



Curriculum Vitae

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<https://www.jax.org/research-and-faculty/research-labs/the-tarchini-lab>

Place of Birth: Lausanne, Switzerland (CH)

Education

Year	Degree	Field of Study	Institution
1998	B.S.	Biology	University of Geneva, CH
2004	Ph.D.	Biology (Mentor: Denis Duboule, Ph.D.)	University of Geneva, CH

Postdoctoral Training

2007-2010	Post-doctoral fellow	Institut de recherches cliniques de Montréal (IRCM)
2006	Post-doctoral fellow	McGill University, Montreal, Canada
2005	Post-doctoral fellow	University of Geneva, CH

Academic Appointments

2021-present	Associate Professor, The Jackson Laboratory (JAX)
2023-present	Research Associate Professor, Tufts University School of Medicine
2016-2023	Assistant Professor, Tufts University School of Medicine
2015-2021	Assistant Professor, The Jackson Laboratory (JAX)
2015-present	Affiliated faculty, University of Maine, Graduate School of Biomedical Science and Engineering (GSBSE)
2011-2014	Research Associate, Institut de recherches cliniques de Montréal (IRCM)

Honors and Awards

2007-2010	Human Frontier Science Program	Long-term post-doctoral fellowship
2007	Swiss National Science Foundation	Long-term post-doctoral fellowship (declined)
2006	Swiss National Science Foundation	Short-term post-doctoral fellowship

Grant Review Activities

2025	NIH CSR, Auditory System study section	Ad-hoc reviewer
2023	NIH CSR, Auditory System study section	Ad-hoc reviewer
2022	German Israeli Foundation for Scientific Research and Development	Ad-hoc reviewer
2021	NIH CSR, Auditory System study section	Ad-hoc reviewer
2019	UK Research and Innovation	Ad-hoc reviewer
2018	NIH CSR, Auditory System study section	Ad-hoc reviewer

Editorial Activities

Ad-hoc Reviewer: Nature, The New England Journal of Medicine, Science Signaling, Elife, Proceedings of the National Academy of Sciences (PNAS), Science Advances, Plos Biology, Developmental Cell, Journal of Cellular Physiology, Nature Communications, The EMBO Journal, EMBO Reports, Current Biology, Development, Journal of Neuroscience, Developmental Biology, Science Reports, Stem Cell Reports, Journal of Visualized Experiments (JOVE), Plos One, Molecular and Cellular Neuroscience, Communications Biology.

Committee Service

2021- present.	Admission director; Mammalian Genetics at JAX graduate program
2020-2022	Travel award committee, Association for Research in Otolaryngology (ARO)
2019	Tufts Neuroscience JAX-Tracks admission committee
2018-present	Organizer, Reproduction and Development Interest Group (Re-DIG) for trainee/mentor presentations, JAX
2018-present	Library committee, JAX
2016	Internal Grant Review Committee, Ad-hoc reviewer, JAX
2015-present	External speaker seminar committee, JAX
2015-present	New faculty recruiting, JAX

Outreach Activities at The Jackson Laboratory

2024	Maine Science Festival, 5 minute genius talk, ME
2020	*Art and Science presentation, Fisher Island, FL
2019	*Forum for Discovery, JAX, ME
2019	Speaker, Forum for Discovery, JAX, ME

- 2019 *Jesup Library concert, Bar Harbor, ME
- 2018 *Jesup Library concert, Bar Harbor, ME
- 2016 *Governor Malloy reception, JAX-GM, CT
- 2016 *Forum for Discovery, JAX, ME
- 2016 *Art and Science presentation, Eastern Connecticut University, CT
- 2015 *Maine Center for Creativity event, JAX, ME
- 2015 *Board of Trustees reception, JAX, ME
- 2015 *Forum for Discovery, JAX, ME
- * performed with JAX President and CEO Edison Liu

