

CURRICULUM VITAE

YUAN-XIANG TAO

DEMOGRAPHIC AND PERSONAL INFORMATION

Current Appointment: Associate Professor, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University

Address: Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine, 720 Rutland Ave., Ross 370, Baltimore, MD 21205, USA

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EDUCATION AND TRAINING (in chronological order):

<u>Dates</u>	<u>Degree</u>	<u>Institution</u>	<u>Discipline</u>
1981 – 1986	MD	Department of Clinical Medical Science, Nanjing Medical University, Nanjing, China	Medicine
1988 – 1992	MSc	Department of Anatomy and Neurobiology, Nanjing Medical University, Nanjing China	Neurobiology and pain
1994 – 1997	PhD	Laboratory of Neuropharmacology, Shanghai Brain Research Institute, Chinese Academy of Sciences, Shanghai, China	Neuroscience and pain
1997 – 1998	Postdoctoral Fellow	Department of Anesthesiology, Health Sciences Center, University of Virginia, Charlottesville, USA	Neuroscience and pain

PROFESSIONAL EXPERIENCE (in chronological order):

<u>Dates</u>	<u>Position</u>	<u>Institution</u>
1986 – 1991	Instructor	Department of Anatomy, Nanjing Medical University, Nanjing, China
1992 – 1994	Assistant Professor	Department of Anatomy and Neurobiology Nanjing Medical University, Nanjing, China

1998 – 1999	Research Associate	Department of Anesthesiology, Health Sciences Center, University of Virginia, Charlottesville, USA
1999 – 2000	Instructor	Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine, Baltimore, MD, USA
2001 – 2004	Assistant Professor	Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine, Baltimore, MD, USA
2003 – 2006	Visiting Professor	The State Key Laboratory of Pharmaceutical Biotechnology and Institute of Molecular and Cell Biology, Nanjing University, Nanjing 210000, China
2005 – present	Associate Professor	Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine, Baltimore, MD, USA
2006 – 2010	Visiting Professor	Department of Pharmacology, National Defense Medical Center, Taipei, Taiwan
2009 – present	Guest Professor	Departments of Anatomy and Neurobiology, Nanjing Medical University, Nanjing, China

RESEARCH ACTIVITIES

Publications:

1. Xiuli Zhao, Zongxiang Tang, Wei Wang, Xiaowei Guan, Fidelis E. Atianjoh, Lingli Liang, Sheng-Chin Kao, Paul N. Hoffman, Hengmi Cui, Xinzhong Dong, Min Li, Yuan-Xiang Tao. Identification of a long noncoding RNA and its contribution to neuropathic pain by specifically silencing Kv1.2 in the primary afferent neurons. *Cell* (Under the review)
2. Xiaowei Guan, Wei Wang, Bo Tao, Xiuli Zhao, Jinsung Bae, Fidelis Atianjoh, Lingli Liang, Estelle B. Gauda, Myron Yaster, Yuan-Xiang Tao. Subpopulation distribution and peripheral nerve injury-induced regulation of voltage-gated potassium channel subunit Kv1.2 in primary afferent neurons. *Journal of Comparative Neurology* 2011 (Revised)
3. Wei Wang, Fidelis E. Atianjoh, Estelle B. Gauda, Myron Yaster, Yun-Qing Li, Yuan-Xiang Tao. Increased expression of sodium channel subunit Nav1.1 in the injured dorsal root ganglion after peripheral nerve injury. *Anatomical Record* 294 (2011) 1406-1411.
4. Wei Wang, Jianguo Gu, Yun-Qing Li, Yuan-Xiang Tao. Are voltage-gated sodium channels on the dorsal root ganglion involved in the development of neuropathic pain? *Mol Pain* 7 (2011) 16.

5. Wei Wang, Ronald S. Petralia, Kogo Takamiya, Jun Xia, Yun-Qing Li, Richard L. Huganir, Myron Yaster, Yuan-Xiang Tao. Preserved acute pain and impaired neuropathic pain in mice lacking protein interacting with C kinase 1. *Mol Pain* 7 (2011) 11.
6. Chun-Yi Lee, Federico M. Perez, Wei Wang, Xiaowei Guan, Xiuli Zhao, Yun Guan, Sarah M. Sweitzer, Srinivasa N. Raja, Yuan-Xiang Tao. Dynamic temporal and spatial regulation of mu opioid receptor expression in primary afferent neurons following painful spinal nerve injury. *Eur J Pain* 15 (2011) 669-675.
7. Olga Kopach, Sheng-Chin Kao, Ronald S. Petralia, Pavel Belan, Nana Voitenko, and Yuan-Xiang Tao. Inflammation alters trafficking of extrasynaptic AMPA receptors in tonically firing lamina II neurons of the rat dorsal horn. *Pain* 152 (2011) 912-923.
8. Myron Yaster, Xiaowei Guan, Ronald S. Petralia, Jeffery D. Rothstein, Wei Lu, Yuan-Xiang Tao. Effect of inhibition of spinal cord glutamate transporters on inflammatory pain induced by formalin and complete Freund's adjuvant. *Anesthesiology* 114 (2011) 412-423.
9. Wen-Kuei Chang, Yuan-Xiang Tao, Juo-Lan Shen, Kowk-Hon Chan, Ya-Chun Chu. Lack of beneficial effect for preemptive analgesia in postoperative pain control: verifying the efficacy of preemptive analgesia with N-methyl-D-aspartate receptor antagonists in a modified animal model of postoperative pain. *Anesth Analg* 112 (2011) 710-718.
10. Fidelis E. Atianjoh, Myron Yaster, Xiuli Zhao, Kogo Takamiya, Jun Xia, Richard L. Huganir, Yuan-Xiang Tao. Spinal cord protein interacting with C kinase 1 is required for the maintenance of complete Freund's adjuvant-induced inflammatory pain but not for incision-induced post-operative pain. *Pain* 151 (2010) 226-234.
11. Ji-Tain Xu, Xiuli Zhao, Myron Yaster, and Yuan-Xiang Tao. Expression and distribution of mTOR, p70S6K, 4E-BP1, and their phosphorylated counterparts in the dorsal root ganglion and spinal cord dorsal horn. *Brain Res* 1336 (2010) 46-57.
12. Yuan-Xiang Tao. Dorsal horn α -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptor trafficking in inflammatory pain. *Anesthesiology* 112 (2010) 1259-65.
13. Meijuan Zhang, Ji-Tain Xu, Zhongyuan Wang, Xiuli Zhao, Zichun Hua, Yuan-Xiang Tao, Yun Xu. PSD-93 deficiency protects cultured cortical neurons from NMDA receptor-triggered neurotoxicity. *Neuroscience* 166 (2010) 1083-1090.
14. Xiaowei Guan, Xuguang Zhu, and Yuan-Xiang Tao. Peripheral nerve injury up-regulates expression of interactor protein for cytohesin exchange factor 1 (IPCEF1) mRNA in rat dorsal root ganglion. *Naunyn-Schmiedeberg Archives of Pharmacology* 380 (2009) 459-463.
15. Jang-Su Park, Nana Voitenko, Ronald S. Petralia, Xiaowei Guan, Ji-Tian Xu, Jordan P. Steinberg, Kogo Takamiya, Andrij Sotnik, Olga Kopach, Richard L. Huganir, Yuan-Xiang Tao. Persistent inflammation induces GluR2 internalization via NMDA receptor-triggered PKC activation in dorsal horn neurons. *J Neurosci* 29 (2009) 3206-19.

