**Jeanne M. Nerbonne**
**Curriculum Vitae**

## Education:

| | |
|---|---|
| 1974 | B.Sc., Chemistry, Framingham State College, Framingham, MA |
| 1978 | Ph.D., Physical Organic Chemistry, Georgetown University, Washington, DC |

## Postdoctoral Training:

| | |
|---|---|
| 1979-1982 | Postdoctoral Research Fellow, Division of Biology, California Institute of Technology, Pasadena, CA |
| 1982-1984 | Senior Research Fellow, Division of Biology, California Institute of Technology, Pasadena, CA |

## Academic Appointments:

| | |
|---|---|
| 1985-1990 | Assistant Professor, Department of Pharmacology, Washington University School of Medicine, St. Louis, MO |
| 1991-1996 | Associate Professor, Department of Molecular Biology and Pharmacology, Washington University School of Medicine, St. Louis, MO |
| 1997-2001 | Professor, Department of Molecular Biology and Pharmacology, Washington University School of Medicine, St. Louis, MO |
| 2002-2008 | Alumni Endowed Professor of Molecular Biology and Pharmacology, Department of Molecular Biology and Pharmacology, Washington University School of Medicine |
| 2006-present | Professor, Department of Biomedical Engineering, School of Engineering, Washington University (secondary appointment) |
| 2008-2013 | Professor, Department of Medicine, Washington University School of Medicine (secondary appointment) |
| 2009-2013 | Alumni Endowed Professor of Molecular Biology and Pharmacology, Department of Developmental Biology, Washington University School of Medicine |
| 2010-present | Co-Director, Center for the Investigation of Membrane Excitability Diseases (CIMED), Washington University School of Medicine |
| 2013-present | Alumni Endowed Professor of Molecular Biology and Pharmacology, Departments of Developmental Biology and Medicine (dual appointment), Washington University School of Medicine |
| 2013-present | Director, Center for Cardiovascular Research, Department of Medicine, Cardiovascular Division, Washington University School of Medicine |

## Honors and Awards:

| | |
|---|---|
| 1979 | W. W. Zorbach Memorial Prize for the Outstanding Chemistry Ph.D. Dissertation, Georgetown University, Washington, DC |
| 1979-1981 | National Institutes of Health Postdoctoral Fellowship |
| 1981-1983 | American Heart Association Postdoctoral Fellowship |
| 1984-1989 | American Heart Association Established Investigator Award |

| | |
|---|---|
| 2001 | Founding Fellow of the American Heart Association, Basic Cardiovascular Sciences |
| 2002 | Alumni Endowed Professor of Molecular Biology and Pharmacology |
| 2002 | Medical Science Graduate Student Association 10th Annual Symposium, **Science Today**! Keynote Speaker, University of Calgary, Banff, Canada |
| 2003 | Neurosciences Graduate Student Organization Invited Speaker, Division of Neuroscience, Baylor College of Medicine, Houston, TX |
| 2003 | The Rudy Clarenburg Distinguished Lecturer, Kansas State University, Manhattan, KS |
| 2004 | Neurosciences Interdisciplinary Graduate Program Invited Speaker, Program in Neuroscience, Georgetown University, Washington, DC |
| 2005 | Nora Eccles Harrison Distinguished Lecturer, Cardiovascular Research and Training Institute, University of Utah, Salt Lake City, UT |
| 2006 | Silver Heart Member, Basic Cardiovascular Sciences, American Heart Association |
| 2006-2007 | Chair, Electrical Signaling, Transport and Arrhythmia Study Section, Center for Scientific Review, National Institutes of Health |
| 2006 | Davis Heart and Lung Research Institute Discovery Series Distinguished Lecturer, Ohio State University, Columbus, OH |
| 2007 | Distinguished Investigator Award, Washington University School of Medicine |
| 2012 | Fellow, American Association for the Advancement of Science |
| 2013 | Visiting Distinguished Wiersma Professor of Neuroscience, Division of Biology, California Institute of Technology, Pasadena, CA |
| 2013 | Getz Distinguished Lecturer, Department of Biology, Branders University, Waltham, MA |
| 2013 | Dutch Heart Foundation Lecturer, Dutch Physiological Society 29th Annual Symposium, **Adaptive Physiology,** Keynote Speaker, Utrecht, Netherlands |
| 2015 | Shining Star Award, Academic Women's Network, Washington University School of Medicine |
| 2016 | Gold Heart Member, Basic Cardiovascular Sciences, American Heart Association |
| 2016 | Abboud Cardiovascular Center Distinguished Lecturer, University of Iowa Carver College of Medicine, Iowa City, IA |
| 2017 | Keynote Speaker, FASEB Summer Research Conference: Ion Channel Regulation, Steamboat Springs, CO |
| 2017 | Matthew N. Levy Endowed Lecturer, Case Western Reserve University, Cleveland, OH |

**Editorial Responsibilities:**

| | |
|---|---|
| 1995-2014 | Editorial Board, **Circulation Research** |
| 1995-1998 | Editorial Board, **American Journal of Physiology** |
| 1995-2010 | Editorial Board, **Journal of General Physiology** |
| 1998-2002 | Editorial Board, **Journal of Molecular and Cellular Cardiology** |

1999-2002 Editorial Board, **Journal of Cardiovascular Electrophysiology**
2003-2007 Associate Editor, **Journal of Neuroscience**
2006-present Associate Editor, **Channels**
2007-2013 Reviewing Editor, **Journal of Neuroscience**
2008-present Editorial Board, **Journal of Molecular and Cellular Cardiology**
2011-present Associate Editor, **Molecular Pharmacology**
2013-present Editorial Board, **American Journal of Physiology**
2013-present Senior Editor, **Journal of Neuroscience**
2014-present Consulting Editor, **Circulation Research**

**Professional Affiliations:**

American Association for the Advancement of Science
American Epilepsy Society
American Heart Association
American Physiological Society
Biophysical Society
Cardiac Electrophysiology Society
Cardiac Muscle Society
Heart Rhythm Society
International Society for Heart Research
Society of General Physiologists
Society for Neuroscience

**Major Research Interests:**

Voltage-gated ion channels in the regulation and dysregulation of myocardial and neuronal membrane excitability; Molecular determinants of native myocardial and neuronal voltage-gated ion channel diversity, expression, biophysical properties and functioning; Inherited and acquired disorders of excitability in the cardiovascular and nervous systems.

**Peer Reviewed Publications:**

Nerbonne, J.M., and Weiss, R.G. The effects of liquid crystal solvents on the photodimerization of acenaphthylene. **Journal of the American Chemical Society 100**: 2571-2573 (1978).

Nerbonne, J.M., and Weiss, R.G. Elucidation of the thermal isomerization mechanism for azobenzene in a cholesteric liquid crystal solvent. **Journal of the American Chemical Society 100**: 5953-5954 (1978).

Nerbonne, J.M., and Weiss, R.G. Liquid crystal solvents as mechanistic probes. III. The influence of ordered media on the efficiency of the photodimerization of acenaphthylene. **Journal of the American Chemical Society 101**: 402-407 (1979).

Nerbonne, J.M., and Weiss, R.G. Liquid crystal solvents as mechanistic probes. IV. The influence of ordered media on the Norrish Type II photoprocesses in α-diketones. **Journal of Israeli Chemistry 18**: 266-271 (1980).

Nerbonne, J.M., Sheridan, R.E., Chabala, L.D., and Lester, H.A. Properties of pure cis-Bis-Q at acetylcholine receptors of *Electrophorus* electroplaques. **Molecular Pharmacology 23**: 344-349 (1983).

Nargeot, J., Nerbonne, J.M., Engels, J., and Lester, H.A. Time course of the increase in myocardial calcium current after a photochemically generated concentration jump of intracellular cAMP. **Proceedings of the National Academy of Sciences, USA 80**: 2395-2399 (1983).

Nerbonne, J.M., Richard, S., Nargeot, J., and Lester, H.A. New photoactivatable cyclic nucleotides produce intracellular "jumps" in cAMP and cGMP concentrations. **Nature 310**: 74-76 (1984).

Spray, D.C., Nerbonne, J.M., Campos de Carvalho, A., Harris, A.L., and Bennett, M.V.L. Substituted benzyl esters: A new class of compounds that reduce gap junctional conductance by cytoplasmic acidification. **Journal of Cell Biology 99**: 174-179 (1984).

Richard S., Nerbonne, J.M., Nargeot, J., Lester, H.A., and Garnier, D. Photochemically produced intracellular concentration jumps of cAMP mimic the effects of catecholamines on excitation-contraction coupling in frog atrial fibers. **Pflügers Archives 403**: 312-317 (1985).

Nerbonne, J.M., Richard, S., and Nargeot, J. Calcium channels are 'unblocked' within a few milliseconds after photoremoval of nifedipine. **Journal of Molecular and Cellular Cardiology 17**: 511-515 (1985).

Gurney, A.M., Nerbonne, J.M., and Lester, H.A. Photoinduced removal of nifedipine reveals mechanisms of calcium antagonist action on single heart cells. **Journal of General Physiology 86**: 353-379 (1985).

Blache, D., Nargeot, J., and Nerbonne, J.M. Direct evidence for the inhibition of platelet aggregation and release by intracellular cyclic AMP produced with a new photoactivatable derivative. **Thrombosis and Haemostasis 55**: 168-172 (1986).

Nerbonne, J.M., Gurney, A.M., and Rayburn, H.B. Development of the fast, transient outward $K^+$ current in embryonic sympathetic neurones. **Brain Research 378**: 197-202 (1986).

Nerbonne, J.M., and Gurney, A.M. Blockade of $Ca^{2+}$ and $K^+$ currents in bag cell neurons of *Aplysia californica* by dihydropyridine $Ca^{2+}$ antagonists. **Journal of Neuroscience 7**: 882-893 (1987).

Apkon, M., and Nerbonne, J.M. $\alpha_1$-Adrenergic agonists selectively suppress voltage-dependent $K^+$ currents in rat ventricular myocytes. **Proceedings of the National Academy of Sciences, USA 85**: 8756-8760 (1988).

Nerbonne, J.M., and Gurney, A.M. Development of electrically excitable membrane properties in mammalian sympathetic neurons. **Journal of Neuroscience 9**: 3272-3286 (1989).

Richard, S., Tiaho, F., Charnet, P., Nargeot, J., and Nerbonne, J.M. Two pathways for $Ca^{2+}$ channel gating differentially modulated by physiological stimuli. **American Journal of Physiology 258**: H1872-H1881 (1990).

Tiaho, F., Richard, S., Lory, P., Nerbonne, J.M., and Nargeot, J. Cyclic AMP-dependent phosphorylation modulates the stereospecific activation of cardiac Ca channels by Bay K 8644. **Pflügers Archives 417**: 58-66 (1990).

Giffin, K., Solomon, J.S., Burkhalter, A., and Nerbonne, J.M. Differential expression of voltage-gated calcium channels in identified visual cortical neurons. **Neuron 6**: 321-332 (1991).

Boyle, W.A., and Nerbonne, J.M. A novel type of depolarization-activated $K^+$ current in isolated adult rat atrial myocytes. **American Journal of Physiology 260**: H1236-H1247 (1991).

Apkon, M., and Nerbonne, J.M. Characterization of two distinct depolarization-activated $K^+$ currents in isolated adult rat ventricular myocytes. **Journal of General Physiology 97**: 973-1011 (1991).

Paulmichl, M., Nasmith, P., Hellmiss, R., Reed, K., Boyle, W.A., Nerbonne, J.M., Peralta, E.G. and Clapham, D.E. Cloning and expression of a cardiac delayed rectifier potassium channel RAK. **Proceedings of the National Academy of Sciences, USA 88**:7892-7895 (1991).

Rust, R.S., Jr., Carter, J.G., Martin, D., Nerbonne, J.M., Lampe, P.A., Pusateri, M.E., and Lowry, O.H. Enzyme levels in cultured astrocytes, oligodendrocytes and Schwann cells and neurons from the cerebral cortex and superior cervical ganglia of the rat. **Neurochemical Research 16**: 991-999 (1991).

Boyle, W.A., and Nerbonne, J.M. Two functionally distinct 4-aminopyridine-sensitive outward $K^+$ currents in rat atrial myocytes. **Journal of General Physiology 100**: 1041-1067 (1992).

Richard, S., Charnet, P., and Nerbonne, J.M. Voltage- and time-dependent interconversion between distinct gating pathways of the high threshold cardiac calcium channel. **Journal of Physiology, *London* 462**: 197-228 (1993).