External Guest Speakers Invited at JAX

- 2023 Dr. Katie Kindt, NIH/National Institute on Deafness and Other Communication Disorders (NIDCD)
- 2022 Dr. Michael Deans, University of Utah
- 2021 Dr. Benjamin J. Perrin, Purdue University (IUPUI)
- 2019 Dr. Jeffrey Holt, Boston Children's Hospital, Harvard University
- 2018 Dr. Peter Barr-Gillespie, Oregon Health and Science University
- 2017 Dr. Matthew Kelley, NIH/National Institute on Deafness and Other Communication Disorders (NIDCD)
- 2016 Dr. Lisa Goodrich, Harvard Medical School
- 2016 Dr. Helen McNeill, Lunenfeld-Tanenbaum Institute, Mount Sinai Hospital, Toronto, Canada

Funding Information: Current

- 2025-2027 *Exploring morphological changes in supporting cell: new cell polarity perspective and approaches*
NIH/NIDCD R21DC023369
Role: Principal Investigator
- 2024-2027 *The role of Aco2 in progressive hearing loss*
NIH/NIDCD F32 DC022781 (training fellowship)
Role: Mentor to postdoctoral fellow Lubriel Sambolin-Escobales
- 2024-2029 *Discovery of synthetic and endogenous ligands for orphan GPCR GPR156*
NIH/NIDCD R01 DC022104
Role: Co-I for Dr. Cesare Orlandi (U of Rochester)
- 2021-2026 *Hair Cell Polarization and Sensory Bundle Development*
NIH/NIDCD R01 DC015242 (competing Renewal)
Role: Principal Investigator

Goal: Investigate the role of the GPSM2/LGN-G α i protein complex and its regulators in the morphogenesis and maintenance of the hair bundle.

2021-2026 *Milestones Award following promotion to Associate Professor*
The Jackson Laboratory

2015-no limit *Start-up Funds*
The Jackson Laboratory

Funding Information: Past

2022-2025 *A small calcium-binding protein may be key to stabilize the sensory hair cell Elongation complex*
NIH/NIDCD
F31 DC020345
Role: Mentor to doctoral candidate Elli Hartig, Tufts University

2023-2024 *Modeling Hearing and Balance Disorders in Mice: The HEar@JAX Workshop*
NIH/NIDCD R13 DC021891 (conference mechanism)
Role: Principal Investigator
Goal: Supports a 1-week workshop at The Jackson Laboratory. Held Sept 15-20, 2024

2019-2024* *Mechanism and Functional Significance of Polarity Reversal in Mechanosensory Organs*
NIH/NIDCD R01 DC018304
Role: Principal Investigator (Co-PIs: R.A Eatock, K. Cullen)
Goal: Understand how reversal of hair cell orientation is achieved at the molecular level in mouse vestibular organs and zebrafish neuromasts, and how this anatomical feature contributes to organ function.
** A competing Renewal application submitted in 2024, and a revised Renewal submitted in 2025 did not obtain fundable scores.*

2022-2024 Administrative Diversity Supplement to
Hair Cell Polarization and Sensory Bundle Development
NIH/NIDCD R01 DC015242 (2 years with competing renewal)
Role: Mentor to postdoctoral fellow Lubriel Sambolin-Escobales

2021-2023 *Somatic gene transfer to the inner ear from fetus to adult*
Director's Innovation Fund, The Jackson Laboratory
Role: Principal Investigator (co-PI: Vidhya Munnamalai)

- 2021-2023 *Modeling Hearing and Balance Disorders in Mice: The HEar@JAX Workshop*
 NIH/NIDCD R13 DC019012
Role: Principal Investigator
Goal: Supports a 1 week workshop at The Jackson Laboratory. Held September 19-22, 2022.
- 2021-2022 *Training Program in Precision Genetics of Aging, Alzheimer's Disease and Related Dementias (PGAD)*
 NIH/NIA
 T32 AG062409
Role: Mentor to doctoral candidate Elli Hartig, Tufts University
- 2016-2021 *Hair Cell Polarization and Sensory Bundle Development*
 NIH/NIDCD R01 DC015242
Role: Principal Investigator
Goal: Solve the function of the GPSM2/LGN-Gai protein complex in stereocilia elongation and hair bundle morphogenesis, and study its interaction with the previously described MYO15A-WHRN-EPS8 complex.
Renewed in 2021
- 2019-2021 *"JAX Scholar" Fellowship*
 The Jackson Laboratory
Role: Mentor to post-doctoral associate Anil Akturk
- 2020-2021 *Training Program in the Genetics of Development and Origins of Disease*
 NIH/NICHD
 T32 HD00706
Role: Mentor to doctoral candidate Elli Hartig, Tufts University
- 2018-2020 *La Fondation Pour L'Audition (Paris, France) Fellowship*
 FPA RD 2018-3
Role: Mentor to post-doctoral associate Amandine Jarysta
- 2018-2019 *Modeling Hearing and Balance Disorders in Mice: The HEar@JAX Workshop*
 NIH/NIDCD R13 DC017388
Role: Principal Investigator
Goal: Supports a 1 week workshop at The Jackson Laboratory. Held September 23-28, 2018