16. Om V. Singh, Myron Yaster, Yun Guan, Arun M Dharmarajan, Srinivasa N. Raja, Pamela L. Zeitlin, Yuan-Xiang Tao. Proteome of synaptosome-associated proteins in spinal cord dorsal horn after peripheral nerve injury. *Proteomics* 9 (2009) 1241-53.
17. Peizhong Mao, Yuan-Xiang Tao, Masahiro Fukaya, Feng Tao, Dechun Li, Claire F Levine, Masahiko Watanabe, Roger A Johns. Cloning and characterization of E-dlg, a novel splice variant of mouse homologue of the drosophila discs large tumor suppressor binds preferentially to SAP102. *IUBMB Life* 60 (2008) 684-92.
18. Jang-Su Park, Myron Yaster, Xuehong Shang, Ming-Hung Shih, Yun Guan, Srinivasa N. Raja, Yuan-Xiang Tao. Role of spinal cord alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptors in Complete Freund's Adjuvant-induced inflammatory pain. *Mol Pain* 4 (2008) 67.
19. Wen-Jinn Liaw, Xu-Guang Zhu, Myron Yaster, Roger A. Johns, Estelle B. Gauda, Yuan-Xiang Tao. Distinct expression of synaptic NR2A and NR2B in the central nervous system and impaired morphine tolerance and physical dependence in mice deficient in postsynaptic density-93 protein. *Mol Pain* 4 (2008) 45.
20. Yun Guan, Lisa M Johaneck, Timothy V Hartke, Shim Beom, Yuan-Xiang Tao, Matthias Ringkamp, Meyer A Richard, Srinivasa N Raja. Peripherally acting mu-opioid receptor agonist attenuates neuropathic pain in rats after L5 spinal nerve injury. *Pain* 138 (2008) 318-329.
21. Yuko Sato, Yuan-Xiang Tao, Quingning Su, Roger A Johns. PSD-93 is required for Fyn-mediated tyrosine-phosphorylation of the NMDA receptors. *Neuroscience* 153 (2008) 700-708
22. Meng Chen, Yuan-Xiang Tao, and Jianguo G. Gu. Inward currents induced by hypoxia in rat spinal cord dorsal horn neurons, *Mol Pain* 3 (2007) 10
23. Ya-Chun Chu, Kon-Hon Chen, Su-Man Lin, Ying-Chou Hsieh, Yuan-Xiang Tao. Enhanced mechanical hyperalgesia and the effects of NMDA receptor antagonists after incisional surgeries in rats subjected to neonatal peripheral carrageenan inflammation. *Anesthesiology* 106 (2007) 1204-1212.
24. Yun Guan, Myron Yaster, Srinivasa N. Raja, Yuan-Xiang Tao. Pharmacological inhibition and genetic knockout of neuronal nitric oxide synthase attenuate nerve injury-induced mechanical hypersensitivity in mice. *Mol Pain* 3 (2007) 29.
25. Hao-Ai Shui, Shung-Tai Ho, Jhi-Joung Wang, Chin-Chen Wu, Chih-Huan Lin, Yuan-Xiang Tao, and Wen-Jinn Liaw. Proteomic analysis of spinal protein expression in rats exposed to repeated intrathecal morphine injection. *Proteomics* 7 (2007) 796-803.
26. Chengshui Zhao, Lun Chen, Yuan-Xiang Tao, Jill M. Tall, Matthias Ringkamp, Richard A. Meyer, and Srinivasa N. Raja. Lumbar sympathectomy fails to attenuate the

- mechanical allodynia and hyperalgesia in rats with spared nerve injury. *J Pain* 8 (2007) 931-937.
27. Yuan-Xiang Tao, Are the PDZ domains at excitatory synapses potential targets for prevention and treatment for chronic pain? *Mol Pain* 2 (2006) 38.
 28. Yuan-Xiang Tao and Roger A Johns. PDZ domains at excitatory synapses: potential molecular targets for persistent pain treatment. *Curr Neuropharmacol* 4 (2006) 217-223.
 29. Yuan-Xiang Tao. Functional role of spinal glutamate transporter in normal sensory transmission and pathological pain conditions. *Chinese J Pain* 16 (2006) 8-9
 30. Yuan-Xiang Tao, Jianguo Gu, and Robert L. Stephens Jr. Role of spinal cord glutamate transporter during normal sensory transmission and pathological pain states. *Mol Pain* 1 (2005) 30
 31. Yachun Chu, Yun Guan, John Skinner, Srinivasa N. Raja, Roger A. Johns, and Yuan-Xiang Tao. Effect of genetic knockout or pharmacologic inhibition of neuronal nitric oxide synthase on complete Freund's adjuvant-induced persistent pain. *Pain* 119 (2005) 113-123.
 32. Wen-Jinn Liaw, Robert L. Stephens Jr., Brian C. Binns, Yachun Chu, Jehuda Sepkuty, Roger A. Johns, Jeffery D. Rothstein and Yuan-Xiang Tao. Spinal glutamate uptake is critical for maintaining normal excitatory synaptic transmission in rat spinal cord. *Pain* 115 (2005) 60-70.
 33. Yun Xu, Bosheng Zhang, Zichun Hua, Roger A. Johns, David S. Bredt, and Yuan-Xiang Tao, Targeted disruption of PSD-93 gene reduces platelet-activating factor-induced neurotoxicity in cultured cortical neurons. *Exp Neurol* 189 (2004) 16-24.
 34. Yuan-Xiang Tao and Srinivasa N. Raja, Are synaptic MAGUK proteins involved in chronic pain? *Trends Pharmacol Sci* 25 (2004) 397-400.
 35. Yuan-Xiang Tao and Roger A. Johns. Neuronal PDZ domain: a promising new target for inhaled anesthetics? *Mol Interv* 4 (2004) 215-221.
 36. Yuan-Xiang Tao, Molecular mechanism of NMDA receptor action in of chronic pain. In: *Progress in Neuroscience*, XM Wang et al., (Eds.) Higher Education Press, Beijing, 2004; pp 377-383.
 37. Feng Tao, Yuan-Xiang Tao, Chengshui Zhao, Sylvain Dore, Wen-Jinn Liaw, Bosheng Zhang, Srinivasa N. Raja, and Roger A. Johns. Neuronal nitric oxide synthase is essential for the late phase but can be compensated for by endothelial nitric oxide synthase during carrageenan-induced inflammatory hyperalgesia. *Neuroscience* 128 (2004) 421-430.
 38. Yun Xu, and Yuan-Xiang Tao. Involvement of NMDA receptors/nitric oxide signaling pathway in platelet-activating factor-induced neurotoxicity in mouse neuronal cultures. *NeuroReport* 15 (2004) 263-266.

39. Feng Tao, Wen-Jinn Liaw, Bosheng Zhang, Myron Yaster, Jeffery D. Rothstein, Roger A Johns, and Yuan-Xiang Tao. Evidence of neuronal excitatory amino acid carrier 1 expression in rat dorsal root ganglion neurons and their central terminals. *Neuroscience* 123 (2004) 1045-1051.
40. Wen-Jinn Liaw, Bosheng Zhang, Feng Tao, Myron Yaster, Roger A. Johns and Yuan-Xiang Tao. Knockdown of spinal cord postsynaptic density protein-95 prevents the development of morphine tolerance in rats. *Neuroscience* 123 (2004) 11-15.
41. Yuan-Xiang Tao, Role of synaptic MAGUK proteins in analgesia and anesthesia. *Journal of Nanjing Medical University*, 18 (2004) 225-226.
42. Yuan-Xiang Tao, Gavin Rumbaugh, Guo-Du Wang, Chengshui Zhao, Frederick Kauer, Feng Tao, Min Zhuo, Srinivasa N. Raja, Richard L. Huganir, David S. Brecht, Roger A. Johns, Impaired NMDA receptor-mediated postsynaptic function and blunted NMDA receptor-dependent persistent pain in mice lacking PSD-93, *J Neurosci* 23 (2003) 6703-6712.
43. Cheng-Shui Zhao, Yuan-Xiang Tao, Jill M Tall, Richard A. Meyer, Srinivasa Raja, Role of μ -opioid receptor in the formalin-induced pain behavior in mice, *Exp Neurol* 184 (2003) 839-845.
44. Ming Fang, Yuan-Xiang Tao, Fahu He, Mingjie Zhang, Claire F. Levine, Peizhong Mao, Chil-Ling Chou, Scheherazade Sadegh-Nasser, Roger A. Johns, Synaptic PDZ protein interactions are disrupted by inhalational anesthetics, *J Biol Chem* 278 (2003) 36669-36675.
45. Bosheng Zhang, Feng Tao, Wen-Jinn Liaw, David S. Brecht, Roger A Johns, Yuan-Xiang Tao. Effect of knock down of spinal cord PSD-93/chapsin-110 on chronic inflammatory pain induced by the complete Freund's adjuvant and peripheral nerve injury. *Pain* 106 (2003) 187-196.
46. Feng Tao, Yuan-Xiang Tao, Peizhong Mao, Chengshui Zhao, Claire F. Levine, Dechun Li, Srinivasa N. Raja, Roger A. Johns, Intact carrageenan-induced thermal hyperalgesia in mice lacking inducible nitric oxide synthase. *Neuroscience* 120 (2003) 847-854.
47. Feng Tao, Yuan-Xiang Tao, Peizhong Mao, Roger A. Johns, Role of postsynaptic density protein-95 in the maintenance of peripheral nerve injury-induced neuropathic pain in rats. *Neuroscience* 117(2003) 731-739.
48. Yuan-Xiang Tao and Roger A. Johns, Activation and up-regulation of spinal cord nitric oxide receptor, soluble guanylate cyclase, after formalin injection into the rat hind paw, *Neuroscience* 112 (2002) 439-436.
49. Feng Tao, Yuan-Xiang Tao, Julio A. Gonzalez, Ming Fang, Peizhong Mao and Roger A. Johns, Knockdown of PSD-95/SAP90 delays the development of neuropathic pain in rats, *NeuroReport* 12 (2001) 3251-3255.

