

# CURRICULUM VITAE

## Sharona E. Gordon, Ph.D.

### **Education:**

- 1990 Sc.B. *With Honors*, Neural Sciences, Brown University, Providence, Rhode Island
- 1993 Ph.D. Physiology, Brown University, Providence, Rhode Island

### **Graduate and Postgraduate Experience:**

- 1990-1993 Graduate study with Dr. Anita Zimmerman. Using the patch-clamp technique, I discovered that the cGMP-gated ion channel in rod photoreceptors can be modulated by at least three different systems.
- 1993-1997 Senior Fellow, Howard Hughes Medical Institute, Department of Physiology and Biophysics, University of Washington. My postdoctoral work with Dr. William Zagotta focused on the structure and function of cyclic nucleotide-gated channels involved in sensory transduction.

### **Faculty Positions Held:**

- 1998-1999 Assistant Professor of Physiology, University of Texas Southwestern Medical Center at Dallas.
- 1999-2003 Assistant Professor, Department of Ophthalmology (primary); University of Washington, Seattle.
- 1999-2003 Assistant Professor, Department of Physiology and Biophysics (joint); University of Washington, Seattle.
- 2003-2005 Assistant Professor, Department of Physiology and Biophysics; University of Washington, Seattle.
- 2005-2013 Associate Professor, Department of Physiology and Biophysics, University of Washington, Seattle.
- 2013-present Professor, Department of Physiology and Biophysics, University of Washington, Seattle.

### **Teaching Experience:**

- 1998-1999 Teaching fundamentals of the visual system to first-year medical students, properties of excitable membranes to first-year graduate students, and leading discussion groups on genetic techniques to first-year graduate students at the University of Texas Southwestern Medical Center at Dallas.
- 2001 P-Bio 547: A journal club course for advanced graduate students (2 2-hour sessions)
- 2001 Basic Science Grand Rounds - Ophthalmology
- 2001-present Conjoint 531/PBio 504/Nbeh 504: "Cell Signaling". A course in signal transduction for first-year graduate students (4 50-minute lectures)
- 2001 P-Bio 512: A Physiology survey course for second-year graduate students (1 2-hour session)

- 2003 Basic and Clinical Science Course: Retina-Vitreous. A course for Ophthalmology Residents and Medical Students. Organized by Dr. John Saari. (2 1-hour lectures)
- 2004 P-Bio/NeuBeh 557 "Ion Channel Gating." A course for graduate students on fundamental concepts in gating of voltage-gated and ligand-gated ion channels. A 5-week mini-course (1 credit) co-taught with Dr. William Zagotta.
- 2004-2009 NBio 402 "Neuropathophysiology." An undergraduate course on diseases of the nervous system. Required for seniors majoring in Neurobiology. 3 Credits.
- 2014-present Developed and teaching a 2-year professional development program for postdoctoral scholars called "Hit the Ground Running: Preparing Postdoctoral Scholars for Academic Career Success."

### ***Trainees:***

Undergraduate research students: Rachel Ono, Ivy Butler, Joshua Burnell, Meenakshi Vanka, Alex Pazevic, Ruian Wang, Erin Williams, Charles Williams, Nicolas Basil, Nicolas Reyes, Moshe Gordon, Ramkumar Rajanbabu, Maianna Dematteis, Luke Cody

Neurobiology & Behavior rotations students: Alex Stein, Robert Silverstein, Andrea McQuate, Rich Pang

Physiology & Biophysics rotations students: David George, Anne Carlson, Li Hua, Sean Slee, Jeremy Cooper, Margaret Hamner, Andrew Franck, Grant Storey, Juan Angueyra, Aaron Williams

Biophysics rotation students: Kiri Choi

Senior Fellows: Iman Shammatt (Professor, Ahfad University for Women, Omdurman, Sudan), Tamara Rosenbaum (Principal Investigator, Instituto de Fisiologia Celular, UNAM, Mexico), Rodolfo Madrid (Assistant Professor, University of Chile), Ariela Gordon-Shaag (Director, Optometry Graduate Program, Hadassah College, Jerusalem), Guangyu Wang, Rebecca Klein (Investigator, Merck), Carmen Ufret-Vincenty (Seattle Children's Research Institute), Jose Mercado, Marcus Collins (Microsoft Corp), Ivan F. Gonzalez, Eric Senning (Assistant Professor, UT-Austin), Thomas Portet (Sackler Scholar; Microsoft Corp), Gilbert Martinez, Mario Rosasco (Seattle Benaroya Research Institute)

