ARMINDA SULI, Ph.D.

Associate Professor
Physiology and Developmental Biology *(801) 422-2646*
Brigham Young University *asuli@byu.edu*
3048 LSB
Provo, UT 84602

EDUCATION

Postdoctoral Fellow
University of Washington, Seattle, WA (2008-2013)

PhD in Neurobiology and Anatomy
University of Utah, Salt Lake City, UT (2001-2007)

BS in Microbiology, Minor in Chemistry
Brigham Young University, Provo, UT (1996-1999)

AS in Natural Science
Ricks College, Rexburg, ID (1994-1996)

PROFESIONAL AND RESEARCH EXPERIENCE

Associate Professor, Department of Physiology and Developmental Biology (PDBIO)
Brigham Young University, Provo, UT (August 2013- Present)

- Ribbon synapse formation in mechanosensory hair cells
- Identification and development of multisensory integrating cells in the optic tectum
    - Developing optogenetic tools to identify and study auditory-visual integrating neurons in optic tectum

Postdoctoral Fellow, Department of Biological Structure
University of Washington, Seattle, WA (2008-2013)
Mentor: David Raible, PhD; Ed Rubel, PhD

- Developed a novel behavioral test to assess the functionality of mechanosensory lateral line system in zebrafish, which is responsible for motion detection in fish and amphibians.
- Studied ribbon synapses in mechanosensory lateral line hair cells.
- Developed a new bipartite gene expression system that uses the tryptophan repressor and its upstream activating sequence (TrpR/tUAS).

Doctoral Student, Molecular Biology Program: Department of Neurobiology and Anatomy
University of Utah, Salt Lake City, UT (2001-2007)
Mentor: Chi-Bin Chien, PhD (deceased)

- Investigated how nervous system and vascular/lymphatic system formation are dependent on each other during embryogenesis.
- Studied dendritic guidance during nervous system development in neurons that innervate the lateral line hair cells.

Laboratory Technician, Department of Pathology
University of Utah/ARUP Laboratories, Salt Lake City, UT (1999-2001)
Mentor: Elaine Lyon, PhD

- Established a novel real-time PCR assay for breast cancer detection by quantifying HER2/*neu* gene amplification.

Undergraduate Researcher, Department of Microbiology
Brigham Young University, Provo, UT (1997-1999)
Mentor: Ronald Leavitt, PhD

- Worked on developing an interfering bacterial agent to fight Colibacillosis in turkeys.

EDUCATIONAL ACTIVITIES

Instructor, BYU

- PDBIO550R, Light Microscopy and Digital Imaging, Brigham Young University (Winter 2018-present)
- PDBIO482/PDBIO382, Developmental Biology, Brigham Young University (Winter 2014-present)
- PDBIO494R/PDBIO295R, Undergraduate Research in Physiology and Developmental Biology (Fall 2013-present)
- PDBIO495R**,** Advanced Undergraduate Research in Physiology and Developmental Biology (Summer 2014-present)
- Neuro449R, Neuro Research Experience (2014-present)
- PDBIO498**,** Advanced Senior Research in Physiology and Developmental Biology (Winter 2016-present)
- PDBIO649R**,** Laboratory Research in Physiology and Developmental Biology (Fall 2013-present)

Guest Lecturer, BYU

- PDBIO463**,** Genetics of Human Disease (Winter 2016)

Course Coordinator

- Zebrafish Development and Genetics Summer Course Marine Biological Laboratories, Woods Hole, MA. (Summer 2011)

Instructor

- Senior Undergraduate Neurobiology Seminar Series. Course supported by HHMI funding. University of Washington, Seattle, WA. (Winter 2011)
- Biology of Inner Ear, Marine Biological Laboratories, Woods Hole, MA. (Summer 2010)
- Zebrafish Development and Genetics, Marine Biological Laboratories, Woods Hole, MA. (Summer 2008, Summer 2005)
- Medical Student Gross Anatomy, University of Utah School of Medicine, Salt Lake City, UT. (Fall 2005)

