

Na,K-ATPase & RELATED CATION PUMPS: Structures, Mechanisms, & Diseases

SCHEDULE OF EVENTS

Tuesday, September 6

- 2:00-10:00 Registration and Room Assignments (Swope Center, 1st Floor)
- 6:00-8:00 Buffet (Swope Center, Meigs Room)
- 9:30-11:30 Mixer (Swope Center, Meigs Room)

Wednesday, September 7

- 7:00-8:30 Breakfast (Swope Center, Dining Room)
- 8:30-11:50 **SYMPOSIUM SESSION I** (Lillie Auditorium)
ATOMIC STRUCTURE OF CATION PUMPS
- 8:30-8:45 Opening Remarks (Lillie Auditorium)
Director (Marine Biological Laboratory)
Kevin P. Campbell, President (Society of General Physiologists)
David Gadsby, Jack Kaplan, and Jerry Lingrel, Organizers
- 8:50-9:00 Paul De Weer, Chair (University of Pennsylvania Medical School)
Introductory remarks
- 9:00-9:25 Yuji Sugita (University of Tokyo)
Sarcoplasmic reticulum Ca-ATPase atomic structure and molecular dynamics simulations
- 9:30-9:55 Jesper Møller (University of Aarhus)
Structure and mechanism of sarcoplasmic reticulum Ca-ATPase
- 10:00-10:25 Break (Lillie, Lobby)
- 10:30-10:55 Steven Karlish (Weizmann Institute)
Purification of Na,K-ATPase expressed in Pichia pastoris: Prospects for structural work?
- 11:00-11:20 Oleg Dmitriev (University of Wisconsin-Madison)
Solution structure of the nucleotide binding domain of the Wilson disease ATPase
- 11:25-11:45 Melina Haupt (Technical University of Munich)
Structure of the nucleotide-binding domain of the Kdp ATPase in the free and AMP-PNP bound state: Implications for the reaction cycle

- 12:00-2:00 Lunch (Swope Center, Dining Room)
- 2:00-5:30 **SYMPOSIUM SESSION II** (Lillie Auditorium)
ION BINDING SITES & TRANSPORT MECHANISMS
- 2:00-2:10 Luis Beaugé, Chair (Institute M y M Ferreira, Cordoba)
Introductory remarks
- 2:10-2:35 Peter Jørgensen (University of Copenhagen)
Binding of Na or ATP control opening or closing of the cytoplasmic gate to the Na sites in Na,K-ATPase
- 2:40-3:05 José Argüello (Worcester Polytechnic Institute)
Heavy metal binding sites in P-IB-type ATPases
- 3:10-3:35 Hans-Jürgen Apell (University of Konstanz)
Next stop: Binding sites – Ion transport in P-type ATPases
- 3:40-4:05 Break (Lillie, Lobby)
- 4:10-4:35 Pablo Artigas (Rockefeller University)
Na,K-ATPase ion translocation pathway
- 4:40-4:55 Jean-Daniel Horisberger (University of Lausanne)
Ion accessibility and binding in the Na,K-ATPase
- 5:00-5:25 Jens Peter Andersen (University of Aarhus)
Mechanism of SR Ca-ATPase from functional analysis of site-specific mutants
- 5:45-7:45 Dinner (Swope Center, Dining Room)
- 7:50-10:25 **SYMPOSIUM SESSION III** (Lillie Auditorium)
CATION PUMP SUBUNIT INTERACTIONS
- 7:50-8:00 Kazuya Taniguchi, Chair (Hokkaido University)
Introductory remarks
- 8:00-8:25 Ernst Bamberg (MPI Biophysics, Frankfurt)
Conformational dynamics of P-type ATPases: Intraprotein signaling and subunit interaction probed by voltage clamp fluorometry
- 8:30-8:55 Jack Kaplan (University of Illinois at Chicago)
Characterization of subunit interactions and their role in Na,K-ATPase delivery to the plasma membrane
- 9:00-9:25 Break (Lillie, Lobby)

- 9:30-9:55 Ayyappan Rajasekaran (University of California Los Angeles)
Na,K-ATPase in epithelial cell polarity and signaling
- 10:00-10:20 Olga Vagin (University of California Los Angeles)
N-linked glycosylation provides apical sorting information to the gastric H,K-ATPase beta and to the Na,K-ATPase beta 2 subunit
- 10:30- Midnight Mixer (Swope Center, Meigs Room)

Thursday, September 8

- 7:00-8:30 Breakfast (Swope Center, Dining Room)
- 8:30-11:35 **SYMPOSIUM SESSION IV** (Lillie Auditorium)
INHERITED DYSFUNCTION OF CATION PUMPS
- 8:30-8:40 Carolyn Slayman, Chair (Yale University School of Medicine)
Introductory remarks
- 8:40-9:05 Svetlana Lutsenko (Oregon Health and Science University)
Function and regulation of human copper-transporting ATPases, the Menkes disease and Wilsons disease proteins
- 9:10-9:35 Amy Moseley (University of Cincinnati Medical School)
Behavioral abnormalities in Na,K-ATPase alpha 2 and alpha 3 haploinsufficient mice
- 9:40-10:05 Break (Lillie, Lobby)
- 10:10-10:35 Kathy Sweadner (Massachusetts General Hospital)
Inherited Na,K-ATPase alpha subunit mutations in neurological disease
- 10:40-11:00 Bente Vilsen (University of Aarhus)
Rapid-onset dystonia Parkinsonism mutation F785L affects Na but not K binding to the Na,K-ATPase
- 11:05-11:30 Rhoda Blostein (McGill University)
Alterations of the Na,K-ATPase alpha 2 isoform associated with Familial Hemiplegic Migraine Type 2
- 12:00-2:00 Lunch (Swope Center, Dining Room)
- 2:00-5:30 **POSTER SESSION I** (Swope Center, 2nd Floor)
Posters may be displayed after 8:00 a.m. on Wednesday, and may stay up until 8:00 a.m. on Friday
- 2:00-4:00 Authors at posters for discussion with attendees and with judges for the poster competition (for those who applied to compete).

