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Associate Professor of Biology



Since the time of Aristotle, we have marveled at the ability of animals to run, fly and swim. These behaviors are the product of the interaction between the intent of the organism and the physics of the world they inhabit. How can sailfish reach swimming speeds of 68 miles per hour? How can seabirds fly 40,000 miles each summer in search of food? More and more, we are looking at how animals sense and navigate their environment to provide inspiration for designing better planes, ships and robots. We have active research interests in the following topics:

BIOMECHANICS: We are interested in the mechanics, energetics and control of how fish swim in natural flow conditions. Fishes routinely encounter unsteady flows in nature, such as when schooling or swimming behind a rock in a stream. Our approach is to expose fish to unsteady flows found in the characterized wakes of simple objects such as cylinders. By systematically altering vortex size, spacing, and shedding frequency, we have found that fish can extract energy from their environment and save energy by swimming in turbulent flows. Our current work looks to understand the role of body shape, flexibility and kinematics in exploiting flows under more complex hydrodynamic habitats.

NEUROSCIENCE: Animals must accurately sense their environment in order to translate them into appropriate motor behaviors. In fishes, hair cells of the lateral line system enable the ability to sense water flow during important behaviors such as catching food or escaping from predators. Our lab takes advantage of optical, genetic and electrophysiological techniques available in zebrafish to examine the organization and physiology of neurons involved in flow sensing and locomotion. Advances in zebrafish genetics allow us to use powerful techniques to monitor the connectivity and function of neurons in an intact, behaving animal.

MOVEMENT ECOLOGY: We track and monitor red drum movement and migration patterns in Northeast Florida via acoustic telemetry. Red drum (*Sciaenops ocellatus*) are known to aggregate in St. Augustine for spawning each year. Despite this species' economical and ecological importance, the local residency patterns of reproductively active fish are poorly known. Our goal is to better understand local fish habitat usage so we can unlock the mysteries of migration. We are part of the *iCoast* UF Moonshot Initiative and the FACT (Florida Atlantic Coast Telemetry Network), a network that provides access to over a thousand acoustic receivers located from Cuba to Nova Scotia.

Education:

2003-2004 Ph.D. Harvard University, Cambridge, MA
1999-2003 M.A. Harvard University, Cambridge, MA
1993-1996 B.A. Wesleyan University, Middletown, CT *magna cum laude*

Employment:

2016- Associate Professor, Department of Biology UF, Whitney Laboratory for Marine Bioscience
2015- Affiliate Professor, Clayton Pruitt Family Department of Biomedical Engineering, UF
2011- Research Associate, Division of Vertebrate Zoology, American Museum of Natural History
2009-2016 Assistant Professor, Department of Biology UF, Whitney Laboratory for Marine Bioscience
2009- Affiliate Assistant Curator of Ichthyology, Florida Museum of Natural History
2007-2008 Research Associate, Department of Neurobiology, Cornell University
2004-2007 NIH NRSA Postdoctoral Fellow, Cornell University

Honors:

- 2016 University Term Professor (2016-2019)
- 2015 Blavatnik Award for Young Scientists, UF Nomination
- 2004 Elsevier Young Investigator Award, 2nd place, Society for Experimental Biology
- 2003 Derek Bok Certificate of Excellence in Teaching, Harvard University (1999-2003)
- 2003 Stoye Award, American Society for Ichthyologists and Herpetologists
- 2003 Robert A. Chapman Memorial Scholarship, Harvard University

Research Interests:

- Neurobiology of sensory and motor systems
- Biomechanics of aquatic locomotion
- Ecology, evolution and behavior of fishes

Professional Societies:

- Association for Research in Otolaryngology
- Society for Integrative and Comparative Biology
- International Society for Neuroethology

Grants:

- 2021 Elizabeth and John Taylor Foundation: Acoustic telemetry for marine fish conservation (\$50,000, 1 year, PI)
- 2021 NSF Physics of Living Systems (POLs): Schooling through vortex streets: a biological and computational approach to understanding collective behavior in wild fish (\$540k, 3 years, PI)
- 2021 Anonymous Foundation- *iCoast*: Unlocking the secrets of migration: real-time tracking of large marine animals for conservation (\$188k, 1 year, PI)
- 2020 Anonymous Foundation- *iCoast*: Unlocking the secrets of migration: real-time tracking of large marine animals for conservation (\$260k, 1 year, PI)
- 2019 Patagonia Conservation Grant. Redfish Conservation in Northeast Florida (\$20k for 1 year, PI)
- 2019 Anonymous Foundation- Unlocking the secrets of migration: real-time tracking of large marine animals for conservation (\$60k, 1 year, PI)
- 2019 NSF IOS Animal Behavior- Flexibility and robustness of attack and evasion: reverse-engineering the mechanisms of behavioral control (\$620k, 3 years, co-PI)
- 2019 UF *iCoast*: A 21st century coastal monitoring network (\$750,000 for 2 years, co-PI Whitney Lab)
- 2019 UF SEED Grant- Karman gait ladders for improving fish passage (\$100k, 2 years, co-PI)
- 2018 Private Foundation- Unlocking the secrets of migration: real-time tracking of large marine animals for conservation (PI, \$120,000, 01/01/18-01/01/20)
- 2016 NIH RO1 NIDCD-Organization and functional of lateral line afferents-Amendment. (PI, \$32,382, 7/1/16 – 6/30/18)
- 2013 NSF IOS- Single neuron resolution of flow sensing in the zebrafish lateral line during development (sole PI, \$516,083, 7/1/13-6/30/16)
- 2010 NIH RO1 NIDCD- Organization and functional of lateral line afferents (sole PI, \$1.73 million, 7/1/10-6/30/15)
- 2010 UF Office of Research- South East Neuroscience Conference (\$3000)
- 2004 National Institutes of Health NRSA Postdoctoral Fellowship (\$122,700, 11/1/04-10/31/07)
- 2002 Sigma Xi Grants in Support of Research (\$3000)
- 2002 Lerner-Gray Fund, American Museum of Natural History (\$3000)
- 2000 Putnam Expedition Grant, Harvard Museum of Comparative Zoology (\$2,600)
- 2000 Bermuda Biological Station Grant in Aid of Research (\$1600)
- 1995 Howard Hughes Undergraduate Summer Scholarship (declined)
- 1993-96 Charles Ray Scholarship and Wesleyan Scholarship, Wesleyan University

1991-15 Awards < \$1500: UF Faculty travel award, Harvard University Graduate Student Council Travel Award, SICB Grants in Aid of Research, ASIH Student Travel Award, Mote Marine Laboratory Scholarship, The School for Field Studies Scholarship

Publications:

total citations: 4,560 ----- h-index: 29 ----- i10-index: 38

(Undergraduate^U, Technician^T, Graduate^G, Postdoc^P)

