ARDEM PATAPOUTIAN

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POSITIONS HELD:

Howard Hughes Medical Institute (HHMI) Investigator, 2014-present

Department of Neuroscience, Dorris Neuroscience Center, 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, 2000-2014. Director of Discovery Research, 2006-2014; Head of Neuroscience, 2002-2005; Staff Scientist, 2000-2003

EDUCATION:

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

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

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

SERVICES, AWARDS, AND HONORS:

- Alexander M. Cruickshank Lecturer, Gordon Research Conferences, 2019
- Rosenstiel Award for Distinguished Work in Basic Medical Research, Brandeis University, 2019 (shared with David Julius)
- Member, Pradel Research Award Selection Committee, 2018-
- Member, National Academy of Sciences (NAS), 2017-
- Alden W. Spencer Award, Columbia University, 2017 (shared with David Ginty)
- Fellow, American Association for the Advancement of Science (AAAS), 2016-
- Editorial Board of Neuron, 2016-
- Member of The Scripps Research Institute Academic Planning Committee, 2015-
- Co-Chair, Working group to advise a steering committee to develop a National Pain Strategy (Affordable Care Act), 2015-2017

- Howard Hughes Medical Institute (HHMI) Investigator, 2014-
- Special Lecture, Society for Neuroscience Annual Meeting, 2014
- Michael J Brody Memorial Lecture, University of Iowa, 2014
- Wiersma Visiting Professor, California Institute of Technology, 2012
- Young Investigator Award, Society for Neuroscience, 2006
- Damon Runyon Scholar Award, 2003-2005
- Basil O'Connor Starter Scholar Research Award, March of Dimes Birth Defects Foundation, 2001-2003
- Damon Runyon-Walter Winchell Cancer Research Foundation, Postdoctoral Fellowship1996-1999

BIOSKETCH

Ardem Patapoutian is a molecular biologist specializing in sensory transduction. His notable contributions to science include identifying novel ion channels and receptors activated by temperature, mechanical force, and increased cell volume. His laboratory has shown that these ion channels play crucial roles in sensing temperature, touch, proprioception, pain, and regulating vascular tone. Patapoutian was born in Lebanon in 1967 and attended the American University of Beirut for one year before he immigrated to The United States in 1986 and became a US citizen. He graduated from UCLA in 1990 and received his Ph.D. at Caltech in the lab of Dr. Barbara Wold in 1996. After postdoctoral work with Dr. Lou Reichardt at UCSF, he joined the faculty of Scripps Research in 2000, where he is currently a Professor in the Department of Neuroscience. He also held a position at the Genomics Institute of The Novartis Research Foundation from 2000-2014. Patapoutian was awarded the Young Investigator Award from the Society for Neuroscience in 2006 and was named an Investigator of the Howard Hughes Medical Institute in 2014. He is a fellow of the American Association for the Advancement of Science (2016), and a member of the National Academy of Sciences (2017). He is a co-recipient of the 2017 Alden Spencer Award from Columbia (with David Ginty), and the 2019 Rosenstiel Award for Distinguished Work in Basic Medical Research (with David Julius).

BIBLIOGRAPHY:

Research Articles:

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2. 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 LY, Jan YN (2019) The mechanosensitive ion channel Piezo inhibits axon regeneration. Neuron 102:373-389. PMID: 30819546

3. Nonomura K, Lukacs V, Sweet DT, Goddard LM, Kanie A, Whitwam T, Ranade SS, Fujimori T, Kahn ML, **Patapoutian A** (2018) Mechanically activated ion channel

PIEZO1 is required for lymphatic valve formation. Proc Natl Acad Sci USA 115:12817-22. PMID: 30482854

4. Hoffman BU, Baba Y, Griffith TN, Mosharov EV, Woo SH, Roybal DD, Karsenty G, **Patapoutian A**, Sulzer D, Lumpkin EA (2018) Merkel cells activate sensory neural pathways through adrenergic synapses. Neuron 100:1401-13. PMID: 30415995