- 2:00-2:30 SGP Business Meeting (Lillie Auditorium)
- 5:30-7:30 Dinner (Swope Center, Dining Room)
- 7:50-10:25 **SYMPOSIUM SESSION V** (Lillie Auditorium)
REGULATION OF CATION PUMPS
- FXYP proteins**
- 7:50-8:00 Michael Caplan, Chair (Yale University School of Medicine)
Introductory remarks
- 8:00-8:25 Kathi Geering (University of Lausanne)
Structural and functional aspects of Na,K-ATPase regulation by FXYP proteins
- 8:30-8:50 Francesca Marassi (The Burnham Institute, La Jolla)
The structures of three FXYP family proteins in membrane environments
- 8:55-9:20 Break (Lillie, Lobby)
- 9:25-9:50 Flemming Cornelius (University of Aarhus)
Structural and functional interactions of FXYP regulatory protein with shark Na,K-ATPase
- 9:55-10:20 Haim Garty (Weizmann Institute)
Regulation of the Na,K-ATPase by FXYP proteins

Friday, September 9

- 7:00-8:45 Breakfast (Swope Center, Dining Room)
- 9:00-11:40 **SYMPOSIUM SESSION V** (Lillie Auditorium)
REGULATION OF CATION PUMPS (continued)
- Phospholamban, sarcolipin, and receptor-mediated regulation**
- 9:00-9:15 Carlos Pedemonte, Chair (University of Houston)
Introduction: *Receptor-mediated modulation of P-type ATPases*
- 9:20-9:45 David MacLennan (University of Toronto)
SR Ca-ATPase regulation by phospholamban and sarcolipin
- 9:50-10:15 David Thomas (University of Minnesota)
Molecular mechanism of cardiac Ca-ATPase regulation by phospholamban, revealed by site-directed spectroscopy

- 10:20-10:45 Break (Lillie, Lobby)
- 10:50-11:05 Don Bers, Chair (Loyola University)
Introduction: Beta adrenergic modulation of Na,K-ATPase activity
- 11:10-11:35 Alejandro Bertorello (Karolinska Institute)
Intracellular traffic of Na,K-ATPase molecules: Integrating responses from GPCR signals
- 12:00-2:00 Lunch (Swope Center, Dining Room)
- 2:00-5:30 **POSTER SESSION II** (Swope Center, 2nd Floor)
Posters may be displayed after 8:00 a.m. on Friday, and may stay up until 8:00 a.m. on Sunday.
- 2:00-4:00 Authors at posters for discussion with attendees and with judges for the poster competition (for those who applied to compete).
- 5:30-7:30 Dinner (Swope Center, Dining Room)
- 7:35-10:30 **SYMPOSIUM SESSION V** (Lillie Auditorium)
REGULATION OF CATION PUMPS (continued)
- Specific P-type ATPase inhibitors**
- 7:35-7:45 Robert Farley, Chair (University of Southern California)
Introductory remarks
- 7:45-8:10 George Sachs (University of California Los Angeles)
Structure-function of the H,K-ATPase as revealed by inhibitor binding sites and mutations
- 8:15-8:40 Jan Joep De Pont (Nijmegen Center for Molecular Life Sciences)
Elucidation of the ouabain-binding site in Na,K-ATPase by chimeric approaches
- 8:45-9:10 Break (Lillie, Lobby)
- Signaling via Na,K-ATPase**
- 9:15-9:30 Amir Askari, Chair (Medical University of Ohio)
Introduction: *Amplification of digitalis signals through the Na,K-ATPase*
- 9:35-10:00 Zi-Jian Xie (Medical University of Ohio)
Na,K-ATPase signalosome: Its organization and membership
- 10:05-10:25 Georgios Scheiner-Bobis (Justus-Liebig-University Giessen)
Signaling pathways involving the sodium pump and insulin receptor stimulate NO production in endothelial cells

Saturday, September 10

- 7:00-8:30 Breakfast (Swope Center, Dining Room)
- 8:30-11:10 **SYMPOSIUM SESSION VI** (Lillie Auditorium)
PHYSIOLOGICAL ROLES OF CATION PUMPS
- 8:30-8:55 Mordecai Blaustein, Chair (University of Maryland)
Introduction: *Alpha-2 Na,K pumps: Key role in regulating arterial myogenic tone and blood pressure*
- 9:00-9:25 Jerry Lingrel (University of Cincinnati Medical School)
Biological role of the conserved cardiac glycoside binding site of the Na,K-ATPase alpha 2 isoform
- 9:30-9:55 Break (Lillie, Lobby)
- 10:00-10:25 Gary Shull (University of Cincinnati Medical School)
Gene targeting studies of Ca-transporting ATPases
- 10:30-10:55 J. Iasha Sznajder (Northwestern University)
Hypoxia-mediated endocytosis and degradation of the Na,K-ATPase
- 11:30 Bus departs for whale-watch trip
- 12:00-1:30 Lunch (Swope Center, Dining Room)
- FREE AFTERNOON or WHALE-WATCH EXCURSION**
- 7:00-9:00 Banquet and Awards Ceremony (Swope Center, Dining Room)
- FREE EVENING**
- 9:30-11:00 Mixer (Swope Center, Meigs Room)

Sunday, September 11

- 7:00-8:30 Breakfast (Swope Center, Dining Room)
- 10:00 Checkout time