50. Julio A. Gonzalez, Yuan-Xiang Tao, Feng Tao, Ming Fang, Roger A. Johns, PSD-95/SAP90 protein deficiency reduced formalin-induced behaviors during tonic phase, *Anesthesiology* 95 (2001 Suppl.) A 869.
51. Yuan-Xiang Tao, and Roger A. Johns, Effect of the deficiency of spinal PSD-95/SAP90 on the minimum alveolar anesthetic concentration of isoflurane in rats, *Anesthesiology* 94 (2001) 1010-1015.
52. Yuan-Xiang Tao, Yang-Zhong Huang, Lin Mei and Roger A. Johns, Expression of PSD-95/SAP90 is critical for NMDA receptor-mediated thermal hyperalgesia in the spinal cord, *Neuroscience* 98 (2000) 201-206.
53. Yuan-Xiang Tao, Yun-Qing Li, Zhi-Qi Zhao and Roger A Johns, Synaptic relationship of the neurons containing a metabotropic glutamate receptor, mGluR5, with nociceptive primary afferent and GABAergic terminals in rat spinal superficial laminae, *Brain Res.* 875 (2000) 138-143.
54. Yuan-Xiang Tao, Yun-Qing Li and Zhi-Qi Zhao, Synaptic interaction between GABAergic terminals and substance P receptor-positive neurons in rat spinal superficial laminae, *Acta Pharmacologica Sinica.* 21 (2000) 911-914.
55. Yuan-Xiang Tao, Aalya Hassan, Elie Haddad and Roger A. Johns, Expression and action of cGMP-dependent protein kinase α in formalin-induced inflammatory hyperalgesia in rat spinal cord, *Neuroscience* 95 (2000) 525-533.
56. Yuan-Xiang Tao and Roger A Johns, Activation of cGMP-dependent protein kinase α is required for N-methyl-D-aspartate- or nitric oxide-produced spinal thermal hyperalgesia. *Eur J Pharmacol* 392 (2000) 141-145.
57. Yuan-Xiang Tao, Aalya Hassan and Roger A. Johns, Intrathecal administered cGMP-dependent protein kinase α inhibitor dose-dependently reduced the threshold isoflurane anesthesia: Implication for a novel role of cGMP-dependent protein kinase α . *Anesthesiology*, 92 (2000) 493-499.
58. Yuan-Xiang Tao, Xin-Huan Zhan and Roger A Johns, Halothane and isoflurane dose-dependently inhibited formalin-induced c-fos expression in the spinal cord. *Anesthesiology*, 89 (1999) 939.
59. Yuan-Xiang Tao, Feng Wei and Zhi-Qi Zhao, A contribution of neurokinin-1 receptor to formalin-induced c-fos expression in the rat spinal cord. *Neurosci Lett* 221 (1997) 105-108.
60. Yuan-Xiang Tao and Zhi-Qi Zhao, Ultrastructure of Fos-labeled neurons relating to nociceptive primary afferent and substance P terminals in rat spinal superficial laminae, *Neuropeptides*, 31 (1997) 327-332.

61. Yuan-Xiang Tao and Zhi-Qi Zhao, Ultrastructural localization of substance P receptor and its synaptic relationship with the primary afferents in the superficial dorsal horn of the rat spinal cord, *Acta Anatomica Sinica*, 29 (1998) 228-231.
62. Yuan-Xiang Tao and Zhi-Qi Zhao, NMDA receptors mediating Fos expression in rat spinal induced by subcutaneous injection of formalin, *Acta Pharmacologica Sinica*, 19 (1998) 506-509.
63. Yuan-Xiang Tao and Zhi-Qi Zhao, Neurokinin-1 receptor mediated formalin-induced *c-fos* expression in the rat spinal cord, *Acta Physiologica Sinica* 50 (1998) 361-266.
64. Yuan-Xiang Tao and Zhi-Qi Zhao, Colocalization of *c-fos* protein and substance P receptor in the neurons of the dorsal horn, *Acta Anatomica Sinica*, 28 (1997) 346- 349.
65. Yuan-Xiang Tao and Zhi-Qi Zhao, SP and CGRP in electrophysiological identified C- and A δ -fiber neurons of the dorsal root ganglia of cats, *Chin J Neuroanatomy*, 13 (1997) 15-18.
66. Yuan-Xiang Tao and Zhi-Qi Zhao, The distribution of FOS-positive neurons induced by noxious stimulation and the relations between FOS- and NADPH-d positive neurons in the rat spinal cord: a double-labeling study, *Chin J Neuroanatomy* 13 (1997) 225-229.
67. Yuan-Xiang Tao and Zhi-Qi Zhao, *In situ* hybridization of somatostatin mRNA in the rat spinal cord, *Acta Zoologica Sinica*, 42 (1996) 244-246.
68. Yuan-Xiang Tao and Xiao-Zhang Dai, Electron microscopic immunocytochemical localization of neurotensin in the area postrema of rat, *Chin J Anatomy*, 19 (1996) 40-43.
69. Yuan-Xiang Tao and Xiao-Zhang Dai, Aging changes of somatostatin mRNA-positive neurons in the dorsal hippocampus of the rat, *Acta Anatomica Sinica*, 26 (1995) 261-264.
70. Yuan-Xiang Tao and Xiao-Zhang Dai, Somatostatin mRNA expression in the arcuate nucleus of Aging rats, *Journal of Nanjing Medical University*, 15 (1995) 762-764.
71. Yuan-Xiang Tao and Xiao-Zhang Dai, Somatostatin mRNA expression in the periventricular nucleus of the rat hypothalamus *Journal of Nanjing Medical University*, 15 (1995) 20-23.
72. Yuan-Xiang Tao and Xiao-Zhang Dai, Light and electron microscopic observation of NT-LI components in the caudal part of the fourth ventricular floor, *Chin Sci Bull*, 38 (1993) 943-945.
73. Yuan-Xiang Tao and Xiao-Zhang Dai, A light and electron microscopic observation of the postnatal ontogeny and aging changes of NT-LI components in nucleus of solitary tract of the rat, *Chinese Journal of Neuroanatomy*, 9 (1993) 55-61.

74. Yuan-Xiang Tao and Xiao-Zhang Dai, Ultrastructural observation of NT-containing neurons in the nucleus of solitary tract of the rat, *Journal of Nanjing Medical University*, 13 (1993) 236-239.
75. Yuan-Xiang Tao and Xiao-Zhang Dai, The distribution and relationship of neurotensin-like immunoreactivity in the nucleus of solitary tract and area postrema, *Journal of Nanjing Medical University*, 13 (1993) 122-124.
76. Yuan-Xiang Tao and Xiao-Zhang Dai, Light and electron microscopic study of neurotensin-like immunoreactivity in the dorsal horn of the rat spinal cord, *Journal of Nanjing Medical University*, 12 (1992) 249 -252.

