TIMOTHY A. OTTO
Program in Behavioral Neuroscience
Dept. of Psychology
Rutgers University
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Professional History:

2009-Present	**Professor and Behavioral Neuroscience Area Coordinator**, Dept. of Psychology, Rutgers University
2004-2009	**Associate Professor and Behavioral Neuroscience Area Coordinator,** Dept. of Psychology, Rutgers University
1999-2009	**Associate Professor**, Dept. of Psychology, Rutgers University.
1993-1999	**Assistant Professor**, Dept. of Psychology, Rutgers University.
1991-1993	**Research Assistant Professor**, Dept. of Psychology, University of North Carolina, Chapel Hill.
1989-1991	**Research Associate**, Dept. of Biological Sciences, Wellesley College. Sponsor: Dr. Howard Eichenbaum
1987-1989	**Postdoctoral Research Fellow**, Center for the Neurobiology of Learning and Memory, Univ. California, Irvine. Sponsor: Dr. Gary Lynch

Education:

1984-1986	**Ph.D.**	University of New Hampshire. Psychology. *Dissertation:* The effects of intraventricular infusion of leupeptin, a thiol-protease inhibitor, on spatial memory.
1981-1984	**M.A.**	University of New Hampshire. Psychology. *Thesis:* The spatial proximity rule and visual depth perception.
1977-1981	**B.A.**	Bowling Green State University. Psychology.

Awards and Grants:

2009-2014	**National Science Foundation,** IOS 0919159**.** "Dissociating the Contributions of Discrete Hippocampal Subregions to Contextual and Trace Conditioning". Total Award: $588,000
2003-2008	**National Science Foundation,** IBN 0316247**.** "Characterizing the Contributions of Discrete Hippocampal Subfields to Contextual and Cued Fear Conditioning Using Multiple Measures". Total Award: $432,130.
2004	**Excellence in Graduate Teaching Award**, Graduate School, Rutgers University, New Brunswick
1999-2002	**National Science Foundation,** IBN9817145. "Contributions of Perirhinal Cortex and Hippocampus to Olfactory, Auditory, and Contextual Fear Conditioning". Total Award: $225,471.
1998-2000	**Johnson & Johnson Discovery Award,** "Enhancing Neuroanatomical and Functional Recovery Following Experimentally-Induced Damage to the Olfactory System". Total Award: $19,788.
1996-1999	**National Science Foundation,** IBN9514526. "Response Properties of Lateral Entorhinal Cortex Neurons During Associative Learning." Total Award: $180,000.
1994-1995	**National Institutes of Health,** 1R03MH53880-01"Associative Odor-Place Learning in the Rat". Total Award: $29,817.
1986-1988	**National Institutes of Health,** NRSA Postdoctoral Fellowship, "Olfactory Learning and Cortical Long-Term Potentiation".

Research in Progress:

1. Examining the relationship between gene expression, NMDA receptor activation, synaptic plasticity, and learning in the hippocampus and the parahippocampal cortical regions.

2. Assessing the potentially dissociable roles of the CA1, CA3, and dentate gyrus within dorsal and ventral hippocampus.

3. Determining the role of intracellular protein expression in synaptic plasticity and learning.

University and Departmental Committees:

2008	**Chair,** Cognitive Neuroscience Search Committee
2005-2009	**Chair,** Institutional Animal Care and Use Committee (IACUC, Rutgers University)
2004-Present	Area Coordinator, Program in Behavioral Neuroscience, Dept. of Psychology
2003-2009	Animal Care and Facilities Committee, Rutgers University
2001-Present	**Chair,** Biomedical Research Advisory Committee, Rutgers University
2000-Present	Executive Council, Dept. of Psychology
2001-2006	Curriculum Committee, Dept. of Psychology
2000-2005	Space Committee, Dept. of Psychlogy
2000-2004	Organizer, Wyeth-Ayerst Distinguished Lecture Series
1994-2002	Undergraduate Honors Committee, Dept. of Psychology
1997-2001	Biomedical Research Advisory Committee, Rutgers University
1998-2000	Undergraduate Advising Committee, Dept. of Psychology
1997-2000	University Committee on Student Judicial Affairs
1999	Webpage Committee, Dept. of Psychology
1993-1999	**Chair,** BBN Colloquium Committee, Dept. of Psychology
1997-1998	Committee organizing the Internship Program in Psychopharmacology
1996-1998	Busch Space Renovation Committee, Dept. of Psychology
1993-1994	**Chair,** Graduate Admissions Committee, Dept. of Psychology
1993-1994	**Chair,** Committee charged with reorganizing graduate course offerings in Research Design and Analysis, Dept. of Psychology

