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EMPLOYMENT

Department of Cell Biology, Harold Dorris Neurological Institute, The Scripps Research Institute, La Jolla, CA, 2000-present. Professor, 2008-present; Associate Professor, 2005-2008; Assistant Professor, 2000-2005

Genomics Institute of the Novartis Research Foundation, San Diego, CA, 2000-present. Director of Discovery Research, 2006-present; Head of Neuroscience, 2002-2005; Staff Scientist, 2000-2003

Adjunct Professor, Neuroscience program, University of California, San Diego, La Jolla, CA 2001-present

EDUCATION

Postdoctoral Fellow, University of California at San Francisco, 1996-2000. Sponsor: Dr. Louis Reichardt

Doctor of Philosophy in Biology, Department of Biology, California Institute of Technology (Caltech), Pasadena, CA, 1990-1996. Thesis Advisor: Dr. Barbara Wold

Bachelors of Science, Magna Cum Laude, Molecular, Cellular and Developmental Biology, University of California, Los Angeles (UCLA), 1987-1990. Advisor: Dr. Judy A. Lengyel

BIBLIOGRAPHY

Research Articles

Schmidt M, Dubin AE, Petrus MJ, Earley TJ, **Patapoutian A.** (2009) Nociceptive signals induce trafficking of TRPA1 to the plasma membrane. Neuron. 64:498-509.

Miyamoto T, Dubin AE, Petrus MJ, **Patapoutian A.** (2009) TRPV1 and TRPA1 mediate peripheral nitric oxide-induced nociception in mice. PLoS One. 29;4(10):e7596

TRPV3 in keratinocytes transmits temperature information to sensory neurons via ATP. Mandadi S, Sokabe T, Shibasaki K, Katanosaka K, Mizuno A, Moqrich A, **Patapoutian A**, Fukumi-Tominaga T, Mizumura K, Tominaga M (2009). Pflugers Arch. 458:1093-102.

Mandadi S, Nakanishi ST, Takashima Y, Dhaka A, **Patapoutian A**, McKemy DD, Whelan PJ. (2009) Locomotor networks are targets of modulation by sensory transient receptor potential vanilloid 1 and transient receptor potential melastatin 8 channels.

Neuroscience. 162:1377-97

Hu H, Bandell M, Petrus MJ, Zhu MX, **Patapoutian A.** (2009) Zinc activates damage-sensing TRPA1 ion channels. Nat Chem Biol. 5:183-90

Hu H, Grandl J, Bandell M, Petrus M, **Patapoutian A.** (2009) Two amino acid residues determine 2-APB sensitivity of the ion channels TRPV3 and TRPV4. PNAS 106:1626-31

Dhaka A, Uzzell V, Dubin AE, Mathur J, Petrus M, Bandell M, **Patapoutian A**.(2009) TRPV1 is activated by both acidic and basic pH. J Neuroscience, 29: 153-8

Xiao B., Dubin A.E., Bursulaya B., Viswanath V., Jegla T.J., **Patapoutian A.** (2008) Identification of transmembrane domain 5 as a critical molecular determinant of menthol sensitivity in mammalian TRPA1 channels. J Neuroscience, 28: (39):9640-51.

Grandl J., Hu H., Bandell M., Bursulaya B., Schmidt M., Petrus M, and **Patapoutian A.** (2008) Pore region of TRPV3 ion channel is specifically required for heat-activation. Nature Neuroscience, 11: 1007-13.

Dhaka A., Earley T.E., Watson J., and **Patapoutian A.** (2008) Visualizing cold spots: TRPM8-expressing sensory neurons and their projections. J Neuroscience, 28:566-75.

Petrus M., Peier A.M., Bandell M., Hwang S.W., Huynh T., Olney N., Jegla T., **Patapoutian A.** (2007) A role of TRPA1 in mechanical hyperalgesia is revealed by pharmacological inhibition. Molecular Pain, 3: 40.

Macpherson L.J., Xiao B., Kwan K.Y., Petrus M.J., Dubin A.E., Hwang S.W., Cravatt B., Corey D.P., **Patapoutian A.** (2007) An ion channel essential for sensing chemical damage. J Neuroscience, 27:11412-5

Dhaka A., Murray A.N., Mathur J., Earley T.J., Petrus M.J., **Patapoutian A**. (2007) TRPM8 is Required for Cold Sensation in Mice. Neuron, 54: 371-8.

Kindt K.S., Viswanath V., Macpherson L.J., Quast K., Hu H, **Patapoutian A**. Schafer W.R. (2007) Caenorhabditis elegans TRPA1 functions in mechanosensation. Nature Neuroscience, 10: 568-77.

