

Curriculum Vitae

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Citizenship: Citizen of United States of America



Educational Qualifications

Australian National University	Ph.D., Neuroscience	1989-1992
University of Madras, India	M.S., Pharmacology	1978-1981
University of Madras, India	B.S., Chemistry	1975-1978

Professional Qualifications

Professor/Principal investigator Department of Pharmacology, Southern Illinois University School of Medicine, Springfield, IL	2010-Present
Associate Professor/Principal investigator/Co-director of Year 2 Medical Curriculum-Cardiovascular Renal and Respiratory unit Department of Pharmacology, Southern Illinois University School of Medicine, Springfield, IL	2007-2010
Associate Professor/Principal investigator/Director of graduate Program, Department of Pharmacology, Southern Illinois University School of Medicine, Springfield, IL	2003-2007
Assistant Professor/Principal investigator, Department of Pharmacology, Southern Illinois University School of Medicine, Springfield, IL	1999-2003
Research Assistant Professor/Principal investigator, Department of Physiology and Biophysics, State University of New York at Buffalo, Buffalo, NY	1995-1999
Post-Doctoral Associate, Department of Biophysics, State University of New York at Buffalo, Buffalo, NY	1994-1995
Post-Doctoral Fellow, Division of Neuroscience, John Curtin School of Medical Research, Australia	1992- 1994
Research Officer, King Faisal Specialist Hospital, Saudi Arabia	1986-1989
Lecturer, M. S. R. Medical College, Bangalore, India	1984-1986
Lecturer, Christian Medical College, Vellore, India	1982-1984
Research Assistant, Christian Medical College, Vellore, India	1981-1982

Teaching

Sophomore Medical Pharmacology

1. Introduction to Cardiovascular/Renal/Respiratory (CRR) Physiology/Pharmacology
2. Adrenergic and Cholinergic Physiology/Pharmacology
3. Anti-arrhythmic Agents
4. Treatment of Congestive Heart Failure
5. Treatment of Ischemic Heart Disease
6. Diuretics
7. Treatment of Migraine
8. General and local anesthetics

Year 4 Medical Students:

1. Advanced Therapeutics Fourth Year Elective
2. Advanced Therapeutics Elective - Treatment of Hypertension
3. Advanced Therapeutics Elective - Vasodilators
4. Advanced Therapeutics Elective - Management of Chronic Pain

Graduate Pharmacology:

PHRM 550a&b (Principles of Pharmacology) Course Overview

1. Diuretics
2. Digitalis/Cardiac Glycosides
3. Anesthetics (General and Local)
4. Antihypertensive agents
5. Antianginal agents
6. Anti-arrhythmic agents
7. Student presentations

PHRM 555 (Cardiovascular Pharmacology)

1. Electrophysiology and EC Coupling: Molecular approaches in cardiovascular function
2. Student presentations

PHRM 574 (Neuropharmacology)

1. Excitatory Amino Acid Receptors-NMDA
2. Opioid Peptides and Other Drugs of Abuse
3. Neuromethodologies
4. Student Presentations

Undergraduate Teaching:

1. University of Illinois at Springfield - CHE 480
2. Special Topics in Pharmacology: Molecular Mechanisms of Pain Perception

Resident Lectures (Grand rounds):

1. Lecture to Endocrinology Residents and faculty "Molecular Mechanism of Pain Perception" SIU School of Medicine
2. Lecture to Endocrinology Residents and faculty "Role of Vanilloid Receptors in Peripheral Diabetic Neuropathy" SIU School of Medicine
3. Lecture to Endocrinology Residents and faculty "TRP Channels" SIU School of Medicine
4. Neurology resident lecture "Pain Pathways", SIU School of Medicine

5. Lecture to Endocrinology Residents and faculty "TRPV1: A Target for Next Generation Analgesics" SIU School of Medicine
6. Medical Grand Rounds "Treatment of migraine headache", SIU School of Medicine
7. Lecture to Anesthesia Interest Group "Resiniferatoxin for Chronic Pain" SIU School of Medicine
8. Lecture to Endocrinology Residents and faculty "Role of TRP Channels in Diabetic Peripheral Neuropathy" SIU School of Medicine
9. Lecture to Endocrinology Residents and faculty "Is Diabetes a Preventable Disease?" SIU School of Medicine