46. Lunsford^G, E.T., Paz, A., Keene, A.C., **Liao, J.C.** 2022. *Evolutionary convergence of a neural mechanism in the cavefish lateral line system*. eLife. doi:10.7554/eLife.77387.
45. **Liao, J.C.** 2022. *Fish swimming efficiency* Current Biology. Volume 32, Issue 12. R666-R671. doi.org/10.1016/j.cub.2022.04.073.
44. Akanyeti, O., Di Santo, V., Goerig, E., Wainwright, D.K., **Liao, J.C.**, Castro-Santos, T., Lauder, G.V. 2022. *Fish-inspired segment models for undulatory steady swimming* (2022). Bioinspiration & Biomimetics. doi:10.1088/1748-3190/ac6bd6.
43. Di Santo, V., Goerig, E., Wainwright, D.K.,^P, Akanyeti, O., **Liao, J.C.**, Castro-Santos, T., Lauder, G.V. 2021. *Convergence of undulatory swimming kinematics across a diversity of fishes*. Proceedings of the National Academy of Sciences. 118(49). doi:10.1073/pnas.2113206118.
42. Skandalis, D.A.^P, Lunsford, E.T.^G, and **Liao, J.C.** 2021. *Corollary discharge enables proprioception from lateral line sensory feedback*. PLoS Biology. 19(10). doi:10.1371/journal.pbio.3001420.
41. Cook, C.N., Freeman, A.R., **Liao, J.C.** Mangiamele, L.A. 2021. *The philosophy of outliers: reintegrating rare events into biological science*. Integrative and Comparative Biology. 61(6): 2191-2198. doi:10.1093/icb/icab166.
40. Schwab, F., Lunsford, E.T.^G, Hong, T., Wiesenmüller, F., Kovac, M., Park, Y.L., Akanyeti, O., **Liao, J.C.**, Jusufi, A. 2021. *Body caudal undulation measured by soft sensors and emulated by soft artificial muscles*. Integrative and Comparative Biology. 61(5): 1955-1965. doi:10.1093/icb/icab182.
39. Lunsford, E.T.^G and **Liao, J.C.** 2021. *Activity of Posterior Lateral Line Afferent Neurons During Swimming in Zebrafish*. Journal of Visualized Experiments. 168: e62233. doi:10.3791/62233.
38. Yi Zhu, Y., Tian, F., Young, J., **Liao, J.C.**, and Lai, J.C.S. 2021. *A numerical study of fish adaption behaviors in complex environments with a deep reinforcement learning and immersed boundary–lattice Boltzmann method*. Scientific Reports. 11(1): 1-20. doi:10.1038/s41598-021-81124-8.
37. Hein, A.M., Altshuler, D.L., **Liao, J.C.**, Martin, B.T., Taylor, G.K. 2020. *An algorithmic approach to natural behavior*. Current Biology. 30(11): R663-R675. doi:10.1016/j.cub.2020.04.018.
36. Johansen, J.L.^P, Akanyeti, O.^P, and **Liao, J.C.** 2020. *Oxygen consumption of drift-feeding rainbow trout: the energetic tradeoff between locomotion and feeding in flow*. Journal of Experimental Biology. 223(12): jeb220962. doi:10.1242/jeb.220962.
35. Lunsford, E.T.^G, Skandalis, D.A.^P and **Liao, J.C.** 2019. *Efferent modulation of spontaneous lateral line activity during and after zebrafish motor commands*. Journal of Neurophysiology. 122(6): 2438-2448. doi:10.1152/jn.00594.2019.
34. McHenry, M.J., Johansen, J.L.^P, Soto, A.P., Free, B.A., Paley, D.A. and **Liao, J.C.** 2019. *The pursuit strategy of predatory bluefish (Pomatomus saltatrix)*. Proceedings of the Royal Society B. 286(1897). doi:10.1098/rspb.2018.2934.

33. Yanagitsuru, Y.R. ^G, Akanyeti, O. ^P, and **Liao, J.C.** 2018. *Head width influences flow sensing by the lateral line canal system in fishes*. Journal of Experimental Biology. 221(21): jeb180877. doi:10.1242/jeb.180877.
32. Haehnel-Taguchi, M. ^P, Akanyeti, O. ^P, **Liao, J.C.** 2018. *Behavior, Electrophysiology, and Robotics Experiments to Study Lateral Line Sensing in Fishes*. Integrative and Comparative Biology. 58(5): 874-883. doi:10.1093/icb/icy066.
31. Akanyeti, O. ^P, Putney, J. ^U, Yanagitsuru, Y.R. ^G, Lauder, G.V., Stewart, W.J. ^P, and **Liao, J.C.** 2017. *Accelerating fishes increase propulsive efficiency by modulating vortex ring geometry*. Proceedings of the National Academy of Sciences. 114(52): 13828-13833. doi:10.1073/pnas.1705968115.
30. **Liao, J.C.** and Akanyeti, O. ^P. 2017. *Fish swimming in a Kármán vortex street: kinematics, sensory biology and energetics*. Marine Technology Journal. 51(5): 48-55. doi:10.4031/MTSJ.51.5.8.
29. Liu, G., Ren, Y., Dong, H., Akanyeti, O. ^P, **Liao, J.C.** and Lauder, G. 2017. *Computational analysis of vortex dynamics and thrust enhancement due to body-caudal fin interactions in carangiform fish locomotion*. Journal of Fluid Mechanics. 829: 65-88. doi:10.1017/jfm.2017.533.
28. Stewart, W.J. ^P, Johanssen, J. ^P and **Liao, J.C.** 2017. *A non-toxic dose of cobalt chloride blocks the zebrafish lateral line*. Hearing Research. 350: 17-21. doi:10.1016/j.heares.2017.04.001.
27. Stewart, W.J. ^P, Tian, F., Akanyeti, O. ^P, Walker, C. T. ^T and **Liao, J.C.** 2016. *Refuging rainbow trout selectively exploit flows behind tandem cylinders (highlighted and featured article)*. The Journal of Experimental Biology. 219(14): 2182-2191. doi:10.1242/jeb.140475.
26. Caixia, L., Stewart, W.J. ^P, Akanyeti, O. ^P, Frederick, C., Zhu, J., Santos-Sacchi, J., Sheets, L., **Liao, J.C.** and Zenisek, D. 2016. *Synaptic ribbons require ribeye for electron density, proper synaptic localization, and recruitment of calcium channels*. Cell Reports. 15(12): 2784-2795. doi:10.1016/j.celrep.2016.05.045.
25. Akanyeti, O. ^P, Thornycroft, P.J.M., Lauder, G.V., Yanagitsuru, Y.R. ^G, Peterson, A.N. ^T and **Liao, J.C.** 2016. *Fishes optimize sensing and respiration during undulatory swimming*. Nature Communications. 7(1): 1-8. doi:10.1038/ncomms11044.
24. Ristroph, L. **Liao, J.C.**, and Zhang, J. 2015. *Lateral line layout correlates with the differential hydrodynamic pressure on swimming fish*. Physical Review Letters. 114(1): 018102. doi:10.1103/PhysRevLett.114.018102.
23. Levi, R. ^P, Akanyeti, O. ^P, Ballo, A. ^T and **Liao, J.C.** 2015. *Frequency response properties of primary afferent neurons in the posterior lateral line system of larval zebrafish*. The Journal of Neurophysiology. 113(2): 657-668. doi:10.1152/jn.00414.2014.
22. Haehnel-Taguchi M. ^P, Akanyeti, O. ^P and **Liao, J.C.** 2014. *Afferent and motoneuron activity in response to single neuromast stimulation in the posterior lateral line of larval zebrafish*. The Journal of Neurophysiology. 112(6): 1329-1339. doi:10.1152/jn.00274.2014.
21. **Liao, J.C.** 2014. *Functional Architecture in Lateral Line Afferent Neurons in Larval Zebrafish*. Flow Sensing in Air and Water: Behavioral, Neural and Engineering Principles of Operation. Bleckman, Mogdans & Coombs (Eds.). Springer, New York. 319-332. doi:10.1007/978-3-642-41446-6_13
20. Akanyeti, O. ^P and **Liao, J.C.** 2013. *A kinematic model of Kármán gaiting in rainbow trout (cover article)*. The Journal of Experimental Biology. 216 (24): 4666-4677. doi:10.1242/jeb.093245.