Book Chapter

1. Om V. Singh and Yuan-Xiang Tao, Two-dimensional gel electrophoresis: Discovering neuropathic pain-associated synaptic biomarkers in spinal cord dorsal horn, Z David Luo (ed.) *Pain Research: Methods: Methods and Protocols*, Methods in Molecular Biology, vol. 851. Springer Science + Business Media, LLC 2012.
2. “Neuroscience in the 21st Century” Editor-in-Chief, Donald Pfaff. Springer

Patents:

1. Date: 11/05/2002
Title: “Isoform specific inhibition for treatment of pain and reduction of anesthetic threshold”. Yuan-Xiang Tao, USA Patent No. 7030100
2. Date: 02/24/2009
Title: “Inhibition of interaction of PSD93 and PSD95 with nNOS and NMDA receptor”. Yuan-Xiang Tao, U.S. Patent No. 20090191570.
3. Date: 07/01/2010
“Spinal mammalian target of rapamycin (mTOR) inhibition for treatment of chronic opioid tolerance”. Yuan-Xiang Tao, U.S. Provisional Patent Application JHU Ref. No. P10883

Extramural Funding:

Ongoing Projects

1. NIH: RO1 NS 072206 “Epigenetic mechanisms of neuropathic pain: role of native Kv1.2 antisense RNA” 07/01/2011-06/30/2015. \$907,500 Direct Cost (\$1,488,300 Total)
Role: Principle Investigator
2. NIH: RO1 NS058886 “PKC-dependent spinal GluR2 internalization triggered by NMDARs in chronic inflammatory pain” 09/30/2007–05/30/2012. \$ 915,688 Direct Cost (\$1,433,688 Total)

Role: Principle Investigator

3. David H. Koch Prostate Cancer Research Funds, “Role of spinal mTOR in prostate cancer cell-induced pain” 4/11/2010–3/30/2012. \$ 150,000 Direct Cost
Role: Principle Investigator
4. Rita Allen Foundation Award in Pain from The Rita Allen Foundation and the American Pain Society, “Discovery of a large native non-coding RNA and its involvement in neuropathic pain”. 08/01/2011–07/30/2014. \$150,000 Direct Cost
Role: Principle Investigator
5. NIH: RO1 NS26363 “Injury-induced pain: Chemical modulation of nociceptors” 3/3/06–2/28/12. Principle Investigator: Srinivasa N. Raja
Role: Co-Investigator
6. NIH: R25DA021630 “Immersion in drug abuse” 07/01/2007–06/30/2012. Principle Investigator: Estelle B. Gauda
Role: Co-Investigator
7. The Blaustein Pain Research Fund from the Blaustein Pain Treatment Center, JHU, “Phosphatidylinositol 3-kinase/protein kinase B are key mediators in the development of chronic morphine tolerance” 01/01/2011–12/31/2011. Principle Investigator: Myron Yaster.
Role: Co-Investigator

Completed Projects

1. NIH: R21 NS057343 “PKC-dependent GluR2 internalization in the spinal cord by post-operative pain” 02/01/2008–1/30/2010. \$188,125 Direct Cost (\$308,525 Total)
Role: Principle Investigator
2. The Blaustein Pain Research Fund from the Blaustein Pain Treatment Center, JHU, “Role of spinal mTOR in the development of chronic morphine tolerance” 1/01/2010–12/31/2010. \$ 41,200 Direct Cost
Role: Principle Investigator
3. NIH: RO1 NS44219. “Role of spinal cord PSD-93/Chapsyn-110 in chronic pain” 03/01/2003–02/30/2008. Principle Investigator: Roger Johns.
Role: Co-Investigator
4. NIH: RO1 GM 49111. “NO signaling in mechanisms of analgesia and anesthesia” 06/2001/00–05/30/2004. Principle Investigator: Roger Johns.
Role: Co-Investigator
5. The award for interim support from the Johns Brain Science Institute, “Role of spinal mTOR in chronic morphine tolerance” 07/01/2010–06/30/2011. \$45,000 Direct Cost.
Role: Principle Investigator

6. The Blaustein Pain Research Fund from the Blaustein Pain Treatment Center, JHU, “Involvement of dorsal root ganglion native Kv1.2 antisense RNA in neuropathic pain” 01/01/2009–12/31/2009. \$45,000 Direct Cost
Role: Principle Investigator
7. The Blaustein Pain Research Fund from the Blaustein Pain Treatment Center, JHU, “Proteomic study of primate dorsal root ganglion and spinal dorsal horn following peripheral nerve injury” 01/01/2008–12/31/2008. \$ 49,169 Direct Cost
Role: Principle Investigator
8. The Blaustein Pain Research Fund from the Blaustein Pain Treatment Center, JHU, “Proteomic analysis of protein expression in spinal cord and brain following chronic morphine exposure” 01/01/2007–12/31/2007. \$34,272 Direct Cost
Role: Principle Investigator
9. The Blaustein Pain Research Fund from the Blaustein Pain Treatment Center, JHU, “PKC-dependent internalization of GluR2 by persistent pain” 01/01/06–12/30/06. \$ 43,000 Direct Cost
Role: Principle Investigator
10. The Blaustein Pain Research Fund from the Blaustein Pain Treatment Center, JHU, “PICK1 expression and its modulation of acid-sensing ion channels in the dorsal horn ganglion” 1/01/2005–12/31/2005. \$ 45,000 Direct Cost
Role: Principle Investigator
11. The Blaustein Pain Research Fund from the Blaustein Pain Treatment Center, JHU, “Role of PSD-93 in opioid tolerance and physical dependence” 01/01/2004–12/31/2004. \$ 43,049 Direct Cost
Role: Principle Investigator
12. The Blaustein Pain Research Fund from the Blaustein Pain Treatment Center, JHU, “Role of spinal cord glutamate transporter in chronic pain” 01/01/2003–12/31/2003. \$ 49,171 Direct Cost
Role: Principle Investigator
13. The Blaustein Pain Research Fund from the Blaustein Pain Treatment Center, JHU, “Role of different NOS isoforms in chronic inflammatory and neuropathic pain” 01/01/2002–12/31/2002. \$ 31,090 Direct Cost
Role: Principle Investigator
14. National Fellowship in Academic Medicine for Minority Students (Abere Karibi-Ikiriko). “The role of PSD-93 in chronic inflammatory pain”. 2002
Role: Mentor
15. The Blaustein Pain Research Fund from the Blaustein Pain Treatment Center, JHU, “Specific coupling of NMDA receptor activity to NO signaling pathway in spinal

nociceptive mechanism by PSD-95/SAP90” 01/01/2000–12/31/2000. \$ 34,896 Direct Cost

Role: Principle Investigator

16. NIH: RO1 GM 49111 “Anesthetics and nitric oxide signaling” 08/01/1997–04/30/2000. Principle Investigator: Roger Johns

Role: Co-Investigator

17. NSFC: “The ultrastructural changes of central nervous system in aging” 01/01/1992–12/30/1994. RMB 20,000 Direct Cost

Role: Principle Investigator

EDUCATIONAL ACTIVITIES

Teaching:

1986–1994: Taught neurobiology and gross anatomy to medical graduate students and nursing students in Nanjing Medical University, China.

Mentoring:

Aalya Hassan, Graduate Student, 1998, University of Virginia Health Sciences Center.

Julio Gonzalez, MD., Pain Fellow, 2000-2001, Johns Hopkins University School of Medicine.

Claire F Levine, MS, Lab Specialist, 1999-2001, Johns Hopkins University School of Medicine.

Feng Tao, MD, PhD, Postdoctoral Fellow, 1999-2001, Johns Hopkins University School of Medicine.

Bosheng Zhang, MD, Lab Technician, 2002-2003, Johns Hopkins University School of Medicine.

Abere Karibi-Ikiriko, Graduate Student, 2002, Howard University College of Medicine, Washington, DC.

Muraya Gathinji, Undergraduate student. 2001-2003, Johns Hopkins University

Wen-Jinn Liaw, Visiting Scientist, 2002-2003, Department of Anesthesiology, Tri-Service General Hospital, National Defense Medical Center, Taipei, Taiwan.

Myron Yaster, Professor, 2003, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine, Baltimore, MD

John Skinner, Lab Technician, 2003-2004, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine.

Zhipeng Hou, Lab Technician, 2003, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine.

Ya-chun Chu, MD, PhD, Visiting Scientist, 2004-2005, Department of Anesthesiology, Taipei Veterans General Hospital, Taipei, Taiwan.

Xuehong Shang, Lab Technician, 2005-2007, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine

Jang Su Park, MD, PhD, Visiting Scientist, 2005-2007, Division of Pain Medicine, Department of Anesthesiology and Pain Medicine, Inje University Ilsan Paik Hospital, Goyan-Si, Gyeonggi-do, Korea.

Robert W. Hurley, MD, PhD, Clinical Fellow, 2006, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine

Xiaolin Li, MD, Postdoctoral Fellow, 2006, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine

Xuguang Zhu, Postdoctoral Fellow, 2007-2008, Department of Pediatrics, Johns Hopkins University School of Medicine

Weizhu Tang, Technician, 2007-2010, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine

Xiaowei Guan, PhD Student, 2008-2009, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine

Ji-Tian Xu, Postdoctoral Fellow, 2008-2010, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine

Xiuli Zhao, Postdoctoral fellow, 2008-2010, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine

Ming-Hung Shih, Visiting Scientist, 2008-2009, Department of Anesthesiology, Chang-Gung Memorial Hospital, Kueishan, Taoyuan, Taiwan

Fidelis E. Atianjoh, Postdoctoral fellow, 2009-present, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine

Chun-Yi Lee, Visiting Scientist, 2009-2010, Department of Anesthesiology, Buddhist Xindain Tzu Chi General Hospital, Tzu Chi University, Taipei, Taiwan

Sheng-Chin Kao, Visiting Scientist, 2009-2010, Department of Anesthesiology, Chang-Gung Memorial Hospital, Kueishan, Taoyuan, Taiwan

Wei Wang, PhD student, 2010-2011, Department of Anatomy, The Fourth Military Medical University, Xi'an, China.

