

Date: October 14, 2025

Lavinia Sheets, Ph.D.

Contact Information

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Present Position

2024– Associate Professor
Department of Otolaryngology
Washington University School of Medicine in St. Louis

Education

- Undergraduate
 - B.S. Biology (Music Minor), Pacific University, Forest Grove, Oregon, U.S.A.
- Graduate
 - Ph.D. Neuroscience, Oregon Health & Science University
 - "Zebrafish melanocytes as a model system to investigate intracellular transport regulation", Advisor: Bruce Schnapp
 - **Sheets L**, Ransom DG, Mellgren EM, Johnson SL, Schnapp BJ., Zebrafish melanophilin facilitates melanosome dispersion by suppressing dynein motility. Current Biology 2007 Oct 23;17(20):1721-34
- Postgraduate
 - 2007 – 2013: Postdoctoral Research Associate; Molecular Basis of Hearing and Balance, Howard Hughes Medical Institute, Oregon Hearing Research Center and Vollum Institute, Portland, Oregon, U.S.A.

Academic Positions / Employment:

2013 – 2015 Amelia Peabody Research Fellow, Independent Investigator
Massachusetts Eye and Ear
Harvard Medical School

2015 – 2017 Instructor
Massachusetts Eye and Ear
Harvard Medical School

2017 – 2024 Assistant Professor
Department of Otolaryngology
Washington University School of Medicine in St. Louis

Teaching Title and Responsibilities

Teaching of Students in Courses

2008	Instructor, Introduction to Neuroscience (BIO 492B) University of Portland
2011-12	Teaching Assistant, Model Systems Biology (CELL 620) Oregon Health & Science University
2012	Instructor, Physiology of Sensory Systems Pacific Northwest College of Art
2015	Co-director and Instructor, Molecular Biology of the Auditory System (SHBT 206) Harvard Medical School
2017, 2020, 2023	Instructor, Pathology of Human Disease States Markey Pathway Special Emphasis Course Washington University School of Medicine in St. Louis
2018	Group Leader, Fellowship/ NSF Grant Writing Workshop Washington University School of Medicine in St. Louis
2018	Group Leader, NIH Grant Writing Workshop Washington University School of Medicine in St. Louis
2019-2024	Advanced Genetics Study Section and Review Washington University School of Medicine in St. Louis
2022, 2024	Biology of the Inner Ear Marine Biological Laboratory, University of Chicago
2024, 2025	1 st Year Fundamentals, Neuroscience Washington University School of Medicine in St. Louis

Laboratory and Other Research Supervisory and Training Responsibilities

2007-2008	Research Supervisor, Research (RES 401) Portland State University
2017	Research Supervisor Harvard College

Formally Supervised Trainees

2010-2011	Mentor, Thesis (BIOL 470), Reed College Matthew W. Hagen. "Exogenous Ribeye-NAD(H) Binding Domain in Sensory Hair Cells Disrupts Basal Aggregation of Endogenous Ribeye"
2017	Mentor, Harvard College Research Program Guner Ege Eskibozkurt "Screening Zebrafish for Promoters of Hair-Cell Synapse Regeneration"
2018	Mentor, Amherst College Caroline Yao "Modeling cochlear implants via electrical stimulation of zebrafish lateral-line organs"
2018-2020	Mentor, Washington University in St. Louis, MARC uSTAR Program Joseph Kwengwa "Protective Agents against Cisplatin-Induced Hair Cell Loss"
2020-2021	Primary Advisor, Washington University in St. Louis, PACS Program, Capstone Tali Westreich "Dexamethasone as an Otoprotective Agent in Humans with a Focus on Use of Cisplatin"
2023-2025	Mentor, Amherst College Elayna Malak "Effects of low-dose cisplatin on lateral-line innervation and hair cell function"
2025-	Thesis Advisor, Washington University in St. Louis, DRSCB Graduate Program Jun Ikeda, "Mechanisms of Sensory Afferent Nerve Regeneration"

Thesis Advisory Committee Member (former)

Ariel Edward Hight, Speech and Hearing Bioscience and Technology,
Harvard Medical School (received PhD 2019)

Alaa Koleilat, Clinical and Translational Science, Mayo Clinic Graduate School of
Biomedical Sciences (received PhD 2020)

Eva Kramer, Developmental Regenerative & Stem Cell Biology, Washington
University School of Medicine (received PhD 2022)

Catherine Newsom-Stewart, Developmental Regenerative & Stem Cell Biology,
Washington University School of Medicine (defended PhD 2024)

