

**Swetha Murthy, Ph.D.**  
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**Employment:**

Assistant Scientist/Professor **November 2019-Present**  
Vollum Institute  
Oregon Health & Science University  
3181 SW Sam Jackson Road, Portland, OR 97239

Research Associate, Patapoutian Lab **2012 – 2019**  
Department of Neuroscience  
Scripps Research  
Howard Hughes Medical Institute  
10550 North Torrey Pines Road, La Jolla, CA 92037

**Education:**

**Ph.D. Biochemistry** **June 2012**  
State University of New York at Buffalo  
Department of Biochemistry  
Thesis advisor: Gabriela Popescu, Ph.D.  
Thesis title: Molecular determinants of proton sensitivity and gating in NMDA receptors

**M.S.** **2007**  
Major: Biochemistry  
Sri Bhagawan Jain College, Bangalore University, India  
Project title: Characterization of fungal Laccase from *Pleurotus* sp.

**B.S.** **2005**  
Majors: Microbiology, Chemistry, and Zoology  
St Joseph's College of Arts and Science, Bangalore University, India

**Academic Positions and Affiliations:**

Executive committee member on OHSU PREP Program **2022-present**  
Biophysical Society member **2008-2012, 2020-present**  
Society for Neuroscience member **2009-2011**

**Honors and Awards:**

- NIH Director's New Innovator Award. 2021.
- OHSU-Silver Family Faculty Excellence and Innovation Award. 2021.
- Biochemistry Dissertation Research Recognition Award, University at Buffalo, 2012.
- Tascione Travel Award to the 2011 Biophysical Society Annual Meeting.

## **Training, Mentoring, and Advising Experience**

Antonio Munoz (2021-present), PREP Postbact

Tess Whitwam (2015-2018), Research Assistant, Patapoutian Lab  
Current status: Graduate student at Harvard

Allain Fransisco (2014-2017), Research Assistant, Patapoutian Lab.  
Current status: Medical student at University of California San Diego

Kathleen Steel (summer 2015), high school student, The Bishop's School  
Current status: Undergraduate at Berkley

Nadine Bradbury (summer 2014), high school student, The Bishop's school  
Current status: Undergraduate student at California Institute of Technology

Invited panelist on Women in Science (Portland chapter)/AVDS BIPOC Imposter Syndrome Lunch and Learn (October 2020)

## **Oral presentations:**

**2021** The Molecular basis of mechanically activated ion channels, OSCAs. *65<sup>th</sup> Biophysical Society Annual Meeting* (Virtual). Mechanobiology subgroup symposium.

**2021** How do cells sense force and why is it important? Department of Biochemistry and Molecular Biology. *Kansas University Medical center*.

**2021** How do cells sense force and why is it important? Chemistry Department. *Portland State University*

**2021** When touch evokes pain. *NeuroZoom*.

**2019** Mechanosensitive ion channels and their role in physiology. Seminar: faculty candidate. *Vollum Institute, OHSU*.

**2019** Mechanosensitive ion channels and their role in physiology. Seminar: Stadtman Investigator candidate. *National Institute of Dental and Craniofacial Research and National center for Complementary and Integrative Health, NIH*.

**2019** Mechanosensitive ion channels and their role in physiology. Seminar: faculty candidate. Department of Biology, *University of Texas San Antonio*.

**2019** Mechanosensitive ion channels and their role in physiology. Seminar, Center for Molecular and Neuroscience in Health and Disease; faculty candidate. *Stanford*.

**2019** OSCA/TMEM63 Are an Evolutionarily Conserved Family of Mechanically Activated Ion Channels. Short talk. Mammalian Sensory Systems. *Keystone Symposium Conference, Seattle*.

**2017** Piezo2 in acute and chronic pain. DNC seminar, Neuroscience department. *The Scripps Research Insitute*.

**2011** Subunit specific impact of lurcher motif residues on NMDA Receptor gating. Platform talk. *Biophysical Society, Baltimore*.

### Scientific Publications:

**Murthy SE**. Deciphering Mechanically Activated Ion Channels at the Single Channel level in Dorsal Root Ganglion Neurons. 2022. In revision.

Xie Q, Li J, Li H, Udeshi ND, Svinkina T, Orlin D, Kohani S, Guajardo R, DR Mani, Xu C, Li T, Han S, Wei Wei, Shuster SA, Luginbuhl DJ, Quake SR, **Murthy SE**, Ting AY, Carr SA, Luo L. 2022. Transcription Factor Acj6 Controls Dendrite Targeting via Combinatorial Cell-Surface Codes. *bioRxiv*.

Jojoa-Cruz S, Saotome K, Alex Tsui CC, Lee W-H, Sansom M.S.P., **Murthy SE\***, Patapoutian A\* & Ward AB\*. 2022. Structural insights into the Venus flytrap mechanosensitive ion channel Flycatcher1. *Nature Communications*, 850(2022).

Procko C\*, **Murthy SE\***, Keenan WT, Mousavi SAR, Dabi T, Coombs A, Procko E, Baird L, Patapoutian A, Chory J. 2021. Stretch-activated ion channels identified in the touch-sensitive structures of carnivorous Droseraceae plants. *eLIFE*, 10:e64250.

Yan H, Helman G, **Murthy SE**, Ji H, Crawford J, Kubisiak T, Bent SJ, Xiao J, Taft RJ, Coombs A, Wu Y, Pop A, Li D, de Vries LS, Jiang Y, Salomons GS, van der Knaap MS, Patapoutian A, Simons C, Burmeister M, Wang J, Wolf NI. 2019. Heterozygous Variants in the Mechanosensitive Ion channel TMEM63A Result in Transient Hypomyelination during Infancy. *The American Journal of Human Genetics*, 0002-9297.