Macpherson L.J., Dubin A.E., Evans M.J., Marr F., Schultz P.G., Cravatt B.F., **Patapoutian A.** (2007) Noxious compounds activate TRPA1 ion channels through covalent modification of cysteines. Nature 445:541-5

McCleverty C.J., Koesema E, **Patapoutian A**, Lesley S.A., Kreusch A. (2006) Crystal structure of the human TRPV2 channel ankyrin repeat domain. Protein Sci. 15:2201-6.

Saghatelian A., McKinney M.K., Bandell M., **Patapoutian A**., Cravatt B.F. (2006) A FAAH-regulated class of N-acyl taurines that activates TRP ion channels. Biochemistry, 45:9007-15.

Macpherson L.J., Hwang S.W., Miyamoto T., Dubin A.E., **Patapoutian A.**, Story G.M. (2006) More than cool: Promiscuous relationships of menthol and other sensory compounds. Molecular and Cellular Neuroscience, 32:335-43.

Bandell M., Dubin A.E., Petrus M.J., Orth A., Mathur J., Hwang S.W., **Patapoutian A.** (2006) High-throughput random mutagenesis screen reveals TRPM8 residues specifically required for activation by menthol. Nature Neuroscience, 9:493-500.

Macpherson L., Geierstanger B.H., Viswanath V., Bandell M., Eid S.R., Hwang SW., **Patapoutian A.** (2005) The pungency of garlic: activation of TRPA1 and TRPV1 in response to allicin. Current Biology, 15:929-1034.

Moqrich A., Hwang S.W., Earley T.J., Petrus M.J., Murray A.N., Spencer K.S.R., Andahazy M., Story G., **Patapoutian A.** (2005) Impaired thermosensation in Mice Lacking TRPV3, a Heat-Sensing channel in skin. Science, 307: 1468-72.

Rosenzweig M., Brennan K.M., Tayler T.D., Phelps P.O., **Patapoutian A.,** Garrity P.A. (2005) The *Drosophila* ortholog of vertebrate TRPA1 regulates thermotaxis. Genes & Development, 19: 419-24.

Moqrich A., Earley T., Watson J., Andahazy M., Backus C., Martin-Zanca D., Wright D.E., Reichardt L.F., **Patapoutian A.**, (2004) Expressing TRKC from the TRKA locus causes a subset of DRG neurons to switch fate. Nature Neuroscience, 7: 812-8.

Bandell M., Story G.M., Hwang S.W., Viswanath V., Eid S.R., Petrus M.J., Earley T.J., **Patapoutian A.** (2004) Noxious Cold Ion Channel TRPA1 Is Activated by Pungent Compounds and Bradykinin. Neuron, 41:849-57.

Viswanath V., Story G.M., Peier A.M., Petrus M.J., Lee V.L., Hwang S.W., **Patapoutian A.** and Jegla T. (2003) Opposite thermosensor in fruitfly and mouse. Nature, 423: 822-3.

Story G.M., Peier A.M., Reeve A.J., Eid S.R., Mosbacher J., Hricik T.R., Earley T.J., Hergarden A.C., Andersson D.A., Hwang S.W., McIntyre P., Bevan S., and **Patapoutian A.** (2003) ANKTM1, a TRP-like channel expressed in nociceptive neurons, is activated by cold temperatures. Cell, 112: 819-829.

Peier A.M., Reeve A.J., Andersson D.A., Moqrich A., Earley T.J., Hergarden A.C., Story G.M., Colley S., Hogenesch J.B., McIntyre P., Bevan S., and **Patapoutian A.** (2002) A novel heat-sensitive TRP channel expressed in keratinocytes. Science, 296: 2046-9.

Su A.I., Cooke M.P., Ching K.A., Hakak Y., Walker J.R., Wiltshire, T., Orth A.P., Vega R.G., Sapinoso L.M., Moqrich A., **Patapoutian A.**, Hampton G.M., Schultz P.G., Hogenesch J.B. (2002) Large-scale analysis of the human and mouse transcriptomes. Proc Natl Acad Sci, 99 (7): 4465-70.

Peier A.M., Moqrich A., Hergarden A.C., Reeve A.J., Andersson D.A., Story G.M., Earley T.J., Dragoni I., McIntyre P., Bevan S., and **Patapoutian A.** (2002) A Trp Channel that Senses Cold Stimuli and Menthol. Cell, 108: 705-715.

Patapoutian A., Backus C., Kispert A., and Reichardt L.F. (1999) Regulation of Neurotrophin-3 expression by epithelial-mesenchymal interactions: the role of Wnt factors. Science, 283: 1180-3.

Fariñas I., Wilkinson A., Backus C., Reichardt L.F., and **Patapoutian A.** (1998) Characterization of neurotrophin and trk receptor functions in developing sensory ganglia: direct NT-3 activation of trkB neurons in vivo. Neuron, 21: 325-334.

