

MARCOS SOTOMAYOR

Department of Chemistry and Biochemistry
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PERSONAL

Birth: September 6, 1978 (Caracas, Venezuela)
Nationality: Chilean (US permanent resident)
Web Page: <http://research.cbc.osu.edu/sotomayor.8>

POSITIONS & EMPLOYMENT

2013 – *Assistant Professor*
Alfred P. Sloan Fellow (2015-2017)
NIH-R00 Pathway to Independence Award (2013-2016)
Department of Chemistry and Biochemistry, The Ohio State University.
Affiliate, Biophysics, Ohio State Biochemistry, and Chemical Physics Programs.

EDUCATION & TRAINING

2008 – 2013 *Postdoctoral Fellow*
NIH-K99 Pathway to Independence Award (2012 – 2013).
Helen Hay Whitney (2009 – 2012) – Howard Hughes Medical Institute.
Department of Neurobiology, Harvard Medical School, USA.
Department of Molecular and Cellular Biology, Harvard University, USA.
Advisors: Dr. David P. Corey, Dr. Rachelle Gaudet.

2007 *Ph.D., Physics*
2004 *M.S., Physics*
Department of Physics, University of Illinois at Urbana-Champaign, USA.
Advisor: Dr. Klaus Schulten.

2002 *M.S., Physics*
2001 *B.S., Physics*
DFI, FCFM, Universidad de Chile, Chile.
Advisors: Dr. Fernando Lund, Dr. Rodrigo Soto.

RESEARCH INTERESTS

Mechanotransduction; Mechanosensitive Ion Channels; Elasticity of Modular Proteins;
Adhesion Molecules in Morphogenesis, Neural Circuits and Cancer; Theoretical
Modeling; Molecular Dynamics Simulations; X-ray Crystallography & Structural Biology.

HONORS & AWARDS

- 2018 **Geraldine Dietz Fox Young Investigator Award, Association for Research in Otolaryngology.**
- 2017 **Elizabeth L. Gross Award for Faculty Excellence, Biophysics Graduate Program OSU.**
- 2015 – 2017 **Alfred P. Sloan Fellowship in Neuroscience.**
- 2015 **Distinguished Undergraduate Research Mentor Award OSU.**
- 2012 – 2016 **NIH Pathway to Independence Award K99/R00.**
- 2012 Selected to participate in the 62nd Lindau Nobel Laureate Meeting.
- 2009 Helen Hay Whitney Foundation Fellowship (accepted).
- 2009 Damon Runyon Cancer Research Foundation Fellowship (declined).
- 2007 Best Talk Prize, UIUC Cell and Molecular Biology – Molecular Biophysics Symposium.
- 2007 MCC/UIUC travel award to attend the CECAM meeting Ionic Transport: from Nanopores to Biological Channels, Lyon, France.
- 2005 BPS/IUPAB travel fellowship award to attend and participate in the International Biophysics Congress in Montpellier, France.
- 2004 Member of The Honor Society Phi Kappa Phi.
- 2002 Graduated with “Distinción Máxima” (Maximum Distinction), Master in Science, Physics, Universidad de Chile, Chile.
- 2002 Graduate Research Fellowship, CONICYT-Chile (National Commission for Scientific and Technological Research).
- 1997 – 2000 “Beca Presidente de la República” Chilean Government Undergraduate Scholarship.
- 1997 – 2000 “Outstanding Student” (Alumno Destacado). Top 5% of the Mathematical and Physical Sciences Division (FCFM) undergraduate students at Universidad de Chile are selected in this category each year.

PUBLICATIONS

32 peer-reviewed publications; sum of ISI citations (using all databases): 2104; h-index: 19.¹

† Corresponding author; * Equal contributions; § Undergraduate students from Sotomayor Laboratory