Noah DiGeorgia, Developmental Regenerative & Stem Cell Biology,
Washington University School of Medicine (defended PhD 2024)

Thesis Exam Committee Member

Christopher Jons Buswinka, Speech and Hearing Bioscience and Technology,
Harvard Medical School (defended PhD 2024)

Thesis Advisory Committee Member (current)

Chase Weinholtz, Neuroscience Graduate Program,
Washington University School of Medicine

Michael Hilzendeger, MSTP/ Cancer Biology,
Washington University School of Medicine

Mona Jawad, Program in Audiology and Communication Sciences
Washington University School of Medicine

Xinyi Yang, Developmental Regenerative & Stem Cell Biology,
Washington University School of Medicine

University, School of Medicine and Hospital Appointments and Committees

2013-2017	Investigator, Eaton-Peabody Laboratory Massachusetts Eye and Ear Infirmary Harvard Medical School
2017-2024	Assistant Professor Department of Otolaryngology Washington University School of Medicine in St. Louis
2022-present	Admissions Committee B Division of Biology and Biomedical Sciences Washington University School of Medicine in St. Louis
2024-present	Associate Professor Department of Otolaryngology Washington University School of Medicine in St. Louis

Honors and Awards

2003	Tartar Trust Fellowship
2004	Student Talks, 2nd Place, 21st Annual Student Research Forum, OHSU
2005	Student Poster, 3rd Place, 4th European Zebrafish Genetics and Development Meeting
2004-07	Ruth L. Kirschstein NRSA Predoctoral Fellowship
2013-15	Amelia Peabody Fellowship, Eaton-Peabody Laboratories, HMS

Editorial Responsibilities

Guest Reviewing Editor

eLife

Editorial Responsibilities (continued)

Ad hoc Reviewer

Audiology and Neurotology (2019)
Biochemical Pharmacology (2024)
BiologyOpen (2024)
Communications Biology (2025)
Cellular and Molecular Life Sciences (2022)
Developmental Cell (2025)
eLife (2017- 2024)
EMBO (2017, 2023)
Frontiers (2019-2024)
Genesis: The Journal of Genetics and Development (2021)
Hearing Research (2016, 2022, 2023)
iScience (2021, 2024)
Journal of the Association for Research in Otolaryngology (2017, 2022)
Journal of Neurophysiology (2016)
Journal of Neuroscience (2019, 2020, 2025)
Journal of Physiology (2019, 2021)
Molecular Psychiatry (2025)
Otology & Neurotology (2023)
Physiological Reviews (2017)
PLoS Genetics (2023)
PLoS ONE (2016)
Scientific Reports (2018, 2019)
Science Advances (2020)
Science Translational Medicine (2024)
Synapse (2018)
Zebrafish (2021, 2024)

National Panels, Committees, Boards

2018	Reviewer, Medical Research Council (UK)
2019, 2023	Member, Special Emphasis Panel, NIDCD, National Institute of Health
2020	Ad Hoc Member, AUD, National Institute of Health
2023	Reviewer, NSPIRES, National Aeronautics and Space Administration
2023	Reviewer, Biotechnology and Biological Sciences Research Council (UK)
2023 - 2024	Chairperson, Special Emphasis Panel, NIDCD, National Institute of Health
2024	Ad Hoc Member, Special Emphasis Panel, NINDS, National Institute of Health
2025 - 2029	Standing Member, AUD, National Institute of Health

Community Service Contributions

- **School of Medicine, University, or Hospital system committees and activities**
 - Series Organizer, Seminar in Auditory Physiology, Eaton Peabody Laboratories. Harvard Medical School, 2013-15
 - Co-Director, Washington University Zebrafish Facility, 2017-present
 - Series Co-organizer, WUSTL Zebrafish Investigator Meeting, Washington University School of Medicine in St. Louis, 2017-2018
 - Reviewer, 3rd Year Neuroscience Program Grant Competition, Washington University School of Medicine in St. Louis, 2018
 - Chairperson, 3rd Year Neuroscience Program Grant Competition, Washington University School of Medicine in St. Louis, 2019, 2020
 - Reviewer, McDonnell Post-Doctoral Fellowships, Washington University School of Medicine in St. Louis, 2020
 - Reviewer, Hope Center Pilot Projects, Washington University School of Medicine in St. Louis, 2020, 2021
 - Series Organizer, Otolaryngology Research Seminar Series, 2021-22

- **School of Medicine, University, or Hospital system committees and activities (cont.)**