Undergraduate Research Students Trained, BYU

P. Robe, Z. Swenson, J. Armknecht, B. Hellberg, T. Hoybjerg, R. Petersen, D. Cahoon, M. Hansen, J. Ivey, B. Merrill, H. Waddel, C. Cooper, Z. Malhees, N. Nelson, N. Waltz, B. Warner, S. Young, C. Keenan, S. Cox, J. Oldroyd, L. Woodward, A. Graff, S. Caton, J. Dunn, D. Rallsion, K. Manner, A. Dunn, M. Mortensen, C. Hansen, E. Marks.

Thesis Chair, BYU
Annalie Martin (Ph.D.) 2019-present
Thesis: Understanding optic tectum circuitry

Maurice Hunt (M.S.) 2020-present
Thesis: Identification and development of multisensory integrating cells in the optic tectum

Thesis Defense, External Reviewer
Rakesh Kumar Banote (Ph.D.) 2017
Thesis: Physiological role of amyloid precursor protein during neural development. Inst. Neuroscience and Physiology, Sahlgrenska Academy, University of Gothenburg

UNIVERSITY SERVICE, BYU
Chair of PDBIO New Faculty Hire Search Committee (2020-2021)
Member of "PDBIO Research Committee" (2019)
Member of "College of Life Sciences Faculty Advising Committee" (2017-present)
Member of "Brigham Young University Biosafety Committee" (2017-2018)
Member of "Neuroscience Graduate Committee" (2017-2018)
Member of "PDBIO Graduate Committee" (2014-2017)
Organizer of "Q&A Session with Faculty for PDBIO Students" (Fall 2016)
Member and Chair for "Mentoring Environment Grant Review Committee" (2014, 2015)

COMMUNITY OUTREACH
Presenter, University of Washington Brain Awareness Week Open House, Seattle WA. (2012)
- Taught middle and high school students about hearing biology, damage and protection.

Presenter, Loyal Heights Elementary School Science Fair, Seattle WA. (2012)
- Taught elementary school students about hearing biology, damage and protection.

Grant Reviewer, University of Washington Center for Ecogenetics and Environmental Health (CEEH) Pilot Committee, Seattle WA. Institute supported by grant UL1RR025014 from the NIH National Center for Research Resources. (2011)
Presenter, Loyal Heights Elementary School Science Fair, Seattle WA. (2009)
- Organized and presented an exhibit about using zebrafish model system to study development.

FUNDING
- NICHD,NIH, Identifying and characterizing multisensory neurons in the optic tectum of zebrafish larvae. Arminda Suli (PI) *$449,997 including indirect costs (scored below payline, expected to be funded in 2019)*
- BYU, Gerontology Program, The role of neurexins and neuroligins in the formation of synapses in mechanosensory hair cells. (2017, 2018) Arminda Suli (PI) $10,000/year
- BYU, Tech Transfer Office, Leveraging three anti-influenza drug patent applications by development of a zebrafish larvae virus-injection assay. (2017, 2018) David Busath (PI), Arminda Suli (Co-PI) $15,000/year
- BYU, College of Life Sciences, Myriad Award of Excellence in Learning Leadership. (2017) Arminda Suli (PI) $10,000
- BYU, College of Life Sciences, New Faculty Start-Up Grant. (2013-2016) Arminda Suli (PI) $20,000/year
- Otolaryngology Research Training Grant. University of Washington, WA (2011-2012) Arminda Suli T32 DC000018-28

- Hearing and Balance Science Research Grant. Hearing Health Foundation New York, NY (2009-2011) $25,000/year

