

## Dr. Jens Herberholz

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Department of Psychology • Neuroscience and Cognitive Science Program

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### **Education**

1999	Dr. rer. nat. (PhD, Natural Sciences)	Technical University Munich, Germany
1995	Diplom (M.Sc., Zoology)	Albert-Ludwigs-University Freiburg, Germany
1992	Vordiplom (B.Sc., Biology)	Albert-Ludwigs-University Freiburg, Germany

### **Academic Positions & Appointments**

8/2015 - present	<u>Co-Director</u> , Brain and Behavior Initiative (BBI), University of Maryland, College Park, USA
7/2013 - 6/2017	<u>Director</u> , Neuroscience and Cognitive Science Program (NACS), University of Maryland, College Park, USA
1/2012 - 7/2012	<u>Visiting Professor</u> (sabbatical), Department of Zoology, Technical University Munich, Germany
8/2011 - present	<u>Associate Professor</u> (tenured), Department of Psychology, University of Maryland, College Park, USA
8/2005 - 8/2011	<u>Assistant Professor</u> , Department of Psychology, University of Maryland, College Park, USA
1/2002 - 7/2005	<u>Research Scientist</u> , Department of Biology, Georgia State University, Atlanta, USA
8/1999 - 12/2001	<u>Postdoctoral Research Associate</u> , Department of Biology, Georgia State University, Atlanta, USA

### **Affiliations & Memberships**

2018	Member, International Behavioral Neuroscience Society
2009 - present	Affiliate Faculty Member, Department of Biology, University of Maryland, College Park
2009 - 2013	Affiliate Faculty Member, Center for Comparative and Evolutionary Biology of Hearing, University of Maryland, College Park
2005 - present	Affiliate Faculty Member, Neuroscience & Cognitive Science Graduate Program (NACS), University of Maryland, College Park
2003 - 2005	Member, Center for Behavioral Neuroscience, Atlanta
2003 - present	Member, International Society for Neuroethology
2000 - present	Member, Society for Neuroscience

## Awards & Honors

- 2012 Emerging Scholars Program Award; College of Behavioral and Social Sciences, University of Maryland, College Park
- 2008 Research Support Award; General Research Board, Graduate School, University of Maryland, College Park
- 2007 Faculty Mentor Award; Philip Merrill Presidential Scholars Program, University of Maryland, College Park
- 2006 Summer Research Award; General Research Board, Graduate School, University of Maryland, College Park

## Publications

### A) Peer-reviewed articles and book chapters

1. Venuti L.S. and **Herberholz J.** (2019) A possible role for GABAA- $\rho$  receptors and tonic inhibition in regulating the relationship between social experience and alcohol sensitivity of crayfish. *Pharmacology, Biochemistry, and Behavior*. (in revision)
2. **Herberholz J.**, Swierzbinski M.E., Widjaja A., and Kohn A. (2019) Not so fast: giant interneurons control precise movements of antennal scales during escape behavior of crayfish. *Journal of Comparative Physiology A* 205: 687-698.
3. Algarin J.M., Ramaswamy B., Venuti L., Swierzbinski M.E., Baker-McKee J., Weinberg I.N., Chen Y.J., Krivorotov I.N., Katine J.A., **Herberholz J.**, Araneda R.C., Shapiro B., and Waks E. (2019) Activation of microwave signals in nanoscale magnetic tunnel junctions by neuronal action potentials. *IEEE Magnetics Letters* 10: DOI 10.1109/LMAG.2019.2896307
4. Weinberg I.N., Mair L.O., Jafari S., Algarin J., Benlloch Baviera J.M., Baker-McKee J., English B., Chowdhury S., Malik P., Watson-Daniels J., Hale O., Stepanov P.Y., Nacev A., Hilaman R., Ijanaten S., Koudelka C., Araneda R., **Herberholz J.**, Martinez-Miranda L.J., Shapiro B., Villar P.S., Krivorotov I., Khizroev S., and Fricke S. (2018) Image-guided Placement of Magnetic Nanoparticles as a Potential High-Resolution Brain-Machine Interface. In: Evolving BCI Therapy-Engaging Brain State Dynamics. IntechOpen; x.doi.org/10.5772/intechopen.75522
5. Swierzbinski M.E. and **Herberholz J.** (2018) Effects of ethanol on sensory inputs to the medial giant interneuron of crayfish. *Frontiers in Physiology* 9: 448. doi: 10.3389/fphys.2018.00448
6. Swierzbinski M.E., Lazarchik A.R., and **Herberholz J.** (2017) Prior social experience affects the behavioral and neural responses to acute alcohol in juvenile crayfish. *Journal of Experimental Biology* 220: 1516-1523. [Editor's choice][2017 Outstanding Paper Prize nomination]
7. Schadegg A.C. and **Herberholz J.** (2017) Satiation level affects anti-predatory decisions in foraging juvenile crayfish. *Journal of Comparative Physiology A* 203: 223-232.
8. **Herberholz J.**, Swierzbinski M.E., and Birke J.M. (2016) Effects of different social and environmental conditions on established dominance relationships in crayfish. *Biological Bulletin* 230: 152-164. [Cover picture]
9. **Herberholz J.** (2014) Neurobiology of social status in crustaceans. In: The Natural History of the Crustacea, Vol. 3: Crustacean Nervous Systems and Their Control of Behavior, C. Derby and M. Thiel (eds). Oxford University Press, 457-483.

