

JGP 100th Anniversary

Looking in the rear-view mirror as we anticipate another 100 years

Sharona E. Gordon

Editor-in-Chief, *Journal of General Physiology*

It has become a February tradition to publish an editorial that summarizes recent changes at JGP, discusses planned changes, and introduces new members of the Editorial Advisory Board. This editorial will continue that tradition, but in the broader context of our reflections and celebrations (Gordon, 2017b) as we approach the 100th anniversary of our first issue published in September 1918.

The *Journal of General Physiology's (JGP) mission is to publish mechanistic and quantitative molecular and cellular physiology of the highest quality, to provide a best-in-class author experience, and to nurture future generations of independent researchers.* To evaluate whether we are successful in our mission, it is worth looking at each of these three mission components. The first component, publishing great physiological research, requires an ongoing reevaluation of what defines physiology. In our first year of publication, not a single paper appeared that featured experiments on mammals. Physiology was broad, with much work on microorganisms, plants, invertebrate animals, reptiles, amphibians, and birds. Today, the breadth of physiology in JGP is organism neutral, with mechanistic insight and rigor as the driving criteria for publication. Physiology in JGP has evolved to include computational work that stands on its own. We have also introduced a new article category called Hypothesis, an example of which was recently published (Ficici et al., 2017), which is especially suited for novel theoretical analyses, as well as interpretations of existing data, that help to define a new conceptual framework or perspective for future investigations.

Our focus on author experience emphasizes a fast, fair, and transparent review process. Our median time to evaluate whether manuscripts should be sent for review is 1 d, and our median time to first decision after review is 30 d (for submissions between July 2014 and June 2016). All decisions are made collectively by the six associate editors and myself, with our in-depth discussions ensuring consistency in the review process and clarity in communicating what is required of authors in decision letters. As active scientists, we are available to discuss authors' work at any stage and to explain our decisions in detail. When manuscripts fall outside the associate editors' range of expertise, we bring in guest editors from among our ed-



itorial advisory board, who choose reviewers and manage the review and decision-making process. The guest editors are invited to our weekly editors' meeting to discuss the reviews and bring the work into our collective decision-making process. We believe our review system is the best in the business and keeps the journal grounded within the physiology community.

This year, we added an exciting new strand to our program for early-career scientists. The Junior Faculty Networking Cohorts support and connect junior faculty in the first stage of their independent careers (Gordon, 2017a). Up to six junior faculty are matched with a member of our Editorial Advisory Board for quarterly group discussions about topics such as selecting and managing personnel, overseeing finances, and collaborating wisely. Each cohort continues to meet until most or all of the participants have transitioned to the next stage of their careers. In addition, we have recently added postdoctoral scholars to our Focus Groups, and we continue to recruit postdocs into the Postdoctoral Reviewer Mentoring Program. These programs help us fulfill the third component of our mission by offering one-on-one and group mentoring across the early stages of scientific careers.

Suggestions for new programs and directions come from across the community, but especially from members of our Editorial Advisory Board. This year, we have expanded the board once again. In addition to enriching the traditional areas of strength in the journal, new members focusing on excitation-contraction coupling, membrane trafficking, molecular motors, and reproductive physiology have joined the JGP fold. Each new member offers a glimpse of themselves in the biographies found below. We hope you will enjoy learning about them. We also hope you will take the opportunity to get to know them better by reading our new series of Essays—the first of which is published in this issue of JGP (Aldrich, 2018)—in which Editors, Editorial Advisory Board members, and other members of our community discuss factors that influenced the evolution of their careers. As we look toward the 100th anniversary of JGP, we also look back on what makes us who we are as individuals and as a community.

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New Editorial Advisory Board members



Alessio Accardi

Alessio Accardi is an Associate Professor in the Departments of Anesthesiology, of Physiology and Biophysics, and of Biochemistry at Weill Cornell Medical College. He received his degree in Physics from the University of Rome, "La Sapienza" with a thesis on pore-forming toxins. For his doctoral research, he joined the laboratory of Michael Pusch at the Institute for Biophysics of the CNR in Genoa, Italy, where he studied the biophysical and pharmacological properties of the voltage-gated CLC-type Cl^- channels. He continued his studies of these channels in the group of Chris Miller at Brandeis University as a postdoctoral fellow, where they discovered that the CLCs are a functionally divergent family that comprises both Cl^- channels and H^+/Cl^- exchangers. In his group at Weill Cornell, Alessio uses a combination of electrophysiological, biochemical, and structural approaches to study two functionally diverse families of membrane proteins, the CLCs and the recently identified TMEM16s, which encompass both Ca^{2+} -activated Cl^- channels as well as dual-function phospholipid scramblases and nonselective ion channels. PHOTO COURTESY OF CORNELL UNIVERSITY, DEPARTMENT OF PHYSIOLOGY AND BIOPHYSICS.



