

CV 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
2004 – 2011	Studies in biology at the Freie Universität Berlin

RESEARCH EXPERIENCE

Harvard University Molecular and Cellular Biology Cambridge, MA August 2016 – pending	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 Leibnitz Institut. for Neurobiology Magdeburg, Germany Sept 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 – Sept 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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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
- 2020-2022 Supervision of Master thesis, Harvard University (Paula Pflitsch)
- 2019 - current Supervision of two undergraduate theses, Harvard University (Nadine Oury, Terzah Hill)
- 2018 Guest lecturer for Harvard Neurobiology of Behavior course for undergraduates
- 2017 - 2022 Guest lecturer for Harvard System Neuroscience course
- 2012 - 2016 Supervision of eleven undergraduate theses, Freie Universität Berlin (Stefanie Schreyer, Annika Lingnau, Marike Hilker, Sophie Lehfeld, Meida Jusyte, Vivien Frank, Ana Culo, Moritz Goetsch, Nadja Lehmann, Arne Beutel, Elsa Marlene Vorderwuelbecke)
- 2009 - 2010 Neurobiology at the Freie Universität Berlin. Lecturing, lab demonstrations, tutoring, grading

OUTREACH

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

CONFERENCE PRESENTATIONS

Talks

- 2021 Harvard Museum, Science Festival
Do fish smell?
- 2019 Janelia Farm, Virginia. Sleep in *Drosophila*
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 *Drosophila* – Meeting
A virtual environment for stationary walking honeybees

Poster

- 2022 Cold Spring Harbour- 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
- 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

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- 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 Lehfeltd, 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 Lehfeltd, 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 Lehfeltd, 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**, 9(2), 027103.
- 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**, 25 (21)
- 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** 10: 90.
- 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.,

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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). BioRxiv.
<https://doi.org/10.1101/2022.04.14.488363>

SKILLS

TECHNIQUES

Behavioral experiments
Extracellular recording
Intracellular recording
Immunohistochemistry
3D neuron reconstruction
Single neuron staining
Confocal microscopy
Two-photon imaging
Microscope building

SOFTWARE

Adobe Illustrator *pro*
Amira *pro*
MATLAB *basic*
R *basic*
Spike2 *pro*
Python *intermediate*

LANGUAGE

German *native*
English *fluent*
Turkish *fluent*
French *basi*