Solomon, J.S., and Nerbonne, J.M. Hyperpolarization-activated currents in isolated superior colliculus-projecting neurons from rat visual cortex. **Journal of Physiology, *London* 462**: 393-420 (1993).

Solomon, J.S., and Nerbonne, J.M. Two kinetically distinct components of hyperpolarization-activated current in rat superior colliculus-projecting neurons. **Journal of Physiology, *London* 469:** 291-313 (1993).

Muralidharan, S., Maher, G.M., Boyle, W.A., and Nerbonne, J.M. "Caged" phenylephrine: development and application to probe the mechanism of $\alpha$-receptor mediated vasoconstriction. **Proceedings of the National Academy of Sciences, USA 90**: 5199-5203 (1993).

Solomon, J.S., Doyle, J.F., Burkhalter, A., and Nerbonne, J.M. Differential expression of hyperpolarization-activated currents reveals distinct classes of visual cortical projection neurons. **Journal of Neuroscience 13**: 5082-5091 (1993).

Manchester, J., Kong, X., Nerbonne, J.M., Lowry, O.H., and Lawrence, J.C., Jr. Glucose transport in single ventricular myocytes: rate limiting steps in glucose uptake by control and insulin-stimulated cells. **American Journal of Physiology 266**: E326-E333 (1994).

Bu, G., Maksymovitch, E.A., Nerbonne, J.M., and Schwartz, A.L. Expression and function of the low density lipoprotein receptor-related protein (LRP) in mammalian central neurons. **Journal of Biological Chemistry 269**: 18521-18528 (1994).

Muralidharan, S., and Nerbonne, J.M. Photolabile "caged" adrenergic receptor agonists and related model compounds. **Journal of Photochemistry and Photobiology 27**: 123-127 (1995).

Barry, D.M., Trimmer, J.S., Merlie, J.P., and Nerbonne, J.M. Differential expression of voltage-gated $K^+$ channel subunits in the adult rat heart: Relationship to functional $K^+$ channels? **Circulation Research 77**: 361-369 (1995).

Albert, J.L., and Nerbonne, J.M. Calcium-independent depolarization-activated potassium currents in superior colliculus-projecting rat visual cortical neurons. **Journal of Neurophysiology 73**: 2163-2178 (1995).

Tiaho, F., and Nerbonne, J.M. VIP and secretion augment voltage-gated L-type calcium channel currents in adult rat ventricular myocytes. **Pflügers Archives, European Journal of Physiology 432**: 821-830 (1996).

Xu, H., Dixon, J.E., Barry, D.M., Trimmer, J.S., Merlie, J.P., McKinnon, D., and Nerbonne, J.M. Developmental analysis reveals mismatches in the expression of $K^+$ channel $\alpha$ subunits and voltage-gated $K^+$ channel currents in rat ventricular myocytes. **Journal of General Physiology 108:** 405-420 (1996).

Van Wagoner, D.R., Pond, A.L., McCarthy, P.M., Trimmer, J.S., and Nerbonne, J.M. Outward $K^+$ current densities and Kv1.5 expression are reduced in chronic human atrial fibrillation. **Circulation Research 80**: 772-781 (1997).

Locke, R.E., and Nerbonne, J.M. Three kinetically-distinct $Ca^{++}$-independent depolarization-activated $K^+$ currents in callosal-projecting rat visual cortical neurons. **Journal of Neurophysiology 78**: 2309-2320 (1997).

Locke, R.E., and Nerbonne, J.M. Role of voltage-gated $K^+$ currents in mediating the regular-spiking phenotype of callosal-projecting rat visual cortical neurons. **Journal of Neurophysiology 78**: 2321-2335 (1997).

Takimoto, K., Li, D., Nerbonne, J.M., and Levitan, E.S. Distribution, splicing and glucorticoid-induced expression of cardiac $\alpha_{1C}$ and $\alpha_{1D}$ voltage-gated $Ca^{2+}$ channel mRNAs. **Journal of Molecular and Cellular Cardiology 29**: 3035-3042 (1997).

Boyle, W.A., Muralidharan, S., Maher, G.M., and Nerbonne, J.M. Vascular actions of caged-phenylephrine analogues depend on the structure and site of attachment of the photolabile group. **Journal of Photochemistry and Photobiology 41**: 233-244 (1997).

Malin, S.A., Guo, A.W.-X., Jafari, G., Goate, A.M., and Nerbonne, J.M. Presenilins upregulate functional $K^+$ channel currents in mammalian cells. **Neurobiology of Disease 4**: 398-409 (1998).

Barry, D.M., Xu, H., Schuessler, R., and Nerbonne, J.M. Functional knockout of the transient outward current, long QT syndrome and cardiac remodeling in mice expressing a dominant negative Kv4 $\alpha$ subunit. **Circulation Research 83**: 560-567 (1998).

Petersen, K.R., and Nerbonne, J.M. Expression environment determines $K^+$ current properties: Kv1 and Kv4 $\alpha$ subunit-induced $K^+$ currents in mammalian cell lines and cardiac myocytes. **Pflügers Archives European Journal of Physiology 437:** 381-392 (1999).

Wang, Z., Feng, J., Shi, H., Pond, A., Nerbonne, J.M., and Nattel, S. Potential molecular basis of different physiological properties of the transient outward $K^+$ current in rabbit and human hearts. **Circulation Research 84**: 551-561 (1999).

Brahmajothi, M.V., Campbell, D.L., Rasmusson, R.L., Morales, M.J., Trimmer, J.S., Nerbonne, J.M., and Strauss, H.C. Distinct transient outward potassium current ($I_{to}$) phenotypes and distribution of fast-activating potassium channel alpha subunits in ferret left ventricular myocytes. **Journal of General Physiology 113:** 581-600 (1999).

Boyle, W.A., and Nerbonne, J.M. Two functionally distinct 4-aminopyridine-sensitive outward $K^+$ currents in rat atrial myocytes. **Journal of General Physiology 100**: 1041-1067 (1992).

Barry, D.M., Xu, H., Schuessler, R., and Nerbonne, J.M. Functional knockout of the transient outward current, long QT syndrome and cardiac remodeling in mice expressing a dominant negative Kv4 α subunit. **Circulation Research 83**: 560-567 (1998).

Xu, H., Guo, W., and Nerbonne, J.M. Four kinetically-distinct depolarization-activated $K^+$ currents in adult mouse ventricular myocytes. **Journal of General Physiology 113:** 661-678 (1999).

Bou-Abboud, E., and Nerbonne, J.M. Molecular correlates of the $Ca^{++}$-independent, depolarization activated $K^+$ channels in rat atrial myocytes. **Journal of Physiology, *London* 517:** 407-420 (1999).

Xu, H., Li, H., and Nerbonne, J.M. Elimination of the transient outward current and action potential prolongation in mouse atrial myocytes expressing a dominant negative Kv4 α subunit, **Journal of Physiology, *London* 519**: 11-21 (1999).

Van Wagoner, D.R., Pond, A.L., Lamorgese, M., Rossie, S.S., and Nerbonne, J.M. Atrial L-type calcium currents and human atrial fibrillation. **Circulation Research 85:** 428-436 (1999).

Xu, H., Barry, D.M., Li, H., Brunet, S., Guo, W., and Nerbonne, J.M. Attenuation of the slow component of delayed rectification, action potential prolongation and triggered activity in mice expressing a dominant-negative Kv2 α subunit. **Circulation Research 85:** 623-633 (1999).

Guo, W., Xu, H., London, B., and Nerbonne, J.M. Molecular basis of transient outward $K^+$ current diversity in mouse ventricular myocytes. **Journal of Physiology, *London***, **521:** 587-599 (1999).

Pond, A.L., Scheve, B.K., Benedict, A.T., Petrecca, K., Van Wagoner, D.R., Shrier, A., and Nerbonne, J.M. Expression of distinct ERG proteins in rat, mouse and human heart: relation to functional $I_{Kr}$ channels. **Journal of Biological Chemistry 275**: 5997-6006 (2000).

Gussak, I., Chaitman, B.R., Kopecky, S.L., and Nerbonne, J.M. Rapid ventricular repolarization in rodents: Electrocardiographic manifestations, molecular mechanisms, and clinical insights. **Journal of Electrocardiology 33**: 159-170 (2000).

Emmi, A., Wenzel, J., Schwartzkroin, P.A., Tagliatela, M., Castaldo, L., Bianchi, L., Robertson, G.A., Nerbonne, J.M., and Janigro, D. Expression and functional role for erg-like currents in hippocampalstrocytes. **Journal of Neuroscience 20**: 3915-3925 (2000).

Malin, S., and Nerbonne, J.M. Elimination of the fast transient in superior cervical ganglion neurons with expression of Kv4.2W362F: Molecular dissection of $I_A$. **Journal of Neuroscience 20**: 5191-5199 (2000).

Guo, W., Li, H., London, B., and Nerbonne, J.M. Functional consequences of elimination of $I_{to,f}$ and $I_{to,s}$: early afterdepolarizations, atrioventricular block and ventricular arrhythmias in mice lacking Kv1.4 and expressing a dominant-negative Kv4 α subunit. **Circulation Research 87**: 73-79 (2000).

Bou-Abboud, E., Li, H., and Nerbonne, J.M. Molecular diversity of the repolarizing voltage-gated $K^+$ currents in mouse atrial myocytes. **Journal of Physiology, *London* 529:** 345-358 (2000).

Feng, G., Hood, R., Bernstein, M., Keller-Peck, C., Nguyen, Q., Wallace, M., Nerbonne, J.M., Lichtman, J.W., and Sanes, J.R. Imaging neuronal subsets in transgenic mice expressing multiple spectral variants of GFP. **Neuron 28:** 41-51 (2000).

London, B., Guo, W., Pan, X.H., Lee, J.S., Shusterman, V., Logothetis, D.A., Nerbonne, J.M., and Hill, J.A. Targeted replacement of Kv1.5 in the mouse leads to loss of the 4 amino pyridine-sensitive component of $I_{K,slow}$ and resistance to drug-induced QT prolongation. **Circulation Research 88**: 940-946 (2001).

Brunner, M., Guo, W., Mitchell, G.F., Buckett, P.D., Nerbonne, J.M., and Koren, G. Characterization of mice with a combined suppression of $I_{to}$ and $I_{K,slow}$. **American Journal of Physiology 281**: H1201-H1209 (2001).

Malin, S.A., and Nerbonne, J.M. Molecular heterogeneity of the voltage-gated fast transient outward potassium current, $I_A$, in mammalian neurons. **Journal of Neuroscience 21**: 8004-8014 (2001).

Li, H., Guo, W., Hood, R., Benedict, A., Xu, H., and Nerbonne, J.M. Heterogeneity in the functional expression of a GFP-tagged Kv1.5 $\alpha$ subunit in mouse ventricles. **American Journal of Physiology 281**: H1955-H1967 (2001).

Nerbonne, J.M., Nichols, C.G., Schwarz, T.L., and Escande, D. Genetic manipulation of cardiac $K^+$ channel function: What have we learned and where do we go from here? **Circulation Research 89**: 944-956 (2001).

Guo, W., Li, H., Aimond, F., Johns, D.C., Rhodes, K.J., Trimmer, J.S., and Nerbonne, J.M. Role of heteromultimers in the generation of myocardial transient outward $K^+$ currents. **Circulation Research 90**: 586-593 (2002).

Guo, W., Malin, S.A., Johns, D.C., Jeromin, A., and Nerbonne, J.M. Modulation of Kv4-encoded $K^+$ currents in the mammalian myocardium by neuronal calcium sensor-1. **Journal of Biological Chemistry 277**: 26436-26443 (2002).

Malin, S., and Nerbonne, J.M. Delayed rectifier $K^+$ currents, $I_K$, are encoded by Kv2 $\alpha$ subunits and regulate tonic firing in mammalian sympathetic neurons. **Journal of Neuroscience 22**: 10094-10105 (2002).

Zhou, J., Kodirov, S, Murata, M., Buckett, P.D., Nerbonne, J.M., and Koren, G. Regional upregulation of Kv2.1-encoded current, $I_{K,slow2}$, in Kv1 DN mice is abolished by crossbreeding with Kv2 DN mice. **American Journal of Physiology 284:** H491-H500 (2003).

Le Bouter, S., Demolombe, S., Chambellan, A., Bellocq, C., Toumaniantz, G., Lande, G., Siavoshian, S., Baró, I., Pond, A. L., Nerbonne, J.M., Léger, J.J., Escande, D., and Charpentier, F. MicroArray analysis reveals complex remodeling of cardiac ion channel expression with altered thyroid status: relation to cellular and integrated electrophysiology. **Circulation Research 92:** 234-242 (2003).