Techniques Used in the Laboratory

1. Double electrode oocyte voltage-clamp technique to study cloned heterologously expressed receptors
2. Giga-seal patch clamp technique (whole-cell and single-channel current recordings from cultured and dissociated neurons and from spinal cord slices)
3. Evoked and spontaneous/miniature excitatory and inhibitory synaptic currents from DRG and DH co-cultures using double patch and patch clamp techniques and from spinal cord slices from control and diabetic mice to determine changes in synaptic transmission
4. Fast solution exchange in outside-out patches (surrogate synapse)
5. Detailed kinetic analysis of single channel currents using Hidden Markov Model based techniques (I played a part in its development, Chung et al., 1990)
6. Fluorescence imaging for detecting changes in intracellular Ca^{2+} and free radicals using fluorescence and confocal microscopy
7. Immunocytochemistry to determine expression of receptor proteins in DRGs, dissociated DRG neurons and to determine dendritic arborization in dorsal horn. Tissues will be collected from animals generated using chronic pain models and diabetic animals exhibiting hyperalgesic and hypoalgesic phenotypes
8. Radiochemical assay to detect TRPV1 levels (3H RTX) and phosphorylated protein
(^{32}P) labeling to determine changes in receptor expression
9. Western blots to detect TRPV1 (His-tagged TRPV1) and TRPM8 (FLAG-tagged) and to detect phosphorylated forms
10. Real-time RT-PCR to determine the expression of TRP channels in different regions of the CNS
11. Determination of membrane translocation of TRPV1 and TRPM8 by detecting levels of protein in the membrane fraction. Detect translocation of GFP-tagged TRPV1 and TRPM8 using real time confocal imaging
12. Heterologous expression in HEK293 and CHO cells with GFP-tagged TRPV1 to determine the levels of expression, translocation and internalization using confocal microscopy
13. Site directed mutagenesis to study molecular determinants
14. Organ bath experiments to study changes in vascular tone
15. Generation of autoimmune diabetic mice (TCR-SFE (T-cell receptor for hemagglutinin)/Ins-HA/B10.D2 (pancreatic beta cells produce hemagglutinin). The offspring become diabetic within 3-6 weeks of age, where diabetes is functionally defined by hyperglycemia (blood glucose >299 mg/dl)
16. Streptozotocin and alloxan induced diabetic mice

17. Nocifensive behavior testing using hot plate, cold plate and intraplantar injection of algesic and analgesic substances
18. Intrathecal injection of drugs to test whether nocifensive behavior could be blocked at the level of the spinal cord
19. Animal models of inflammatory (carrageenen) and chronic (sciatic nerve ligation) pain
20. Chronic focal infusion of drugs using osmotic mini pump

Ongoing Research Projects

1. Transient Receptor Potential Channels as Targets for Phytochemicals
2. Role of TRPV1 in Descending Pain Pathway in Diabetic Peripheral Neuropathy
3. Novel Role of TRPA1 in Promoting Insulin and GLP-1 Release
4. Novel Approach to Treat Chronic Pain by Resiniferatoxin
5. Resiniferatoxin Cream to Treat Diabetic Peripheral Neuropathy
6. Role of Extracellular Matrix in Inflammation and Pain
7. Subunit Specific Functional Properties of NMDA Receptors

Publications

1. Sharma A, Ramena G, Yin Y, **Premkumar L.S.** Elble RC. CLCA2 is a positive regulator of store-operated calcium entry and TMEM16A. PLoS One. 2018 May 14;13(5):e0196512. doi: 10.1371/journal.pone.0196512.
2. Pabbidi MR, **Premkumar LS** (2017) Role of Transient Receptor Potential Channels Trpv1 and Trpm8 in Diabetic Peripheral Neuropathy. J Diabetes Treat: JDBT-129.
3. Samineni VK, **Premkumar LS**, Faingold CL (2017). Neuropathic pain-induced enhancement of spontaneous and pain-evoked neuronal activity in the periaqueductal gray that is attenuated by gabapentin. Pain 158:1241-1253 PMID: 28328571.
4. Abooj M, Bishnoi M, Bosgraaf CA, **Premkumar LS.** (2017) Changes in spinal cord following inflammatory and neuropathic pain and the effectiveness of resiniferatoxin The Open Pain J. 8. 180-191.
5. Khare P, Jagtap S, Jain Y, Baboota RK, Mangal P, Boparai RK, Bhutani KK, Sharma SS, **Premkumar LS**, Kondepudi KK, Chopra K, Bishnoi M. (2016) Cinnamaldehyde supplementation prevents fasting-induced hyperphagia, lipid accumulation, and inflammation in high-fat diet-fed mice. Biofactors. 42(2):201-11.
6. Yu S, **Premkumar L.S.** (2015) Ablation and regeneration of peripheral and Central TRPV1 Expressing Nerve Terminals and the Consequence of Nociception. The Open Pain J. 8, 1-9.
7. Abooj, M., Bosgraaf, C. A., **Premkumar, L. S.** (2014) Intrathecal administration extracellular matrix in alleviation of both thermal and mechanical hypersensitivity (Mol. Pain submitted)
8. Feng L. and **Premkumar L.S.** (2014) Expression and function of Transient Receptor Potential Ankyrin 1 in the nucleus of the solitary tract (Neuroscience, submitted)
9. Baboota, R. K., Murtaza, N., Jagtap, S., Singh, D. P, Karmase, A., Kaur, J., Bhutani, K.K., Bopara, R. K., **Premkumar, L. S.**, Kondepudi, K. K., Bishnoi, M. (2014) Capsaicin-induced transcriptional changes in hypothalamus and alterations in gut microbial count in high fat diet fed mice. J Nutr Biochem. 25: 893-902.