Frances Ashcroft

Ashcroft is Professor of Physiology at the University of Oxford and a Fellow of Trinity College, Oxford. She received her PhD from the Cambridge University in 1979 and then did postdoctoral studies with Peter Stanfield at the University of Leicester and with Susumu Hagiwara at the University of California at Los Angeles. She established her own group at the University of Oxford in 1983, with a focus on the regulation of insulin secretion from the pancreatic β cell. Her current research includes studies of the ATP-sensitive potassium channel, its regulation by intracellular nucleotides and therapeutic drugs, and its role in diseases of insulin secretion such as neonatal diabetes and hyperinsulinism. She also has a growing interest in β cell metabolism and in the effects of chronic hyperglycemia on islet cell function. In addition, she enjoys writing popular science books, one of which (The Spark of Life) is about ion channels. PHOTO COURTESY OF ROBERT TAYLOR (TAYLOR-PHOTO.CO.UK)



Anne Carlson

Anne Carlson is an Assistant Professor in the Department of Biological Sciences at the University of Pittsburgh. She received her PhD at the University of Washington in the Department of Physiology and Biophysics working with Bertil Hille to uncover the role that CatSper channels play as mammalian sperm prepare to fertilize an egg. For her postdoctoral studies, she continued on at UW and worked with Bill Zagotta. In the Zagotta laboratory, Dr. Carlson performed structural and functional studies on voltage-gated potassium channels in the Ether-a-go-go family. Dr. Carlson now has her own group that studies both the ion channels important for the earliest events of fertilization and how these channels are regulated. PHOTO COURTESY OF JOEL ROSENBAUM.



Nancy Carrasco

Nancy Carrasco is Professor of Cellular and Molecular Physiology at the Yale School of Medicine, which she joined in 2011. She obtained her MD and Master's Degree in Biochemistry from the National Autonomous University of Mexico in her native Mexico City, where she began working on membrane proteins and transport phenomena. Nancy did her postdoctoral work in Ron Kaback's laboratory at the Roche Institute of Molecular Biology in New Jersey, where she elucidated the proton translocation pathway of the lac permease. She then joined the faculty at the Albert Einstein College of Medicine, where she cloned and characterized the sodium/iodide symporter (NIS), the key plasma membrane protein that mediates the active transport of iodide in the thyroid and a few other tissues. Nancy's cloning and characterization of NIS were a breakthrough in thyroid pathophysiology with ramifications in many other fields, including structure/function of transport proteins, molecular endocrinology, gene transfer, and public health. Nancy's current work focuses on elucidating in detail the transport mechanisms of NIS and related plasma membrane transporters and extending the medical applications of NIS beyond thyroid disease. PHOTO COURTESY OF ALBERT EINSTEIN COLLEGE OF MEDICINE.



Sudha Chakrapani

Sudha Chakrapani is an Associate Professor at Case Western Reserve University. She has had a longstanding interest in the molecular mechanisms underlying the membrane transport phenomena. Sudha received her Master's Degree in Biomedical Engineering from Indian Institute of Technology, Mumbai, India. Her doctoral work with Tony Auerbach at the University at Buffalo focused on single-channel kinetic studies of nicotinic acetylcholine receptors. She then went on to do her postdoctoral work with Eduardo Perozo at University of Virginia and then at University of Chicago. Here, she was trained in EPR spectroscopy and x-ray crystallography and studied gating mechanisms in potassium channels and sodium channels. Currently, her group studies the structure and dynamics of ligand- and voltage-gated channels using a combination of approaches that include, EPR spectroscopy, x-ray crystallography, and, more recently, cryo-EM. A particular focus of the group is to understand the molecular nature of the intricate relationship between ion channels and membrane lipid constituents. PHOTO COURTESY OF ANNIE O'NEILL.