Shawn Sumida, MD, Clinical Fellow, 2010, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine

JinSung Bae, MD, Visiting Scientist, 2010-2011, Department of Anesthesiology & Pain medicine, Cheju Halla General Hospital, Yeon-Dong, Jeju city, Jeju special self-governing province, Republic of Korea.

Ling-Li Liang, MD, PhD, Postdoctoral fellow, 2010-present, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine

Dao-Yun Zhang, PhD, Postdoctoral fellow, 2010-present, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University School of Medicine

Benjamin Zhu, High School Student, 2011 summer, Wes Windsor-Plainsboro High School South

ORGANIZATIONAL ACTIVITIES

Advisory Committees:

2009-present: Junior Faculty Advisory Committee, Brain Science Institute at Johns Hopkins

2009-present: The Scholarship Oversight Committees for the Neonatology Fellows at Johns Hopkins

2009-present: Core Faculty in Interdisciplinary Training Program in Biobehavioral Pain Research at Johns Hopkins

Editorial Advisory Boards:

2007-present: The Open Anesthesiology Journal

2008-present: The Open Pain Journal

2009-present: Journal of Medical Sciences

2009-present: Journal Biomedical Research

2011-2012: International Journal of Psychological Studies

Journal Peer Review Activities:

Acta Pharmacologica Sinica	1994-1997
Acta Physiologica Sinica	1994-1997
Anesthesia and Analgesia	2011-present
Anesthesiology	1998-present
Brain Research	1999-present
Brain Research Bulletin	2006-present
British Journal of Pharmacology	2008-present

European J of Neuroscience	2006-present
European J of Pain	2008-present
International Journal of Developmental Neuroscience	2008-present
Journal of Cellular and Molecular Medicine	2009-present
Journal of Dental Research	2003-present
Journal of Neurochemistry	2000-present
Journal of Neuroscience	2003-present
Journal of Pain	2009-present
Life Science	2001-present
Molecular Pain	2006-present
Neuroscience	2000-present
Neuroscience Letters	2006-present
Pain	2004-present
Proteomics	2009-present
Trends in Neuroscience	2003-present
Journal of Neurophysiology	2010-present

Grant Peer Review Activities:

National Science Foundation of China 2011

Professional Societies:

2003-present: American Society of Pain
 2002-present: International Society for the Study of Pain
 2000-present: Society for Neuroscience
 2000-present: The Johns Hopkins University Medical & Surgical Association
 1995-1997: Chinese Society of Neuroscience

RECOGNITION

Awards:

1996 Outstanding PhD Student from the Chinese Academy of Sciences.
 1996 Beckman Outstanding Young Scientist Award from BECKMAN Instruments.
 1999 Remarkable Contribution to Nature and Science from the Chinese Academy of Sciences.
 2011 Rita Allen Foundation Scholar from the Rita Allen Foundation and the American Pain Society

International and National Lectures:

1. "Rita Allen Foundation Scholars in Pain: Frontiers in Basic Pain Research" The American Pain Society's 31st Annual Scientific Meeting, May 16-19, 2012, Honolulu, HI., USA
Invited lecture.

2. "Synaptic AMPA Receptor Trafficking in Inflammatory Pain" Department of Anesthesiology, Miller School of Medicine, August 29-30, 2011, University of Miami, USA. **Invited lecture.**
3. "mTOR, a new hope for prevention and treatment of chronic opioid tolerance" 2010 Annual Meeting and Scientific Conference of the Taiwan Society of Anesthesiologists, Sept 18-19, 2010, Taipei, Taiwan, ROC. **Invited lecture.**
4. "Spinal RNA transduction inhibition, a new potential strategy of prevention and treatment of chronic opioid tolerance" Fuda University, May 25, 2010, Shanghai, China. **Invited lecture.**
5. "Dorsal horn AMPA receptor GluR2 trafficking in chronic inflammatory pain", The 2010 International Symposium on Synaptic Transmission and Plasticity, May 15-16, 2010, Hangzhou, China. **Invited lecture.**
6. "Synaptic AMPA receptor trafficking in inflammatory pain", The American Pain Society's 29th Annual Scientific Meeting, May 6-8, 2010, Baltimore, MD, USA, **Invited lecture and moderator of symposium.**
7. "Advance of spinal mechanisms in chronic pain", Guangdong Province Pain Annual Meeting", June 27, 2009, Guangzhou, China, **Invited lecture.**
8. "Synaptic AMPA receptor trafficking in inflammatory pain", Fuda University, June 30, 2009, Shanghai, China, **Invited lecture.**
9. "Synaptic AMPA receptor trafficking in inflammatory pain", Nanton University, June 21, 2009, Jiangsu Province, China, **Invited lecture.**
10. "Synaptic AMPA receptor trafficking in inflammatory pain", Nanjing Medical University, June 18, 2009, Jiangsu Province, China, **Invited lecture.**
11. "Synaptic AMPA receptor trafficking in inflammatory pain", Capital Hospital, The Fourth Military Medical University, June 15, 2009, Xi'an, China, **Invited lecture.**
12. "Synaptic AMPA receptor trafficking in inflammatory pain", Department of Anatomy, The Fourth Military Medical University, June 13, 2009, Xi'an, China, **Invited lecture.**
13. "Synaptic AMPA receptor trafficking in inflammatory pain". Institute of Neuroscience, Chinese Academy of Sciences, June 4, 2009, Shanghai, China, **Invited lecture.**
14. "Synaptic AMPA receptor trafficking in dorsal horn in inflammatory pain" The Blaustein Pain Treatment Center, The Johns Hopkins University School of Medicine. March 13, 2009. **Invited lecture.**
15. "Dorsal horn AMPA receptor trafficking in persistent inflammatory pain," Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University, Baltimore, February 26, 2009. **Invited lecture.**
16. "AMPA receptor trafficking in spinal dorsal horn neurons contributes to the maintenance of persistent inflammation-induced pain hypersensitivity," The 28th Annual Scientific Meeting of the American Pain Society, May 7-9, 2009, San Diego, CA, USA. **Oral presentation**
17. "Altered NMDA receptor trafficking and blunted persistent pain and opioid tolerance and physical dependence in mice deficient PSD-93 protein," Drug Abuse Scientist in Training Weekly Workshop. Department of Pediatrics, Division of Neonatology, The Johns Hopkins University School of Medicine, Oct. 14, 2008, Baltimore, MD, USA. **Invited lecture**
18. "AMPA receptor trafficking in persistent pain," The 2008 Meeting of broadening the dimensions of Anesthesia in Taiwan, Sep. 26-27, 2008, Taichung, Taiwan. **Invited lecture**

