CURRICULUM VITAE

Jerrel Louis Yakel, Ph.D.

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'http://neuroscience.nih.gov/Lab.asp?Org_ID=473'

Biographical: Nationality- American (of Native American descent)

Education: Ph.D. - University of California, Los Angeles, 1988.
Department of Biology. Thesis Advisor - Meyer B. Jackson
B.S. - Oregon State University, Corvallis, Oregon, 1982
Major: Developmental Biology

Positions Held:

7/93 to present
NIEHS/NIH Senior Investigator/SBRS
Ion Channel Physiology Group Leader
Laboratory of Neurobiology (LN)
NIEHS, F2-08
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Research Triangle Park, N.C. 27709

4/91 to 7/93
Postdoctoral Associate
Vollum Institute, OHSU
3181 S.W. Sam Jackson Park Road
Portland, OR 97201
Advisor- Thomas Soderling, Associate Director

9/88 to 4/91
Postdoctoral Associate
Laboratoire de Neurobiologie
Ecole Normale Supérieure
46 rue d'Ulm
75230 Paris Cedex 05 France
Advisor- Hersch Gerschenfeld

9/83 to 9/88
Research Associate / Graduate Student
UCLA Dept. of Biology
405 Hilgard Ave.
Los Angeles, CA. 90024
Advisor- Meyer Jackson

Other appointment:

6/00 to 6/10	Adjunct Assistant Professor Department of Neurobiology Duke University Medical Center
02/13 to present	Adjunct Professor Department of Pharmacology UNC-Chapel Hill

Research Interests and Experience:

Employing electrophysiological (patch-clamp and two-electrode voltage-clamp) and imaging techniques to study the properties of ligand- (i.e. nicotinic ACh, 5-HT_3 and glutamate) and voltage-activated ion channels, as well as GPCRs, in a variety of preparations, including brain slices, dissociated neurons and clonal cell lines, and expressed channels and receptors in *Xenopus* oocytes.

Fellowships and Awards:

Andrea Marie Andrade Memorial Scholarship, 1977.
Dorothy Danforth Compton Fellowship, 1983-1987.
Graduate Affirmative Action Research Grant, 1985-1986.
Dissertation Year Fellowship, 1987-1988.
Otto Scherbaum Award for the most outstanding graduate student research, UCLA Department of Biology, 1988.
NIH French CNRS Program postdoctoral fellowship, 1988.
NSF Long-Term Research Program postdoctoral fellowship, 1989.
NATO-NSF Postdoctoral Fellowships in Science, 1990.
FORD Foundation Postdoctoral Fellowship, 1991
Society for Neuroscience Travel Fellowship for Minorities, 1992
National Research Service Award, NIH (NRSA), 1992
Human Frontiers Short-Term Fellowship, 1995
Fellow of the American Association for the Advancement of Science (AAAS), 2008
E. E. Just Lecturer Award, American Society of Cell Biology, 2009
Senior Biomedical Research Service (SBRS), NIH, 2011

Societal Memberships and Panels:

Advisory Committee Member for Society for Neuroscience's Minority Neuroscience Fellowship Program (MNFP)
Advisory Committee Member (Former) for Society for Neuroscience's Minority Education, Training, and Professional Advancement Committee (METPAC)
Advisory Committee Member (Former) for the Minority Fellowship Program, American Psychological Association
Society for Neuroscience
Serotonin Club
SACNAS- Society for the Advancement of Chicanos and Native Americans in Science
Panelist Chair for the Ford Foundation Predoctoral Fellowship Program administered by the National Research Council
Panelist for the Howard Hughes Medical Institute Fellowship Program administered by the National Research Council

Neuroscience Scholars Fellowship Committee of Society for the Advancement of Chicanos and Native Americans in Science (SACNAS)
Physiological Society (UK)
NIH Academy Selection Committee
American Association for the Advancement of Science (AAAS)
International Society for Neurochemistry (ISN)

Editorial Boards:

Journal of Physiology (Reviewing Editor, 2007-2009; Senior Editor, 2010-
Journal of Molecular Neuroscience (2004-
Frontiers in Neuropharmacology, Associate Editor (2009-