Colleen Clancy

Dr. Clancy is the Associate Vice Chancellor for Academic Personnel and a Professor in the Departments of Physiology and Membrane Biology and Pharmacology at the University of California, Davis, School of Medicine, Davis, CA. Dr. Clancy has authored 75+ publications, serves on the editorial board for the *Journal of Physiology*, the advisory board of the National Biomedical Computation Resource, as a member of the NIH Multiscale Modeling Consortium, the Heart Rhythm Society Fellowship Subcommittee, and engages in peer review for dozens of national and international granting agencies and journals. In the past two years, Dr. Clancy recently led a multidisciplinary team of junior and senior investigators to develop two successfully funded distinct NIH projects on the topic of computational pharmacology. Dr. Clancy served as the Chair of the University of California System-wide Committee on Affirmative Action and Diversity, Chair of the Compensation Advisory Committee at the UC Davis School of Medicine, and the faculty salary equity task force for the UC Davis SOM. Dr. Clancy is an alumna of the 2015–16 class for the national program: Executive Leadership in Academic Medicine (ELAM). She was awarded the 2014 Dean's Excellence in Mentoring Award in the Research Area at the UC Davis School of Medicine. PHOTO COURTESY OF JOSH TULMAN.



Michael Duchen

Michael was born in South Africa, moving to the UK in 1960. He studied Physiology and Medicine in Oxford, 1971–75, then moved to St. George's Hospital Medical School to complete his clinical training, graduating in 1978. He worked in clinical medicine in junior hospital appointments in 1978–1981, including a period working at a rural hospital in the Transkei, South Africa. He moved to the UCL Department of Physiology to embark on PhD studies in 1981–1984 with Tim Biscoe as supervisor and mentor. He has stayed at UCL Physiology (now the Department of Cell and Developmental Biology) ever since, first as a Royal Society University Research Fellow and then as Reader and Professor. His early research was electrophysiological with an interest in neurotransmitter receptor biology, but he became interested first in the influence of cell metabolism on excitability and then increasingly fascinated by mitochondrial biology, in the dialog between cell signaling pathways and mitochondria, in the roles of mitochondria in disease and ultimately in the question of whether mitochondrial pathways represent viable therapeutic targets in a variety of disease states. PHOTO COURTESY OF MICHAEL DUCHEN.



Teresa Giraldez

Teresa Giraldez is Lecturer in Physiology at the University of La Laguna, Spain. She received her PhD at the University of Oviedo (Spain, 2001), working on HERG ion channels and intracellular Ca^{2+} signaling in pituitary cells. She then trained as postdoctoral fellow with Fred Sigworth at Yale University, where she developed a project to monitor conformational changes of large conductance voltage and Ca^{2+} -regulated potassium channels (BK) as they make transitions driven by calcium binding and membrane potential changes. She came back to her home country as a Group Leader of the National Health System in 2006, to later join the University of La Laguna, after receiving a "Ramón y Cajal" national Award (2014). A major focus of her current research perseveres in unveiling the structural rearrangements underlying BK channel function, using this knowledge to deploy novel optoelectrical reporters to study the physiological function of subcellular Ca^{2+} nano-domains. Additionally, she also investigates novel regulation mechanisms of neuronal Kv7 channels, in the context of a mouse model created by her group with relevance in epilepsy research. PHOTO COURTESY OF FRANCISCO TRUJILLO @ ULL MEDICAL SCHOOL COMMUNICATION AND DESIGN DEPARTMENT.



Vincent Jacquemond

Vincent received his PhD degree in Physiology from University Claude Bernard Lyon 1 in France. His thesis work, supervised by Oger Rougier, was on the role of Ca^{2+} entry in muscle excitation contraction coupling. Vincent performed postdoctoral research in the laboratory of Martin F. Schneider at University of Maryland at Baltimore, where he worked on the role of Ca^{2+} and Mg^{2+} in the regulation of sarcoplasmic reticulum Ca^{2+} release in muscle. Afterward, he returned to France, where he first took an Assistant Professor position in Physiology at University of Tours for 2 yr. He then earned a permanent research position at the French National Centre for Scientific Research (CNRS), and he has, since that time, developed his own projects at University Lyon 1. Vincent's projects are focused on the physiological regulation of ion channels, Ca^{2+} signaling, and excitation-contraction coupling in mammalian skeletal muscle with a specific interest for how these mechanisms are altered in disease situations such as Duchenne dystrophy, ryanodine receptor-related diseases or centronuclear myopathies. His group joined the newly created NeuroMyoGene Institute in 2016. PHOTO COURTESY OF VINCENT JACQUEMOND.