19. "AMPA receptor trafficking in persistent pain," Department of Anesthesiology, Tri-Service General Hospital National Defense Medical Center, Sep. 24, 2008, Taipei, Taiwan. **Invited lecture**
20. "Altered NMDA receptor trafficking and blunted persistent pain and opioid tolerance and physical dependence in mice deficient in PSD-93 protein", Department of Neurology, University of Michigan, August 17-8, 2008, Ann Arbor, MI, USA. **Invited lecture.**
21. "Proteome of synaptosome-associated proteins in spinal cord dorsal horn after peripheral nerve injury", The 2008 ASA Annual Meeting, Oct 18-22, 2008, Orlando, FL, USA. **Oral presentation**
22. "Peripheral nerve injury insult alters proteomic profile of the spinal dorsal horn synaptosome-associated proteins", The 27th Annual Scientific Meeting of the American Pain Society, May 8-10, 2008, Tampa, FL, USA. **Oral presentation**
23. "Expressional and functional regulation of spinal cord NMDARs by their interacting proteins in chronic pain", Departments of Pharmacology and Anesthesiology, University of Tennessee Health Science Center, April 28-29, 2008, Memphis, TN, USA. **Invited lecture.**
24. "Expressional and functional regulation of spinal cord NMDARs by their interacting proteins in chronic pain", Department of Anesthesiology, University of Cincinnati School of Medicine, March 19-20, 2008, Cincinnati, OH, USA. **Invited lecture.**
25. "Expressional and functional regulation of spinal cord NMDARs by their interacting proteins in chronic pain", Institute of Neuroscience, Peking University School of Medicine, July 9, 2007, Beijing, China. **Invited lecture.**
26. "Expressional and functional regulation of spinal cord NMDARs and AMPARs by their interacting proteins in chronic pain", Department of Anesthesiology, Peri-operative and Pain Medicine, Brigham and Women's Hospital Harvard Medical School, March 15-16, 2007, Boston, MA, USA. **Invited lecture.**
27. "Contribution of spinal AMPA receptors to the development and maintenance of chronic inflammatory pain", The 36th Annual Meeting of the Society for Neuroscience, Oct. 14-18, 2006, Atlanta, GA, USA. **Oral presentation.**
28. "Spinal glutamate transporter is critical for maintaining normal sensory transmission", The 25th Annual Scientific Meeting of the American Pain Society, May 3-6, 2006, San Antonio, TX, USA. **Oral presentation.**
29. "Are the PDZ domains at excitatory synapses potential molecular targets for prevention and treatment of chronic pain?" Synapses, Memory, Drug addition, and Pain. August 21-23, 2006, Toronto, Canada. **Invited Speaker.**
30. "Functional role of spinal glutamate transporter in normal sensory transmission and pathological pain conditions", Department of Anesthesiology and Critical Care Medicine, Johns Hopkins University, Baltimore, MD, April 25, 2006. **Invited lecture.**
31. "Functional role of spinal glutamate transporter in normal sensory transmission and pathological pain conditions", Department of Pharmacology, National Defense Medical University, Taipei, Taiwan, March 15, 2006. **Invited Lecture.**
32. "Functional role of spinal glutamate transporter in normal sensory transmission and pathological pain conditions", Chinese Association for the Study of Pain 2006 Annual Meeting and Scientific Conference, March 18-19, 2006, Kaoshiung, Taiwan. **Invited lecture.**

33. "Effect of genetic knock-out or pharmacologic inhibition of neuronal nitric oxide synthase on complete Freund's adjuvant-induced persistent pain", 2005 Society for Neuroscience Meeting, Washington, DC. **Oral presentation.**
34. "Synaptic scaffolding proteins and pain signaling", Fuda University, July 22, 2005, Shanghai, China, **Invited lecture.**
35. "Synaptic scaffolding proteins and pain signaling", Nanjing University, June 24, 2005, Jiangsu Province, China, **Invited lecture.**
36. "Synaptic scaffolding proteins and pain signaling". Institute of Neuroscience, Chinese Academy of Sciences, June 22, 2005, Shanghai, China, **Invited lecture.**
37. "Synaptic scaffolding proteins and pain signaling". Department of Anesthesiology, UPMC, June 14-15, 2005, Pittsburgh, PA, USA. **Invited lecture.**
38. "Spinal glutamate transporters are critical for maintaining normal sensory transmission". The Association of University Anesthesiologists 52nd Annual Meeting, May 6-8, 2005, Baltimore, MD, USA. **Oral presentation.**
39. "Spinal cord postsynaptic density-93 protein contributes to the development of opioid tolerance and dependence". The 24th Annual Scientific Meeting of the American Pain Society, March 30-April 2, 2005, Boston, MA, USA. **Oral presentation.**
40. "Synaptic scaffold proteins and pain signaling". Pain Research Program, The University of Iowa, Nov. 16, 2004. Iowa City, Iowa, USA. **Invited lecture.**
41. "Expression and distribution of glutamate transporters in the spinal cord and dorsal root ganglion". Society for Neuroscience 34th Annual Meeting, Oct. 25, 2004. San Diego, CA, USA. **Oral presentation.**
42. "Role of synaptic MAGUK proteins in anesthesia and analgesia". The 48th Annual Meeting of Taiwan Society of Anesthesiologists, Sep. 25-26, 2004. Taoyuan, Taiwan. **Invited lecture.**
43. "Molecular mechanism of NMDA receptor action in chronic pain". The Third Symposium on Neuroscience for Young Scholars Worldwide, June 11-16, 2004. Gunagzhou, China. **Invited lecture.**
44. "Role of PSD-93 in morphine tolerance and physical dependence". Oct. 20, 2003. Johns Hopkins University and University of Maryland Workshop, Baltimore, **Invited lecture.**
45. "Evidence for the involvement of spinal cord glutamate transporters in the development of chronic inflammatory pain". Oct. 12-16, 2003. ASA 2003 Annual Meeting. San Francisco, CA, USA. **Oral presentation.**
46. "Effect of knock down of spinal cord PSD-93/chapsin-110 on chronic inflammatory pain induced by the complete Freund's adjuvant". Oct. 12-16, 2003. ASA 2003 Annual Meeting. San Francisco, CA, USA. **Oral presentation.**
47. "Effect of the targeted disruption of PSD-93 gene on morphine tolerance and dependence in mice". Oct. 12-16, 2003. ASA 2003 Annual Meeting. San Francisco, CA, USA. **Poster Discussion.**
48. "Synaptic NMDA receptor trafficking in chronic pain". March 14, 2003, The Blaustein Pain Treatment Center, JHU and Dental School, UMB. **Invited lecture.**
49. "Glutamate transporters and pain". Dec. 4, 2002, Johns Hopkins University and University of Maryland Workshop, Baltimore, MD, **Invited lecture.**
50. "NMDA receptor trafficking and pain". Nov. 31, 2002. Department of Anesthesiology, University of Philadelphia. Philadelphia, PA, USA. **Invited lecture.**

51. "Molecular mechanism of NMDA receptor action in chronic pain". Jan. 4, 2002. University of Maryland at Baltimore. The Blaustein Pain Treatment Center, JHU and Dental School, UMB. **Invited lecture.**
52. "PSD-93 knockout mice exhibit intact acute pain and blunted neuropathic pain". April 12-14, 2002. 49th Annual Meeting of AUA. Nashville, TN, USA. **Oral presentation.**
53. "Spinal cord PSD-95 and inflammatory pain". Sep. 20, 2001. The Blaustein Pain Treatment Center, JHU. **Invited lecture.**
54. "Inhalational anesthetics inhibit PDZ domain mediated protein-protein interaction with the NMDA receptor signaling pathway". Oct. 4-7, 2001. Molecular Mechanisms of Alcohol and Anesthetic Action. Philadelphia, PA, USA. **Invited lecture.**
55. "The reduced minimum alveolar concentration of isoflurane in rats lacking spinal PSD-95/SAP90". May 18-20, 2001. 48th Annual Meeting of AUA, Rochester, NY, USA. **Oral presentation.**
56. "Evidence of the involvement of cGMP-dependent protein kinase I α in spinal processing of nociceptive information". Oct. 14-18, 2000. ASA 2000 Annual Meeting. San Francisco, CA., USA. **Poster Discussion.**
57. "Evidence of the involvement of cGMP-dependent protein kinase I α in spinal processing of nociceptive information". June 3-7, 2000. The First International Conference, Biology, Chemistry and Therapeutic Applications of Nitric Oxide. San Francisco, CA, USA. **Oral presentation.**
58. "Evidence of the involvement of cGMP-dependent protein kinase I α in spinal processing of nociceptive information". May 3-7, 2000. 47th Annual Meeting of AUA. Salt Lake City, UT, USA. **Oral presentation.**
59. "NO-cGMP signaling pathway and pain". Dec. 15, 1999, The Blaustein Pain Treatment Center, JHU. **Invited lecture.**
60. "cGMP-dependent protein kinase I α inhibitor dose-dependently and significantly reduced the threshold for isoflurane anesthesia at the spinal cord level". May 12-16, 1999. 46th Annual Meeting of AUA. Philadelphia, PA, USA. **Poster Discussion.**
61. "Halothane and isoflurane dose-dependently inhibited formalin-induced c-fos expression in the spinal cord". May 7-9, 1998. 45th Annual Meeting of AUA. San Francisco, CA, USA. **Poster Discussion.**
62. "Noxious stimulation-induced c-fos expression in the spinal cord mediated by substance P". Oct. 15-19, 1997. The Second Chinese Conference of Neuroscience, Xi'an, China. **Invited lecture.**
63. "Noxious stimulation-induced c-fos expression in the spinal cord mediated by NK-1 receptor". Sep. 10-15, 1996. The Annual Conference of Anatomy. Wuhan, China. **Invited lecture.**
64. "Noxious stimulation-induced NDP and Fos expression in the spinal cord mediated by the NMDA receptor". Oct. 15-19, 1995. The First Chinese Conference of Neuroscience. Shanghai, China. **Invited lecturer.**
65. "The aging changes of somatostatin mRNA-contained neurons in rat hippocampus". Oct. 15-20, 1994, The Annual Conference of Anatomy. Xi'an, China. **Invited lecture.**