19. Akanyeti, O. ^P and **Liao, J.C.** 2013. *The effect of flow speed and body size on Kármán gait kinematics in rainbow trout*. The Journal of Experimental Biology. 216(24): 3442-3449. doi:10.1242/jeb.087502.
18. McHenry, M.J. & **Liao, J.C.** 2013. *The Hydrodynamics of Flow Stimuli*. Handbook of Auditory Research: The Lateral Line System. Coombs, Bleckman, Fay & Popper (Eds.). Springer, New York. 48: 73-98. doi:10.1007/2506_2013_13.
17. **Liao, J.C.** and Cotel, A. 2012. *Effects of turbulence on fish swimming in aquaculture*. Swimming Physiology of Fish. Chapter 5: 109-127. Palstra and Planas (Eds.). Springer, Berlin Heidelberg. doi:10.1007/978-3-642-31049-2_5.
16. Olszewski, J. ^U, Haehnel, M. ^P, Taguchi, M. ^T and **Liao, J.C.** 2012. *Zebrafish Larvae Exhibit Rheotaxis and Can Escape a Continuous Suction Source Using Their Lateral Line*. PLoS ONE. 7(5): e36661. doi:10.1371/journal.pone.0036661.
15. **Liao, J.C.** and Haehnel, M. ^P 2012. *Physiology of afferent neurons in larval zebrafish provides a functional framework for lateral line somatotopy*. The Journal of Neurophysiology. 107(10): 2615-2623. doi:10.1152/jn.01108.2011.
14. Haehnel, M. ^P, Taguchi, M. ^T and **Liao, J.C.** 2012. *Heterogeneity and dynamics of lateral line afferent innervation during development in zebrafish (Danio rerio)*. Journal of Comparative Neurology. 520(7): 1376-1386. doi:10.1002/cne.22798.
13. Lacey, J.R.W., Neary, V.S., **Liao, J.C.**, Enders, E.C., and Tritico, H.M. 2011. *The IPOS framework: linking fish swimming performance in altered flows from laboratory experiments to rivers*. River Research and Applications. 28(4): 429-443. doi:10.1002/rra.1584.
12. Tian, F-B., Luo, H., Zhu, L., **Liao, J.C.** and Lu, X-Y. 2011. *An efficient immersed boundary-lattice Boltzmann method for the hydrodynamic interaction of elastic filaments*. Journal of Computational Physics. 230(19): 7266-7283. doi:10.1016/j.jcp.2011.05.028.
11. Taguchi, M. ^T and **Liao, J.C.** 2011. *Trout decrease oxygen consumption in turbulence: evidence for an energetic hierarchy across speed and behaviors*. The Journal of Experimental Biology. 214(9): 1428-1436. doi:10.1242/jeb.052027.
10. **Liao, J.C.** 2010. *Organization and physiology of posterior lateral line afferent neurons in larval zebrafish*. Biology Letters. 6(3): 402-405. doi:10.1098/rsbl.2009.0995.
9. **Liao, J.C.** and Fetcho, J.R. 2008. *Shared versus specialized glycinergic spinal interneurons in axial motor circuits of larval zebrafish*. The Journal of Neuroscience. 28(48): 12982-12992. doi:10.1523/JNEUROSCI.3330-08.2008.
8. **Liao, J.C.** 2007. *A review of fish swimming mechanics and behavior in altered flows*. Philosophical Transactions of the Royal Society B. 362(1487): 1973-1993. doi:10.1098/rstb.2007.2082.
7. **Liao, J.C.** 2006. *The role of the lateral line and vision on body kinematics and hydrodynamic preference of rainbow trout in turbulent flow*. The Journal of Experimental Biology 209(20): 4077-4090. doi:10.1242/jeb.02487.
6. Beal, D.N., Hover, F.S., Triantafyllou, M.S., **Liao, J.C.** and Lauder, G.V. 2006. *Passive propulsion in vortex wakes*. Journal of Fluid Mechanics. 549: 385-402. doi:10.1017/S0022112005007925.
5. **Liao, J.C.** 2004. *Neuromuscular control of fish swimming in a vortex street: implications for energy economy*. The Journal of Experimental Biology 207(20): 3495-3506. doi:10.1242/jeb.01125.

4. **Liao, J.C.**, Beal, D. N., Lauder, G.V., and Triantafyllou, M.S. 2003. *Fish exploiting vortices decrease muscle activity (cover article)*. Science 302(5650): 1566-1569. doi:10.1126/science.1088295.
3. **Liao, J.C.**, Beal, D. N., Lauder, G.V., and Triantafyllou, M.S. 2003. *The Kármán gait; novel body kinematics of rainbow trout swimming in a vortex street (cover article)*. The Journal of Experimental Biology 206(6): 1059-1073. doi:10.1242/jeb.00209.
2. **Liao, J.C.** 2002. *Swimming in needlefish (Belonidae): anguilliform locomotion with fins*. The Journal of Experimental Biology 205(18): 2875-2884. doi:10.1242/jeb.205.18.2875.
1. **Liao, J.C.** and Lauder, G.V. 2000. *Function of the heterocercal tail in white sturgeon: flow visualization during steady swimming and vertical maneuvering*. The Journal of Experimental Biology 203(23): 3585-3594. doi:10.1242/jeb.203.23.3585.

Presentations and Published Abstracts:

Gibbs, B.J., Morgan, C., Longmire, S. Liao, J.C. 2023. Swimming kinematics and energetics of wild red drum under ecologically relevant flows. Society for Integrative and Comparative Biology. Austin, TX.

Liao, J.C., Coraggioso, M. Demarchi, L. Ginoux, F. Mirat, O. Paço, M., Sridhar, G., Wyart, C. 2023. Fine motor kinematics of larval zebrafish in laminar flow. Society for Integrative and Comparative Biology. Austin, TX.

Liao, J.C. 2022. The importance of natural behavior and ecology in driving animal locomotion research. The Whitney Lab for Marine Bioscience.

Liao, J.C. 2021. The efferent neurons of the lateral line system prevent signal distortion and enhances sensing during swimming. 44th Association for Research in Otolaryngology

Lunsford, E.T., Keene, A.C., and Liao, J.C. 2021. Neurophysiological Basis of Enhanced Lateral Line Sensitivity in Blind Cavefish. 44th Association for Research in Otolaryngology

Liao, J.C. Rajeev, E., Canestrelli, A., and Ray, B. 2021. Flooded forests in flow; trout exploit wakes behind multi-cylinder arrays. Integrative and Comparative Biology.

Lunsford, E.T., Keene, A.C., and Liao, J.C. 2021. Evolution of eye loss shapes lateral line sensitivity of blind cavefish during swimming: new insights from neurophysiology. Integrative and Comparative Biology.

Gibbs, B.J., Akanyeti, O., Liao, J.C. 2021. Pectoral fin kinematics and electromyography in Karman gaiting trout. Integrative and Comparative Biology.

Liao, J.C. 2020. Fluid-fish interactions: an integrative approach to aquatic sensing and locomotion. Center for Environmental and Applied Fluid Dynamics, Dept. of Mechanical Engineering, Johns Hopkins University

Liao, J.C. 2020. How Fish Feel: Robotic Inspiration from Sensory Information. Robotics Inspired Biology Workshop IROS.

