

JEFFREY A. RIFFELL CURRICULUM VITAE

University of Washington
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EDUCATION

UC Los Angeles	Ph. D. in Physiology	2004
UC Santa Cruz	B.A. in Biology, Chemistry	1996

EMPLOYMENT

Endowed Professor	Dept. Biology, Univ. Washington	2019-current
Associate Professor	Dept. Biology, Univ. Washington	2015-2018
Assistant Professor	Dept. Biology, Univ. Washington	2010-2015
Adjunct Professor	Pima Community College	2004-2007
Postdoctoral Fellow	University of Arizona	2004-2010

RESEARCH INTERESTS: Sensory-mediated behaviors; Neuroscience; Chemical Ecology; Plant-insect interactions; Disease vector sensory ecology and neurobiology.

HONORS, FELLOWSHIPS AND AWARDS

National Geographic Explorer	2018
Endowed Professor for Excellence in Biology	2015
Kavli Frontiers of Science Fellow	2011
International Society for Neuroethology, Young Investigator Award	2010
Polak Young Investigator Award, AChemS	2009
Cota-Robles Fellow, UC Los Angeles	1998

CURRENT RESEARCH GRANTS (\$21,028,424 awarded 2020-2028)

National Science Foundation (PI) “Olfactory basis of learning in mosquitoes” (\$1,000,000).	2023-2026
Air Force Office of Scientific Research – Multi-University Research Initiative (PI) “Flexible, multimodal integration of decision and control in a spike resolved sensorimotor program for flight” (\$7,500,000)	2023-2028
NIH-NIAID (PI) “R01: Visual and olfactory integration in mosquitoes” (\$3,367,760)	2023-2028

NIH-NIAID (PI, with S. Luckhart UI) “R01: Biogenic amines, malaria and manipulation of mosquito physiology and behavior” (\$2,727,122)	2022-2026
National Science Foundation (PI) “Neural basis of olfactory behaviors in a unique mosquito-flower association” (\$800,000).	2022-2026
Bill and Melinda Gates Foundation (PI) “Re-engineering insect odorant receptors for disease diagnosis” (\$2,145,513)	2022-2024
Bill and Melinda Gates Foundation (PI) “Advanced machine learning for discovery of mosquito repellents” (\$204,015 to UW)	2022-2024
NIH-NIAID (PI) “R01: Olfactory basis of nectar-seeking in mosquitoes” (\$3,125,649)	2021-2026
Human Frontiers in Science Foundation (PI). “How do malaria mosquitoes swarm and mate? The functional biology of mating swarms”(\$335,000 to UW)	2021-2024
Air Force Office of Scientific Research (PI) “Neural and behavioral bases of sensory integration in the mosquito” (\$1,168,719)	2020-2024
Air Force Office of Scientific Research (PI) “Miniature Autonomous Odor-Guided Flight Vehicles” (\$693,414)	2020-2024

PREVIOUS RESEARCH GRANTS (2018-2021)

Royalty Research Fund (PI) “Neural and behavioral bases of visual and auditory responses in the <i>Aedes aegypti</i> mosquito” (\$38,327)	2020-2021
NSF-IOS (PI) “Collaborative Research: Origin and Evolutionary Divergence of the Pancrustacean Brain” (\$720,976)	2018-2021
NIH-NIAID (PI) “R21: Visual and olfactory integration in mosquito behavior” (\$427,625)	2019-2021
National Geographic Society Explorer’s Grant (PI) “Orchid pollination by mosquitos.” (\$25,000)	2019-2020
University of Washington Innovation Award (PI) “Genetic and neural bases of learning in the mosquito” (\$198,000)	2017-2020
Air Force Office of Scientific Research (CoPI) “Nature inspired	

flight technologies and ideas” (\$5,983,000)	2014-2020
NSF-CBET (PI) “MRI: Development of a hyper-sensed environmentally controlled wind tunnel” (\$977,475.00)	2016-2020
Air Force Office of Scientific Research (PI) “Bio-inspired volatile detection systems for human scent detection and discrimination” (\$778,270.00)	2016-2020
NSF-DEB (CoPI) “Collaborative Research: Chance or necessity? Adaptive vs. non adaptive evolution in plant-frugivore Interactions” (\$579,874)	2015-2020
NSF-DMS (CoPI) “Inference of network dynamics and architecture in neural systems with data-driven methods” (\$879,377)	2014-2020

Graduate Student Awards:

Claire Rusch	UWIN Graduate Fellowship	2016-2018
Eleanor R Lutz	NSF GRFP (\$132,000)	2015-2018
Ryo Okubo	Northwest Orchid Society (\$5,000)	2017,2018
Yasmeen Hussain	NSF GRFP (\$132,000)	2013-2016
Marie Clifford	NSF-GRFP (\$132,000)	2012-2015
	King Conservation District Grant (\$13,000)	2014
	US Fish and Wildlife Grant (\$1,000)	2014
Kelsey J. P. Byers	NSF-IOS-DDIG (CoPI with T. Bradshaw) (\$14,000)	2013-2014
	NSF-GRFP (\$132,000)	2010-2012