Teaching Experience:

Rutgers University

7/93-Present	Research Design and Analysis (Graduate)
	Seminar in Synaptic Plasticity and Behavior (Graduate)
	Quantitative Methods (Undergraduate)
	Physiological Psychology (Undergraduate)
	Nervous System and Behavior (Graduate, with Dr. Mark West)
	Seminar in Electrophysiology (Graduate, with Dr. Louis Matzel)

Graduate Student Committees:

Masters:

Committee Chair: Cousens, Schettino, Yoon, Waxler, Czerniawski, Parsons, Cox, Hudgins

Committee Member: Kawashima, Coppotelli, Hildreth, Kelly, Protomastro, Talk, Rossi-George, Duke, Ghitza, Hodes, Townshend, Bangasser, Ciani, Kolata, Lu, Shafer, Kass, Maeng, Curlik

Qualifying Exam:

Committee Chair: Herzog, Cousens, Yoon, Czerniawski, Parsons

Committee Member: Coppotelli, Muzzio, Talk, Rogers, Hartshorn, Hildreth, Horvath, Hodes, Sisti, Cuevas, Papachristos, Colas, Yochum, Lu, Light, Kolata, Mallimo, Medvecky, Barker

Doctoral:

Committee Chair: Herzog, Cousens, Yoon, Czerniawski

Committee Member: Hildreth, Dougherty (Opello), Rogers, Talk, Epstein, Ghitza, Papachristos, Yochum, Curlik

Publications:

Articles in Peer Reviewed Journals

Cox, D., Czerniawski, J., Ree, F., & Otto, T. (2013). Time course of dorsal and ventral hippocampal involvement in the expression of trace fear conditioning. *Neurobiology of Learning & Memory*, *106*, 316-323.

Chia, C., & Otto, T. (2013). Hippocampal Arc (Arg3.1) expression is induced by memory recall and required for memory reconsolidation in trace fear conditioning. *Neurobiology of Learning & Memory, 106*, 48-55.

Wass, C., Pizzo, A., Sauce, B., Kawasumi, Y., Sturzoi, T., Ree, F., Otto, T., & Matzel, L.D. (2013). Dopamine D1 sensitivity in the prefrontal cortex predicts general cognitive abilities and is a target for working memory training. *Learning & Memory*, *20*, 617-627.

Czerniawski, J., Ree, F., Chia, C., & Otto, T. (2012). Dorsal vs. ventral hippocampal contributions to trace and contextual conditioning: Differential effects of regionally selective NMDA receptor antagonism on acquisition and expression. *Hippocampus, 22,* 1528-1539.

Czerniawski, J., Ree, F., Chia, C. Ramamoorthi, K., Kumata, Y, & Otto, T. (2011). The importance of having Arc: Expression of the immediate early gene Arc is required for hippocampus-dependent fear conditioning and blocked by NMDA receptor antagonism. *Journal of Neuroscience,* 31, 11200-11207.

Ramamoorthi, K., Fropf, R., Fitzmaurice, H.L., McKinney, R.M., Belfort, G.M., Neve, R.L., Otto, T., & Lin, Y. (2011). Npas4 regulates a transcriptional program in CA3 required for contextual memory formation. *Science,* 334, 1669-1675.