Liao, J.C. 2020. Fish Behavior Using Artificial Intelligence. UF Dept Biology.

Liao, J.C. and Angelini, C. 2020. iCoast; Coastal Monitoring for Action. UF Foundation National Board Meeting, Gainesville FL.

Liao, J.C. and Akanyeti, O. 2020. How fishes use body wave interference to accelerate. Society for Integrative and Comparative Biology, Austin, TX.

Lunsford, E.T. and Liao, J.C. 2020. Lateral line activity is attenuated during the glide phase of intermittent swimming behavior. *Integrative and Comparative Biology*. 60, E145-E145

Liao, J.C. 2019. Sensorimotor transformations and energetics in aquatic locomotion. Monterey Bay Aquarium Research Institute

Liao, J.C. 2019. Hair cells and vortex streets: understanding how fish sense and exploit flow. Hopkins Marine Lab, Stanford University

Liao, J.C. 2019. Attack and Evasion Workshop: Kavli Institute for Theoretical Physics UCSB

Liao, J.C. 2019. Life in flow: neurophysiology and biomechanics of aquatic locomotion. Department of Biology, University of Montana.

Liao, J.C. 2019. The biomechanics and neuroscience of fish swimming in unsteady flows. Department of Civil Engineering. University of Auckland

Lunsford E.T. and Liao, J.C. 2019. Efferent neurons modulate lateral line activity during active and passive phases of intermittent swimming behavior in zebrafish. South-Eastern Regional Zebrafish Conference, University of Miami.

Skandalis, D.A., Lunsford, E.T., Liao, J.C. 2019. Optogenetic dissection of cholinergic and dopaminergic efferent neuron function in the lateral line system of zebrafish suggests a linear microcircuit model. *Integrative and Comparative Biology*, 59, E214-214.

Liao, J.C. and Akanyeti, O. 2018. The Interplay between Locomotion and Lateral Line Sensing in Swimming Fishes. *Integrative and Comparative Biology*. 58, E4-E4

Lunsford, E.T., Liao, J.C. 2018. Lateral Line Afferent Neurons Decrease Spike Rate During Motor Activity in Larval Zebrafish. *Integrative and Comparative Biology*. 58, E139-E139

Lubeck, L.A., Lunsford, E.T., Haehnel-Taguchi, M., Liao, J.C. 2018. Live-imaging reveals organization of efferent neurons in the zebrafish lateral line system. *Integrative and Comparative Biology*. 58, E367-E367

Lauder, G., Akanyeti, O., Castro-Santos, T., Disanto, V., Dong, H., Goerig, E., Liao, J.C., Wainwright, D.K. 2018. Comparative Undulatory Kinematics in Swimming Fishes: Quantitative Database from a Diversity of Species. *Integrative and Comparative Biology*. 58, E128-E128

Liao, J.C., Akanyeti, O., Putney, J., Yanagitsuru, Y.R., Lauder, G.V., Stewart, W.S. 2018. Acceleration in fishes; a multi-species comparison reveals a common hydrodynamic mechanism. Society for Integrative and Comparative Biology, San Francisco, California.

Liao, J.C. The biomechanics and neuroscience of fish behavior. 2018. Volunteer/Docent lecture. The Whitney Lab for Marine Bioscience.

Stewart W., Johansen J. and Liao J.C. 2017. A non-toxic dose of cobalt chloride blocks hair cells of the zebrafish lateral line. Association for Research in Otolaryngology, Baltimore Maryland.

Liao J.C., Haehnel-Taguchi M. and Akanyeti O. 2016. Afferent spike response to mechanical deflection of single neuromasts in the zebrafish lateral line system. 10th Federation of European Neuroscience Societies, Copenhagen Denmark.

Liao J.C. 2016. The response of the zebrafish lateral line to mechanical stimulation. Association for Research in Otolaryngology, San Diego, California.

Stewart W., Akanyeti O., Tian F, Liao J.C. and Walker C. 2016. Trout selectively swim behind tandem cylinders in flow depending on gap spacing. Society for Integrative and Comparative Biology, Portland, Oregon.

Liao J.C. 2015. Fish locomotion and sensing. The Whitney Lab for Marine Bioscience, NSF REU Seminar.

Liao J.C. Smith C and Haehnel-Taguchi M. 2015. Regional specialization of posterior lateral line efferent neurons in the hindbrain of larval zebrafish. Association for Research in Otolaryngology, Baltimore, Maryland.

Akanyeti O, Liao J.C. 2015. Using 3-D printing technology to investigate the function of cranial lateral line canals in fishes during rheotaxis. Society for Integrative and Comparative Biology, West Palm Beach, Florida.

Liao J.C. 2014. Fish swimming and flow sensing. Departmental Seminar, Biomedical Engineering. University of Florida.

Liao J.C., Akanyeti O., Ballo A., Haehnel-Taguchi M. and Levi R. 2014. Responses of larval zebrafish to single neuromast deflections in the lateral line system International Conference for Neuroethology, Hokkaido, Japan.

Liao J.C. 2014. Effects of mechanical stimulation on the lateral line neuromasts in larval zebrafish: from afferent activity to motor response. 7th World Congress of Biomechanics, Boston MA.

Haehnel-Taguchi M., Liao J.C., and Akanyeti O. 2014. Afferent neuron activity in response to single neuromast deflections in the posterior lateral line system of larval zebrafish. Association for Research in Otolaryngology, San Diego.

Liao J.C. Akanyeti O., Ballo A., Haehnel-Taguchi M., and Levi R. 2014. Sensory and motor responses to deflection of single neuromasts in the lateral line system in larval zebrafish. Society for Integrative and Comparative Biology, Austin, Texas.

Liao J.C. Smith C. and Haehnel-Taguchi M. 2014. Connectivity of posterior lateral line efferent neurons in the zebrafish hindbrain. Society for Integrative and Comparative Biology, Austin, Texas.

Liao J.C. 2013. Transmission characteristics and frequency response properties of the zebrafish larval lateral line. 7th European Conference on Comparative Neurobiology, Budapest, Hungary.

Liao J.C., Chambers L. and Akanyeti O. 2013. Pressure distribution on the head of a freely-swimming rainbow trout (*Onchorynchus mykiss*) in uniform flow. Society for Integrative and Comparative Biology, San Francisco, California.

Liao J.C., Ballo A. and Akanyeti O. 2013. Signal transmission properties of the zebrafish larval lateral line in response to neuromast deflections. Society for Integrative and Comparative Biology, San Francisco, California.

Liao J.C. 2012. Neural reliability of afferent neurons in the posterior lateral line system of larval zebrafish (*Danio rerio*). The Society for Neuroscience poster, 460.01/U4 New Orleans, Louisiana.

Liao J.C. 2012. The effect of swimming speed and body size on swimming kinematics of rainbow trout in a vortex street. The Society for Neuroethology, Washington D.C.

Liao J.C. 2012. Locomotion in oscillating flows: insights from experimental kinematics and modeling. UF Department of Neuroscience.

Liao J.C. and Taguchi M. 2012. Exploring the parameter space for Kármán gaiting: kinematics across speed and size. Society for Integrative and Comparative Biology, Charleston, South Carolina.

Liao J.C. and Haehnel M. 2011. Functional architecture of zebrafish lateral line afferent neurons. The Society for Neuroscience poster, 477.11/U9 Washington DC.

Liao J.C. 2011. Lateral line architecture and function in larval zebrafish. International Congress of Flow Sensing in Air and Water, Bonn, Germany.

