Jeffry B. Lansman, Ph.D.

Professor Emeritus
University of California, San Francisco

EDUCATION

1971 - 1973	Purchase College	B.A., Biology
1976 - 1978	Tufts University	M.S., Biology
1978 - 1982	University of California, Los Angeles	Ph.D., Physiology/Biophysics

PRINCIPAL POSITIONS HELD

1982 - 1983	Department of Physiology University of California, Los Angeles	NIMH Postdoctoral Fellow
1983 - 1984	Department of Physiology Yale School of Medicine	NIH Postdoctoral Fellow
1985 - 1986	Physiological Laboratory University of Cambridge	NSF-NATO Postdoctoral Fellow
1987 - 1992	Department of Pharmacology, University of California, San Francisco	Assistant Professor
1992 - 2012	Department of Cellular & Molecular Pharmacology University of California, San Francisco	Associate Professor
2012 -2017	Department of Cellular & Molecular Pharmacology University of California, San Francisco	Professor

AFFILIATED ACADEMIC PROGRAMS

Neuroscience Graduate Program
Cardiovascular Research Institute

HONORS AND AWARDS

1980	Sigma Xi, Tufts University
1985	NATO Postdoctoral Fellowship, Cambridge University National Science Foundation
1986	Syntex Scholars Achievement in Cardiovascular Research Syntex Corporation
1987	Basil O'Connor Scholar Award March of Dimes Foundation
1991	Dunaway-Burnam Visiting Professor of Physiology Dartmouth Medical School
2002	Long Prize "Teacher of the Year" UCSF School of Pharmacy
2004	Joseph M. Long Foundation Prize for Excellence in Teaching, UCSF School of Pharmacy (Awarded by the Class of 2004)

2004 Long Prize "Teacher of the Year"
UCSF School of Pharmacy

2006 Joseph M. Long Foundation Prize for Excellence in Teaching,
UCSF School of Pharmacy (awarded by the graduating Class of 2006)

2006 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy, (Winter)

2006 Nominated Academic Senate Distinction in Teaching

2006 Long Prize "Teacher of the Year"
UCSF School of Pharmacy

2007 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Fall)

2008 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Winter)

2008 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Spring)

2008 Long Prize "Teacher of the Year"
UCSF School of Pharmacy

2008 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Fall)

2008 Nominated: Essential Core Teaching Award for Excellence in Small Group,
UCSF School of Medicine

2008 Nominated for Kaiser Award for Excellence Teaching
UCSF School of Medicine

2009 Joseph M. Long Foundation Prize for Excellence in Teaching
UCSF School of Pharmacy (awarded by the Graduating Class of 2009)

2009 AACP Teacher of the Year
American Association Colleges of Pharmacy

2009 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Winter)

2009 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Spring)

2010 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Winter)

2010 Joseph M. Long Foundation Prize for Excellence in Teaching
UCSF School of Pharmacy (awarded by the Graduating Class of 2010)

2010 AACP Teacher of the Year
American Association Colleges of Pharmacy

2010 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Spring)

2011 Long Prize "Teacher of the Year" UCSF School of Pharmacy

2012 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Winter)

2013 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Winter)

2013 Joseph M. Long Foundation Prize for Excellence in Teaching
UCSF School of Pharmacy (awarded by the Graduating Class of 2013)

2013 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Fall)

2013 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Winter)

2014 Dean's Recognition for Excellence in Teaching
School of Pharmacy (Winter)

2014 Dean's Recognition for Excellence in Teaching
UCSF School of Pharmacy (Spring)

2015 Dean's Recognition for Excellence in Teaching,
UCSF School of Pharmacy (Winter)

AREAS OF INTEREST

Calcium channels and signaling
Mechanosensory transduction
Degenerative diseases of nerve and muscle
Drug Discovery

SERVICE TO PROFESSIONAL PUBLICATIONS

ACS Chemical Biology
Biophysical Journal
FASEB Journal
Journal Cell Biology
Journal of General Physiology
Journal of Physiology
Journal of Neurophysiology
Neuroscience
Plos One
Plos One Computational Biology

SCIENTIFIC CONTRIBUTIONS

- Discovery of the hyperpolarization-activated sodium current now known to be the pacemaker current in the heart (UCLA, 1982)

- Discovery of a non-selective ion channel current activated by calcium influx which controls the duration of individual action potentials (UCLA, 1982)