10. **Premkumar L. S.** (2014) Transient Receptor Potential Channels as Targets for Phytochemicals. *ACS Chem. Neurosci.* 5: 1117-30.
11. **Premkumar L. S.**, Pabbidi RM. Diabetic Peripheral Neuropathy: Role of Reactive Oxygen and Nitrogen Species. *Cell Biochem Biophys.* 67:373-83.
Premkumar L. S., Abooj M. TRP channels and analgesia. (2013) *Life Sci.* 92: 41524.
12. Cao, D.S., Zhong, L., Hsieh, T.H., Abooj, M., Bishnoi, M., Hughes, L., **Premkumar L.S.**(2012) Expression of Transient Receptor Potential Ankyrin 1 (TRPA1) and Its Role in Insulin Release from Rat Pancreatic Beta Cells. *PLoS One* 7(5):e38005. Epub 2012 May 31.
13. Evans, M.S., Cheng, X., Jeffry, J.A., Disney, K.E., **Premkumar, L.S.** (2012). Sumatriptan inhibits TRPV1 channels in trigeminal neurons. *Headache.* May;52(5):773-84.
14. Bishnoi, M., Bosgraaf, C.A., Abooj, M., Zhong, L. and **Premkumar, L.S.** (2011) Streptozotocin-Induced Early Thermal Hyperalgesia is independent of Glycemic State of Rats: Role of Transient Receptor Potential Vanilloid 1 (TRPV1) and Inflammatory mediators. *Mol Pain* 2011 Jul 27;7:52.
15. Raisinghani, M., Zhong, L., Jeffry, J.A., Bishnoi, M., Pabbidi, R.M., Pimentel, F., Cao, D.S., Evans, M.S. and **Premkumar, L.S.** (2011) Activation Characteristics of Transient Receptor Potential Ankyrin 1 and its Role in Nociception. *Am J Physiol Cell Physiol.* 301: C587-600.
16. Walia, V., Yu, Y., Cao, D., Sun, M., McLean, J.R., Hollier, B.G., Cheng, J., Mani, S.A., Rao, K., **Premkumar, L.** and Elble, R. C. (2011) Loss of breast epithelial marker hCLCA2 promotes epithelial-to-mesenchymal transition and indicates higher risk of metastasis. *Oncogene.* 2011 Sep 12. doi: 10.1038/onc.2011.392. [Epub ahead of print]
17. Lee, R.H., Liu, Y.Q., Chen, P.Y., Liu, C.H., Chen, M.F., Lin, H.W., Kuo, J.S., **Premkumar, L.S.** and Lee, T.J. (2011) Sympathetic alpha 3 beta 2-nAChRs mediate cerebral neurogenic nitergic vasodilation in the swine. *Am J Physiol Heart Circ Physiol.* 301: H344-354.
18. Samineni, V.K., **Premkumar, L.S.** and Faingold, C.L. (2011) Post-ictal analgesia in genetically epilepsy-prone rats is induced by audiogenic seizures and involves cannabinoid receptors in the periaqueductal gray. *Brain Res.* 1389:177-82.
19. Bishnoi, M., Bosgraaf C. A. and **Premkumar L. S.** (2011a) Preservation of acute pain and efferent functions following intrathecal RTX-Induced analgesia *J. Pain,* 12: 991-1003 .
20. **Premkumar, L. S.** and Bishnoi, M. (2011) Disease-related changes in TRPV1 expression and its implications for drug development. *Curr. Topics in Med. Chem.* 11: 2192-209.
21. **Premkumar, L. S.** and Pabbidi, R. (2011) Diabetic Peripheral Neuropathy: Role of reactive oxygen and nitrogen species *Cell Biochem. Biophys.* (in press).
22. Bishnoi, M. and **Premkumar, L.S.** (2011) Possible consequences of blocking TRPV1. *Curr. Pharm. Biotechnol.* 12: 102-114.
23. Liu G, Hu X, **Premkumar L**, Chakrabarty S. (2011) Nifedipine synergizes with calcium in activating the calcium sensing receptor, suppressing the expression of thymidylate synthase and survivin and promoting sensitivity to fluorouracil in human colon carcinoma cells. *Mol Carcinog.* 2011 Mar 3. doi: 10.1002/mc.20752. [Epub ahead of print]
24. Evans M.S., Cheng X., Jeffry J.A., Kimberly E. Disney K.E., **Premkumar L. S.** (2011) Sumatriptan inhibits TRPV1 channels in trigeminal neurons. *Headache* (in press).
25. **Premkumar L, S.** (2010) Targeting TRPV1 as an Alternative Approach to Narcotic Analgesics to Treat Chronic Pain Conditions. *AAPS J.* 12: 361-370.