10. **Herberholz J.** (2013) Serotonergic modulation of aggression. In: Serotonin: Biosynthesis, Regulation and Health Implications, F.S. Hall (ed.). NOVA Science Publishers, 27-51.
11. Sullivan J.M. and **Herberholz J.** (2013) Structure of the nervous system: general design. In: The Natural History of the Crustacea, Vol. 1: Functional Morphology and Diversity, L. Watling and M. Thiel (eds). Oxford University Press, 451-484.
12. **Herberholz J.** and Marquart G. (2012) Decision making and behavioral choice during predator avoidance. *Frontiers in Neuroscience* 6:125. doi: 10.3389/fnins.2012.00125.
13. **Herberholz J.**, Mishra S.H., Uma D., Germann M.W., Edwards D.H., and Potter K. (2011) Non-invasive imaging of neuroanatomical structures and neural activation with high-resolution MRI. *Frontiers in Neuroscience* 5:16. doi: 10.3389/fnbeh.2011.00016.
14. Liden W.H., Phillips M.L., and **Herberholz J.** (2010) Neural control of behavioral choice in crayfish. *Proceedings of the Royal Society B: Biological Sciences* 277: 3493-3500.
15. Liu Y.C. and **Herberholz J.** (2010) Sensory activation and receptive field organization of the lateral giant escape neurons in crayfish. *Journal of Neurophysiology* 104: 675-684.
16. **Herberholz J.** (2009) Recordings of neural circuit activation in freely behaving animals. *Journal of Visualized Experiments* 29, doi: 10.3791/1297.
17. Graham M.E. and **Herberholz J.** (2009) Stability of dominance relationships in crayfish depends on social context. *Animal Behaviour* 77, 195-199.
18. Liden W.H. and **Herberholz J.** (2008) Behavioral and neural responses of juvenile crayfish to moving shadows. *Journal of Experimental Biology* 211, 1355-1361.
19. **Herberholz J.** (2007) The neural basis of communication in crustaceans. In: Evolutionary ecology of social and sexual systems: crustaceans as model organisms, J. E. Duffy and M. Thiel (eds). Oxford University Press, 71-89.
20. **Herberholz J.**, McCurdy C., and Edwards D.H. (2007) Direct benefits of social dominance in juvenile crayfish. *Biological Bulletin* 213, 21-27.
21. Song C.-K., **Herberholz J.**, and Edwards D.H. (2006) The effects of social experience on the behavioral response to unexpected touch in crayfish. *Journal of Experimental Biology* 209, 1355-1363.
22. Antonsen B.L., **Herberholz J.**, and Edwards D.H. (2005) The retrograde spread of synaptic potentials and recruitment of presynaptic inputs. *Journal of Neuroscience* 25, 3086-3094.
23. Edwards D.H. and **Herberholz J.** (2005) Crustacean models of aggression. In: The Biology of Aggression, R. J. Nelson (ed). Oxford University Press, 38-61.
24. **Herberholz J.**, Mims C.J., Zhang X., Hu X., and Edwards D.H. (2004) Anatomy of a live invertebrate revealed by manganese-enhanced Magnetic Resonance Imaging. *Journal of Experimental Biology* 207, 4543-4550.
25. **Herberholz J.**, Sen M.M., and Edwards D.H. (2004) Escape behavior and escape circuit activation in juvenile crayfish during prey-predator interactions. *Journal of Experimental Biology* 207, 1855-1863.
26. Edwards D.H., Issa F.A. and **Herberholz J.** (2003) The neural basis of dominance hierarchy formation in crayfish. *Microscopy Research and Technique* 60, 369-376.