Finck, B.N., Xianlin H., Courtois, M., Aimond, F., Nerbonne, J.M., Kovacs, A., Gross, R.W., and Kelly, D.P. A critical role for PPAR$\alpha$-mediated lipotoxicity in the pathogenesis of diabetic cardiomyopathy: Modulation of phenotype by dietary fat content. **Proceedings of the National Academy of Sciences, USA 100**: 1226-1231 (2003).

Rosati, B., Grau, F., Rodriguez, S., Li, H., Nerbonne, J.M., and McKinnon, D. Concordant expression of KChIP2 mRNA, protein and transient outward current throughout canine ventricle. **Journal of Physiology, *London* 548**: 815-822 (2003).

Pal, S., Hartnett, K.A., Nerbonne, J.M., Levitan, E.S., and Aizenman, E. Mediation of neuronal apoptosis by Kv2.1-encoded potassium channels in rat cortical neurons. **Journal of Neuroscience 23**: 4798-4802 (2003).

Li, H., Guo, W., Yamada, K.A., and Nerbonne, J.M. Selective elimination of one component of delayed rectification, $I_{K,slow1}$, in mouse ventricular myocytes expressing a dominant negative Kv1.5 α subunit. **American Journal of Physiology 286**: H319-H328 (2004).

Kodirov, S., Brunner, M., Busconi, L., Nerbonne, J.M., Buckett, P., Mitchell, G., and Koren, G. Attenuation of $I_{K,slow1}$ and $I_{K,slow2}$ in Kv1 DN mice prolongs the APD and QT intervals but does not prevent spontaneous or inducible arrhythmias. **American Journal of Physiology 286**: H368-H374 (2004).

Dong, H.W., Shao Z.W., Nerbonne, J.M., and Burkhalter, A. Differential depression of inhibitory synaptic responses in feedforward and feedback circuits between different areas of mouse visual cortex. **Journal of Comparative Neurology 475**: 361-373 (2004).

Brunet, S., Aimond, F., Li, H., Guo, W., Eldstrom, J., Fedida, D.A., Yamada, K.A., and Nerbonne, J.M. Heterogeneous expression of repolarizing voltage-gated $K^+$ currents in adult mouse ventricles. **Journal of Physiology, *London* 559**: 103-120 (2004).

Chiu, H.-C., Kovacs, A., Han, X., Courtois, M., Yamada, K.A., Brunet, S., Xu, H., Nerbonne, J.M., Welch, M.J., Kim, J., Sharpe, T., Gropler, R.J., Herrero, P., Ory, D.S., and Schaffer, J.E. Transgenic expression of FATP1 in the heart causes lipotoxic cardiomyopathy. **Circulation Research 96**: 225-233 (2005).

Aimond, F., Kwak, S., Rhodes, K.J., and Nerbonne, J.M. Accessory Kvbeta1 subunits differentially modulate the functional expression of voltage-gated $K^+$ channels in mouse ventricular myocytes. **Circulation Research 96**: 451-458 (2005).

Li, H., Guo, W., Mellor, R.L., and Nerbonne, J.M. KChIP2 modulates the cell surface expression of Kv1.5-encoded $K^+$ channels. **Journal of Molecular and Cellular Cardiology 39**:121-132 (2005).

Yuan, W., Burkhalter, A., and Nerbonne, J.M. Functional role of the fast transient outward $K^+$ current, $I_A$, in pyramidal neurons in (rat) primary visual cortex. **Journal of Neuroscience 25**: 9185-9194 (2005).

Lou, J.Y., Laezza F., Gerber, B.R., Yamada, K.A., Craig, A.M., Nerbonne, J.M., and Ornitz, D.M. Fibroblast growth factor 14 is an intracellular modulator of voltage-gated sodium channels. **Journal of Physiology 569**: 179-193 (2005).

Guo, W., Jung, W.E.D., Marionneau, C., Aimond, F., Xu, H., Yamada, K.A., Schwarz, T.L., Demolombe, S., and Nerbonne, J.M. Targeted deletion of Kv4.2 eliminates $I_{to,f}$ and results in electrical and molecular remodeling with no evidence of ventricular hypertrophy or myocardial dysfunction. **Circulation Research 97**: 1342-1350 (2005).

Hu, H.J., Carrasquillo, Y., Karion, F., Jung, W.E., Nerbonne, J.M., Schwarz, T.L., and Gereau, R.W. The potassium channel Kv4.2 alpha subunit is required for pain plasticity. **Neuron 50**: 89-100 (2006).

Li, J., Marionneau, C., Zhang, R., Shah, V., Hell, J.W., Nerbonne, J.M., and Anderson, M.E. Calmodulin kinase II inhibition shortens action potential duration by upregulation of $K^+$ currents. **Circulation Research 99**: 1092-1099 (2006).

Burkhalter, A., Gonchar, Y., Mellor, R.L., and Nerbonne, J.M. Differential expression of $I_A$ channel subunits Kv4.2 and Kv4.3 in mouse visual cortical neurons and synapses. **Journal of Neuroscience 26**: 12274-12282 (2006).

London, B., Baker, L.C., Petkova-Kirova, P., Nerbonne, J.M., Choi, B.-R., and Salama, G. Dispersion of repolarization and refractoriness are determinants of arrhythmogenic phenotype in transgenic mice with long QT. **Journal of Physiology 578:** 115-129 (2007).

Laezza, F., Gerber, B.R., Lou, J.-L., Kozel, M., Hartman, H., Craig, A.M., Ornitz, D.O., and Nerbonne, J.M. The FGF14$^{F145S}$ mutation disrupts the interaction of FGF14 with voltage-gated $Na^+$ channels and impairs neuronal excitability. **Journal of Neuroscience 27**: 2033-2044 (2007).

Li, J., Marionneau, C., Koval, D., Zingman, L., Mohler, P., Nerbonne, J.M., and Anderson, M.E. Calmodulin kinase II inhibition enhances ischemic preconditioning by augmenting ATP-sensitive $K^+$ current. **Channels 1**: 387-394 (2007).

Niwa, N., Wang, W., Sha, Q., and Nerbonne, J.M. Kv4.3 is not required for the generation of functional $I_{to,f}$ channels in adult mouse ventricles. **Journal of Molecular and Cellular Cardiology 44**: 95-104 (2008).

Marrus, S. and Nerbonne, J.M. Mechanisms linking short and long term electrical remodeling in the heart: Is it a stretch? **Channels 2**: 125-129 (2008).

Nerbonne, J.M., Gerber, B., Mellor, R.L., and Burkhalter, A. Electrical remodeling maintains firing properties in cortical pyramidal neurons lacking *Kcnd2*-encoded A-type $K^+$ currents. **Journal of Physiology 586**: 1565-1579 (2008).

****See Perspectives**: Foehring, R.C. Who needs A current? Functional remodeling in the Kv4.2-/- mouse. **Journal of Physiology 586**: 1461 (2008).

Marionneau, C., Brunet, S., Flagg, T.P., Pilgram, T.K., Demolombe, S. and Nerbonne, J.M. Distinct cellular and molecular mechanisms underlie functional remodeling of repolarizing $K^+$ currents with left ventricular hypertrophy. **Circulation Research 102**: 1406-1415 (2008).

****See Editorial:** Nattel, S. Effects of heart disease on cardiac ion current density versus current amplitude: important conceptual subtleties in the language of arrhythmogenic ion channel remodeling. **Circulation Research 102**: 1298-1300 (2008).

Marionneau, C., Aimond, F., Brunet, S., Niwa, N., Finck, B., Kelly, D.P., and Nerbonne, J.M. PPARα-mediated remodeling of repolarizing voltage-gated $K^+$ (Kv) channels in a mouse model of metabolic cardiomyopathy. **Journal of Molecular and Cellular Cardiology 44**: 1002-1015 (2008).

Lindsley, R.C., Gill, J.G., Murphy, T.L., Langer, E.M., Cai, M., Mashayekhi, M., Wang, W., Niwa, N., Nerbonne, J.M., Kyba, M., and Murphy, K.M. Mesp1 coordinately regulates cardiovascular fate restriction and epithelial-mesenchymal transition in differentiating ESCs. **Cell Stem Cell 3**: 55-68 (2008).

****See Commentary:** Wu, S.M. Mesp1 at the heart of mesoderm lineage specification. **Cell Stem Cell 3**: 1-2 (2008).

Skakkotai, V., Xiao, M., Xu, L., Wong, M., Nerbonne, J.M., Ornitz, D.M., and Yamada, K.A. FGF14 regulates the intrinsic excitability of cerebellar Purkinje neurons. **Neurobiology of Disease 33**: 81-88 (2009).

Flagg, T.P., Remedi, M., Haim, T.E., Tones, M.A., Bahinski, T., Numann, R., Kovacs, A., Schaffer, J.E., Nichols, C.G., and Nerbonne, J.M. $Ca^{2+}$-independent alterations in diastolic sarcomere length and relaxation kinetics in a mouse model of lipotoxic diabetic cardiomyopathy. **Circulation Research 104**: 95-103 (2009).

Odening, K.E., Nerbonne, J.M., Bode, C., Zehender, M., and Brunner, M. Impact of the elimination of $I_{to,f}$ *in vivo* on the induction of atrial fibrillation in elderly transgenic Kv4.2DN mice. **Circulation Journal 73**: 461-467 (2009).

Laezza, F., Lampert, A., Kozel, M.A., Gerber, B.R., Rush, A.M., Nerbonne, J.M., Waxman, S.G., Dib-Hajj, S.D., and Ornitz, D.M. FGF14 N-terminal splice variants differentially

modulate Nav1.2 and Nav1.6 sodium channels. **Molecular and Cellular Neuroscience 42**: 90-101 (2009).

Ye, B. and Nerbonne, J.M. Proteolytic processing of HCN2 and heteromeric assembly with HCN4 in the generation of cardiac pacemaker channels. **Journal of Biological Chemistry 284**: 25553-25559 (2009).

Marionneau, C., LeDuc, R.D., Rohrs, H.W., Link, A.J., Townsend, R.R., and Nerbonne, J.M. Proteomic analysis of native brain Kv4.2 channel complexes. **Channels 3**:284-294 (2009).

Lorenzetto, E., Caselli, L., Feng, G., Yuan, W., Nerbonne, J.M., Sanes, J.R., and Buffelli, M. Genetic perturbation of postsynaptic activity regulates synapse elimination in developing cerebellum. **Proceedings of the National Academy of Sciences, USA 106**:16475-16480 (2009).

Matkovich, S.J., Wang, W., Tu, Y., Eschenbacher, W.H., Dorn, L.E., Diwan, A., Nerbonne, J.M., and Dorn, G.W. 2nd. MicroRNA-133a decreases interstitial fibrosis and increases electrical remodeling without altering normal or pathological myocardial growth. **Circulation Research 106**: 165-175 (2010).

****See Editorial**: Abdellatif, M. The role of microRNA-133 in cardiac hypertrophy uncovered. **Circulation Research 106**: 16-18 (2010).

Haim, T.E., Wang, W., Flagg, T.P., Tones, M.A., Bahinski, T., Numann, R., Nichols, C.G., and Nerbonne, J.M. Palmitate attenuates myocardial contractility through augmentation of repolarizing $K^+$ currents. **Journal of Molecular and Cellular Cardiology 48**: 395-405 (2010).

Norris, A. J., and Nerbonne, J.M. Molecular dissection of $I_A$ in cortical pyramidal neurons reveals three distinct components encoded by Kv4.2, Kv4.3 and Kv1.4 (alpha) subunits. **Journal of Neuroscience 30**: 5092-5101 (2010).

Foeger, N.C., Marionneau, C., and Nerbonne, J.M. Co-assembly of Kv4 subunits with $K^+$ channel interacting protein 2 stabilizes protein expression and promotes surface retention of channel complexes. **Journal of Biological Chemistry 285**: 33413-33422 (2010).

Norris, A.J., Foeger, N.C., and Nerbonne, J.M. Interdependent roles for accessory KChIP2, KChIP3 and KChIP4 in the generation of Kv4-encoded $I_A$ channels in cortical pyramidal neurons. **Journal of Neuroscience 30**: 13644-13655 (2010).

Yang, K.-C., Foeger, N.C., Marrionneau, C., Jay, P.Y., McMullen, J.R., and Nerbonne, J.M. Homeostatic regulation of electrical excitability in physiological cardiac hypertrophy. **Journal of Physiology 588**: 5015-5032 (2010).