26. Jeffrey J. A., Yu S. Q., Sikand P., Parihar A., Evans M.S., and **Premkumar L. S.** (2009) Selective targeting of TRPV1 expressing central terminals of spinal cord for long lasting analgesia. *PLoS One* 15;4(9):e7021.
27. Walia V., Ding M., Kumar S., Nie D., **Premkumar L. S.**, Elble R. C. (2009) hCLCA2 is a p53-inducible inhibitor of breast cancer cell proliferation. *Cancer Res.* 69: 6624-6632.
28. Cao D. S., Yu S. Q., **Premkumar L.S.** (2009) Modulation of transient receptor potential vanilloid 4-mediated membrane currents and synaptic transmission by protein kinase C. *Mol Pain* 5(1):5.
29. Lin H. W., Liu C. Z., Cao D., Chen P.Y., Chen M. F., Lin S. Z., Mozayan M., Chen A. F., **Premkumar L. S.**, Torry D.S and Lee T. J (2008). Endogenous methyl palmitate modulates nicotinic receptor-mediated transmission in the superior cervical ganglion.. *Proc. Natl. Acad. Sci. U S A.* 105:19526-1953.
30. Pabbidi R., Yu S-Q., Peng S., Khardori R., Pauza M. E and **Premkumar L. S.** (2008) Influence of TRPV1 on diabetes-induced alterations in thermal pain sensitivity. *Mol. Pain* 4:9.
31. **Premkumar L. S.** and Sikand P. (2008) TRPV1: a target for next generation analgesics. *Curr. Neuropharmacol.* 6: 151-163 .
32. Pabbidi R., Cao D-S., Parihar A., Pauza M.E and **Premkumar L. S.** (2007) Direct Role of streptozotocin in inducing thermal hyperalgesia by enhanced expression of TRPV1 in sensory neurons *Mol. Pharmacol.* 73: 995-1004.
33. Sikand P. and **Premkumar L. S.** (2007) Potentiation of glutamatergic synaptic transmission by protein kinase C mediated sensitization of TRPV1 at the first sensory synapse. *J. Physiol.* 581: 418-424.
34. **Premkumar L. S.** and Raisinghani M. (2006) Nociceptors in cardiovascular functions: complex interplay as a result of cyclooxygenase inhibition. *Mol. Pain* 2:26.
35. Mozayan M., Chen M. F., Si M., Yi Chen P., **Premkumar L. S.**, Lee T. J. (2006) Cholinesterase inhibitor blockade and its prevention by statins of sympathetic alpha7 nAChR-mediated cerebral nitroergic neurogenic vasodilation. *J. Cereb Blood Flow Metab.* 26: 1562-1576.
36. **Premkumar L. S.**, Raisinghani M., Pingle S., Long C. and Pimentel, F. (2005) Downregulation of TRPM8 by protein kinase C mediated dephosphorylation. *J. Neurosci.* 25: 11322-11329.
37. **Premkumar L. S.** (2005) Block of calcium activated potassium channels by cocaine *J. Memb. Biol.* 204: 129-36.
38. Van Buren J., Bhat S., Smith S., Pauza M., **Premkumar L. S.** (2005) Role of TRPV1 in diabetic peripheral neuropathy. *Mol. Pain* 1: 17.
39. Raisinghani, M., and Pabbidi, R., **Premkumar L. S.** (2005) Activation of TRPV1 by Resiniferatoxin: Implications in chronic pain conditions. *J. Physiol.* 567: 771-786.
40. Puntambekar P., Van Buren J., Raisinghani M., **Premkumar L. S.** and Ramkumar V. (2004) Direct interaction of Adenosine with the TRPV1 channel protein. *J. Neurosci.* 24: 3663-3671.
41. Raisinghani M. and **Premkumar L. S.** (2004). Block of Native and Cloned Vanilloid Receptor 1 (TRPV1) by Aminoglycoside Antibiotics. *Pain* 113: 123-133.
42. **Premkumar L. S.**, Qi Z.H., Van Buren J. and Raisinghani M. (2004) Enhancement of potency and efficacy of NADA by PKC-mediated phosphorylation of vanilloid receptor. *J. Neurophysiol.* 91:1442-1449.
43. Watanabe J., Beck C., Kuner T., **Premkumar L. S.** and Wollmuth L. P. (2003) DRPEER: A motif in the extracellular vestibule conferring high Ca²⁺ flux rates in NMDA receptor channels. *J. Neurosci.* 22:10209-10216.
44. Ahern G. P. and **Premkumar L. S.** (2002). Voltage-dependent priming of vanilloid receptor: effects of agonists and phosphorylation state. *J. Physiol.* 545: 441-451.

45. **Premkumar L. S.**, Agarwal S. and Steffen D. (2002). Single channel properties of native and cloned rat vanilloid receptors. *J. Physiol.* 545: 107-117.
46. Sasaki Y. F., Rothe T., **Premkumar L. S.**, Das S., Cui J., Talantova M. V., Wong H. K., Gong X., Chan S. F., Zhang D., Nakanishi N., Sucher N. J. and Lipton S. A. (2002). Characterization and comparison of the NR3A Subunit of the NMDA receptor in recombinant systems and primary cortical neurons. *J. Neurophysiol.* 87:2052-2063.
47. Chatterton J. E., Awobuluyi M., **Premkumar L. S.**, Takahashi H., Talantova M., Shin Y., Cui J., Tu S., Sevarino K. A., Nakanishi N., Tong G., Lipton S. A. and Zhang D. (2002). Excitatory glycine receptors containing the NR3 family of NMDA receptor subunits. *Nature* 415:793-798.
48. **Premkumar L. S.** (2001) Interaction between vanilloid receptors and purinergic metabotropic receptors: pain perception and beyond. *Proc. Natl. Acad. Sci. U S A.* 98:6537-6539.
49. **Premkumar L. S.** and Ahern G. P. (2000) Induction of vanilloid receptor channel activity by protein kinase C. *Nature* 408:985-990.
50. Kuehl-Kovarik C.M., Partin, M., Premkumar L. S. and Magnusson, K. R. (2000) Electrophysiological analysis of NMDA receptor subunit changes in the aging mouse cortex. *Mech. Ageing Dev.* 115:39-59.
51. **Premkumar L. S.** (1999) Selective potentiation of L-type calcium currents in cardiac myocytes and hippocampal neurons by cocaine. *Mol. Pharmacol.* 56:1138-1142.
52. Das D., Sasaki Y. F., Rothe T., **Premkumar L. S.**, Takasu M., Crandall J. E., Dikkes P., Connor D. A., Rayudu P. V., Cheung W., Chen H-S.V., Lipton S. A. and Nakanishi N. (1998). Increased NMDA current and spine density in mice lacking a novel NMDAR subunit, NR3A. *Nature* 393: 377-381.
53. **Premkumar L. S.** and Auerbach A. (1997) Stoichiometry of mouse recombinant NMDA receptor channels inferred from single-channel conductance patterns. *J. Gen. Physiol.* 110:485-502.
54. **Premkumar L. S.**, Qin F. and Auerbach A. (1996) Subconductance states of a mutant NMDA receptor channel: kinetics and voltage-dependence. *J. Gen. Physiol.* 109: 1-9.
55. **Premkumar L. S.** and Auerbach A. (1996) Identification of a high affinity divalent binding site at the entrance of NMDA receptor channel. *Neuron* 16: 869-880.
56. Sunstrom N.A., **Premkumar L. S.** Ewart G. Cox G. B. and Gage, P.W. (1996) Ion channel formed by NB, an influenza B virus protein. *J. Membr. Biol.* 150: 127-132.
57. **Premkumar L. S.** and Ahern G. P. (1995) Blockade of a resting potassium channel and modulation of synaptic transmission by ecstasy in the hippocampus. *J. Pharmacol. Expt. Ther.* 274: 718-722.
58. **Premkumar L. S.** and Chung S-H. (1995) Activation of K⁺ channels by stimulation of metabotropic receptor stimulation. *NeuroReport* 6: 765-768.
59. **Premkumar L. S.** and Gage P. W. (1994) Potassium channels activated by GABAB agonists and serotonin. *J. Neurophysiol.* 71: 2570-2575.
60. Kurmi J., **Premkumar L. S.**, Birnir B. and Gage P. W. (1993) The influence of membrane potential on chloride channels activated by GABA in rat cultured hippocampal neurons. *J. Membr. Biol.* 136: 273-280.
61. Vasudevan S., **Premkumar L. S.**, Stowe S., Gage P. W., Reilander H. and Chung S-H. (1992) Muscarinic acetylcholine receptor produced in recombinant baculovirus infected SF9 insect cells couples with endogenous G-proteins to activate ion channels. *FEBS. Lett.* 311: 7-11.
62. **Premkumar L. S.**, Chung S-H. and Gage P. W. (1990) GABA-induced potassium channels in cultured neurons. *Proc. R. Soc. Lond. B.* 241: 153-158.