PATENTS / RECORD OF INNOVATIONS

- Patent 62/808,710 filed 2/21/2019 Entitled: MOSQUITO ATTRACTANT COMPOSITIONS Inventors: Jeffrey Riffell UW Reference: 48294.01US1

PUBLICATIONS – Published (*denote authors contributed equally; authors in blue are graduate students; green are undergraduates)

2023:

86. Gupta, S., Blake, A.J. and **Riffell, J.A.**, 2023. Mosquito biology: Scents and selectability. *Current Biology*, 33(12), pp.R686-R688.
85. Lahondère, C., Vinauger, C., **Liaw, J.E.**, **Tobin, K.K.**, **Joiner, J.M.** and **Riffell, J.A.**, 2023. Effect of temperature on mosquito olfaction. *Integrative and Comparative Biology*, 63, 356–367, <https://doi.org/10.1093/icb/icad066>
84. **Coles, T.A.**, **Briggs, A.M.**, Hambly, M.G., Céspedes, N., Fellows, A.M., Kaylor, H.L., Adams, A.D., **Van Susteren, G.**, **Bentil, R.E.**, Robert, M.A. and **Riffell, J.A.**, Lewis, E.E., and Luckhart, S. 2023. Ingested histamine and serotonin interact to alter *Anopheles stephensi* feeding and flight behavior and infection with *Plasmodium* parasites. *Frontiers in Physiology*, 14.83.
83. San Alberto, D.A., **Rusch, C.** and **Riffell, J.A.** 2023. Conducting an Analysis of Mosquito Flight Behaviors in a Wind Tunnel. *Cold Spring Harbor protocols*. doi: 10.1101/pdb.prot108257
82. Vinauger, C. and **Riffell, J.A.** 2023. Tethered Preparation for the Analysis of Mosquito visual-motor responses using modular visual displays. *Cold Spring Harbor Protocols*. doi: 10.1101/pdb.prot108179
81. Wolff, G.H., Lahondère, C., Vinauger, C., **Rylance, E.** and **Riffell, J.A.**, 2023. Neuromodulation and differential learning across mosquito species. *Proceedings of the Royal Society B*, 290(1990), p.20222118.

2022:

80. Briggs, A.M., Hambly, M.G., Simão-Gurge, R.M., Garrison, S.M., Khaku, Z., **Van Susteren, G.**, Lewis, E.E., **Riffell, J.A.** and Luckhart, S., 2022. *Anopheles stephensi* Feeding, Flight Behavior, and Infection With Malaria Parasites are Altered by Ingestion of Serotonin. *Frontiers in Physiology*, 13, pp. 1036-1045.
79. Gupta, S., and **J. A. Riffell**. "Chapter 30: Sensory neurophysiology and integration in mosquitoes." In *Sensory ecology of disease vectors*, pp. 773-799. Wageningen Academic Publishers, 2022.
78. Alonso San Alberto, D., **Rusch, C.**, Zhan, Y., Straw, A.D., Montell, C. and Riffell, J.A., 2022. The olfactory gating of visual preferences to human skin and visible spectra in mosquitoes. *Nature Communications*, 13(1), pp.1-14.
[Featured in: *Scientific American*, BBC, NPR National, CBS, NBC, CNN, Science Daily]

2021:

77. Santana, S.E., Kaliszewska, Z.A., **Leiser-Miller, L.B.**, Lauterbur, M.E., Arbour, J.H., Dávalos, L.M. and **Riffell, J.A.**, 2021. Fruit odorants mediate co-specialization in

a multispecies plant–animal mutualism. *Proceedings of the Royal Society B*, 288(1956), p.20210312.

76. [Rodriguez, A.M.](#), Hambly, M.G., [Jandu, S.](#), Simão-Gurge, R., Lowder, C., Lewis, E.E., **Riffell, J.A.** and Luckhart, S., 2021. Histamine Ingestion by Anopheles stephensi Alters Important Vector Transmission Behaviors and Infection Success with Diverse Plasmodium Species. *Biomolecules*, 11(5), p.719.
75. Coutinho-Abreu, I. V., Riffell, J.A., Akbari, O.S. 2021. Human attractive cues and mosquito host-seeking behavior. *Trends in Parasitology*.
74. [Rusch, C.](#), San Alberto, D. A., & **Riffell, J. A.** 2021. Visuo-motor feedback modulates neural activities in the medulla of the honeybee, Apis mellifera. *Journal of Neuroscience*, 41(14), pp.3192-3203.
73. **Riffell, J. A.** 2021. The neuroecology of insect-plant interactions: The importance of physiological state and sensory integration. *Current Opinion in Insect Science*.
72. Zhan, Y., San Alberto, D.A., [Rusch, C.](#), Riffell, J.A. and Montell, C., 2021. Elimination of vision-guided target attraction in Aedes aegypti using CRISPR. *Current Biology*. doi.org/10.1016/j.cub.2021.07.003
[Featured in: New York Times, BBC, NPR National, CBS, NBC, CNN, Science Daily, Phys.org, UW Daily]