Past Graduate Students: Li Hua (Physiology & Biophysics); Alex Stein (Neurobiology & Behavior)

Current Graduate Students: Anastasiia Stratiievaska, Gabriela Bergollo

### ***Awards:***

- 1998 Young Investigator Award from Federation of American Societies of Experimental Biology
- 1990 National Science Foundation Graduate Research Fellowship, awarded for 3 years
- 1990 Elected to Sigma Xi, scientific research society
- 1992 National Eye Institute Travel Fellowship Grant
- 1993 Sigma Xi Award for Excellence in Research
- 1993 Biophysical Society Award for best student poster, Membrane Biophysics Subgroup
- 1999-2003 Jules and Doris Stein Research to Prevent Blindness Professor

2013

Science in Medicine Lecture, University of Washington

**Organizations:**

Biophysical Society  
 Society of General Physiologists  
 Society for Neuroscience  
 Association for Research in Vision and Ophthalmology

**Editorial Responsibilities:**

2014- Editor-in-Chief, *Journal of General Physiology*  
 2011-2014 Associate Editor, *Journal of General Physiology*  
 2000-2011 Editorial Board, *Journal of General Physiology*  
 2010 Guest Editor for Perspectives Issue of *Journal of General Physiology*  
 2008-2015 Editorial Board, *Channels*  
 2007-2010 *Faculty of 1000*

*Ad Hoc* reviewer for: *Nature Neuroscience*, *Neuron*, *Biophysical Journal*, *Journal of Neuroscience*, *Journal of Neurophysiology*, *Visual Neuroscience*, *FEBS letters*, *Journal of Physiology*, *Molecular Biology of the Cell*, *British Journal of Pharmacology*, *Cell*, etc.

**Special National Responsibilities**

2014-2017 Chair, Board of Scientific Counselors, National Heart Lung Blood Institute, NIH  
 2014-2017 Member, Public Affairs Advisory Committee, American Society for Biochemistry and Molecular Biology  
 2014- Member, the Dana Alliance for Brain Initiatives  
 2013-2014 Member, Board of Scientific Counselors, National Heart Lung Blood Institute, NIH  
 2007-2011 Chartered member, Neurotransmitter Transporters, Receptors, and Channels study section, NIH  
 2011 *Ad Hoc* reviewer, Biology and Diseases of the Posterior Eye study section, NIH  
 2005-2007 *Ad Hoc* Reviewer for FO3B Study Section (Individual Training Grants, Neuroscience), NIH  
 2008-2010 Elected Secretary of the Society of General Physiology  
 2012 Program Chair, Biophysical Society Meeting  
 2003-2006 Elected member of Biophysical Society Council  
 2004-2011 Elected Member, Committee on Professional Opportunities for Women, Biophysical Society  
 2006-2007 Elected Member, Nominating Committee, Biophysical Society  
 2012 Elected Member, Nominating Committee, Biophysical Society

***Special Local Responsibilities***

- 2000-2002 Faculty Senate, Group 7 (2 year term)
- 2000-2003 Faculty Council for Research (3 year term)
- 2000-2001 Graduate Program in Neurobiology and Behavior Admissions Committee
- 2001-present Physiology and Biophysics Adjunct/Joint Faculty Committee
- 2002-2004 Co-director, Molecular Techniques Module of the Vision Core Grant
- 2002 Wayne E. Crill Graduate Award committee
- 2003 Graduate Program in Physiology and Biophysics Recruitment Committee (Chair)
- 2003/2004 Physiology and Biophysics Faculty Search Committee
- 2004/2005 Graduate Student Academic Advising/Graduate Program in Physiology and Biophysics
- 2004/2005 Lamport Lecture selection committee
- 2004-present Graduate Program in Physiology and Biophysics Recruitment Committee
- 2005 Hille Lecture selection committee
- 2006 Chair, Hille Lecturer Selection Committee
- 2006-present Graduate Student Progress Committee, Physiology and Biophysics Graduate Program
- 2009-2011 Graduate School Academic Resource Committee, on-call member
- 2014-present Diversity and Inclusion Coordinator, Department of Physiology & Biophysics
- 2015 Member, Faculty Search Committee, Department of Physiology & Biophysics
- 2015-2016 Member, Search Committee for Chair of Biological Structure, School of Medicine