Undergraduate Student Funding, BYU

- Rallison, D. College of Life Sciences Undergraduate Research Award (2020)
- Dunn, A. College of Life Sciences Undergraduate Research Award (2020)
- Dunn, J.D. College of Life Sciences Undergraduate Research Award (2019)
- Caton, S.A. College of Life Sciences Undergraduate Research Award (2019)
- Keenan C. Tracking the development of zebrafish tectal neurons. BYU Office of Research and Creative Activities, Undergraduate Mentoring Grant. (2017)
- Cooper C., Warner B. RibeyeA protein in zebrafish and the auditory system. BYU Office of Research and Creative Activities, Undergraduate Mentoring Grant. (2016)
- Ivey J. Inducible and reversible system for protein degradation in zebrafish. BYU Office of Research and Creative Activities, Undergraduate Mentoring Grant. (2016)
- Waddel H. Transcription factor interactions in developing hair cells. BYU Office of Research and Creative Activities, Undergraduate Mentoring Grant. (2016)
- Waddel H. Sensory integration in zebrafish larvae. BYU Office of Research and Creative Activities, Undergraduate Mentoring Grant. (2015)

AWARDS

- Teaching Apprenticeship. HHMI Future Faculty Fellows Program (Competitive Selection), University of Washington, WA (2009)
- 1st place in postdoctoral poster presentation. Northwest Society for Developmental Biology Regional Meeting. Friday Harbor Laboratory, San Juan Island, WA (2009)
- Graduate Research Travel Award, University of Utah, Salt Lake City, UT (2003)
- Academic Scholarship, Brigham Young University, Provo, UT (1996-1999)
- Golden Key National Honor Society
- Phi Theta Kappa National Honor Society
- Presidential Scholarship, Ricks College, Rexburg, ID (1994-1996)

PROFESIONAL MEMBERSHIPS

Society for Neuroscience
Society for Developmental Biology
Genetics Society of America
Association for Research in Otolaryngology

INVITED TALKS

One fish, two fish, transgenic fish, green fish: Using zebrafish to study multisensory neurocircuitry development. (2017) Utah Valley University, Orem UT

One fish, two fish, transgenic fish, green fish: Using zebrafish to study multisensory neurocircuitry development. (2017) Inst. Neuroscience and Physiology, Sahlgrenska Academy, University of Gothenburg

Spotty hearing: Understanding ribbon synapse localization at mechanosensory hair cell synapses. Southwest Regional Meeting of the Society for Developmental Biology Regional Meeting. (2016) SLC, UT

Ribbon localization at mechanosensory hair cell synapses. LDS Life Sciences Symposium. (2016) Lehi, UT

PUBLICATIONS

Dunn JD* †, Caton SA* †, Waltz NK* †, Woodward LR*, Seng F, McLaughlin S, Schultz S, Suli A. Optic tectum responses to different levels of saccular stimulation (2020) (*in preparation)*

Warner BK*, Alder JK, Suli A. Genome Editing in Zebrafish using CRISPR/Cas9: Applications for Developmental Toxicology. In: Hansen J., Winn L. (eds) (2019) Developmental Toxicology. Methods in Molecular Biology, vol 1965. Humana, New York, NY

Sheffield ID, McGee MA, Glenn SJ, Baek DY, Coleman JM, Dorius BK, Williams C, Rose BJ, Sanchez AE, Goodman MA, Daines JM, Eggett DL, Sheffield VC, Suli A, Kooyman DL. (2018) Osteoarthritis-Like Changes in Bardet-Biedl Syndrome Mutant Ciliopathy Mice (*Bbs1*$^{M390R/M390R}$): Evidence for a Role of Primary Cilia in Cartilage Homeostasis and Regulation. Frontiers in Physiology. 9:708.

Ringer KP, Roth MG, Garey MS, Piorczynski TB, Suli A, Hansen JM, Alder JK. (2018) Comparative analysis of lipid-mediated CRISPR-Cas9 genome editing techniques. Cell Biology International. 42(7):849-858.