- First demonstration of distinct L- and T-type channels in ventricular muscle of the heart at the level of single ion channels. Elucidation of the actions of dihydropyridine dugs and beta receptor agonists responsible for sympathetic stimulation of heart rate and contractility (Yale, 1984)

- First direct measurements of the lifetime of a single calcium ion in the calcium channel and proof of the two-site model for calcium permeability of cell membrane (Yale, 1985)

- Discovery of mechanosensitive ion channels in vascular endothelial cells as a primary sensor detecting blood pressor and blood flow in the vascular system (Cambridge, 1986)

- Discovery of mechanosensitive ion channel dysfunction in muscular dystrophy and the role of mechanosensitive channels in degenerative disease of muscle (UCSF, 1990)

- Discovery and analysis of a role of L-type and NMDA receptor upregulation in the pathogenesis of neurodegenerative disease (UCSF, 2001)

SERVICE TO PROFESSIONAL ORGANIZATIONS

2016	- 2017	Annals of Pharmacology and Therapeutics	Editorial Board
2016	- 2017	Brain and Neuroscience	Editorial Board

INTERNATIONAL INVITED PRESENTATIONS

1984	Physiological Society, Oxford University	Invited Speaker
1984	Department of Physiology, Oxford University	Invited Seminar
1986	Physiological Laboratory, Cambridge University	Invited Speaker
1990	International Symposium on the Regulation of Coronary Circulation, Kobe, Japan	Invited Speaker
1990	International Symposium on Basic Neurophysiology, Okazaki, Japan	Invited Speaker
1991	International Symposium on Mechanoreceptors, Nagoya, Japan	Invited Speaker
1991	Third International Congress of Comparative Physiology, Tokyo	Invited Speaker
1995	Université Montpellier, France	PhD Committee Member
2004	Australian Physiological Society Symposium "Stretch-activated ion channels"	Invited speaker

MEMBERSHIPS

1986-2019	Biophysical Society
1986-2019	Society of General Physiologists

UNIVERSITY OF CALIFORNIA SYSTEM-WIDE LEADERSHIP

MEMBER, ACADEMIC SENATE BOARD ON ADMISSION & RELATIONS WITH SCHOOLS
(2003-2005) The Board on Admissions and Relations with Schools sets system-wide admissions policy for all nine undergraduate campuses of the University of California. Dr. Lansman reviewed and amended admission requirements and policies regarding "Eligibility in a Local Context," admission metrics as correlated with future success at UC, principles and policies for undergraduate admissions testing, UC Subject admission requirements, and inclusiveness indicators in admissions policy.

MEMBER, UNIVERSITY COMMITTEE ON PRIVILEGE AND TENURE (2012-2013) Privilege and Tenure is an Academic Senate Committee charged as a quasi-judicial body to hear faculty grievances and to provide due process adjudication of faculty disciplinary cases. At the system-wide level, the committee reviews policies and procedures that govern the Privilege and Tenure hearings on the ten UC campuses.

CHAIR, UNIVERSITY COMMITTEE ON PRIVILEGE AND TENURE (2013-2016) Dr. Lansman reviewed and revised policy related to concerns from incidents of racial discrimination and sexual harassment on several campuses. Under his direction, the committee evaluated how divisional Privilege and Tenure Committees interact with their respective administrations and Title VII and IX Offices, particularly in relation to investigative procedures and evidentiary standards. Dr. Lansman drafted guidelines for procedures for handling sexual harassment cases on all campuses, which coordinated Title IX Office investigations with University investigations.

http://senate.universityofcalifornia.edu/_files/committees/ucpt/UCPT2013-14AnnualReport.pdf
http://senate.universityofcalifornia.edu/_files/committees/ucpt/UCPT2013-14AnnualReport.pdf

MEMBER, PRESIDENT NAPOLITANO'S WORK GROUP ON DISCRIMINATION AND BIAS (2013-2014) University of California President Janet Napolitano formed an independent task force headed by former California State Supreme Court Justice Carlos Moreno to investigate university policies and procedures for addressing racial bias and discrimination. The report of the Moreno Task Force concluded campus procedures " …failed to adequately record, investigate, or provide for disciplinary sanctions for incidents which, if substantiated, would constitute violations of university nondiscrimination policy." Based on these conclusions the President formed a work group to propose new policies and procedures for both dealing effectively with acts of discrimination and ensuring a university climate of respect and recognition of all members of the campus community. The report can be found at:

http://www.ucop.edu/moreno-report/moreno-senate-admin-work-group-12-23-13.pdf

UCSF CAMPUS LEADERSHIP

MEMBER, ACADEMIC SENATE GRADUATE COUNCIL (2004-2006) The Graduate Council is charged with making reports and recommendations to the Academic Senate, periodic external quality reviews of existing graduate programs, setting policies and standards concerning graduate students' progress towards their degrees and the conduct of examinations for degrees, overseeing standards for part-time degree status, making recommendations for the awards of fellowships, and advising the administration on foundation and research institution issues related to graduate education.

