JAMES STROTHER, Ph.D.
Assistant Professor of Biology

I graduated from UC Berkeley with a Bachelor's degree in Physics. Inspired by the complexity of biological systems, I went on to study physiology and biomechanics at UC Irvine and earned my PhD for research on the respiratory physiology of fishes. Intrigued by animal behavior, I next examined the architecture of the neural circuits that process visual stimuli in *Drosophila* as a postdoctoral fellow at the Howard Hughes Medical Institute Janelia Campus. I subsequently started my own lab at Oregon State University and just recently moved to the Whitney Laboratory.

My current research focuses on questions at the interface between neurobiology and physiology using fishes as model organisms. My lab is especially interested in understanding processes at multiple levels of organization, from the properties of individual cells up to the responses of the whole animal. Ongoing projects in the lab examine a range of topics, including nervous control of the cardiovascular system, the effects of stress on animal behavior, and the biomechanics of feeding. Several of my lab's projects leverage fish larvae as a model system, since their small size, transparency, and genetics toolkit enable unique experimental approaches.

Education:

2000-2005	B.A. Physics, University of California, Berkeley
2005-2011	Ph.D., Dept. of Ecology and Evolution, University of California, Irvine
2011-2015	Postdoctoral Fellow, Janelia Research Campus, Howard Hughes Medical Institute

Professional Experience:

2015-2019	Assistant Professor, Dept. of Integrative Biology, Oregon State University
2019-Present	Assistant Professor of Biology, Whitney Laboratory for Marine Bioscience, University of Florida

Research Interests:

- Nervous control of the cardiovascular system
- Neural circuits mediating stress induced behaviors
- Biomechanics of ventilation in fishes
- Biomechanics of filtering feeding in fishes

Honors:

- Grover Stephens Award, University of California – Irvine (2010)
- Grant In Aid of Research Fellow, Society for Integrative and Comparative Biology (2007)
- Grant in Aid of Research Fellow, Sigma Xi (2006)
- GAANN Fellowship, University of California – Irvine (2005)
- Best Student Poster, DIZ, Society for Integrative and Comparative Biology (2002)
- Biology Fellow, University of California - Berkeley (Fall 2001, Spring 2002, Summer 2002)
- Gompertz Fellow, University of California – Berkeley (2001)
- Alumni Scholar, University of California – Berkeley (2000-2001)

Membership in Professional Societies:

- Society for Integrative and Comparative Biology
- Society for Neuroscience

Recent Publications (2003-Present):

Total citations: 1084
h-index: 15
i10-index: 17

Lunsford, E.T., Bobkov, Y.V., Ray, B.C., Liao, J.C., Strother, J.A. Anion efflux mediates transduction in the hair cells of the zebrafish lateral line. In review.

Gibbs, B.J., Strother, J.A., Liao, J.C. Recording central nervous system responses of freely-swimming marine and freshwater fishes with a customizable, implantable AC differential amplifier. In review.

Strother, J.A. 2021. Reduction of spherical and chromatic aberration in axial-scanning optical systems with tunable lenses. *Biomedical Optics Express*. 12(6): 3530-3552.

Strother, J.A. 2021. Aberration corrected optical assembly. US Patent App. 63159626. Filed 3/11/2021.

Haney, W.A., Moussaoui, B., and Strother, J.A. 2020. Prolonged exposure to stressors suppresses exploratory behavior in zebrafish larvae. J. Exp. Biol. 223: 1-12.

Overacker, R.D., Banerjee, S., Neuhaus, G.F., Millicevic Sephton S., Herrman, A., Strother, J.A., Brack-Werner, R., Blakemore, P.R., Loesgen, S. 2019. Biological evaluation of molecules of the azaBINOL class as antiviral agents: Inhibition of HIV-1 RNase H activity by 7-isopropoxy-8-(naphth-1-yl)quinoline. *Bioorganic & Medicinal Chemistry*. 27(16):3595-3604.

Paig-Tran, E.W.M., Strother, J.A., Divi, R.V. 2019. Filtration system and method of use. US Patent Application No 16,240,732.

Divi, R.V., Strother, J.A.*, and Paig-Tran, E.W.M.* 2018. Manta rays feed using ricochet separation, a novel nonclogging filtration mechanism. *Science Advances*, eaat9533. *Co-corresponding

Strother, J.A., Wu, S.T., Rogers, E.M., Eliason, J.L.M., Wong, A.M., Nern, A., and Reiser, M.B. 2018. Behavioral state modulates the ON visual motion pathway of *Drosophila*. *PNAS*, E102-E111.