Parsons, T.C., & Otto, T. (2010). Time-limited involvement of dorsal hippocampus in unimodal discriminative contextual conditioning. *Neurobiology of Learning and Memory*, 94, 481-487.

Czerniawski, J., Yoon, T., & Otto, T. (2009). Dissociating space and trace in dorsal and ventral hippocampus. *Hippocampus, 19*, 20-32.

Parsons, T.C., & Otto, T. (2008). Dorsal hippocampal inactivation disrupts acquisition and retention of explicitly nonspatial contextual conditioning. *Neurobiology of Learning & Memory, 90,* 261-268.

Yoon, T., & Otto, T. (2007). Differential contributions of dorsal vs. ventral hippocampus to auditory trace fear conditioning. *Neurobiology of Learning and Memory, 87,* 464-475.

Otto, T., & Poon, P. (2006). Dorsal hippocampal contributions to unimodal contextual fear conditioning. *Journal of Neuroscience, 26*, 6603-6609.

Nicot, A., Otto, T., Brabet, P., & DiCicco-Bloom, E.M. (2004). Altered social behavior in pituitary adenylate cyclase-activating polypeptide Type-I receptor-deficient mice. *Journal of Neuroscience, 24,* 8786-8795.

Cousens, G., & Otto, T. (2003). Contributions of orbitofrontal cortex and basolateral amygdaloid complex to olfactory discrimination learning with auditory secondary reinforcement. *Integrative Physiological & Behavioral Science, 38*, 272-294.

Herzog, C.D., & Otto, T. (2002). Administration of transforming growth factor alpha enhances anatomical and behavioral recovery following olfactory nerve transection. *Neuroscience, 113,* 569-580.

Schettino, L.F. , & Otto, T. (2001). Patterns of Fos expression in the amygdala and ventral perirhinal cortex induced by training in an olfactory fear conditioning paradigm. *Behavioral Neuroscience, 115 (6),* 1257-1272.

Otto, T., & Giardino, N. (2001). Pavlovian conditioning of emotional responses to olfactory and contextual stimuli: A potential model for the development and expression of chemical intolerance. *Annals of the New York Academy of Sciences, 933*, 291-309.

Otto, T., Cousens, G., & Herzog, C. (2000). Behavioral and neuropsychological foundations of olfactory fear conditioning. *Behavioral Brain Research*, *110,* 119-128.

Herzog, C., & Otto, T. (1999). Regeneration of olfactory receptor neurons following chemical lesion: Time course and enhancement with growth factor administration. *Brain Research*, *849*, 155-161.

Cousens, G., & Otto, T. (1998). Both pre- and post-training lesions of the basolateral amygdala abolish the expression of olfactory and contextual fear conditioning. *Behavioral Neuroscience, 112(5),* 1092-1103.

Herzog, C.D., & Otto, T. (1998). Contributions of anterior perirhinal cortex to olfactory and contextual fear conditioning. *Neuroreport, 9,* 1855-1859.

Cousens, G., & Otto, T. (1998). Long-term potentiation and its transient suppression in the rhinal cortices induced by theta-related stimulation of hippocampal field CA1. *Brain Research*, *780,* 95-101.

Flaherty, C.F., Coppotelli, C., Hsu, D., & Otto, T. (1998). Excitotoxic lesions of the hippocampus disrupt instrumental but not consummatory contrast. *Behavioural Brain Research,93, 1-9.*

Otto, T., & Garruto, D. (1997). Rhinal cortical lesions impair simultaneous olfactory discrimination learning in rats. *Behavioral Neuroscience*, *111,* 1146-1150.

Otto, T., Cousens, G., & Rajewski, K. (1997). Odor-guided fear conditioning. I. Acquisition, retention, and latent inhibition. *Behavioral Neuroscience, 111,* 1257-1264.

Herzog, C.D., & Otto, T. (1997). Odor-guided fear conditioning. II. Lesions of anterior perirhinal cortex disrupt fear conditioned to the explicit CS but not to the training context. *Behavioral Neuroscience, 111,* 1265-1274.