****See Perspectives**: Naud, P., Guasch, E., and Nattel, S. Physiological versus pathological cardiac electrical remodeling: potential basis and relevance to clinical management. **Journal of Physiology 588**: 4855-4856 (2010).

Cappola, T.P., Matkovich, S.J., Wang, W., Van Booven, D., Li, M., Wang, X., Qu, L., Sweitzer, N.K., Fang, J.C., Reilly, M., Hakonarson, H., Nerbonne, J.M., and Dorn, G.W. 2nd. Loss-of-function DNA sequence variant in the CLCNKA chloride channel implicates the cardio-renal axis in interindividual heart failure risk variation. **Proceedings of the National Academy of Sciences, USA 108**: 2456-2461 (2011).

Marionneau, C., Townsend, R.R. and Nerbonne, J.M. Proteomic analysis highlights the molecular complexities of native Kv4 channel macromolecular complexes. **Seminars in Cell and Developmental Biology 22**: 145-152 (2011).

Marrus, S.B., Cuculich, P.S., and Nerbonne, J.M. Characterization of a novel, dominant negative *KCNJ2* mutation in a patient with Andersen-Tawil syndrome. **Channels 5**: 500-509 (2011).

Yang, K.-C., Jay, P.Y., McMullen, J.R., and Nerbonne, J.M. Enhanced cardiac P13Kα signaling mitigates arrhythmogenic electrical remodeling in pathological cardiac hypertrophy and heart failure. **Cardiovascular Research 93**: 252-262 (2012).

****See Editorial**: Rozanski, G. Physiological remodeling of potassium channels in the heart. **Cardiovascular Research 93**: 218-219 (2012).

Foeger, N.C., Norris, A.J., Wren, L.M., and Nerbonne, J.M. Augmentation of Kv4.2-encoded currents by accessory dipetidyl peptidases 6 and 10 subunits reflects selective cell surface Kv4.2 protein stabilization. **Journal of Biological Chemistry 287**: 9640-9650 (2012).

Liu, F., Kang, I., Park, C., Chang, L.W., Wang, W., Lee, D., Lim, D.S., Vittet, D., Nerbonne, J.M., and Choi, K. ER71 specifies Flk-1$^{+}$ hemangiogenic mesoderm by inhibition of cardiac mesoderm and Wnt signaling. **Blood 119**: 3295-3305 (2012).

Marionneau, C., Carrasquillo, Y., Norris, A.J., Isom, L., Townsend, R.R., Link, A.J., and Nerbonne, J.M. The sodium channel accessory subunit, Navβ1, regulates neuronal excitability through modulation of voltage-gated $K^{+}$ channels. **Journal of Neuroscience 32**: 5716-5727 (2012).

****See Commentary**: **This week in the Journal**, Navβ1 regulates expression of A-type $K^{+}$ channels. **Journal of Neuroscience 32**:i (2012).

****See Commentary: Current Literature**: Voltage-gated ion channel accessory subunits: Sodium, potassium or both? **Epilepsy Currents 13**: 30-31 (2013).

Yang, K.-C., Ku, Y.-C., Lovett, M., and Nerbonne, J.M. Combined deep microRNA and mRNA sequencing identifies protective transcriptional signature of enhanced P13Kα signaling in cardiac hypertrophy. **Journal of Molecular and Cellular Cardiology 53**: 101-112 (2012).

Carrasquillo, Y., Burkhalter, A., and Nerbonne, J.M. A-type $K^{+}$ channels encoded by Kv4.2, Kv4.3 and Kv1.4 differentially regulate the intrinsic excitability of cortical pyramidal neurons. **Journal of Physiology 590**: 3877-3890 (2012).

Chen, X., Csordás, G., Jowdy, C., Schneider, T.G., Csordás, N., Wang, W., Liu, Y., Kohlhaas, M., Meiser, M., Bergen, S., Nerbonne, J.M., Dorn, G.W. 2$^{nd}$, and Maack, C. Mitofusin2-containing mitochondrial-reticular microdomains direct rapid cardiomyocyte bioenergetic responses via inter-organelle $Ca^{2+}$ crosstalk. **Circulation Research 111**: 863-875 (2012).

Granados-Fuentes, D., Norris, A.J., Carrasquillo, Y., Nerbonne, J.M., and Herzog, E.D. $I_A$ channels encoded by Kv1.4 and Kv4.2 regulate neuronal firing in the suprachiasmatic nucleus and circadian rhythms in locomotor activity. **Journal of Neuroscience 32**: 10045-10052 (2012).

Yang, K.-C., Tseng, Y.-T., and Nerbonne, J.M. Exercise training and P13Kα-induced electrical remodeling is independent of cellular hypertrophy and Akt signaling. **Journal of Molecular and Cellular Cardiology 53**: 532-541 (2012).

Kaufmann, W.A., Matsui, K., Jeromin, A., Nerbonne, J.M., and Ferraguti, F. Kv4.2 potassium channels segregate to extra synaptic domains and influence intrasynaptic NMDA receptor NR2B subunit expression. **Brain Structure and Function**, Epub Aug 30 (2012).

Pietka, T.A., Sulkin, M., Kuda, O., Wang, W., Zhou, D., Yamada, K.A., Yang, K., Su, X., Gross, R.W., Nerbonne, J.M., Efimov, I.R., and Abumrad, N.A. CD36 protein influences myocardial calcium homeostasis and phospholipid metabolism: Conduction anomalies in

CD36-deficient mice during fasting. **Journal of Biological Chemistry 287**: 38901-38912 (2012).

Marionneau, C., Lichti, C.F., Lindenbaum, P., Charpentier, F., Nerbonne, J.M., Townsend, R.R., and Mérot, J. Mass spectrometry-based identification of native cardiac Nav1.5 channel α subunit phosphorylation sites. **Journal of Proteome Research 11**: 5994-6007 (2012).

Ambrosi, C.M., Yamada, K.A., Nerbonne, J.M., and Efimov, I.R. Gender differences in electrophysiological gene expression in failing and non-failing human hearts. **PLoS One 8**: e54635 (2013).

Yamada, K.A., Patel, A.Y., Ewald, G.A., Whitehead, D.S., Pasque, M.K., Silvestry, S.C., Janks, D.L., Mann, D.L., and Nerbonne, J.M. How to build an integrated biobank: The Washington University Translational Cardiovascular Tissue Biobank and repository. **Clinical Sciences 6**: 226-231 (2013).

Foeger, N.C., Wang, W., Mellor, R.L., and Nerbonne, J.M. Stabilization of Kv4 protein by the accessory $K^+$ channel interacting protein 2 (KChIP2) is required for the generation of native myocardial fast transient outward currents. **Journal of Physiology 591**: 4149-4166 (2013).

Xiao, M., Bosch, M.K., Nerbonne, J.M., and Ornitz, D.M. FGF14 localization and organization of the axon initial segment. **Molecular and Cellular Neuroscience 56**: 393-403 (2013).

Yang, W., Carrasquillo, Y., Hooks, B., Nerbonne, J.M., and Burkhalter, A. Distinct balance of excitation and inhibition in feedforward and feedback currents of mouse visual cortex. **Journal of Neuroscience 33**: 17373-17384 (2013).

Laughner, J.I., Marrus, S.B., Zellmer, E.R., Weinheimer, C.J., MacEwan, M.R., Cui, S.X., Nerbonne, J.M., and Efimov, I.R. A fully implantable pacemaker for the mouse: From battery to wireless power. **PLoS One 8**: e76291 (2013).

Yang, K.C., Yamada, K.A., Patel, A.Y., Topkara, V.K., Ewald, G.A., Mann, D.L., and Nerbonne, J.M. Deep RNA sequencing reveals dynamic regulation of myocardial non-coding RNAs in the failing human heart and remodeling with mechanical circulatory support. **Circulation 129**:1009-1021(2014).

****See Editorial**: Xiao, X.G., Touma, M., and Wang, Y. Decoding the noncoding transcripts in human heart failure. **Circulation 129**: 958-960 (2014).

Speca, D.J., Ogata, G., Mandikian, D., Bishop, H.I., Wiler, S.W., Eum, K., Jürgen-Wenzel, H., Doisy, E.T., Matt, L., Campi, K.L., Golub, M.S., Nerbonne, J.M., Hell, J.W., Trainor, B.C., Sack, J.T., Schwartzkroin, P.A., and Trimmer, J.S. Deletion of the Kv2.1 delayed rectifier potassium channel leads to neuronal and behavioral hyperexcitability. **Genes Brain and Behavior 13**: 394-408 (2014).

Bosch, M.K., Nerbonne, J.M., and Ornitz, D.M. Dual transgene expression in murine cerebellar Purkinje neurons by viral transduction *in vitro*. **PLoS One 9**: e104062 (2014).

Boczek, N.J., Ye, D., Wang, W., Johnson, E.K., Crotti, L., Teskr, D.J., Dagradi, F., Mizusawa, Y., Torchio, M., Alders, M., Guidicessi, J.R., Wilde, A.A., Schwarz, P.J., Nerbonne, J.M., and Ackerman, M.J. Characterization of SEMA3A-encoded semaphorine as a naturally occurring Kv4.3 protein inhibitor and its contribution to Brugada Syndrome. **Circulation Research 115**: 460-469 (2014).

Victor, M.B., Richner, M., Hermanstyne, T.O., Ransdell, J.L., Sobieski, C., Deng, P.-Y., Klyachko, V.A., Nerbonne, J.M., and Yoo, A.S. Generation of human striatal neurons by microRNA-dependent direct conversion of fibroblasts. **Neuron 84**: 311-323 (2014).

Granados-Fuentes, D., Hermanstyne, T.O., Carrasquillo, Y., Nerbonne, J.M., and Herzog, E.D. $I_A$ channels encoded by Kv1.4 and Kv4.2 regulate circadian period of PER2 expression in the suprachiasmatic nucleus. **Journal of Biological Rhythms 30**: 396-407 (2015).

Bosch, M.K., Carrasquillo, Y., Ransdell, J.L., Kanakmedala, A., Ornitz, D.M., and Nerbonne, J.M. Intracellular FGF14 (iFGF14) is required for spontaneous and evoked firing in cerebellar Purkinje neurons and for motor coordination and balance. **Journal of Neuroscience 35**: 6752-6769 (2015).

Hermanstyne, T.O, Simms, C.L., Carrasquillo, Y., Herzog, E.D., and Nerbonne, J.M. Distinct firing properties of Vasoactive Intestinal Peptide- (VIP-) expressing neurons in the suprachiasmatic nucleus. **Journal of Biological Rhythms 31**: 57-67 (2016).

Bosch, M.K., Nerbonne, J.M., Townsend, R.R., Miyazaki, H., Nukina, N, Ornitz, D.M., and Marionneau, C. Proteomic analysis of native cerebellar iFGF14 complexes. **Channels 10**: 297-312 (2016).

****See News and Views**: Dib-Hajj, S.D. iFGF14-$Na_v$s: A monogamous partnership? **Channels 10**: 602-603 (2016).

Chiplunkar, A., Springer, S., Wang, W., Diaz-Trelles, R., Nerbonne, J.M., and Rentschler, S. Notch mediated epigenetic regulation of voltage-gated potassium currents. **Circulation Research 119**: 1324-1338 (2016).

****See Editorial**: Anumonwo, J.B. Reprogramming of cardiac repolarization: Notch signals as a potential role for epigenetic transcriptional events. **Circulation Research 119**: 1265-1266 (2016).

Hueneke, R., Adenwala, A., Mellor, R., Seidman, J.G., Seidman, C.E., and Nerbonne, J.M. Early remodeling of repolarizing $K^+$ currents in the $aMHC^{403/+}$ mouse model of hypertrophic cardiomyopathy. **Journal of Molecular and Cellular Cardiology 103**: 93-101 (2017).

Ransdell, J.L., Dranoff, E., Lau, B., Lo, W.-L., Donermeyer, D.L., Allen, P.M., and Nerbonne, J.M. Loss of Navβ4-mediated regulation of sodium currents in Purkinje neurons disrupts firing and impairs motor coordination and balance. **Cell Reports 19**: 532-544 (2017).

Hermanstyne, T.D., Granados-Fuentos, D., Mellor, R., Herzog, E.D., and Nerbonne, J.M. Acute *in vivo* "knockdown" of Kv4.1 modulates neuronal firing rates and clock gene expression in the suprachiasmatic nucleus and disrupts circadian rhythms in behavior. **eNeuro**, in revision (2017).

