
Jun 5-6, 2019	*High Risk High Reward Symposium*, National Institutes of Health, Bethesda, MD
May 22, 2019	*Seminar – Department of Structural Bio.*, National Cancer Institute, Frederick, MD
May 4-7, 2018	*29th Annual World Molecular Engineering Network*, Cabo San Lucas, Mexico
Apr 9-10, 2019	*WIS EM Facility Inaugural Symposium*, Weizmann Institute of Science, Rehovot, Israel
Feb 21, 2019	*Evnin Chemical and Structural Bio. Seminar*, Rockefeller Univ., New York City, NY

Feb 5, 2019	*College of Pharmacy, Pharmacology and Toxicology Graduate Seminar*, Univ of Arizona, Tuscon, AZ
Jan 14-15, 2019	*Frontiers in cryo-EM Validation workshop*, EMBL-EBI, Hinxton, UK
Dec 14, 2018	*Seminar – Dept. of Structural Bio.*, St. Jude Children's Research Hospital, Memphis, TN
Nov 28, 2018	*Anatomy and Cell Biology Seminary Series*, McGill University, Montreal, Canada
Oct 18, 2018	*Amgen Young Investigator Symposium*, Boston, MA
Oct 7-10, 2018	*Fragment-Based Lead Discovery Conference*, San Diego, CA
Sep 9-14, 2018	*19th Annual International Microscopy Congress*, Sydney, Australia
Aug 26-29, 2018	*Kuo Symposium on 3D-EM of Macromolecules and Cells*, Zhejian University, Hangzhou, China
Aug 24, 2018	*Department of Biological Sciences Colloquium*, National University of Singapore, Singapore
Jul 20-24, 2018	*American Crystallographic Association*, Toronto, Canada
Jun 26-29, 2018	*50 years of Synchrotron Radiation in the UK and its global impact*, University of Liverpool, Liverpool, UK
Jun 25, 2018	*Dept. Seminar*, Birkbeck, University of London, London, UK
Jun 22, 2018	*Structural Biology Interest Group Seminar Series*, Francis Crick Institute, London, UK
Jun 13-15, 2018	*NovAliX Conference – Biophysics in Drug Discovery*, Boston, MA
May 19, 2018	*The Third Coast Workshop on Biological Cryo-EM*, University of Chicago, Chicago, IL
May 5-8, 2018	*28th Annual World Molecular Engineering Network*, Cabo San Lucas, Mexico
Apr 27-28, 2018	*Symposium on Frontiers and Careers in Cryo EM*, UCLA, Los Angeles, CA
Apr 18, 2018	*University Lecture*, IIT Roorkee, Roorkee, India
Feb 17-21, 2018	*Biophysical Society 62st Annual Meeting*, San Francisco, CA
Feb 4-8, 2018	*Keystone Symposium: Cryo-EM from Cells to Molecules: Multi-Scale Visualization of Biological Systems,* Granlibakken Tahoe, Tahoe City, CA
Jan 19, 2018	*Biochemistry Seminar Series*, University of Missouri, Columbia, MO
Jan 26, 2018	*Dept. Biochemistry Seminar*, Illinois University, Urbana-Champaign, IL
Nov 2, 2017	*Biochemistry Seminar Series*, University of California, San Diego, CA
Oct 20, 2017	*Biology Colloquium Series*, Massachusetts Institute of Technology, Boston, MA
Oct 19, 2017	*Molecular and Cellular Bio. Dept. Seminar*, University of Massachusetts, Amherst, MA
Oct 18, 2017	*Biochemistry & Molecular Pharmacology Seminar Series*, University of Massachusetts, Worcester, MA
Aug 7-11, 2017	*Microscopy & Microanalysis Meeting*, St. Louis, MO
May 6-9, 2017	*27th Annual World Molecular Engineering Network*, Cabo San Lucas, Mexico
May 2, 2017	*CryoEM Symposium*, Washington University, St. Louis, MO
Apr 28, 2017	*Dept. Biochemistry Seminar*, Duke University, Raleigh, NC
Jan 23, 2017	*Molecular Biophysics & Biochemistry Seminar*, Yale University, New Haven, CT
Nov 29, 2016	*Institute of Molecular Biology (IMB)*, University of Oregon, Eugene, OR
Jun 19-24, 2016	*3DEM Gordon Research Conference*, Chinese Univ. of Hong Kong, Hong Kong, China
May 26, 2016	*Department of Molecular and Cellular Biology*, University of California, Davis, CA
May 8-11, 2016	*26th Annual World Molecular Engineering Network*, Cabo San Lucas, Mexico
Dec 1, 2015	*Departmental Seminar*, Genentech, San Francisco, CA
Nov 16, 2015	*Dept of Biochem and Mol Biol Seminar*, U of Texas Medical School, Houston, TX
Oct 22, 2015	*Biochem & Mol Biol Departmental Seminar*, Michigan State University, East Lansing, MI
Oct 15, 2015	*NIH Departmental Seminar*, NIH, Bethesda, MD
Jul 6-10, 2015	*3D solutions in CryoEM*, Maastricht University, Maastricht, Netherlands
Jun 21-26, 2015	*3DEM Gordon Research Conference*, New London, NH
Apr 25, 2015	*Science Saturday*, TSRI, La Jolla, CA
Nov 9-14, 2013	*Workshop on Advanced Topics in EM Structure Determination*, TSRI, La Jolla, CA
Oct 8-12, 2014	*110th International Titisee Conference: Structure, forces, and dynamics of macromolecular complexes*, Titisee, Black Forest, Germany
Sep 15-18, 2014	*Horizons in Molecular Biology*, International Max Planck Research School for Mol Bio, Göttingen, Germany
Jun 4-6, 2014	*Bioimaging at the Nanoscale Symposium*, Oregon Health & Science Univ, Portland, OR
Oct 1-4, 2013	*3D solutions in CryoEM*, University of Barcelona, Barcelona, Spain
Dec 15-19, 2012	*American Society for Cell Biology Annual Meeting*, San Francisco, CA