CHAIR, ACADEMIC SENATE GRADUATE COUNCIL (2007-2009) I directed external review of UCSF's doctoral programs in Neuroscience, Chemistry and Chemical Biology, Developmental Biology, Bioengineering, Medical Anthropology, and the Masters in Clinical Sciences. In addition, he evaluated program proposals, defined support and teaching staff needs, and determined cost and revenue

structures for new Masters degree programs in Global Health, Science and Technology Studies in Medicine, and Dental Hygiene, and a Ph.D. program in Epidemiology and Translational Sciences.

http://senate.ucsf.edu/2006-2007/i-gradc-2006-07-annualreport.pdf
http://senate.ucsf.edu/2007-2008/i-gradc-2007-08-annualreport.pdf

CHAIR, ACADEMIC TASK FORCE ON THE UCSF INSTITUTE OF QUANTITATIVE BIOSCIENCES (2008) **T**he Institute of Quantitative Biology is a consortium of UC faculty whose goal is to advance quantitative biosciences using the methods of physics, chemistry, and computer science to solve fundamental problems in human biology. The Institute fosters transfer of basic science to commercial start-ups.

CHAIR, TASK FORCE TO REVIEW NEW DEPT. OF BIOENGINEERING AND THERAPEUTIC SCIENCE (2008)

MEMBER, CHANCELLOR'S EXECUTIVE BUDGET COMMITTEE (2009)

CHAIR, ACADEMIC SENATE COMMITTEE ON PRIVILEGE AND TENURE (2012-2014) I presided over evidentiary hearings involving faculty disciplinary and grievance cases and also negotiated settlements with administration counsel and grievant. I led in developing policies to extend Privilege and Tenure due process rights to faculty in the Adjunct Series.

MEMBER, ACADEMIC COMMITTEE ON COURSES OF INSTRUCTION (2014-2017) The Committee on Courses of Instruction reviews and approves all new courses at UCSF. Working with faculty throughout the university, I worked with program instructors to define specific skill sets, methods to evaluate student progress and skill and knowledge acquisition, and define course content within the context of existing courses and the specific program.

PEER-REVIEWED PUBLICATIONS

1. Lansman, J. and Haynes, D.H. (1975) Kinetics of a Ca2+-triggered membrane aggregation reaction of phospholipid membranes. *Biochimica Biophysica Acta* 394:335-347.
2. Lansman, J.B. and Haynes, D.H. (1979) Charge asymmetry does not affect the rate of Ca2+-induced aggregation of phospholipid vesicles. *Biophysical Journal* 26:335-337.
3. Haynes, D.H., Lansman, J.B., Cahill, A.L. and Morris, S.J. (1979) Kinetics of cation-induced aggregation of Torpedo electric organ synaptic vesicles. *Biochimica Biophysica Acta* 557:340-353.
4. Lansman, J.B. and Cochrane, D.E. (1979) Wheat germ agglutinin stimulates exocytotic histamine secretion from rat mast cells in the absence of extracellular calcium. *Biochemical Pharmacology* 29:455-458.
5. Cochrane, D.E., Distel, D.L., Lansman, J.B. and Paterson, B.M. (1982) Stimulus-secretion coupling in rat mast cells: Inactivation of calcium-dependent secretion. *Journal of Physiology* 323:423-435.
6. Carraway, R., Cochrane, D.E., Lansman, J.B., Leeman, S.E., Paterson, B.M. and Welch, H.J. (1982) Neurotensin stimulates histamine secretion from rat mast cells and elevates plasma histamine levels. *Journal of Physiology* 323:403-414.
7. Moody, W.J. and Lansman, J.B. (1983) Developmental regulation of Ca and K currents during hormone-induced meiotic maturation of starfish oocytes. *Proceedings of the National Academy of Sciences USA* 80:3096-3100.
8. Lansman, J.B. (1983) Voltage clamp study of the conductance activated at fertilization in the egg of a starfish. *Journal of Physiology* 345:353-372.