RESEARCH PAPERS

- (24) A. Jaiganesh, P. De-la-Torre, A. A. Patel[§], D. J. Termine[§], F. Velez-Cortes[§], C. Chen[§], M. Sotomayor[†]. “Zooming in on cadherin-23: Structural diversity and potential mechanisms of inherited deafness”. *Structure*, in press, 2018.
- (23) T. Fecker*, P. Galaz-Davison*, F. Engelberger, M. Sotomayor[†], L. P. Parra[†], C. A. Ramírez-Sarmiento[†]. “Active Site Flexibility as a Hallmark for Efficient PET-Degradation by *I. sakaiensis* PETase”. *Biophysical Journal*, 114:1302-1312, 2018.
- (22) Y. Narui, M. Sotomayor[†]. “Tuning Inner-Ear Tip-Link Affinity Through Alternatively Spliced Variants of Protocadherin-15”. *Biochemistry*, 57:1702-1710, 2018.
- (21) D. Choudhary, A. Kumar, T. J. Magliery, M. Sotomayor[†]. “Using thermal scanning assays to test protein-protein interactions of inner-ear cadherins”. *PLoS One*, 12(12):e0189546, 2017.
- (20) R. E. Powers, R. Gaudet[†], M. Sotomayor[†]. “A partial calcium-free linker confers flexibility to inner-ear protocadherin-15”. *Structure*, 25:482-495, 2017.

¹ Number of citations - May 2018.

- (19) R. Araya-Secchi, B. L. Neel, M. Sotomayor[†]. "An elastic element in the protocadherin-15 tip link of the inner ear". *Nature Communications*, 7:13458, 2016 (ISI 3)¹.
- (18) S. R. Cooper, J. D. Jontes[†], M. Sotomayor[†]. "Structural determinants of adhesion by protocadherin-19 and implications for its role in epilepsy". *eLife*, 5:e18529, 2016 (ISI 9)¹.
- (17) M. A. Koussa, M. Sotomayor, W. Wong[†]. "Protocol for sortase-mediated construction of DNA-protein hybrids and functional nanostructures" *Methods*, 67:134-141, 2014 (ISI 9)¹.
- (16) R. Geng, M. Sotomayor, K. J. Kinder, S. R. Gopal, J. Gerka-Stuyt, D. H.-C. Chen, R. E. Hardisty-Hughes, G. Ball, A. Parker, R. Gaudet, D. Furness, S. D. M. Brown, D. P. Corey, K. N. Alagramam[†]. "Noddy, a mouse harboring a missense mutation in protocadherin-15, reveals the impact of disrupting a critical interaction site between tip-link cadherins in inner-ear hair cells" *The Journal of Neuroscience*, 33:4395-4404, 2013 (ISI 13)¹. Recommended by F1000Prime.
- (15) M. Sotomayor, W. A. Weihofen, R. Gaudet[†], and D. P. Corey[†]. "Structure of a Force-Conveying Cadherin Bond Essential for Inner-Ear Mechanotransduction" *Nature*, 492:128-132, 2012 (ISI 61)¹.
- (14) H. Inada, E. Procko, M. Sotomayor, R. Gaudet[†]. "Structural and biochemical consequences of disease-causing mutations in the ankyrin repeat domain of the human TRPV4 channel" *Biochemistry*, 51:6195-6206, 2012 (ISI 32)¹. Recommended by F1000Prime.
- (13) J. Gumbart, F. Khalili-Araghi, M. Sotomayor, and B. Roux[†]. "Constant electric field simulations of the membrane potential illustrated with simple systems" *BBA – Biomembranes*, 1818:294-302, 2012 (ISI 58)¹.
- (12) R. Gamini, M. Sotomayor, C. Chipot, and K. Schulten[†]. "Cytoplasmic domain filter function in the mechanosensitive channel of small conductance" *Biophysical Journal*, 101:80-89, 2011 (ISI 16)¹.
- (11) D. Asenjo, F. Lund[†], S. Poblete, R. Soto, and M. Sotomayor. "Characterization of the melting transition in two dimensions at vanishing external pressure using molecular dynamics simulations" *Physical Review B*, 83:174110, 2011 (ISI 1)¹.
- (10) M. Sotomayor*, W. A. Weihofen*, R. Gaudet[†], and D. P. Corey[†]. "Structural Determinants of Cadherin-23 Function in Hearing and Deafness" *Neuron*, 66:85-100, 2010 (ISI 69)¹. Cover article. Recommended by F1000Prime.
- (9) V. Vasquez, M. Sotomayor, J. Cordero-Morales, K. Schulten, and E. Perozo[†]. "A structural mechanism for MscS gating in lipid bilayers" *Science*, 321:1210-1214, 2008 (ISI 115)¹.
- (8) M. Sotomayor and K. Schulten[†]. "The Allosteric Role of the Ca²⁺ Switch in Adhesion and Elasticity of C-Cadherin" *Biophysical Journal*, 94:4621-4633, 2008 (ISI 65)¹.
- (7) B. Lim*, E. H. Lee*, M. Sotomayor, and K. Schulten[†]. "Molecular basis of fibrin clot elasticity" *Structure*, 16:449-459, 2008 (ISI 77)¹.
- (6) V. Vasquez, M. Sotomayor, D. Marien Cortes, B. Roux, K. Schulten, and E. Perozo[†]. "Three dimensional architecture of membrane-embedded MscS in the closed conformation" *Journal of Molecular Biology*, 378:55-70, 2008 (ISI 51)¹.

