



Christopher T. Smith

Graduate Student
Curriculum in Neurobiology
University of North Carolina at Chapel Hill
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Education:

Ph.D. Neurobiology, University of North Carolina, Chapel Hill (UNC-CH) 2014
(May expected)

Dissertation: Now Versus Later Decision Making: Effects of Frontal Development and Alcohol Use
(Advanced to candidacy 2010)

Advisor: Charlotte A. Boettiger, PhD

B.S. Neuroscience (magna cum laude), Furman University 2008

Academic Honors and Awards:

Graduate Student Award, Cognitive Neuroscience Society 2012 Annual Meeting (\$500)	2012
Funded trainee for 2011 <i>Training Course in fMRI</i> program at the University of Michigan	2011
T32 Fellowship (NIDA) – Pre-doctoral Training in Research on Drug Abuse	2009-2011
Graduate Mentor Award from UNC Office of Undergraduate Research (\$1000)	2010
Research Society on Alcoholism Student Merit Travel Award (\$150)	2010
S.C. NIH-IDEA Networks of Biomedical Research Excellence Summer Research Fellow	2007

Research Experience:

Graduate Research Assistant May 2009-Present

Curriculum in Neurobiology, UNC-CH

Advisor: Charlotte A. Boettiger, PhD

Investigating the neurobiology of immediate reward bias, an intermediate behavioral phenotype associated with substance use disorders in humans.

Findings and conclusions:

- Prefrontal cortex dopamine levels as indexed by a polymorphism in the COMT enzyme interacts with age group (18-21 vs. 22-40) to affect degree of discounting behavior observed in a delay discounting task (Smith & Boettiger, 2012).
- Discounting of delayed rewards decreases as function of age in low/moderate drinkers but not heavy, possible problem drinkers.
- Working memory performance as indexed by an n-back task negatively relates to the degree of discounting behavior observed in adults 25-40.

Graduate Research Assistant, Rotating Student
Curriculum in Neurobiology, UNC-CH

June 2008 - May 2009

Wightman Lab (Department of Chemistry)

June – August 2008

Used fast-scan cyclic voltammetry to investigate changes in dopamine in the nucleus accumbens of rats in response to natural rewards.

Hodge Lab (Department of Pharmacology)

September – December 2008

Studied the relationship between depression and alcohol in mice through behavioral and immunohistochemical techniques to investigate cell signaling pathways altered in response to acute i.p. injections of alcohol.

Boettiger Lab (Department of Psychology)

January 2009 – March 2009

- Studied the effect of dopamine on prefrontal cortex function in delay discounting behavior by taking advantage of state-related changes in dopamine via estrogen fluctuations in the female menstrual cycle.
- Investigated the interaction between COMT and female menstrual cycle day on discounting behavior.

Maness Lab (Department of Biochemistry)

March 2009 – May 2009

Investigated the role of the L1 cell adhesion molecule and Eph/ephrin signaling in early axonal targeting.

Undergraduate Research Assistant

2007-2008

Department of Psychology, Furman University

Advisor: Lab of Judith E. Grisel, PhD

Assisted Dr. Grisel in planning, data collection, and analysis of three inter-related experiments:

1. *in vivo* microdialysis and HPLC to detect fundamental neurological differences in the dopamine and glutamate levels of three difference strains of transgenic mice.
2. Behavioral tests to analyze behavioral despair (depression) and anxiety in mice and the role of b-endorphin and alcohol (EtOH) in influencing these mice's behavior.
3. Conditioned place preference experiment to investigate the degree of reward three different strains of mice associated with alcohol (EtOH) and whether b-endorphin affected the mice's propensity to associate alcohol with reward.

Publications:

Smith CT, Boettiger CA (2012). Age modulates the effect of COMT genotype on delay discounting behavior. *Psychopharmacology*, DOI: [10.1007/s00213-012-2653-9](https://doi.org/10.1007/s00213-012-2653-9).

Talks:

- Cognitive Neuroscience Society 2012 Annual Meeting. Chicago, IL. **2012**
“Interacting effects of genetic polymorphisms regulating dopamine signaling in the frontal cortex on accurate target detection under high working memory load.” **Smith CT**, Boettiger CA.
- Behavioral Neuroscience Seminar Series, UNC – Chapel Hill, Chapel Hill, NC. **2010**
“Understanding the relationship between immediate reward bias and problem drinking Behavior.” **Smith CT**
- First Annual Summer Research Conference Between Furman & Davidson Universities, **2007**
Furman University, Greenville, SC.
“Evaluating the neurocircuitry of β -endorphin mediated reinforcement in the nucleus accumbens using transgenic mice” **Smith CT**, Cloonan G, Grisel JE

Poster Abstracts:

1. **Smith CT**, Boettiger CA (2012). Interacting effects of genetic polymorphisms regulating dopamine signaling in the frontal cortex on accurate target detection under high working memory load. North Carolina Conference on Cognition 2012. Chapel Hill, NC.
2. **Smith CT**, Boettiger CA (2011). Age Modulates the Effect of COMT Genotype on Delay Discounting Behavior. Society for Neuroscience 2011 Annual Meeting: 839.12. Washington, DC.
3. **Smith CT**, Freeman-Daniels E, Boettiger CA (2011). Effects of Age and Alcohol Use Behavior on Impulsive Decision Making. Neurobiology of Adolescent Drinking in Adulthood (NADIA) 2011 Retreat. Chapel Hill, NC.
4. Le M*, **Smith CT**, Boettiger CA (2011). Cognitive Impulsivity, Working Memory, and Genotype Effects. Celebration of Undergraduate Research, University of North Carolina at Chapel Hill. Chapel Hill, NC.
5. **Smith CT**, Freeman-Daniels E, Boettiger CA (2010). Effects of Gender, Age, and Alcohol Use Behavior on Impulsive Decision Making. *Alcoholism: Clinical & Experimental Research*, *34*, 119A.
6. Chanon VW, **Smith CT**, Kalka LS, Kampov-Polevo AB, Garbutt JC, Boettiger CA (2010). Effects Of Naltrexone On Alcohol Attentional Bias And Delay Discounting: A Pilot Study. *Alcoholism: Clinical & Experimental Research*, *34*, 177A.
7. **Smith CT**, Boettiger CA (2010). Ovarian Cycle Effects on Immediate Reward Bias: a Window on PFC Dopamine. *Cognitive Neurosci Soc* 17:194. Montreal, QC, Canada.
8. Boettiger CA, **Smith CT** (2010). Immediate Reward Bias in Humans: Effects of Alcohol Use, Dopamine, Hormones, Age, and Gender. *Clinical and Translational Science* 3:S34.
9. **Smith CT**, Cloonan G, Lee A, Grisel JE (2008). Investigating the role of β -endorphin in mediating alcohol reward using *in vivo* microdialysis. Symposium for Young Neuroscientists and Professors of the SouthEast. Charleston, SC.
10. **Smith CT**, Cloonan G, Lee A, Grisel JE (2008). Role of β -endorphin in behavioral despair, stress, and anxiety. South Carolina IDeA Networks of Biomedical Research Excellence 2008 Research Symposium. Charleston, SC.

11. **Smith CT**, Cloonan G, Lee A, Grisel JE (2007). Role of β -endorphin in behavioral despair, stress, and anxiety. Faculty for Undergraduate Neuroscience Social and Poster Session. Society for Neuroscience 2007 Annual Meeting. San Diego, CA.

* undergraduate mentee presenter

Funding:

F31-AA020132 (Christopher Smith)

8/2011 - 7/2014

National Institute on Alcohol Abuse and Alcoholism

\$93,000

Now Versus Later Decision Making: Effects of Frontal Development and Alcohol Use

This Predoctoral Fellowship was awarded to explore the neurobiological bases for the decline in the tendency to choose smaller, sooner rewards (“*Now*”) over larger, later rewards (“*Later*”) from late adolescence to early adulthood, a tendency that also characterizes individuals with alcohol use disorders. Studying developmental changes in the structure and function of frontal and subcortical brain structures that regulate *Now/Later* decision-making using sMRI, fMRI, and DTI approaches may provide insight into why late adolescents are at increased risk for developing alcohol use disorders.

Teaching:

Instructional Assistant, UNC Dept. of Psychology, Chapel Hill, NC

Spring 2011

Intro to Psychology (Psych 101)

Number Enrolled: 288

- Graded course assignments including exams and writing assignments with 2 other IAs.
- Managed online course material and online grade book via Blackboard system.
- Maintained weekly office hours for students.

Mentoring:

Undergraduate Honors Thesis advisor for Martina Le (2010-11 academic year)

Thesis title: Cognitive Impulsivity, Working Memory, and Genotype Effects

Biology 395 Research Project advisor for Ankita Desai (Summer 2011)

Project title: Effect of C957T DRD2 on ICR

Directly supervised undergraduate research volunteers:

Rachel Kaplan (Spring 2012)

Chelsea Lang (Fall 2011)

Jose Lopez (Fall 2010 - Spring 2011)

Community Outreach:

Brain Awareness Week 2011 - Brain Lab Volunteer

March 18-19th, 2011

Museum of Life and Science Durham,

Professional Affiliations:

Society for Neuroscience (member since 2007)

Cognitive Neuroscience Society (member since 2009)

Research Society on Alcoholism (member since 2009)