***Selected Invited Lectures***

- 2002 Gordon Research Conference, Ion Channels, Tilton, NH
- 2002 Brown University, Providence, RI
- 2004 Gordon Research Conference, Ion Channels, Tilton, NH
- 2005 University of California, Davis, CA
- 2007 FASEB Conference on Ion Transport, Snowmass, CO
- 2007 Minerva Symposium on TRP Channels, Eilat, Israel
- 2008 Biophysical Society Discussions – Calmodulin Modulation of Ion Channels, Asilomar, CA
- 2008 Symposium on Integrative Membrane Biology, Kobe, Japan
- 2009 UMDNJ New Jersey Medical School, Newark, NJ
- 2009 International Ion Channel Retreat, Vancouver, BC, Canada

- 2010 Gordon Research Conference, Ion Channels, Tilton, NH
- 2010 University of Wisconsin-Madison, WI
- 2010 NEI Workshop on Ocular Pain, Washington, DC
- 2011 National Institute for Environmental Health Sciences, Durham, NC
- 2011 Brown University, Providence, RI
- 2011 University of Texas Health Science Center at San Antonio
- 2011 Kobe University School of Medicine, Kobe, Japan
- 2013 Science in Medicine Lecture, University of Washington, Seattle, WA
- 2013 UW-Kobe University Symposium on Membrane Biology, Seattle, WA
- 2015 Brown University, Providence, RI
- 2015 National Autonomous University of Mexico (UNAM), Mexico City, Mexico
- 2016 Gordon Research Conference, Ion Channels, Mount Holyoke, MA
- 2017 Biophysical Society Meeting, TRP Channel Symposium, New Orleans, LA
- 2017 Seattle Children's Research Institute, Seattle, WA
- 2017 Arizona State University, Tempe, AZ
- 2017 International Ion Channel Conference, Quindao, China
- 2017 IUPS World Congress, TRP Channel Symposium, Rio de Janeiro, Brazil
- 2017 Texas Tech University of Health Sciences, Lubbock, TX
- 2017 University of Colorado School of Medicine, Anschutz, CO

**Current Funding:**

Title of Project: "Inflammatory hyperalgesia mediated by TRPV1, the pepper spray receptor in cornea"

Principal Investigator: Sharona E. Gordon, PhD (PI)

Agency: National Institutes of Health, NEI

Type: RO1, EY017564, 09/01/2006 – 04/30/2018, Renewal Pending

Objectives: Chemical and thermal pain in the cornea is primarily transduced by a calcium- and sodium-permeable ion channel called TRPV1 expressed in nociceptors with cell bodies in the trigeminal ganglia. When injury (including surgery) or illness cause inflammation, the inflammatory process increases the sensitivity of TRPV1 ion channels to painful stimuli, a phenomenon known as inflammatory hyperalgesia. Our long-term goal is to understand the molecular mechanisms mediating inflammatory hyperalgesia, a critical first step in developing more effective pain therapies for corneal injury. In this study, we will focus on the molecular mechanisms of TRPV1 modulation by Nerve Growth Factor (NGF).

Title of Project: Mechanisms of TRPV1 Channel Regulation

Principal Investigator: Sharona E. Gordon, PhD (Dual-PI)

Agency: National Institutes of Health, NIGMS

Type: R01 GM125351, funding approved, pending NGA

Objectives: TRPV1 ion channels mediate the response to painful chemical and thermal stimuli in pain receptor neurons. We will use a number of innovative new techniques which we have developed to probe the mechanisms by which painful stimuli regulate the activity

of these ion channels. We particularly focus on the molecular events that underlie TRPV1 regulation by signaling lipids.

