

BRAD K. HULSE

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EDUCATION

California Institute of Technology 2010 - 2017
Ph.D. in Systems Neuroscience
Department of Biology and Biological Engineering
Laboratory of Professor Thanos Siapas

University of Wisconsin-Madison 2005 - 2009
Bachelor of Science in Letters and Science
Major: Neurobiology (GPA: 3.97/4.00)

RESEARCH EXPERIENCE

Postdoctoral Associate and Research Scientist 2017 -
Howard Hughes Medical Institute, Janelia Research Campus
Laboratory of Dr. Vivek Jayaraman

Associate Research Specialist and Research Assistant 2006 - 2010
University of Wisconsin-Madison, Department of Psychiatry
Laboratory of Professors Giulio Tononi and Chiara Cirelli

PUBLICATIONS

Hulse, B.K.*†, Haberkern, H. *†, Franconville, R. *†, Turner-Evans, D.B. *†, Takemura, S., Wolff, T., Noorman, M., Dreher, M., Dan, C., Parekh, R., et al. (2020). A connectome of the *Drosophila* central complex reveals network motifs suitable for flexible navigation and context-dependent action selection. *eLife* 2021;10:e66039.

*co-first author | †co-corresponding author

Dana, H. *, Sun, Y. *, Mohar, B. *, **Hulse, B.K.** *, Kerlin, A.M., Hasseman, J.P., Tsegaye, G., Tsang, A., Wong, A., Patel, R., et al. (2019). High-performance calcium sensors for imaging activity in neuronal populations and microcompartments. *Nat Methods* 16, 649-657.

*co-first author

Hulse, B.K. †, and Jayaraman, V.†. (2019). Mechanisms Underlying the Neural Computation of Head Direction. *Annu Rev Neurosci.* 43:1, 31-54.

†co-corresponding author

Hulse, B.K. †, and Jayaraman, V. (2019). Busted! A Dope Ring with Activity Clocked at Dawn and Dusk. *Neuron* 102, 713-715.

† corresponding author

Hulse, B.K., Lubenov, E.V., and Siapas, A.G. (2017). Brain State Dependence of Hippocampal Subthreshold Activity in Awake Mice. *Cell reports* 18, 136-147.

Hulse, B.K., Moreaux, L.C., Lubenov, E.V., and Siapas, A.G. (2016). Membrane Potential Dynamics of CA1 Pyramidal Neurons during Hippocampal Ripples in Awake Mice. *Neuron* 89, 800-813.

Goldstein, M.R., Plante, D.T., **Hulse, B.K.**, Sarasso, S., Landsness, E.C., Tononi, G., and Benca, R.M. (2012). Overnight changes in waking auditory evoked potential amplitude reflect altered sleep homeostasis in major depression. *Acta Psychiatr Scand* 125, 468-477.

Hulse, B.K. *, Landsness, E.C. *, Sarasso, S., Ferrarelli, F., Guokas, J.J., Wanger, T., and Tononi, G. (2011). A postsleep decline in auditory evoked potential amplitude reflects sleep homeostasis. *Clin Neurophysiol* 122, 1549-1555.

*co-first author

Riedner, B.A., **Hulse, B.K.**, Murphy, M.J., Ferrarelli, F., and Tononi, G. (2011). Temporal dynamics of cortical sources underlying spontaneous and peripherally evoked slow waves. *Prog Brain Res* 193, 201-218.

Tononi, G., Riedner, B.A., **Hulse, B.K.**, Ferrarelli, F., Sarasso, S. (2010). Enhancing sleep slow waves with natural stimuli. *MedicaMundi*. 54:82–88.

Landsness, E.C., Crupi, D., **Hulse, B.K.**, Peterson, M.J., Huber, R., Ansari, H., Coen, M., Cirelli, C., Benca, R.M., Ghilardi, M.F., et al. (2009). Sleep-dependent improvement in visuomotor learning: a causal role for slow waves. *Sleep* 32, 1273-1284.

PREPRINTS

Kajikawa, K., **Hulse, B.K.**, Siapas, A.G., and Lubenov, E.V. (2021). Inhibition is the hallmark of CA3 intracellular dynamics around awake ripples. *bioRxiv*, 2021.2004.2020.440699.

Dan, C., **Hulse, B.K.**, Jayaraman, V., Hermundstad, A.M. (2021). Flexible control of behavioral variability mediated by an internal representation of head direction. *bioRxiv*, 10.1101/2021.08.18.456004

RECENT PRESENTATIONS

Circuit motifs for vector navigation and goal-directed action selection: insights from the Drosophila central complex connectome.

- The Scientist Magazine webinar series (invited talk) 2022
- Cosyne (poster) 2021
- Society for Neuroscience annual meeting (poster) 2021
- HHMI cognitive and systems neuroscience meeting (poster) 2020

A multimodal rotational velocity signal required for angular path integration in Drosophila.

- CSHL neural circuits meeting (invited talk) 2022
- HHMI conference on the operating regime of neural circuits (poster) 2019
- Ascona conference on the assembly and function of neural circuits (poster) 2019

TEACHING ASSISTANT EXPERIENCE

Topics in Systems Neuroscience 2013
Cellular and Systems Neuroscience 2011
Introduction to Neuroscience 2010 - 2011

WORKSHOPS

Optical Imaging and Electrophysiological Methods in Neuroscience 2013
Ecole Des Neurosciences. Paris, France

OUTREACH

HHMI Janelia Student Outreach Program (RESET) 2018
UW-Madison Neurobiology Student Outreach Program 2007 - 2008

FUNDING, HONORS, AWARDS, AND PRESS

Approaches for non-invasive imaging of neural activity in Drosophila (HHMI grant)	2021
Cover of Cell Reports (Volume 18, Issue 1).	2017
Brain Awareness Week Image of the Day (NSF, Science 360)	2016
NSF Graduate Research Fellowship Program: Honorable Mention	2012

OTHER PROFESSIONAL ACTIVITIES

Ad Hoc Reviewer: Science, Cell, Neuron, Hippocampus

REFERENCES

Vivek Jayaraman, Ph.D.

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Thanos Siapas, Ph.D.

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