

72nd Annual SGP Symposium Program, Woods Hole, MA, September 5-9, 2018

WEDNESDAY, SEPTEMBER 5

- 14:00–22:00** **Registration and Room Assignments** (Swope Center, 1st Floor)
- 18:45–19:45** **Buffet Dinner** (Swope Center, Dining Room, 2nd Floor)
- 19:45–20:15** **Opening Remarks** (Lillie Auditorium)
Conference Organizers, José Faraldo-Gómez and Janice L. Robertson
Merritt Maduke, President, Society of General Physiologists
Olaf Andersen & Sharona Gordon, Past and Present Editors in Chief, *JGP*
- 20:15–21:15** **‘Friends of Physiology’ Keynote Lecture** (Lillie Auditorium)
Introduction: Janice Robertson (The University of Iowa)

Christopher Miller (Brandeis University, HHMI)
Biological fluoride transport: surprises in physiology and protein chemistry
- 21:15–23:00** **Mixer** (Swope Center, Meigs Room)

THURSDAY, SEPTEMBER 6

- 07:00–08:00** **Breakfast** (Swope Center, Dining Room)
- 08:15–10:15** **Session I: Somatosensation & Signaling** (Lillie Auditorium)
Chair: Sharona Gordon (University of Washington)
Kenton Swartz (NIH/NINDS) 8:15 am
Sensing and gating mechanisms in TRP channels
Valeria Vásquez (University of Tennessee) 8:45 am
Fine-tuning ion channel gating with dietary fatty acids
Crina Nimigean (Weill Cornell Medical College) 9:15 am
Ligand gating and discrimination in CNG channels
William Zagotta (University of Washington) 9:45 am
Conformational dynamics in ion channel gating
- 10:15 – 10:45** **Break** (Coffee & Snacks)
- 10:45 – 12:45** **Session II: The Intriguing Protein-Lipid Interface** (Lillie Auditorium)
Chair: Jon Sack (University of California - Davis)
Olaf Andersen (Weill Cornell Medical College) 10:45 am
Bilayer-mediated regulation of membrane protein function by small molecules
Short Talk: Arnd Pralle (University of Buffalo) 11:15 am
Quantification of how properties of the actin cortex modulate the dimerization and signaling rates of membrane receptors
Peter Tieleman (University of Calgary) 11:30 am
Computer simulations of complex membranes
Short Talk: Kallol Gupta (Yale University) 12:00 pm
Deconstructing membrane protein interactome through native mass spectrometry
Alessio Accardi (Weill Cornell Medical College) 12:15 pm
Molecular mechanisms of phospholipid scrambling

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THURSDAY, SEPTEMBER 6 (continued)

13:00–14:00 Lunch (Swope Center, Dining Room)

14:00–16:00 Free time

14:00–15:30 Boat trip #1 (Meet in Swope Center Lobby)

15:00–15:45 Yoga session (MBL Club)

16:00–17:00 Panel Discussion (Meigs Room)

Formulating action plans against gender inequality and sexual harassment

Panelists: Ana Fernández-Mariño, Sharona Gordon, Vera Moisenkeeva-Bell, Crina Nimigeau

17:00–18:30 Poster Session A

18:45–19:45 Dinner (Swope Center, Dining Room)

20:00–21:15 Session III: Permeation & Gating (Lillie Auditorium)

Chair: Igor Vorobyov (UC Davis)

Short Talk: Fatemeh Khalili-Araghi (University of Illinois - Chicago) 8:00 pm

Molecular simulations of paracellular ion transport through claudin pores

Short Talk: Juan M. Valdez Cappucino (Rutgers University) 8:15 pm

Experimental and computational experiments on a human Connexin26 mutation (N14K) reveal a key role of the cytosolic domains in hemichannel gating

Short Talk: Anabel Fernández-Mariño (NIH/NINDS) 8:30 pm

Understanding potassium channel architecture and gating

Michael Grabe (University of California - San Francisco) 8:45 pm

An efficient method for calculating current-voltage curves from fully atomistic simulations

21:15–23:00 Mixer (Swope Center, Meigs Room)

FRIDAY, SEPTEMBER 7

07:00–08:00 Breakfast (Swope Center, Dining Room)

08:15–10:15 Session IV: Folding and Unfolding in the Membrane (Lillie Auditorium)

Chair: Gunnar von Heijne (Stockholm University)

Karen Fleming (Johns Hopkins University) 8:15 am

Protein folding experiments reveal foundations of stability in membrane proteins

Heedeok Hong (Michigan State University) 8:45 am

Defining the folding-degradation relationship of a helical membrane protein mediated by the conserved ATP-dependent protease ftsH

Thomas Miller (Caltech) 9:15 am

Long-timescale dynamics of co-translational membrane integration and translocation via the Sec translocon

Robert Best (NIH/NIDDK) 9:45 am

Molecular simulations of membrane protein folding

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FRIDAY, SEPTEMBER 7 (continued)

10:15–10:45 **Break** (Coffee & Snacks)

10:45–12:45 **Session V: Mechanisms of Active Uptake** (Lillie Auditorium)

Chair: Joe Mindell (NIH/NINDS)

Rachelle Gaudet (Harvard University) 10:45 am

Panning for precious metals: mechanics of a transition metal transporter

Dirk Slotboom (University of Groningen) 11:15 am

Sodium coupling in the aspartate transporter GltTk

Lucy Forrest (NIH/NINDS) 11:45 am

Integrating structural and spectroscopic data for a sodium-dependent transporter using molecular simulations

Avner Schlessinger (Icahn Mount Sinai School of Medicine) 12:15 pm

Structure-based ligand discovery for nutrient transporters

13:00–14:00 **Lunch** (Swope Center, Dining Room)