**Bibliography**

1. Gordon SE, Brautigan D, Zimmerman AL. Protein phosphatases modulate the apparent agonist affinity of the light-regulated ion channel in retinal rods. *Neuron* 1992 Oct;9(4):739-48.
2. Gordon SE, Zagotta WN. A histidine residue associated with the gate of the cyclic nucleotide-activated channels in rod photoreceptors. *Neuron* 1995 Jan;14(1):177-83.
3. Gordon SE, Downing-Park J, Zimmerman AL. Modulation of the cGMP-gated ion channel in frog rods by calmodulin and an endogenous inhibitory factor. *J Physiol* 1995 Aug;486 ( Pt 3):533-46.
4. Gordon SE, Zagotta WN. Localization of regions affecting an allosteric transition in cyclic nucleotide-activated channels. *Neuron* 1995 Apr;14(4):857-64.
5. Gordon SE, Downing-Park J, Tam B, Zimmerman AL. Diacylglycerol analogs inhibit the rod cGMP-gated channel by a phosphorylation-independent mechanism. *Biophys J* 1995 Aug;69(2):409-17.
6. Gordon SE, Zagotta WN. Subunit interactions in coordination of Ni<sup>2+</sup> in cyclic nucleotide-gated channels. *Proc Natl Acad Sci U S A* 1995 Oct;92(22):10222-6.
7. Gordon SE, Oakley J, Varnum MD, Zagotta WN. Altered ligand specificity by protonation in the ligand binding domain of cyclic nucleotide-gated channels. *Biochemistry* 1996 Apr;35(13):3994-4001.
8. Fodor AA, Gordon SE, Zagotta WN. Mechanism of tetracaine block of cyclic nucleotide-gated channels. *J Gen Physiol* 1997 Jan;109(1):3-14.
9. Gordon SE, Varnum MD, Zagotta WN. Direct interaction between amino- and carboxyl-terminal domains of cyclic nucleotide-gated channels. *Neuron* 1997 Aug;19(2):431-41.
10. Crary JI, Gordon SE, Zimmerman AL. Perfusion system components release agents that distort functional properties of rod cyclic nucleotide-gated ion channels. *Vis Neurosci* 1998 Nov-Dec;15(6):1189-93.
11. Shammat IM, Gordon SE. Stoichiometry and arrangement of subunits in rod cyclic nucleotide-gated channels. *Neuron* 1999 Aug;23(4):809-19.
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13. Gordon SE. Using state-specific modifiers to study rod cGMP-activated ion channels expressed in *Xenopus* oocytes. *Methods Enzymol* 2000;315:772-85.
14. Gordon SE. "Light" reading: targeting tryptophans in cyclic nucleotide-gated channels. *J Gen Physiol* 2000 Aug;116(2):223-5.
15. Richards M, Gordon S. Cooperativity and cooperation in cyclic nucleotide-gated ion channels. *Biochemistry* 2000 Nov;39(46):14003-11.
16. Rosenbaum T, Gordon SE. Dissecting intersubunit contacts in cyclic nucleotide-gated ion channels. *Neuron* 2002 Feb;33(5):703-13.
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19. Rosenbaum T, Gordon-Shaag A, Munari M, Gordon SE.  $Ca^{2+}$ /calmodulin modulates TRPV1 activation by capsaicin. *J Gen Physiol* 2004 Jan;123(1):53-62.
20. Rosenbaum T, Gordon-Shaag A, Islas LD, Cooper J, Munari M, Gordon SE. State-dependent block of CNG channels by dequalinium. *J Gen Physiol* 2004 Mar;123(3):295-304.
21. Rosenbaum T, Gordon SE. Quickening the pace: looking into the heart of HCN channels. *Neuron* 2004 Apr;42(2):193-6.
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45. Gordon SE. The Junior Faculty Networking Cohort: Filling a gap in support for our community. *J Gen Physiol.* doi: 10.1085/jgp.201711849. PubMed PMID: 28729458; PubMed Central PMCID: PMC5560781. (2017).
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