- Qual Exam Committee Member (Developmental Biology & Regenerative Medicine and Systems Neuroscience), 2017-present
- Series Co-organizer, WashU Zebrafish Group Meeting, Washington University School of Medicine in St. Louis, 2019-present
- Graduate Admissions Committee B, Division of Biology and Biomedical Sciences, WashU Med, 2022-2024
- Graduate Admissions Committee, Developmental Biology and Regenerative Medicine, WashU Med, 2024-present
- Midwestern Zebrafish Conference, Co-organizer, June 2024
- Co-director, R25 Resident Training Program, WashU Department of Otolaryngology, 2024-present

- **Professional Societies and Organizations**

Membership

- 2003-2007 Member, American Society for Cell Biology
- 2005-2007 Member, American Association for the Advancement of Science
- 2003- Member, Society for Neuroscience
- 2009- Member, Association for Research in Otolaryngology (ARO)
- 2016- Member, International Zebrafish Society

Leadership Position

- 2018-2021 External Relations Committee Member, ARO
- 2020-2024 spARO Facility Mentor, ARO
- 2024-2026 Vice -Chair, Auditory Systems, Gordon Research Conference
- 2025-2028 Program Committee Member, ARO

- **Media activities**

- Quoted in "Anemone proteins offer clue to restoring hearing loss" Science News, August 12, 2016

Invited Professorships and Lectureships

Invited Seminars:

Johns Hopkins School of Medicine, Department of Otolaryngology
The Center for Hearing and Balance, October 18, 2012

Amherst College
Department of Biology, February 3, 2014

Harvard Medical School, Department of Otolaryngology
Eaton-Peabody Laboratory, November 5, 2015

Ohio University, Department of Biological Sciences
College of Arts & Sciences, November 23, 2015

Washington University School of Medicine in St. Louis
Department of Developmental Biology, September 14, 2017
Department of Neuroscience, January 31, 2018
Department of Genetics, November 1, 2018

Decibel Therapeutics
January 31, 2018

Southern Illinois School of Medicine
Department of Pharmacology, April 25, 2018

Invited Seminars (continued):

National Institutes of Health

National Institute on Deafness and Other Communication Disorders, October 2, 2018

University of Florida

Whitney Laboratory for Marine Bioscience, November 9, 2018

University of Wyoming

Zoology and Physiology, December 5, 2019

University of Michigan, Department of Otolaryngology

Kresge Hearing Research Institute, February 6, 2020

Universidad de Buenos Aires

CONICET-UBA, September 22, 2020

University of Colorado

Department of Neuroscience, October 20, 2020

University of Missouri–Kansas City

School of Science and Engineering, November 3, 2022

Medical University of South Carolina

Hearing Science Interest Group, December 7, 2022

Pharmaceutical Interventions for Hearing Loss (PIHL) Working Group

Department of Defense, January 10, 2023

Harvard Medical School, Department of Otolaryngology

Eaton-Peabody Laboratory, August 1, 2023

Zebrafish Disease Models Society

RIG Meet Up/ Drug Discovery, February 28, 2024

Georgetown University

Interdisciplinary Program in Neuroscience, October 22, 2024

University of Iowa

Department of Biology, December 13, 2024

Washington University School of Medicine in St. Louis

Department of Otolaryngology Grand Rounds, November 27, 2024

Biophotonics Research Center, February 13, 2025

Ophthalmology & Visual Sciences, October 9, 2025

Research Support (Past, present, and pending grants, in forward chronological order)

- ***Governmental***
 - Principle Investigator (*past*)
Predoctoral Ruth L. Kirschstein National Research Service Award (F31GM071198)
“Regulation of Molecular Motors in Zebrafish”
09/1/2004-01/14/2007
\$83,350
 - Principle Investigator (*past*)
Department of Defense Focused Research Award (W81XWH2110826)
“Role of Innate Immune Cells in Synaptic Repair Following Noise Injury”
09/30/2021-09/30/2023
\$393,750 total direct cost
 - Principle Investigator (**present**)
NIH Research Project Grant (2R01DC016066)
“Roles of the Synapse in Hair-Cell Pathology”
07/1/2017-05/31/2028
\$325,253/yr direct cost