Nov 11-16, 2012	*Workshop on Advanced Topics in EM Structure Determination*, TSRI, La Jolla, CA
March 1, 2012	*Automated Molecular Imaging Forum*, TSRI, La Jolla, CA
Jan 27, 2012	*Bay Area CryoEM Symposium*, UC Davis, CA
Aug 11, 2011	*Automated Molecular Imaging Forum*, TSRI, La Jolla, CA
Nov 9-12, 2008	*39th NIPS International Symposium, Frontiers of Biological Imaging: Synergy of Advanced Techniques*, Okazaki, Japan
June 15-20, 2008	*3DEM Gordon Research Conference*, Lucca (Barga), Italy
May 25-29, 2007	*Biennial Conference of Phage/Virus Assembly*, Toronto, Canada
Mar 3-7, 2007	*Biophysical Society 51st Annual Meeting*, Baltimore, Maryland
Jun 17-22, 2006	*FASEB Virus Assembly Meeting*, Saxtons River, VT

Participation in Societies, Conference Organization, and Editorial Boards

2019 – present	Editorial Board, Journal of Molecular Biology
2019 – 2020	Chair, Cryo-EM special interest group, American Crystallographic Association
2018 – 2019	Cryo-EM subgroup committee, Biophysical Society
2019	Chair-elect, Cryo-EM special interest group, American Crystallographic Association
2016	Organizer of the Southern California Cryo-EM Symposium
2019 – present	Member, American Association for Cancer Research
2008 – present	Member, American Society of Cell Biology
2008 – present	Member, Biophysical Society

Service in Federal Agencies Review Panels

2018-2022	NIH Biochemistry and Biophysics of Membranes Study Section (standing member)
2017	NIH P01 Program Project Review Panel (ad hoc)
2016	NIH Special Emphasis Panel, S10 Evaluation (ad hoc)