Liao J.C. and Taguchi M. 2011. Velocity-dependent energetic hierarchy for trout swimming in vertical flows. Society for Integrative and Comparative Biology, Salt Lake City, Utah.

Liao J.C. and Taguchi M. 2011. Velocity-dependent energetic hierarchy for trout swimming in vertical flows. UF Marine Biology Symposium, The Whitney Lab for Marine Bioscience.

Liao J.C. 2010. Organization and heterogeneity in lateral line afferent neurons. International Congress for Neuroethology, Salamanca Spain.

Liao J.C. 2010. Structure and architecture of lateral line afferent neurons in larval zebrafish. UF Marine Biology Symposium.

Liao J.C. 2010. Organismal and physiological approaches to understanding vertebrate locomotion. South East Nerve Conference, Whitney Lab, Saint Augustine.

Liao J.C. 2010. *In vivo* approaches to understanding vertebrate hair cell circuits. UF Department of Neuroscience.

Liao J.C. and Fetcho J. 2010. Organization and function of lateral line afferent neurons in larval zebrafish. Society for Integrative and Comparative Biology, Seattle, WA.

Liao J.C. and Fetcho J. 2008. Insight into the neural encoding of flow; morphological and functional heterogeneity in the lateral line neurons of larval zebrafish. Society for Integrative and Comparative Biology, San Antonio, Texas.

Liao J.C. and Fetcho J. 2007. Optical and electrophysiological techniques reveal functional diversity in posterior lateral line ganglion neurons in larval zebrafish. The Society for Neuroscience, San Diego, CA.

Liao J.C. and Fetcho J. 2006. Optical, genetic, and electrophysiological techniques in larval zebrafish support a role for a commissural, glycinergic spinal interneuron type in switching motor behaviors. Society for Neuroscience, Atlanta GA.

Liao J.C. 2004. The effect of lateral line and vision on the Kármán gait. Society for Integrative and Comparative Biology, New Orleans, LA.

Liao J.C. 2004. How fish negotiate turbulent flow: function of the lateral line neuromasts. Society for Experimental Biology, Heriot-Watt University, Edinburgh, Scotland.

Liao J.C., Beal D., Lauder G.V., Hover F. and Triantafyllou M.S. 2003. Passive energy extraction in the wake of bluff objects by fish. 13th International Symposium on Unmanned, Untethered Submersible Technology, NH.

Liao J.C. and Taguchi M. 2003. The Kármán gait: insights from kinematics, electromyography and flow visualization. Society for Integrative and Comparative Biology, Toronto, Canada.

Liao J.C., Beal D., Lauder G.V. and Triantafyllou M.S. 2002. How trout swim in a von Kármán vortex street. Society of Experimental Biology, University of Swansea, Wales. (Elsevier Young Investigator Award).

Liao J.C. 2002. The Kármán gait. Division of Vertebrate Morphology, Regional Meeting. Harvard University.

Liao J.C., Beal D., Lauder G.V. and Triantafyllou M.S. 2002. Novel kinematics of a trout swimming in a vortex street. Society for Integrative and Comparative Biology, Anaheim, CA.

Liao J.C., Beal D., Lauder G.V. and Triantafyllou M.S. 2001. The Kármán gait: novel body kinematics of trout swimming in a vortex street. American Society of Ichthyologists and Herpetologists, Manaus, Brazil. (Stoye Award).

Liao J.C. 2001. Locomotion in needlefish: anguilliform swimming with fins. Society for Integrative and Comparative Biology, Chicago, IL.

Liao J.C. and Lauder G.V. 2000. Function of the heterocercal tail in sturgeon, *Acipenser transmontanus*. American Society of Ichthyologists and Herpetologists, La Paz, Mexico.

Liao J.C. and Lauder G.V. 2000. Wake dynamics of the heterocercal tail in freely-swimming sturgeon, *Acipenser transmontanus*. Society for Integrative and Comparative Biology, Atlanta GA.

Liao J.C. and Lauder G.V. 1999. Wake dynamics of the heterocercal tail in freely-swimming sturgeon, *Acipenser transmontanus*. Division of Vertebrate Morphology, Regional Meeting, Brown University.

Teaching:

- 2023 Invited lecture, Academy of Aquaculture at St. Johns Technical High School
- 2022 Instructor, *Neurophysics of Locomotion*, UC Santa Barbara Advanced School of Quantitative Biology/ Kavli Institute for Theoretical Physics (5 week summer course).
- 2022 Biomechanics in Unsteady Flows. Comparative Biomechanics, Chapman University.
- 2022 Invited Lecture: Research from a Marine Biologist, Class 4, Chapin School NYC, all-girls independent K-12 day school (01/28/2022)
- 2021 Guest Lecture, Auditory Pharmacology/Advanced Topics in Audiology, 11/15/21, UF College of Public Health & Health Professions
- 2020 ZOO: PCB4460/6456C: *Ichthyology*, Semester of Immersion, UF Dept of Biology (4 credit class)
- 2018 Instructor, *Neurophysics of Sensory Navigation*, Santa Barbara Advanced School of Quantitative Biology/ Kavli Institute for Theoretical Physics.
- 2018 Mentor NSF summer REU student Katie Stokes
- 2018 ZOO: PCB4460/6456C: *Ichthyology*, Semester of Immersion, UF Dept of Biology (4 credit class)
- 2017 Mentor, NSF summer REU student Lauren Lubeck
- 2017 GMS 6070-2B96 *Sensory Biology* UF Dept of Pharmacology
- 2016 ZOO 4926 *Science Communication: Acting for Scientists*. UF Dept of Biology (1 credit class)
- 2016 Graduate Orientation Seminar Parade of Faculty, UF Dept of Biology
- 2015 Mentor, NSF summer REU student Joy Putney
- 2015 Graduate Orientation Seminar Parade of Faculty, UF Dept of Biology
- 2015 ZOO 6927 *Marine Biology Seminar*, (spring/fall semesters). Whitney Lab, St. Augustine

