Hannah J. M. Haberkern

haberkernh@janelia.hhmi.org | +1 571-699-7739
HHMI Janelia Research Campus, 19700 Helix Dr, Ashburn, VA 20147

EDUCATION

University of Cambridge, UK / HHMI Janelia Research Campus, USA *2012-2017*
PhD at the Department of Zoology
Advisors: Berthold Hedwig (University of Cambridge), Vivek Jayaraman (Janelia)
PhD thesis title: Multisensory navigation in tethered walking insects

ETH Zürich, Switzerland *2009-2012*
Master of Science in Computational Biology and Bioinformatics
Master thesis title: Measurement of *Drosophila's* phase response curve with mechanosensory stimuli

Julius Maximilians Universität Würzburg, Germany *2006-2009*
Bachelor of Science in Biomedicine
Bachelor thesis title: Operant learning in *Drosophila* larvae?

RESEARCH EXPERIENCE

Postdoctoral associate | HHMI Janelia Research Campus *Feb 2017 - present*
Supervisor: Vivek Jayaraman
Development of conditioning paradigms for head-fixed walking flies in VR, transfer of paradigm to two-photon imaging rig (in progress).

PhD Project | HHMI Janelia Research Campus *Sep 2012 - Jan 2017*
Supervisor: Vivek Jayaraman
Landmark-guided navigation of head-fixed walking fruit flies in a 2D virtual reality.

PhD Project | University of Cambridge, Department of Zoology *Sep 2011 - Aug 2012*
Supervisor: Berthold Hedwig
Integration of auditory and antennal stimulation in tethered walking field crickets.

Research Technician | HHMI Janelia Research Campus *Feb - Jul 2012*
Supervisor: Vivek Jayaraman
Assembly of 2D virtual reality rig for tethered walking fruit flies.

Master thesis project | Institute of Neuroinformatics, ETH Zürich *May 2011 - Jan 2012*
Supervisors: Jan Bartussek, Steven Fry, Ruedi Stoop
Measurement of Drosophila's wing-beat response in tethered flight to small mechanosensory disturbances.

Rotation | D-INFK, ETH Zürich *Apr - May 2011*
Supervisor: Petros Koumoutsakos
Simulation of Juxtacrine signalling using "Subcellular Elements" method.

Rotation | D-BSSE Basel, ETH Zürich *Mar - Apr 2011*
Supervisor: Dagmar Iber
Development of a parameterization technique for Turing models.

Rotation | Institute of Neuroinformatics, ETH Zürich *Mar 2011*
Supervisor: Jan Bartussek

Investigation of self-induced feedback during tethered flight in Drosophila using a vibrometer.

Bachelor thesis project | Biozentrum, Universität Würzburg *Mar - Jun 2009*
Supervisor: Bertram Gerber
Attempted conditioning of crawling and turn movements of Drosophila larva using vibration stimuli.

Internship | Rudolf Virchow Zentrum, Universität Würzburg *Jul - Aug 2008*
Supervisor: Stephan Sigrist
Complementation analysis with bruchpilot mutants and histological investigation of their neuromuscular junction in Drosophila.

PUBLICATIONS

In preparation: **Haberkern H**, Bruns C, Jayaraman V. A virtual reality paradigm for studying visually guided 2D navigation in head-fixed flies.

Haberkern H, Hedwig B (2016). Behavioural integration of auditory and antennal stimulation during phonotaxis in the field cricket *Gryllus bimaculatus*. *J Exp Biol.* 219(Pt 22):3575-3586.

Haberkern H, Jayaraman V (2016). Studying small brains to understand the building blocks of cognition. *Curr Opin Neurobiol.* 37:59-65.

Milde F, Tauriello G, **Haberkern H**, Koumoutsakos P (2014). SEM++: a particle model of cellular growth, signaling and migration. *Computational Particle Mechanics* 1 (2), 211-227

Wang D, Freitag F, Gattin Z, **Haberkern H**, Jaun B, Siwko M, Vyas R, van Gunsteren W F, Dolenc J (2012). Validation of the GROMOS 54A7 Force Field Regarding Mixed α/β -Peptide Molecules. *Helvetica Chimica Acta* 95 (12), 2562- 577

Eschbach C, Cano C, **Haberkern H**, Schraut K, Guan C, Triphan T, Gerber B (2011). Associative learning between odorants and mechanosensory punishment in larval *Drosophila*. *J Exp Biol.* 214(Pt 23):3897-905.

