

HANNA ZWAKA

EDUCATION

December 2015	Dissertation at the Freie Universität Berlin, title: Behavioral and neural analysis of learning and memory in the honeybee <i>Apis mellifera</i> (Summa cum Laude)
2011 – 2015	Ph.D. position at the Institute of Neurobiology at the Freie Universität Berlin
2011	Diploma degree with honors in biology (1.0), key aspect neurobiology, ecology, zoology, paleontology

RESEARCH EXPERIENCE

LIN Leibniz Institut. for Neurobiology Magdeburg, Germany January 2024 – pending	Principal Investigator Project: Effects of sleep deprivation on brain and behavior
Harvard University Molecular and Cellular Biology Cambridge, MA August 2016 – December 2023	Postdoctoral Fellow, Advisor: Florian Engert Project: Sleep deprivation affects motion stabilization task. Covert attention to obstacles biases escapes via the Mauthner cell. Experience dependent changes in innate behavior in larval zebrafish
LIN Leibniz Institut. for Neurobiology Magdeburg, Germany September 2015 – July 2016	Research assistant, Advisor: Bertram Gerber Project: Cognitive enhancement in insects by <i>Rhodiola rosea</i>
Freie Universität Berlin Institute for Neurobiology Berlin, Germany April 2011 – September 2015	Research assistant, Advisor: Randolph Menzel Projects: Neuronal correlates of instrumental learning in a virtual environment. Cognitive enhancement in insects by <i>Rhodiola rosea</i> . Sleep and memory consolidation in honeybees. Anatomy of projection neurons in the honeybee brain

FUNDING

2017-2019	DFG Research Fellowship
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PLACEMENTS IN APPOINTMENT PROCEDURES

2022	2nd placement in appointment procedure for W2 Zebrafish professorship Neurobiology, Göttingen
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PROFESSIONAL TRAINING

2018	Imaging Structure & Function in the Nervous System, Cold Spring Harbor, NY (Microscope building, confocal microscopy, two-photon imaging, light-sheet imaging, optogenetics, digital image processing)
2017	Zebrafish Genetic and Development, MBL, Woods Hole, MA (In-situ hybridization, optogenetics, genetic screening, small molecule screening, mRNA overexpression, functional knockdown)

AWARDS AND HONORS

2022	FENS Travel Grant
2018	Consult General of Japan Award at JSPS
2018	Cold Spring Harbor imaging course scholarship
2017	Marine Center for Biology Walter L. Wilson Endowed Scholarship
2016	FU Berlin publication scholarship

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TEACHING AND MENTORING EXPERIENCE

2022	Teaching assistant for Harvard System Neuroscience course
2021	Guest lecturer for the behavioral neurobiology master's course at University of Konstanz
2021-2023	Supervision of Master thesis, Harvard University
2019 - 2023	Supervision of two undergraduate theses, Harvard University
2018	Guest lecturer for Harvard Neurobiology of Behavior course for undergraduates
2017 - 2023	Guest lecturer for Harvard System Neuroscience course
2012 - 2016	Supervision of eleven undergraduate theses, Freie Universität Berlin
2009 - 2010	Neurobiology at the Freie Universität Berlin. Lecturing, lab demonstrations, tutoring, grading

OUTREACH

Since 2023	Committee member of the Harvard Task Force on Diversity, Inclusion, and Belonging.
2020 - 2022	Mentor for HGWISE (Harvard Graduate Women in Science and Engineering)
2021	Panelist for the Cambridge Science Festival on the topic of science communication
Since 2021	Science Education Partner for the Harvard Museum
2010 - 2015	Lecturer of yearly neurobiology class for schools visiting the Freie Universität Berlin

CONFERENCE PRESENTATIONS

Talks

2021	Harvard Museum, Science Festival Do fish smell?
2019	Janelia Farm, Virginia. Sleep in <i>Drosophila</i> Memory consolidation during sleep in honeybees
2017	Neurotuscan, Italy Memory consolidation in honeybees during sleep
2016	Neurotuscan, Italy Instrumental learning in a virtual environment for stationary walking honeybees
2014	Janelia Farm, Virginia. Learning and Memory: A Synthesis of Bees and Flies Conference Instrumental learning in a virtual environment for stationary walking honeybees
2012	Universität Konstanz, Honeybee <i>Drosophila</i> – Meeting A virtual environment for stationary walking honeybees

Poster

2023	Cold Spring Harbor- Zebrafish meeting Sleep deprivation enhances decision making in larval zebrafish. Paula Pflitsch, Nadine Oury, Will Joo, Armin Bahl, Jason Rihel, Florian Engert and Hanna Zwaka
	Paris - FENS Meeting Sleep deprivation enhances decision making in larval zebrafish. Paula Pflitsch, Nadine Oury, Will Joo, Armin Bahl, Jason Rihel, Florian Engert and Hanna Zwaka
2022	Cold Spring Harbor- Neuronal Circuits meeting Sleep deprivation enhances decision making in larval zebrafish. Hanna Zwaka, Paula Pflitsch, Nadine Oury, Will Joo, Armin Bahl, Jason Rihel and Florian Engert

