

# Donald Cooper

Curriculum Vitae, February 2008

## Present Position

Assistant Professor (since 2004)  
University of Texas Southwestern Medical Center  
Department of Psychiatry  
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## Personal Data

Date and Place of Birth: December 17, 1970; Denver, CO., USA  
Married: December 2, 2005  
Citizenship: USA

## Research Interests

Molecular mechanisms of synaptic and intrinsic plasticity within the hippocampal/prefrontal cortical pathway as it relates to working memory and addiction

## Education and Research Experience

2004 (July)-Present	Assistant Professor, University of Texas Southwestern Medical
2000-2004	Postdoctoral Fellow, Department of Neurobiology & Physiology Northwestern University, Evanston, IL. Advisor: Prof. Nelson Spruston, Ph.D.
1994–2000	Graduate Student, Department of Neuroscience Chicago Medical School, North Chicago, IL Advisor: Prof. Francis J. White Ph.D.
1990-1994	Undergraduate, Department of Psychology University of Colorado, Boulder, CO B.A. (Honors), Psychology, 1994 Undergraduate thesis advisor, Prof. Allan Collins, Ph.D.

**Grant Support – Present**

- 2005-2010 NIH NIDA K-01 /5years: DNA Microarray Analysis of Neuronal Excitability
- 2006-2009 NIDA NRSA F31 Fellowship (Melissa Fowler: DA214932) TRPC Channels in dopamine modulation of frontal cortical excitability
- 2006-2008 NARSAD Young Investigator Award : Molecular mechanisms controlling neuronal excitability in the hippocampal/prefrontal cortical pathway: The role of TRPC channels in Schizophrenia.
- 2008-2010 Dept of Veterans Affairs: Corticolimbic Plasticity in Response to Organophosphates
- 2008-2010 NIMH R-21 Circadian Regulation of Dopaminergic Activity and Restless Legs Syndrome (Co-Investigator with Dr. Colleen McClung)
- 2008-2010 NIH NIDA R-03: Pathway specific MDMA-induced plasticity of intrinsic excitability in the hippocampal prefrontal cortical pathway
- 2008-2013 NIH NIDA R-01: Plasticity in the prefrontal/hippocampal pathway after high cocaine intake.

**Grant Support – Prior**

- 2001-2003 NIH NIDA Computational Modeling Supplement/2years; Modeling bursting in the hippocampal subicular neurons.
- 2000-2003 NIH National Research Service Award (Postdoctoral)/3years  
Dendritic excitability in the subiculum after cannabinoids
- 1997-2000 NIH National Research Service Award (Predoctoral)/3years: Cocaine-induced neuroadaptations in accumbens neurons
- 1992-1994 Undergraduate Research Award, University of Colorado (Collins) Behavioral Sensitization to Amphetamine: Role of Corticosterone and Associative Learning.

**Fellowships, Honors, and Awards**

- 2008 Program Committee member for US/Japan Kavli Frontiers in Science
- 2007 Kavli Fellow US/Japan Frontiers in Science National Academy of Science
- 2006 NARSAD Young Investigator Award
- 2005 NIDA K-01 Career award
- 2003 NIDA Director's Travel Award to attend the annual CPDD meeting in Bal Harbor, FL
- 2002 Travel Award from NIDA to present at the "Synaptic change and addiction" symposium at the annual Neuroscience Meeting in Orlando, FL

- 2000 Nickerson Award for the outstanding graduate student from FUHS/Chicago Medical School, North Chicago, IL
- 1999 Wine Award for Best presentation at the Neurobiology of Addiction Workshop. Madrid, Spain
- 1999 Travel Award from Fundacion de Juan March to attend the Neurobiology of Addiction Workshop, Madrid, Spain
- 1999 Travel Award from NIDA to attend the FASEB summer conference on Vulnerabilities to Develop Drug and Alcohol Addiction, Copper Mountain, CO
- 1999 Outstanding senior graduate student slide presentation at the Chicago chapter of the Society for Neuroscience, Chicago, IL
- 1998 Award for Outstanding Poster from the American Society of Pharmacology and Experimental Therapeutics, Chicago, IL
- 1997 Travel Award from NIDA to attend the FASEB summer conference on Drug addiction, Copper Mountain, CO