Suli A, Pujol R, Cunningham DE, Hailey D, Prendergast A, Rubel EW, Raible DW. (2016) Innervation regulates synaptic ribbons in lateral line mechanosensory hair cells. Journal of Cell Science. 129 (11):2250-60. (*corresponding author*)

Yoshimatsu T, D'Orazi F, Gamlin C, Suzuki S, Suli A, Kimelman D, Raible DW, Wong RO. (2016) Presynaptic partner selection during retinal circuit reassembly varies with timing of neuronal regeneration in vivo. Nature communications. 7:10590.

Suli A**,** Guler AD, Raible DW, Kimelman D. (2014) Targeted gene expression system using the tryptohpan repressor in zebrafish shows no silencing in subsequent generations. Development 141,1-8.

McGraw HF, Snelson CD, Prendergast A, Suli A and Raible DW. (2012) Postembryonic neuronal addition in zebrafish dorsal root ganglia is regulated by Notch signaling. Neural development. 7:23.

Suli A**,** Watson GM, Rubel EW, Raible DW. (2012) Rheotaxis in larval zebrafish is mediated by lateral line mechanosensory hair cells. PloS ONE. 7 (2):e29727

Lim AH†, Suli A†, Yaniv K, Weinstein B, Li DY, Chien CB. (2011) Motorneurons are essential for vascular pathfinding. Development. 138 (17):3847-57.
(†Authors contributed equally to the work)

Willardsen MI, Suli A, Pan Y, Marsh-Armstrong N, Chien CB, El-Hodiri H, Brown NL, Moore KB, Vetter ML. (2009) Temporal regulation of Ath5 gene expression during eye development. Developmental Biology. 326 (2):471-81.

Navankasattusas S, Whitehead KJ, Suli A, Sorensen LK, Lim AH, Zhao J, Park KW, Wythe JD, Thomas KR, Chien CB, Li DY. (2008) The Netrin Receptor, UNC5B, Promotes Angiogenesis in Specific Vascular Beds. Development. 135 (4): 659-667.

Suli A, Mortimer N, Shepherd I, Chien CB. (2006) Netrin/DCC signaling controls contralateral dendrites of octavolateralis efferent neurons. The Journal of Neuroscience. 26(51): 13328-37

Wilson BD†, Ii M†, Park KW†, Suli A†, Sorensen LK, Larrieu-Lahargue F, Urness LD, Suh W, Asai J, Kock GA, Thorne T, Silver M, Thomas KR, Chien CB, Losordo DW, Li DY. (2006) Netrins promote developmental and therapeutic angiogenesis. Science. 313 (5787): 640-4.
(†Authors contributed equally to the work)

Millson A, Suli A, Hartung L, Kunitake S, Bennett A, Nordberg MC, Hanna W, Wittwer CT, Seth A, Lyon E. (2003) Comparison of two quantitative polymerase chain reaction methods for detecting HER2/neu amplification. Journal of Molecular Diagnostics. 5(3):184-90.

Lyon E, Millson A, Suli A. HER2/neu gene amplification quantified by PCR and melting peak analysis using a single base alteration competitor as an interval standard. In Meuer, Wittwer, and Nakagawara: "Rapid Cycle Real Time PCR-Methods and Application". (2001) Springer-Verlag, Heidelberg, Germany.

* Undergraduate students
†Authors contributed equally to the work

SELECTED PRESENTATIONS AT MEETINGS

Dunn JD*†, Caton SA*†, Waltz NK*†, Woodward LR*, Suli A. Dissecting optic tectum microcircuitry that responds to saccular activation. Society for Developmental Biology. (2019) Boston, MA

Rallison DS*†, Manner WK*†, Dunn AR*†, Young S†*, Ivey J†*, Merrill B†*, Alder JK, Suli A. Using Pin1 and Aux1 channel proteins to adapt the auxin inducible degradation system to all zebrafish tissues. Society for Developmental Biology. (2019) Boston, MA

Dunn JD*†, Caton SA*†, Waltz NK*†, Woodward LR*†, Suli A. Identifying and characterizing multisensory integrating neurons in the optic tectum of zebrafish. Suli presenter at Zebrafish PI Meeting. (2019) Asilomar, CA

