

CHRISTOPHER SMITH

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EDUCATION

GRADUATE STUDENT IN CURRICULUM IN NEUROBIOLOGY
FALL 2008 - PRESENT
University of North Carolina at Chapel Hill - Chapel Hill, NC

BACHELOR OF SCIENCE IN NEUROSCIENCE – 2008
Furman University – Greenville, SC

- G.P.A. - 3.748
- Math/Science G.P.A. - 3.867
- Major G.P.A. - 3.667

SOUTH CAROLINA HIGH SCHOOL DIPLOMA, WITH HONORS -- 2004
Greenwood High School – Greenwood, SC

- G.P.A - 4.0
- Honors and Awards – National Honors Society, Beta Club, Eagle SAT STARS: 1300+ Club, South Carolina Palmetto Fellows Scholar, South Carolina Governor's School at the College of Charleston Participant (Summer 2003), Furman Scholar

HONORS AND ACTIVITIES

- **Student Member - Society for Neuroscience** June 2007 - present
- **Student Member - Cognitive Neuroscience Society** September 2009 - present
- **Treasurer for Wesley Fellowship, a United Methodist College Student Organization, at Furman University:**
September 2005 - September 2007
- **America Counts, America Reads Tutor at Stone Academy in Greenville, SC:**
November 2006 - May 2008
- **Religious Council Representative for Wesley Fellowship: September 2005 - May 2006**
- **Furman University Deans List: Fall Term 2004 - Winter Term 2005/2006 & Fall Term 2006 - Spring Term 2007**

TECHNICAL AND COMPUTER SKILLS

Computer Skills:

Microsoft Word
Microsoft Excel
Microsoft Money
Power Point
Basic S.P.S.S. knowledge
SYSTAT
GraphPad Prism

Lab Skills:

gel electrophoresis
thin-layer chromatography
column chromatography
microscope use
acid/base titration
in vivo microdialysis and HPLC
pipette usage
animal husbandry
stereotax usage

RESEARCH

Dissertation Lab - Boettiger Lab
University of North Carolina at Chapel Hill
Chapel Hill, NC

May 2009 - present
Curriculum in Neurobiology
Department of Psychology

- Continuing to investigate the role of dopamine on prefrontal cortex function and performance on a delayed-discounting decision-making task.
- Investigating the effect of age on impulsive choice ratios (ICRs) on a delayed-discounting task.
 - o Investigating structural differences between the frontal cortical areas of young adults and older adults.
 - o Investigating functional differences between how young adults and older adults' brains function as they complete a delayed-discounting task.
- Investigating the role of alcohol on performance on the delayed-discounting task. Can the task be used as a behavioral marker for risk of substance abuse (substance abusers have been found to have higher ICRs than control subjects).

First-Year Rotations at UNC

Chapel Hill, NC
June 2008 - May 2009

Wightman Lab (Department of Chemistry)

June - August 2008

- Using fast-scan cyclic voltammetry to investigate changes in dopamine in the nucleus accumbens of rats in response to natural rewards
 - o Performed surgeries to insert the guide for the recording electrode, stimulating electrode, and reference electrode
 - o Learned the program TarHeel CV used to stimulate and record the electrical signature of dopamine in the rat brain
 - o Conditioned the rats to press for sugar pellets in the operant conditioning chamber used in the later parts of the study

Hodge Lab (Department of Pharmacology)

September - December 2008

- Studied the relationship between depression and alcohol in mice through behavioral and immunohistochemical techniques to try understand the cell signaling pathways altered in response to acute i.p. injections of alcohol.
 - o Used automated Forced Swim Test apparatus from BIOobserve to measure depressant-like behaviors in mice given alcohol to controls.
 - o Performed immunohistochemistry on brain tissue from these mice to look for increases in active protein kinases and their downstream targets following alcohol administration.