- (5) M. Sotomayor*, V. Vasquez*, E. Perozo, and K. Schulten†. "Ion Conduction through MscS as Determined by Electrophysiology and Simulation" *Biophysical Journal*, 92:886-902, 2007 (ISI 89)¹.
- (4) M. Sotomayor*, T. A. van der Straaten*, U. Ravaioli, and K. Schulten†. "Electrostatic Properties of the Mechanosensitive Channel of Small Conductance MscS" *Biophysical Journal*, 90:3496-3510, 2006 (ISI 40)¹.
- (3) M. Sotomayor, D. P. Corey†, and K. Schulten†. "In Search of the Hair-Cell Gating Spring: Elastic Properties of Ankyrin and Cadherin Repeats" *Structure* 13:669-682, 2005 (ISI 183)¹.
- (2) M. Sotomayor and K. Schulten†. "Molecular Dynamics Study of Gating in the Mechanosensitive Channel of Small Conductance MscS" *Biophysical Journal* 87:30503065, 2004 (ISI 119)¹.
- (1) C.J. Clarke†, A. Gendrin, and M. Sotomayor. "The dispersal of circumstellar discs: the role of the ultraviolet switch" *Monthly Notices of the Royal Astronomical Society* 328:485-491, 2001 (ISI 309)¹.

REVIEWS & BOOK CHAPTERS

- (8) A. Jaiganesh, Y. Narui, R. Araya-Secchi, M. Sotomayor†. "Beyond Cell-Cell Adhesion: Sensational Cadherins for Hearing and Balance" *CSH Perspectives in Biology, Cell-Cell Junctions*, 2017.
- (7) M. Sotomayor†, R. Gaudet†, D. P. Corey†. "Sorting Out a Promiscuous Superfamily: Towards Cadherin Connectomics" *Trends in Cell Biology*, 24:524-536, 2014 (ISI 26)¹.
- (6) E. H. Lee, J. Hsin, M. Sotomayor, G. Comellas, and K. Schulten†. "Discovery through the computational microscope" *Structure*, 17:1295-1306, 2009 (ISI 139)¹.
- (5) F. Khalili-Araghi, J. Gumbart, P. Wen, M. Sotomayor, E. Tajkhorshid, and K. Schulten†. "Molecular dynamics simulations of membrane channels and transporters" *Current Opinion in Structural Biology*, 19:128-37, 2009 (ISI 135)¹.
- (4) M. Sotomayor and K. Schulten†. "Single-Molecule Experiments *in Vitro* and *in Silico*" *Science*, 316:1144-1148, 2007 (ISI 386)¹.
- (3) M. Gao, M. Sotomayor, E. Villa, E. Lee, and K. Schulten†. "Molecular Mechanisms of Cellular Mechanics" *Physical Chemistry-Chemical Physics*, 8:3692-3706, 2006 (ISI 47)¹.
- (2) E. Tajkhorshid, J. Cohen, A. Aksimentiev, M. Sotomayor, and K. Schulten†. "Towards understanding membrane channels" in *Bacterial ion channels and their eukaryotic homologues*, Boris Martinac and Andrzej Kubalski, editors, pp. 153–190. ASM Press, Washington, DC, 2005 (ISI 11)¹.
- (1) D.P. Corey† and M. Sotomayor. "Tightrope act" *Nature* 428:901-902, 2004 (ISI 41)¹.

PRESENTATIONS

- "Molecular Mechanics of Hearing". *Bollum Symposium in Chemical and Structural Biology, The University of Minnesota*, 2018, Minneapolis, USA.
- "Inner-Ear Sensory Perception and Brain Wiring Enabled by Exceptional Cadherins". *Computational*

Neuroscience Seminar Series, The University of Chicago, 2018, Chicago, USA.