- 2014 EML 4220 *Vibrations*, UF Dept of Mechanical and Aerospace Engineering (lecture)
- 2014 ZOO 6927 *Marine Biology Seminar*, (spring/fall semesters) Whitney Lab, St. Augustine
- 2013 Mentor, NSF Summer REU student Katelyn Ward (Best Presentation Award, M.A. student, Northwestern University Feinberg School of Medicine's Prosthetics-Orthotics)
- 2013 Mentor, NSF Summer REU Yuzo Yanagitsuru (SICB travel scholarship, started Ph.D. program at UF with fellowship support)
- 2013 Lecturer, Florida Master Naturalist Program, Ripple Effect Ecotours/UF IFAS
- 2013 ZOO 6927 *Marine Biology Seminar*, (spring/fall semesters) Whitney Lab, St. Augustine
- 2012 ZOO 6927 *Marine Biology Seminar*, (spring/fall semesters) Whitney Lab, St. Augustine
- 2012 BIO 135L, *Undergraduate Research: Tropical Biology on a Changing Planet*, Organization for Tropical Studies, Bocas del Toro, Panama
- 2011 ZOO 4926/6456C, *Ichthyology*, UF Dept of Biology (3 credit class)
- 2011 ZOO 6927 *Marine Biology Seminar*, (spring/fall semesters) Whitney Lab, St. Augustine
- 2011 Mentor, NSF summer REU student Lena Chen
- 2011 Research lecture, NSF summer REU
- 2011 Research lecture, UF Neuroscience Club
- 2010 Mentor, NSF summer REU student Julia Olszewski (PhD student, UNC Chapel Hill))
- 2010 GMS 6074 *Comparative and Evolutionary Neurobiology*, University of Florida (lectures)
- 2010 Academy of Biotechnology and Medical Research, Ponte Vedra Highschool (lectures)
- 2010 ZOO 6927 *Marine Biology Seminar*, (spring/fall semesters). Whitney Lab, St. Augustine
- 2009 ZOO 3713, *Functional Vertebrate Anatomy*, University of Florida (lectures)
- 2009 Mentor, Luis J. Perez, Pedro Menendez High School lab volunteer
- 2009 ZOO 6927 *Marine Biology Seminar*, (fall semester). Whitney Lab, St. Augustine
- 2007 *Biology of Fishes*, Cornell University (lectures)
- 2006 *Biological Science 1*, Cornell University (lectures)
- 2006 *Biology and Filmmaking*, HPSS S505, Rhode Island School of Design (lecture)
- 2005 *Neural Development and Genetics of Zebrafish*, Marine Biological Laboratory, Woods Hole (TA)
- 2003 *Patterns and Processes in Fish Diversity*, Harvard University (TA, lecturer)
- 2002 *Vertebrate Paleontology*, Bio 139, Harvard University (lecture).
- 2002- *Graduate Tropical Field Biology*, Organization for Tropical Studies, Cabo Blanco, La Selva, Monte Verde Costa Rica (research faculty)
- 2001 *Biology of Fishes*, Bermuda Biological Station for Research (TA, lecturer)
- 2001- *Graduate Tropical Field Biology*, Organization for Tropical Studies, Cabo Blanco, Costa Rica (research faculty)
- 2000 *Patterns and Processes in Fish Diversity*, Harvard University (TA, lecturer)
- 2000 *Advanced Topics in Vertebrate Physiology and Anatomy*, Bio 121. Harvard University (TA)
- 1999 *Patterns and Processes in Fish Diversity*, Harvard University (TA, lecturer)
- 1999 *Structure and Physiology of Vertebrates*, Harvard University (TA)
- 1998 *Physiology*, University of California at Irvine (TA)

Invited Presentations:

- 2023 Collapsing fish swimming biodiversity. Departmental Seminar Series. **Florida Museum of Natural History. University of Florida**, Gainesville FL.
- 2022 Understanding fish locomotion, sensing and behavior. Promotion to Full Professor Seminar, Department of Biology, **University of Florida**, Gainesville FL.
- 2022 The importance of natural behavior and ecology in driving animal locomotion research. **Kavli Institute for Theoretical Physics/QBIO UC Santa Barbara**.
- 2022 Reconstructing the Behavior of Fishes in Complex Environments. Department of Electrical and Computer Engineering, **University of Florida**

- 2021 Biomechanics, Neuroscience and Movement Ecology. **Harvard University** Dept. of Organismic and Evolutionary Biology, Cambridge MA.
- Soft robotics in underwater sensing systems. **Max Planck Institute for Intelligent Systems**, Stuttgart, Germany.
- The efferent neurons of the lateral line system prevent signal distortion and enhances sensing during swimming. **44th Association for Research in Otolaryngology**
- 2020 Liao, J.C. and Angelini, C. iCoast; Coastal Monitoring for Action 2020. **UF Foundation National Board Meeting, Gainesville FL.**
- When flow meets fish: insights into aquatic locomotion. **Dept. of Physics, Vrije Universiteit Amsterdam/ Okinawa Institute for Science and Technology.**
- Fluid-fish interactions: an integrative approach to aquatic sensing and locomotion. Center for Environmental and Applied Fluid Dynamics, Dept. of Mechanical Engineering, **Johns Hopkins University**
- 2019 Sensorimotor transformations and energetics in aquatic locomotion. **Monterey Bay Aquarium Research Institute**
- Hair cells and vortex streets: understanding how fish sense and exploit flow. **Hopkins Marine Lab, Stanford University**
- Attack and Evasion Workshop: **Kavli Institute for Theoretical Physics UCSB**
- Life in flow: neurophysiology and biomechanics of aquatic locomotion. Department of Biology, **University of Montana.**
- The biomechanics and neuroscience of fish swimming in unsteady flows. Department of Civil Engineering. **University of Auckland**
- 2018 Fish swimming: insights and challenges in biological fluid-structure interactions. **Fluid Structure Interactions Workshop, School of Engineering and Information Technology**, University of New South Wales, Canberra, Australia.
- Modulation of lateral line afferent neuron activity during motor behaviors in larval zebrafish. **41st Association for Research in Otolaryngology**, San Diego, California.
- 2017 Lateral line function; insights from electrophysiology and optogenetics. **Zebrafish Neural Circuits and Behavior Workshop**, NIH, Maryland D.C.
- Locomotion of salmonids in turbulence; feeding, energetics and mechanics. **NOAA NMFS** Santa Cruz, California.
- How fish sense and exploit flows. **Marine Technology Society TechSurge Meeting**, Norfolk Virginia.
- Hair cells systems in basal vertebrates. **Hearing Research Center Symposium**, Dept. of Speech, Language and Hearing Science, University of Florida, Gainesville.

- 2016 Sensory and motor physiology in fishes: from single neurons to behavior. **Center for Exercise Science** Seminar, Dept. of Applied Physiology and Kinesiology, University of Florida, Gainesville.
- Mechanisms of vertebrate behavior. **Department of Biomedical Engineering** Seminar Series, University of Florida, Gainesville.
- 2015 Understanding mechanisms of fish behavior across levels of biological organization. **Biology Department University of Florida**, Gainesville.
- How fish swim. **Daytona State College** STEM Seminar Series, Daytona, FL.
- How fish swim and sense flow. Dept of Mechanical Engineering, **NYU Polytechnical University**, Brooklyn, NY.
- 2014 Passive vortex exploitation in a cylinder wake. Auckland Bioengineering Institute, **University of Auckland**.
- How fish swim in turbulence. Institute of Marine Science and School of Biological Sciences. **University of Auckland**.
- 2013 Biomechanics and sensory biology of fish swimming. Department of Biology, **Brooklyn College**.
- 2012 Fluid-fish interactions: insights from energetics and behavior. Courant Institute of Mathematical Sciences, Applied Math Lab, **New York University**.
- 2011 Understanding the mechanics and control of fish swimming using optical, genetic and electrophysiological techniques. Department of Biology, **University of Miami**.
- 2010 Trout use less oxygen in turbulent flows: evidence for an energetics hierarchy. **International Leverhulme Workshop for Fish Passage**, Winnipeg, Canada.
- Metabolic cost of trout swimming in vortical flows. **American Society for Ichthyologists and Herpetologists**, Providence R.I.
- 2009 Understanding how fish sense and exploit flows using optical, genetic and electrophysiological techniques. Department of Theoretical Biology, **University of Groningen**, Netherlands.
- How To Catch More Fish: Insights from Biomechanics. **Evenings at the Whitney Lecture Series**.
- Links between marine science and human health. **Whitney Docent Training Program**.
- How fish swim. **Whitney Public Open House Lecture**.
- Understanding underwater locomotion. **Valdosta State University**.
- 2008 Neuromechanics of fish locomotion. Department of Engineering Science and Mechanics, **Virginia Polytechnic Institute and State University**.
- Organismal and cellular approaches to understanding vertebrate behavior. Dept. of Biology, **University of New Orleans**.