Song Y, Li D, Farrelly O, Miles L, Li F, Kim SE, Lo TY, Wang F, Li T, Thompson-Peer KL, Gong J, **Murthy SE**, Coste B, Yakubovich N, Patapoutian A, Xiang Y, Rompolas P, Jan LY0, Jan YN. 2019. The Mechanosensitive Ion Channel Piezo Inhibits Axon Regeneration. *Neuron* 102, 373-389.e376.

**Murthy SE**, Dubin AE, Whitwam T, Jojoa-Cruz S, Cahalan SM, Mosavi SAR, Ward AB, Patapoutian A. 2018. OSCA/TMEM63 are an Evolutionarily Conserved Family of Mechanically Activated Ion Channels. *eLIFE* 7, e41844.

Jojoa-Cruz S\*, Saotome K\*, **Murthy SE**, Tsui CC, Sansom MP, Patapoutian A, Ward AB. 2018. Cryo-EM structure of the mechanically activated ion channel OSCA1.2. *eLIFE*. 7, e41845.

**Murthy SE**, Loud MC, Daou I, Marshall KL, Schwaller F, Kühnemund J, Francisco AG, Keenan WT, Dubin AE, Lewin GL, Patapoutian A. 2018. Mechanosensitive Ion Channel Piezo2 mediates Sensitized Mechanical Pain in mice. *Science Translational Medicine*. 2018 Oct 10; 10:462.

Ma S, Cahalan S, LaMonte G, Grubaugh ND, Zeng W, **Murthy SE**, Paytas E, Gamini R, Lukacs V, Whitwam T, Loud M, Lohia R, Berry L, Khan SM, Janse CJ, Bandell M, Schmedt C, Wengelnik K, Su AI, Honore E, Winzeler EA, Andersen KG, Patapoutian A. 2018. Common PIEZO1 Allele in African Populations Causes RBC Dehydration and Attenuates Plasmodium Infection. *Cell*. 2018 Apr 5;173(2):443-455.

Saotome K, **Murthy SE**, Kefauver JM, Whitwam T, Patapoutian A, Ward AB. 2018. Structure of the mechanically activated ion channel Piezo1. *Nature*. 2018 Feb 22;554(7693):481-486.

Dubin AE\*, **Murthy SE\***, Lewis AH, Brosse L, Cahalan SM, Grandl J, Coste B, Patapoutian A. 2017. Endogenous Piezo1 can confound mechanically activated channel identification and characterization. *Neuron*. Apr 19;94(2):266-270.

**Murthy SE**, Dubin AE, Patapoutian A. 2017. Piezos thrive under pressure: mechanically activated ion channels in health and disease. *Nature Reviews Molecular Cell Biology*. Dec;18(12):771-783.

Syeda R, Qiu Z, Dubin AE, **Murthy SE**, Florendo MN, Mason DE, Mathur J, Cahalan SM, Peters EC, Montal M, Patapoutian A. 2016. LRRC8 Proteins Form Volume-Regulated Anion Channels that Sense Ionic Strength. *Cell*. Jan 28;164(3):499-511.

Coste B\*, **Murthy SE\***, Mathur J, Schmidt M, Mechioukhi Y, Delmas P, Patapoutian A. 2015. Piezo1 ion channel pore properties are dictated by C-terminal region. *Nature Communications* 6:7223.

Ranade SS, Qiu Z, Woo SH, Hur SS, **Murthy SE**, Cahalan SM, Xu J, Mathur J, Bandell M, Coste B, Li YS, Chien S, Patapoutian A. 2014. Piezo1, a mechanically activated ion channel, is required for vascular development in mice. *Proc Natl Acad Sci* 111(28):10347-52.

Maki BA, Cummings KA, Paganelli MA, **Murthy SE**, Poepescu GK. 2014. One-channel cell-attached patch-clamp recording. *Journal of Visualized Experiments* Jun 9;(88).

Albuisson J\*, **Murthy SE\***, Bandell M, Coste B, Louis-Dit-Picard H, Mathur J, Feneant-Thibault M, Tertian G, de Jaureguiberry JP, Syfuss PY, Cahalan S, Garcon L, Toutain F, Simon Rohrlich P, Delaunay J, Picard V, Jeunemaitre X, Patapoutian A. 2013. Dehydrated hereditary stomatocytosis linked to gain-of-function mutations in mechanically activated PIEZO1 ion channels. *Nature Communications* 4:1884.

**Murthy SE**, Shogan T, Page JC and Popescu GK. 2012. Probing the activation sequence of NMDA Receptors with Lurcher-like mutations. *Journal of General Physiology*.

Holley S.M, Ahmed A.H, Srinivasan J, **Murthy SE**, Weiland G.E, Oswald R.E and Nowak LM. 2012. Loss of an Electrostatic Contact Unique to AMPA Receptor Ligand-Binding Domain 2 Slows Channel Activation. *Biochemistry*.

Borschel WF, **Murthy SE**, Kasperek EM, Popescu GK. 2011. NMDA receptor activation requires remodeling of intersubunit contacts within ligand-binding heterodimers. *Nature Communications* 2:498.

Amico-Ruvio SA, **Murthy SE**, Popescu GK. 2011. Zinc effects on NMDA receptor gating kinetics. *Biophysical Journal* 100(8): 1910-1918.

Popescu GK, **Murthy SE**, Borschel WF. 2010. Allosteric Inhibitors of NMDA Receptor Functions. *Pharmaceuticals* 3:3240-3257.