Teaching Experience

2019 – present	Lecturer for the Structural Biology Course at Rockefeller University (Biennial)
Apr 14-21, 2018	Course organizer and instructor: *Recent advancements in biophysical techniques and virology*, IIT Roorkee, Roorkee, India
2018 – present	Lead instructor/organizer of the Cryo-EM course at Cold Spring Harbor Lab (Annual)
2018 – present	Course Director, Biophysics, Skaggs Graduate School at Scripps Research (Annual)
2017 – present	Course Director, Structural Biology, Skaggs Graduate School at Scripps Research (Annual)
2013 – 2017	Lectures and hands-on practicals in the Biophysics and Structural Bio courses at TSRI.
2011	Mentored undergraduate student Elaine Liu, UC Berkeley. Upon graduation Elaine won the 2012 Fimognari Memorial award for outstanding senior studying Biochemistry & Molecular Biology
2007	Graduate Student Teaching Assistant, *Biophysical Chemistry*, TSRI
2007	Graduate Student Teaching Assistant, *Crystallography*, TSRI

Present trainees

Marsha Hirschi, PhD
Postdoc, September 2017- present
Previous Training: MSc & BS, Delft University of Technology and Leiden University, the Netherlands
PhD, Duke University, Durham, NC
Funding: Damon Runyon Cancer Research Foundation Fellowship

Edmond Watson, PhD
Postdoc, October 2018 – present
Previous Training: BS, Lambuth University, Jackson, TN
PhD, St. Jude Children's Research Hospital, Memphis, TN
Funding: Celgene Fellowship

Jie Yang, PhD

Postdoc, August 2019 – present
Previous Training: BS, College of Life Sciences, Wuhan University, Hubei, China
PhD, Case Western Reserve University, Cleveland, OH
Funding: NIH R21 grant

Colby Sandate
PhD Student, August 2015- present
Previous Training: BS, University of California, Santa Cruz, CA
Funding: National Science Foundation Fellowship

Mia Shin
PhD Student, January 2017- present
Previous Training: BA, University of Berkeley, Berkeley, CA
Funding: National Science Foundation Fellowship

Albert Song
MD-PhD Student, August 2018- present
Previous Training: BA, Northwestern University, Evanston, IL

Mengyu Wu
PhD Student, November 2016- present
Previous Training: BS, Wellesley College, Wellesley, MA
Funding: National Science Foundation Fellowship

Past trainees

Cristina Puchades
PhD Student, May 2015 – September 2019
Previous Training: MSc & BSc, Polytechnic University of Valencia, Valencia, Spain
Funding: American Heart Association Fellowship
Subsequent Position: Postdoc, Yifan Cheng lab, University of San Francisco, CA

Andres Hernandez, PhD
Postdoc, June 2016 – April 2019
Previous Training: BS, University of Houston, Houston, TX
PhD, Johns Hopkins University, Baltimore, MD
Funding: American Cancer Society Fellowship
Subsequent Position: Director of Cryo-EM Studies, Celgene, San Diego, CA

Mark Herzik, PhD
Postdoc, October 2014-December 2018
Previous Training: BS, University of Houston, Houston, TX
PhD, University of California, Berkeley, CA
Funding: Helen Hay Whitney Foundation Fellowship
Subsequent Position: Assistant Professor at University of California, San Diego, CA

Saikat Chowdhury, PhD
Postdoc, March 2013 – June 2018
Previous Training: BENG, Vellore Institute of Technology, Vellore, Tamil Nadu, India
PhD, Pennsylvania State University, University Park, PA
Subsequent Position: Assistant Professor at Stony Brook University

Corey M. Dambacher, PhD
Postdoc, Oct 2013 - Sept 2015
Previous Training: BS, San Diego State University, San Diego, CA
PhD, The Scripps Research Institute, La Jolla, CA
Subsequent Position: Lead Scientist, Research & Development, Omniome Inc.

Fei Li, PhD

Postdoc, May 2015 - Dec 2015
NOTE: Fei Li arranged to spend 6 months in my lab to learn cryo-EM before beginning her postdoc with Bob Stroud.
Previous Training: BS, Xiamen University, China
PhD, Michigan State University, East Lansing, MI
Subsequent Position: Postdoc in Dr. Robert Edwards and Dr. Bob Stroud's labs at UCSF

Danielle Grotjahn, PhD
PhD Student, May 2014- April 2018
Previous Training: BS, University of Wisconsin-Madison, Madison, WI
PhD, The Scripps Research Institute
Funding: National Science Foundation Fellowship
Subsequent Position: Fellow at The Scripps Research Institute