

# BRIAN J WILTGEN, Ph.D.

## Curriculum Vitae

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Center for Neuroscience  
1544 Newton Court  
University of California, Davis  
Davis, CA

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### Research interests

#### **Integration of cellular, systems and cognitive neuroscience in mice, in the areas of:**

- Neurobiological mechanisms of learning and memory
  - Synaptic plasticity and Alzheimer's disease
  - Memory processes and addiction
  - Fear and anxiety
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### Education

Ph.D., University of California, Los Angeles, Psychology	2003
M.A., University of California, Los Angeles, Psychology	1999
B.S., University of Iowa, Psychology	1997

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### Academic appointments

Associate Professor of Psychology, University of California, Davis	2015 -
Assistant Professor of Psychology, University of California, Davis	2012 – 2014
Assistant Professor of Psychology, University of Virginia	2008 – 2012

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### Employment and professional affiliations

Pavlovian Society Executive Committee	2015 -
Faculty Fellow, Center for the Neurobiology of Learning & Memory University of California, Irvine	2014 -
Postdoctoral fellow (Alcino Silva), UCLA	2004-2008
Postdoctoral researcher (Michael Fanselow), UCLA	2003-2004
Graduate student researcher (Michael Fanselow), UCLA	1997-2003
Undergraduate researcher (Isidore Gormezano), University of Iowa	1995-1997

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### Honors and Awards

McKnight Foundation Memory & Cognitive Disorders Award	2012
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Whitehall Foundation Award	2011
Alzheimer's Association New Investigator Award	2011
Mead Endowment Honored Faculty	2010
NIH National Research Service Award	2003
UCLA Research Mentorship Fellowship	2000
UCLA University Fellowship Award	1997

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### Grants

NIH/NINDS 1RO1 NS088053-01A1 (\$1,666,740) Neurobiological Mechanisms of Systems Consolidation	2015 - 2020
McKnight Foundation (\$300,000), Memory and Cognitive Disorders Award Reactivation of Neocortical Memory Networks During Consolidation	2012 - 2015
Whitehall Foundation (\$225,000), Research Grant The Contribution of Calcium-permeable AMPA Receptors to Synaptic Plasticity	2011 - 2014
Alzheimer's Association (\$100,000), New Investigator Grant The Role of Synaptic Plasticity in the Development of Alzheimer's Disease	2011 - 2013
US Army Small Business Technology Transfer Program (\$45,000) A Rugged Automated Training System for Landmine Detection-Phase I	2011 - 2012
NIH/NIDA RO3 (\$77,000) Motivational Control of Goal-directed Actions and Habits	2010 - 2012
Jeffress Memorial Trust Research Grant (\$30,000) In vivo Experience Modifies Cellular Plasticity Mechanisms in the Hippocampus	2010 - 2011
NIH/NIA F32 AG023403 (\$132,472) Memory Following CaMKII Loss in Hippocampal Subregions	2003 - 2006

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### Mentored Grants

Anahita Hamidi, NSF Fellowship	2012 - 2015
Kaycie Tayler, NSF Fellowship	2009 - 2012

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### Teaching Experience

<b>University of California, Davis</b> Undergraduate: <i>Neurobiology of Learning and Memory, Animal Cognition</i> Graduate: <i>Hippocampal Contributions to Fear and Anxiety, Current Topics in Memory, Subregion Specialization in the Hippocampus</i>	2012 -
<b>University of Virginia</b> Undergraduate: <i>Neurobiology of Learning and Memory, Biological Models of Cognition</i> Graduate: <i>Neurobiology of Learning and Memory, Mechanisms of Memory</i>	2009 - 2012

**Cold Spring Harbor** 2001 – 2002  
*Mouse Behavioral Analysis* (w/ Drs. Fanselow, Mayford and Anagnostaras)

**University of California, Los Angeles** 2007  
 Undergraduate: *Animal Learning and Behavior, Research Methods, Learning Laboratory*

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**Invited Talks**

Manipulating memory retrieval 2017  
 Cornell University  
 Ithaca, NY

Neurobiology of memory consolidation 2017  
 University of California, San Diego  
 San Diego, CA

Recent and remote memory retrieval 2017  
 Tufts University  
 Boston, MA

Manipulating memory consolidation 2017  
 Neurobiology of Learning & Memory Winter Meeting  
 Park City, Utah

Interactions between the hippocampus and neocortex during memory retrieval 2016  
 Memory Mechanisms in Health and Disease Conference  
 Tampa, FL

Retrieving memory with the hippocampus 2016  
 Northwestern University  
 Chicago, IL

Interactions between the hippocampus and neocortex during memory retrieval 2016  
 McKnight Foundation Annual Meeting  
 Minneapolis, MN

Context fear and the hippocampus 2015  
 Pavlovian Society Meeting  
 Portland, OR