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- 2019 Sölden, 21st International Winter Conference
Stress changes innate behavior in larval zebrafish. Hanna Zwaka, Kristian Herrera, Florian Engert
- Berlin, Bernstein Conference
Experience changes innate behavior in zebrafish larvae. Hanna Zwaka, Kristian Herrera, Armin Bahl, Florian Engert
- Cold Spring Harbour, Zebrafish Neural Circuits and Behavior
Experience changes innate behavior. Hanna Zwaka, Kristian Herrera, Armin Bahl, Terzah Hill, Florian Engert
- 2018 Cambridge, The Japan-US Science Forum
Memory consolidation in honeybees during sleep. Hanna Zwaka, Ruth Bartels, Jacob Gora, Randolph Menzel
- 2017 Göttingen, 12th meeting of the German Neuroscience Society
Cognitive enhancement' in insects: associative function increased by *Rhodiola rosea* food supplementation. Birgit Michels, Katrin Franke, Ludger Wessjohann, Dushyant Mishra, Oleh Lushchak, Hanna Zwaka, Ruth Bartels, Bertram Gerber
- Woods Hole, Zebrafish Development and Genetics 20th Anniversary Symposium
Memory consolidation in honeybees during sleep. Hanna Zwaka, Ruth Bartels, Jacob Gora, Randolph Menzel
- Bethesda, Zebrafish Neural Circuits and Behavior Meeting
Operant conditioning in Zebrafish. Hanna Zwaka, Kristian Herrera, Florian Engert.
- 2016 Sölden, 18th International Winter Conference
Instrumental learning in a virtual environment for stationary walking honeybees. Hanna Zwaka, Ruth Bartels, Sören Hantke, Simon Menzel, Sophie Lehfelddt, Meida Jyste, Raul Rojas and Randolph Menzel
- 2015 Göttingen, 11th meeting of the German Neuroscience Society
-'Cognitive enhancement' in insects: associative function increased by *Rhodiola rosea* food supplementation. Birgit Michels, Katrin Franke, Ludger Wessjohann, Dushyant Mishra, Oleh Lushchak, Hanna Zwaka, Ruth Bartels, Bertram Gerber
- Neuronal correlates of instrumental learning in the honeybee. Hanna Zwaka, Meida Jusyte, Sophie Lehfelddt, Randolph Menzel
- 2014 Janelia Farm, Virginia, Learning and memory: A synthesis of bees and flies Conference
Searching for neuronal correlates of decision making/operant learning in honeybees. Hanna Zwaka, Sophie Lehfelddt, Randolph Menzel
- 2013 Göttingen, 10th meeting of the German Neuroscience Society In search of neuronal correlates of decision making in honeybees. Hanna Zwaka, Randolph Menzel
- 2012 New Orleans, Annual meeting of the Society of Neuroscience
Searching for neural correlates of decision making in honeybees. Hanna Zwaka, Randolph Menzel
- 2011 Washington DC, Annual meeting of the Society for Neuroscience Olfactory projection neurons in the honeybee: Structural input-output relations. Hanna Zwaka, Daniel Münch, Gisela Manz, Jürgen Rybak, Randolph Menzel

PUBLICATIONS

- 2014 Schallschmidt, K., Becker, R., Zwaka, H., Menzel, R., Johnen, D., Fischer- Tenhagen, C., ..., Nehls, I. In vitro cultured lung cancer cells are not suitable for animal-based breath biomarker detection. **Journal of Breath Research**
- 2015 Zwaka, H.*, Bartels, R.*, Gora, J., Franck, V., Culo, A., Götsch, M., Menzel, R. Context Odor Presentation during Sleep Enhances Memory in Honey- bees. **Current Biology**
- 2016 Zwaka, H., Münch, D., Manz, G., Menzel, R., Rybak, J. The circuitry of olfactory projection neurons in the brain of the honeybee, *Apis mellifera*. **Frontiers in Neuroanatomy**

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- 2018 [Zwaka, H.*](#), Bartels, R.*, Gruenewald, B., Menzel, R. Neural organization of mushroom body intrinsic circuits in the honeybee brain. **Frontiers in Neuroanatomy** .
- Michels, B.*, [Zwaka, H.*](#), Lushchak, O.*, Bartels, R.*Schreyer, S., Lignau, A., Mishra, D., Haberkern, H., Eschbach, C., Koblowsky, M., Niewalda, T, Menzel, R., Gerber, B.,. Memory enhancement by ferulic acid ester across species. ***contributed equally. Science Advances**.
- Haenicke, J., Yamagata, N., [Zwaka, H.](#), Nawrot, M., Menzel, R. Neural correlates of odor learning in the presynaptic microglomerular circuitry of the honeybee mushroom body calyx. **eNeuro**.
- 2019 [Zwaka, H.](#) , Bartels, R., Lehfeldt, S., Jusyte, M., Hantke, S., Menzel, S., Gora, J., Alberdi R., and Menzel, R.. Learning and its neural correlates in a virtual environment for honeybees. **Frontiers in Neuroanatomy**.
- 2022 [Zwaka, H.](#), McGinnis, O.J., Pflitsch, P., Prabha, S., Mansinghka, V., Engert, F., Bolton, A.D.. Covert attention to obstacles biases escapes via the Mauthner cell (preprint). **Current Biology**.
- 2023 Kraus, A., Garcia, B., Ma, J., Herrera, K., [Zwaka, H.](#), Harpaz, R., Wong, R., Engert, F., Salinas, I.. Peripheral detection of viruses shapes brain immunity and behavior in zebrafish. **eLife**
- Krishnan, K., Muthukumar, A., Sterrett, S., Pflitsch, P., Fairhall, A., Fishman, M., Bahl, A., **Zwaka, H.***, and Engert, F.* Attentional Switching in Larval Zebrafish: The Attentive Leaky Integrator. **Researchsquare**. Under Review in Nature. ***shared last author**

PROFESSIONAL EXPERIENCE

- Neuroethology conference Berlin Concept and organization of satellite symposium *Danionella*
Berlin, Germany
2024
- Center for Brain Science Harvard Concept and organization of the Harvard CBS lecture series
Cambridge, MA
2021-2023
- Neuro DoWo Conference organizer, planning of the Neurobiology Doctoral
Berlin, Germany Workshop (NeuroDoWo) in Berlin with 70 participants
June 2014