Zhu, W., Varga, Z., Li, G., Mellor, R.L., Schubert, A.R., Naegele, K.M., Nukina, N., Nerbonne, J.M., and Silva, J.R. Mechanisms of non-covalent β subunit regulation of Nav channel gating, submitted (**Journal of General Physiology**).

Johnson, E.K., Springer, S.J., Wang, W., Dranoff, E.J., Zhang, A., Yamada, K.A., and Nerbonne, J.M. Differential expression and remodeling of transient outward potassium currents in human left ventricles, submitted (**Circulation**).

**Book Chapters and Invited Reviews:**

Krouse, M.E., Nass, M.M., Nerbonne, J.M., Lester, H.A., Wassermann, N.H., and Erlanger, B.F. Agonist-receptor interaction is only a small component in the synaptic delay of nicotinic transmission. In: **Neurotransmitter and Hormone Receptors in Insects**. D. Satelle, Ed., Elsevier-North Holland, pp. 17-25 (1980).

Lester, H.A., Nass, M.M., Krouse, M.E., Nerbonne, J.M., Wassermann, N.H., and Erlanger, B.F. Electrophysiological experiments with photoisomerizable cholinergic compounds.

Review and Progress Report. **Annals of the New York Academy of Sciences 346**: 475-490 (1980).

Lester, H.A., Krouse, M.E., Nerbonne, J.M., Wassermann, N.H., and Erlanger, B.F. Light activated compounds as probes for nicotinic acetylcholine receptors. In: **Drug Receptors and Their Effectors**. N.J.M. Birdsall, Ed., MacMillan-London, pp. 97-106 (1981).

Lester, H.A., and Nerbonne, J.M. Physiological and pharmacological manipulations with light flashes. **Annual Review of Biophysics and Bioengineering 11**: 151-175 (1982).

Nerbonne, J.M. Design and application of photolabile intracellular probes. In: **Optical Methods in Cell Physiology. Society of General Physiologists Series, Volume 40**. P. DeWeer and B.M. Salzberg, Eds. John Wiley and Sons, pp. 417-445 (1986).

Nerbonne, J.M., Rakowski, R.F., and Bloch, R.J. Illuminating approaches to cell physiology. **Trends in Neurosciences 18**: 241-243 (1995).

Barry, D.M., and Nerbonne, J.M. Myocardial potassium channels: Electrophysiological and molecular diversity. **Annual Review of Physiology 58**: 363-394 (1996).

Nerbonne, J.M. Caged Compounds: Tools for illuminating neuronal responses and connections. **Current Opinion in Neurobiology 6**: 379-386 (1996).

Nerbonne, J.M. Regulation of voltage-gated $K^+$ channel expression in the developing mammalian myocardium. **Journal of Neurobiology 37**: 37-59 (1998).

Van Wagoner, D.R., and Nerbonne, J.M. Molecular basis of atrial fibrillation. In: **Heart Physiology and Pathophysiology, 4th Edition**. N. Sperelakis, Y. Kurachi, A. Terzic and M. Cohen, Eds., Academic Press, N.Y., N.Y., **Chapter 62:** (2000).

Nerbonne, J.M. Molecular basis of functional voltage-gated $K^+$ channel diversity in the myocardium. **Journal of Physiology, *London* 525**: 285-298 (2000).

Van Wagoner, D.R., Nerbonne, J.M., and Waldo A.L. Remodeling of atria during atrial fibrillation. In: **Atrial-AV Nodal Electrophysiology: A view from the Millennium**, T. Mazgalev and P.J. Tchou, Eds., Futura Publ. Co., Armonk, N.Y., pp. 335-352 (2000).

Van Wagoner, D.R., and Nerbonne, J.M. Molecular basis of electrical remodelling in atrial fibrillation. **Journal of Molecular and Cellular Cardiology 32**: 1101-1117 (2000).

Nerbonne, J.M. Molecular mechanisms controlling functional voltage-gated $K^+$ channel diversity and expression in the mammalian heart. In: **Potassium Channels in Cardiovascular Biology**, N.J. Rusch and S.L. Archer, Eds., Plenum Press, N.Y., NY., **Chapter 17**: pp. 297-335 (2001).

Nerbonne, J.M. Molecular analysis of voltage-gated $K^+$ channel diversity and functioning in the mammalian heart. In: **Handbook of Physiology, Section 2: The Cardiovascular System, Volume 1: The Heart**, E. Page, H.A. Fozzard and R.J. Solaro, Eds. Oxford University Press, New York, N.Y. **Chapter 15**: 568-593 (2001).

Pond, A.L., and Nerbonne, J.M. ERG proteins and functional cardiac $I_{Kr}$ channels in rat, mouse and human heart. **Trends in Cardiovascular Medicine 11**: 286-294 (2001).

Nerbonne, J.M., Nichols, C.G., Schwarz, T.L., and Escande, D. Genetic manipulation of cardiac $K^+$ channel function: What have we learned and where do we go from here? **Circulation Research 89**: 944-956 (2001).

Nerbonne, J.M., and Guo, W. Heterogeneous expression of voltage-gated $K^+$ channels in the heart: roles in normal excitation and arrhythmias. **Journal of Cardiovascular Electrophysiology 13**: 406-409 (2002).

Nerbonne, J.M. and Kass, R.S. Physiology and molecular biology of cardiac ion channels. In: **Cardiac Repolarization**, **Bridging Basic and Clinical Science**, I.B. Gussak, C. Antzelevitch, Eds., Humana Press, Totowa, N.J., **Chapter 3,** pp. 25-62 (2003).

Nerbonne, J.M. Molecular diversity of ion channels in the mouse heart: Is the mouse a suitable model for cardiac drug development? In: **Cardiac Drug Development Guide**, M.K. Pugsley, Ed., Humana Press, Totowa, N.J., **Chapter 13**, pp. 245-270 (2003).

Nerbonne, J.M. Studying cardiac arrhythmias in the mouse: A reasonable model for probing mechanisms? **Trends in Cardiovascular Medicine 14**: 83-93 (2004).

Nerbonne, J.M. Heterogeneous expression of potassium channels in the mammalian myocardium. In: **Cardiac Electrophysiology from Cell to Bedside**, Fourth Edition, D. Zipes and J. Jalife, Eds. Saunders, New York, N.Y., **Chapter 20**, pp. 169-180 (2004).

Nerbonne, J.M., and Kass, R.S. Molecular physiology of ion channels that control cardiac repolarization. In: **Cardiac Safety of Non-Cardiac Drugs**, J. Morganroth and I. Gussak, Eds. Humana Press, Totowa, N.J., **Chapter 2**, pp. 13-36 (2004).

Adamson, P.B., Barr, R. C., Cullans, D.J., Chen, P.-S.C., Lathrop, D.A., Makielski, J.C., Nerbonne, J.M., Nuss, B.J., Olgin, J.E., Przywara, D.A., Rosen, M.R., Rozanski, G.J., Spach. M.S., and Yamada, K.A. The perplexing complexity of cardiac arrhythmias: beyond electrical remodeling. **Heart Rhythm 2**:650-659 (2005).

Nerbonne, J.M., and Kass, R.S. Molecular physiology of cardiac repolarization. **Physiological Reviews 85**: 1205-1253 (2005).

Yamada, K., and Nerbonne, J.M. Validation of a model for predicting drug induced Torsades de Pointes: The risky business of assessing arrhythmogenic potential. **Heart Rhythm 3**: 957-958 (2006).

Lehnart, S.E., Ackerman, M.J., Benson, D.W. Jr., Brugada, R., Clancy, C.E., Donahue, J.K., George, A.L. Jr., Grant, A.O., Groft, S.C., January, C.T., Lathrop, D.A., Lederer, W.J., Makielski, J.C., Mohler, P.J., Moss, A., Nerbonne, J.M., Olson, T.M., Przywara, D.A., Towbin, J.A., Wang, L.H., and Marks, A.R. Inherited Arrhythmias: A National Heart, Lung, and Blood Institute and Office of Rare Diseases workshop consensus report about the diagnosis, phenotyping, molecular mechanisms, and therapeutic approaches for primary cardiomyopathies of gene mutations affecting ion channel function. **Circulation 116**: 2325-2345 (2007).
***See erratum: Circulation 118**: e132 (2008).

Nerbonne, J.M. Heterogeneous expression of repolarizing potassium currents. In: **Cardiac Electrophysiology from Cell to Bedside**, Fifth Edition, D. Zipes and J. Jalife, Eds., Saunders, N.Y., N.Y. **Chapter 28**, 293-305 (2009).

Niwa, N., and Nerbonne, J.M. Molecular determinants of cardiac transient outward $K^+$ current ($I_{to}$): Expression and regulation. **Journal of Molecular and Cellular Cardiology 48**: 12-25 (2010).

Fishman, G.I., Chugh, S., DiMarco, J., Albert, C., Anderson, M., Bonow, R.O., Buxton, A., Chen, P.-S., Estes, M., Jouven, X., Kwong, R., Lathrop, D., Mascette, A., Nerbonne, J., O'Rourke, B., Page, R., Roden, D., Rosenbaum, D.S., Sotoodehnia, N., Trayanova, N., and Zheng, Z.-J. Sudden cardiac death prediction and prevention. Report from a National Heart, Lung, and Blood Institute and Heart Rhythm Society Workshop. **Circulation 122**: 2335-2348 (2010).

Norris, A.J., Foeger, N.C., and Nerbonne, J.M. Neuronal voltage-gated $K^+$ channels function in macromolecular protein complexes. **Neuroscience Letters 486**: 73-77 (2010).

Niwa, N., and Nerbonne, J.M. Myocardial $K^+$ Channels: Primary determinants of action potential repolarization. In: **Novel Therapeutic Targets for Antiarrhythmia Drugs**. G.E. Billman, Ed. John Wiley & Sons, **Chapter 2**, pp. 8-58 (2010).

Nerbonne, J.M. Repolarizing cardiac potassium channels: Multiple sites and mechanisms for CaMKII-mediated regulation. **Heart Rhythm 8**: 938-941 (2011).

Yang, K.-C.. Wang, W., and Nerbonne, J.M. Patch clamp recordings. In: **Manual of Research Techniques in Cardiovascular Medicine**, H. Ardehali, D. Losordo, R. Bolli, Eds., Wiley Blackwell, Oxford, **Chapter 6**, pp. 50-59 (2013).

Nerbonne, J.M. Voltage-regulated $K^+$ channels. In: **Cardiac Electrophysiology From Cell to Bedside**, Sixth Edition, D. Zipes and J. Jalife, Eds., Saunders, New York, N.Y., **Chapter 3**, pp. 23-32 (2013).

Carrasquillo, Y., and Nerbonne, J.M. $I_A$ channels: diverse regulatory mechanisms. **The Neuroscientist 20**: 104-111 (2014).

Nerbonne, J.M. Mouse models of arrhythmogenic cardiovascular disease: challenges and opportunities. **Current Opinion in Pharmacology 15**: 107-114 (2014).

Nerbonne, J.M. Molecular basis of functional myocardial potassium channel diversity in **Cardiac Potassium Channel Disorders, Cardiac Electrophysiology Clinics 8**: 257-273 (2016).

Peyronnet, R., Nerbonne, J.M., and Kohl, P. Cardiac mechano-gated ion channels and arrhythmias. **Circulation Research 118**: 311-329 (2016).

Nerbonne, J.M. Functional and molecular diversity of native neuronal $K^+$ channels. **eLS**, John Wiley & Sons, Ltd. (2016).

Yang, K.-C., and Nerbonne, J.M. Mechanisms contributing to myocardial potassium diversity, regulation and remodeling. **Trends in Cardiovascular Medicine 26**: 209-218 (2016).

Nerbonne, J.M., and Mann, D.L. Training the next generation of translational cardiovascular investigators: Is the pipeline half-full or half-empty? **Journal of the American College of Cardiology, Basic to Translational Science 1**: 524-526 (2016).

Chaimvimonvat, N., Chen-Izu, Y., Clancy, C.E., Deschenes, I., Dobrev, D., Heijman, J., Izu, L., Qu, Z., Ripplinger, C.M., Vandenberg, J.I., Weiss, J.N., Koren, G., Banyasz, T., Grandi, E., Sanguinetti, M.C., Bers, D.M., and Nerbonne, J.M. Potassium currents in the heart: Functional roles in repolarization, arrhythmia and therapeutics. **Journal of Physiology** , **595**: 2229-2252 (2017).

**Invited Conferences and Symposia:**

"**Design and application of photolabile intracellular probes." Conference entitled: Optical Methods in Cell Physiology**. Society of General Physiologists Annual Meeting, Woods Hole, MA, September, 1984.