9. Hess, P., Lansman, J.B. and Tsien, R.W. (1984) Different modes of calcium channel gating behavior favored by dihydropyridine agonists and antagonists. *Nature* 311:538-544.

10. Nilius, B., Hess, P., Lansman, J.B. and Tsien, R.W. (1985) A novel type of cardiac calcium channel in ventricular cells. *Nature* 316:443-446.

11. Hess, P., Lansman, J.B. and Tsien, R.W. (1986) Calcium channel selectivity for divalent and monovalent cations. Voltage and concentration dependence of single channel current in ventricular heart cells. *Journal of General Physiology* 88:293-319.

12. Lansman, J.B., Hess, P. and Tsien, R.W. (1986) Blockade of current through single calcium channels by Cd, Mg, and Ca. Voltage-and concentration-dependence of Ca entry into the pore. *Journal of General Physiology* 88:321-347.

13. Tsien, R.W., Bean, B.P., Hess, P., Lansman, J.B., Nilius, B. and Nowycky, M.C. (1986) Mechanisms of calcium channel modulation by beta-adrenergic agents and dihydropyridine agonists. *Journal of Molecular and Cellular Cardiology* 18:691-710.

14. Hess, P., Lansman, J.B., Nilius, B. and Tsien, R.W. (1987) Calcium channel types in cardiac myocytes: Modulation by dihydropyridines and beta-adrenergic stimulation. *Journal of Cardiovascular Pharmacology* 8 (suppl. 9):511-521.

15. Lansman, J.B. (1987) Calcium current and calcium-activated inward current in the oocyte of the starfish *Leptasterias hexactis*. *Journal of Physiology* 390:397-413.

16. Lansman, J.B., Hallam, T.J. and Rink, T.J. (1987) Single stretch-activated ion channels in vascular endothelial cells as mechanotransducers? *Nature* 325:811-813.

17. Nilius, B., Hess, P., Lansman, J.B. and Tsien, R.W. (1987) Two kinds of calcium channels in isolated ventricular cells form guinea pig heart. *Fortschritte der Zoologie* 33:83-98.

18. Franco, A. and Lansman, J.B. (1990) Calcium entry through stretch-inactivated ion channels in mdx myotubes. *Nature* 344:670-673.

19. Franco, A. and Lansman, J.B. (1990) Stretch-sensitive channels in developing muscle cells from a mouse cell line. *Journal of Physiology* 427:361-380.

20. Lansman, J.B. (1990) Blockade of current through single calcium channels by trivalent lanthanide cations. Effect of ionic radius on the rates of ion entry and exit. *Journal of General Physiology* 95:679-696.

21. Winegar, B. and Lansman, J.B. (1990) Voltage-dependent block by zinc of single calcium channels in mouse myotubes. *Journal of Physiology* 425:563-578.

22. Forsayeth, J.R., Rossi, A.B., Franco, A., Lansman, J.B., and Hall, Z. (1990). Expression of functional mouse muscle acetylcholine receptors in Chinese Hamster Ovary cells. *Journal of Neuroscience* 10(8):2771-2779.

23. Gu, Y., Franco, A., Gardner, P.D., Lansman, J.B., Forsayeth, J.R., and Hall, Z.W. (1990). Properties of embryonic and adult muscle acetycholine receptors transiently expressed in COS cells. *Neuron* 5:147-157.

24. Winegar, B., Kelly, R., and Lansman, J.B. (1991) Block of current through single calcium channels by Fe, Co, Ni. Location of the transition metal binding site in the pore. *Journal of General Physiology* 97:351-367.

25. Slesinger, P.A. and Lansman, J.B. (1991a) Inactivation of calcium currents in granule cells cultured from mouse cerebellum. *Journal of Physiology* 435:101-121.

26. Slesinger, P.A. and Lansman, J.B. (1991b) Inactivating and non-inactivating dihydropyridine-sensitive calcium channels in mouse cerebellar granule cells. *Journal of Physiology* 439:301-3

27. Franco, A., Winegar, B.D., and Lansman, J.B. (1991) Open channel block by gadolinium ion of the stretch-inactivated ion channel in mdx myotubes. *Biophysical Journal* 59:1-7.