2020:

71. [Leiser-Miller, L.B.](#), Kaliszewska, Z.A., Lauterbur, M.E., Mann, B., **Riffell, J.A.** and Santana, S.E., 2020. A fruitful endeavor: scent cues and echolocation behavior used by Carollia castanea to find fruit. *Integrative Organismal Biology*, 2(1), p.obaa007.
70. [Lutz, E.K.](#), [Ha, K.T.](#) and **Riffell, J.A.**, 2020. Distinct navigation behaviors in Aedes, Anopheles and Culex mosquito larvae. *Journal of Experimental Biology*, 223(7).
69. Lahondère, C., Vinauger, C., [Okubo, R.P.](#), Wolff, G.H., [Chan, J.K.](#), Akbari, O.S. and **Riffell, J.A.**, 2020. The olfactory basis of orchid pollination by mosquitoes. *Proceedings of the National Academy of Sciences*, 117, 708-716.
Featured in: BBC, NPR National, NBC, Science Daily, UW Daily, others: “Mosquitoes are drawn to flowers as much as people -- and now scientists know why”]
68. Melo, N., Wolff, G.H., Costa-da-Silva, A.L., Arribas, R., Triana, M.F., Gugger, M., **Riffell, J.A.**, DeGennaro, M. and Stensmyr, M.C., 2019. Geosmin attracts Aedes aegypti mosquitoes to oviposition sites. *Current Biology*, 30(1), pp.127-134.

2019:

67. **Riffell, J.A.**, 2019. Olfaction: Repellents that congest the mosquito nose. *Current Biology*, 29(21), pp.R1124-R1126.

66. Chittka, L., Giurfa, M. and **Riffell, J.A.**, 2019. The Mechanisms of Insect Cognition. *Frontiers in Psychology*, 10, p.2751.
65. **Lutz, E.K.**, **Grewal, T.S.**, and **Riffell, J.A.** 2019. Computational and experimental insights into the chemosensory navigation of *Aedes aegypti* mosquito larvae. *Proceedings of the Royal Society, B*. 286, 1-10.
64. Vinauger, C., Van Breugel, F., **Locke, L.**, **Tobin, K.**, Dickinson, M., Fairhall, A., Akbari, O. and **Riffell, J.A.**, 2019. Visual-olfactory integration in the human disease vector mosquito, *Aedes aegypti*. *Current Biology*, 29, 2509–2516
63. Shyong, J.*, **Lutz, E.***, Bui, M., Yang, T., Li, M., Truong, K., Arvidson, R., Buchman, A., **Riffell, J.A.**, and Akbari, O.S. Live calcium imaging of odor-evoked responses in *Aedes aegypti* neuronal tissues reveals distinct olfactory responses in larva. *BMC Neuroscience*, 20: 27-35.

2018:

62. **Delahunt, C.**, **Riffell, J. A.**, and Kutz, N. 2018. Biological mechanisms for learning: A computational model of olfactory learning in the *Manduca sexta* moth. *Frontiers in Computational Neuroscience*, 12: 1-20.
61. **Wang, T.**, **Clifford, M.**, **Martínez-Gómez, J.**, Johnson, J., **Riffell, J.A.**, and Di Stilio, V. Scent Matters: Repeated loss of insect attraction by floral scent accompanies transitions to wind pollination. *Annals of Botany* doi.org/10.1093/aob/mcy131
60. Wolff, G.H., and **Riffell, J.A.** 2018. Olfaction, experience and neural mechanisms underlying mosquito host preference. *Journal of Experimental Biology*, 221(4), jeb157131.
59. **Fenske, M.P.**, **Nguyen, L.P.**, Horn, E.K., **Riffell, J.A.**, and Imaizumi, T. 2018. Circadian clocks of both plants and pollinators influence flower seeking behavior of the pollinator hawkmoth *Manduca sexta*. *Scientific reports*, 8(1), 2842.
58. **Pang, R.**, van Breugel, F., Dickinson, M.H., **Riffell, J.A.**, and Fairhall, A. 2018. History dependence in insect flight decisions during odor tracking. *PLoS Computational Biology* 14(2): e1005969.
57. Vinauger, C., Lahondere, C., Wolff, G.H., **Locke, L.T.**, **Liaw, J.E.**, Parrish, J.Z., Ackbari, O.S., Dickinson, M.H., and **Riffell, J.A.** 2018. Modulation of host learning in *Aedes aegypti* mosquitoes. *Current Biology* 28(3): 333-344.