- The mechanics and sensory biology of fish swimming. Dept. of Biology, **University of Wyoming**.
- 2007 How fish encode and exploit flows in a Karman vortex street. Courant Institute of Mathematical Sciences, **New York University**.
- Physiology of flow exploitation; implications for hydraulics and ecological habitat modeling **U.S. Army Engineer Research and Development Center**, Vicksburg, MS.
- Biomechanics and neural control of adaptive behavior in fishes. Dept. of Integrative Biology, **University of Guelph**, Canada.
- Optical, genetic, and electrophysiological approaches to understanding neural circuits in larval zebrafish. Dept. of Biology, **University of Las Vegas**.
- 2006 Wu wei: the Tao of environmental vortex capture by fish. Sibley School of Mechanical and Aerospace Engineering, **Cornell University**.
- Using larval zebrafish as a model system to understand vertebrate sensorimotor systems. Dept of Biology Seminar. **Hawaii Institute of Marine Biology**.
- Fluid dynamics, physiology and sensory ecology of fishes swimming in perturbed environments. Dept. of Biology , **Scripps Institute of Oceanography/ University of California at San Diego**.
- Optical, genetic and electrophysiological approaches to understanding vertebrate sensorimotor systems. Dept. of Biology, **Indiana University**.
- 2005 Mechanics and control of fish swimming in turbulent flows. Dept of Biology, **UNC Chapel Hill**.
- Vortex exploitation in fishes. Dept. Neurobiology and Behavior, **Cornell University**.
- 2004 Mechanics and control of vortex capture in swimming fishes. Machines and Organisms Group (IGERT), **Cornell University**
- 2003 The Kármán gait: implications for passive thrust generation in a vortex street. Dept. of Integrative Biology, **University of California at Berkeley**
- To surf or swim? How fish hold station via vortex exploitation. Dept. of Biology, **University of Massachusetts**.
- 2002 How fish use vortices. **University of Guelph**, Ontario, Canada.

Service:

- 2023 GTM NERR Fish Technical Advisory Group Workshop
- 2023 Whitney Lab Graduate Student Brown Bag discussion series
- 2022 Letter writer, Tenure and Promotion Dept. of Ocean and Mechanical Engineering, Florida Atlantic University
- 2022 Program Officer, SICB Division of Comparative Biomechanics
- 2022 Panel Speaker, NIH Brain Behavior Quantification and Synchronization (BBQS) workshop on March 1 – 2, 2022
- 2021 Research Faculty Search, Whitney Lab for Marine Bioscience
- 2021 Discussion Leader, Mechanics in Physiological Systems: From Organelle to Organism. HHMI/Janelia Research Campus
- 2020- present Inclusion, Diversity, Equity and Accessibility Committee, Dept Biology UF

2020- present Inclusion, Diversity, Equity and Accessibility Committee, Whitney Lab
 2020 NSF Panel, IOS Physiological and Structural Systems Cluster Oct 19-21 2020
 Diversity Equality and Inclusion Committee, Dept Biology UF
 NSF Jumpstart SICB conference
 Diversity Equality and Inclusion Committee, Whitney Lab
 Graduate Climate Committee, Dept Biology UF
 2019 TEDxUF Salon, Invited Discussion Leader “The Modern Explorer”
 Organizer, SICB Public Affairs Committee “Persuasive Communication: When Acting Meets Science” Workshop
 2017-2019 Chair, Whitney Lab Bioengineering/Neuroscience Faculty Search
 2017-present Advisory Council, UF Biology Dept.
 2017-present Whitney Graduate Student Coordinator
 2017-2020 Public Affairs Committee, *Society for Integrative and Comparative Biology*
 2017 Molecular Neuroscience Faculty Search, UF Biology
 2016 Research Faculty Search, Whitney Lab for Marine Bioscience
 2016 UF Pre-eminence Faculty Search in Neuroscience, UF Biology
 2015 Research Faculty Search, Whitney Lab for Marine Bioscience
 2015 NSF IOS full proposal ad-hoc reviewer
 2015 Judge, The Ocean 180 Video Challenge, Florida Center for Ocean Sciences Education Excellence (COSEE)
 2014 NSF Panel Reviewer, IOS Neural Cluster (Washington, D.C.)
 2014 Chair, UF Seahorse Key Marine Lab Director Search
 2014 Best Student Presentation Judge Division of Comparative Biology (DCB), SICB
 2013 Moderator, Neuroethology Gordon Research Seminar, VT
 2013-16 UF Biology Graduate Awards Committee
 2013 Whitney Lab Research Seminar Series Coordinator
 2013 Whitney Lab Seawater Lab Planning and Development
 2013 NSF Pre-proposal Grant Committee, IOS Neural Cluster
 2013 Chair and Judge for Best Student Presentation, Division of Vertebrate Morphology (DVM) and Division of Comparative Biology (DCB), SICB
 2013- Whitney Website/Outreach Committee
 2013 Underwater webcam development, Ocean Classrooms
 2012- Review Editorial Board, *Frontiers in Aquatic Physiology*
 2012- Harvard College Undergraduate Admissions, NE Florida Recruiter and Interviewer
 2012 Director Search Committee, Whitney Lab
 2011-13 IACUC officer, Whitney Lab
 2011 Judge for Best Student Presentation, Division of Vertebrate Morphology (DVM) and Division of Neurobiology (DNB), SICB
 2011 Co-organizer, Southeast Nerve Net Conference
 2011 Judge, Best Student Presentation, Southeast Nerve Net Conference
 2011 Judge, Best Student Presentation, UF Marine Biology Symposium
 2010 Bioinformatics Faculty Search Committee, Whitney Lab
 2010 Faculty Panel Discussion Member, UF Department of Neuroscience Retreat
 2010 NSF IOS full proposal ad-hoc reviewer
 2010 Judge, Best Student Presentation, UF Marine Biology Symposium
 2010 Judge, Best Student Presentation, Southeast Nerve Net Conference
 2009 Anatomy and Physiology Lecturer search committee, UF Biology Department
 2005 Judge for Best Student Presentation SICB, Division of Vertebrate Morphology (DVM)
 2002-03 Graduate Student Representative, Dept of Organismic and Evolutionary Biology, Harvard University
 2000-03 Undergraduate Tutor in Biology (non-resident), Dunster House, Harvard University
 2000-02 Foreign Student Representative, graduate School of Arts and Sciences, Harvard University

Reviewer for:

Animal Biotelemetry
The Biological Bulletin
Bioinspiration & Biomimetics
Canadian Journal of Fisheries and Aquatic Sciences
Coral Reefs
Ecology
Environmental Biology of Fishes
IEEE Journal of Ocean Engineering
Integrative and Comparative Biology
Journal of Comparative Physiology A
Journal of Experimental Biology
Journal of Neuroscience
Journal of Theoretical Biology
Journal of Zoology
Marine Biology
Naturwissenschaften
Nature
Proceedings of the National Academy of Sciences
Transactions of the American Fisheries Society
Zoology
NSF Integrative and Organismal Systems Division
Neural Systems: Preproposal and Panel
Organism-Environment Interactions: ad-hoc
MacArthur Foundation Fellowship
Singapore-MIT Alliance for Research and Technology Grant (SMART) 8th Innovation Grant Science
Review Report

Professional Experience:

