

BREE A. HUMBURG

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EDUCATION

Ph.D in Psychology

University of Kentucky, Lexington, KY 40536

August 2020-Current

B.S. in Psychology

Kansas State University, Manhattan, KS 66506

May 2018

HONORS AND AWARDS

Doreen Shanteau Undergraduate Research Fellowship

Kansas State University

Spring 2017

College of Arts and Sciences Student Travel Funding

Kansas State University

Fall 2017

RESEARCH EXPERIENCE

University of Kentucky

July 2020-Present

Graduate Research Assistant- Dr. Michael T. Bardo, University of Kentucky, Lexington, KY

- Social paradigm of drug self-administration in rats
- Chemogenetics in rats
- Data Analysis
- Immunohistochemistry
- Confocal Microscopy
- Jugular catheter implantation surgery, connected to headmounts, for intravenous drug self-administration in rats (male and female)

National Institute on Drug Abuse Intramural Research Program, July 2018 to July 2020

Postbaccalaureate Fellow – Dr. Zheng-Xiong Xi & Amy Hauck Newman, Molecular Targets & Medications Discovery Branch, Baltimore, MD

- Jugular catheter implantation surgery, connected to headmounts, for intravenous drug self-administration in rats (male and female) and transgenic mice
- Stereotaxic surgery involving viral vector microinjections
- Optogenetic activation of cell-type specific neural circuitry in transgenic mice
- RNAscope *in situ* hybridization
- Behavioral testing: i.v. drug self-administration, conditioned place preference, hot plate nociception, optogenetic intracranial self-stimulation, optogenetic real time place preferences, locomotor open field and rotarod tests
- Telemetry (cardiovascular monitoring for medication development)

- Transcardial perfusions in rats and mice
- Estrus Monitoring
- Cryostat brain sectioning of fresh frozen and perfused tissue
- Fluorescence microscopy and cell counting
- Manuscript editing
- Database maintenance and statistical analysis. Software proficiencies include: MS Excel, SPSS, and SigmaStat/SigmaPlot.
- Training and shared supervision of summer students in animal handling and behavioral testing skills

National Institute on Drug Abuse Summer Internship June 2017 to August 2017

Paid Intern – Dr. Shilpa Buch, University of Nebraska Medical Center, Omaha, NE

- Culturing BV-2 cells and rat primary microglial cells
- Pierce BCA protein assays
- Western blot assays for NLRP3, caspase-1, interleukin-1, AcsC protein
- Quantifying and analyzing western blot images using ImageJ
- Presenting data
- Figure preparation for manuscripts and publications

Kansas State University

June 2016 - June 2018

Undergraduate Research Assistant - Dr. Mary E. Cain, Kansas State University.

Manhattan KS

- Basic rat husbandry
- Operant training for self-administration in rats with amphetamine and sucrose injections (s.c. and i.p.)
- Brain extractions: Fresh and perfused tissue preparations
- Rat aseptic survival surgery prep and post-operative care
- Western blot assays for GluA1, GluA2, mGluR5 protein
- Quantifying and analyzing western blot images using ImageJ
- Data entry and analysis, preparation of figures
- Poster preparation and presentations
- Training and supervision of undergraduates in experimental design, statistical analysis, MEDPC, responsibility, and communication skills

PUBLICATIONS

1. **Humburg, B. A.***, Jordan, C. J.*, Zhang, H. Y., Shen, H., Han, X., Bi, G. H., Hempel, B., Galaj, E., Baumann, M. H., & Xi, Z. X. (2021). Optogenetic brain-stimulation reward: A new procedure to re-evaluate the rewarding versus aversive effects of cannabinoids in dopamine transporter-Cre mice. *Addiction biology*, e13005. *Contributed equally to the work.
2. Galaj, E., Han, X., Shen, H., Jordan, C.J., He, Y., **Humburg, B.**, Bi, G-H., Xi, Z-X. (2020). Dissecting the role of GABA neurons in the VTA versus SNr in opioid reward. *Journal of Neuroscience*, 40, 8853-8869.

3. Jordan, C.J., **Humburg, B.A.**, Thorndike, E.B., Xi, Z.X., Baumann, M.H., Newman, A.H., Schindler, C.W. (2019). Newly developed dopamine D3 receptor antagonists, R-VK4-40 and RVK4-116, do not potentiate cardiovascular effects of cocaine or oxycodone in rats. *Journal of Pharmacology and Experimental Therapeutics*, 371, 602-614.
4. Jordan, C.J., **Humburg, B.**, Rice, M., Bi, G-H., You, Z-B., Shaik, A., Bonifazi, A., Cao, J-J., Xi, ZX., Newman, A. (2019). (\pm)VK4-40, a novel dopamine D3 receptor partial agonist, attenuates cocaine reward and relapse in rodents. *Neuropharmacology*, 158, 1-11.
5. Hu, G., Niu, F., **Humburg, B.A.**, Liao, K., Bendi, V. S., Callen, S., Fox, H. S., & Buch, S. (2018). Molecular mechanisms of long noncoding RNAs and their role in disease pathogenesis. *Oncotarget*, 1-16.