[Featured in: New York Times, BBC, The Guardian, NPR, CBS, NBC, CNN, Science Daily, Phys.org, UW Daily, others: “If you swat mosquitoes, they may learn to avoid your scent”]

2017:

56. **Blazka, D.**, **Sanders, E.**, **Riffell, J.A.**, and Shlizerman, E. 2017. Classification of fixed point network dynamics from multiple node timeseries data. *Frontiers in Neuroinformatics*, <https://doi.org/10.3389/fninf.2017.00058>
55. **Zhao, Y.**, **Chan, J.**, Lopez-Hilfiker, F.D., **Riffell, J.A.**, and Thornton, J.A. 2017. An electrospay chemical ionization source for real-time measurement of atmospheric

organic and inorganic compounds. *Atmospheric Measurement Techniques*, 10: 3609-3625.

54. [Rusch, C.](#), Roth, E., Vinauger, C., and **Riffell, J.A.** 2017. Honeybees in a virtual reality environment learn unique combinations of colour and shape. *Journal of Experimental Biology* 220: 3478-3487.
53. [Lutz, E.K.](#), Lahondere, C., Vinauger, C., and **Riffell, J.A.** 2017. Olfactory learning and chemical ecology of olfaction in disease vector mosquitoes: A life history perspective. *Current Opinion in Insect Science*, 20, 75–83.
52. **Riffell, J.A.** 2017. Plant defense: Timing is everything. *Current Biology*, 27, R344–R346.
51. [Hussain, Y.H.](#), Sadilek, M., [Salad, S.](#), Zimmer, R.K. and **Riffell, J.A.** 2017. Individual female differences in chemoattractant production change the scale of sea urchin gamete interactions. *Developmental Biology*, 422, 186–197. <http://dx.doi.org/10.1016/j.ydbio.2017.01.006>

2016:

50. **Riffell, J.A.**, and Rowe, A.H. 2016. Neuroecology: Neural Mechanisms of Sensory and Motor Processes that Mediate Ecologically Relevant Behaviors. *Integrative and Comparative Biology* 56: 853-856.
49. Vinauger, C., Lahondère, C., Cohuet, A., Lazzari, C.R., and **Riffell, J.A.** 2016. Learning and Memory in Disease Vector Insects. *Trends in Parasitology*, <http://dx.doi.org/10.1016/j.pt.2016.06.003>.
48. Ho, W.W., and **Riffell, J.A.** 2016. The Olfactory Neuroecology of Herbivory, Hostplant Selection and Plant–Pollinator Interactions. *Integrative and Comparative Biology*, <http://dx.doi.org/10.1093/icb/icw096>.
47. [Rusch, C.](#), Broadhead, G.T., Raguso, R.A., and **Riffell, J.A.** 2016. Olfaction in context—sources of nuance in plant-pollinator communication. *Current Opinion in Insect Science*, <http://dx.doi.org/10.1016/j.cois.2016.03.007>.
46. [Hussain, Y.H.](#), Guasto, J.S., Zimmer, R.K., Stocker, R. and **Riffell, J.A.** 2016. Sperm chemotaxis promotes individual fertilization success in sea urchins. *Journal of Experimental Biology*, pp.jeb-134924.

2015:

45. [Lundin, J.](#), **Riffell, J.A.**, and Wasser, S.K. 2015. Polycyclic aromatic hydrocarbons in caribou, moose, and wolf scat samples from three areas of the Alberta oil sands. *Environmental Pollution*, 206: 527–534.
44. Reisenman, C. E., and **Riffell, J.A.** The neural bases of host plant selection in herbivorous insects in a Neuroecology framework. *Frontiers in Physiology*, 6.
43. van Breugal, F., **Riffell, J.A.**, Fairhall, A., and Dickinson, M. H. 2015. Mosquitoes Use Vision to Associate Odor Plumes with Thermal Targets. *Current Biology*, 25: 2123-2129
42. [Fenske, M.P.](#), Hazelton, K.D., [Hempton, A.K.](#), Shim, J.S., **Riffell, J.A.**, and Imaizumi, T. 2015. The circadian clock gene *LATE ELONGATED HYPOCOTYL*

directly regulates the timing of floral scent emission in *Petunia*. *Proceedings of the National Academy of Sciences, USA*; 131:9775-9780.