Otto, T., Wolf, D., & Walsh, T. (1997). Combined lesions of perirhinal and entorhinal cortex impair rats' performance in two versions of the spatially-guided radial arm maze. *Neurobiology of Learning and Memory, 68,* 21-31.

Young, B.J., Otto, T., Fox, G., & Eichenbaum, H. (1997). Memory representation in the parahippocampal region. *Journal of Neuroscience, 17,* 5183-5195.

Eichenbaum, H., Otto, T., & Cohen, N.J. (1996). The hippocampal system: Dissociating its functional components and recombining them in the service of declarative memory. *Behavioral and Brain Sciences, 19*, 762-776.

Zyzak, D.R., Otto, T., Eichenbaum, H., & Gallagher, M. (1995). Cognitive decline associated with normal aging in rats: A neuropsychological approach. *Learning & Memory,* 2, 1-16.

Nagahara, A. H., Otto, T., & Gallagher, M. (1995). Entorhinal lesions impair performance in two versions of place learning in the Morris water maze. *Behavioral Neuroscience 109,* 3-9.

Eichenbaum, H., Otto, T., & Cohen, N.J. (1994). Two functional components of the hippocampal memory system. *Behavioral and Brain Sciences, 17(3)*,449-517.

Otto, T., & Eichenbaum, H. (1992). Neuronal activity in the hippocampus during delayed non-match to sample performance in rats: Evidence for hippocampal processing in recognition memory. *Hippocampus, 2(3)*, 324-334.

Otto, T., & Eichenbaum, H. (1992). Complementary roles of orbital prefrontal cortex and the perirhinal/entorhinal cortices in an odor-guided delayed non-matching to sample task. *Behavioral Neuroscience, 106*, 763-775.

Eichenbaum, H., Otto, T. & Cohen, N.J. (1992). The Hippocampus - What Does It Do? *Behavioral and Neural Biology, 57,* 1-35.

Otto, T., Schottler, F., Staubli, U., Eichenbaum, H., & Lynch, G. (1991). The hippocampus and olfactory discrimination learning: Effects of entorhinal cortex lesions on odor memory in a successive-cue, go, no-go task. *Behavioral Neuroscience, 105*, 111-119.

Otto, T., Eichenbaum, H. Wiener, S.I., & Wible, C.G. (1991). Learning-related patterns of CA1 spike trains parallel stimulation parameters optimal for inducing hippocampal long-term potentiation. *Hippocampus 1*, 181-192.

McCollum, J., Larson, J., Otto, T., Schottler, F., Granger, R., & Lynch, G. (1991). Short-latency single unit processing in olfactory cortex. *Journal of Cognitive Neuroscience, 3*, 293-299.

Granger, R., Staubli, U., Powers, H., Otto, T., Ambros-Ingerson, J., & Lynch, G. (1991). Behavioral tests of a prediction from a cortical network simulation. *Psychological Science, 2*, 116-118.

Mair, R.G., Otto, T.A., Knoth, R., Rabchenuk, S., & Langlais, P. (1991). An analysis of aversively conditioned learning and memory in rats recovered from pyrithiamine-induced thiamine deficiency. *Behavioral Neuroscience, 105*, 351-359.

Fuld, K., Otto, T.A., & Slade, C.W. (1986). The spectral responsivity of the white-black channel. *Journal of the Optical Society of America, A, 3*, 1182-1188.

Fuld, K., & Otto, T.A. (1985). Colors of monochromatic lights that vary in contrast-induced brightness. *Journal of the Optical Society of America, A, 2*, 76-83.

Chapters and Commentaries:

Otto, T. (1997). Long-term potentiation in the hippocampus of the anesthetized rat. In C.A. Paul, B. Beltz, & J. Berger-Sweeney (Eds.), *Discovering Neurons.*Cold Spring Harbor Laboratory Press.