2017-2018 *A genetic toolkit combining click chemistry and functional mutagenesis to solve Gαi signaling in vivo*
 Director's Innovation Fund, The Jackson Laboratory
Role: Principal Investigator

Educational Activities

2025-present Ph.D. Thesis Advisory Committee (Brianna Vonderhaar, University of Rochester, Pharmacology, Orlandi lab)
 2022-present Ph.D. Thesis Advisory Committee (Caryl Young, University of Maine, GSBSE, Murray lab)
 2021-present 1-2 day "Bootcamp" lecture and laboratory for first-year students joining the Tufts Neurobiology graduate program at JAX
2021-present Admission director for the Tufts Genetics graduate program at JAX ("Mammalian Genetics at JAX")
 2016, 2018, 2022, 2024 *Modeling Hearing and Balance Disorders in Mice: The HEar@JAXWorkshop*
Roles:
 - (2018, 2022, 2024): PI of the supporting R13 grant with JAX Education (Berwin)
 - (2016, 2018, 2022, 2024): Course organizer with currently Kelley, M. (NIH/NIDCD), Bowl, M. (UCL), Richardson, G. (University of Sussex), Weisz, C. (NIH/NIDCD), Hertzano, R (NIH/NIDCD)
 - Lecture on inner ear planar polarity (1h)
 - Preparation and teaching of laboratory sessions (4 afternoons)
 2016 External Ph.D. thesis reviewer (Yonatan Bhonker, Tel Aviv University)
 2015-present Genetics Program Journal Club moderator, Tufts University (once a year)
 2015-2017 Ph.D. Thesis Advisory Committee (Cong Tian, University of Maine, GSBSE)

Mentoring Activities

Summer Student Program, JAX (10 weeks per year)

2023 Kayla Bright
 2022 Lilly Krupp
 2019 Anna Kasper
 2017 Kate Romero
 2016 Michaela Flonard
 2015 Lawrence Jacobs

Academic Intern (10 hrs/week)

2018 Olivia Jolley (College of the Atlantic)

Rotation Students (1 semester)

2024	Muthumeena Ramanathan (University of Maine, GSBSE)
2022	Alexa (Lexi) Michaels (Tufts University, Genetics)
2021	Rose Besen-McNally (University of Maine, GSBSE)
2019	Elli Hartig (Tufts University, Genetics)
2016	Xi (Wes) Wu (University of Maine, GSBSE)

Current Doctoral candidate

2025-present	Muthumeena (Meena) Ramanatha (University of Maine, GSBSE)
2020-2025	Elli Hartig (Tufts University, Genetics)

Current Post-doctoral associates

2024-present	Suraj Ranganath Chakravarthy (Ph.D., NCBS, Bangalore, India)
2022-present	Lubriel Sambolin-Escobales (Ph.D., Ponce Health Sciences University, PR)
2018-2025	Amandine Jarysta (Ph.D., Université Paris Saclay-Orsay / CEA, France)

Previous trainees

2018-2022	Anil Akturk (Ph.D., Cornell University, NY), Post-doctoral associate
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Current and past other laboratory members