63. **Premkumar L. S.**, Gage P. W. and Chung S-H. (1990) Coupled potassium channels induced by arachidonic acid in cultured neurons. *Proc. R. Soc. Lond. B.* 242: 17-22.
64. Chung S-H., Moore J. B., Xia L., **Premkumar L. S.** and Gage P. W. (1990) Characterization of single-channel currents using digital signal processing techniques based on hidden Markov models. *Phil. Trans. R. Soc. Lond. Biol.* 329: 265-285.
65. Almotrefi A. A., Dzimiri N., Aboul-Enein H. Y. and **Premkumar L. S.** (1993). Synthesis and pharmacological evaluation of the antifibrillatory effect of fluorinated derivatives of carazolol and celiprolol: comparison with propranolol. *Gen. Pharmacol.* 24: 721-725.
66. Almotrefi A. A., Aboul-Enein H. Y. and **Premkumar L. S.** (1989). Evaluation of antifibrillatory activity of fluorinated derivatives of indenolol and nadolol in isolated rabbit and rat hearts. Comparison with propranolol. *Arch. Int. Pharmacodyn. Ther.* 301: 122-130.

Book Chapters

1. **Premkumar L.S.** (2015) Changes in TRP channel expression in acquired diseases “TRP Channels as Therapeutic Targets: from Basic Science to Clinical Use” Ed. Arpad Szallasi. Elsevier
2. **Premkumar L. S.** (2011) Methods used for studying TRP channel function in sensory neurons. TRP Channels, *CRC Methods in Signaling Transduction Series*.
3. Van Buren J. and **Premkumar L. S.** (2003). Modalities of nociception and the Underlying molecular mechanisms. Chapter 16. Eds. Flora, S. J. S., Romano, J, A., Baskin, S. I., and Sekhar, K. Narosa Publishing House, New Delhi.
4. Gage P. W., **Premkumar L. S.** and Chung S-H. (1993). Potassium channels in cultured mammalian neurons. Molecular and Cellular Biology of Pharmacological Targets. Chapter 7. Eds. Glossmann, H and Striessnig, J. Plenum Press, New York.
5. Gage P. W., Chung S-H., Moore J. B. and **Premkumar L. S.** (1990). Detection and interpretation of multiple conductance levels in ion channels in membranes. In exocrine Secretion II. Eds. P. Y. D. Wong and J. A. Young. United League Graphic and Printing Co. Ltd., Hong Kong.

Abstracts

1. **Premkumar L.S.**, Thyagarajan B., and Nemenov M. (2018) Polymer coated proprietary cream formulation of resiniferatoxin nanoparticles for the Treatment of Pain Associated with Diabetic Peripheral Neuropathy. *Neurodiab*, European Diabetic Neuropathy Study Group. Rome, Italy.
2. Premkumar L.S. (2017) Role of descending pain pathway in diabetic peripheral Neuropathy *Neurodiab*, European Diabetic Neuropathy Study Group. Coimbra, Portugal.
3. **Premkumar L.S.** (2017) Role of TRPA1 in Insulin and GLP-1 Release. *Diabetes and Endocrinology Disorders Dubai UAE*.
4. **Premkumar L.S.** (2016) Resiniferatoxin for the treatment of diabetic peripheral neuropathy. *Neurodiab*, European Diabetic Neuropathy Study Group. Bucharest, Romania.
5. **Premkumar L.S.** (2015) Role of Transient Receptor Potential channels TRPV1 and TRPM8 in diabetic peripheral Neuropathy. *Neurodiab*, European Diabetic Neuropathy Study Group. Elsinore, Denmark.