Ad Hoc Reviewer:

Neuron, Nature Neuroscience, Nature Structural & Molecular Biology, Science, Journal of Neuroscience, Journal of Physiology, PNAS, TIPS, Journal of Neurophysiology, Physiological Reviews, British Journal of Pharmacology, European Journal of Neuroscience, Neuroscience, Molecular Pharmacology, Neuropharmacology, Hippocampus, Journal of Membrane Biology, Journal of Neurochemistry, Receptors and Channels, Biophysical Journal, Learning and Memory, Journal of General Physiology, Neuroscience Letters, Journal of Biological Chemistry, Progress in Neurobiology, Neurobiology of Aging, FASEB Journal, Cerebral Cortex

Publications (Peer-Reviewed):

1. **Yakel, J.L**., L.O. Trussell & M.B. Jackson (1988) Three serotonin responses in cultured mouse hippocampal and striatal neurons. *J. Neurosci. 8*:1273-1285.

2. **Yakel, J.L**. & M.B. Jackson (1988) 5-HT_3 receptors mediate rapid responses in cultured hippocampus and a clonal cell line. *Neuron 1*:615-621.

3. **Yakel, J.L**., X.M. Shao & M.B. Jackson (1990) The selectivity of the channel coupled to the 5-HT_3 receptor. *Brain Res. 533*:46-52.

4. Gerschenfeld, H.M., D. Paupardin-Tritsch & **J.L. Yakel** (1991) Muscarinic enhancement of the voltage-dependent calcium current in an identified snail neuron. *J. Physiol. 434*:85-105.

5. Shao, X.M., **J.L. Yakel** & M.B. Jackson (1991) Differentiation of NG108-15 cells alters the channel conductance and desensitization kinetics of the 5-HT_3 receptor. *J. Neurophysiol. 65*:630-638.

6. **Yakel, J.L**., X.M. Shao & M.B. Jackson (1991) Activation and desensitization of the 5-HT_3 receptor in a rat glioma X mouse neuroblastoma hybrid cell. *J. Physiol. 436*:293-308.

7. **Yakel, J.L**. (1991) The neuropeptide FMRFa both inhibits and enhances the Ca^{2+} current in dissociated *Helix* neurons via independent mechanisms. *J. Neurophysiol. 65*:1517-1527.

8. Kavanaugh, M.P., R.S. Hurst, **J. Yakel**, M.D. Varnum, J.P. Adelman & R.A. North (1992) Multiple subunits of a voltage-dependent potassium channel contribute to the binding site for tetraethylammonium. *Neuron 8*:493-497.

9. **Yakel, J.L**. (1992). Inactivation of the Ba^{2+} current in dissociated *Helix* neurons: Voltage-dependence and the role of phosphorylation. *Pflügers Arch. 420*:470-478.

10. Hurst, R.S., M.P. Kavanaugh, **J. Yakel**, J.P. Adelman & R.A. North (1992) Cooperative interactions among subunits of a voltage-dependent potassium channel: Evidence from expression of concatenated cDNAs. *J. Biol. Chem. 267*:23742-23745.

11. **Yakel, J.L**., R.A. Warren, S.M. Reppert & R.A. North (1993) Functional expression of adenosine A_{2b} receptor in *Xenopus* oocytes. *Mol. Pharm. 43*:277-280.

12. **Yakel, J.L**., A. Lagrutta, J.P. Adelman & R.A. North (1993) Single amino acid substitution affects desensitization of the 5-HT_3 receptor expressed in *Xenopus* oocytes. *P.N.A.S. 90*:5030-5033.

13. **Yakel, J.L**., P. Vissavajjhala, V. Derkach, D. Brickey, & T.R. Soderling (1995) Identification of a CaM-Kinase II regulatory phosphorylation site in non-NMDA glutamate receptors. *P.N.A.S. 92*:1376-1380.

14. Gilon, P., G.St.J. Bird, X. Bian, **J.L. Yakel**, and J.W. Putney, Jr. (1995) The Ca^{2+}-mobilizing actions of a Jurkat cell extract on mammalian cells and *Xenopus laevis* oocytes. *J. Biol. Chem. 270*:8050-8055.