Amy Lee

Amy Lee is Professor in the Department of Molecular Physiology and Biophysics and Assistant Dean for Research in the Carver College of Medicine at the University of Iowa. She received her PhD in Neuroscience at the University of Virginia with Kevin Lynch and was a postdoctoral fellow with William Catterall at the University of Washington. Her research focuses on the structure/function of voltage-gated Ca^{2+} channels and the roles of these channels in regulating neuronal excitability and synaptic transmission. PHOTO COURTESY OF TODD ADAMSON.



Polina V. Lishko

Polina V. Lishko is an Assistant Professor in Molecular and Cell biology at the University of California, Berkeley. She received her PhD in biophysics in 2000 from the Bogomoletz Institute of Physiology of the National Academy of Sciences of Ukraine, where she worked with Dr. Oleg Krishnal on regulation of ion channels in hippocampal neurons. She engaged in postdoctoral research with Dr. Vadim Arshavsky of Harvard Medical School, working on molecular mechanisms of phototransduction in mammalian retina. From 2005, she worked as postdoctoral researcher in Dr. Rachelle Gaudet at Harvard University and studied the structure–function relation of TRPV channels. From 2006 to 2011, Dr. Lishko was an instructor at the University of California, San Francisco (UCSF), where she studied regulation of sperm physiology by ion channels. In 2012, she joined the faculty of the University of California, Berkeley. Her team is exploring the pathways of steroid signaling, focusing on how various steroid molecules and other bioactive lipids regulate ion channels in nervous and reproductive systems. She is also interested in the physiology of mitochondrial calcium uptake and how ion channels regulate mitochondrial calcium uptake in the sperm cells and eggs. PHOTO COURTESY OF UNIVERSITY OF CALIFORNIA, BERKELEY.



Justin Molloy

Justin Molloy is a senior Group Leader at The Francis Crick Institute in London. He received his undergraduate and graduate training in the Biology Department at the University of York, UK, and he then held a 2-yr NATO Postdoctoral Fellowship at the University of Vermont. His early work focused on the mechanism of force production by insect fibrillar flight muscle. He returned to York, supported by a Royal Society University Research Fellowship, where he developed an optical tweezers-based device to measure the force and movement produced by single myosin molecules. In 2002, he became Head of the Division of Physical Biochemistry at the MRC National Institute for Medical Research in London and later Head of Structural Biology (2004). In 2015, he moved to the Francis Crick Institute, where his research group uses optically based, single-molecule techniques to study the mechanism of force production by molecular motors and the ways in which proteins are regulated and targeted inside living cells. PHOTO COURTESY OF THE FRANCIS CRICK INSTITUTE.



Anna Moroni

Anna Moroni is a Professor of Plant Physiology and Biophysics at the University of Milan, Italy. She received her PhD in Molecular and Cellular Biology from the same university, where she studied membrane transport in plants with Dr. Erasmo Marrè and did postdoctoral training with Dr. Dario DiFrancesco in cardiac molecular physiology. Her focus is on biophysical and cellular aspects of ion channel gating. To this end, she applies functional and structural approaches to a variety of model systems, from the viral channel Kcv to the inward rectifiers HCN and KAT1. Current projects center on cellular factors influencing channel gating and on engineering of synthetic channels and regulatory peptides. PHOTO COURTESY OF GERHARD THIEL.



Ruth Murrell-Lagnado

Ruth Murrell-Lagnado studied Pharmacology at University College London and then moved to Cambridge to pursue a PhD in the Physiology Laboratory, working with Denis Haydon and carrying out single-channel recordings to look at the effects of general anesthetics on ligand-gated ion channels. She continued her training as a postdoctoral fellow, first at Oxford University with Aviva Tolkovsky and then in the early 90's moved to Stanford University to work with Rick Aldrich on the gating mechanisms of the Shaker potassium channel. In 1993, she returned to the UK to a lectureship in the Department of Pharmacology at the University of Cambridge. In the early days, her main interest continued to be structure-function relationships within the potassium channel family, but in recent years, her focus has been to understand the structure, function, and cell biology of the P2X-purinergic receptor family. Another recent interest is the Sigma1 receptor and its regulation of calcium homeostatic mechanisms. In 2015, she moved to the School of Life Sciences at the University of Sussex, where she is now a Reader in Neuroscience. PHOTO COURTESY OF THE UNIVERSITY OF SUSSEX.