27. **Herberholz J.**, Sen M.M., and Edwards D.H. (2003) Parallel changes in agonistic and non-agonistic behaviors during dominance hierarchy formation in crayfish. *Journal of Comparative Physiology A* 189, 321-325.
28. **Herberholz J.**, Antonsen B.L., and Edwards D.H. (2002) A lateral excitatory network in the escape circuit of crayfish. *Journal of Neuroscience* 22, 9078-9085.
29. Drummond J., Issa F.A., Song C.K., **Herberholz J.**, S.R. Yeh, and D.H. Edwards (2002) Neural mechanisms of dominance hierarchies in crayfish. In: The Crustacean Nervous System, K. Wiese (ed). Springer Verlag, Berlin, 124-135.
30. **Herberholz J.**, Issa F.A., and Edwards D.H. (2001) Patterns of neural circuit activation and behavior during dominance hierarchy formation in freely behaving crayfish. *Journal of Neuroscience* 21, 2759-2767.
31. Edwards D.H., Antonsen B.L., and **Herberholz J.** (2001) Network, neuronal and biochemical computations in the escape circuit of crayfish. In: Proceedings of the Eleventh Yale Workshop on Adaptive and Learning Systems, K. S. Narendra (ed). Center for Systems Science, Yale University, New Haven, 225-232.
32. **Herberholz J.** and Schmitz B. (2001) Signaling via water currents in behavioral interactions of snapping shrimp (*Alpheus heterochaelis*). *Biological Bulletin* 201, 6-16.
33. **Herberholz J.** and Schmitz B. (1999) Flow visualisation and high speed video analysis of water jets in the snapping shrimp (*Alpheus heterochaelis*). *Journal of Comparative Physiology A* 185, 41-49.
34. **Herberholz J.** and Schmitz B. (1998) Role of mechanosensory stimuli in intraspecific agonistic encounters in the snapping shrimp (*Alpheus heterochaelis*). *Biological Bulletin* 195, 156-167.
35. Schmitz B. and **Herberholz J.** (1998) Snapping behaviour in intraspecific agonistic encounters in the snapping shrimp (*Alpheus heterochaelis*). *Journal of Biosciences* 23, 623-632.

## **B) Published conference proceedings**

1. Chapin A., Rajasekaran P.R., **Herberholz J.**, Bentley W.E., and Ghodssi R. (2019) Dynamic In Vitro Biosensing with Flexible Microporous Multimodal Cell-Interfacial Sensors. *Transducers 2019 Eurosensors XXXIII, Berlin*.
2. **Herberholz J.** (2018) The effects of alcohol on crayfish neural circuitry and behavior depend on prior social experiences. *International Behavioral Neuroscience Society 18<sup>th</sup> Annual Meeting*; 162.
3. Rajasekaran P.R., Chapin A., Quan D.N., Jang S.-H., **Herberholz J.**, Hu L., Bentley W.E., and Ghodssi R. (2018) Multimodal Intelligent Transwell System (MITS). *Solid-State Sensors, Actuators, and Microsystems Workshop, Hilton Head*; MP-04 [invited paper]
4. **Herberholz J.**, Swierzbinski M.E., Venuti L.S., Lee H.J., and Exum A.C. (2017) Neuropharmacology of alcohol effects on crayfish neural circuitry. *Society for Neuroscience 47<sup>th</sup> Annual Meeting*; 156.27.
5. Rajasekaran P.R., Quan D.N., Chapin A., Bentley W.E., **Herberholz J.**, and Ghodssi R. (2017) A bio-electronic membrane to investigate the gut brain microbiome axis. *254<sup>th</sup> American Chemistry Society National Meeting*; 159.

6. Algarin J.M., Ramaswamy B., Venuti L., Swierzbinski M., Villar P., Chen Y.J., Weinberg I., **Herberholz J.**, Araneda R., Shapiro B. and Waks E. (2017) Modulation and detection of single neuron activity using spin transfer nano-oscillators. *Spintronics X* 10357; 27 [invited paper]
7. **Herberholz J.**, Swierzbinski M.E., and Hu R. (2014) Modulation of neural thresholds in a decision-making circuit. *Conference Abstract: Eleventh International Congress of Neuroethology*; PO2194
8. **Herberholz J.**, Swierzbinski M.E., and Lazarchik A.R. (2014) Interactions between social status and alcohol intoxication in crayfish. *Society for Neuroscience 44<sup>th</sup> Annual Meeting*; 181.16
9. Hu R., Murphy M. and **Herberholz J.** (2014) Monoaminergic modulation of sensory inputs to the crayfish medial giant escape neurons. *Society for Neuroscience 44<sup>th</sup> Annual Meeting*; 181.17
10. Swierzbinski M.E. and **Herberholz J.** (2014) Inhibitory properties of the medial giant escape circuit in crayfish. *Society for Neuroscience 44<sup>th</sup> Annual Meeting*; 181.18
11. Venuti L.S., Swierzbinski M.E. and **Herberholz J.** (2014) Investigation of fast autoinhibition in the lateral giant circuit of crayfish. *Society for Neuroscience 44<sup>th</sup> Annual Meeting*; 181.19
12. Swierzbinski M.E. and **Herberholz J.** (2012) Interactions between alcohol and GABAergic inhibition in the escape circuit of crayfish. *Front. Behav. Neurosci. Conference Abstract: Tenth International Congress of Neuroethology*. doi: 10.3389/conf.fnbeh.2012.27.00327
13. Uma D. and **Herberholz J.** (2012) Are juvenile crayfish attracted to their natural predators? *Front. Behav. Neurosci. Conference Abstract: Tenth International Congress of Neuroethology*. doi: 10.3389/conf.fnbeh.2012.27.00196
14. Swierzbinski M.E. and **Herberholz J.** (2011) Effects of alcohol on escape behavior and underlying neural circuitry in crayfish. *Society for Neuroscience 41<sup>th</sup> Annual Meeting*; 944.09.
15. Richards J.M., Leonard J.R., Meshera N., **Herberholz J.**, Lejeuz C.W. and Daughters S.B. (2011) HPA axis response to stress predicts distress tolerance in a sample of cocaine users. *The College on Problems of Drug Dependence Annual Meeting*; 585.
16. **Herberholz J.**, Phillips M.L., Sichler, K. and Medley V.A. (2010) Crayfish select escape strategies based on external conditions and internal states. *Proceedings of the 9<sup>th</sup> International Congress of Neuroethology*, Salamanca, Spain; P150.
17. **Herberholz J.** and Liden W. H. (2009) Escape circuit activation and behavioral choice in juvenile crayfish. *Society for Neuroscience 39<sup>th</sup> Annual Meeting*; 287.
18. Medley V.A. and **Herberholz J.** (2009) Mechanisms underlying visual activation of the medial giant escape circuit in crayfish. *Society for Neuroscience 39<sup>th</sup> Annual Meeting*; 288.
19. **Herberholz J.** and Liu Y.-C. (2008) Receptive field organization of the giant escape neurons in crayfish. *Society for Neuroscience 38<sup>th</sup> Annual Meeting*; 198.4.
20. **Herberholz J.** (2007) Manganese-enhanced Magnetic Resonance Imaging in crayfish. *Proceedings of the 8<sup>th</sup> International Congress of Neuroethology*, Vancouver, Canada; SY45.
21. **Herberholz J.** and Liden W. H. (2007) Behavioral and neural responses of juvenile crayfish to visual threat stimuli. *Proceedings of the 8<sup>th</sup> International Congress of Neuroethology*, Vancouver, Canada; PO219.
22. **Herberholz J.** and Edwards D.H. (2005) The control of escape in crayfish through interactions of command neurons. *Society for Neuroscience 35<sup>th</sup> Annual Meeting*; 754.7.