OTHER PROFESSIONAL ACCOMPLISHMENTS

International and National Abstracts:

1. Lingli Liang, Ronald S. Petralia, Jeffery D. Rothstein, Myron Yaster, Yuan-Xiang Tao. Effect of inhibition of spinal cord glutamate transporters on inflammatory pain induced by formalin and complete Freund's adjuvant. The 41th Annual Meeting Society for Neuroscience, Nov. 12-16, 2011, Washington, DC, USA.
2. Duo-Yun Zhang, Wei Wang, Fidelis Atianjoh, Myron Yaster, Yuan-Xiang Tao. Increased expression of sodium channel subunit Nav1.1 in the injured dorsal root ganglion after peripheral nerve injury. The 41th Annual Meeting Society for Neuroscience, Nov. 12-16, 2011, Washington, DC, USA.
3. Fidelis E. Atianjoh, Myron Yaster, Xiuli Zhao, Kogo Takamiya, Jun Xia, Estelle B. Gauda, Richard L. Huganir, Yuan-Xiang Tao. Spinal cord protein interacting with C kinase 1 is required for the maintenance of complete Freund's adjuvant-induced inflammatory pain but not for incision-induced post-operative pain. The 41th Annual Meeting Society for Neuroscience, Nov. 12-16, 2011, Washington, DC, USA.
4. Wei Wang, Ronald S. Petralia, Kogo Takamiya, Jun Xia, Richard L. Huganir, Myron Yaster, Yuan-Xiang Tao. Preserved acute pain and impaired neuropathic pain in mice lacking protein interacting with C Kinase 1. The 41th Annual Meeting Society for Neuroscience, Nov. 12-16, 2011, Washington, DC, USA.
5. Yuan-Xiang Tao and Myron Yaster. Persistent Peripheral Inflammation Drives NMDA Receptor/Protein Kinase C-Dependent GluR2 Internalization in Dorsal Horn Neurons. AUA 58th Annual Meeting, May 12-14, 2011, Philadelphia, PA. USA
6. Xiuli Zhao, Fidelis Atianjoh, and Yuan-Xiang Tao. Silencing the Kv1.2 potassium channel subunit in the rat dorsal root ganglion produces a major symptom of neuropathic pain. The 40th Annual Meeting Society for Neuroscience, Nov. 13-17, 2010, San Diego, CA, USA.
7. Ji-Tain Xu, Xiuli Zhao, Myron Yaster, and Yuan-Xiang Tao. Expression and distribution of mTOR, p70S6K, 4E-BP1, and their phosphorylated counterparts in rat dorsal root ganglion and spinal cord dorsal horn. The 40th Annual Meeting Society for Neuroscience, Nov. 13-17, 2010, San Diego, CA, USA.
8. Fidelis E. Atianjoh, Chun-Yi Lee, Sheng-Chin Kao, Myron Yaster, Estelle Gauda, and Yuan-Xiang Tao. Role of spinal PI3K in the development of chronic morphine tolerance. The 40th Annual Meeting Society for Neuroscience, Nov. 13-17, 2010, San Diego, CA, USA.
9. Olga Kopach, Andrij Sotnik, V. Viatchenko-Karpinski, Yuan-Xiang Tao, P. Belan, and Nana Voitenko. *In vivo* silencing of spinal protein kinase C α gene alleviates inflammation-induced hyperalgesia by adjusting a functional expression of Ca²⁺-permeable AMPA receptors in *Substantia Gelatinosa* neurons. The 40th Annual Meeting Society for Neuroscience, Nov. 13-17, 2010, San Diego, CA, USA.

10. Yuan-Xiang Tao. Dorsal horn AMPA receptor trafficking in inflammatory pain. The 2010 international Symposium on Synaptic Transmission and Plasticity. May 15-16, 2010. Hangzhou, China.
11. Ji-Tain Xu, Xiuli Zhao, Myron Yaster, and Yuan-Xiang Tao. Expression and distribution of mTOR, p70S6K, 4E-BP1, and their phosphorylated counterparts in rat dorsal root ganglion and spinal cord dorsal horn. The International Association Society of Pain's 13th World Congress on Pain, Aug. 29-Sep. 2, 2010, Montreal, Canada.
12. Ji-Tain Xu, Xiuli Zhao, Myron Yaster, and Yuan-Xiang Tao. Expression and distribution of mTOR, p70S6K, and 4E-BP1 in the dorsal root ganglion and spinal cord dorsal horn. The American Pain Society's 29th Annual Scientific Meeting, May 6-8, 2010, Baltimore, MD, USA
13. Xiuli Zhao, Xiaowei Guan, Ji-Tian Xu, Ming-Hung Shih, Yuan-Xiang Tao. Nerve injury down-regulates Kv1.2 expression in the dorsal root ganglion. The 2009 ASA Annual Meeting, Oct. 17–21, 2009, New Orleans, LA, USA.
14. Myron Yaster, Jang-Su Park, Richard L. Huganir, Yuan-Xiang Tao. Persistent peripheral inflammation drives NMDA receptor/protein kinase C-dependent GluR2 internalization in dorsal horn neurons. The 2009 ASA Annual Meeting, Oct. 17–21, 2009, New Orleans, LA, USA.
15. Olga Kopach, Jang-Su Park, Ronald S Petralia, Andrij Sotnik, P. Belan, Yuan-Xiang Tao, Nana Voitenko. The extrasynaptic AMPA receptor functioning is altered under inflammatory pain. The 39th Annual Meeting Society for Neuroscience, Oct. 17-21, 2009, Chicago, IL, USA.
16. Andrij Sotnik, Olga Kopach, V. Viatchenko-Karpinski, Yuan-Xiang Tao, P. Belan, Nana Voitenko. Protein kinase C α blocking or gene silencing in dorsal horn neurons demonstrates its major role in nociception. The 39th Annual Meeting Society for Neuroscience, Oct. 17-21, 2009, Chicago, IL, USA.
17. Xiaowei Guan, Ji-Tian Xu, Jordan P. Steinberg, Kogo Takamiya, Richard L. Huganir, Yuan-Xiang Tao. GluR2 PKC phosphorylation at serine 880 is required for complete Freund's adjuvant- induced dorsal horn GluR2 internalization and pain hypersensitivity during the maintenance period. The 39th Annual Meeting Society for Neuroscience, Oct. 17-21, 2009, Chicago, IL, USA.
18. Jang-Su Park, Nana Voitenko, Ronald S. Petralia, Ji-Tian Xu, Richard L. Huganir, Yuan-Xiang Tao. Persistent inflammation promotes synaptic GluR2 internalization via NMDA receptor- mediated triggering of protein kinase C activation in dorsal horn neurons. The 39th Annual Meeting Society for Neuroscience, Oct. 17-21, 2009, Chicago, IL, USA.
19. Wen-Jinn Liaw, Xu-Guang Zhu, Yaster Myron, Srinivasa N. Raja, Estelle B Gauda, Yuan-Xiang Tao. Targeted disruption of PSD-93 gene alters NMDA receptor trafficking and blunts morphine-induced pain hypersensitivity. The 38th Annual Meeting Society for Neuroscience, Nov. 15-19, 2008, Washington, DC, USA.