2023-current	Jada Veazie, Research Assistant II
2022-2024	Anil Akturk (Ph.D., Cornell University, NY), Associate Research Scientist
2022-2023	Helen Murray-James, Research Assistant I
2020-2022	Gwendolyn Rickmeyer, Research Assistant I
2018-2022	Matthew Day, Research Assistant I
2015-2018	Nick Devanney, Research Assistant I (obtained a PhD at University of Kentucky, 2023)
2015-2018	Abigail Tadenev, Ph.D., Associate Research Scientist (ARS) (currently ARS/Program Manager, Burgess laboratory, JAX)

Invitations and Lectures

April 2026	Creighton University Department of Biomedical Sciences <u>Host:</u> Dr. Justine Renauld
April 2025	University of Michigan Kresge Hearing Research Institute <u>Host:</u> Dr. Gabriel Corfas
June 2024	Gordon Research Conference, Cell Polarity Signaling Podium presenter
April 2024	University of Rochester

	Department of Pharmacology and Physiology <u>Host:</u> Dr. Cesare Orlandi
Sept 2023	University of Kentucky Department of Physiology <u>Host:</u> Dr. Catalina Velez-Ortega
Dec 2022	Stanford University Otolaryngology – Head & Neck Surgery <u>Host:</u> Dr. Stefan Heller
May 2022	University of Southern California Department of Otolaryngology – Head and Neck Surgery <u>Host:</u> Dr. Ksenia Gnedeva
April 2022	University of Virginia School of Medicine Department of Cell Biology <u>Host:</u> Dr. Xiaowei Lu
April 2022	Johns Hopkins University Center for Hearing and Balance <u>Host:</u> Dr. Kathleen Cullen
March 2022	Harvard University/ Mass. Eye and Ear Eaton Peabody Laboratories of Auditory Research <u>Host:</u> Dr. Artur Indzhykilian
2021	Association for Research in Otolaryngology (ARO) Mid-Winter Meeting Podium presenter
2020	Boston University Department of Biochemistry <u>Host:</u> Dr. Mikel Garcia-Marcos
2020	Association for Research in Otolaryngology (ARO) Mid-Winter Meeting Podium presenter
2019	Oregon Health & Science University Vollum Institute <u>Host:</u> Dr. Peter Barr-Gillespie
2019	NIH National Institute on Deafness and Other Communication Disorders (NIDCD) <u>Host:</u> Dr. Katie Kindt
2017	EMBO Conference, Cell Polarity and Membrane Dynamics Podium presenter
2017	The Rockefeller University/HHMI <u>Host:</u> Dr. A.J. Hudspeth
2017	Association for Research in Otolaryngology (ARO) Mid-Winter Meeting Podium presenter

- 2016 University of Maryland School of Medicine
Department of Otorhinolaryngology Head & Neck Surgery
Host: Dr. Ronna Hertzano
- 2016 Gordon Research Conference, Auditory System
Podium presenter
- 2016 Maine Biological and Medical Sciences Symposium
Podium presenter
- 2016 Association for Research in Otolaryngology (ARO) Mid-Winter Meeting
Podium presenter
- 2014 University of Utah
Department of Neurobiology and Anatomy/Otolaryngology
Host: Dr. Michael Deans
- 2014 Gordon Research Conference, Auditory System
Podium presenter
- 2014 Gordon Research Conference, Cell Polarity Signaling
Podium presenter
- 2014 Life Sciences Switzerland annual meeting
Podium presenter

Publications

Kindt KS and Tarchini B. Not a hair out of place: polarizing and orienting sensory hair cells. *Curr Top Dev Biol*. 2025;165:85-124. PMID: 40973240. Book chapter.

Erhardt V, Hartig E, Lorenzo K, Megathlin HR, Tarchini B, Hosur V. Systematic optimization and prediction of cre recombinase for precise genome editing in mice. *Genome Biol*. 2025 Apr 4;26(1):85. PMID: 40186303.

Hughes NC, Roberts DC, Tarchini B, Cullen KE. Instrumented swim test for quantifying motor impairment in rodents. *Science Reports*. 2024 Nov 26;14(1):29270. PMID: 39587238.

Ono K, Jarysta A, Hughes NC, Jukic A, Chang HHV, Deans MR, Eatock RA, Cullen KE, Kindt KS, Tarchini B. Contributions of mirror-image hair cell orientation to mouse otolith organ and zebrafish neuromast function. *Elife*. 2024 Nov 12;13:RP97674. PMID: 39531034.