### **Journal Editorial Board**

- 2007 Substance Abuse: Research and Treatment (Open Access Journal)

### **Teaching Activities**

- 2006-2007 Co-Director of the Ion Channels Course Structure and Function (Don Cooper and Ilya Bezprozvanny)
- 2005-2007 Neurobiology of Addiction (UT Southwestern Medical Center) 3 lectures on  
1. Alcohol and Nicotine 2. Marijuana and Hallucinogens 3. Ecstasy
- 2005-2007 Advanced Neurobiology Lectures for Medical Residents: 1. Psychostimulant Addiction 2. Clinical use of Neurophysiology in Medicine (UT Southwestern Medical Center)
- 2005-2007 Behavior and Systems Neurobiology Journal Club (UT Southwestern)
- 1999-03 Teaching Assistant, Undergraduate course on Fundamentals of Neurobiology (Northwestern University)
- 1996-99 Neuroanatomy Teaching Assistant, Medical Neuroscience (Chicago Medical School)
- 1993 Teaching Assistant, General Psychology (University of Colorado, Boulder)

**Administrative Duties**

- 2005-2008 Director of the Stereology and Neurolucida microscopy and imaging suite
- 2006 Organized the Neuroscience Program Retreat
- 2005-2007 Organized the Psychiatry Dept Works in Progress talks (WIPs)
- 2006-2007 Leader and organizer of Cellular Neurophysiology Journal Club

**Graduate Student Training**

University of Texas Southwestern Medical Center, Dallas TX

- 2005-2007 Melissa Fowler, Graduate student, Cooper Lab (The role of TRPC4/5 channels in the brain).

**Professional Affiliations**

- 1993–present Society for Neuroscience
- 2006-present American Association for the Advancement of Science (AAAS)

**CSR study section/Referee Duties**

- 2005-2007 Ad hoc member of the Biophysical and Physiological Neuroscience (FO3B) Study Section.
- 2000-2006 Reviewer for Journal of Neuroscience, Journal of Neurophysiology and Brain Research, Psychopharmacology, Neuropsychopharmacology, Biological Psychiatry, Proceedings of the National Academy of Science

**Courses Attended**

- May 2004 Affymetrix Microarray Data Analysis course, Chicago, IL
- May 2003 Affymetrix Microarray user group meeting, Chicago, IL
- June 2001 NEURON Summer Course on Computational Neural Modeling, San Diego Supercomputing Center

**Invited Seminars at Universities**

- April 2007 Neuroscience Program, University of California, Irvine CA
- April 2007 Grand Rounds, University of Texas Southwestern Medical School, Dallas, TX
- June 2004 Department of Psychiatry, University of Texas Southwestern Medical School, Dallas, TX
- May 2004 Neuroscience Department, University of Chicago
- June 2002 Department of Psychiatry, University of Texas Southwestern Medical School, Dallas, TX

**Invited Presentations at National and International Conferences**

- Feb 2008 Winter Conference on Neural Plasticity, St. Lucia
- Jan 2008 Winter Brain Conference, Snowbird, Utah
- Nov 2007 Kavli Frontiers in Science, Shonan Village, Japan
- Feb 2004 Winter Conference on Neural Plasticity, St. Lucia (Chair)
- Feb 2003 Winter Conference on Neural Plasticity, Guadeloupe, French Antilles
- Aug 2001 Cellular Communication and Signaling Satellite. International Society for Neurochemistry, Rio de Janeiro, Brazil
- Dec 1999 Workshop on the Neurobiology of Addiction, Madrid, Spain

**Dissertation/Theses**

**Cooper D.C.** (2000) The Effects of Cocaine on D1 Dopamine Receptor Signaling: Behavioral and Electrophysiological Studies. Ph.D. dissertation, FUHS/Chicago Medical School (Dissertation Advisor: Francis J. White, Ph.D.)

**Cooper D.C.** (1994) Behavioral Sensitization to Psychomotor Stimulants (Undergraduate honors thesis, Advisor Allan Collins, Ph.D.)