Patapoutian A., Wold B., and Wagner R. (1995) Evidence for developmentally programmed transdifferentiation of smooth muscle to skeletal muscle in mouse esophagus. Science, 270: 1818-20.

Patapoutian A., Yoon J.K., Miner J.M., Wang S., Stark K., and Wold B. (1995) Disruption of the mouse *MRF4* gene identifies multiple waves of myogenesis in the myotome. Development, 121: 3347-58.

Patapoutian A., Miner J.H., Lyons G., and Wold B. (1993) Isolated sequences from the linked *Myf-5* and *MRF4* genes drive distinct patterns of muscle-specific expression in transgenic mice. Development, 118: 61-9.

Verma R., **Patapoutian A.**, Gordon B.C., and Campbell J.L. (1991) Identification and purification of a factor that binds to the *MluI* cell cycle box of yeast DNA replication genes. Proc. Natl. Acad. Sci., 88: 7155-9.

Pignoni F., Baldarelli R.M., Steingrimsson E., Diaz R.J., **Patapoutian A.**, Merriam J.R., and Lengyel J.A. (1990) The Drosophila gene *tailless* is expressed at the embryonic termini and is a member of the steroid receptor superfamily. Cell, 62: 151-63.

Select Review Articles

Patapoutian, A., Tate, S., Woolf, C.J. (2009) Transient receptor potential channels: targeting pain at the source. Nature Reviews Drug Discovery, 8:55-68

Bandell M, Macpherson L.J., **Patapoutian A.** (2007) From chills to chilis: mechanisms for thermosensation and chemesthesis via thermoTRPs. Curr Opin Neurobiol. 4: 490-7

Patapoutian A, Macpherson L.J. (2006) Channeling pain.
Nat Med. 2:506-7. (news & views)

Dhaka A., Viswanath V., **Patapoutian A**. (2006) TRP ion channels and temperature sensation. Annu. Rev. Neurosci. 29: 135-61.

Patapoutian A. and Wood J.N. (2004) Mechanisms of Nociception: molecules to behaviour. J. Neurobiology, 61: 1-2 (Introduction to a special issue on Nociception, guest editors).

Patapoutian A., Peier A.M., Story G.M., and Viswanath V. (2003) ThermoTRP channels and beyond: Mechanisms of temperature sensation. Nature Reviews Neuroscience, 4: 529-39.

Patapoutian A. and Reichardt L.F. (2001) Trk Receptors: Mediators of Neurotrophin Action. Current Opinion in Neurobiology, 11 (3): 272-80.

Patapoutian A. and Reichardt L.F. (2000) Roles of Wnt proteins in neural development and maintenance. Current Opinion in Neurobiology, 10 (3): 392-9.

PROFESSIONAL ACTIVITIES, GRANTS, & HONORS

2009 Co-chair, Keystone symposium on Neurobiology of Pain and Analgesia

2006	Young Investigator Award, Society for Neuroscience
2006-2011	NIH U01: C57Bl/6 Mouse Lines Expressing CRE-Recombinase in the Nervous System. PI: Ulrich Mueller
2006-2011	NIH R01: Nociceptive Ion Channels: mechanisms of activation
2005-2010	NIH R01: Temperature-activated TRP Channels & Thermosensation
2005-	Editorial Board of *Molecular Pain*
2005	Co-chair of symposium on Molecular mechanisms of thermosensation: Congress of International Union of Physiological Sciences, San Diego
2005	Keynote speaker, Gordon Research Conference on Temperature Stress in Plants
2004-2014	NIH R01: Molecular Characterization of Sensory Function (competitive renewal pending)
2004-	Adhoc member of various NIH study sections
2004	Co-chair ASCB (Cell Biology): Thermal and Mechano-sensation minisymposium, Washington DC
2004	Guest co-editor, special issue on nociception, Journal of Neurobiology
2003-2006	Damon Runyon Scholar Award
2002-2005	NIH R01: Somatic sensory neurons: Mechanisms of heterogeneity
2001-2003	Novartis grant: Thermal gated channels in sensory neurons
2001-2003	Basil O'Connor Scholar Research Award from March of Dimes
1996-1999	Damon Runyon-Walter Winchell Foundation Postdoctoral Fellowship
1992	Merck Manufacturing Division Graduate Fellowship, Caltech
1990	Undergraduate Research Award, Department of Biology, UCLA

ISSUED PATENTS

US 7,465,581 (2008) ANKTM1, a cold-activated TRP-like channel expressed in nociceptive neurons
US 7,396,910 (2008) Transient receptor potential channel TRPV3 and its use
US 7,115,414 (2006) Vanilloid receptor-related nucleic acids and polypeptides

MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS

American Association for the Advancement of Science (AAAS)
American Pain Society
Society for Neuroscience