15. Gilon, P., & **Yakel, J.L**. (1995) Activation of 5-HT_3 receptors expressed in *Xenopus* oocytes does not increase cytoplasmic Ca^{2+} levels. *Receptors and Channels 3*:83-88.

16. **Yakel, J.L**. (1996) Desensitization of the 5-HT_3 receptor expressed in *Xenopus* oocytes: Dependence on voltage and primary structure. *Behav. Brain Research 73*:269-272.

17. Andjus, P., Khiroug, L., **Yakel, J.L**., Cherubini, E., & Nistri, A. (1996) Changes in intracellular calcium induced by NMDA in cultured hippocampal neurons require exogenous glycine. *Neurosci. Lett. 210*:25-28.

18. Gilon, P., **Yakel, J**., Gromada, J., Zhu, Y., Henquin, J-C., & Rorsman, P. (1997) G-protein-dependent inhibition of L-type Ca^{2+} currents by acetylcholine in mouse pancreatic B-cells. *J. Physiology 499*:65-76.

19. **Yakel, J.L**. (1997) Calcineurin regulation of synaptic function: From ion channels to transmitter release and gene transcription. *Trends in Pharmacological Sciences 18*:124-134.

20. Zhu, Y., & **Yakel, J.L**. (1997) Modulation of Ca^{2+} currents by various G protein-coupled receptors in sympathetic neurons of male rat pelvic ganglia. *J. Neurophysiol. 78*:780-789.

21. Zhu, Y., & **Yakel, J.L**. (1997) Calcineurin modulates G protein-mediated inhibition of N-type calcium channels in rat sympathetic neurons. *J. Neurophysiol. 78*:1161-1165.

22. Jones, S., & **Yakel, J.L**. (1997) Functional nicotinic ACh receptors on interneurones in the rat

hippocampus. *J. Physiology 504*:603-610.

23. Jones, S., & **Yakel, J.L**. (1998) Ca^{2+} influx through voltage-gated Ca^{2+} channels regulates 5-HT_3 receptor channel desensitization in rat glioma X mouse neuroblastoma hybrid NG108-15 cells. *J. Physiology 510*:361-370.

24. van Hooft, J.A., Spier, A.D., **Yakel, J.L**., Lummis, S.C.R., & Vijverberg, H.P.M. (1998) Promiscuous coassembly of serotonin 5-HT_3 and nicotinic α4 receptor subunits into Ca^{2+} permeable ion channels. *P.N.A.S. 95*:11456-11461.

25. Kriegler, S., Sudweeks, S, & **Yakel, J.L**. (1999) Communication: The nicotinic α4 receptor subunit contributes to the lining of the ion channel pore when expressed with the 5-HT_3 receptor subunit. *Journal of Biological Chemistry*. *274*: 3934-3936.

26. Jones, S., & **Yakel, J.L**. (1999) Inhibitory interneurons in the hippocampus: sites for rapid regulation of information flow by neurotransmitters. *Cell Biochem. Biophys. 31*:207-218.

27. Kriegler, S., Sudweeks, S, & **Yakel, J.L**. (1999) MTSEA potentiates 5-HT_3 receptors containing the nicotinic α4 subunit. *Neuropharmacology 38*: 1913-1915.

28. Jones, S., Sudweeks, S. & **Yakel, J.L**. (1999) Nicotinic receptors in the brain: correlating physiology with function. *Trends in Neurosciences 22*: 555-561.

29. Sudweeks, S, & **Yakel, J.L**. (2000) Functional and molecular characterization of neuronal nicotinic ACh receptors in rat CA1 hippocampal neurons. *J. Physiology 527*: 515-528.

30. Shao, Z. & **Yakel, J.L**. (2000) Single channel properties of neuronal nicotinic ACh receptors in stratum radiatum interneurons of rat hippocampal slices. *J. Physiology 527*: 507-513.

31. Pettit, D.L., Shao, Z. & **Yakel, J.L**. (2001) β-Amyloid $_{1-42}$ peptide directly modulates nicotinic receptors in the rat hippocampal slice. *J. Neuroscience (Rapid Communication) 21*:RC120:1-5.