- "Molecular Mechanics of Hearing". *Department of Physics and Astronomy Seminar Series, Iowa State University, 2017, Ames, USA.*
- **"Sound Perception and Brain Wiring Enabled by Exceptional Cadherins". *Society for Neuroscience Annual Meeting, 2017, Washington, DC, USA.***
- "Large-Scale Molecular Dynamics Simulations of Cadherin Complexes" *Klaus Schulten Memorial Symposium, 2017, Urbana, USA.*
- "Structural Biology at Ohio State and the Biochemistry of Hearing" *First OSU/PUC Interdisciplinary Symposium, Pontificia Universidad Católica, 2017, Santiago, Chile.*
- "Strings Attached: Sound Perception and Brain Wiring Enabled by Cadherins". *Cellular, Molecular & Biochemical Sciences Training Program Annual Symposium, The Ohio State University, 2017, Ohio, USA.*
- **"Strings Attached: Sound Perception and Brain Wiring Enabled by Cadherins". *American Society for Biochemistry and Molecular Biology Annual Meeting, 2017, Chicago, Illinois, USA.***

- "Strings Attached: Sound Perception, Brain Wiring, and Epithelial Morphogenesis Enabled by Cadherins". *CBC Seminar Series, The Ohio State University, 2016, Ohio, USA.*
- "Strings Attached: Sound Perception and Brain Wiring Enabled by Cadherins". *Pharmacology Lecture Series, Case Western Reserve University, 2016, Ohio, USA.*
- "Modeling the Molecular Mechanics of Hearing". *47th Central Regional Meeting, American Chemical Society, 2016, Kentucky, USA.*
- "Mechanisms and Mechanosensitivity: Exceptional Cadherins for Hearing, Balance & Beyond". *Department of Biology Seminar Series, University of Toledo, 2016, Ohio, USA.*
- "Mechanisms and Mechanosensitivity: Exceptional Cadherins for Hearing, Balance & Beyond". *Physiology Seminar Series at the University of Kentucky, 2016, Kentucky, USA.*
- "Molecular Mechanics and Biochemistry of Hearing". *Indiana State University Department of Chemistry and Physics Seminar Series, 2016, Terre Haute, USA.*
- "Mechanisms and Mechanosensitivity: Exceptional Cadherins for Hearing, Balance & Beyond". *Ohio State University Pharmacology and Pharmaceuticals Seminar Series, 2016, Columbus, USA.*

- "Modeling the Molecular Mechanics of Hearing". *Ohio State University Applied Math Seminar, 2015 Columbus, USA.*
- **"Mechanisms and Mechanosensitivity: Exceptional Cadherins for Hearing and Balance". *Society for Neuroscience's 45th Annual Meeting, 2015, Chicago, Illinois, USA.***
- "Challenges and Opportunities for Biomolecular Modeling". *Midwest Computational Biomolecular Modeling Symposium, 2015, Urbana, USA.*
- "Life Under Tension: Exceptional Cadherins for Hearing and Balance". *OSU Life Sciences Interdisciplinary Graduate Program Symposium, 2015, Columbus, USA. Invited by students.*
- "Mechanisms and Mechanosensitivity: Inner-Ear Cadherins Gone Wild". *Georgia Tech Soft Condensed Matter and Biophysics Seminar, 2015, Atlanta, USA.*
- "Life under Tension: Molecular Mechanisms of Mechanosensation". *Georgia Tech Molecular Biophysics Seminar, 2015, Atlanta, USA. Invited by students.*
- **"Mechanisms and Mechanosensitivity: Exceptional Cadherins for Hearing and Balance". *Force-Gated Ion Channels, 2015, HHMI Janelia Farm, USA.***
- **"Mechanisms and Mechanosensitivity: Exceptional Cadherins for Hearing and Balance". *Biophysical Society 59th Annual Meeting, 2015, Maryland, USA.***

- "Life under tension: imaging and stretching a molecular handshake essential for hearing and balance". *Nexos 2014, Philadelphia, USA.*
- **"Computational Exploration of Single-Protein Mechanics by Steered Molecular Dynamics". *Mechanics of Hearing, 12th International Workshop, 2014, Cape Suonio, Greece.***
- "Molecular Mechanics of Inner-Ear Tip Links". *IUPUI Department of Physics Colloquium, 2014, Indianapolis, USA.*
- **"Molecular Mechanics of Hair Cell Tip Links". *37th Midwinter Research Meeting, Association for Research in Otolaryngology, 2014, San Diego, USA.***
- **"Molecular Mechanisms of deafness mutations disrupting tip-link function in hair-cell mechanotransduction". *Biophysical Society, 58th Annual Meeting 2014, San Francisco, USA.***