28. Haws, C.M. and Lansman, J.B. (1991a) Calcium permeable ion channels open at negative membrane potentials in cerebellar neurons from mdx mice. *Proceedings of the Royal Society of London B* 244:185-189.

29. Haws, C.M. and Lansman J.B. (1991b) Developmental regulation of mechanosensitive Ca2+ channels in skeletal muscle from normal and mdx mice. *Proceedings of the Royal Society of London B* 245:173-177.

30. Slesinger, P.A. and Lansman, J.B. (1991c) Reopening of Ca2+ channels in mouse cerebellar neurons at resting membrane potentials during recovery from inactivation. *Neuron* 7:755-762.

31. Haws, C.M., Slesinger, P.A., and Lansman, J.B. (1993) Dihydropyridine- and ω-conotoxin-sensitive Ca2+ currents in cerebellar neurons. Persistent block of L-type channels by a pertussis toxin-sensitive G protein. *Journal of Neuroscience* 13:1148-1156

32. Elam, T.R. and Lansman, J.B. (1993) Mechanosensitive ion channels in vascular endothelial cells. In, NATO Advanced Studies Workshop: The Role of Ion Flux in Pulmonary Vascular Control. ed., E. Kenneth Weir, Plenum Press: New York

33. Franco-Obregón, A. and Lansman, J.B. (1994) Mechanosensitive ion channels in skeletal muscle from normal and dystrophic mice. *Journal of Physiology* 481(2):299-309

34. Elam, T.R. and Lansman, J.B. (1995) The role of Mg2+ in the inactivation of inwardly rectifying K+ channels in aortic endothelial cells. *Journal of General Physiology* 105:463-484.

35. Franco-Obrégon, A. and Lansman, J.B. (1995) Spontaneous and agonist-induced activity of acetylcholine receptor channels in developing muscle cells from normal and dystrophic mice. *Journal of Neuroscience Research* 42:452-458.

36. Chavis, P., Fagni, L., Bockaert, J., and Lansman, J.B. (1995) Modulation of calcium channels by metabotropic glutamate receptors in cerebellar granule cells. *Neuropharmacology* 34(8):929-937.

37. Slesinger, P.A. and Lansman, J.B. (1996) Reopening of single L-type Ca2+ channels in mouse cerebellar granule cells: voltage- and ion concentration-dependence. *Journal of Physiology* 491.2:335-345.

38. Haws, C.M., Winegar, B., and Lansman, J.B. (1996) Block of L-type Ca2+ channels in skeletal muscle fibers by aminoglycoside antibiotics. *Journal of General Physiology* 107:421-432

39. Winegar, B., Haws, C.M. and Lansman, J.B. (1996) Subconductance block of mechanosensitive ion channels in skeletal muscle fibers by aminoglycoside antibiotics. *Journal of General Physiology* 107:433-443

40. Parri, H.R. and Lansman, J.B (1996) Multiple components of Ca2+ channel facilitation in cerebellar granule cells. Expression of facilitation during development in culture. *Journal of Neuroscience* 16:4890-4902.

41. Chavis, P., Fagni, L, Lansman, J.B, and Bockaert, J. (1996) Functional coupling between ryanodine receptors and L-type calcium channels in neurons. *Nature* 382:719-722

42. Franco-Obrégon, A. and Lansman, J.B. (2002) Changes in mechanosensitive channel gating following mechanical stimulation in skeletal muscle myotubes from the mdx mouse. *Journal of Physiology* 539.2:391-407

43. Lansman, J.B. and Franco-Obregon, A. (2006) Mechanosensitive ion channels in skeletal muscle: a link in the membrane pathology of muscular dystrophy. *Clinical and Experimental Physiology and Pharmacology* 33:649-656

44. Vasquez, I., Tan, N., Boonyasampant, M, , Koppitch, K., and Lansman, J.B. (2012) Partial opening and subconductance gating of mechanosensitive ion channels in dystrophic skeletal muscle. *Journal of Physiology* 590(Pt 23):6167-6185.

45. Ho, T.C., Horn, N.A., Huyhn, T., Kelava, L. and Lansman, J.B. (2012) Evidence TRPV4 contributes to mechanosensitive ion channels in mouse skeletal muscle fibers. *Channels* 6(4):246-254.