Hartig EI, Day M, Jarysta A, Tarchini B. Proteins required for stereocilia elongation during mammalian hair cell development ensure precise and steady heights during adult life. *Proc Natl Acad Sci U S A*. 2024 Oct;121(40):e2405455121. PMID: 39320919.

Jukic A, Lei Z, Cebul E, Pinter K, Mosequeda N, David S, Tarchini B, Kindt K. Presynaptic Nr3x1 is essential for synapse assembly in hair cells. *Development* 2024. Oct 1;151(19):dev202723. PMID: 39254120.

Buswinka CJ, Rosenberg DB, Simikyan RG, Osgood RT, Fernandez K, Nitta H, Hayashi Y, Liberman LW, Nguyen E, Yildiz E, Kim J, Jarysta A, Renaud J, Wesson E, Wang H, Thapa P, Bordiga P, McMurtry N, Llamas J, Kitcher SR, López-Porrás AI, Cui R, Behnammanesh G, Bird JE, Ballesteros A, Vélez-Ortega AC, Edge ASB, Deans MR, Gnedeva K, Shrestha BR, Manor U, Zhao B, Ricci AJ, Tarchini B, Basch ML, Stepanyan R, Landegger LD, Rutherford MA, Liberman MC, Walters BJ, Kros CJ, Richardson GP, Cunningham LL, Indzhukulian AA. Large-scale annotated dataset for cochlear hair cell detection and classification. *Scientific Data*. 2024 Apr 23;11(1):416. PMID: 38653806.

Inhibitory G proteins play multiple roles to polarize sensory hair cell morphogenesis. Jarysta A, Tadenev ALD, Day M, Krawchuk B, Low BE, Wiles MV, Tarchini B. *Elife*. 2024 Apr 23;12:RP88186. PMID: 38651641.

Jia S, Tatzan EM, Goodrich EJ, Abrar R, Heiland H, Tarchini B, Deans MR. The dark kinase STK32A regulates hair cell planar polarity opposite of EMX2 in the developing mouse inner ear. *Elife*. 2023 May 5;12:e84910. PMID: 37144879.

Akturk A, Day M, Tarchini B. RGS12 polarizes the GPM2-GNAI complex to organize and elongate stereocilia in sensory hair cells. *Science Advances*. 2022 Oct 21;8(42). PMID:36260679.

Tarchini B. A Reversal in Hair Cell Orientation Organizes Both the Auditory and Vestibular Organs. *Frontiers in Neuroscience*. 2021 Sep 27;15:695914. PMID: 34646115.

Trofka A, Huang BL, Zhu J, Heinz WF, Magidson V, Shibata Y, Shi YB, Tarchini B, Stadler HS, Kabangu M, Al Haj Baddar NW, Voss SR, Mackem S. Genetic basis for an evolutionary shift from ancestral preaxial to postaxial limb polarity in non-urodele vertebrates. *Current Biology*. 2021 Nov 22;31(22):4923-4934. PMID: 34610275.

Jarysta A, Tarchini B. Multiple PDZ domain protein maintains patterning of the apical cytoskeleton in sensory hair cells. *Development*. 2021 Jul 15;148(14):dev199549. PMID: 34228789.

Kindt KS, Akturk A, Jarysta A, Day M, Beirl A, Flonard M, Tarchini B. EMX2-GPR156-Gαi reverses hair cell orientation in mechanosensory epithelia. *Nature Communications*. 2021 May 17;12(1):2861. PMID: 34001891. PMID: 34228789.

Tarchini B. (*), Lu X. New insights into regulation and function of planar polarity in the inner ear. **Neuroscience Letters**. 2019 Sep 14;709:134373. PMID: 31295539.

(*) *co-corresponding author*

Jean P, Özçete ÖD, Tarchini B. (*), Moser T. Intrinsic planar polarity mechanisms influence the position-dependent regulation of synapse properties in inner hair cells. **Proc Natl Acad Sci U S A**. 2019 Apr 30;116(18):9084-9093. PMID: 30975754.