32. Khiroug, S.S., Harkness, P.C., Lamb, P.W., Sudweeks, S.N., Khiroug, L., Millar, N.S., & **Yakel, J.L**. (2002) Rat nicotinic ACh receptor α7 and β2 subunits co-assemble to form functional heteromeric nicotinic receptor channels. *J. Physiology 540*: 425-434.

33. Sudweeks, S.N., van Hooft, J.A., & **Yakel, J.L**. (2002) Serotonin 5-HT_3 Receptors in Rat CA1 Hippocampal Interneurons: Functional and Molecular Characterization. *J. Physiology 544*:715-726.

34. van Hooft, J.A. & **Yakel, J.L.** (2003) 5-HT_3 receptors in the CNS: 3b or not 3b? *Trends in Pharmacological Sciences 24*:157-160.

35. Jones, S., & **Yakel, J.L**. (2003) Casein kinase II (protein kinase CK2) regulates serotonin 5-HT_3 receptor channel function in NG108-15 cells. *Neuroscience 119*: 629-634.

36. Khiroug, L., Giniatullin, R., Klein, R.C**.,** Fayuk, D. & **Yakel, J.L**. (2003) Functional mapping and Ca^{2+} regulation of nicotinic acetylcholine receptor channels in rat hippocampal CA1 neurons. *J. Neuroscience 23*: 9024-9031.

37. **Yakel, J.L**. & Shao, Z. (2004) Functional and Molecular Characterization of Neuronal Nicotinic ACh Receptors in Rat Hippocampal Interneurons. *Progress in Brain Research 145:* 95-107.

38. Khiroug, S., Khiroug, L., & **Yakel, J.L**. (2004) Rat nicotinic ACh receptor α2β2 channels: Comparison of functional properties with α4β2 channels in *Xenopus* oocytes. *Neuroscience 124*: 817-822.

39. Klein, R.C. & **Yakel, J.L**. (2004) Inhibition of nicotinic acetylcholine receptors by Apolipoprotein E-derived peptides in rat hippocampal slices. *Neuroscience (Rapid Report) 127*: 563-567.

40. Fayuk, D. & **Yakel, J.L**. (2004) Regulation of nicotinic acetylcholine receptor channel function by acetylcholinesterase inhibitors in rat hippocampal CA1 interneurons. *Mol. Pharm. 66*: 658-666.

41. Lamb, P.W., Melton, M.A. & **Yakel, J.L**. (2005) Inhibition of neuronal nicotinic acetylcholine receptor channels expressed in *Xenopus* oocytes by β-amyloid$_{1-42}$ peptide. *J. Mol. Neuroscience 27*: 13-22.

42. Giniatullin, R., Nistri, A. & **Yakel, J.L**. (2005) Desensitization of Nicotinic ACh Receptors: Shaping Cholinergic Signaling. *Trends in Neurosciences 28*: 371-378.

43. Fayuk, D. & **Yakel, J.L**. (2005) Ca^{2+} permeability of nicotinic acetylcholine receptors in rat hippocampal CA1 interneurones. *J. Physiology 566*: 759-768.

44. Klein, R.C. & **Yakel, J.L**. (2005) Paired-pulse potentiation of α7-containing nAChRs in rat hippocampal CA1 stratum radiatum interneurones. *J. Physiology 568*: 881-889.

45. Gay, E.A., Klein, R.C. & **Yakel, J.L**. (2006) Apolipoprotein E-derived peptides block α7 neuronal nicotinic acetylcholine receptors expressed in *Xenopus* oocytes. *J. Pharm. Exp. Ther. 316*: 835-842.

46. Klein, R.C. & **Yakel, J.L**. (2006) Functional somato-dendritic α7-containing nicotinic acetylcholine receptors in the rat basolateral amygdala complex. *J. Physiology 576*: 865-872.

47. Fayuk, D. & **Yakel, J.L**. (2007) Dendritic Ca^{2+} signaling due to activation of α7-containing nicotinic acetylcholine receptors in rat hippocampal neurons. *J. Physiology 582*: 597-611.