6. **Premkumar L.S.** (2014) TRPV1: a target to treat Diabetic Peripheral Neuropathy. *Neurodiab*, European Diabetic Neuropathy Study Group. Sopron, Hungary.
7. Bishnoi M, Abooj M., Bosgraaf C. A., **Premkumar L. S.** (2012) Role of spinal transient receptor potential vanilloid 1 (TRPV1) in Inflammatory and nerve injury induced early thermal hyperalgesia. *Neurosci. Abst.*
8. **Premkumar L. S.**, Bishnoi M., Bosgraaf C. A., Abooj, M. and Zhong, L. (2011) Involvement of Transient receptor potential vanilloid 1 (TRPV1) and inflammation in STZ-induced early thermal hyperalgesia is independent of glycemic state of rats. *Neurosci. Abst.*
9. Abooj, M., Bishnoi M., Bosgraaf C. A, and **Premkumar L. S.** (2011). Role of growth hormone in nociception. *Neurosci. Abst.*
10. **Premkumar L.S.**, Cao D-S., Jeffrey J. A. and Hughes L. (2010) Role of TRPA1 channels in diabetic peripheral neuropathy. *Neurosci. Abst.*
11. Cao D-S., **Premkumar L.S.** (2010) The expression and function of TRP channels in the hippocampus. *Neurosci. Abst.*
12. Bishnoi M., Bosgraaf C. A, and **Premkumar L. S.** (2010) Preservation of acute pain and efferent functions following intrathecal RTX-Induced analgesia. *Neurosci. Abst.*
13. **Premkumar L. S.** (2010) Role of TRP channels in diabetic peripheral neuropathy. *Neurodiab, Stockholm.*
14. **Premkumar L.S.**, Cao D-S., Jeffrey J.A. and Pabbidi R.M. (2009) Role of TRP channels in diabetic peripheral neuropathy. *Neurosci. Abst.*
15. Jeffrey J.A., Evans M.S., **Premkumar L.S.** (2009) Anandamide enhances excitatory synaptic transmission in the spinal cord dorsal horn. *Neurosci. Abst.*
16. Cao D-S. and **Premkumar L. S.** (2009) Activation characteristics of TRPA1. *Neurosci Abst*
17. **Premkumar L. S.** (2009) Role of TRP channels in diabetic peripheral neuropathy (2009) *Neurodiab*
18. Cao D-S. and **Premkumar L. S.** (2008) Activation of TRPV4 by direct mechanical force. *Neurosci. Abst.*
19. Jeffrey J.A., Evans M.S., **Premkumar L. S.** (2008) Modulation of synaptic transmission at first sensory synapse of the caudal spinal trigeminal nucleus by TRPV1 and TRPA1. *Neurosci. Abst.*
20. Pabbidi R. M., Parihar A., Pauza M.E. and **Premkumar L. S.** (2008) Role of streptozotocin (STZ) in TRPV1-mediated hyperalgesia. *Neurodiab* 7: 31 P54.
21. Cao D-S., Yu S-Q., **Premkumar L. S.** (2007) Co-expression of TRPV1 and TRPV4 in Sensory Neurons and their Modulation by PKC. *Neurosci. Abst.*
22. **Premkumar L. S.**, Yu S-Q. and Sikand P. (2007) Role of TRPV1 in Central Terminals of Sensory Neurons in Nociception. *Neurosci. Abst.*
23. Jeffrey J., Evans M.S., and **Premkumar L. S.** (2007) Modulation of Synaptic transmission in the Caudal Spinal Trigeminal Nucleus by TRP channels: Implications for Migraine. *Neurosci. Abst.*
24. Pabbidi R. M. and **Premkumar L. S.** (2007) TRPV1 and TRPM8 mediated heat and cold sensitivity in diabetic peripheral neuropathy.
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59. **Premkumar L. S.** and Auerbach A. (1996) Stoichiometry of recombinant NMDA receptor channels. *Neurosci. Abst.* 237.8: 593P.
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65. **Premkumar L. S.** and Gage P. W. (1992) Potassium channels activated by excitatory amino acids in hippocampal neurons from neonatal rats. *Proc. Aus. Physiol. Pharmacol. Soc.* 23: 103P.
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67. **Premkumar L. S.** and Gage P. W. (1991) Potassium channels activated by GABA and serotonin in cultured mammalian neurons. *Proc. Aus. Physiol. Pharmacol. Soc.* 22: 133P.
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71. Gage P. W., **Premkumar L. S.** and Chung S-H. (1990). Oligomeric potassium channels activated in neurons by GABA. *Proc. Aus. Physiol. Pharmacol. Soc.* 21: 17P.
72. Gage P. W., Chung S-H., Moore J. B. and **Premkumar L. S.** (1990). Detection and interpretation of multiple conductance levels in ion channels in membranes. *Presented at the International symposium on exocrine secretion* held in Leura Australia from 21-25 August.
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Graduate and Postdoctoral Training