46. Tan, N. and Lansman, J.B. (2014) Utrophin regulates modal gating of mechanosensitive ion channels in dystrophic skeletal muscle. *Journal of Physiology* 592(Pt 15):3303-3323

47. Lansman, J.B. (2015) Utrophin suppresses low frequency oscillations and coupled gating of mechanosensitive ion channels in dystrophic skeletal muscle. *Channels* 9(3):145-160.

48. Lansman, J.B. (2020) Compensatory changes in L-type and NMDA channels **in** cerebellar granule cells from leaner mice. (in revision)

49. Lansman, J.B. (2020) Hidden Markov Model analysis of individual subunit gating during single activations of mechanosensitive ion channels in dystrophic skeletal muscle. (in preparation)

50. Lansman, J.B. (2020) Analysis of the subconductance blocking mechanism of ruthenium red on single mechanosensitive channels in skeletal muscle fibers. (in preparation)

51. Lansman, J. (2019) The sodium and potassium currents in skeletal muscle from *mdx* and *mdx/utrophin* double knock out mice (in preparation)

REVIEW ARTICLES

1. Lansman, J.B. (1983) Components of the starfish fertilization potential: Role of calcium and calcium-dependent inward current. In, Neurology and Neurobiology Vol. 5, The Physiology of Excitable Cells. Grinnell, A. and Moody, W.J., eds., New York: Alan Liss, Inc.

2. Hess, P., Lansman, J.B. and Tsien, R.W. (1984) Mechanism of calcium channel modulation by dihydropyridine agonists and antagonists. In, Control and Manipulation of Calcium Movement. Parrat, ed., New York: Raven Press.

3. Tsien, R.W., Hess, P. and Lansman, J.B. (1985) Current views of cardiac calcium channels and their response to calcium antagonists and agonists. In, Cardiac Electrophysiology and Arrhythmias. Zipes, D.F. and Jalife, J., eds., Orlando, Grune and Stratton.

4. Hess, P., Fox, A.P., Lansman, J.B., Nilius, B., Nowycky, M.C. and Tsien, R.W. (1986) Calcium channel types in cardiac, neuronal and smooth muscle derived cells. Differences in gating, permeation and pharmacology. In, Ionic Channels in Neural Membranes. Ritchie, J.M., and Keynes, R., eds., Alan R. Liss, Inc., New York

5. Fox, A.P., Hess, P., Lansman, J.B., Nilius, B., Nowycky, M.C., and Tsien, RW. (1986) Shifts between modes of calcium channel gating as a basis for pharmacological modulation of calcium in cardiac, neuronal and smooth muscle-derived cells. in: New Insights into Cell & Membrane Transport Process A. Poste & S.J. Cooke, eds., Plenum Press: New York

6. Lansman, J.B. (1988) Endothelial mechanosensors. *Nature* 325:811-813.

7. Lansman, J.B. and Franco, A. (1991) What does dystrophin do in normal muscle? *Journal of Muscle Research and Cell Motility* 12:409-411.

8. Chavis, P., Fagni, L., Conquet, F., Lansman, J. and Bockaert, J. (1998) Metabotropic glutamate mGluR1 receptors couple L-type Ca^{2+} channels and ryanodine receptors in neurons. In "Metabotropic Glutamate Receptors and Brain Function" Edited by Moroni, F., Nicoletti, F., and Pelligrini-Giampietro, D.E. London: Portland Press

9. Lansman, J.B. and Franco-Obregon, A. (2005) Stretch-inactivated channels in skeletal muscle. In, "Mechanosensitivity of Cells and Tissues." Ed, Kamkin, A. Moscow: Academia Press

10. Lansman, J.B. (2007) Mechanosensitive ion channels in dystrophic muscle. pp 467-484. Current Topics in Membranes Volume 59. Ed., Hamill, O. San Diego: Elsevier Press

Citations (total): 8179
h-index: 32
i10-index: 48

FORMAL TEACHING

Immunopharmacology and Endocrine Pharmacology	Course Director, Lecturer
Basic Concepts of Cellular & Molecular Neuroscience	Course Director, Lecturer
Prologue, School of Medicine	Small Group Leader
Autonomic & Cardiovascular Pharmacology,	Course Director, Lecturer
Neuropharmacology	Course Director, Lecture

PROFESSIONAL SCHOOL TEACHING

I directed and taught the second-year course in pharmacology for doctoral pharmacy students. The course covered Immunopharmacology and Endocrine Drugs; Autonomic and Cardiovascular Pharmacology; and Neuropharmacology. I also directed small group sessions in the School of Medicine, and lectured in the Biomedical Sciences basic science curriculum.