48. Gay, E.A., Bienstock, R. J., Lamb, P.W. & **Yakel, J.L**. (2007) Structural determinates for apolipoproteinE–derived peptide interaction with the α7 nicotinic acetylcholine receptor. *Mol. Pharm 72*:838–849.

49. Gay, E.A. & **Yakel, J.L**. (2007) Gating of nicotinic ACh receptors; new insights into structural transitions triggered by agonist binding that induce channel opening. *J. Physiology (Topical Review) 584*: 727-733.

50. Gay, E.A, Giniatullin, R., Skorinkin, A. & **Yakel, J.L**. (2008) Aromatic residues at position 55 of rat α7 nAChRs are critical for maintaining rapid desensitization. *J. Physiology 586*:1105-1115.

51. Poisik, O.V., Shen, J., Jones, S. & **Yakel J. L**. (2008) Functional α7-containing Nicotinic Acetylcholine Receptors Localize to Cell Bodies and Proximal Dendrites in the Rat Substantia Nigra pars Reticulata. *J. Physiology 586*: 1365-1378.

52. Gay, E.A, Klein, R.C., Melton, M.A., Blackshear, P.J. & **Yakel, J.L**. (2008) Inhibition of Native and Recombinant Nicotinic Acetylcholine Receptors by the Myristoylated Alanine-Rich C Kinase Substrate Peptide. *J. Pharm. Exp. Ther. 327*: 884-890.

53. Shen, J., Tu, B. & **Yakel, J.L**. (2009) Inhibition of α7-containing nicotinic ACh receptors by muscarinic M_1 ACh receptors in rat hippocampal CA1 interneurons in slices. *J. Physiology 587*: 1033-1042.

54. Eddins, D., Klein, R.C., **Yakel, J.L**. & Levin, E.D. (2009) Hippocampal infusions of apolipoprotein E peptides induce long-lasting cognitive impairment. *Brain Res. Bull. 79*:111-115.

55. Tu, B., Gu, Z., Shen, J., Lamb, P.W. & **Yakel**, J.L (2009) Characterization of a nicotine-sensitive neuronal population in rat entorhinal cortex. *J. Neuroscience 29*:10436 –10448.

56. Shen, J.X. & **Yakel, J.L**. (2009) Nicotinic acetylcholine receptor-mediated calcium signaling in the nervous system. *Acta Pharmacol Sin.30*:673-680.

57. Timofeeva, O.A., Eddins, D., **Yakel, J.L**., Blackshear, P.J. & Levin ED. (2010) Hippocampal infusions of MARCKS peptides impair memory of rats on the radial-arm maze. *Brain Res. 1308*:147-152.

58. **Yakel, J.L**. (2010) Gating of nicotinic ACh receptors: latest insights into ligand binding and function. *J. Physiology 588*:597-602.

59. McCormack, T., Petrovich, R.M., Mercier, K.A., DeRose, E.F., Cuneo, M.J., Williams, J., Johnson, K.L., Lamb, P.W., London, R.E. & **Yakel, J.L**. (2010). Identification and Functional Characterization of a Novel Acetylcholine-binding Protein from the Marine Annelid Capitella teleta. *Biochemistry 49*:2279-2287.

60. Seipel, A.T. & and **Yakel, J.L.** (2010). The frequency-dependence of the nicotine-induced inhibition of dopamine is controlled by the α7 nicotinic receptor. *J. Neurochemistry 114*: 1659-1666.

61. McCormack, T.J., Melis, C., Colón, J., Gay, E.A., Mike, A., Karoly, R., Lamb, P.W., Molteni, C. & **Yakel, J.L**. (2010). Rapid Desensitization of the Rat α7 nAChR is Facilitated by the Presence of a Proline Residue in the Outer β-Sheet. *J. Physiology588*:4415-4429.

62. Brams, M., Gay, E.A., Colón Sáez, J.,Guskov, A., van Elk, R., van der Schors, R.C., Peigneur, S., Tytgat, J., Strelkov, S.V., Smit, A.B., **Yakel, J.L**. & Ulens, C. (2011). Crystal structures of a cysteine-modified mutant in loop D of acetylcholine binding protein. *Journal of Biological Chemistry 286*:4420-4428.