- “Mechanisms and Mechanosensitivity: A Cadherin Handshake for Hearing and Balance”. *McGill University, Physiology Friday Seminar Series*, 2013, Montreal, Canada.
- “Mechanisms and Mechanosensitivity: Inner-Ear Cadherins Gone Wild”. *UIUC Theoretical and Computational Biophysics Group Seminar Series*, 2013, Urbana, USA.
- “Mechanisms and Mechanosensitivity: A Cadherin Handshake for Hearing and Balance”. *OSU Biophysics Graduate Program Seminar Series*, 2013, Columbus, USA.
- **“Molecular Mechanisms of Deafness Mutations Disrupting Tip-Link Function in Hair Cell Transduction”**. *18th International Symposium on Ca²⁺-Binding Proteins and Ca²⁺ Function in Health and Disease*, 2013, Kiruna, Sweden.
- **“Molecular Mechanisms of Deafness Mutations Disrupting Tip-Link Function in Hair Cell Transduction”**. *36th Midwinter Research Meeting, Association for Research in Otolaryngology*, 2013, Baltimore, USA.
- “Modelos, Estructuras y Dinámica de Proteínas Esenciales para la Audición y el Equilibrio”. *Universidad Adolfo Ibañez*, 2013, Santiago, Chile.
- “De las estrellas a la biofísica de proteínas: haciendo una carrera científica interdisciplinaria al andar”. *Universidad de Talca*, 2012, Talca, Chile.
- “Structures and Simulated Dynamics of a Force-Conveying Cadherin Bond Essential for Inner-Ear Mechanotransduction”. *NIDCD – NIH*, 2012, Bethesda, USA.
- **“A Cadherin Handshake for Hearing and Balance”**. *Exciting Biologies – Forces in Biology*, 2012, Dublin, Ireland.
- “Estructuras y Dinámica de Proteínas Esenciales para la Audición y el Equilibrio”. *Universidad Andrés Bello*, 2012, Santiago, Chile.
- “Estructuras y Dinámica de Proteínas Esenciales para la Audición y el Equilibrio”. *Universidad de Chile*, 2012, Santiago, Chile.
- “A Cadherin Handshake for Hearing and Balance”. *Boston Area Young Chilean Investigators Symposium*, 2012, Boston, USA.
- “Molecular Mechanisms Underlying Function of Mechanosensitive Channels and Mechanical Proteins”. *Georg-August-Universität*, 2012, Göttingen, Germany.
- “Life under Tension: Molecular Mechanics of Sensory Transduction in the Inner Ear”. *Delft University of Technology*, 2012, Delft, The Netherlands.
- “Life under Tension: Molecular Mechanics of Sensory Transduction in the Inner Ear”. *Stanford University*, 2012, Stanford, USA.
- “Life under Tension: Molecular Mechanics of Sensory Transduction in the Inner Ear”. *Johns Hopkins University*, 2012, Baltimore, USA.
- “Life under Tension: Molecular Mechanics of Inner-Ear Cadherins”. *UT Southwestern*, 2012, Dallas, USA.
- “Life under Tension: Molecular Mechanics of Inner-Ear Cadherins”. *The Ohio State University*, 2012, Columbus, USA.
- **“A Cadherin Handshake for Hearing and Balance”**. *Mechanical Forces in Development*, 2011, Boston, USA.
- “Molecular Mechanics of Tip-Link Cadherins”. *Eaton-Peabody Laboratories Seminar*, 2011, Boston, USA.
- **“Structural Determinants of Tip-Link-Cadherin Function in Hearing and Deafness”**. *17th International Symposium on Ca²⁺-Binding Proteins and Ca²⁺ Function in Health and Disease*, 2011, Beijing, China.
- **“Structural Determinants of Tip-Link-Cadherin Function in Hearing and Deafness”**. *Society for Neuroscience’s 40th Annual Meeting*, 2010, San Diego, California, USA.
- **“Structure, Dynamics, and Elasticity of Cadherin-23 Repeats Involved in Hereditary Deafness”**. *49th Annual Meeting of the American Society for Cell Biology*, 2009, San Diego, California, USA.
- **“Conformational Transitions Underlying Tension-dependent Gating in Prokaryotic Mechanosensitive Channels”**. *Gordon Research Conference on Cellular Osmoregulation and Mechanotransduction*, 2009, Biddeford, Maine, USA.
- **“Cadherin Dynamics and Molecular Mechanisms of Hereditary Deafness”**. *32nd Midwinter Research Meeting, Association for Research in Otolaryngology*, 2009, Baltimore, Maryland, USA.
- **“Cadherin Dynamics and Molecular Mechanisms of Hereditary Deafness”**. *Force-Gated Ion Channels: From Structure to Sensation*, 2008, HHMI Janelia Farm Research Campus, USA.