RESEARCH CONT'D

First-Year Rotations at UNC continued

Boettiger Lab (Department of Psychology)

January 2009 – March 2009

- Studied the effect of dopamine on prefrontal cortex function in a decision-making task by taking advantage of state-related changes in dopamine via estrogen fluctuations in the female menstrual cycle. Also, looked at how variations in the catechol-O-methyltransferase (COMT) gene affected performance on the task.
 - o Learned protocols important in human research (IRB, confidentiality, etc...).
 - o Learned how to using E-Prime to create computer-based behavioral experiments.
 - o Became familiar with MATLAB as a means to compile and summarize data.

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.
 - o Performed growth cone collapse assays using EphrinA-EphA growth cone retraction signaling to see if L1 null mouse cortical neurons collapsed similar to wild-type mouse cortical neurons.
 - o Sought to identify the binding site on L1 for the EphA4 receptor using co-immunoprecipitation experiments.

Lab of Dr. Judith E. Grisel Furman University

Greenville, SC
June – September 2007

- Assisted Dr. Grisel in the experimental planning, data collection, and data analysis of three interrelated 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.
- Became proficient in animal husbandry, weaning, and sexing.
- Learned how to use powerful statistical programs (SYSTAT) and graphing programs (GraphPad Prism) to summarize, organize, and report data.

EXPERIENCE

Scientific Poster Presentations

**Symposium for Young Neuroscientists and Professors of the SouthEast (SYNAPSE)
College of Charleston**

**Charleston, SC
March 15, 2008**

- Presented preliminary findings for FST and TST tests of behavioral despair in male and female β -endorphin KO, HT, and C57BL6 mice given ethanol or saline i.p. injection.
- Presented pilot study findings from *in vivo* microdialysis experiment.

**South Carolina IDeA Networks of Biomedical Research Excellence (INBRE) 2008 Research Symposium
College of Charleston**

**Charleston, SC
January 17-18, 2008**

- Presented preliminary findings for FST and TST tests of behavioral despair in male and female β -endorphin KO, HT, and C57BL6 mice given ethanol or saline i.p. injection.

**Society for Neuroscience Annual Meeting Faculty for Undergraduate Neuroscience (FUN) Social and Poster Session
San Diego Marriott Hotel and Marina**

**San Diego, CA
November 3-7, 2007**

- Presented preliminary findings for FST and TST tests of behavioral despair in male and female β -endorphin KO, HT, and C57BL6 mice given ethanol or saline i.p. injection.

Scientific Oral Presentations

**First Annual Summer Research Conference Between Furman and Davidson Universities
Furman University**

**Greenville, SC
July 23, 2007**

- Gave research talk entitled "Evaluating the neurocircuitry of b-endorphin mediated reinforcement in the nucleus accumbens using transgenic mice" to a group of faculty and peers from both institutions which summarized the work we were doing in Dr. Grisel's lab.

Clinical Exposure

**Family Practice Rotation
Montgomery Center for Family Medicine of Self Regional Healthcare**

**Greenwood, SC
June - August 2006**

- Observing family practice physicians perform various duties including the diagnosis and treatment of infants, young children, adolescents, adults, and older adults with a wide range of symptoms.
- Exposed to electronic medical record software, residency protocols, and the schedule that new doctors are required to maintain during their residency (hospital rotations, clinic rotations, being on call, attending lectures/presentations, and discussing patient treatment with attending faculty physicians).

EXPERIENCE: CLINICAL EXPOSURE CONT'D

Hospital Rotation
Greenville Memorial Hospital

Greenville, SC
April - May 2006

- Rotating through surgery, blood bank, clinical labs, and pathology at Greenville Memorial, obtaining a broad overview of the various areas of medicine and health care.
- Observing various physicians and medical workers perform their jobs in a real-world setting and being exposed to patient-doctor interactions, diagnostic practices, and various other tasks that health care workers are responsible for (confidentiality, safety, quality control, etc.).

Pediatrics Rotation
GHS Center for Pediatric Medicine

Greenville, SC
March 2006

- Shadowing resident physicians at the clinic during an average workday, including observing well child checkups, physicals, and diagnosis and treatment of a variety of illnesses.
- Observing the inner operations of running a clinic and the various protocols that residents must follow in completing required paperwork and making medical diagnoses.