Simon Newstead

Simon Newstead is Professor of Molecular Membrane Biology in the Department of Biochemistry at the University of Oxford and tutor in Biochemistry at Christ Church. He received his MBiochem (Hons.) degree from the University of Bath and his PhD in protein crystallography with Garry Taylor at the University of St. Andrews. Simon then joined the laboratory of So Iwata, at Imperial College London, where he worked on structural studies of secondary active transporters and methods development in membrane protein structural biology. In 2009, he was awarded an MRC career development award to establish his independent research group in Oxford and in 2013 became a Wellcome New Investigator. Research in his laboratory focuses on the structural and biochemical understanding of secondary active transporters, with a particular focus on nutrient and drug uptake systems in the human body. PHOTO COURTESY OF JO PARKER.



Cristina Paulino

Prof. Cristina Paulino, originally from Portugal, studied biochemistry at the Heinrich-Heine University in Dusseldorf, Germany, graduating in 2008. During her undergraduate and following doctoral studies at the Max-Planck Institute of Biophysics in Frankfurt, she was trained in membrane protein biology. Under the supervision of Prof. Werner Kühlbrandt, a pioneer in the field, she became proficient in cryo-electron microscopy (cryo-EM) and obtained her PhD with distinction in 2014. Building upon her expertise, she established cryo-EM during her postdoctoral studies in the group of Prof. Raimund Dutzler (University of Zurich). In 2017, she obtained a tenure-tracked position as an Assistant Professor and head of the cryo-EM unit at the University of Groningen. Her interdisciplinary research combines structural data, determined by high-resolution single-particle cryo-EM, with the functional characterization of target proteins. Her main interest is focused on elucidating the structure-function relationships that explain the transport mechanism of membrane transporters and channels. Paulino was awarded with a PhD Fellowship from the Portuguese Science and Technology Foundation FCT, a Postdoc Fellowship from the University of Zurich, a Marie Skłodowska-Curie Individual Fellowship, and a NWO Veni grant. PHOTO COURTESY OF CRISTINA PAULINO.



Stephan Pless

Stephan Pless is an Associate Professor in the Department of Drug Design and Pharmacology at the University of Copenhagen. He received his MSc degree in biochemistry and molecular biology from the University of Hamburg, before joining the laboratory of Joe Lynch at the Queensland Brain Institute in Brisbane, Australia. Working on the molecular function of glycine receptors, he started to use fluorometry and noncanonical amino acids in collaboration with Henry Lester and Dennis Dougherty at the California Institute of Technology (Caltech). Next, he joined the laboratory of Christopher Ahern and later Harley Kurata at the University of British Columbia (Vancouver, Canada) as a postdoc, working on voltage-gated sodium and potassium channels. In 2014, he was recruited to the University of Copenhagen, where he works on ion channel function and pharmacology using electrophysiology, noncanonical amino acids, fluorescence-based approaches, and protein engineering. PHOTO COURTESY OF PETER DAHLERUP.



Indira M. Raman

Indira M. Raman is a Professor in the Department of Neurobiology at Northwestern University, where she holds the Bill and Gayle Cook Chair in Biological Sciences. She completed her PhD in Neuroscience at the University of Wisconsin-Madison (with Larry Trussell) and postdoctoral training at the Vollum Institute (with Craig Jahr) and Harvard Medical School (with Bruce Bean). Her research is in the areas of ion channel biophysics, synaptic transmission, and cerebellar physiology, and she has been the recipient of several awards, including a Javits Neuroscience Investigator Award from NINDS. She has served on NIH study sections, the NINDS Board of Scientific Counselors, and NINDS Advisory Council and has been a reviewing editor for the *Journal of Neuroscience*, *Biophysical Journal*, and *eLife*. She has also served as Director of the Northwestern University Interdepartmental Neuroscience (NUIN) graduate training program. She has received awards for her teaching and scientific training of graduate and undergraduate students, including a Charles Deering McCormick Professorship of Teaching Excellence. Essays in which she has expressed her perspectives on scientific research and training have been published in *Neuron* and *eLife*. PHOTO COURTESY OF R. GABER.