- “The Allosteric Role of the Ca²⁺ Switch in Adhesion and Elasticity of C-Cadherin”. *20th CMB–MB Annual Research Symposium*, 2007, Urbana, USA.
- “Ion conduction through the Mechanosensitive Channel of Small Conductance MscS”. *CECAM meeting Ionic Transport: from Nanopores to Biological Channels*, 2007, Lyon, France.
- “Life under Tension: Molecular Mechanisms of Mechanosensitive Channels and Mechanical Sensors”. *MCTP/ICAM Workshop Mechanics of Life: From Biomolecules to Molecular Machines*, 2007, Ann Arbor, Michigan, USA.
- “Tertiary and Secondary Structure Elasticity of Repeat Proteins”. *87th International Bunsen Discussion Meeting on Mechanically Induced Chemistry—Theory and Experiment—* 2005, Tutzing, Germany.
- **“Mechanisms of Mechanosensitive Channels and Mechanical Sensors Studied by Molecular Dynamics Simulations”**. *Gordon Research Conference on Mechano-transduction and Gravity Signaling in Biological Systems*, 2005, Biddeford, Maine, USA.
- “The Molecular Basis of Hearing”. *4D Nanostructure Lecture Series*, 2005, Beckman Institute, Urbana, Illinois, USA.

SUMMER SCHOOLS & TRAINING WORKSHOPS

2017	SBGrid Workshop on Electron Microscopy Data Processing (RELION 2.0)
2009	Rapid Data Collection & Structure Solving at the NSLS: A Practical Course in Macromolecular X-Ray Diffraction Measurement (April 19-24) <i>Brookhaven National Laboratory</i> , NY, USA.
2007	Biology of the Inner Ear: Experimental and Analytical Approaches (August 19-September 1) <i>Marine Biology Lab</i> , Woods Hole, MA, USA.
2000	Particle Physics and Astronomy International Undergraduate Summer School (IUSS, 24 June to 4 August) <i>University of Cambridge & PPARC</i> , UK. Supervised by Dr. C. J. Clarke.
1998	Astronomy Summer School, Las Campanas Observatory. <i>Fundación Andes-Carnegie Institution of Washington</i> .

TEACHING

- 2016 **Project leader. Ohio Supercomputer Center Summer Institute for High School Students.**
- 2015 – 2017 Instructor. Graduate Course “Quantum Mechanics and Spectroscopy” OSU, USA.
- 2015 Instructor. Graduate Course “Introduction to Electronic Structure” OSU, USA.
- 2014 Instructor & Organizer, Biochemistry Training Day “Hands-on Introduction to Protein Simulations”. London, UK.
- 2014 – 2018 **Instructor. Undergraduate Course “Physical Chemistry – Physical Biochemistry II” OSU, USA.**
- Co-author of NAMD, VMD, Membrane Proteins, and Ion Conduction Tutorials. <http://www.ks.uiuc.edu/Training/TutorialsOverview/index.html>
- Co-author of Water Case Study. <http://www.ks.uiuc.edu/Training/CaseStudies/index.html>
- 2003 – 2007 Instructor. Theoretical and Computational Biophysics School (Urbana, 2003; Boston, 2004; Chicago, 2005; Talca–Chile, 2006; Bethesda, 2007). <http://www.ks.uiuc.edu/Training/>
- 2002 Teaching Assistant (Grader). Undergraduate Course “Quantum Physics I” UIUC.
- 2001 Teaching Assistant. Undergraduate Course “Quantum Mechanics” University of Chile.
- 2000 Teaching Assistant. Undergraduate Course “Electromagnetism” University of Chile.
- 1999 – 2000 Teaching Assistant. Undergraduate Course “Modern Physics” University of Chile.
- 1999 Teaching Assistant. Undergraduate Course “Dynamical Systems” (Mechanics II), University of Chile.