GRADUATE TEACHING AND CURRICULUM DEVELOPMENT

I directed and taught in Basic Concepts in Cellular and Molecular Neuroscience, the core course for first year neuroscience graduate students. Lectures covered the biophysics of nerve excitation, including the thermodynamics of electro-diffusion, the Nernst-Planck flux equation, origin of the membrane potential, voltage clamp methods, the Hodgkin and Huxley model for the nerve action potential, selective ion transport, and ion channel functional diversity relevant to the integrative properties of neurons in information processing in the brain.

MENTORING AND TRAINING

PRE-DOCTORAL STUDENTS SUPERVISED/MENTORED

Date	Name	Program or School	Role	Current Position
1987 - 1991	Paul Slesinger	Neuroscience	PhD Advisor	Professor Dept. Neuroscience, Mt. Sinai School of Medicine
1987 - 1993	Alfredo Franco-Obregon	Neuroscience	PhD Advisor	Research Associate Professor Dept. of Surgery. National University of Singapore
1988 - 1993	Teryl Elam	Physiology	PhD Advisor	Private Practice, OB-GYN
1995 - 1996	Pascal Chavis	Visiting PhD student	PhD Advisor	Institut de Neurobiologie de la Méditerranée, Marseille

POSTDOCTORAL FELLOWS/RESIDENTS SUPERVISED/MENTORED

Date	Name	Fellow	Faculty Role	Current Position
1989 - 1993	Bruce Winegar, PhD	Post-Doc	Research Supervision	Senior Scientist, Pherin Pharmaceuticals
1987 - 1991	Christine Haws Ph.D.	Post-Doc	Research Supervision	
1997 - 1998	Ronan Kelly D.Phil	Post-Doc	Research Supervision	University Laboratory of Physiology, Oxford
1993 - 1993	Munir Hussain Ph.D.	Burroughs-Wellcome Visiting Post-Doc	Research Supervision	University of Leeds, Leeds UK
1993 - 1994	Rajeswari Medicherla, Ph.D.	Post-Doc	Research supervision	Not known
1992 - 1995	Rheinnalt Parri, Ph.D.	Post-Doc	Research Supervision	Senior Lecturer, Aston University, Birmingham, UK
1996 - 1996	Leonard Koh M.D.	Visiting Clinical Fellow	Research Supervision	Dept. of Endocrinology, Singapore General Hospital
2000 - 2001	Gang Lu, M.D.	Post-Doc	Research Supervision	Senior Associate Scientist, Hoffmann-La Roche

I have also mentored and supervised the research of 16 undergraduate or post -baccalaureate students who have gone on to enroll in highly rated Medical School and Ph.D. Programs.

RESEARCH AND CREATIVE ACTIVITIES

Biophysical basis of mechanical sensitivity and role in muscle disease

My research seeks to understand how cells and tissues sense and respond to mechanical forces. Mechanical forces control many fundamental physiological functions including touch, hearing, proprioception, cardiovascular and pulmonary function. There is also strong evidence mechanical forces play a role in cellular growth, development, and cancer. How mechanosensitive (MS) channels detect mechanical forces in remains a major unsolved problem in biology. It is virtually impossible to study single MS channels in sensory cells because they are localized to structures too small or too imbedded in other tissue to be accessible to electrophysiological recording methods. Examples are tiny mechanosensory nerve endings in skin or structures like Pacinian corpuscles in muscle. Understanding how mechanical forces activate ion fluxes through channels requires understanding the physical properties the membrane bilayer, as well as the organization of submembrane cytoskeletal, which provides mechanical support to the membrane. MS channels differ fundamentally from conventional voltage-gated ion channels in which the events that link stimulation to channel opening occur primarily within the channel protein itself.

MS channels are expressed abundantly on mammalian skeletal muscle. Skeletal muscle is an excellent preparation to study the details of mechanotransduction because it possesses a highly structured cytoskeletal lattice designed to prevent membrane damage by contraction-induced stresses. This structural assembly is composed of dystrophin, a 427-kDa cytoskeletal protein, an absence of which causes Duchenne muscular dystrophy in humans. Dystrophin is held tightly to the membrane by a glycoprotein complex, which binds to the extracellular matrix and links it to the intracellular actin cytoskeleton. The dystrophin-glycoprotein network helps prevent muscle damage by transmitting mechanical forces during contraction to the extracellular matrix. Mice with genetic mutations that cause loss of components of the dystrophin-glycoprotein cytoskeletal network and leads to degeneration of skeletal and cardiac muscle.