**Book Chapters**

1. **Cooper D.C.**, Hu X-T, and White F.J. (1998) Alterations in Dopamine Neurotransmission Produced by Genetic Knockouts of Dopamine D1 Receptors. In Dopamine Receptor Subtypes: From Basic Science to Clinical Application. Pp. 29-45 Eds. P. Jenner and R. Demirdamar, IOS Press

2. Koeltzow T.E., **Cooper D.C.**, Hu X.T., Xu M, Tonegawa, S, Wolf M.E., White F.J. (1998) Assessment of Dopamine D3 Receptor Function Using D3 Receptor Knockout Mice. In Dopamine Receptor Subtypes: From Basic Science to Clinical Application. Pp. 131-146 Eds. P. Jenner and R. Demirdamar, IOS Press
3. Marinelli M, **Cooper D.C.**, and White F.J. (2001) Electrophysiological correlates of enhanced vulnerability to cocaine self-administration. In: Phenotypic differences in drug effects related to behavioral traits versus states. N.I.D.A. Res. Monogr. 181: 46-48

### Research Publications

1. Sidiropoulou K., Lu, FM ;Fowler M, Ozkan E, Phillips C, White F.J. **Cooper D.C.** Dopamine modulation of prefrontal cortical mGluR5-mediated intrinsic regenerative activity (In review Nat Neurosci.)
2. Moore S.J. **Cooper D.C.** Spruston N. P. Bidirectional plasticity of burst firing is regulated by synergistic activation of metabotropic glutamate and acetylcholine receptors in pyramidal neurons of subiculum. (In review Neuron)
3. Lu FM, **Cooper D.C.** L-type  $Ca^{2+}$  channels permit hippocampal subicular repetitive burst spiking output in response to sustained, but not brief inputs. (In Preparation).
4. Krishnan V, Han MH\*, Graham DL, Berton O, Renthal W, Laplant Q, Graham A, Russo SJ, Lutter M, Lagace DC, Ghose S, Reister R, Tannous P, Green TA, Neve RL, Chakravarty S, Eisch AJ, Self DW, Lee FS, Tamminga C, **Cooper D.C.**, Gershenfeld HK, Nestler EJ (2007) Molecular Mechanisms of Resilience in Brain Reward Regions. Cell 131(2):391-404.
5. Fowler M.A. Sidiropoulou K. Phillips C. Ozkan E.. and **Cooper D.C.** (2007) Corticolimbic expression of TRPC4 and TRPC5 channels in the rodent brain. PLoS One 2(6): e573
6. Hawasli A.H. Benavides D.R. Nguyen C. Kansy J.W. Hayashi K. Chambon P. Greengard P. Powell C. **Cooper D.C.** and Bibb J. (2007) Cyclin-dependent kinase 5 Governs Learning and Synaptic Plasticity via NMDA Receptors. Nat Neuroscience Epub May 27
7. **Cooper D.C.** Klipec W.D., Fowler, M, Ozkan E.D. (2006) A role for the subiculum in the brain motivation/reward circuit. Behav. Brain Res. 174(2):225-31. Epub Jul 25.
8. McClung C.A. Sidiropoulou, K. Vitaterna M. Takahshi J.S. White F.J. **Cooper D.C.** Nestler E. J. (2005) Regulation of dopaminergic transmission and cocaine reward by the Clock gene. PNAS 102(26):9377-81.
9. **Cooper D.C.** Chung S. and Spruston N. (2005) Output-mode transitions are controlled by prolonged inactivation of sodium channels in pyramidal neurons of subiculum. PLoS Biology 3(6) e175