23. **Herberholz J.**, Sen M.M. and Edwards D.H. (2004) Patterns of neural activity during escape from predators. *Society for Neuroscience 34<sup>th</sup> Annual Meeting*; 870.4.
24. Mims C.J., **Herberholz J.**, Zhang X., Hu X. and Edwards D.H. (2004) Anatomical and functional studies in the crayfish brain by means of manganese-enhanced Magnetic Resonance Imaging. *Proceedings of the 7<sup>th</sup> International Congress of Neuroethology*, Nyborg, Denmark; 251.
25. **Herberholz J.**, Sen M.M. and Edwards D.H. (2004) Behavioral and neural responses in crayfish to attacks from a natural predator. *Proceedings of the 7<sup>th</sup> International Congress of Neuroethology*, Nyborg, Denmark; 233.
26. Zhang X., **Herberholz J.**, Mims C. J., Edwards D.H. and Hu X. (2004) Observation of neural activity in crayfish with Mn-enhanced MRI. *Proceedings of the International Society of Magnetic Resonance in Medicine* 11: 1115.
27. **Herberholz J.**, Mims C.J., Zhang X. , Hu X. and Edwards D.H. (2003) Manganese-enhanced MRI of the crayfish brain. *Society for Neuroscience 33<sup>rd</sup> Annual Meeting*; 270.5.
28. Versteeg S., Antonsen B.L., Agran J., **Herberholz J.** and Edwards D.H. (2003) Simulation of the lateral excitatory network in crayfish based on anatomical and physiological data. *Society for Neuroscience 33<sup>rd</sup> Annual Meeting*; 270.8.
29. **Herberholz J.**, Antonsen B.L. and Edwards D.H. (2002) Lateral and retrograde amplification of sensory inputs to the lateral giant escape circuit of crayfish. *Society for Neuroscience 32<sup>nd</sup> Annual Meeting*; 60.9.
30. Antonsen B.L., **Herberholz J.** and Edwards D.H. (2002) Interactions between primary afferent neurons mediated through the dendrites of the lateral giant interneuron in crayfish. *Society for Neuroscience 32<sup>nd</sup> Annual Meeting*; 60.10.
31. **Herberholz J.**, Antonsen B.L. and Edwards D.H. (2001) Coupled sensory afferents form a presynaptic excitatory network in the terminal ganglion of crayfish. *Society for Neuroscience 31<sup>st</sup> Annual Meeting*; 307.8.
32. Antonsen B.L., **Herberholz J.** and Edwards D.H. (2001) The organization of sensory input to the lateral giant escape command neuron of crayfish. *Proceedings of the 6<sup>th</sup> International Congress of Neuroethology*, Bonn, Germany; 196.
33. Issa F.A., **Herberholz J.** and Edwards D.H. (2001) Patterns of tailflip escape behavior in crayfish during agonistic interactions. *Proceedings of the 6<sup>th</sup> International Congress of Neuroethology*, Bonn, Germany; 249.
34. Song C.K., **Herberholz J.**, Drummond J. and Edwards D.H. (2001) The behavioral response to unexpected touch depends on the agonistic condition in socially experienced crayfish. *Proceedings of the 6<sup>th</sup> International Congress of Neuroethology*, Bonn, Germany; 195.
35. **Herberholz J.**, Issa F.A., and Edwards D.H. (2000) The role of tailflip behavior in crayfish during dominance hierarchy formation. *American Zoologist* 40: 1053.
36. **Herberholz J.**, Issa F.A., and Edwards D.H. (2000) Hands-off-electrophysiology reveals a new offensive type of tail flip in fighting juvenile crayfish. *Society for Neuroscience 30<sup>th</sup> Annual Meeting*; 1725.
37. Song C.-K., **Herberholz J.**, Drummond J. and Edwards D.H. (2000) Social experience changes the behavioral response to unexpected touch in crayfish. *Society for Neuroscience 30<sup>th</sup> Annual Meeting*; 174.