2014:

41. **Riffell, J.A.**, Shlizerman, E., **Sanders, E.** Abrell, L., Medina, B. **Hinterwirth, A.J.**, Kutz, J.N. 2014. Flower discrimination by pollinators in a dynamic chemical environment. *Science*, 344:1515-1518.
 [Featured in: *Science Perspectives*, New York Times, BBC, NPR National, CBS, NBC, CNN, Science Daily, Phys.org, UW Daily, others: “Fumes Keep Moths From Finding Flowers”]
40. **Riffell, J.A.** and Hildebrand J.G. 2014. Insect olfactory filters in mediating natural, ecologically relevant behaviors. *Insect Neuroethology*, ed. E. Warrant.
39. Shlizerman, E., **Riffell, J.A.**, and Kutz, J.N. 2014. Data-driven inference of network connectivity for modeling the dynamics of neural codes in the insect antennal lobe. *Frontiers in Computational Neuroscience*. doi: 10.3389/fncom.2014.00070.
38. Vinauger, C., **Lutz, E.K.**, **Riffell, J.A.** 2014. Olfactory learning and memory in the disease vector mosquito, *Aedes aegypti*. *Journal of Experimental Biology*. 217, 2321-2330.
37. **Byers, K.J.R.P.**, Bradshaw, H.D., **Riffell, J.A.** 2014. Three floral volatiles contribute to differential pollinator attraction in monkeyflowers (*Mimulus*). *Journal of Experimental Biology*. 217: 614-623.
36. **Byers, K.J.**, **Vela, J.**, **Riffell, J.A.**, Bradshaw, H.D. 2014. Floral volatile alleles can contribute to pollinator-mediated reproductive isolation in monkeyflowers (*Mimulus*). *The Plant Journal*. 80, 1031-1042.

2013:

35. **Riffell, J.A.**, Lei, H., Abrell, A., Hildebrand, J.G. 2013. Neural basis of a pollinator’s buffet: olfactory specialization and learning in *Manduca sexta*. *Science* 339: 200-204.
 [Recommended by Faculty of 1000; featured in: e!Science News, Science Daily, Phys.org, others: “Moths wired two ways”]
34. **Riffell, J.A.** 2013. Neuroethology: Lemon-fresh scent makes flies lay eggs. *Current Biology*, 23, R1108-R1110.
33. Sprayberry, J.D.H., Ritter, K.A., **Riffell, J.A.** 2013. The effect of olfactory exposure to non-insecticidal agrochemicals on bumblebee foraging behavior. *PLoS ONE* 8(10): e76273. doi:10.1371/journal.pone.0076273
32. Martin, J.P., Lei, H., **Riffell, J.A.**, Hildebrand, J.G. 2013. Enhanced synchrony of antennal-lobe projection neurons encodes the behaviorally effective ratio of sex-pheromone components in male *Manduca sexta*. *Journal of Comparative Physiology A* 199: 963-979.
31. **Riffell, J.A.** and Alarcon, R. 2013. Multimodal floral signals and moth foraging decisions. *PLoS-ONE* 8(8): e72809. doi:10.1371/journal.pone.0072809.
30. **Clifford, M.R.**, **Riffell, J.A.** 2013. Mixture and odorant processing in the olfactory

systems of Insects: a comparative perspective. *Journal of Comparative Physiology A*. 199:911-928. doi: 10.1007/s00359-013-0818-6

29. Fricke, E.C., Simon, M.J., Reagan, K.M., Haak, D.C., Levey, D.J., Riffell, J.A., and Tewksbury, J.J. 2013. When condition trumps location: seed consumption by fruit-eating birds removes pathogens and predator attractants. *Ecology Letters* 16:1031-1036.
28. Riffell, J.A., Reisenman, C.A., Hicks, M. 2013. Chemical ecology and olfactory preferences of ovipositing *Manduca sexta* moths. *Journal of Chemical Ecology* 39:76-89. doi: 10.1007/s10886-012-0228-1
27. Byers, K.J., Sanders, E., Riffell, J.A. 2013. Identification of olfactory volatiles using gas chromatography-multi-unit recordings (GCMR) in the insect antennal lobe. *Journal of Visualized Experiments* e4381, doi:10.3791/4381.

2012:

26. Dacks, A.M., Riffell, J.A., Martin, J.P., Gage, S.L., Nighorn, A. 2012. Olfactory modulation by dopamine in the context of aversive learning. *Journal of Neurophysiology* 108: 539-550. [cover article]
25. Riffell, J.A. 2012. Olfactory ecology and the processing of complex mixtures. *Current Opinion in Neurobiology* 22: 236-242, <http://dx.doi.org/10.1016/j.conb.2012.02.013>.

2011:

24. Martin, J.P., Beyerlein, A., Dacks, A.M., Reisenman, C.E., Riffell, J.A., Lei, H., Hildebrand, J.G. 2011. The neurobiology of insect olfaction: Sensory processing in a comparative context. *Progress in Neurobiology*, 95: 427-447.
23. Agrawal, S., and Riffell, J.A. 2011. Behavioral neurobiology: the bitter life of male flies. *Current Biology*, 21, R470-R472.
22. Riffell, J.A. 2011. The neuroecology of a pollinator's buffet: olfactory preferences and learning in insect pollinators. *Integrative and Comparative Biology*. 51: 781-793.
21. Riffell, J.A.* and Zimmer, R.K. 2011. Extrinsic mechanisms driving sperm-egg interactions. *Proceedings of the National Academy of Sciences, USA*, 108: 13200-13205. *authors contributed equally
20. Riffell, J.A.*, Veitinger, T.*, Zimmer, R.K., Hatt, H., Spehr, M. 2011. Chemosensory Ca²⁺ fingerprints define diverse behavioral phenotypes in human sperm. *Journal of Biological Chemistry*, 286: 17311-17325. *authors contributed equally
19. Himes, J., Riffell, J.A., Zimmer, C.A., Zimmer, R.K. 2011. Sperm chemotaxis as revealed with live and synthetic eggs. *Biological Bulletin*, 220: 1-5.