10. Dong Y., Nasif .F, Tsui J.J., Ju W.Y., **Cooper D.C.**, Hu X-T, Malenka R.C. and White F.J. (2005) Cocaine-induced Plasticity of Intrinsic Membrane Properties in Prefrontal Cortex Pyramidal Neurons: Adaptations in Potassium Currents. J Neurosci. 26:25(4):936-40
11. Dong Y., **Cooper D.C.**, Nasif F., Hu XT, White F.J. (2004) Dopamine modulates inwardly rectifying potassium currents in medial prefrontal cortex pyramidal neurons. J Neurosci. 24(12):3077-85
12. **Cooper D.C.**, Moore, S.M., Staff, N., and Spruston, N. (2003) Psychostimulant-Induced Plasticity of Intrinsic Neuronal Plasticity in the Ventral Subiculum. J Neurosci. 30:9937-9946
13. Marinelli M., **Cooper D.C.**, Baker L.K., and White F.J. (2003) Impulse Activity of Midbrain Dopamine Neurons Modulates Cocaine-Seeking Behavior Psychopharm 168(1-2):84-98
14. Carr D., **Cooper D.C.**, Surmeier D.J., and Spruston N. (2002) 5-HT<sub>2A/C</sub> Receptor Activation Reduces the Fast and Persistent Sodium Current in Layer V Prefrontal Cortical Neurons via a PKC-dependent Mechanism. J Neurosci. 22:6846-6855
15. **Cooper D.C.** (2002) The Significance of Action Potential Bursting in the Brain Reward Circuit. Neurochem Int 41(5):333-340
16. Zhang X-F., **Cooper D.C.**, and White F.J. (2002) Repeated Cocaine Treatment Decreases Whole-Cell Calcium Current in Rat Nucleus Accumbens Neurons. J Pharmacol Exp Ther 301:1119-1125
17. Hu XT, Koeltzow T.E., **Cooper D.C.**, Robertson G.S., White FJ, Vezina P. (2002) Repeated ventral tegmental area amphetamine administration alters dopamine D1 receptor signaling in the nucleus accumbens. Synapse 1;45(3):159-70
18. White F.J. and **Cooper D.C.** (2001) The Vicious Cyclin of Addiction Nature Medicine 7 (4) 416-417
19. **Cooper D.C.** and White F.J. (2000). L-type Calcium Channels Modulate Glutamate-Driven Bursting Activity in the Nucleus Accumbens *In Vivo*. Brain Res 880:212-218
20. Jones S.R., Gainetdinov R.R. Hu X-T., **Cooper D.C.**, Wightman R.M., White F.J., and Caron M.G. (1999) Loss of Dopamine Autoreceptor Function in Mice Lacking the Dopamine Transporter. Nat Neurosci. 2:649-655
21. Fienberg A.A., Hiroi N., Mermelstein P., Song W-J., Snyder G.L., Nishi A., Cheramy A., O'Callaghan J. P., Miller D., Cole D.G., Corbett R., Haile C.N., **Cooper D.C.**, Onn S.P., Grace A.A., Oumet C.C, White F.J., Surmeier D.J., Girault J.A., Nestler E.J., and Greengard P. (1998) DARPP-32 Regulator of the Efficacy of Dopaminergic Neurotransmission. Science 281:838-842
22. Koeltzow T.E., Xu M., **Cooper D.C.**, Hu X-T., Tonegawa S., Wolf M.E., and White F.J. (1998) Alterations in dopamine release but not dopamine autoreceptor function in dopamine D3 receptor mutant mice. J Neurosci 15:2231-2238

23. Xu M., Koeltzow T.E., Santiago G.T., Moratalla R., **Cooper, D.C.**, Hu, X-T., White N. M., Graybiel A., White F.J., and Tonegawa S. (1997) Dopamine D3 receptor Mutant Mice Exhibit Increased Behavioral Sensitivity to Concurrent Stimulation of D1 and D2 Receptors. Neuron 19: 837-848
24. Xu M., Koeltzow T.E., **Cooper D.C.**, Tonegawa S., and White F.J. (1999) Dopamine D3 receptor Mutant and Wild-Type Mice Exhibit Identical Responses to Putative D3 Receptor-Selective Agonists and Antagonists. Synapse 31:210-219
25. Xu M., Hu X-T., **Cooper D.C.**, White F.J., and Tonegawa S. (1996) A Genetic Approach to Study Mechanisms of Cocaine Action. Ann N Y Acad Sci. 801:51-63
26. Xu M., Hu X-T., **Cooper D.C.**, Moratalla R., Graybiel A.M., White F.J., and Tonegawa S. (1994) Elimination of Cocaine-Induced Hyperactivity and Dopamine-Mediated Neurophysiological effects in dopamine D1 receptor mutant mice. Cell. 79:945-955