2021 Co-mentor NIH K-99 Andrea McQuate (Ph.D. U. Washington)
2020 Author, **How Fish Work**. Princeton University Press (book contract 5/20-5/21)
2017 Panel Member for screening of "A Plastic Ocean," US Green Building Council FL
Chapter
2017 Harvard University Interviewer, Northeast Florida
2016 Sunrise International Rotary Club Member
2015 CreateTech Conference NYC
2013 Student, Upright Citizen's Brigade, Improvisation I, NYC
Consultant, Science Daily, Canadian TV Program
2008 Screen Actors Guild (SAG) eligible
2006 Student, Meisner Technique (2 years), Ithaca Actor's Workshop
2004 Student, Neural Systems and Behavior, Marine Biological Laboratory, Woods Hole MA.
2003 Consultant, M.I.T. Leg Lab
2001 Consultant, Hall of Ocean Life exhibit, American Museum of Natural History
2001 Scientific Diver, Bermuda Biological Station for Research
2001 Student, Biology of Fishes, Bermuda Biological Station for Research
2000 Student, Human Gross Anatomy, Harvard Medical School
2000 Student, Phylogenetics Workshop, Bodega Marine Lab, UC Davis.
1997 Fisheries Technician, Mote Marine Laboratory
1997 Field Ecologist Intern, USGS Biological Resources Division, Hawai'i
1996 Marine Ecologist Intern, The School for Field Studies, British Columbia
1995 Semester abroad, James Cook University, Townsville Australia
1993 Student, Shoals Marine Laboratory FMS I, Cornell University
1991 Student, Humpback Whale Ecology, The School for Field Studies

Review Editorial Board:

Frontiers in Aquatic Physiology

Press/Outreach:

- 2023 Lecture, St, Johns Technical Highschool Aquaculture Group
- 2022 01/20/22 - <https://www.wired2fish.com/fish-biology/a-scientific-look-into-realistic-fishing-lures>
- 2021 04/14/21 - Podcast WeFishASA: American Sportfishing Association: <https://www.wefishasa.com/251-april-14-2021/>
01/21/21 - <https://thefishingwire.com/yamaha-rightwaters-powers-redfish-study-at-university-of-florida/>
- 2021 How fish swim. Ancient City Angling Club, St. Augustine FL.
- 2020 09/28/20 - <https://www.wired2fish.com/opinions-philosophies/chatterbait-science-vibration-and-the-right-hookset-with-rick-clunn> Wired2Fish
Sip'n Science. Virtual Public Lecture. **Whitney Laboratory for Marine Bioscience**
Virtual Town Hall, The Tao of (Just Keep) Swimming, **Kavli Institute for Theoretical Physics UCSB**
The Wild Bunch, research featured in **Florida Gator Magazine**
- 2019 05/16/19 - http://www.bassfan.com/opinion_article.asp?ID=1558 Joe Balog article
Fish Code Studios YouTube Channel (> 10,000 subscribers)
Featured article in **Hakai Magazine**: Marine Animal Movement Expert
Invited speaker, Flagler Sportfishing Association
Highlighted researcher, How to Walk on Water and Climb up Walls, book by David Hu
Host, National Geographic Wild, "When Sharks Attack" 2019 air date.
- 2018 Invited Speaker, First Coast Fly Fishers, Black Creek Outfitters
- 2017 Host, National Geographic Wild, Shark Fest "Mayhem in Mexico" July 15, 2018 air date.
Panel member, screening of A Plastic Ocean (US Green Building Council FL Chapter)
- 2016 The Scientist "Sensory Biology Around the Animal Kingdom: Feeling the Flow"
Invited speaker, Sunrise Rotary Club
Speaker, The Moth StorySLAM, NYC
UF **News** "To save energy, fish use their heads"
- 2015 UF **Explore** Magazine article "Lateral line: solving a fish mystery, with human implications"
UF **The Post**, cover story "A gem by the sea"
How fish feel. **The New Yorker** magazine, March 18th.
Inside Science, video interview (**American institute for Physics**)
Centers for Ocean Sciences Educational Excellence (COSEE) Faculty Finalist Judge
Interview for **NYU** on PRL paper
Interview for **Northern Woodlands** Magazine for PRL article 2/3/15
Interview, Laura Escobar, University of Florida 2016, B.S. Public Relations
- 2014 **Fish Code Studios**, founder, science-based videos
(<https://www.youtube.com/watch?v=aRWgqDi-ihs>)
Interview, *Shaping the Future*, **Gator** Magazine, Florida Alumni Association
Keynote Speaker, *Resolution in Science*, **Pecha Kucha** 20 x 20 St. Augustine, FL
Keynote Speaker, Marine Science and the Public, Flagler Sportfishing Club
Ocean Classrooms, underwater web camera for international marine education initiative
Featured, **Wesleyan University** Alumni News
- 2013 Actor, **Scientist for a Day**, Whitney Lab K-12 educational video
(<https://www.youtube.com/watch?v=3XVg9BbI0DQ>)
Presentations to the FL division of the American Water Resources Association (**AWRA**)
Ripple Effect EcoTours Fish Lecture (2/7/13), Master Naturalist (UF **IFAS**)
Featured Institute, UF homepage for application of particle imaging system to biology
Interview, **Palm Coast Observer**.com

James C. Liao, Ph.D.

- 2011 Research lecture, **Ponta Vedra High School**, Academy of Biotechnology and Medical Research “Links between Marine Science and Human Health” presentation to the **Whitney Lab Docents**.
- 2010 Interview, “Matanzas Inlet, Ponce redfish and Marine Biology” **Fish Daytona Webisode 9**.
- 2012 Author, *The Tao of Fishing Currents*, **In Fisherman Magazine** (national publication)
Invited audition for Animal Planet/Discovery TV show
- 2010 Actor, *Reel Science*, host for pilot reel, **National Geographic Television**
- 2009 Invited speaker, How to Catch More Fish, **Evenings at the Whitney** Public Lecture Series
- 2007 Actor, It Depends on the Lens (training video), Gender Equality in Faculty Hiring, **NSF ADVANCE and Cornell University Interactive Theatre Ensemble (CITE)**
(<http://www.news.cornell.edu/stories/2012/02/cu-advance-celebrates-majoraccomplishments>)
- 2006 Invited speaker, Trout Unlimited national conservation group.
Invited speaker, The Hook: Life Lessons Learned from Fish, **Science Cabaret**, Boyce Thompson Institute, Ithaca NY
- 2004 Interview, Physics of fish, **All Things Considered, NPR**
Author, I Believe in Turbulence, **This I Believe, NPR**
Author, This I Believe II (book): More Personal Philosophies of Remarkable Men and Women
Harvard Magazine (March/April). “The Way of Trout”
“Different Stroke,” **Natural History Magazine**
- 2003 Interview, “Physics of fish.” **National Public Radio, Morning Edition** with Chris Joyce,
<http://www.npr.org/features/feature.php?wflid=1524674>
MSNBC.com “The Tao of Fish Swimming” (<http://msnbc.msn.com/id/3607002/>)
New Scientist, Fish hitch a ride upstream on eddies,
(<http://www.newscientist.com/news/news.jsp?id=ns99994432>)
Harvard University Gazette, “Scientists show how fish save energy by swimming in schools.”
- 2001 Aqua Kinema (film), Dr. Hanna Rose Shell **Science, Technology and Society Program at M.I.T.**

References:

Dimitri Skandalis (Kavli Fellowship Jan 2022, Banting, etc)
Edwin Rajeev (UFII Graduate Fellowship in Artificial Intelligence)

1/26/22 declined Guest Editor for the open access journal Life (ISSN 2075-1729), to establish a Special Issue. Our suggested topic is ‘Fish Behavior, Movement, and Migration Patterns’.