- **Governmental (continued)**
 - Principle Investigator (**present**)
NIH Exploratory/Developmental Research Grant Award (R21DC021762)
“Development of an *in vivo* model system of sensory afferent neuron regeneration”
09/19/2024-08/31/2026
\$275,000 total direct cost
 - Principle Investigator (**pending**)
NIH Research Project Grant (1R01DC022871)
“Roles of mitochondria in cisplatin-related toxicity”
07/1/2025-05/31/2030
\$357,496/yr direct cost
- **Non-governmental**
 - Principle Investigator (*past*)
Amelia Peabody Charitable Fund
“Zebrafish as a Model for Noise Induced Hearing Loss”
03/1/2013-03/31/2015
\$250,000
 - Principle Investigator (*past*)
Curing Kids Fund
“Bioactive Molecule Screen for Drugs that Modulate Hair-Cell Nerve Regeneration and Synaptogenesis in Zebrafish”
04/01/2016-04/01/2017
\$50,000
 - Principle Investigator (*past*)
Royal National Institute for Deaf People (formerly Action on Hearing Loss)
International Grant
“Identifying Novel Therapies to Promote Nerve Regeneration and Hair-Cell Reinnervation”
03/01/2017-04/30/2021
£176,531
 - Principle Investigator (*past*)
The McDonnell Center for Cellular and Molecular Neurobiology
“Development of an *in vivo* model system for the study of sensory afferent regeneration”
09/01/2020-08/31/2021
\$36,000
 - Principle Investigator (*past*)
Children’s Discovery Institute
“Prevention of Sensory Pathology Following Cisplatin Chemotherapy”
07/01/2017-06/30/2022
\$354,049
 - Co-investigator (**present**)
St. Baldrick’s Foundation Research Grant
“Developing a new alternative therapy to mitigate chemo-induced hearing loss in childhood cancer”
7/1/2024-6/30/2026
\$200,000

Trainee/Mentee/Sponsorship Record

• Kyle Newton, Ph.D.	Postdoctoral Trainee	2018-2022
• David Lee, M.D.	ENT Resident Postdoc	2021-2023
• Keziah-Khue Nguyen	DRSCB Postbacc Scholar	2022-2024
• Prithwjit Roychowdhury, M.D	ENT Resident Postdoc	2024-
• Sophie Cohen-Bodénès, Ph.D.	Postdoctoral Trainee	2024-
• Neva Bergemann	DRSCB Postbacc Scholar	2024-
• June Ikeda	DRSCB Graduate Student	2025-

Bibliography

Original, peer reviewed articles in refereed journals

1. **Sheets L**, Ransom DG, Mellgren EM, Johnson SL, Schnapp BJ.
Zebrafish melanophilin facilitates melanosome dispersion by suppressing dynein motility.
Current Biology 2007 Oct 23;17(20):1721-34. doi: 10.1016/j.cub.2007.09.028.
2. **Sheets L**, Trapani JG, Mo W, Obholzer N, Nicolson T.
Ribeye is required for presynaptic CaV1.3a channel localization and afferent innervation of sensory hair cells.
Development 2011 Apr;138(7):1309-19. doi: 10.1242/dev.059451.
3. **Sheets L**, Kindt KS, Nicolson T.
Presynaptic CaV1.3 channels regulate synaptic ribbon size and are required for synaptic maintenance in sensory hair cells.
The Journal of Neuroscience 2012 Nov 28; 32(48):17211-17224. doi: 10.1523/JNEUROSCI.3005-12.2012.
4. **Sheets L**, Hagen MW, Nicolson T.
Characterization of Ribeye subunits in zebrafish hair cells reveals that exogenous Ribeye B-domain and CtBP1 localize to the basal ends of synaptic ribbons.
PLoS ONE 2014 Sep 10; 9(9):e107256. doi: 10.1371/journal.pone.0107256.
5. Toro C, Trapani JG, Pacentine I, Maeda R, **Sheets L**, Mo W, and Nicolson T.
Dopamine modulates the activity of sensory hair cells.
The Journal of Neuroscience, 2015 Dec 16, 35(50):16494-16503. doi: 10.1523/JNEUROSCI.1691-15.2015.
6. Lv C, Stewart WJ, Akanyeti O, Frederick C, Zhu J, Santos-Sacchi J, **Sheets L**, Liao JC, and Zenisek D. Synaptic ribbons require Ribeye for electron density, synaptic localization and proximity to calcium channels, but not for vesicle recruitment and neurotransmitter release
Cell Reports, 2016, Jun 21;15(12):2784-95. doi: 10.1016/j.celrep.2016.05.045.
7. **Sheets L**.
Excessive activation of ionotropic glutamate receptors induces apoptotic hair-cell death independent of afferent and efferent innervation
Scientific Reports. 2017 Jan 23;7:41102. doi: 10.1038/srep41102.
8. Sebe J, Cho S, **Sheets L**, Rutherford MA, von Gersdorff H, and Raible D
Ca²⁺ permeable AMPARs mediate glutamatergic transmission and excitotoxic damage at the hair cell ribbon synapse
The Journal of Neuroscience, 2017 Jun 21;37(25):6162-6175. doi: 10.1523/JNEUROSCI.3644-16.2017.
9. **Sheets L**, He X, Olt J, Schreck M, Petralia RS, Wang Y, Zhang Q, Nicolson T, Marcotti W, Trapani JG, and Kindt KS.
Enlargement of ribbons in zebrafish hair cells increases calcium currents, but disrupts afferent spontaneous activity and timing of stimulus onset
The Journal of Neuroscience, 2017 Jun 28;37(26):6299-6313. doi: 10.1523/JNEUROSCI.2878-16.2017.