38. **Herberholz J.** and Schmitz B. (1998) The visible water jet: flow visualisation in snapping shrimp (*Alpheus heterochaelis*). N. Elsner and R. Wehner (eds). Thieme, Stuttgart. *Proceedings of the 26<sup>th</sup> Göttingen Neurobiology Conference*; 242.
39. Schmitz B. and **Herberholz J.** (1998) Snapping movements and laser Doppler anemometry analysis of water jets in the snapping shrimp *Alpheus heterochaelis*. N. Elsner and R. Wehner (eds). Thieme, Stuttgart. *Proceedings of the 26<sup>th</sup> Göttingen Neurobiology Conference*; 241.
40. Schmitz B., **Herberholz J.**, Schultz S. and Wuppermann K. (1998) Behavioral and biophysical analysis of rapid waterjets in the snapping shrimp *Alpheus heterochaelis*. *Proceedings of the 5<sup>th</sup> International Congress of Neuroethology*, San Diego, USA; 183.
41. **Herberholz J.** and Schmitz B. (1997a) The role of visual and mechanosensory input during intraspecific agonistic encounters in the snapping shrimp (*Alpheus heterochaelis*). N. Elsner and H. Wässle (eds). Thieme, Stuttgart. *Proceedings of the 25<sup>th</sup> Göttingen Neurobiology Conference*; 251.
42. **Herberholz J.** and Schmitz B. (1997b) Sex-specific behaviour in intraspecific agonistic encounters in the snapping shrimp (*Alpheus heterochaelis*). *Verhandlungen der Deutschen Zoologischen Gesellschaft* 90: 355.

### C) Conference presentations

1. Chapin A., Rajasekaran P.R., Quan D.N., Jang S.-H., Hu L., Bentley W.E., **Herberholz J.** and Ghodssi R. (2018) A discovery platform to peek into the “Gut Feeling”. Mid-Atlantic Nano/Micro Alliance Symposium, Washington, D.C.
2. Phillips M.L., Florek K.E., Liden W.H. and **Herberholz J.** (2010) Integration of sensory signals during escape behavior in crayfish. South East Nerve Net Conference, Atlanta, GA.
3. Liu Y.C. and **Herberholz J.** (2008) Integration of sensory signals and interactions of command neurons in the escape circuitry of crayfish. The 34th Annual East Coast Nerve Net Conference, Woods Hole, MA.
4. **Herberholz J.** and Liden W.H. (2008) Behavioral and neural responses of juvenile crayfish to visual threat stimuli. The 34th Annual East Coast Nerve Net Conference, Woods Hole, MA.

### Research Grant Support

#### Current

1. “Developing engineering solutions to measure, investigate, and predict gut microbiome-to-neuron communication”. PI: Reza Ghodssi. Co-PIs: Jens Herberholz, William Bentley, Wolfgang Losert. Agency: National Science Foundation. Grant type: Integrative Strategies for Understanding Neural and Cognitive Systems (NCS). Total costs: \$1,000,000. Funding period: 9/15/2019 - 8/31/2022.
2. “Comparative analysis of neurobehavioral responses to short-term social isolation”. PI: Jens Herberholz. Co-PIs: Erica Glasper, Anna Li, Farrah Madison, Matthew Roesch. Agency: University of Maryland, Division of Research. Grant type: Strategic Growth Fund. Total costs: \$15,000. Funding period: 8/16/2019 - 8/15/2020.

3. "Modulation of alcohol effects on nervous system function by social experience". PI: Jens Herberholz. Agency: National Institute on Alcohol Abuse and Alcoholism (NIAAA). Grant type: Small Research Grant Program (R03). Total costs: \$152,000. Funding period: 8/1/2017 - 7/31/2020.