Michael Regnier

Mike received his PhD in Neurobiology from the University of Southern California in 1991, studying the effect of androgen hormones on neuromuscular plasticity. This was followed by postdoctoral fellowships at the Mayo Clinic and UCLA, where he used biophysical and protein biochemical approaches to study striated muscle mechanics and the process of energy utilization (chemomechanical transduction) by the motor protein myosin. Mike then moved to Seattle in 1995 to work with Albert Gordon's research group to study thin filament regulation of cardiac and skeletal muscle contraction. He has remained at the University of Washington (UW) since then and is the Washington Research Foundation Professor and Associate Chair of Bioengineering and an Adjunct Professor of Physiology and Biophysics. He is an American Heart Association Established Investigator, was appointed as a UW Presidential Entrepreneurial Faculty Fellow in 2014, and was elected as a Fellow of the American Institute for Medical and Biological Engineering in 2016. His UW-based research program is highly collaborative, interdisciplinary, and spanning basic science to translational research. Basic science research interests include the biophysical properties of cardiac and skeletal contraction and its dysfunction resulting from diseases or injury at the level of protein, contractile organelle, cell tissue, and organ. Translational research includes development of myofilament targeted gene, protein, and cell engineering approaches to treat muscle diseases. PHOTO COURTESY OF MARIA RAZUMOVA.



Tamara Rosenbaum

Tamara Rosenbaum obtained her Biology Bachelor degree in 1994 and then went on to obtain her Doctorate in 1998, both from the National Autonomous University of Mexico (UNAM), under the mentorship of Dr. Marcia Hiriart. During this time, she worked on the physiology of pancreatic β cells. She then went on for her postdoctoral training in Dr. Sharona Gordon's laboratory, where she studied structure-function relationships in cyclic nucleotide-gated ion channels and on the regulation of the activity of the TRPV1 channel. At the end of 2004, she established her own laboratory at the Institute for Cellular Physiology of UNAM, where she works as a researcher studying several aspects of the function of transient receptor potential (TRP) channels. Her research interests include regulation, structure-function, and gating properties of TRP channels. She has also studied the role of these proteins in pain and itch, described endogenous modulators, and determined the molecular mechanisms underlying the activation or inhibition of TRP channels by these molecules. PHOTO COURTESY OF LINDA LASKY.



Eric Sobie

Eric Sobie is an Associate Professor in the Department of Pharmacological Sciences at Icahn School of Medicine at Mount Sinai. After receiving a BSE Degree from Duke University in Biomedical Engineering, he obtained a PhD in Biomedical Engineering at Johns Hopkins and completed postdoctoral training at the University of Maryland, Baltimore. Eric joined the Mount Sinai faculty in 2006 and established a laboratory that investigates cardiac calcium signaling, mechanisms of arrhythmias, and cardiovascular pharmacology. His group combines mechanistic mathematical modeling with quantitative physiological experiments to understand normal and abnormal cardiac physiology and how drugs may improve function. PHOTO COURTESY OF NORA MC LAUGHLIN.



Randy Stockbridge

Randy graduated from Princeton University with an AB in Molecular Biology in 2005. She went on to study with Richard Wolfenden at the University of North Carolina at Chapel Hill, where she worked to understand the thermodynamic origin of the rate enhancements of chemical reactions achieved by enzymes and other catalysts. She received a PhD in Biochemistry and Biophysics in 2010, before beginning postdoctoral work with Chris Miller at Brandeis University. She initially worked on proteins from the CLC family before discovering and diving into a brand new, very weird family of bacterial fluoride channels with unusual "dual topology" architecture. She started her laboratory at the University of Michigan in 2016 and continues to work on the structure, function, and evolution of unusual and primitive dual topology channels and transporters. PHOTO COURTESY OF RANDY STOCKBRIDGE.