Doctoral Degree

1. Jeremy van Buren, MD. Ph.D, specializing in ophthalmology, University of Wisconsin. (Thesis: Role of Vanilloid Receptor 1 in diabetic peripheral neuropathy)
2. Parul Sikand, Ph.D. Postdoctoral Fellow in the Department of Pharmacology, Yale University, Connecticut. (Thesis: Modulation of synaptic transmission by TRPV1 at first sensory synapse)
3. Reddy M. Pabbidi, completed a postdoctoral Fellow in at Loyola Medical School, Chicago; Tenure track Assistant Professor in Jackson, Mississippi (Thesis: Role of TRP channels in diabetic peripheral neuropathy)
4. Joe Jeffry, Ph.D., Postdoctoral Fellow, Washington University, Saint. Louis, MO (Thesis: Synaptic transmission at Caudal spinal trigeminal nucleus and substantial gelatinosa).
5. Da-shou Cao, Ph.D., Postdoctoral Fellow, University of California, San Deigo (Thesis: Role of TRPV4 in nociception).
6. Lin Feng, Ph.D, just completed (Thesis: Modulation of synaptic transmission at the nucleus tractus solitarius)
7. Mruvil Abooj Ph.D, just completed (Thesis: Mechanisms underlying chronic pain)
8. Yufang Yin (Ph.D student)

Master's Degree

1. Fatima Pimentel Montero Fulbrihtg Scholar from University de Panama (Thesis: Modulation of transient receptor melastatin 8 by protein kinase C).
2. Jeff Hsieh (Thesis: Role of TRPA1 in insulin release from pancreatic beta cells).

Postdoctoral Training

1. Dr. Gerard Ahern has taken up a tenure track Asst. Professor position at Georgetown University.
2. Dr. Cheng Long, has taken up a Res. Asst. Prof. position at Baylor College of Medicine. Dr. Zhan-Heng Qi has taken up a position at National Institutes of Health, Pain Center, UCSF
3. Dr. Sandeep Pingle has taken up a position at University of San Diego.

4. Dr. Bhat has taken up a Res. Asst. Prof. position in Johns Hopkins University.
5. Dr. Raisinghani has taken up a position in Columbia University.
6. Dr. Yu has taken up a Research Associate position in Michigan State University
7. Dr. Mahendera Bishnoi, National Institute of Agricultural Biotechnology, Chandigarh, India

Patents

Licensing our technology to treat chronic pain conditions with RTX
Mount Cook Pharmaceuticals has expressed interest (Pending).

Pursuing a patent to treat burn injuries with RTX for pain relief (Pending).

Research Funding

Current

- National Institutes of Health (NIH RO1; NIDA, DA028017): “A novel approach for chronic pain treatment using resiniferatoxin” (2009-2016).

Pending:

- National Institutes of Health: “A novel approach for chronic pain treatment using resiniferatoxin.”
- National Institutes of Health: “Role of TRA1 in insulin and GLP-1 release”.
- National Institutes of Health (NCCAM): “Transient Receptor Potential as Targets for Botanicals”.

PAST

- National Institutes of Health (NIH RO1; NIDDK, DK065742): “Role of TRPV1 in diabetic peripheral Neuropathy,” (2005-2010).
- National Institutes of Health (NIH RO1; NINDS, NS-042296): “Endogenous activators of vanilloid receptors,” (2001-2007).
- Excellence in Academic Medicine (EAM) award: “Role of TRPV1 in diabetic neuropathy”.
- Excellence in Academic Medicine (EAM) award: “Modulation of Ca²⁺ permeability and Mg²⁺ block of NMDA receptors by toxic divalent cations,” (2001-2002). □
Excellence in Academic Medicine (EAM) award: “Potentiation of Calcium currents by cocaine,” (2000-2001).
- National Science Foundation (NSF) grant: “Subunit specific functional properties of NMDA receptors,” (1999-2002).

Invited Lectures

1. TRPV1: A target for next generation analgesics, University of Illinois School of Medicine. Peoria, Illinois May 5, 2018
2. Role of TRPA1 in Insulin and GLP-1 Release. Diabetes and Endocrinology Disorders Dubai UAE. May 16, 2017.
3. TRPV1: a Target for Next Generation Analgesics, Pain Medicine Meeting, Chicago, June 8, 2015.
4. Transient Receptor Potential channels as targets for botanicals. International conference on recent advances in research and treatment of human diseases. January 9, 2015,
5. Activation of TRP channels by phytochemicals: Therapeutic Implications, Oxford, Mississippi, 2, September, 2014.