20. Om V. Singh, Myron Yaster, Ji-Tain Xu, Yun Guan, Xiaowei Guan, Arun M. Dharmarajan, Srinivasa N. Raja, Pamela L. Zeitlin, Yuan-Xiang Tao. Proteome of synaptosome-associated proteins in spinal cord dorsal horn after peripheral nerve injury. The 38th Annual Meeting Society for Neuroscience, Nov. 15-19, 2008, Washington, DC, USA.
21. Myron Yaster, Om V. Singh, Yun Guan, Srinivasa N. Raja, Yuan-Xiang Tao. Proteome of synaptosome-associated proteins in spinal cord dorsal horn after peripheral nerve injury. The 2008 ASA Annual Meeting, Oct 18-22, 2008, Orlando, FL, USA.
22. Wen-Jinn Liaw, Xu-Guang Zhu, Yaster Myron, Srinivasa N. Raja, Estelle B Gauda, Yuan-Xiang Tao. Targeted disruption of PSD-93 gene alters NMDA receptor trafficking and blunts morphine-induced pain hypersensitivity. The 12th World Congress on Pain, Glasgow, Scotland, UK, Aug 17-22, 2008.
23. Om V. Singh, Myron Yaster, Yun Guan, Srinivasa N. Raja, Pamela L. Zeitlin, Yuan-Xiang Tao. Peripheral nerve injury insult alters proteomic profile of the spinal dorsal horn synaptosome-associated proteins. The 27th Annual Scientific Meeting of the American Pain Society, Tampa, FL, May 8-10, 2008.
24. Om V. Singh, Myron Yaster, Xuehong Shang, Yun Guan, Srinivasa N Raja, Pamela L. Zeitlin, Yuan-Xiang Tao. Proteomic profile of synaptosome-associated proteins in spinal dorsal horn after peripheral nerve injury. US HUPO, Washington, DC, Mar 13-17, 2008.
25. Om V. Singh, Myron Yaster, Yun Guan, Srinivasa N Raja, Pamela L. Zeitlin, Yuan-Xiang Tao. Peripheral nerve injury insult alters proteomic profile of the spinal dorsal horn synaptosome-associated proteins. Protein Discovery and Development, Bethesda, MD, USA, Sep 6-7, 2007.
26. Yuan-Xiang Tao, Yun Guan, Xuehong Shang, Myron Yaster, Srinivasa N Raja. Genetic knockout and pharmacological inhibition of neuronal nitric oxide synthase attenuate nerve injury-induced pain hypersensitivity in mice. The 2007 ASA Annual Meeting, San Francisco, CA, Oct 13-17, 2007.
27. Nana Voitenko, Xuehong Shang, O Kopach, A Sotnik, D Isaev, P Belan, Yuan-Xiang Tao. A switch of Ca²⁺-impermeable AMPA receptors expressed on spinal dorsal horn neurons into Ca²⁺-permeable AMPA receptors after peripheral inflammation. 37th Annual Meeting Society for Neuroscience, Nov 3–7, 2007. San Diego, CA.
28. Ya-Chun Chu, Kwok-Hon Chan, Mei-Yung Tsou, Su-Man Lin, Ying-Chou Hsieh, Yuan-Xiang Tao. Mechanical Pain Hypersensitivity Following Incisional Surgery is Enhanced in Rats Subjected to Neonatal Peripheral Inflammation: Effects of N-Methyl-D-Aspartate Receptor Antagonists. 37th Annual Meeting Society for Neuroscience, Nov 3–7, 2007. San Diego, CA.
29. Yun Guan, Yuan-Xiang Tao, Lisa M Johaneck, Xuehong Shang, Timothy V Hartke, Boem Shim, M Ringkamp, Yaster Myron, Richard A Meyer, Srinivasa N Raja. Peripherally

acting mu-opioid receptor agonist attenuates neuropathic pain in rats after L5 spinal nerve injury. 37th Annual Meeting Society for Neuroscience, Nov 3–7, 2007. San Diego, CA.

30. Yun Guan, Xuehong Shang, Myron Yaster, Srinivasa N Raja, Yuan-Xiang Tao. Pharmacological inhibition and genetic knockout of neuronal nitric oxide synthase attenuate nerve injury-induced pain hypersensitivity in mice. The 26th Annual Scientific Meeting of the American Pain Society, San Antonio, TX, May 2-5, 2007.
31. Yuan-Xiang Tao, Xuehong Shang, Yun Guan, Myron Yaster, Kogo Takamiya, Jun Xia, Srinivasa N Raja, Roger A Johns, Richard L Haganir. Specific involvement in chronic inflammatory pain and neuropathic pain of PICK1, an AMPA receptor subunit GluR2-interacting protein. The 36th Annual Meeting Society for Neuroscience, Atlanta, GA. Oct. 14-18, 2006.
32. Jangsu Park, Xuehong Shang, Myron Yaster, Srinivasa N Raja, Yuan-Xiang Tao. Contribution spinal AMPA receptors to the development and maintenance of chronic inflammatory pain. The 36th Annual Meeting Society for Neuroscience, Atlanta, GA. Oct. 14-18, 2006.
33. Gabrielle L McLemore, Yuan-Xiang Tao, Kimberlei A Richardson, Estelle B Gauda, Neonatal C57/BL6 mouse model of acute morphine dependence. The 36th Annual Meeting Society for Neuroscience, Atlanta, GA. Oct. 14-18, 2006.
34. Ya-Chun Chu, Yuan Guan, John Skinner, Srinivasa N. Raja, Roger A. Johns, Yuan-Xiang Tao. Effect of genetic knock-out or pharmacologic inhibition of neuronal nitric oxide synthase on Complete Freund's Adjuvant-induced persistent pain. The 25th Annual Scientific Meeting of the American Pain Society, San Antonio, TX, May 3-6, 2006.
35. Yuko Sato, Quingning Su, Yung-Xiang Tao, David S. Brecht, Roger A. Johns. Localization and Activity of the Src Tyrosine Kinase Fyn Is Regulated by PSD-93. American Society of Anesthesiologists, Atlanta, GA, October 22-26, 2005.
36. Yuan-Xiang Tao, Yachun Chu, Yuan Guan, John Skinner, Srinivasa N. Raja, Roger A. Johns. Effect of genetic knock-out or pharmacologic inhibition of neuronal nitric oxide synthase on complete freund's adjuvant-induced persistent pain. The 35th Annual Meeting Society for Neuroscience, Washington, DC. Nov 12-16, 2005.
37. Yuko Sato, Yuan-Xiang Tao, Qingning Su, David S. Brecht, Roger A. Johns. PSD-93 regulates fyn-mediated phosphorylation of NMDA receptors. The 35th Annual Meeting Society for Neuroscience, Washington, DC. Nov 12-16, 2005.
38. Wen-Jinn Liaw, Robert L Stephens, Brian C Binns, Yachun Chu, Jehuda P Sepkuty, Roger A. Johns, Jeffrey D. Rothstein and Yuan-Xiang Tao. The roles of spinal glutamate uptake in excitatory synaptic transmission in rat. The 11th World Congress on Pain of International Association for the Study of Pain, Sydney, Australia, August 21-26, 2005.
39. Yuan-Xing Tao, Wen-Jinn Liaw, Roger A Johns, Ronald S Petralia, David S. Brecht, Spinal cord postsynaptic density-93 protein contributes to the development of opioid

tolerance and dependence, The 24th Annual Scientific Meeting of the American Pain Society, Boston, MA, USA, March 30-April 2, 2005.

40. Yuan-Xiang Tao, Yachun. Chu, John Skinner, Roger A Johns, Jeffery D Rothstein. Spinal glutamate transporters are critical for maintaining normal sensory transmission, The Association of University Anesthesiologists 52nd Annual Meeting, Baltimore, MD, USA, May 6-8, 2005.
41. Yuan-Xiang Tao, Wen-Jinn Liaw, Ronald S. Petralia, Bosheng Zhang, Roger A. Johns, and Jeffery D. Rothstein, Expression and distribution of glutamate transporters in rat spinal cord and dorsal root ganglion, The 34th Annual Meeting Society for Neuroscience, San Diego, CA, USA, Oct. 23-27, 2004.
42. Roger A. Johns, Yuan Xu, Baosheng Zhang, David S Bredt, and Yuan-Xiang Tao, Targeted disruption of PSD-93 gene reduces platelet-activating factor-induced neurotoxicity in cultured cortical neurons, The The 34th Annual Meeting Society for Neuroscience, San Diego, CA, USA, Oct. 23-27, 2004.
43. Feng Tao, Qingning Su, Yuan-Xiang Tao, Roger A. Johns, Inhibition of complete Freund's adjuvant-induced inflammatory hyperalgesia by perturbing the interactions between n-methyl-d-aspartate receptor and postsynaptic density protein-95. The The 34th Annual Meeting Society for Neuroscience, San Diego, CA, USA, Oct. 23-27, 2004.
44. Qingning Su, Yuan-Xiang Tao, Roger A. Johns, Dynamic changes in microtubule structure and mitochondria trafficking after exposure to halothane, The The 34th Annual Meeting Society for Neuroscience, San Diego, CA, USA, Oct. 23-27, 2004.
45. Feng Tao, Qingning Su, Yuan-Xiang Tao, Roger A Johns, Effect of perturbing NMDA receptor-PSD-95 protein interactions on the threshold for halothane anesthesia in mice. ASA 2004 Annual Meeting. Oct. 23-27, 2004. Las Vegas, NV, USA.
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