"**Illuminating approaches to the nervous system**." Symposium entitled: **Frontiers in the Natural Sciences**. American Association for the Advancement of Science Annual Meeting, Philadelphia, PA, May, 1986.

"**Modulation of myocardial ion channels probed with caged second messengers**." Symposium entitled: **Caged Compounds and their Application in Biology**. Satellite Meeting with the British Biophysical Society Annual Meeting, London, England, July, 1988.

"**Voltage-gated calcium channels in cortical function**." Gordon Research Conference entitled: **Ion Channels**. New London, NH, August, 1990.

**"Molecular and functional $K^+$ channel diversity in cortical neurons."** Society for Neuroscience Annual meeting, Symposium entitled: **Molecular Mechanisms Controlling $K^+$ Channel Diversity and Distribution in the Nervous System**. Miami, FL, November, 1994.

**"Molecular correlates of functional $K^+$ channel diversity in mammalian heart."** Conference entitled: **Electrical responses and pharmacology of mammalian A-V node and atrium**. Conferences on Cardiac Electrophysiology, honoring the contributions of **Professor Denis Noble**, Banff, Canada, November, 1996.

**"Molecular composition of repolarizing $K^+$ currents in the myocardium."** Clinical Tutorial entitled: **Structure and Function of Ion Channels**. North American Society of Pacing and Electrophysiology 18th Annual Meeting, New Orleans, LA, May, 1997.

**"Voltage-gated ion channels in the myocardium."** Gordon Research Conference entitled: **Cardiac Regulatory Mechanisms**. New London, NH, July, 1998.

**"Structure-function studies of voltage-dependent cardiac $K^+$ channels."** International Symposium entitled: **1949-1999: 50 Years of Cardiac Cellular Electrophysiology, A Tribute to Professor Edouard Coraboeuf**. Orsay, France, September, 1999.

**"Molecular mechanisms of arrhythmias in heart failure."** Cardiac Electrophysiology Society Annual Meeting, Symposium entitled: **Arrhythmias in heart failure.** Atlanta, GA, November, 1999.

**"What is new in our understanding of the molecular basis of cardiac repolarization."** American Heart Association Annual Meeting, Symposium entitled: **What's hot, what's new in cardiovascular ion channels**. Atlanta, GA, November, 1999.

**"Myocardial ion channels and electrical remodeling."** 64$^{th}$ Annual Scientific Meeting of the Japanese Circulation Society, Symposium entitled: **Circulation 2000, Japan,** Osaka, Japan, April, 2000.

**"Molecular diversity of repolarizing voltage-gated $K^+$ channels in the myocardium."** Symposium entitled: **Ion Channels in the 21$^{st}$ Century**. International Society for Heart Research North American Section Annual Meeting, Louisville, K.Y., June, 2000.

**"Functional and molecular diversity of repolarizing $K^+$ currents."** Gordon Research Conference entitled: **Cardiac Regulatory Mechanisms**. New London, NH, July, 2000.

**"Molecular diversity of repolarizing voltage-gated $K^+$ currents."** North American Society for Pacing and Electrophysiology, **Clinical Tutorial 51**, **"Molecular Biology of Cardiac Ion Channels."** Boston, MA, May, 2001.

**"Molecular dissection of the repolarizing voltage-gated $K^+$ (Kv) channels/currents in mouse ventricular and atrial myocardium: comparison of results from studies using transgenic and targeted deletion strategies."** International Symposium entitled: **$K^+$ Channel Transgenesis in the Mouse Heart**, Abbaye de Royaumont, France, June, 2001.

**"State of the Art: Kv channel interacting proteins."** American Heart Association Scientific Sessions 2001, **Featured Research Presentation,** AHA National Meeting, Anaheim, CA, November, 2001.

**"Understanding excitability in the mammalian heart: one $K^+$ channel at a time."** Symposium entitled: **Science Today! 10$^{th}$ Annual Symposium of the Medical Science Graduate Student Association** of the University of Calgary. Banff, Canada, May, 2002.

**"Repolarization Remodeling."** Cardiostim 2002: 6th Bienniel World Congress on Cardiac Arrhythmias and 13th International World Congress in Cardiac Electrophysiology, Symposium entitled: **Ion Channel Function**, Nice, France, June, 2002.

**"Molecular dissection of $K^+$ channel functioning in cardiac repolarization."** Special Symposium entitled: **Translational Cardiovascular Research**, **honoring the contributions of Professor Harry Fozzard**, International Society for Heart Research North American Section Annual Meeting, Madison, WI, July, 2002.

**"Remodeling of myocardial voltage-gated $K^+$ channels."** American Heart Association Scientific Sessions 2002, Symposium entitled: **Mechanism Controlling Remodeling in the Mammalian Heart**. AHA National Meeting, Chicago, IL, November, 2002.

**"Animal models of cardiac arrhythmias – is bigger better or do good things really come in small packages."** Keystone Symposium entitled: **Molecular Pathology of Cardiac Arrhythmias**, Santa Fe, NM, January, 2003.

**"Dissection of cardiac repolarization in genetically-altered mice."** Biophysical Society, Symposium entitled: **Probing Excitability and Contractility by Gene Transfer**. Biophysical Society 47th Annual Meeting, San Antonio, TX, March, 2003.

**"Molecular biology of potassium channels."** Symposium of the Sonderforschungsbereich (Collaborative Research Center) 556 entitled: **Heart Failure and Arrhythmias**, Münster, Germany, May, 2003.

**"Potassium channel diversity in the heart."** FASEB Summer Research Conference entitled: **Ion Channel Regulation**, Tucson, AZ, June, 2003.

**"Mouse models of potassium channel function."** Cardiostim 2004: 7th Bienniel World Congress on Cardiac Arrhythmias and 14th International World Congress in Cardiac Electrophysiology, Symposium entitled: **Mouse Models of Cardiac Disease**, Nice, France, June, 2004.

**"Voltage-gated potassium channels and cardiac arrhythmias."** Gordon Research Conference entitled: **Cardiac Arrhythmias**, Santa Barbara, CA, February, 2005.

**"Unconventional subunit modulators of channel function."** 26th Annual Scientific Sessions of the Heart Rhythm Society, Core Curriculum, **Targeted Alteration in Ion Channel Gene Expression**, New Orleans, LA, May, 2005.

**"Auxiliary subunits in the regulation of cardiac $K^+$ channel diversity and functioning."** Third International Workshop on **Ion Channels**: **From Structure to Physiopathology**. Universidad de Colima – Centro Universitario de Investigaciones Biomedicas, Colima, Colima, Mexico, November, 2005.

**"Molecular insights into repolarization and remodeling in the ventricular myocardium."** Annual Retreat of the Cardiac Bioelectricity and Arrhythmia Center, Department of Biomedical Engineering, Washington University, St. Louis, MO, May, 2006.

**"Loss of function potassium channel mutations in inherited long QT syndromes."** National Heart, Lung and Blood Institute and Office of Rare Diseases Workshop entitled: **Recognition and Treatment of Rare Inherited Arrhythmias**, National Institutes of Health, Bethesda, MD, September, 2006.

**"Post-translational changes involved in remodeling of myocardial $K^+$ currents."** 28th Annual Scientific Sessions of the Heart Rhythm Society, Core Curriculum: **Expression of Ion Channels**: **On the Way to Remodeling**, Denver, CO, May, 2007.

**"Cell physiology, pharmacology and signaling, expert commentary."** 28th Annual Scientific Sessions of the Heart Rhythm Society, Denver, CO, May, 2007.

**"Molecular diversity and regulation of repolarizing myocardial $K^+$ channels." Denis Escande Symposium,** First Edition: **Cardiovascular Diseases**, Nantes, France, June, 2007.

**"Multiple mechanisms involved in myocardial potassium channel regulation, remodeling and arrhythmogenesis."** Cardiac Arrhythmia Symposium entitled: **Troubles with Rhythm: Molecular and Genetic Basis for Cardiac Arrhythmias**. GEPROM, Montreal, Quebec, Canada, May, 2008.

**"Atrial fibrillation."** Cardiostim 2008: 9th Bienniel World Congress on Cardiac Arrhythmias and 16th World Congress on Cardiac Electrophysiology and Cardiac Techniques. **Symposium entitled: Atrial Fibrillation**, Nice, France, June, 2008.

**"Diversity of ion channels in the heart."** Mini-symposium: Electrophysiology – from cell to ECG, XVIII International Conference of the Cardiovascular System Dynamics Society Annual Meeting. St. Louis, MO, September, 2008.

**"K channels in metabolic cardiomyopathy."** 30th Annual Scientific Sessions of the Heart Rhythm Society, Core Curriculum: **Metaboelectrical Signaling in the Heart**, Boston, MA, May, 2009.

**"Humans vs. mice vs. rabbits: What do transgenic models teach us about human arrhythmias?"** 30th Annual Scientific Sessions of the Heart Rhythm Society, Core Curriculum, Session Chair. Boston, MA, May, 2009.

**"Molecular physiology of cardiac repolarization."** International Society for Heart Research North American Section Annual Meeting. Symposium entitled: **Novel Mechanisms in Cardiac Electrophysiology**. Baltimore, MD, May, 2009.

**"Molecular determinants of voltage-gated $K^+$ channel diversity and functioning."** 2009 FASEB Summer Research Conference on **Ion Channel Regulation**, Snowmass Village, CO, June, 2009.

**"Proteomic analysis of macromolecular ion channel complexes."** Masterclass on **Proteomics of ion channels.** Denis Escande Symposium, Second Edition: **Arrhythmias,** Nantes, France, June, 2009.

**"Diversity and complexity of repolarizing ion channels."** American Heart Association Scientific Sessions 2009. Symposium entitled **Action Potential Repolarization – From Molecular to Clinical.** AHA Meeting, Orlando, FL, November, 2009.

**"Targeting miRNAs: Can miRNAs be potential targets?"** 31st Annual Scientific Sessions of the Heart Rhythm Society, Special Session on Basic/Translational Science Forum: Novel Targets to Cure Cardiac Arrhythmias. Denver, CO, May, 2010.

**"Ion channels in atrial fibrillation."** Cardiostim 2010; 10th Bienniel World Congress on Cardiac Arrhythmias and 17th World Congress on Cardiac Electrophysiology and Cardiac Techniques. Symposium entitled: **Mechanisms of Fibrillation**. Nice, France, June, 2010.

**"Ion channel remodeling in cardiac hypertrophy and failure."** 33rd Meeting of the North American Section of the International Society for Heart Research (ISHR). Philadelphia, PA, May, 2011.

**"Native Kv4-encoded neuronal and cardiac Kv channels function in macromolecular protein complexes." Integrative Physiology in the Post-Genome Era.** Society of General Physiologists Annual Meeting, Woods Hole, MA, September, 2012.

**"iPS Cells: Useful Model or Boutique Science**." American Heart Association Scientific Sessions 2012, **Ask the Experts**. AHA Meeting, Los Angeles, CA, November 2012.

**"Native cardiac (and neuronal) voltage-gated $K^+$ channels function in macromolecular protein complexes."** The Royal Danish Academy of Science and Letters, **Ion Channel Symposium**, Copenhagen, Denmark, May, 2013.

**"Intracellular FGFs: Novel regulators of membrane excitability."** FASEB Summer Research Conference on Ion Channel Regulation, Nassau, Bahamas, June, 2013**.**

**"Neuronal Kv4-encoded channels function in macromolecular protein complexes."** Symposium entitled: **Potassium Channel Complexes: Dynamic Aspects of Assembly and Regulation Towards their Physiological Roles**. International Union of Physiological Sciences Annual Meeting, Birmingham, UK, July, 2013.

**"Myocardial potassium channel regulation, remodeling and arrhythmogenesis…keeping the beat."** Dutch Heart Foundation Lecture, Dutch Physiological Society 29th Annual Meeting, Keynote Speaker, Utrecht, Netherlands, November, 2013.

**"Long noncoding RNAs in cardiac remodeling."** 36th Annual Scientific Sessions of the Heart Rhythm Society, Boston, MA, May, 2015.

**"Mechanisms contributing to electrical remodeling in cardiac hypertrophy and failure."** International Society for Heart Research North American Section Annual Meeting, Seattle, WA, June, 2015.

**"Mechanisms contributing to myocardial potassium channel diversity, regulation and remodeling."** FASEB Summer Research Conference entitled: **Ion Channel Regulation**, Big Sky, MT, June, 2015.

**"Cardiac $K^+$ channel regulation: functional studies."** Fourth UC Davis Cardiovascular Symposium: **Systems Biology Approach to Understand Cardiac E-C Coupling and Arrhythmias - $K^+$ Channels and Regulation**, University of California at Davis, Davis, CA, March, 2016.