14:00–16:00 **Free time**

15:00–15:45 **Yoga session** (MBL Club)

14:00–15:30 **Boat trip #2** (Meet in Swope Center Lobby)

16:00–17:00 **Panel Discussion** (Meigs Room)

Beyond the sea of lipids: dissecting the role of lipid molecules in membrane protein structure and function

Panelists: Olaf Andersen, Peter Tieleman, Valeria Vásquez, Kallol Gupta

17:00–18:30 **Poster Session B**

18:45–19:45 **Dinner** (Swope Center, Dining Room)

20:00–21:15 **Session VI: Young Investigator Presentations** (Lillie Auditorium)

Chair: Matt Trudeau (University of Maryland)

Short Talk: Antoniya Aleksandrova (NIH/NINDS) 8:00 pm

Systematic analysis of symmetry in membrane proteins

Short Talk: Chen-Wei Tsai (Brandeis University) 8:15 pm

*Electrical recordings of the mitochondrial calcium uniporter in *Xenopus* oocytes*

Short Talk: Ming-Feng Tsai (Brandeis University) 8:30 pm

Mechanisms of Ca^{2+} dependent gating of the mitochondrial Ca^{2+} uniporter

Short Talk: Sun Joo Lee (Washington University) 8:45 pm

Potassium conduction through an eukaryotic inwardly rectifying potassium channel

Short Talk: Ángela Ballesteros (NIH/NINDS) 9:00 pm

Structural relationship between the putative hair cell mechanotransduction channel TMC1 and TMEM16 proteins

21:15–23:00 **Mixer** (Swope Center, Meigs Room)

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SATURDAY, SEPTEMBER 8

07:00–08:00 **Breakfast** (Swope Center, Dining Room)

08:15–10:15 **Session VII: Single-Molecule Approaches to Membrane Protein Folding & Dynamics**
(Lillie Auditorium)

Chair: Eric Senning (University of Texas, Austin)

Janice L. Robertson (University of Iowa) 8:15 am

Tuning the stability of CLC dimerization by changing the lipid solvent

Gunnar von Heijne (Stockholm University) 8:45 am

Cotranslational protein folding

Olga Boudker (HHMI, Weill Cornell Medical College) 9:15 am

Hills and valleys in the functional cycle of the thermophilic transporter GltPh

Vasanthi Jayaramam (University of Texas, McGovern Medical School) 9:45 am

Glutamate receptor modulation by auxiliary subunits

10:15–10:45 **Break** (Coffee & Snacks)

10:45–12:45 **Session VIII: Mechanisms of Active Efflux** (Lillie Auditorium)

Chair: Miguel Holmgren (NIH/NINDS)

Randy Stockbridge (University of Michigan) 10:45 am

Guanidinium export is the primal function of SMR family transporters

Short Talk: Dylan Meyer (Texas Tech University) 11:15 am

Electrophysiological characterization of hyperaldosteronism-associated Na/K pump mutations

Short Talk: Irina Shlosman (NIH/NHLBI/NINDS) 11:30 am

Dissecting the thermodynamics of transport of a sodium-calcium exchanger

Cedric Govaerts (Free University of Brussels) 11:45 am

Structure of LmrP transporter reveals molecular basis of multidrug recognition

Short Talk: Emel Ficici (NIH/NHLBI) 12:15 pm

A broadly conserved Na⁺ binding site in the N-lobe of prokaryotic multi-drug MATE transporters

Short Talk: Merritt Maduke (Stanford University) 12:30 pm

CLC chloride/proton antiporters

13:00–14:00 **Lunch** (Swope Center, Dining Room)

14:00–16:30 **Free time**

14:00–16:30 **Yoga session** (MBL Club)

16:00–16:30 **SGP Annual Business Meeting** (Loeb, Room G70)

16:30–17:30 **Panel Discussion** (Loeb, Room G70)

Establishing expectations & benchmarks in collaborations between experiment & computation

Panelists: Lucy Forrest, Rachelle Gaudet, Alessio Accardi, Avner Schlessinger

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SATURDAY, SEPTEMBER 8 (continued)

17:30–18:30 **Panel Discussion** (Loeb, Room G70)

Getting your research in molecular membrane physiology published

Panelists: Kenton Swartz (Associate Editor, *JGP*), Olga Boudker (Reviewing Editor, *eLife*), Karen Fleming (Associate Editor, *JBC*), Peter Tieleman (Editorial Board Member, *BJ*)

18:45–19:45 **Lobster Banquet** (Swope Center, Dining Room)

20:00–21:15 **Session IX: The Cryo-EM Revolution** (Lillie Auditorium)

Chair: Christopher Miller (Brandeis University, HHMI)

Short Talk: Benjamin J. Orlando (Harvard University) 8:00 pm

Structure of the mitochondrial calcium uniporter: a tetramer with a twist

Short Talk: Huaizong Shen (Tsinghua University) 8:15 pm

Snapshots of Nav channels

Short Talk: Julio Cordero-Morales (University of Tennessee) 8:30 pm

Structural and functional analyses of TRPC channels

Vera Moiseenkova-Bell (University of Pennsylvania) 8:45 pm

Molecular mechanisms of TRPV channel activation and inhibition

21:15–23:00 **Mixer (Swope Center, Swope Café, 1st Floor)**

Cranefield and Poster Awards

SUNDAY, SEPTEMBER 9

07:00–08:00 **Breakfast** (Swope Center, Dining Room)

10:00 **Check-out deadline**

Note: Talks are 25 minutes + 5 minutes for Q&A
Short Talks are 12 minutes + 3 minutes for Q&A