### **Past**

1. "Neurobehavioral investigation of socially-mediated mechanisms underlying alcohol addiction". PI: Jens Herberholz. Co-PI: Matthew Roesch. Agency: College of Behavioral and Social Sciences, University of Maryland. Grant type: Research Initiative Award. Direct costs: \$17,480. Funding period: 6/1/2018 - 6/30/2019.
2. "A multimodal sensor discovery platform to study the molecular events underlying the Gut-Microbiome-Brain Axis". Co-PIs: Jens Herberholz, Reza Ghodssi, William Bentley. Agency: University of Maryland, Brain and Behavior Initiative. Grant type: Seed grant. Direct costs: \$80,000. Funding period: 6/1/2018 - 5/31/2019.
3. "Effects of social and non-social stress on decision-making in crayfish". PI: Erik Gunnarsson. Research Sponsor: Jens Herberholz. Agency: College of Behavioral and Social Sciences, University of Maryland. Grant type: Summer Scholar Award. Direct costs: \$3,000. Funding period: 6/1/2017 - 8/31/2017.
4. "A novel use of catanionic vesicles to modulate nervous system function and behavior". PIs: Jens Herberholz, Philip DeShong, Erica Glasper, Farrah Madison. Agency: University of Maryland, Brain and Behavior Initiative. Grant type: Seed grant. Direct costs (Herberholz): \$11,575. Funding period: 4/1/2016 - 3/31/2017.
5. "Wireless Measurement of Neuronal Currents Using Spin-Torque Nano-Oscillators". PIs: Jens Herberholz, Edo Waks, Ben Shapiro, Ricardo Araneda. Agency: University of Maryland, Brain and Behavior Initiative. Grant type: Seed grant. Direct costs (Herberholz): \$10,985. Funding period: 4/1/2016 - 3/31/2017.
6. "Social Status and Stress Effects on Cost Benefit Decisions in *Procambarus Clarkii*". PI: Amelia Kracinovich. Research Sponsor: Jens Herberholz. Agency: Maryland Undergraduate Research Office, University of Maryland. Grant type: Maryland Summer Scholar Award. Direct costs: \$3,000. Funding period: 6/15/2016 - 8/15/2016.
7. "Physiological Effects of Alcohol on Crayfish Escape Circuitry". PI: Matthew Swierzbinski. Research Sponsor: Jens Herberholz. Agency: College of Behavioral and Social Sciences, University of Maryland. Grant type: Doctoral Dissertation Research Award. Direct costs: \$2,500. Funding period: 7/1/2015 - 6/30/2016.
8. "Investigation of a novel glia-mediated inhibitory mechanism". PI: Jens Herberholz. Agency: College of Behavioral and Social Sciences, University of Maryland. Grant type: Research Initiative Award. Direct costs: \$6,500. Funding period: 7/1/2014 - 12/31/2015.
9. "Cellular mechanisms underlying alcohol intoxication". PI: Andrew Lazarchik. Research Sponsor: Jens Herberholz. Agency: College of Behavioral and Social Sciences, University of Maryland. Grant type: Summer Scholar Award. Direct costs: \$3,000. Funding period: 6/15/2015 - 8/15/2015.



10. "Identification of underlying mechanisms for decision-making and behavioral choice in crayfish". PI: Jens Herberholz. Agency: National Science Foundation. Grant type and number: Standard grant; IOS-0919845. Total costs: \$509,882. Funding period: 9/1/2009 – 8/31/2014.
11. "Can crayfish learn to associate specific visual features with an involuntary escape behavior?" PI: Jens Herberholz. Agency: University of Maryland, College of Behavioral and Social Sciences. Grant type: BSOS Emerging Scholars Program. Direct costs: \$1,000. Funding period: 8/29/2012 - 12/11/2012.
12. "Integrative study of reward processes". Co-PIs: Jens Herberholz, Carl Lejuez, Laura MacPherson, Matthew Roesch, Richard Yi, Catalina Kopetz. Agency: University of Maryland, Division of Research. Grant type: DRIF support request; Tier 2 Incentive Program. Direct costs (Herberholz): \$28,470. Funding period: 1/11/2011- 12/31/2011.
13. "Development of a new model system to study the effects of alcohol on neural circuitry that is modified by social experience". PI: Jens Herberholz. Agency: University of Maryland, Division of Research. Grant type: DRIF support request; Seed grant Type A. Direct costs: \$49,985. Funding period: 4/1/2009-3/31/2011.
14. "Non-invasive imaging of escape circuitry in crayfish". PI: Jens Herberholz. Agency: University of Maryland, General Research Board. Grant type: Research Support Award. Direct costs: \$3,500. Funding period: 7/1/08-6/30/09.
15. "Micro-imaging of brain activity in socially experienced crayfish". PI: Jens Herberholz. Agency: University of Maryland, General Research Board. Grant type: Summer Research Award. Direct costs: \$8,750. Funding period: 6/1/06-8/31/06.
16. "The effects of conspecific odor on behavior of socially experienced crayfish". Co-PIs: Jens Herberholz, Charles Derby, Donald Edwards. Agency: National Science Foundation (Science & Technology Center Program). Grant type and number: Venture Grant; IBN-9876754. Direct costs (Herberholz): \$26,600. Funding period: 11/30/2004-8/22/2005.
17. "Magnetic Resonance Imaging of the crayfish brain". Co-PIs: Jens Herberholz, Donald Edwards. Agency: National Science Foundation (Science & Technology Center Program). Grant type and number: Center for Behavioral Neuroscience Venture Grant; IBN-9876754. Direct costs (Herberholz): \$30,000. Funding period: 5/31/2003-5/30/2004.