The hippocampus reactivates cortical representations during memory retrieval 2015  
 Annual Meeting of the Japan Neuroscience Society  
 Kobe, Japan

Interactions between the hippocampus and neocortex during memory retrieval 2015  
 Center for the Neurobiology of Learning and Memory Spring Meeting  
 Irvine, CA

Retrieving memory with the hippocampus 2015

Brain, Cognition, Behavior and Evolution Meeting Sao Paulo, Brazil	
Cortical representations are reactivated during memory retrieval Annual Meeting of the Japan Neuroscience Society Yokohama, Japan	2014
Hippocampal replay and memory retrieval Pavlovian Society Meeting Austin, TX	2013
Reactivation of hippocampal and cortical circuits during memory consolidation European Brain and Behavior Society Conference Munich, Germany	2013
Reactivation of hippocampal and cortical circuits during memory consolidation Memory Disorders Research Society (MDRS) Meeting Davis, CA	2012
Reactivation of neural ensembles during memory retrieval Winter Conference on Neural Plasticity St. Kitts, Caribbean	2012
Reactivation of individual neurons in the hippocampus and neocortex UC Irvine Center for the Neurobiology of Learning & Memory Irvine, CA	2012
Recent and remote context fear memories Neurobiology of Learning & Memory Winter Meeting Park City, Utah	2011
The cellular mechanisms of memory are modified by experience Duke University, Psychology Department Seminar Durham, NC	2010
Precise context memories require the hippocampus Pavlovian Society Meeting Baltimore, MD	2010

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## Research Sponsorship

### University of California, Davis

#### Graduated Ph.D. students

Kazumasa Tanaka, Ph.D. 2010-2015

Currently a postdoc at the Riken Brain Science Institute with Dr. Tom McHugh

#### Current Ph.D. students

Anahita Hamidi, Ph.D. candidate, 2012-

Jalina Graham, Ph.D. candidate, 2013-  
Jamie Slater, Ph.D. candidate, 2014-  
Jacob Wilmot, Ph.D. candidate, 2015-  
Yusuke Ota, Ph.D. candidate, 2015-  
Kyle Puhger, Ph.D. candidate, 2016-

**Undergraduate honors theses**

Sassan Suarez

**Diversity programs**

Biological undergraduate honors program (BUSP): Sassan Suarez, UC Davis

Howard Hughes Medical Institute (HHMI) Exceptional Research Opportunities Program (EROC): Sassan Suarez, UC Davis

California Alliance for Minority Participation (CAMP): Daffcar Erol, UC Davis

UC LEADS (minority summer internship): Osmar Aguirre, UC Santa Cruz,

**University of Virginia**

**Graduated Ph.D. students**

Kaycie Tayler, Ph.D. 2009-2013

Currently an instructor at the University of Alabama at Huntsville

**Undergraduate honors theses**

Pratik Patel

Zach Collier

Courtney Sinclair

Bryce Grier

Samuel Bacharach

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**Review service**

Journal reviewer: ad hoc for Science, Neuron, Nature Neuroscience, Journal of Neuroscience, Neurobiology of Learning and Memory, Hippocampus, Learning & Memory, Current Biology, Biology Psychiatry, Frontiers in Behavioral Neuroscience

Grant reviewer: ad hoc for NIH/NIDA SEP (2011), NIH/Neurobiology of Learning and Memory Study Section (2014, 2015), NIH/SEP (2014, 2015), NIH/Cognitive Neuroscience Study Section (2016), Canada Foundation for Innovation (2016)

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**University Service**

**UC Davis**

Departmental and college committees

Center for Neuroscience, Shared Space and Equipment Committee	2016-
Graduate Advisor for the Neuroscience Graduate Program	2016-
Department of Psychology, Biopsychology Search Committee	2016
College of Biological Sciences Core Curriculum Review Committee	2015-
Center for Neuroscience, Systems Search Committee	2015
Center for Neuroscience Steering Committee	2015-
Department of Psychology Spring Conference Committee	2014-2015
Perspectives in Neuroscience Seminar Committee	2013-
Neuroscience Graduate Admissions Committee	2013-2015
Neuroscience Graduate Program Qualifying Exam Committee	2013-2015

Student committees (non-advisor)

Gian Greenberg, Ph.D. committee  
Milagros Copara, Ph.D. committee  
Abigail Laman-Maharg, Ph.D. committee  
Halle Zucker, written examination committee  
Marika Inhoff, written examination committee  
Alyssa Borders, written examination committee

**University of Virginia**

Departmental and college committees

Psychology Department Undergraduate Curriculum Committee	2010-2012
Psychology Department Colloquium Committee	2010-2012
Neuroscience Graduate Program Seminar Committee	2009-2012
Psychology Department Chair Nomination Committee	2010

Student committees (non-advisor)

Erin Kerfoot, Ph.D. committee  
Stanley King, Ph.D. committee  
Erica Young, Ph.D. committee  
Rebecca Reddaway, Ph.D. committee  
Su Park, Ph.D. committee

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**Professional Membership**

American Psychology Association, Molecular & Cellular Cognition Society, Pavlovian Society, Society for Neuroscience

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**Publications**

**Journal articles**

Total citations are 2,625 as of August 24, 2016  
H-Index: 20

Nakazawa, Y., Pevzner, A., Tanaka, K. Z., **Wiltgen, B. J.** (2016) Memory retrieval along the proximodistal axis of CA1. *Hippocampus* 26(9), 1140-1148.