63. Johnstone, T.B., Gu, Z., Yoshimura, R.F., Villegier, A.S., Hogenkamp, D.J., Whittemore, E.R., Huang, J.C., Tran, M.B., Belluzzi, J.D., **Yakel, J.L**. & Gee, K.W. (2011). Allosteric modulation of related ligand-gated ion channels synergistically induces long term potentiation in the hippocampus and enhances cognition. *J. Pharm. Exp. Ther. 336*:908-915.

64. Brams, M., Pandya, A., Kuzmin, D., van Elk, R., Krijnen, L., **Yakel, J.L**., Tsetlin, V., Smit, A.B., & Ulens, C (2011). A Structural and Mutagenic Blueprint for Molecular Recognition of Strychnine and *d*-Tubocurarine by Different Cys-Loop Receptors**.** *PLoS Biology 9*: e1001034.

65. Colón-Sáez, J. & **Yakel, J.L** (2011). The α7 nAChR function in hippocampal neurons is regulated by the lipid composition of the plasma membrane. *J. Physiology 589*: 3163-3174.

66. Gu, Z. & **Yakel**, J.L (2011). Timing-dependent septal cholinergic induction of dynamic hippocampal synaptic plasticity. *Neuron 71*: 155-165.

67. Pandya, A. & **Yakel, J.L** (2011) Allosteric modulators of the α4β2 subtype of neuronal nicotinic acetylcholine receptors. *Biochem Pharmacol. 82*: 952-958.

68. Pandya, A. & **Yakel, J.L** (2011) Allosteric modulator desformylflustrabromine relieves the inhibition of α2β2 and α4β2 nicotinic acetylcholine receptors by β-Amyloid1–42 peptide. *J. Mol. Neuroscience 45*: 42-47.

69. Shen, J.X. & **Yakel, J.L**. (2012) Functional α7 nicotinic ACh receptors on astrocytes in rat hippocampal CA1 slices. *J. Mol. Neuroscience 48*:14–21.

70. Billen, B., Spurny, R., Brams, M., van Elk, R., Valera-Kummer, S., **Yakel, J.L.,** Voets, T., Bertrand, D., Smit, A.B. & Ulens, C. (2012) Molecular actions of smoking cessation drugs at α4β2 nicotinic receptors defined in crystal structures of a homologous binding protein. *P.N.A.S. 109*:9173-9178.

71. **Yakel**, J.L (2012) Nicotinic ACh Receptors in the Hippocampus: Role in Excitability and Plasticity. *Nicotine Tob Res 14*:1249-1257.

72. Gu, Z., Lamb, P.W. & **Yakel**, J.L (2012) Cholinergic coordination of presynaptic and postsynaptic activity induces timing-dependent hippocampal synaptic plasticity. *J. Neuroscience 32*: 12337-12348.

73. **Yakel**, J.L (2013) Cholinergic Receptors: Functional Role of Nicotinic ACh Receptors in Brain Circuits and Disease. *Pflugers Archives; in press*

74. Pandya, A. & **Yakel, J.L** (2013) Activation of the α7 nicotinic ACh receptor induces anxiogenic effects in rats which is blocked by a 5-HT1a receptor antagonist. *Neuropharmacology; in press*

Publications (Book Chapters):

1. **Yakel, J.L**., L.O. Trussell & M.B. Jackson (1988). Cytoplasmic modulation of transmitter gated K channels in cultured mammalian central neurons. In *Calcium and Ion Channel Modulation*, A.D. Grinnell, D.L. Armstrong & M.B. Jackson, eds., pp. 291-302, Plenum Press, New York, NY.

2. **Yakel, J.L**. (1992). 5-HT_3 receptors as cation channels. In *Central and Peripheral 5-HT_3 Receptors*, M. Hamon, ed., pp. 103-128, Academic Press, London, England.

3. Jackson, M.B. & **J.L. Yakel** (1995). The 5-HT_3 receptor channel. *Annu. Rev. Physiol. 57*:447-468.

4. Jones, S., & **Yakel, J.L**. (1998) Functional study of glutamate receptor channels in brain slices. In *Neurodegeneration Methods and Protocols*, J. Harry & H.A. Tilson, eds., pp. 247-256, Humana Press, Totowa, NJ.