**"Electrical/molecular remodeling and arrhythmogenesis in the failing heart",** Second **Sudden Cardiac Death Symposium**, Bern, Switzerland, October, 2016.

**"Transcriptional/translational regulation of ion channel complexes: A new frontier in the understanding of arrhythmogenesis",** 38th Annual Meeting of the Heart Rhythm Society, Chicago, IL, May, 2017.

**"Intracellular fibroblast growth factors (iFGFs) in the regulation and dysregulation of neuronal excitability",** Sixth Annual Ion Channel Conference: Ion Channels: Structure, Function & Therapeutics, Qingdao, China, June, 2017.

**"Diversity in cardiac ion channel regulatory mechanisms"**, FASEB Summer Research Conference entitled: **Ion Channel Regulation**, Steamboat Springs, CO, July, 2017.

**Teaching Experience:**

| | |
|---|---|
| 1985-2007 | Lecturer in **Medical Pharmacology** (D.F. Covey, Coursemaster). |
| 1985-1986 | Primary Lecturer in **Cellular Neurobiology** (with G.D. Fischbach, J.H. Steinbach and P.T. Taghert; J.H. Steinbach, Coursemaster). |
| 1986-1988 | Primary Lecturer in **Mediators of Cell Function** (with J.C. Lawrence and J.H. Russell; J.H. Russell, Coursemaster). |
| 1988-1993 | Conference and Laboratory Instructor in **Medical Neuroscience** (T.A. Woolsey, Coursemaster). |
| 1989 | Primary Lecturer in **Cellular Neurobiology** (with E.W. McCleskey, P.S. Stein and J.H. Steinbach; J.H. Steinbach, Coursemaster). |

1990-1992 Primary Lecturer in **Cellular Neurobiology** (with P.S. Stein, J.H. Steinbach and R.S. Wilkinson; J.M. Nerbonne, Coursemaster).

1991-1995 Invited Lecturer and Lab Instructor in **Imaging Structure and Function in the Nervous System**, Cold Spring Harbor Laboratory (L.C. Katz and R.S. Lewis, Course Coordinators, 1991-1992; J.W. Lichtman and G. Augustine, Course Coordinators, 1993-1995).

1994-1995 Invited Lecturer in **Molecular Approaches to Ion Channel Structure and Function**, Cold Spring Harbor Laboratory (J. Margulies, P. Ruben, and G. Robertson, Course Coordinators).

1994-2001 Lecturer and Laboratory Instructor in **Medical Neuroscience** (J.W. Lichtman, W.T. Thach and D.C. Van Essen, Coursemasters).

2002-2004 Invited Lecturer in **Ion Channel Physiology**, Cold Spring Harbor Laboratory (M. Farrant, M. Hausser and N. Spruston, Coursemasters).

2006-2007 Invited Lecturer in **Biophysics of Ion Channels**, Department of Biomedical Engineering, Washington University (Jianmin Cui, coursemaster).

2007 Invited Lecturer in **Scientific Presentation**, Washington University Medical School (B. Kolber and J.H. Steinbach, Coursemasters).

2009-2017 Lecturer in **Biophysics of Ion Channels**, Department of Biomedical Engineering, Washington University (Jianmin Cui, Coursemaster).

2010-2017 Lecturer in **Neurophysiology**, Department of Biomedical Engineering, Washington University (Vitaly Klyachko, Coursemaster).

**Training Experience:**

**Predoctoral Trainees:**

Michael Apkon, M.D/Ph.D. awarded 1989; thesis entitled: "**Properties of Voltage-Activated Outward $K^+$ Currents and their Modulation by Alpha-Adrenergic Agonists in Isolated Rat Ventricular Myocytes**." Present Position: Associate Professor of Pediatrics, Yale University School of Medicine, New Haven, CT.

Kelleen Giffin, Ph.D. awarded 1990; thesis entitled: "**Characterization and Comparison of $Ca^{++}$ Channels in Three Identified Classes of Neurons from the Visual Cortex of Rat**." Present Position: The Many Meanings of Hope, Stamford, CT.

Joel S. Solomon, M.D./Ph.D. awarded 1993; thesis entitled: "**Hyperpolarization-Activated Currents in Identified Neurons from Rat Primary Visual Cortex**." Present Position: Assistant Professor of Surgery and Chief of Hand Surgery, Oregon Health Sciences University, Portland, OR.

Rachel E. Locke, Ph.D. awarded 1996; thesis entitled: **"Depolarization-Activated Potassium Channels in the Functioning of Callosal-Projecting Visual Cortical Neurons**." Present Position: Project Director, Program in Neuroprotection. Neurosciences Institute, University of Pennsylvania, Philadelphia, PA.

Dianne M. Barry, Ph.D. awarded 1997; thesis entitled: "**Molecular Structure of the Cardiac Transient Outward Potassium Channel**." Present Position: Freelance Science Writer, Worcester, MA.

Sacha Malin, Ph.D. awarded 2001; thesis entitled: "**Molecular Basis of Functional Potassium Channel Diversity in the Mammalian Central Nervous System**." Present Position: Assistant Professor, University of Pittsburgh, Pittsburgh, PA.

Aaron Norris, M.D./Ph.D. awarded 2012; thesis entitled: "**Molecular Dissection of $I_A$ Channels in Cortical Pyramidal Neurons**."

Kai-Chien Yang, M.D./Ph.D., awarded 2012; thesis entitled: "**Electrical and Functional Remodeling in Physiological and Pathological Hypertrophy**."

Nicholas Foeger, M.D./Ph.D. awarded 2013; thesis entitled: "**Molecular Mechanisms Controlling the Expression and Functioning of Kv4-Encoded Cardiac $I_{to,f}$ Channels**."

Thesis Committee Member for an additional 26 M.D./ Ph.D. candidates and 29 Ph.D. candidates in the Neural Sciences, Cellular and Molecular Biology, Biochemistry, Biophysics and Biomedical Engineering Graduate Programs (chair of 32 of these committees) since 1985.

**Postdoctoral Trainees:**

Walter A. Boyle, M.D., 1978; Postdoctoral Research Fellow, 1989-1991: "**Functional Diversity of Voltage-Gated $K^+$ Channels in Mammalian Atria**." Present position: Professor of Anesthesiology, Washington University, St. Louis, MO.

Sylvain Richard, Ph.D., 1995; Postdoctoral Research Fellow, 1996-1998: "**Regulation of Voltage-Gated Cardiac $Ca^{2+}$ Channel Gating**." Present position: Senior Scientist, CNRS, INSERM, Montpellier, France.

Fraincois Tiaho, Ph.D., 1997; Postdoctoral Research Fellow, 1997-2000: "**Neuropeptide Modulation of Cardiac Ion Channels and Excitability**." Present position: Associate Professor, Université de Rennes, Rennes, France.

Amber L. Pond, Ph.D., 1995; Postdoctoral Research Fellow, 1996-1998: "**Distinct Isoforms of ERG1 in Mammalian Heart**." Present position: Assistant Professor of Basic Medical Sciences, Purdue University School of Veterinary Medicine, West Lafayette, IN.

Haodong Xu, M.D., Ph.D., 1994; Postdoctoral Research Fellow, 1996-2000, 2003-2004: "**Molecular Diversity of Voltage-Gated $K^+$ Channels in the Mammalian Heart**." Present position: Associate Professor of Pathology, University of Rochester School of Medicine, Rochester, NY.

Elias Bou-Abboud, Ph.D., 1997; Postdoctoral Research Fellow, 1997-2001: "**Molecular Correlates of Voltage-Gated Atrial $K^+$ Currents**." Present position: Senior Scientist, SNBL USA, Seattle, WA.

Sylvain Brunet, Ph.D., 1998; Postdoctoral Research Fellow, 1998-2000: "**Electrical Remodeling in Cardiac Hypertrophy**." Present position: Assistant Professor, Department of Physiology, University of Washington, Seattle, WA.

Weinong Guo, M.D., Ph.D., 1997; Postdoctoral Research Fellow, 1998-2001: "**Molecular Correlates of Functionally Diverse Myocardial Kv Channels**." Present position: Director, Principal Medical Scientific Expert, Global CD & MA, Cardiovascular and Metabolism, Novartis Pharmaceutical Corporation, East Hanover, NJ.

Huilin Li, M.D., Ph.D., 1998; Postdoctoral Research Fellow, 1998-2002: "**Molecular Dissection of Cardiac Delayed Rectifier $K^+$ Currents**." Present position: Attending Physician, St. Luke's Hospital, St. Louis, MO.

Bin Ye, Ph.D., 2002; Postdoctoral Research Fellow, 2002-2004: "**Accessory Subunits and the Regulation of Cardiac $K^+$ Channel Trafficking**." Present position: Assistant Professor of Physiology, University of Wisconsin, Madison, WI.

Franck Aimond, Ph.D., 2000; Postdoctoral Research Fellow, 2000-2004: "**Role of Accessory Subunits in the Generation of Cardiac Kv Channels**." Present position: Staff Scientist, CNRS, INSERM, Montpellier, France.

Weilong Yuan, M.D., Ph.D., 1990; Postdoctoral Research Fellow, 2000-2004: "**Molecular Dissection of Kv Channel Function in Cortical Neurons**." Present position: Staff Scientist, Department of Medicine, Washington University, St. Louis, MO.

Zhengbin (Luke) Li, Ph.D., 2005; Postdoctoral Research Fellow, 2005-2007: "**Molecular Diversity of Kv Channels in Cortical Neurons**." Present position: Senior Research Associate, Chinese Academy of Medical Sciences, Beijing, China.

Fernanda Laezza, M.D., 1991, Ph.D., 2000; Postdoctoral Research Fellow, 2005-2008: **"FGF14 in the Regulation of Neuronal Voltage-Gated Sodium Channels."** Present position: Assistant Professor, Department of Pharmacology, University of Texas Medical Branch, Galveston, TX.

Céline Marionneau, Ph.D., 2005; Postdoctoral Research Fellow, 2005-2008: "**Molecular Mechanisms Controlling Myocardial Kv Channel Remodeling**." Present position: Chargé de Recherché, Deuxieme Classe, CNRS, INSERM, Nantes, France.

Noriko Niwa, Ph.D., 2004; Postdoctoral Research Fellow, 2005-2009: "**Role of Two Pore Domain $K^+$ Channels in the Mammalian Myocardium**." Present position: Staff Physician Cardiology, Nagoya University First Red Cross Hospital, Nagoya, Japan.

Wei (David) Wang, Ph.D., 2006; Postdoctoral Research Fellow, 2006-2012: "**Regulation and Remodeling of Cardiac $K^+$ Channels**." Present Position: Staff Scientist, Department of Internal Medicine, Cardiovascular Division, Washington University School of Medicine.

Yarimar Carrasquillo, Ph.D., 2006; Postdoctoral Research Fellow, 2007-2013: **"Dynamic Regulation of Neuronal Excitability."** Present Position: Tenure-Track Investigator, National Center for Complementary and Alternative Medicines, National Institutes of Health.

Scott B. Marrus, M.D., Ph.D., 2006; Postdoctoral Research Fellow, 2009-2015: **"Molecular Mechanisms Underlying Cardiac Remodeling."** Present Position: Instructor, Department of Electrical Engineering, School of Engineering, Washington University, St. Louis.

Kai-Chien Yang, M.D., 2005, Ph.D., 2012; Postdoctoral Research Fellow, 2012: **"Molecular Determinants of Electrical Remodeling in Human Heart Failure."** Present Position: Assistant Professor of Cardiology and Genetics, Graduate Institute of Pharmacology, National Taiwan University, Taipei, Taiwan.

Steven Springer, Ph.D., 2012: Postdoctoral Research Fellow, 2012-2017: **"Molecular Determinants and Functional Roles of Myocardial Voltage-Gated $K^+$ Channels."** Present Position: Senior Scientist, Nuvasive, New Orleans, LA.

Tracey Hermanstyne, Ph.D., 2012; Postdoctoral Research Fellow, 2013-present: "**Voltage-Gated $K^+$ Channels in the Regulation of Circadian Rhythms**."