2010:

18. Alarcón, R.A., Riffell, J.A., Davidowitz, G., Bronstein, J.L., and Hildebrand J.G. 2010. Sex-dependent variation in the floral preferences of a hawkmoth (*Manduca sexta*). *Animal Behavior*, 80: 289-296.

17. Reisenman, C.E., **Riffell, J.A.**, Bernays, E., and Hildebrand, J.G. 2010. Floral odor signals and context-dependent behaviors in female *Manduca sexta* moths. *Proceedings of the Royal Society B: Biological Sciences* 277: 2371-2379.
16. Lei, H., Oland, L., **Riffell, J.A.**, Beyerlein, A., and Hildebrand, J.G. 2010. Microcircuits in the *Manduca sexta* antennal lobe. In *Handbook of brain microcircuits*, eds Shepherd, G. and Grillner, S. Oxford University Press.

2009:

15. **Riffell, J.A.**, Lei, H., and Hildebrand J.G. 2009. Neural correlates of behavior in the moth *Manduca sexta* in response to complex odors. *Proceedings of the National Academy of Sciences, USA* 106: 19219-19226.
14. Reisenman, C.E., **Riffell, J.A.**, and Hildebrand J.G. 2009. Neuroethology of oviposition behavior in the moth *Manduca sexta*. *Annals of the New York Academy of Sciences* 1170: 462-470.
13. Krug, P.J., **Riffell J.A.**, and Zimmer R.K. 2009. Dynamics of sperm attractant production and release from an abalone egg. *Journal of Experimental Biology* 212: 1092-1100.
12. Lei, H., **Riffell, J.A.**, Gage, S.L., and Hildebrand J.G. 2009. Contrast enhancement of stimulus intermittency in a primary olfactory network and its behavioral significance. *Journal of Biology* 8:2,21: 1-16.
11. **Riffell, J.A.**, Lei, H., Christensen T.C., and Hildebrand J.G. 2009. Characterization and coding of complex olfactory stimuli. *Current Biology* 19: 335-340.

2008:

10. **Riffell, J.A.**, Alarcón, R., Abrell, L., Davidowitz, G., Bronstein, J.L., and Hildebrand J.G. 2008. Behavioral consequences of innate preferences and olfactory learning in hawkmoth-flower interactions. *Proceedings of the National Academy of Sciences, USA* 105: 3404-3409.
9. **Riffell, J.A.**, Abrell, L., and Hildebrand J.G. 2008. Physical processes and real-time chemical measurement of the insect olfactory environment. *Journal of Chemical Ecology* 34: 837-853.
8. **Riffell, J.A.** and Hildebrand J.G. 2008. Preface to the special issue on Olfactory Ecology. *Journal of Chemical Ecology* 34: 820-821.
7. **Riffell, J.A.**, Alarcón, R., and Abrell, L. 2008. Floral trait associations in hawkmoth-specialized and mixed pollination systems: *Datura wrightii* and *Agave* spp. in the Sonoran Desert. *Communicative & Integrative Biology* 1: 6-8.

2007:

6. **Riffell, J.A.** and Zimmer R.K. 2007. Sex and flow: the consequences of fluid shear for sperm-egg interactions. *Journal of Experimental Biology* 210: 3644-3660.

2006:

5. Spehr, M., Schwahn, K., **Riffell, J.A.**, Zimmer, R.K., and Hatt H. 2006. Odorant receptors and olfactory-like signaling mechanisms in mammalian sperm. *Molecular and Cellular Endocrinology* 250(1-2): 128-136.

2004:

4. Spehr, M., Schwahn, K., **Riffell, J.A.**, Barbour, J., Zimmer, R.K., Neauhaus, E.M., and Hatt H. 2004. Olfactory receptor-mediated chemotaxis in human sperm: key role of particulate adenylate cyclase. *Journal of Biological Chemistry* 279(40): 40194-40203.
3. **Riffell, J.A.**, Krug P.J., and Zimmer R.K. 2004. The ecological and evolutionary consequences of sperm chemoattraction. *Proceedings of the National Academy of Sciences, USA* 101(13): 4501-4506.

2003:

2. Spehr, M., Gusselman G., Poplawski, A., **Riffell J.A.**, Zimmer R.K., and Hatt H. 2003. A novel testicular odor receptor controls human sperm chemotaxis. *Science* 299: 2054-2058.