5. Jones, S., & **Yakel, J.L**. (1998) Calcium influx through voltage-gated calcium channels regulates 5-HT_3 receptor channel desensitization in NG108-15 cells. *Ann N Y Acad Sci. 861*:253-254.

6. **Yakel, J.L**. (2000) The 5-HT_3 receptor channel: Function, activation and regulation. In *Pharmacology of Ionic Channel Function: Activators and Inhibitors*, M. Endo, ed., pp. 541-560, Springer-Verlag, Berlin, Germany.

Invited Presentations (since 1994): **(*Symposia in italics*)**

Neuronal Excitability Section, NINDS/NIH, 1994
Department of Biology, University of N. Carolina-Pembroke, 1994
IUPHAR Serotonin Meeting, Chicago, IL., 1994
Vollum Institute, OHSU, Portland, OR. 1994
Department of Neurobiology, SISSA Institute, Trieste, Italy, 1994
Department of Pharmacology, University of Florence, Florence, Italy, 1994
Ecole Normale Supérieure, Paris, France, 1994
Department of Pharmacology, UCLA School of Medicine, L.A., CA., 1994

Ford Annual Conference of Fellows, Washington, DC, 1995
Neurobiology Group, Rhone-Poulenc Rorer, Paris, France, 1995
Neurobiologie Cellulaire et Fonct., INSERM U. 288, Paris, France, 1995

University of Bordeaux, Bordeaux, France, 1996
Neurobiology Division-MRC, University of Cambridge, Cambridge, England, 1996
Ecole Normale Supérieure, Paris, France, 1996
Department of Biology, Texas Women's University, Denton, Texas, 1996
Department of Physiology and Biophysics, Univ. of Washington, Seattle, Wash., 1996
Marine Biological Laboratories, Woods Hole, Mass., 1996

Department of Physiology and Biophysics, Georgetown Univ., Washington, D.C., 1997
Department of Physiology and Pharmacology, University of Nevada, Reno, 1997
Marine Biological Laboratories, Woods Hole, Mass., 1997
Morehouse School of Medicine Neuroscience Institute, 1997

Department of Neurosciences, Univ. of N. Mexico School of Medicine, 1997

Nat'l Institute of Neurological Disorders and Stroke NINDS/NIH, 1998
Department of Pharmacology, George Washington University School of Medicine, 1998
Allegheny University of the Health Sciences, Philadelphia, 1998
Institute of Behavioral Genetics, University of Boulder, 1998
Department of Physiology, Colorado State University, 1998
Marine Biological Laboratories, Woods Hole, Mass., 1998
Fourth IUPHAR Satellite Meeting on Serotonin, Rotterdam, The Netherlands Session Chair and Speaker, 1998
Department of Pharmacology, University of Maryland, 1998
NIH Research Festival, Session Speaker, 1998

Dept. of Physiology and Neurobiology, Univ. of Conn, Storrs, 1999
Division of Life Sciences, Univ. of Texas, San Antonio, 1999
Pharmacia and Upjohn, 1999
Marine Biological Laboratories, Woods Hole, Mass., 1999
Dept. of Biology, UCSD, San Diego, Ca., 1999
SIBIA Neurosciences, La Jolla, Ca., 1999
Biophysics Sector, SISSA, Trieste, Italy, 1999
Institute of Neurobiology, University of Puerto Rico, 1999

National Institute of Neurological Disorders and Stroke, NINDS/NIH, 2000
Winter Conference on Brain Research, Breckenridge, CO, Session Chair and Speaker, 2000
University of Rochester, Department of Physiology and Pharmacology, 2000
Department of Pharmacology, University College London, UK, 2000
Department of Pharmacology, University of Birmingham, UK, 2000
Pasteur Institute, Paris, France, 2000
Department of Neurobiology, Duke University, 2000
University of Texas-Austin, Neurobiology, 2000
Division of Neuroscience, Baylor College of Medicine, 2000
Memory Pharmaceuticals, New York, 2000
Department of Molecular Physiology, Baylor College of Medicine, 2000
Synaptic transmission 100 years after Luigi Luciani: A symposium in honour of Ricardo Miledi, Session Speaker, 2000
Nicotinic Receptor Conference, Erl Wood/Eli Lilly, Surrey, United Kingdom, Session Speaker, 2000
Neuronal Nicotinic Receptors- 10th Neuropharmacology Conference, New Orleans, Session Speaker, 2000