Byung-Chang Suh

Byung-Chang Suh is an Associate Professor in the department of Brain and Cognitive Sciences at Daegu Gyeongbuk Institute of Science and Technology (DGIST) in South Korea. He received his PhD in 1997 in Molecular Neurophysiology from the Pohang University of Science and Technology (POSTECH), where, in the laboratory of K.T. Kim, he studied the G protein-coupled receptor-mediated signal transduction mechanisms and intracellular calcium dynamics in mammalian cells. Then, at the University of Washington in Seattle, in the laboratory of Bertil Hille, he completed postdoctoral training from 2001 to 2004 and advanced Research Professor ranks, where he worked on the functional roles of membrane phospholipids in M-type potassium channel modulation. His current research, at DGIST, is focused on the modulatory mechanisms of voltage-gated calcium and potassium channels by receptors, G proteins and phospholipids, membrane phospholipid dynamics and simulation, lipid kinases and phosphatases, membrane targeting of ion channels, covalent lipid modification of ion channels and receptors, and functional roles of ion channels in synaptic transmission. PHOTO COURTESY OF BYUNG-CHANG SUH.



Stephen Tucker

Stephen Tucker is a Professor of Biophysics at the University of Oxford, UK. After receiving his undergraduate and graduate degrees in Biochemistry from the University of Oxford, he went to the Vollum Institute, Oregon, for two years as a Wellcome Trust Research Fellow with John Adelman, where he first started to work on the structure and function of potassium channels. In 1996, he returned to Oxford to work with Fran Ashcroft on the ATP-sensitive K^+ channel. Further research fellowships from the Wellcome Trust and the Royal Society enabled him to establish his own research group in the Department of Physiology, and in 2008, he moved to the Department of Physics, where he was made a Professor of Biophysics in 2015. His group uses a range of experimental and computational approaches to understand the structural and biophysical mechanisms of ion channel function, with a particular focus on potassium channels. In addition, he is also Director of the OXION PhD Training Program in Ion Channels and Disease. PHOTO COURTESY OF LIBERTY TUCKER.



Francesco Tombola

Francesco Tombola is an Associate Professor of Physiology and Biophysics at the University of California, Irvine. He received his PhD in Molecular and Cellular Biology from the University of Padua (Italy) in 2001. In Padua, he studied channel-forming bacterial toxins and mitochondrial ion channels under the supervision of Mario Zoratti. In 2002, he held the position of lecturer in Biochemistry at the University of Bologna (Italy), and in 2003, he moved to UC Berkeley as a postdoctoral scholar, where he studied the mechanism of voltage-dependent activation of voltage-gated potassium and proton channels in the laboratory of Ehud Y. Isacoff. He joined the faculty at UC Irvine in 2008. His research group is interested in understanding how cells detect and respond to electrical and mechanical stimuli at the molecular level. He uses electrophysiological and optical techniques combined with methods in cell and molecular biology to shed light on the mechanism of gating of Hv and Piezo channels. He collaborates with medicinal and computational chemists to develop small-molecule modulators of ion channel activity. PHOTO COURTESY OF FRANCESCO TOMBOLA.



Alexandra Zahradníková

Alexandra Zahradníková received her PhD in Inorganic Chemistry from the Slovak Technical University in Bratislava, Slovakia. At the Centre of Physiological Sciences, Slovak Academy of Sciences in Bratislava, she worked in the team of Jozef Zachar, where she together with her spouse Ivan Zahradník participated in establishing the first patch-clamp laboratory in Slovakia. She became interested in ryanodine receptors during her postdoctoral stay in the laboratory of Phil Palade at the Department of Physiology and Biophysics, UTMB, Galveston, TX. After returning to her home country, she continued to work at the Institute of Molecular Physiology and Genetics, Slovak Academy of Sciences. As a Fulbright Scholar, she collaborated with Sandor Györke at the Texas Tech University Health Sciences Center in Lubbock, TX, and Laszlo Meszaros in Medical College of Georgia, Augusta, GA. In 1995 and 2000, she received the Howard Hughes Medical Institute International Research Scholar's Award, which enabled her to build a confocal microscopy and electrophysiology laboratory for study of calcium signaling. Her work concentrates on the mechanism of ryanodine receptor activation by calcium and its consequences for calcium signaling and excitation-contraction coupling in cardiac myocytes. In her approach, she combines experimental methods with mathematical modeling and computer simulation. She is a member of the Learned Society of the Slovak Academy of Sciences. PHOTO COURTESY OF ALEXANDRA ZAHRADNÍKOVÁ.

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