Original, peer reviewed articles in refereed journals (continued)

10. Warchol ME, Schrader A, **Sheets L**.
Macrophages Respond Rapidly to Ototoxic Injury of Lateral Line Hair Cells but Are Not Required for Hair Cell Regeneration
Front Cell Neurosci. 2021 Jan 8;14:613246. doi: 10.3389/fncel.2020.613246.
11. Holmgren M, **Sheets L**.
Influence of Mpv17 on hair-cell mitochondrial homeostasis, synapse integrity, and vulnerability to damage in the zebrafish lateral line
Front Cell Dev Biol. 2021 Feb 5;8:628712. doi: 10.3389/fcell.2020.628712.
12. Holmgren M, Ravicz ME, Hancock KE, Strelkova O, Indzhukulia AA, Warchol ME, and **Sheets L**.
Mechanical overstimulation causes acute injury followed by fast recovery in lateral-line neuromasts of larval zebrafish
eLife, 2021, 10:e69264 doi: 10.7554/eLife.69264
13. Lee DS, Schrader S, Bell E, Warchol ME, **Sheets L**.
Evaluation of Cisplatin-Induced Pathology in the Larval Zebrafish Lateral Line
Int J Mol Sci. 2022 Nov 18;23(22):14302. doi: 10.3390/ijms232214302.
14. Lee DS, Schrader S, Warchol ME, **Sheets L**.
Cisplatin exposure acutely disrupts mitochondrial bioenergetics in the zebrafish lateral-line organ
Hear Res. 2022 Dec;426:108513. doi: 10.1016/j.heares.2022.108513. Epub 2022 May 7.
15. Saettele AL, Wong HC, Kindt KS, Warchol ME, **Sheets L**.
Prolonged Dexamethasone Exposure Enhances Zebrafish Lateral-Line Regeneration but Disrupts Mitochondrial Homeostasis and Hair Cell Function
J Assoc Res Otolaryngol. 2022 Dec;23(6):683-700. doi: 10.1007/s10162-022-00875-x.
16. Newton KC, Kacev D, Nilsson SRO, Saettele AL, Golden SA, **Sheets L**.
Lateral Line Ablation by Ototoxic Compounds Results in Distinct Rheotaxis Profiles in Larval Zebrafish
Communications Biology 2023 Jan 21;6(1):84. doi: 10.1038/s42003-023-04449-2.
17. Lee DS, Schrader A, Zou J, Ang WH, Warchol ME, **Sheets L**.
Direct targeting of mitochondria by cisplatin leads to cytotoxicity in zebrafish lateral-line hair cells.
iScience. 2024 Sep 17;27(10):110975. doi: 10.1016/j.isci.2024.110975.
18. David S, Pinter K, Nguyen KK, Lee DS, Lei Z, Sokolova Y, **Sheets L**, Kindt KS.
Kif1a and intact microtubules maintain synaptic-vesicle populations at ribbon synapses in zebrafish hair cells.
J Physiol. 2024 Oct 7. doi: 10.1113/JP286263.

Reviews, peer reviewed in refereed journals

1. Kindt KS and **Sheets L**
Transmission disrupted: modeling auditory synaptopathy in zebrafish
Front. Cell Dev. Biol., 11 September 2018. doi: 10.3389/fcell.2018.00114.
2. Holmgren M and **Sheets L**
Using the zebrafish lateral line to understand the roles of mitochondria in sensorineural hearing loss
Front. Cell Dev. Biol., 05 February 2021 doi: 10.3389/fcell.2020.628712
3. **Sheets L**, Holmgren M, Kindt KS.
How Zebrafish Can Drive the Future of Genetic-based Hearing and Balance Research
J Assoc Res Otolaryngol. 2021 Jun;22(3):215-235. doi: 10.1007/s10162-021-00798-z.

Invited Articles

1. **Sheets L**
Tail of two fishies: age and afferents influence zebrafish lateral-line hair cell regeneration
J Physiol. 2021 Jul 10. doi: 10.1113/JP282012.