National Institute of Aging, NIA/NIH, 2001
Pharmacia and Upjohn, 2001
University of Amsterdam, Swammerdam Institute, 2001
Biophysics Sector, SISSA, Trieste, Italy, 2001
Department of Pharmacology, University of Florence, Florence, Italy, 2001
European Society for Neurochemistry, Perugia, Italy, 2001

XXIVth International Symposium, Centre for Research in Neurological Sciences, University of Montreal, Canada, 2002

Ion Channels in Drug Discovery & Development, Princeton, NJ., 2002
Duke University, Department of Neurobiology, Synapse Club, 2002

Marine Biological Laboratories, Woods Hole, Mass., 2003
Ion Channels in Drug Discovery & Development, Philadelphia, PA., 2003
Brigham Young University, Department of Physiology and Developmental Biology, 2003
Texas A&M University, Neuroscience Seminar Series, 2003

Serotonin EPHAR Satellite Meeting, Porto, Portugal, Speaker and Session Chair, 2004
Ion Channel Drug Targets, San Diego, CA., 2004

Barrows Neurological Institute, Phoenix, AZ., 2005
Albert Einstein College of Medecine, Department of Neuroscience, 2005
Duke University, Integrated Toxicology Program, 2005
Department of Biology, University of N. Carolina-Pembroke, 2005
St. Augustine's Biology Department, Raleigh, North Carolina, 2005
Ion Channels in Drug Discovery & Development- 5th Annual, Philadelphia, PA, 2005
Society for Neuroscience Satellite Symposium: The 5-HT_3 Receptor: A Model Cys-Loop Ligand-Gated Ion Channel, Washington DC, 2005
University of Helsinki, Neuroscience Center, Helsinki, Finland, 2005

Ion Channels in Drug Discovery & Development- 6th Annual, Philadelphia, PA, 2006
Serotonin IUPHAR Satellite Meeting, Sapporo, Japan, Session Co-Chair, 2006

Brody School of Medicine, East Carolina University, 2007
St. Augustine's Biology Department, Raleigh, North Carolina, 2007

Nicotinic Acetylcholine Receptors 2008, Wellcome Trust Conference, Cambridge, UK, 2008
UCLA, Dept. of Physiological Sciences, 2008
Targacept, 2008
Aurora Biomed 6th Annual Ion Channel Retreat, Vancouver, BC, 2008
Society for Neuroscience, Session Chair, 2008

University of Montana, Biomedical and Pharmaceutical Sciences, Missoula, MT, 2009
University of Southern California, Molecular and Computational Biology, LA, Calif., 2009
Journal of Physiology symposium, 'Advances and hold-ups in the study of structure, function and regulation of Cys-loop ligand-gated ion channels and receptors', Organizer and speaker, 2009
E.E. Just Lecturer, American Society of Cell Biology meeting, 2009

Brown University, Providence, RI, 2010
Duke University, Department of Neurobiology, Synapse Club, 2010
SACNAS annual meeting, Anaheim, Calif., 2010

Nicotinic Acetylcholine Receptors 2011, Wellcome Trust Conference, Cambridge, UK, 2011
NIAAA/NIH, Rockville, MD, 2011
SFN Satellite Symposium: nAChR 2011: Emerging Frontiers in Basic Research & Clinical Science, Washington DC, 2011

University of North Carolina, Neuroscience Program, Chapel Hill, NC, 2012
Northwestern University, Chicago, IL, 2012
National Institute of Aging, NIA/NIH, 2012

UNC-Chapel Hill, Department of Pharmacology, 2012
University of California-San Diego, Neurobiology Seminar, Division of Biological Sciences, 2012