Eric Johnson, Ph.D., 2012: Postdoctoral Research Fellow, 2013-present: **"Molecular Determinants of Native Repolarizing $K^+$ Currents in Human Ventricular Myocardium."**

Joseph Ransdell, Ph.D., 2013; Postdoctoral Research Fellow, 2013-present: **"Intracellular Fibroblast Growth Factors in the Regulation of Neuronal Excitability."**

**Administration and Service (Local; Washington University):**

| | |
|---|---|
| 1987-2002 | Member, **Graduate Student Advisory Committee for the Neurosciences Program**, Washington University School of Medicine |
| 1988-1992 | Member, **Steering Committee, McDonnell Center for Cellular and Molecular Neurobiology**, Washington University School of Medicine |
| 1990-1992 | Member, **Neurosciences Program Graduate Admissions Committee**, Washington University School of Medicine |
| 1991-2002 | Member, **Steering Committee, Lucille P. Markey Special Emphasis Pathway in Human Pathobiology**, Washington University School of Medicine |
| 1992-1995 | Member, **Medical Scientist Training Program Admissions Committee**, Washington University School of Medicine |
| 1995-2002 | Chair, **Graduate Student Advisory Committee for the Neurosciences Program**, Washington University School of Medicine |
| 1997-1999 | Member, **Subcommittee on Graduate Education in the Basic Sciences, Research and Basic Science Departments**, Washington University Medical School Accreditation Committee |
| 1997-2002 | Co-Director, **Neurosciences Graduate Program**, Washington University School of Medicine |
| 1998 | Member, **Honorary Scholars Selection Committee**, Washington University College of Arts and Sciences |
| 2000-2002 | Member, **Olin Fellowship Award Committee**, Washington University Graduate School of Arts and Sciences |
| 2001-2003 | Pre-Clinical Representative to the **Executive Committee of the Faculty Council**, Washington University School of Medicine |
| 2002-2008 | Co-Director, **Medical Scientist Training Program**, Washington University School of Medicine |
| 2004 | Member, **Honorary Scholars Selection Committee**, Washington University College of Arts and Sciences |
| 2005-2006 | Member, **Honorary Degree Nominating Committee**, Washington University Medical School |
| 2006-2007 | Member, **Subcommittee on Graduate Education in the Basic and Clinical Sciences**, Washington University Medical School Accreditation Committee |
| 2006-2008 | Member, **Genetics Department Chair Search Committee**, Washington University Medical School |
| 2007-2008 | Chair, **Honorary Degree Nominating Committee**, Washington University Medical School |
| 2007-2008 | Member, **Honorary Degree Selection Committee,** Washington University |
| 2007-2008 | Co-Chair, **Cardiovascular Diseases, Diabetes and Obesity Strategic Planning Committee**, Washington University Medical School |
| 2007-2009 | Member, **Gender Equity Committee**, Washington University Medical School |
| 2008 | Member, **Department of Internal Medicine, Cardiology Division Chief Search Committee**, Washington University Medical School |
| 2008-2009 | Member, **Advisory Committee on Women Faculty**, Washington University |
| 2008-2010 | Member, **Cell Biology & Physiology Department Chair Search Committee**, Washington University Medical School |

| | |
|---|---|
| 2008-2012 | Member, **Distinguished Investigator Awards Committee**, Washington University Medical School |
| 2008-present | Member, Steering Committee, **McDonnell Center for Cellular and Molecular Biology**, Washington University Medical School |
| 2009-2010 | Member, **Advisory Committee on the Appointment of the Dean of the School of Engineering and Applied Science**, Washington University School of Medicine |
| 2009-2012 | Member, **Committee on Research Integrity**, Washington University Medical School |
| 2010-2014 | Member, **Operations Committee**, Institute of Clinical and Translational Sciences, Washington University Medical School |
| 2010-2013 | Member, **HHMI Graduate Fellowship Nominating Committee**, Division of Biology and Biomedical Sciences, Washington University Medical School |
| 2010 | Member, **Developmental Biology Faculty Search Committee**, Washington University Medical School |
| 2011 | Member, **Olin Fellowship Award Selection Committee**, Washington University Graduate School of Arts and Sciences |
| 2012 | Member, **Research Policy on Conflict of Interest Committee**, Washington University Medical School |
| 2012 | Chair, **Distinguished Investigator Awards Committee**, Washington University Medical School |
| 2012-2013 | Member, **Department of Anatomy & Neurobiology** and **Department of Cell Biology & Physiology**, **Developmental Biology, Faculty Search Committees**, Washington University Medical School |
| 2012-2016 | Member, **Second Century Awards Selection Committee**, Washington University Medical School |
| 2014-2015 | Member, **Department of Developmental Biology Faculty Search Committee**, Washington University Medical School |
| 2014-present | Chair, **Center for Cardiovascular Research Faculty Search Committee**, Washington University Medical School |
| 2015-present | Member, **Department of Biochemistry and Molecular Biophysics Faculty Search Committee**, Washington University Medical School |
| 2016-present | Member, **Committee on Research Integrity**, Washington University |
| 2016-present | Member, **Executive Committee of the Division of Biology and Biomedical Sciences**, Washington University Medical School |

**Administration and Service (National/International):**

| | |
|---|---|
| 1988-present | Member, **Basic Science Council of the American Heart Association** |
| 1992-1994 | Council Member, **Society of General Physiologists** |
| 1998-2003 | Member, **American Heart Association Abstracts Selection Committee** |
| 2000-2003 | Member, **North American Society of Pacing and Electrophysiology Abstract Selection Committee** |
| 2001-2003 | Member at Large, **Executive Committee of the Basic Cardiovascular Science Council of the American Heart Association** |

| | |
|---|---|
| 2002-2003 | Member, **North American Society of Pacing and Electrophysiology, National Heart Lung and Blood Institute Task Force** |
| 2006 | Member, **NHLBI Strategic Planning and Working Group on Arrhythmias, National Heart, Lung and Blood Institute, National Institutes of Health, Washington, DC** |
| 2006-2010 | Member, **Abstracts Selection Committee**, **American Heart Association** |
| 2007-2010 | Member, **Abstracts Selection Committee**, **Heart Rhythm Society** |
| 2009 | Member, **International Society for Heart Research, Ion Channels and Arrhythmias Subgroup Nominating Committee** |
| 2009 | Member, **National Heart, Lung and Blood Institute and Heart Rhythm Society Strategic Workshop on Sudden Cardiac Death**, Heart Rhythm Society Headquarters, Washington, DC |
| 2009-2011 | Member, **Abstracts Selection Committee, Cardiac Electrophysiology Society** |
| 2009-2012 | Council Member, **Society of General Physiologists** |
| 2011 | Member, **Scientific Organizing Committee, Denis Escande Symposium Third Edition**, Nantes, France |
| 2011-2014 | **AAAS Electorate Nominating Committee**, Section on Neuroscience |
| 2011-2015 | Council Member, **Biophysical Society** |
| 2012-2015 | Council Member, **International Society for Heart Research** |
| 2013 | Member, **Scientific Organizing Committee, Denis Escande Symposium Fourth Edition**, Amsterdam, Netherlands |
| 2014-present | Member, **Committee for Scientific Sessions Planning (CSSP) of the Basic Cardiovascular Science Council of the American Heart Association** |

**Grant Review Committees (National/International):**

| | |
|---|---|
| 1986 | Adhoc Special Reviewer, **Behavioral and Neurosciences Study Section**, Subcommittee 1, Division of Research Grants, National Institutes of Health |
| 1987 | Adhoc Special Reviewer, **Physiology Study Section**, Division of Research Grants, National Institutes of Health |
| 1988 | Adhoc Special Reviewer, **Physiology Study Section**, Division of Research Grants, National Institutes of Health |
| 1988 | Special Reviewer, **Special Study Section**, Division of Research Grants, National Institutes of Health |
| 1990 | Adhoc Special Reviewer, **Neurological Sciences Study Section**, Division of Research Grants, National Institutes of Health |
| 1993 | Adhoc Special Reviewer, **Science and Technology Center Site Visit Team**, National Science Foundation |
| 1995 | Adhoc Special Reviewer, **Program Projects Site Visit Team**, National Heart, Lung and Blood Institute, National Institutes of Health |
| 1992-1996 | Member, **Physiology Study Section**, Division of Research Grants, National Institutes of Health |
| 1996 | Adhoc Special Reviewer, **Science and Technology Center Site Visit Team**, National Science Foundation |
| 1998 | Adhoc Special Reviewer, **Program Projects Site Visit Team**, National Heart, Lung and Blood Institute, National Institutes of Health |

| | |
|---|---|
| 1998-1999 | Member, **American Heart Association Midwest Affiliate Consortium Group Study Section** |
| 1999 | Adhoc Special Reviewer, **Specialized Centers of Research in Ischemic Heart Disease Special Emphasis Panel**, National Heart, Lung and Blood Institute, National Institutes of Health |
| 1999 | Adhoc Special Reviewer, **Program Projects Site Visit Team**, National Heart, Lung and Blood Institute, National Institutes of Health |
| 2000 | Adhoc Special Reviewer, **Program Projects Site Visit Team**, National Heart, Lung and Blood Institute, National Institutes of Health |
| 2001 | Adhoc Special Reviewer, **Cardiovascular Biology Study Section A**, Center for Scientific Review, National Institutes of Health |
| 2002-2003 | Member, **Cardiovascular Biology Study Section A**, Center for Scientific Review, National Institutes of Health |
| 2004-2007 | Member, **Electrical Signaling, Ion Transport and Arrhythmias (ESTA) Study Section**, Center for Scientific Review, National Institutes of Health |
| 2006-2007 | Chair, **Electrical Signaling, Ion Transport and Arrhythmias (ESTA) Study Section**, Center for Scientific Review, National Institutes of Health |
| 2008 | Member, **Intramural Program on Developmental Neurosciences: Laboratories of Comparative Ethology and Cellular and Synaptic Neurophysiology Site Visit Team**, National Institute for Child Health and Human Development, National Institutes of Health |
| 2009 | Adhoc Special Reviewer, **National Institute of Neurological Disorders and Stroke Special Emphasis Panel: P30-Faculty Recruitment**, National Institute for Neurological Disorders and Stroke, National Institutes of Health |
| 2009 | Adhoc Special Reviewer, **Cardiovascular Research Sciences, Special Emphasis Panel**, Center for Scientific Review, National Institutes of Health |
| 2010 | Adhoc Special Reviewer, **National Institute of Neurological Disorders and Stroke Special Emphasis Panel:** Institutional Training Grant (T32) Awards, National Institute of Neurological Disorders and Stroke, National Institutes of Health |
| 2011 | Adhoc Special Reviewer, **National Institute of Neurological Disorders and Stroke Special Emphasis Panel**: Fellowship (F and K) Awards, National Institute of Neurological Disorders and Stroke, National Institutes of Health |
| 2011 | Adhoc Special Reviewer, **National Institute of Neurological Disorders and Stroke Special Emphasis Panel**: Institutional Training Grant (T32) Awards, National Institute of Neurological Disorders and Stroke, National Institutes of Health |
| 2011 | Adhoc Special Reviewer, **American Heart Association Cardiac Electrophysiology National/Affiliate Study Section** |
| 2011-2013 | Review Committee, **Howard Hughes Medical Institute (HHMI) International Student Research Fellowship Program** |
| 2012 | Adhoc Special Reviewer, **National Institute of Neurological Disorders and Stroke Special Emphasis Panel**: **Institutional Training Grant (T32) Awards**, National Institute of Neurological Disorders and Stroke, National Institutes of Health |

| | |
|---|---|
| 2012-2015 | Member, **American Heart Association**, **Cardiac Electrophysiology 2 National/Affiliate Study Section** |
| 2012 | Adhoc Special Reviewer, **National Institute of Neurological Disorders and Stroke Special Emphasis Panel**: **Institutional Training Grant (T32) Awards**, National Institute of Neurological Disorders and Stroke, National Institutes of Health |
| 2013 | Adhoc Special Reviewer, **National Heart Lung and Blood Institute Special Emphasis Panel: Individual Fellowship and K Awards**, National Heart, Lung and Blood Institute, National Institutes of Health |
| 2014 | Adhoc Special Reviewer, **National Heart Lung and Blood Institute Special Emphasis Panel: Individual Fellowship and K Awards**, National Heart, Lung and Blood Institute, National Institutes of Health |
| 2015 | Member, **Intramural Program Site Visit Team**, National Institute for Child Health and Human Development, National Institutes of Health |
| 2015 | Member, **TransCure Site Visit Team**, Swiss National Science Foundation, Bern, Switzerland |
| 2015-present | Vice-Chair, **American Heart Association, Cardiac Electrophysiology 2 National/Affiliate Study Section** |
| 2016 | Member, **TransCure Site Visit Team**, Swiss National Science Foundation, Bern, Switzerland |
| 2017 | Member, **TransCure Site Visit Team**, Swiss National Science Foundation, Bern, Switzerland |