SEMINARS

1. **Humburg, B.A.** (2019, September). *Optogenetic dissection of ventral tegmental area neural mechanisms underlying cannabis reward versus aversion*. Postbac Research Luncheon, NIDA Intramural Research Program, Baltimore, MD.
2. **Humburg, B.A.** (2019, June). *Repurposing fenobam, an FDA-approved anxiolytic, for cigarette smoking cessation*. Molecular Targets and Medications Discovery Branch, NIDA Intramural Research Program, Baltimore, MD.
3. **Humburg, B.A.** (2019, January). *Analyzing the mechanisms and reward potential for new synthetic cannabinoids in rodents- independent research proposal*. Addiction Biology Unit, NIDA Intramural Research Program, Baltimore, MD.
4. **Humburg, B. A.** (2018, May). *The effects of different abstinence periods and environmental protection on sucrose incubation and accumbal protein expression*. 2018 Undergraduate Research Convocation, Kansas State University, KS.

POSTER ABSTRACTS

1. **Humburg, B.A.**, Hammerslag, L.H., Malone, S.G., Bardo, M.T. (2021, March). *Renewal of Cocaine Seeking using Social and Nonsocial Contexts*. Poster presentation at SURE, [Virtual].
2. Jordan, C.J., **Humburg, B.A.**, Xi, Z-X., Newman, A.H. (2020, December). *Sex differences in the impact of dopamine D3 receptor antagonism on fentanyl self-administration and analgesia in male and female rats*. American College of Neuropsychopharmacology [Virtual].

3. Jordan, C.J., **Humburg, B.A.**, Bi, G-H., Xi, Z-X., Newman, A.H. (2019, December). *Insular Cortex Dopamine D3 Receptor Involvement in Oxycodone Seeking and Analgesia*. American College of Neuropsychopharmacology, Orlando, FL, USA.
4. Jordan, C.J., **Humburg, B.A.**, He, Y., Han, X., Bi, G-H., Gardner, E.L., Xi, Z-X. (2019, November). *Optogenetic dissection of dopamine-related neural mechanisms underlying cannabis reward versus aversion*. Society for Neuroscience, Chicago, IL, USA.
5. You, Z-B., Gardner, E.L., Moore, A., Buck, T., Jordan, C.J., **Humburg, B.A.**, Bi, G-H., Xi, Z-X., Newman, A.H., Leggio, L. (2019, November). *Crucial involvement of endogenous ghrelin in the control of oxycodone self-administration and brain stimulation reward*. Society for Neuroscience, Chicago, IL, USA.
6. **Humburg, B.A.**, Jordan, C. J., Bi, G-H., Newman, A. H., Xi, Z-X. (2019, May). *Repurposing an old drug for new tricks: fenobam, an FDA-approved mGluR5 antagonist, attenuates nicotine reward and relapse in rodent models*. NIDA IRP Poster Day and Mentoring Awards Ceremony, Baltimore, MD.
7. **Humburg, B. A.**, Garcia, E. J., Beesley, A. N., & Cain, M. E. (2018). *The effects of different abstinence periods and environmental protection on sucrose incubation and accumbal receptor expression*. Society for Neuroscience, San Diego, CA.
8. **Humburg, B. A.**, Garcia, E. J., Beesley, A. N., & Cain, M. E. (2017). *The effects of different environmental conditions and abstinence periods on sucrose seeking and glutamate receptors*. Society for Neuroscience, Washington D.C.
9. **Humburg, B.**, Garcia, E., Beesley, A., & Cain, M. (2017). *The effects of environmental enrichment and abstinence period on sucrose seeking and glutamate receptors*. Kansas State University Undergraduate Convocation, Manhattan, KS
10. **Humburg, B.**, Garcia, E., Beesley, A., & Cain, M. (2017). *The effects of environmental enrichment and abstinence period on sucrose seeking and glutamate receptors*. Nebraska Symposium of Motivation, Lincoln, NE. Service and Outreach

TEACHING EXPERIENCE

Teaching Assistant – University of Kentucky

- Introduction into Psychology Fall 2020
- Brain and Behavior Spring 2021

OTHER

Sr. Career Advisor Position Interview Panel 2021
 University of Kentucky, Lexington, KY
 Panelist

Graduate School Panel University of Kentucky, Lexington, KY Panelist	2020
Maryland STEM Career Fair for Girls The Bryn Mawr School, Baltimore, MD NIDA Representative	2019
Undergraduate Panel for High School Interns NIDA, Baltimore, MD Panelist	2019