Strother, J.A., Wu, S.T., Wong, A.M., Nern, A., Rogers, E.M., Le, J.Q., Rubin, G.M., and Reiser, M.B. 2017. The emergence of directional selectivity in the visual motion pathway of Drosophila. *Neuron*, 94(1): 168-182.

Strother, J.A., Nern, A., and Reiser, M.B. 2014. Direct observation of ON and OFF pathways in the *Drosophila* visual system. *Current Biology*, 24: 976-983.

Strother, J.A. 2013. A computational model of flow between the microscale respiratory structures of fish gills. *J. Theor. Biol.*, 338: 23-40.

Strother, J.A. 2013. Hydrodynamic resistance and flow patterns in the gills of a tilapine fish. *J. Exp. Biol.*, 216: 2595-2606.

Paig-Tran, E.W.M., Bizzarro, J.J., Strother, J.A., and Summers, A.P. 2011. Bottles as models: predicting the effects of varying swimming speed and morphology on size selectivity and filtering efficiency in fishes. *J. Exp. Biol.*, 214: 1643-1654.

Gidmark, N.J., Strother, J.A., Horton, J.M., Summers, A.P., and Brainerd, E.L. 2011. Locomotory transition from water to sand and its effects on undulatory kinematics in sand lances (*Ammodytidae*). *J. Exp. Biol.*, 214: 657-664.

von Dassow, M., Strother, J.A., and Davidson, L.A. 2010. Surprisingly simple mechanical behavior of a complex embryonic tissue. *PLOS One*, 5(12): E15359.

Motta, P.J., Maslanka, M., Hueter, R.E., Davis, R.L., de la Parra, R., Mulvany, S.L., Habegger, M.L., Strother, J.A., Mara, K.R., Gardiner, J.M., Tyminski, J.P., Zeigler, L.D. Feeding anatomy, filtering rate, and diet of whale sharks *Rhincodon typus* off the Yucatan Peninsula, Mexico. *Zoology*. *Zoology*, 113: 199-212

Nowroozi, B.N., Strother, J.A., Horton, J.M., Summers, A.P., and Brainerd, E.L. 2009. Whole-body lift and ground effect during pectoral fin locomotion in the nothern spearnose poacher (*Agonopsis vulsa*). *Zoology (Jena)*, 112: 393-402.

McHenry, M.J., Feitl, K.E., Strother, J.A., and Van Trump, W.J. 2009. Larval zebrafish rapidly sense the water flow of a predator's strike. *Biol. Letters*, 5: 477-479.

McHenry, M.J., Strother, J.A., and van Netten, S.M. 2008. Mechanical filtering by the boundary layer and fluid structure interaction in the superficial neuromast of the fish lateral line system. *J. Comp Physiol A*, 194: 795-810.

Van Wassenbergh, S., Strother, J.A., Flammang, B.E., Ferry-Graham, L.A., and Aerts P. 2008. Extremely fast prey capture in pipefish is powered by elastic recoil. *J.R. Soc. Interface*, 5: 285-296.

Koehl, M.A.R., Strother, J.A., Reidenbach, M.A., Koseff, J.R., and Hadfield, M.G. 2007. Individual-based model of larval transport to coral reefs in turbulent, wave-driven flow: behavioral responses to dissolved settlement inducer. *MEPS*, 335:1-18.

Long, J.H., Lammert, A.C., Pell, C.A., Kemp, M., Strother, J., Crenshaw, H.C., and McHenry, M.J. 2004. A navigational primitive: biorobotic implementation of cycloptic helical klinotaxis in planar motion. *IEEE Journal of Oceanic Engineering*, 29(3): 795-806.

McHenry, M.J., Azizi, E., and Strother, J.A. 2003. The hydrodynamics of locomotion at intermediate Reynolds numbers: undulatory swimming in ascidian larvae (Botrylloides sp). *J. Exp. Biol.*, 206: 327-343.

McHenry, M.J. and Strother, J.A. 2003. The kinematics of phototaxis in larvae of the ascidian *Aplidium constellatum*. *Marine Biology*, 142: 173-184.

Research Support:

Current

2019-2023 NSF IOS 1932707: Functional morphology of a high-efficiency filtration mechanism identified in manta rays (PI, $274,273)

Previous

2018 Oregon State University SciRIS: Identifying new antinociceptive compounds for treating chronic pain and itch using *in vivo* assays (Co-PI, $10,000)