Otto, T., & Eichenbaum, H. (1994). The hippocampus, long-term potentiation, and memory: Enhancing the connection. In M. Baudry & J. Davis (Eds.), *Long-Term Potentiation, Vol.2*. Cambridge: MIT Press (pp 305-334).

Otto, T., & Eichenbaum, H. (1992). Toward a comprehensive account of hippocampal function: Studies of olfactory learning permit an integration of data across multiple levels of neurobiological analysis. In *Neuropsychology of Memory*, N. Butters & L.R. Squire (Eds.). New York: Guilford (pp. 415-428).

Otto, T., & Eichenbaum, H. (1992). Olfactory learning and memory in the rat: A "model system" for studies of the neurobiology of memory. In *The Science of Olfaction,* K. Chobor & M. Serby, (Eds.). New York: Springer-Verlag (pp. 213-244).

Eichenbaum, H., & Otto, T. (1993). Odor-guided learning and memory in rats: Is it 'special'? *Trends in Neurosciences, 16*, 22-24.

Eichenbaum, H., & Otto, T. (1993). Where perception meets memory: functional coding in the hippocampus. In *Brain Mechanisms of Perception and Memory: From Neuron to Behavior,* T. Ono, L.R. Squire, D. Perret, & M.E. Raichle (Eds.).

Eichenbaum, H., & Otto, T. (1993). LTP and memory: Can we enhance the connection?. *Trends in Neurosciences, 16,* 163-164.

Eichenbaum, H., & Otto, T. (1992). The hippocampus and the sense of smell. In *Chemical Signals in Vertebrates VI*, R. Doty (Ed.), Plenum Press, NY. (pp. 67-77).

Eichenbaum, H., Otto, T., Wible, C., & Piper, J. (1991). Building a model of the hippocampus in olfaction and memory. In *Olfaction as a Model for Computational Neuroscience*, J. Davis & H. Eichenbaum, (Eds.) Cambridge: MIT Press (pp. 167-210).

Eichenbaum, H., Cohen, N.J., Otto, T., & Wible, C. (1991). Memory representation in the hippocampus: Functional domain and functional organization. In *Memory: Organization and Locus of Change*, L.R. Squire, G. Lynch, N.M. Weinberger, & J.L. McGaugh, (Eds). Oxford University Press.

Eichenbaum, H., Cohen, N.J., Otto, T., & Wible, C. (1991) A snapshot without the album. *Brain Research Reviews, 16,* 209-220.

Ad Hoc Reviewer:

Behavioral Neuroscience
Hippocampus
Journal of Experimental Psychology: Animal Behavior Processes
Journal of Neuroscience
Learning and Memory
National Science Foundation
Neurobiology of Aging
Neurobiology of Learning and Memory
Neuroscience
Neurotoxicology
Psychobiology

Professional Service:

2008 – Present	Editorial Board, Frontiers in Neuroscience
2008 – Present	Editorial Board, Frontiers in Behavioral Neuroscience
2005 – 2008	Executive Board, Pavlovian Society
2001 - 2006	Editorial Board, Integrative Physiological and Behavioral
1998 - 2005	New Jersey Chapter Representative to the Society for Neuroscience

Recent Presentations:

January 2009: Mount Sinai School of Medicine, Dept. of Neuroscience
January 2009: Veterans Administration Medical Center, Dept. of Neurology
October, 2007: Pavlovian Society Annual Meeting
January, 2007: Boston University, Center for Memory and Brain

March 2006: Yale University, Dept. of Psychology
October, 2004: Session Chair, Annual Meeting of the Pavlovian Society, Baltimore, MD
Session Title: Neural substrates of goal-directed behavior.
March, 2004: Brown University, Dept. of Psychology
Presentation Title: The hippocampus, context learning, and trace conditioning.
March, 2003: Institute for Cognitive Sciences, University of Lyon, Lyon, France.
Presentation Title: Behavioral and Neural Foundations of Olfactory Conditioning.