2002:

1. **Riffell, J.A.**, Krug P.J., and Zimmer R.K. 2002. Fertilization in the sea: The chemical identity of an abalone sperm attractant. *Journal of Experimental Biology* 205: 1439-1450.

ACADEMIC PRESENTATIONS (2018-present)

2023

- Entomological Society of America, MD (**invited**)
- Gordon Research Conference – Neuroethology, VT (Poster)
- Bill and Melinda Gates Foundation – Decoding Olfaction Symposium (**invited**)
- Janelia Farm - Navigational Algorithms and Neural Circuit Computations Directing Olfactory Search Across Species (**invited**)
- Association for Chemoreception Sciences annual meeting, FL

2021/22

- International Symposium on Insect Olfaction Around the World (**invited**)
- Max Planck and Lund University (**invited**)
- The 6th Congress of the Latin American Association of Chemical Ecology (**invited**)
- Arizona State University Life Sciences / NeuroNex program (**invited**)

2020/21

- International Society for Olfaction and Taste (**invited**)
- Pacific Branch Entomological Society of America (**invited**)
- International Entomological Society (**invited**)
- University of Nevada, Reno (**invited**)

2019

- Entomological Society of America (**invited**)
- Johns Hopkins University Department of Molecular and Cellular Biology (**invited**)
- Gordon Conference for Neuroethology (**invited**)
- UC Santa Barbara Department of Molecular, Cellular and Developmental Biology (**invited**)

- LeStudium Symposium “New Tools for Studying Disease Vectors”, University of Tours (**invited**)
 - International Symposium on Molecular Insect Science, Melia Sitges, Spain (**invited**)
- 2018
- Duke Univ., Dept. Biology, Raleigh, NC (**graduate student invitation**)
 - Gordon Research Conference on Plant Volatiles, Lucca (Barga), Italy (**invited**)
 - Univ. Alberta, Dept. Biology, Edmonton, Canada (**invited**)
 - Univ. Washington/Univ. Oregon NeuroFutures (**invited**)
 - Society for Integrative and Comparative Biology, San Francisco, CA

UNIVERSITY OF WASHINGTON SERVICE AND ACTIVITIES

Integrative Physiology Faculty Search Committee	2022-2023
Undergraduate Curriculum Committee	2020-current
Office of Minorities Affairs, LSAMP reviewer	2022, 2023
RRF Reviewer	2021-2023
Reviewer for the Mary Gates URP	2021, 2022
Faculty Appointments Committee	2019-2021
Member of the Research Committee	2016-2018
Member of the Neuroscience Admissions Committee	2014-2016
Member of the Biology Department’s Diversity Committee	2012-2014
Royalty Research Fund review committee member	2011-2013

EXTERNAL SERVICE AND ACTIVITIES

NIH-Vector Biology Panel Member	2022-current
Program Chair Neurobiology Division of SICB	2016-2023
Associate Editor for <i>Frontiers in Behavioral Neuroscience</i>	2016-2021
Associate Editor for <i>Frontiers in Ecology and Evolution</i>	2013-2021
<i>Ad-hoc</i> Committee Member for NIH Study Section	2016, 2017, 2019, 2020
Panel Member, NSF-IOS	2010, 2014, 2016, 2020, 2021
<i>Ad-hoc</i> Reviewer, French National Research Agency (ANR)	2013, 2014, 2016, 2021
<i>Ad-hoc</i> Reviewer, Human Frontier in Science Program	2018, 2020
Tenure/Promotion Reviewer: Princeton, UC Berkeley, U. Nevada Reno, Florida International University, Penn State University, John Hopkins University.	

Organizer of “Neuroecology” symposium for the Society for Integrative and Comparative Biology in Portland, OR Jan. 2016

Organizer of “Chemical Ecology and Behavior” symposium for the International Congress of Entomology in Orlando, FL Sept. 2016

Organizer of “Pollinator Behavior” symposium for the Gordon Research Conference on Plant Volatiles in Ventura, CA Jan. 2012

Organizer of a special symposium on “Neuroecology” for the Ninth International Congress of Neuroethology in Salamanca, Spain Aug. 2010

Grant Reviewer: National Science Foundation-IOS; US-Israel Binational Science Foundation (BSF); Rothamsted Research; NIH Vector Biology Study Section; Netherlands Organization for Scientific Research (2016, 2017,2019,2020); Austrian Science Fund (2016, 2017); Swiss National Science Foundation (2017, 2018,2019); French National Research Agency (ANR) (2013-2021); Human Frontiers in Science Program (2018, 2020).