(*) *co-corresponding author*

GPSM2-GNAI Specifies the Tallest Stereocilia and Defines Hair Bundle Row Identity. Tadenev ALD, Akturk A, Devanney N, Mathur PD, Clark AM, Yang J, Tarchini B. **Current Biology**. 2019 Mar 18;29(6):921-934.e4. PMID: 30827920.

Tarchini B. (*), Longo-Guess C., Tian C., Tadenev A.L.D, Devanney N., Johnson K.R. (2018). A spontaneous mouse deletion in Mctp1 uncovers a long-range cis-regulatory region crucial for NR2F1 function during inner ear development. **Developmental Biology**. 2018 Nov 15;443(2):153-164. PMID: 30217595.

(*) *co-corresponding author*

Siletti, K., Tarchini B. (*) and Hudspeth, A.J. (2017). Daple coordinates organ-wide and cell-intrinsic polarity to pattern inner-ear hair bundles. **Proc Natl Acad Sci USA** 114(52), E11170-E11179. PMID: 29229865.

(*) *co-corresponding author*

Tadenev, A.L.D and Tarchini, B. (2017). The Spindle Orientation Machinery Beyond Mitosis: When Cell Specialization Demands Polarization. **Advances in Experimental Medicine and Biology** 1002:209-225. PMID: 28600788.

Tarchini, B. (*), Tadenev, A.L., Devanney, N. and Cayouette, M. (2016). A link between planar polarity and staircase-like bundle architecture in hair cells. **Development** 143(21):3926-32. PMID: 27660326.

(*) *co-corresponding author*

Lacomme, M., Tarchini, B., Boudreau-Pinsonneault, C., Monat, C. and Cayouette, M. (2016). The LGN protein promotes planar proliferative divisions in the neocortex but apicobasal asymmetric terminal divisions in the retina. **Development** 143(4):575-81. PMID: 26755700.

Tarchini, B. (*), Jolicoeur, C., and Cayouette, M. (2013). A molecular blueprint at the apical surface establishes planar asymmetry in cochlear hair cells. **Developmental Cell** 27, 88-102. PMID: 24135232.

(*) *co-corresponding author*

Alsio, J.M., Tarchini, B., Cayouette, M., and Livesey, F.J. (2013). Ikaros promotes early-born neuronal fates in the cerebral cortex. *Proc Natl Acad Sci USA* 110, E716-725. PMID: 23382203.

Tarchini, B., Jolicoeur, C., and Cayouette, M. (2012). In vivo evidence for unbiased Ikaros retinal lineages using an Ikaros-Cre mouse line driving clonal recombination. *Developmental Dynamics* 241, 1973-1985. PMID: 23074133.

Tschopp, P., Tarchini, B., Spitz, F., Zakany, J., and Duboule, D. (2009). Uncoupling time and space in the collinear regulation of Hox genes. *PLoS Genetics* 5, e1000398. PMID: 19266017. PMID: 19266017.

Duboule, D., Tarchini, B., Zakany, J., and Kmita, M. (2007). Tinkering with constraints in the evolution of the vertebrate limb anterior-posterior polarity. *Novartis Foundation Symposium* 284, 130-137; discussion 138-141, 158-163. PMID: 17710851.

Tarchini, B., Duboule, D., and Kmita, M. (2006). Regulatory constraints in the evolution of the tetrapod limb anterior-posterior polarity. *Nature* 443, 985-988. PMID: 17066034.

Tarchini, B., and Duboule, D. (2006). Control of Hoxd genes' collinearity during early limb development. *Developmental Cell* 10, 93-103. PMID: 16399081.

Tarchini, B., Huynh, T.H., Cox, G.A., and Duboule, D. (2005). HoxD cluster scanning deletions identify multiple defects leading to paralysis in the mouse mutant Ironside. *Genes & Development* 19, 2862-2876. PMID: 16322559.

Kmita, M., Tarchini, B., Zakany, J., Logan, M., Tabin, C.J., and Duboule, D. (2005). Early developmental arrest of mammalian limbs lacking HoxA/HoxD gene function. *Nature* 435, 1113-1116. PMID: 15973411.