Tanaka, K.Z., Pevzner, A., Hamidi, A., Nakazawa, Y., Graham, J., **Wiltgen, B.J.** (2014) Cortical representations are reinstated by the hippocampus during memory retrieval. *Neuron*, 84(2): 347-54.

Czajkowski, R., Jayaprakash, B., **Wiltgen, B.**, Rogerson, T., Guzman-Karlsson, M.C., Barth, A.L., Trachtenberg, J.T., Silva, A.J. (2014). Encoding and storage of spatial information in the retrosplenial cortex. *Proc Natl Acad Sci U S A* 111(23): 8661-8666.

Taylor, K.K., **Wiltgen, B.J.** (2013) New methods for understanding systems consolidation. *Learn Mem*, 20(10):553-7.

**Wiltgen B.J.**, Tanaka K.Z. (2013) Systems consolidation and the content of memory. *Neurobiol Learn Mem*, 106:365-71.

Taylor, K.K., Tanaka, K.Z., Reijmers, L.G., **Wiltgen, B.J.** (2013) Reactivation of neural ensembles during the retrieval of recent and remote memory. *Current biology*, 23(2) 99-106.

Boscolo, A., Ori, C., Bennett, J., **Wiltgen B.**, Jevtovic-Todorovic, V. (2013). Mitochondrial protectant pramipexole prevents sex-specific long-term cognitive impairment from early anesthesia exposure in rats. *Br J Anaesth* 110 Suppl 1: i47-52.

**Wiltgen, B. J.**, Sinclair, C., Lane, C., Barrows, F., Molina, M., Chabanon-Hicks, C. (2012) The effect of ratio and interval training on Pavlovian-instrumental transfer in mice. *PLoS One*, 7(10), e48227.

Clement, J.P., Aceti, M., Creson, T. K., Ozkan, E. D., Shi, Y., Reish, N.J., Almonte, A.G., Miller, B.H., **Wiltgen, B.J.**, Miller, C.A., Xu, X., Rumbaugh, G. (2012) Pathogenic SYNGAP1 mutations impair cognitive development by disrupting maturation of dendritic spine synapses. *Cell* 151(4): 709-723.

Nussbaum, J. M., Schilling, S., Cynis, H., Silva, A., Swanson, E., Wangsanut, T., Taylor, K., **Wiltgen, B.**, Hatami, A., Ronicke, R., Reymann, K., Hutter-Paier, B., Alexandru, A., Jagla, W., Graubner, S., Glabe, C.G., Demuth, H.U., Bloom, G.S. (2012). Prion-like behaviour and tau-dependent cytotoxicity of pyroglutamylated amyloid-beta. *Nature* 485(7400): 651-655.

**Wiltgen, B.J.**, Wood, A.N., Levy, B. (2011) The cellular mechanisms of memory are modified by experience. *Learning & memory*, 18(12): 747-50.

Warthen, D.M., **Wiltgen, B.J.**, Provencio, I. (2011) Light enhances learned fear. *Proc Natl Acad Sci U S A*, 108(33): 13788-93.

Taylor, KK, Lowry, E, Tanaka, K, Levy, B, Reijmers, L, Mayford, M, **Wiltgen, BJ.** (2011) Characterization of NMDAR-Independent Learning in the Hippocampus. *Frontiers in behavioral neuroscience*, 5: 28.

**Wiltgen, BJ**, Royle, GA, Gray, EE, Abdipranoto, A, Thangthaeng, N, Jacobs, N, Saab, F, Tonegawa, S, Heinemann, SF, O'Dell, TJ, Fanselow, MS, Vissel, B. (2010) A role for calcium-permeable AMPA receptors in synaptic plasticity and learning. *PloS one*, 5(9) e12818.

**Wiltgen, BJ**, Zhou, M, Cai, Y, Balaji, J, Karlsson, MG, Parivash, SN, Li, W, Silva, AJ. (2010) The hippocampus plays a selective role in the retrieval of detailed contextual memories. *Current biology*, 20(15): 1336-44.