Journal Reviewer (31 reviews in 2022/23): *Science*; *Nature*, *Nature Communications*, *Nature Ecology and Evolution*, *PNAS*; *Current Biology*; *eLife*; *Science Advances*; *BMC Biology*; *Cell Reports*; *Journal of Neuroscience*; *Journal of the Royal Society Interface*; *Biology Letters*; *Proceedings of the Royal Society B*; *Philosophical Transactions of the Royal Society*; *New Phytologist*; *PLoS Computational Biology*; *Journal of Experimental Biology*; *Journal of Comparative Neurology*; *Journal of Comparative Physiology A*; *Comparative Biochemistry and Physiology - Part D*; *Insect Biochemistry and Molecular Biology*; *Biological Bulletin*; *Journal of Chemical Ecology*; *PLoS Pathogens*; *Malaria Journal*; *Trends in Parasitology*; *Journal of Medical Entomology*; *Scientific Reports*; *Current Opinion in Insect Science*.

Science Outreach activities: 1) Seattle Expanding Your Horizons; (2) Paws on Science; (3) Brain Awareness Week; (4) Visits to the laboratory by elementary and middle schools kids during UW’s Lab Day.

MEDIA ATTENTION (2015-present)

- “Mosquitoes are seeing red: Why new findings about their vision could help you hide from these disease vectors” 2022. CNN, New York Post, National Geographic, Wired, Reuters, The Guardian.
- “What If You Could Become Invisible to Mosquitoes?” 2021. CNN, People Magazine, New York Times.
- “Mosquitoes are drawn to flowers as much as people — and now scientists know why” 2020. CNN, Seattle Times, NPR
- “Swatting at Mosquitoes May Help You Avoid Bites, Even if You Miss” 2018. New York Times, NPR, BBC, CNN, Time, Reuters, The Guardian, National Geographic.
- “Mosquitoes Use Complex Tactics To Seek Human Prey” 2015. The Onion.

- “Smell, vision and heat: that’s what mosquitoes need for detecting preys” 2015. BBC, Time, Reuters.
- “Love in the Time of Zika” 2016. The Stranger.
- “UW researchers show that the mosquito smells, before it sees, a bloody feast” 2015. UW News.

TEACHING

As an Endowed Professor at the University of Washington, I have been fortunate to fulfill the dual role of educator and mentor. As an educator, I believe that teaching is a process where the instructor must ignite student interest and enthusiasm in the subject material. My experience as a mentor and faculty has demonstrated that students learn best in an environment conducive to intellectual development by fostering inquiry-based learning techniques. The goal is to promote critical thinking and an appreciation for the course. This can be accomplished by targeting 3 specific topics: (i) communication and participation, (ii) mentoring, and (iii) hands-on learning and student development. An important component of my teaching has been incorporating active learning components in the classroom. This has involved the development of research-intensive courses and the incorporation of laboratory modules in all my courses. These principles have proven useful for the undergraduate- and graduate-level courses I have taught over the last fifteen years.

Biology of Vector-borne Disease (course instructor) 2021-current

This course provides accessible, condensed training and "knowledge networking" for advanced graduate students, postdoctoral fellows, faculty and professionals to ensure competency in basic biology, current trends and developments, and practical knowledge for U.S. and global vector-borne diseases of plants, animals and humans. A 1-week course taught at the University of Idaho, the course is both lecture- and discussion-based and is delivered by internationally recognized experts, with integrated case studies of emerging vector-borne pathogens to highlight parallels and key distinctions in biology across plant, animal and human vector-borne diseases.

Biology 428 “Sensory Neurophysiology & Ecology” 2010-current

Upper-division undergraduate laboratory course with 70-80 students on the current research in sensory ecology and neurophysiology. The course uses current literature to teach neuroscience and experimental sensory biology trends. For the Final, the students learn to write a research proposal in the NIH or NSF format, and how research proposals are reviewed. They perform the proposed experiments from their proposal and write up their results. These experiments tie in with the lecture material.

Biology 457 “Chemical Communication” 2010-current

70 student upper-division undergraduate course in the field of chemical communication and ecology. A synthetic course, comprising material from Organic Chemistry, Sensory Neuroscience, to Community Ecology. Course innovations include the development of Discussion Section modules where the students conduct experiments and analyses using iPad apps, “smell tests”, and other in-class activities.

MENTORING

Personnel mentored in Riffell Laboratory (2015-2022):

- 18 Postdoctorates (8 now in faculty positions; 2 in industry)
 - 10 Postdocs in 2021-2023
- 2 Sabbatical Members (Dr. Joe Langehans, Seattle Univ.; Dr. Walter Leal, UC Davis)
- 1 Research Scientist
- 12 Graduate students – currently supervising 4 graduate students
- 2 UW Biology Rotation students 2020/2021
- 3 Neuroscience Rotation students
- 71 total undergraduate students mentored: 37 undergraduate students 2015/16; 16 undergraduate students in 2017; 12 undergraduate students in 2018; 11 in 2019; 11 in 2020; 2 in 2021; 6 in 2022
- 5 High School students
- 2 Staff Scientists