Kmita, M., Tarchini, B., Duboule, D., and Herault, Y. (2002). Evolutionary conserved sequences are required for the insulation of the vertebrate Hoxd complex in neural cells. *Development* 129, 5521-5528. PMID: 12403721.

Ph.D. Thesis

Basile Tarchini. Paralysis in spontaneous and engineered *HoxD* mutants (University of Geneva, 2004; supervised by Denis Duboule, Ph.D.).

Press Coverage

Internal

2025 Profile Highlight: Lisa Nichols. The better to hear you: Unlocking secrets of the inner ear

- <https://www.jax.org/news-and-insights/2025/august/the-better-to-hear-you-unlocking-secrets-of-the-inner-ear>
- 2022 Research Highlight: Mark Wanner. The exquisite arrangement of stereocilia in the ear.
- <https://www.jax.org/news-and-insights/2022/October/stereocilia-in-the-ear>
- 2021 Research Highlight: Mark Wanner. Building the mirror-image arrangement of sensory hair cells.
- <https://www.jax.org/news-and-insights/2021/may/building-the-mirror-image-arrangement-of-sensory-hair-cells>
- 2019 Research Highlight: Scott Edwards. Mechanisms of Sound Perception.
- <https://www.jax.org/news-and-insights/2019/april/mechanisms-of-sound-perception>
- 2019 Research Highlight: Joyce Dall'Acqua Peterson. Two proteins essential for layered stereocilia elongation in the inner-ear.
- <https://www.jax.org/news-and-insights/2019/february/two-proteins-essential-for-layered-stereocilia-elongation-in-the-inner-ear>
- 2018 Profile in *Search Magazine*: Joyce Dall'Acqua Peterson. Tuning to the inner ear.
- <https://www.jax.org/news-and-insights/2018/may/tuning-in-to-the-inner-ear>
- 2016 Research Highlight: Mark Wanner. Understanding the fine architecture of hearing.
- <https://www.jax.org/news-and-insights/2016/october/understanding-the-fine-architecture-of-hearing>

External

- 2016 Pamela Hines. Layered haircut underlies hearing. *Science*. 2016;354:594-5. doi: 10.1126/science.354.6312.594-g
<https://science.sciencemag.org/content/354/6312/594.7/tab-pdf>
 (Highlight of Tarchini et al., *Development* (2016))
- 2013 Radio interview (Radio Centre-Ville, Montreal, Canada)
 (Highlight of Tarchini et al., *Developmental Cell* (2013))

Short Biography

My scientific interests are rooted in mouse genetics and its unique potential to illuminate mechanisms in developmental and cell biology. My doctoral research addressed how *Hox* genes are transcriptionally regulated to pattern neuron organization in the spinal cord and digit formation in appendages. For my postdoctoral research, I tackled patterning at the single cell level by first investigating how cell polarity mechanisms regulate cell fate in the retina. Venturing away from the retina and focusing instead on the inner ear, I identified new polarity proteins that proved essential for hearing by defining stereocilia placement and elongation in sensory 'hair' cells. These projects laid the foundation for my independent research program at The Jackson Laboratory, beginning in 2015.

Short Research Interest Summary

Hearing and balance are essential for interacting with our surroundings. They rely on sensory 'hair' cells in the inner ear to convert mechanical signals (like sound and head movements) into electrical impulses sent to the brain. Our research focuses on understanding how hair cells develop and maintain their mechanically sensitive compartment, the hair bundle. We are particularly interested in the essential contributions made by guanine nucleotide-binding (G) proteins. In recent years, we discovered several regulators of inhibitory G proteins (GNAI, or $G\alpha_i$) that are crucial for hearing and balance. Our findings suggest that GNAI proteins play different roles in guiding hair cell orientation, elongating stereocilia in the developing hair bundle, and maintaining steady heights in mature hair bundles in all sensory organs. Understanding hair bundle development and maintenance is vital for explaining hearing loss and balance disorders. This knowledge also supports emerging therapies to rescue or regenerate hair cells that are terminally differentiated in mammals.