Dunn JD*†, Caton SA*†, Waltz NK*†, Woodward LR*†, Suli A. Identifying and characterizing multisensory integrating neurons in the optic tectum of zebrafish. Utah Fish Conference, (2018) SLC, UT

Dunn JD*†, Caton SA*†, Waltz NK*†, Woodward LR*†, Suli A. Identifying and characterizing multisensory integrating neurons in the optic tectum of zebrafish. Snowbird Neuroscience Symposium, (2018) SLC, UT

Rallison DS*†, Young S*†, Ivey J*†, Warner BK*†, Cox SA*†, Merrill B*†, Manner WK*, Alder JK, Suli A. Using the auxin inducible degradation system to conditionally remove the cytomatrix protein Bassoon at mechanosensory hair cell ribbon synapses. Utah Fish Conference, (2018) SLC, UT

Rallison DS*†, Young S*†, Ivey J*†, Warner BK*†, Cox SA*†, Merrill B*†, Manner WK*, Alder JK, Suli A. Using the auxin inducible degradation system to conditionally remove the cytomatrix protein Bassoon at mechanosensory hair cell ribbon synapses. Snowbird Neuroscience Symposium, (2018) SLC, UT

Oldroyd J*, Graff A*, Davis M*, Suli A. The role of Neuroligins and Neurexins in mechanosensory hair cell synapse formation. Association for Research in Otolaryngology Conference. (2018) San Diego, CA.

Warner B*, Cox SA*, Young S*, Ivey JE*, Merrill B*, Alder JK, Suli A. Determining the role of *bassoon* in ribbon development. Association for Research in Otolaryngology Conference. (2018) San Diego, CA.

Waltz N, Caton S*, Suli A. Multisensory integration in the optic tectum of zebrafish. Workshop on Zebrafish Neural Circuits and Behavior. (2017) Rockville, MD.

Waltz N*, Mahlees Z*. Ostlund I, Suli A. Multisensory integration in the optic tectum of zebrafish. Society for Developmental Biology. (2017) Minneapolis, MN

Waltz N*, Mahlees Z*, Ostlund I, McLaughlin S, Burgess H, Suli A. Multisensory integration in the optic tectum of zebrafish. College of life sciences poster presentations. (2017) BYU, Provo, UT.

Glenn SJ*, Williams C*, Daines J*, Jensen A*, Starley J*, Suli A, Kooyman DL. Zebrafish as a structural model for studying osteoarthritis. Osteoarthritis Research Society International. (2017) Las Vegas, NV.

Keenan C*, Woodward L*, Waltz N*, Ostlund I, Burgess H, Suli A. Tracking zebrafish tectal neuron lineage. 2017. College of life sciences poster presentations. (2017) BYU, Provo, UT

Oldroyd J*, Suli A. Neuroligins and Neurexins in lateral line mechanosensory hair cells. College of life sciences poster presentations. (2017) BYU, Provo, UT

Warner B*, Harper S*, Alder JK, Suli A. Endogenously tagging RibeyeA protein in zebrafish. College of life sciences poster presentations. (2017) BYU, Provo, UT

Cooper C*, Warner B*, Alder JK, Suli A. The role of RibeyeA protein and ribbon synapses in the lateral-line system of zebrafish. Utah Conference for Undergraduate Research. (2016) SLC UT.

Waddel H*, Nelson N*, Suli A. Transcription factor interactions in developing hair cells. Utah Conference for Undergraduate Research. (2016) SLC UT.

Merrill B*, Ivey J*, Alder JK, Suli A. Auxin-induced protein degradation in zebrafish. Utah Conference for Undergraduate Research. (2016) SLC UT.

Suli A, Pujol R, Cunningham DE, Haley D, Rubel E, Raible D. Innervation regulates synaptic ribbons in lateral line mechanosensory hair cells, 11th International Conference on Zebrafish Development and Genetics. (2014) Madison, WI

* Undergraduate students
†Authors contributed equally to the work