### **Invited Talks (since 2010)**

- 2019 University of Pennsylvania, Dept. of Bioengineering, Philadelphia, PA (*October*)
- 2018 International Behavioral Neuroscience Society, Annual Meeting, Boca Raton, FL
- 2018 Lafayette College, Dept. of Biology, Easton, PA
- 2016 Howard Hughes Medical Institute, Janelia Farm, Ashburn, VA
- 2015 East Carolina University, Dept. of Biology, Greenville, NC
- 2014 United States Institute of Peace (USIP), Washington, D.C.
- 2014 Summer Neuroscience Conference, University of Maryland, College Park, MD
- 2014 National Institute of Child Health and Human Development, Bethesda, MD
- 2013 Maryland Neuroimaging Retreat, University of Maryland, College Park, MD
- 2013 Gordon Research Conference (Neuroethology), West Dover, VT (*cancelled*)
- 2013 Howard Hughes Medical Institute, Janelia Farm, Ashburn, VA

- 2012 College of Charleston, Dept. of Biology, Charleston, SC
- 2011 Johns Hopkins University, Dept. of Psychological & Brain Sciences, Baltimore, MD
- 2010 University of Maryland Baltimore County, Dept. of Biology, Baltimore, MD
- 2010 9<sup>th</sup> International Congress of Neuroethology, Salamanca, Spain
- 2010 St. Mary's College of Maryland, Dept. of Psychology, St. Mary's City, MD

## **Editorial boards**

### ***Journals***

- *Behaviour*; Brill (Associate Editor; since 2012)
- *Frontiers in Invertebrate Physiology*; Frontiers (Review Editor; since 2011)
- *Invertebrate Neuroscience*; Springer (Review Editor; since 2015)

### **Ad hoc reviews**

#### ***A) Funding agencies***

- National Science Foundation (NSF)
- Natural Science and Engineering Research Council of Canada (NSERC)

#### ***B) Panels & Study sections***

- National Science Foundation (NSF); Division of Integrative Organismal Systems; 2017

#### ***C) Journals***

- |  |  |
|--|--|
| • <i>Acta Ethologica</i>                           | • <i>Journal of Comparative Neurology</i>                  |
| • <i>Animal Behaviour</i>                          | • <i>Journal of Comparative Physiology A</i>               |
| • <i>Behavioral Ecology</i>                        | • <i>Journal of Experimental Biology</i>                   |
| • <i>Behavioral Neuroscience</i>                   | • <i>Journal of Experimental Zoology</i>                   |
| • <i>Behaviour</i>                                 | • <i>Journal of Neurophysiology</i>                        |
| • <i>Behavioural Brain Research</i>                | • <i>Journal of Neuroscience</i>                           |
| • <i>Biological Bulletin</i>                       | • <i>Journal of Neuroscience Methods</i>                   |
| • <i>Brain, Behavior &amp; Evolution</i>           | • <i>Journal of Physiology</i>                             |
| • <i>Brain Research</i>                            | • <i>Journal of the Acoustical Society of America</i>      |
| • <i>Bulletin of Marine Science</i>                | • <i>Journal of Visualized Experiments</i>                 |
| • <i>Canadian Journal of Zoology</i>               | • <i>Journal of Thermal Biology</i>                        |
| • <i>Comparative Biochemistry and Physiology</i>   | • <i>Marine and Freshwater Physiology &amp; Behavior</i>   |
| • <i>Ethology, Ecology &amp; Evolution</i>         | • <i>Philosophical Transactions of the Royal Society B</i> |
| • <i>Frontiers in Neuroscience</i>                 | • <i>Physiology &amp; Behavior</i>                         |
| • <i>Frontiers in Physiology</i>                   | • <i>Proceedings of the Royal Society B</i>                |
| • <i>Fundamental and Applied Limnology</i>         | • <i>PLoS</i>  |
| • <i>Hormones and Behavior</i>                     | • <i>Science</i>   |
| • <i>Invertebrate Reproduction and Development</i> | • <i>Science Advances</i>                                  |

**D) External reviews**

- Promotion & Tenure reviews: UC Berkeley; College of Charleston.
- Grants review: Tübingen-Maryland Bioscience, Neuroscience, and Cognitive Science Graduate Education Partnership.
- PhD student thesis reviews: University of Helsinki, Finland; University of Western Australia.
- Book chapter reviews: Chemical Communication in Crustaceans (Springer; T. Breithaupt & M. Thiel, eds.); Crustacean Nervous Systems and their Control of Behavior (Oxford University Press; C.D. Derby & M. Thiel, eds.)