RESEARCH GROUP MEMBERS (current in *italics*)

Nicholas Alcorn (undergraduate student)	<i>Jeffrey Lotthammer</i> (undergraduate student)
Pranay Arora (undergraduate student)	<i>Debadrita Modak</i> (graduate student)
Raúl Araya-Secchi (postdoc)	<i>Yoshie Narui</i> (postdoc)
<i>Marissa Boyer</i> (graduate student)	<i>Brandon Neel</i> (graduate student)
Conghui (Claire) Chen (undergraduate student)	<i>Collin Nisler</i> (graduate student)
<i>Deepanshu Choudhary</i> (graduate student)	<i>Jesse Sandhu</i> (undergraduate student)
Sharon Cooper (graduate student)	<i>Joseph Sudar</i> (undergraduate student)

Pedro De-la-Torre Marquez (postdoc)
Melvyn Drag (master student)
Pablo Galaz-Davison (visiting scholar)
Michelle Gray (graduate student)
Avinash Jaiganesh (graduate student)
Zachary Johnson (undergraduate student)
Deryanur Kilic (visiting scholar)
Carissa Klanseck (undergraduate student)

Leah Pastor (undergraduate student)
Aniket Patel (undergraduate student)
Elakkiya Tamilselvan (graduate student)
Domenic Termine (undergraduate student)
Adrienne Thornburg (graduate student)
Florencia Velez-Cortes (undergraduate student)
Sanket Walujkar (graduate student)
Lahiru Wimalasena (undergraduate student)

NOTABLE TRAINEES ACCOMPLISHMENTS

2018 Fellowship – Molecular Biophysics Training Program – Marissa Boyer
2018 Molecular Biophysics Symposium Best Oral Presentation Award – Collin Nisler
2018 Mayers summer research scholarship – Leah Pastor
2018 Mayers summer research scholarship – Joseph Sudar
2018 Mayers summer research scholarship – Jeffrey Lotthammer
2018 Hayes Forum, Biological Sciences Division, 1st place – Debadrita Modak
2018 Student Research Achievement Award Poster Competition, Biophysical Society – Debadrita Modak
2018 Education Committee Travel Award, Biophysical Society – Debadrita Modak
2017 Devon Walter Meek Lecture Poster Presentation, 3rd place – Deepanshu Choudhary
2017 Fellowship – Molecular Biophysics Training Program – Collin Nisler
2017 Fellowship – Cellular, Biochemical, and Molecular Sciences Training Program – Brandon Neel
2017 Pelotonia postdoctoral fellowship – Pedro De-La-Torre
2017 Pelotonia graduate fellowship – Debadrita Modak
2017 College of Engineering Undergraduate Summer Research Scholarship – Joseph Sudar
2016 Association for Research in Otolaryngology Travel Grant Award – Yoshie Narui
2016 Mayers summer research scholarship – Lahiru Wimalasena
2016 First place and “outstanding oral presentation” OSU IGP Symposium – Avinash Jaiganesh
2016 College of Engineering Undergraduate Summer Research Scholarship – Pranay Arora
2016 Denman Undergraduate Research Forum, 1st place – Lahiru Wimalasena
2016 NSF Graduate Fellowship honorable mention – Collin Nisler
2016 NSF Graduate Fellowship – Florencia Velez-Cortes
2016 Seilhamer Fellowship – Sharon Cooper
2015 Mayers summer research scholarship – Lahiru Wimalasena
2015 Mayers summer research scholarship – Domenic Termine
2015 Denman Undergraduate Research Forum, honorary mention – Aniket Patel
2015 Denman Undergraduate Research Forum, 3rd place – Zachary Johnson
2015 Denman Undergraduate Research Forum, 1st place – Lahiru Wimalasena
2015 Biophysical Society CPOW travel award – Yoshie Narui
2014 Pelotonia postdoctoral fellowship – Raúl Araya-Secchi

SERVICE

Admissions Committee – Chemistry & Biochemistry PhD program 2013-2017. Reviewed files from biological-division applicants and provided evaluations.

Coordinator of research focus group (RFG) seminar series – Chemical and Structural Biology and Biophysics 2014-2019. Organized schedule for RFG seminars and Research in Progress talks (CHEM8896).

Data Analytics Search Committee 2014-2015. Reviewed application material for a junior faculty position in the Department of Chemistry and Biochemistry. Helped host and evaluate candidates visiting during January 2015.

Temporary Advisor – Mentoring and guidance for new Chemistry & Biochemistry Ph.D students (biological and physical chemistry divisions), 2015-2016.