**Wiltgen, BJ**, Godsil, BP, Peng, Z, Saab, F, June, HL, Linn, ML, Cook, JM, Houser, CR, O'Dell, TJ, Homanics, GE, Fanselow, MS. (2009) The alpha1 subunit of the GABA(A) receptor modulates fear learning and plasticity in the lateral amygdala. *Frontiers in behavioral neuroscience*, 3: 37.

Czajkowski, M., **Wiltgen, B.**, Balaji, J., Rogerson, T., Guzman-Karlsson, M., Barth, A., & Silva, A. (2009). Insights into spatial memory formation in retrosplenial cortex. *Acta Neurobiologiae Experimentalis*, 69(3).

Matynia, A., Anagnostaras, S. G., **Wiltgen, B. J.**, Lacuesta, M., Fanselow, M. S., Silva, A. J. (2008) A high through-put reverse genetic screen identifies two genes involved in remote memory in mice. *PLoS one*, 3(5), e2121.

Zhou, Y, Takahashi, E, Li, W, Halt, A, **Wiltgen, BJ**, Ehninger, D, Li, GD, Hell, JW, Kennedy, MB, Silva, AJ. (2007) Interactions between the NR2B receptor and CaMKII modulate synaptic plasticity and spatial learning. *The Journal of neuroscience*, 27(50): 13843-53.

**Wiltgen, BJ**, Silva, AJ. Memory for context becomes less specific with time. (2007) *Learning & memory*, 14(4): 313-7.

**Wiltgen, B. J.**, Law, M., Ostlund, S., Mayford, M., Balleine, B. W. (2007). The influence of Pavlovian cues on instrumental performance is mediated by CaMKII activity in the striatum. *Eur J Neurosci*, 25(8), 2491-2497.

**Wiltgen, BJ**, Sanders, MJ, Anagnostaras, SG, Sage, JR, Fanselow, MS. (2006) Context fear learning in the absence of the hippocampus. *The Journal of neuroscience*, 26(20): 5484-91.

**Wiltgen, BJ**, Sanders, MJ, Ferguson, C, Homanics, GE, Fanselow, MS. (2005) Trace fear conditioning is enhanced in mice lacking the delta subunit of the GABAA receptor. *Learning & memory*, 12(3): 327-33.

**Wiltgen, BJ**, Brown, RA, Talton, LE, Silva, AJ. (2004) New circuits for old memories: the role of the neocortex in consolidation. *Neuron*, 44(1): 101-8.

Gale, G. D., Anagnostaras, S. G., Godsil, B. P., Mitchell, S., Nozawa, T., Sage, J. R., **Wiltgen, B.**, Fanselow, M. S. (2004). Role of the basolateral amygdala in the storage of fear memories across the adult lifetime of rats. *J Neurosci*, 24(15), 3810-3815.

Sanders, M. J., **Wiltgen, B. J.**, Fanselow, M. S. (2003) The place of the hippocampus in fear conditioning. *Eur J Pharmacol*, 463(1-3), 217-223.



Meffert, M. K., Chang, J. M., **Wiltgen, B. J.**, Fanselow, M. S., Baltimore, D. (2003) NF-kappa B functions in synaptic signaling and behavior. *Nat Neurosci*, 6(10), 1072-1078.

**Wiltgen, B. J.**, Sanders, M. J., Behne, N. S., Fanselow, M. S. (2001) Sex differences, context preexposure, and the immediate shock deficit in Pavlovian context conditioning with mice. *Behav Neurosci*, 115(1), 26-32.

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### **Ph.D. Dissertation**

Characterization of dorsal and ventral hippocampal contributions to context fear in a CA1-specific knockout mouse. UCLA, 2003, Available from Dissertations & Theses @ University of California; ProQuest Dissertations & Theses A&I. (305348257).

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### **Book chapters**

Shilyansky, C., Weidong L., Acosta, M., Elgersma, Y., Hannan, M. Hardt, F., Hunter-Schaedle, K., Krab, L.C., Legius, E., **Wiltgen, B.**, and Silva, A.J. (2008) Molecular and Cellular Mechanisms of Learning Disabilities: A Focus on Neurofibromatosis Type I. *Animal and Translational Models for CNS Drug Discovery: Neurological Disorders*. R. A. McArthur and F. Borsini, Academic Press. 2: 77-92.

**Wiltgen, BJ.**, Brown, R.A.M., Talton, L.E., Silva A.J. (2007) Towards a Molecular and Cellular Understanding of Remote Memory, Bontempi, B., Silva, A.J., Christen, Y., (ed), *Memories: Molecules and Circuits*, Springer, New York.

**Wiltgen, BJ**, Fanselow, M.S. (2003) A model of hippocampal-cortical-amygdala interactions based on context fear conditioning, Jeffery, K.J., (ed), *The Neurobiology of Spatial Behaviour*, Oxford University Press, Oxford.

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