5. Murthy SE, Dubin AE, Whitwam T, Jojoa-Cruz S, Cahalan SM, Mousavi SAR, Ward AB, **Patapoutian A** (2018) OSCA/TMEM63 are an evolutionarily conserved family of mechanically activated ion channels. eLife 7. PMID: 30382938

6. Jojoa-Cruz SJ, Saotome K, Murthy SE, Tsui CCA, Sansom MS, **Patapoutian A**, Ward AB (2018) Cryo-EM structure of the mechanically activated ion channel OSCA1.2. eLife 7. PMID: 30382939

7. Zeng WZ, Marshall KL, Min S, Daou I, Chapleau MW, Abboud FM, Liberles SD, **Patapoutian A** (2018) PIEZOs mediate neuronal sensing of blood pressure and the baroreceptor reflex. Science 362:464-7. PMID: 30361375

8. Murthy SE, Loud MC, Daou I, Marshall KL, Schwaller F, Kühnemund J, Francisco AG, Keenan WT, Dubin AE, Lewin GR, **Patapoutian A** (2018) The mechanosensitive ion channel Piezo2 mediates sensitivity to mechanical pain in mice. Sci Transl Med 10(462). PMID: 30305457

9. Kefauver JM, Saotome K, Dubin AE, Pallesen J, Cottrell CA, Cahalan SM, Qiu Z, Hong G, Crowley CS, Whitwam T, Lee WH, Ward AB, **Patapoutian A** (2018) Structure of the human volume regulated anion channel. eLife 7. PMID: 30095067

10. Xu J, Mathur J, Vessières E, Hammack S, Nonomura K, Favre J, Grimaud L, Petrus M, Francisco A, Li J, Lee V, Xiang FL, Mainquist JK, Cahalan SM, Orth AP, Walker JR, Ma S, Lukacs V, Bordone L, Bandell M, Laffitte B, Xu Y, Chien S, Henrion D, **Patapoutian A** (2018) GPR68 senses flow and is essential for vascular physiology. Cell 173:762-75. PMID: 29677517

11. 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 173:443-55. PMID: 29576450

12. Saotome K, Murthy SE, Kefauver JM, Whitwam T, **Patapoutian A**, Ward AB (2018) Structure of the mechanically activated ion channel Piezo1. Nature 554:481-6. PMID: 29261642

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15. Wu Z, Grillet N, Zhao B, Cunningham C, Harkins-Perry S, Coste B, Ranade S, Zebarjadi N, Beurg M, Fettiplace R, **Patapoutian A**, Mueller U (2017) Mechanosensory hair cells express two molecularly distinct mechanotransduction channels. Nat Neurosci 20:24-33. PMID: 27893727

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receptor potential vanilloid 1 and transient receptor potential melastatin 8 channels. Neuroscience 162:1377-97. PMID: 19482068

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Review Articles:

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2. Ranade SS, Syeda R, **Patapoutian A** (2015) Mechanically activated ion channels. Neuron 87:1162-79. PMID: 26402601

3. Woo SH, Lumpkin EA, **Patapoutian A** (2015) Merkel cells and neurons keep in touch. Trends Cell Biol 25:74-81. PMID: 25480024

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12. Bandell M, Macpherson LJ, **Patapoutian A** (2007) From chills to chills: mechanisms for thermosensation and chemesthesis via thermosTRPs. Curr Opin Neurobiol 4:490-7. PMID: 17706410

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MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS:

Member, National Academy of Sciences (NAS)
Fellow, American Association for the Advancement of Science (AAAS)
American Pain Society
Society for Neuroscience

CURRENT RESEARCH SUPPORT:

Howard Hughes Medical Institute Investigator (2/2014-present)
NIH R01 HL143297—Molecular understanding of membrane sensors (04/2019-03/2023) PI: Andrew Ward
NIH/ R01 DE022358 – Role of mechanically activated ion channels in somatosensation (07/2012-06/2021)
NIH/ R01 2R01AR051219 – Mechanism of mechanosensory transduction in Merkel cells (07/2016-06/2021) PI: Ellen Lumpkin
NIH/R35 NS105067—Mechanisms of force sensing in the nervous system (12/2017-11-2025)