SELECTED PRESENTATIONS

Invited talk | *Landmark-guided navigation in a 2D virtual reality environment*. *Dec 2016*
Hosted by Andrew Leifer, PhD, Department of Physics & Princeton Neuroscience Institute, Princeton University

Poster | *Landmark-guided navigation in a 2D virtual reality environment.* *Nov 2016*
Haberkern H, Bruns C, Basnak M, Biafra A, Bolstad M, Cohen J, Jayaraman V;
Annual meeting of the Society for Neuroscience, San Diego, USA

Talk | *Dissecting navigation in a visual and virtual thermal landscape.* *Apr 2016*
University of Cambridge PDN Department Graduate Symposium, Cambridge, UK

Poster | *A virtual reality system for the study of visually guided navigation in head-fixed walking Drosophila.* *Nov 2014*
Haberkern H, Jayaraman V; Flies, worms and robots: combining perspectives on minibrains and behavior, ESF conference, Barcelona, Spain

Poster | *Do crickets integrate polarotaxis and phonotaxis?* *Mar 2013*
Haberkern H, Hedwig B; 10th Göttingen Neuroscience Meeting, Göttingen, Germany

Poster | *Self-induced feedback during tethered flies in Drosophila melanogaster.* *Sep 2011*
Haberkern H, Bartussek J, Medici V, Fry SN; Champalimaud Neuroscience Symposium, Lisbon, Portugal

Poster | *Early lung development: Branching mode selection.* *Jun 2011*
Haberkern H, Menshykau D, Kraemer K, Iber D; 9th [BC]2 Basel Computational Biology Conference on Multiscale Modeling, Basel, Switzerland

TEACHING AND SUPERVISION

Supervision of Janelia Undergraduate Scholars: Dimitra Vardalaki (Jun - Jul 2015), Mélanie Basnak (Jun - Aug 2016, middle author on poster presented at annual SfN meeting 2016), Laura Porta (Jun - Aug 2017) *2015, 2016, 2017*

Teaching Assistant: Supervision of exercises for "Introduction to computer science for biologists and pharmacists" lecture course, ETH Zürich, Switzerland *Sep 2009 - Jul 2010*

Teaching Assistant: Exam preparation for "General Biology" lecture course, Universität Würzburg, Germany *May - Jul 2008*

SKILLS

Experimental
- Behavioral arena design
- Behavioral paradigm development
- Hardware-related programming in Arduino, C/C++, Python
- *Drosophila* handling and applied genetics
- Ex-vivo fly dissection and confocal imaging

Computational
- Data analysis and statistics on Python, Matlab, R
- Mathematical modelling

Languages: English (fluent), German (fluent), French (basic)

OTHER ACTIVITIES

Active member of the newly formed student association of biomedical students at the Universität Würzburg. I helped with reorganizing the bachelor in biomedicine course curriculum based on the Bologna guidelines. *Apr 2008 - Jul 2009*

Active member of the "FIBio", the student association of biology students at the Universität Würzburg *Sep 2007 - Jul 2009*

REFERENCES

Vivek Jayaraman, PhD
Group Leader at Janelia Research Campus, PhD advisor

HHMI Janelia Research Campus, 19700 Helix Dr, Ashburn, VA 20147, United States
vivek@janelia.hhmi.org
+ 1 571 209 4171

Berthold Hedwig, PhD
University Reader in Neurobiology at University of Cambridge, PhD advisor

Department of Zoology, University of Cambridge, Downing St, CB2 3EJ Cambridge, United Kingdom
bh202@cam.ac.uk
+44 1223 36603

Prof. Bertram Gerber, PhD
Leipniz Institute for Neurobiology, Magdeburg, Bachelor thesis advisor

Department Genetics, Leibniz Institute for Neurobiology, Brenneckestraße 6, 39118 Magdeburg, Germany
bertram.gerber@lin-magdeburg.de
+49 391 6263 92261