**Teaching Experience**

*University of Maryland, College Park:*

**A) Main undergraduate courses**

- *Neuroethology (PSYC406)*  
2007-2011, 2013-2019. Lecture; Average enrollment: 34; Average evaluation score: 3.64 (out of 4.0).
- *Animal Behavior (PSYC403)*  
2006-2012, 2014, 2018-2019; Lecture; Average enrollment: 35; Average evaluation score: 3.59 (out of 4.0)

**B) Main graduate courses**

- *Biopsychology of Aggression (PSYC798L)*  
2008-2013. Seminar; Average enrollment: 5; Average evaluation score: 3.84 (out of 4.0).
- *Introduction to Neuroscience (NACS641)*  
2013-2019. Lecture; Average enrollment: 14; Average evaluation score: 3.49 (out of 4.0).

**Mentorship (current and past)**

*University of Maryland, College Park:*

- Postdoctoral Associates [1]
- Faculty research assistants [8]
- Graduate students [7] (*NACS, Psychology*)
- Honors Students [5] (*Biology, Psychology*)
- Undergraduate students [56] (*Animal Sciences, Biology, Computer Science, Economics, Physics, Psychology*)
- High School students [25]

**Awards/fellowships/prizes received by supervised students:**

- APA Summer Science Fellowship
- APA/NIGMS Program for Minority Undergraduates Award
- APA Special Award
- BSOS Doctoral Dissertation Research Award
- BSOS Emerging Scholar Semester Award
- BSOS Summer Scholar Award
- Fulbright Scholar Award
- Gregory F. Ball Scholarship Award

- Louis Stokes Alliances for Minority Participation (LSAMP) Undergraduate Research Program
- Maryland Summer Scholars Award
- NIH Postbaccalaureate IRTA Program Fellowship
- NIH Program in Biomedical Research Summer Internship
- NIH/NCMHD Minority International Research Training Award
- Philip Merrill Presidential Scholar Award
- Ronald E. McNair Post Baccalaureate Achievement Program
- UMD Senior Summer Scholar Award

### **Academic Service**

*University of Maryland, College Park:*

#### **A) University**

- Member, Graduate School Summer Fellowship Committee (2019)
- Member, BBI Director Search Committee (2018 -)
- Member, Neuroscience Major Committee (2016 -)
- Member, Research and Scholarship Awards Selection Committee (2016)
- Member; Limited Submission Review Committee; Division of Research (2015 -)
- Member; Steering Committee, T32 Pre-doctoral Training Grant “Comparative and Evolutionary Biology of Hearing” (2015 - 2017)
- Co-Director; Brain and Behavior Initiative [BBI] (2015 -)
- Member; Review Committee for the Dean, College of BSOS (2013)
- Director, Neuroscience and Cognitive Science Program (2013 - 2017)
- Member; Biological and Chemical Hygiene Committee (2008-2010)

#### **B) College**

- Member, Search Committee Associate/Assistant Dean for Research, College of BSOS (2016)

#### **C) Psychology Department**

- Member; IRB Human Subjects Committee (2018 -)
- Chair, APT committee (2018-2019)
- Member, 3<sup>rd</sup> Year Review committee (2016)
- Chair; Faculty Recruitment Committee (2015 - 2018)
- Chair, 3<sup>rd</sup> Year Review committee (2015)
- Member; Graduate Committee (2012)
- Member; Executive Committee (2011 - 2014)
- Member; Vision Committee (2010 - 2011)
- Member; Space Committee (2009 & 2019 -)
- Member; Faculty Salary Committee (2008 - 2009)
- Member; Faculty Recruiting Committee (2007- 2009)
- Member; Graduate Studies Committee (2006 - 2007)
- Member; Promotion & Tenure Committee (2005 - 2006 & 2007 - 2008)

**D) Neuroscience & Cognitive Science (NACS) Program**

- Member; Executive Committee (2011 – 2013; 2017 - )
- Chair; NACS-Fest Organizational Committee (2006 - 2011)
- Member; Graduate Admissions Committee (2005 - 2009)

**E) Student Committees**Thesis Defense Examination committees:

- Ph.D. students [14] (*Biology, Engineering, Kinesiology, NACS, Psychology*)
- Masters Students [4] (*NACS, Psychology*)
- Honors Students [6] (*Biology, Psychology*)

Advisory committees:

- Ph.D. students [26]

**F) Other Services**

- Served as faculty advisor for Psychology majors enrolled in the “Minor in Neuroscience Program”, University of Maryland (2008-2009)
- Serving as research advisor and student mentor to the Neuroscience Research Laboratory, Thomas Jefferson High School for Science and Technology, Alexandria, VA (since 2007).

**Media coverage/Research Impact**

My work has been covered in numerous media outlets in broadcast, print, and online. This includes The Economist, Fortune Magazine, New Scientist, ScienceDaily, Baltimore Sun, USA Today, The Verge, The Wine Spectator, The Diamondback, EurekAlert, California Academy of Sciences, National Science Foundation, and in the international media (e.g., China, Germany, France, and India). Our 2017 paper “*Prior social experience affects the behavioral and neural responses to acute alcohol in juvenile crayfish*” published in the Journal of Experimental Biology is in the top 5% of all research outputs (>10M) ever tracked by Altmetric.