First Year Oral Exam Committee – Physical Chemistry Division 2015, 2017; Biochemistry Division 2017. Evaluated first year student's progress and whether they are ready to proceed with further requirements

of PhD program.

Doctoral and Master's Committees – Served in >30 committees in various graduate programs at OSU.

Recruiting Committee – Ohio State Biochemistry Program 2017-2019.

Recruiting Committee – Department of Chemistry and Biochemistry Graduate Program 2018-2019.

REVIEWER

Biophysical Journal; The European Physical Journal E -Soft Matter; Journal of Molecular Graphics and Modelling; Molecular Cell; Nature Structural and Molecular Biology; The Journal of Physical Chemistry; Structure; Journal of Molecular Biology; Nature Communications; Nature Neuroscience; Science; Biomechanics and Modeling in Mechanobiology; PLOS Computational Biology; Nature; eLife; PNAS; NSF; Wellcome Trust.

GRANTS/FUNDING

Principal Investigator

- 2018 – 2021 **"Evolutionary mechanics of adhesion complexes" Human Frontier Science Program with Vincent Lynch at U. Chicago and Felix Rico at INSERM (\$900,000).**
- 2016 – 2021 **"Nanomechanics of Inner-Ear Hair-Cell Transduction" NIH NIDCD R01 DC015271 (Direct Costs: \$1,062,500).**
- 2016 – 2019 "Molecular Basis of Sound Perception, Brain Wiring, and Gut Morphogenesis" Advanced Photon Source General User Proposal APS-GUP-49774/59251 for beam time access (Argonne National Laboratory).
- 2014 – 2019 "Molecular Simulations of Cell Adhesion and Sound Transduction Complexes" National Science Foundation XSEDE grant MCB140226.
- 2014 – 2019 "Molecular Mechanisms of Cadherin Dynamics and Force Transduction" Ohio Supercomputer Center grant OSC PAS1037.
- 2016 – 2019 "Molecular Dynamics Simulations of Adherens Junctions" GLCPC Award for computing time on Blue Waters.
- 2016 – 2017 "Bending and Refolding of an Atypical Cadherin Fragment Involved in Inner-Ear Mechanotransduction" PSC/NRC Award for computing time on Anton 1 (PSCA15075P).
- 2015 – 2017 **"Stretching and Sorting Life: Structural Determinants of Mechanosensation and Cadherin Connectomics" Alfred P. Sloan Fellowship in Neuroscience FR-2015-65794 (\$50,000).**
- 2012 – 2017 **"Force Spectroscopy and Structural Biology of Hair-Cell Tip Links," NIH Pathway to Independence Award K99/R00 DC012534 (Direct Costs: \$698,744).**
- 2014 – 2016 "Towards a structural model of inner ear tip links" Advanced Photon Source General User Proposal APS-GUP-40277 for beam time access (Argonne National Laboratory).

Co-Principal Investigator / Subawards

- 2018 – 2021 **"Molecular basis of brush border assembly" NIH NIDDK R01 DK095811, PI Matthew J. Tyska at Vanderbilt University, sub award leader – M. Sotomayor (Total Costs OSU: \$521,031).**
- 2010 – 2012 "Resolving the Molecular Mechanisms of Calcium Binding to Cadherins Involved in Hearing and Deafness," 200,000 SUs. NRBS/PSC PSCA00074P & PSCA10100P for Supercomputer time on DEShaw's Anton, with D. P. Corey and R. Gaudet.
- 2008 – 2012 "Molecular Mechanisms of Hereditary Deafness and Pain Sensation," 4,482,000 SUs. NSF TRAC MCB080015 for Supercomputer time with D. P. Corey and R. Gaudet.

Contributed to Grants:

- Molecular Basis of Inherited Deafness (NIH 1 R01 DC002281).
- Mechanisms of Membrane Proteins through In Situ Modeling (NIH 1 R01 GM067887).
- Molecular Mechanisms of Cellular Mechanics (NIH 1 R01 GM073655).
- Simulations of Supramolecular Biological Systems, 2004-2007 (NSF LRAC MCA93S028).
- Renewal of NIH Resource for Macromolecular Modeling and Bioinformatics (NIH P41-RR05969).

SOFTWARE

VMD Autoionize GUI; VMD Mutator plugin; VMD DataImport plugin;
Assistance in NAMD implementation and validation of CMAP