We first showed that MS channels in dystrophic muscle remained open for tens of seconds (rather than milliseconds) and this was responsible for the high levels of intracellular Ca2+ that cause muscle death (Franco & Lansman, Nature 340: 377, 1990b; Franco-Obregon and Lansman, Journal of Physiology 481:299, 1994; Franco-Obregon and Lansman, Journal of Physiology 539.2:391, 2002. Work from the lab using a combined pharmacological and genetic approach recently showed that MS channels in skeletal muscle contain TRPV4 proteins (Ho, Horn, Huynh, Koppitch & Lansman, Channels 6.4:1, 2012). Mutations in the TRPV4 gene produce a wide variety of neurologic and skeletal disorders, including the autosomal dominant skeletal dysplasias, congenital distal spinal muscular atrophy, and hereditary and motor neuropathies. This work shows that cytoskeletal abnormalities produce gain of function changes in TRPV4 channels. Current work is focused on discovery of novel compounds that block TRPV4 containing MS channels as a cure for degenerative disease of cardiac and skeletal muscle.

Neuronal L-type, voltage-gated calcium channels

While a postdoc at Yale with R.W. Tsien, we were first to characterize L- and T-type voltage - gated calcium channels in ventricular heart cells (Hess, Lansman, and Tsien, Nature 311:538; Nilius Hess, Lansman and Tsien, Nature 316: 1985). L-type Ca^{2+} channels are sensitive to dihydropyridine agonists and antagonists and are responsible for contraction of cardiac and smooth muscle. Although receptors for dihydropyridine drugs had been found in brain tissue, the properties and physiological functions of L-type Ca^{2+} channels in the brain were unknown.

At UCSF, I began studies aimed at understanding the diversity and function of L- type Ca^{2+} channels in the brain. Studies focused on granule cells isolated from the cerebellum of mice because of the availability of a number of known spontaneous mutations that cause the selective loss of granule cells and produce a variety of neurologic disorders. The initial work in Dr. Lansman's lab at UCSF characterized the whole-cell and single-channel Ca^{2+} currents in granule cells, in which a large component is carried by L-type channels (Slesinger and Lansman, J. Physiol. 435:101, 1991; Slesinger and Lansman, J. Physiol. 439:301, 1991; Haws, Slesinger and Lansman, J. Neurosci. 13(3):1148). Subsequent studies revealed functionally distinct L-type channels: type 1 channels that re-opened at negative membrane potentials following a strong depolarization (Slesinger and Lansman, Neuron 7:755, 1991; Slesinger and Lansman, J. Physiol. 491.2:335; and type 2, facilitating channels, in which channel openings during a voltage step were prolonged by a strong pre-pulse to a positive voltage (Parri and Lansman, J. Neurosci.16(6):4890, 1996). The discovery of reopening and facilitating L-type channels expanded the physiological range over which L-type channels could control intracellular Ca^{2+} levels.

L-type channels are often localized to postsynaptic sites. We asked whether synaptically released glutamate acting at metabotropic receptors regulates L- type channels in cerebellum (Chavis, Fagni, Bockaert, and Lansman, Neuropharm 34(8):929, 1996; Chavis, Fagni, Lansman and Bockaert, Nature 382:719, 1996). These studies revealed a novel form of oscillatory calcium signaling in which the depletion of intracellular Ca^{2+} stores increased L-type channel current. This work suggested a direct physical interaction of the L-type Ca^{2+} channel with intracellular Ca^{2+} stores and suggested intracellular stores are refilled by Ca^{2+} entry through L-type channels. More recently, we have shown that L-type channels are up-regulated in cerebellar granule cells from the *leaner* mutant mouse, which lacks presynaptic P-type Ca^{2+} channels that normally control glutamate release. There is also a reduction of NMDA glutamate receptors. The changes in L- type and NMDA receptor channels represent physiological compensation for loss of presynaptic P-type Ca^{2+} channels in the *leaner* mutant mouse. This compensatory process is important because the selective degeneration of granule cells during early postnatal development of the cerebellum of *leaner* mouse, which causes a profound ataxia and provides a useful model for elucidating the role of ion channels in neurodegenerative diseases.