6. TRPV1: a Target for Next Generation Analgesics, School of Pharmacy Edwardsville, March 23, 2014,
7. Transient Receptor Potential channels as targets for botanicals, Indian Pharmacological Society Meeting, Invited Speaker December 15, 2013.
8. TRPs as probes and medications for CNS disorders: Focus on Trptome, Trptomics, Addiction and Pain. Symposium organized by National Institutes of Drug Abuse (July 29, 2013).
9. 12th Annual Oxford, International Conference on Science of Botanicals (April, 2013)
10. National Agricultural Biotechnology Institute, Chandigarh, India (February 7, 2013)
11. NAIPER, Chandigarh. India (February 8, 2013)
12. Carolina Cannabinoid Conference at Triangle Park, Raleigh/Durham (October 27, 2011).
13. Department of Neuroscience, Hebrew University, Jerusalem (January 2011)
14. 10th Annual meeting of the society of free radical research: International conference on recent trends in therapeutic advancement of free radical science. Channi, India (January 2011).
15. 9th Annual meeting of the society of free radical research: International conference on recent trends in therapeutic advancement of free radical science. Hyderabad, India (January 2011).
16. Department of Biochemistry and Molecular Biology, Texas Health Sciences Medical Center, Houston Texas (April, 2010).
17. Department of Anesthesiology, Washington University School of Medicine, Saint Louis (October, 2009).
18. Department of Pharmacology and Physiology, UMDNJ, Medical School New Jersey (September 2009)
19. GlenMark Pharmaceuticals Bombay (July 2008)
20. Neurodiab, Orvieto, Italy (September 2008)
21. University Illinois, Bloomington, Illinois (October 2008)
22. Eli Lilly Pharmaceuticals, Indianapolis, Indiana (November 2007).
23. 5th Anniversary of the Congress of International Drug Discovery Science and Technology (IDDST), Shanghai, China (May 2007).
24. Indian Institute of Science, Bangalore (May 2006)
25. GlenMark Pharmaceuticals Bombay (July 2006)
26. School of Veterinary Medicine, University of Illinois, Urbana-Champaign (April 2006)
27. 4th World Congress of Cellular and Molecular Biology, Poitiers, France (October 2005).
28. Department of Neuroscience, INSREM, Montpellier, France (October 2005)
29. Indian Pharmacological Society Meeting, Kolkata, India, (Jan 2005)
30. Department of Oral Biology, Health Sciences University, San Antonio, TX (March 2005).
31. Department of Pharmacology, St. Louis University, Saint Louis, MO (December 2005).
32. Department of Pharmacology, Finch Health Sciences University, Chicago. IL (August 2005)
33. Conference on Mechanism of Pain Perception, Prague (July, 2003).
34. University of Erlangen, Germany (July, 2003)
35. Indian Defense Research Institute, Gwalier, India (January 2002)
36. Department of Pharmacology, IOWA State University, IOWA City (May 2002).
37. Amgen Corporation, Thousand Oaks, CA (June 2002).
38. Department of Physiology and Biophysics, Case Western Reserve University, Cleveland, OH (July 2002).

39. Department of Pharmacology, Tennessee Health Sciences University Memphis, TN (June 2002).
40. Department of Anesthesiology, University of Chicago, Chicago, IL (June 2002).
41. Department of Pharmacology, University of Wisconsin Madison (September 2001).
42. Indian Pharmacological Society Meeting, Nagpur India (December 2001)
43. Department of Pharmacology, PSG Medical College, Coimbatore (December 2001)

Journal Editorial Board

1. Molecular Pain
2. The Journal of Pain Research
3. Open Pain Journal
4. PLoS One

Journal Referee

1. Biophysical Journal
2. Trends in Pharmacological Sciences
3. Proceedings of the National Academy of Sciences
4. Journal of Physiology
5. Journal of Neuroscience
6. Pain
7. Brain Research
8. Molecular Pain
9. Nature Neuroscience
10. Anesthesiology
11. The Journal of Pain
12. Neuroscience Letters
13. Neuroscience
14. Nature Drug Discovery
15. PLoS One

NIH Study Sections Served

1. NIH study section (ZRG1-NDBG) (March 2005)
2. NIH study section (NIDA-K) (March 2003; November 2003; November 2005)
3. NIH study section (NTRC) (February 2006; October 2006)
4. NIH study section (ZRG1-MDCNK) (2006)
5. NIH study section (NTRC) (Feb 2007 - permanent member until 2010)
6. NIH study section (NTRC) (June 2007 - permanent member until 2010)
7. NIH study section (ZDK1 GRB-G M1) (March 2008)
8. NIH study section (NTRC) (February 2008 - permanent member until 2010)
9. NIH study section (NTRC) (June 2008 - permanent member until 2010)
10. NIH study section (NTRC) (October 2008 - permanent member until 2010)
11. NIH study section (ZRG-1 MDCN-C 02) (February 2009)
12. NIH study section (TID-RAID Program) (July 2009)
13. NIH study section (NTRC) (February 2009 - permanent member until 2010)
14. NIH study section (NTRC) (June 2009 - permanent member until 2010)
15. NIH study section (ZDK1 GRB-J (O1) S) (June 2011)
16. NIH Study Section (NTRC) March 2012
17. NIH Study Section (ZRG1 MDCN-N (59) R) (August 13, 2012)
18. NIH Study Section (NTRC) (October 23, 2012)
19. NIH Study Section ZRG1 IFCN-B (02) M (June 27-28, 2013)

20. NIH Study Section (CNNT) June 6-7, 2013)
21. NIH Study Section ZDC1 SRB-K14 January 15-16, 2014
22. NIH Study Section ZRG1-IFCN-B-02M February 25-26, 2014
23. NIH Study Section NTRC February 12-13, 2015
24. NIH Study Section ZRG1 MDCN-G (05) April 2, 2015
25. NIH Study Section ZGM1 RCB-6 (S2) 301852 October 8-9 2015
26. NIH Study Section ZGM1 RCB-6 (C2) 301852 March 14 2017
27. NIH Study Section ZRG1 F02B-D June 29-30 2017

Membership of Professional Societies

1. Member of the Society for Neuroscience
2. Member of the Australian Physiological and Pharmacological Society
3. Member of Neurodiab, European Diabetes Association
4. Member of Indian Pharmacological Society

References