

April M. Becker

Education **Doctor of Philosophy: Biomedical Sciences (completing), UT Southwestern Medical Center**
Master of Science: Behavior Analysis, University of North Texas, Denton, Texas
Bachelor of Science: Zoology, Colorado State University in Fort Collins, Colorado

Research **With Dr. Mark Goldberg 2011-2017**

- The influence of the basal forebrain cholinergic system on plasticity and behavioral recovery from ischemic stroke
- The structure of the basal forebrain cholinergic system and its changes consequent to motor cortical ischemic stroke
- Methods Developed:
 - Created a novel, automated task requiring distal forelimb muscular precision for the assessment of post-stroke functional impairment and recovery
- Technologies:
 - Various histological techniques including immunohistochemistry with multiple probes
 - PCR & Genotyping
 - Axon tracing: Pseudorabies Virus, BDF
 - Surgery: intracranial stereotaxic injection & implantation, surgical stroke induction
 - Stroke-relevant motor behavior measurement
 - In vivo ontogenetic activation and inhibition (transgenic)
 - In vivo chemogenetic activation and inhibition (transgenic and viral)
 - In vivo electrical recording
 - Slice electrophysiology (aided by specialist)
 - Neurostereology (instruction obtained from Mark West, completed August 2015)
 - Fixed tissue imaging (confocal, scanning fluorescent, scanning brightfield)
 - Matlab (general use and coding), Office, Endnote, Graphpad

With Dr. Jesus Rosales-Ruiz 2007-2011

- The influence of schedule manipulations and limited holds on “motivation”
- The relationship between the current repertoire and the rate of novel behavior under variability schedules
- Methods Developed:
 - Created a novel laboratory analog for an applied procedure designed to increase food reinforcer efficacy.
 - Developed measurement system for object-interaction novelty
- Technologies:
 - Creation of custom operant chambers tailored to multiple projects
 - Behavioral Measurement & Analysis

With Dr. Sigrid S. Glenn 2007-2011

- The effects of metacontingencies on group coordination
- Methods Developed:
 - With co-authors, helped develop a computer-based paradigm to apply metacontingencies to an Iterated n-Players Prisoners' Dilemma Game

- Technologies:
 - Measurement of interlocked behavior in small groups

With Dr. Myron Baker 2001-2003 (Hughes Undergraduate Research Scholar)

- Relationship between alarm call vocalization variation in black-capped chickadees to predator threat and distance
- Technologies:
 - Field observation & measurement (behavioral)
 - Lab observation & measurement (behavioral)
 - Trapping
 - Sonogram analysis
 - Stimuli manipulation (song)

With Dr. Donald Mykles, 1999 – 2001 (Hughes Undergraduate Research Scholar)

- Studied the molecular pathways involved in muscle atrophy, with translational attention to muscular dystrophy.
- Technologies:
 - Various basic bench techniques (protein, DNA, and RNA electrophoresis, bacterial culture, cloning, dissection, etc.)
 - Lab animal husbandry
 - Lab upkeep

Grants

- National Institute of Health (NIH): The Cellular Biophysics of the Neuron T32 Training Grant 5T32NS069562-05
- Society for the Advancement of Behavior Analysis Master's Thesis Grant 2010

Dissemination

- Current work toward publication:
 - Targeting Neuromodulation to Increase Stroke Recovery
 - Reorganization of Cholinergic Projects from the Nucleus Basalis after Stroke
 - The Concept of the Whole Organism in Behavior Analysis
- Submissions underway:
 - Becker, A., and Goldberg, M. Motor forelimb cortical stroke causes loss of precise muscle control in mice
 - Ganzer, P., Meyers, E., Solorzano, B., Robertson, N., Adcock, K., James, J., Ruiz, A., Becker, A., Goldberg, M., Pruitt, D., Moy, J., Hassler, S., Price, T.J., Gluf, W., Kilgard, M., Rennaker, R. (submitted) Enhancing Plasticity and Recovery following Spinal Cord Injury.
- Publications:
 - Becker, A. M., Meyers, E., Sloan, A., Rennaker, R., Kilgard, M., & Goldberg, M. P. (2016). An automated task for the training and assessment of distal forelimb function in a mouse model of ischemic stroke. *Journal of Neuroscience Methods*, 258, 16-23.
 - Ortu, D. Becker, A., Woelz, T.A.R. & Glenn, S. S. (in press) An Iterated Four-Player Prisoner's Dilemma Game with an External Selecting Agent: A Metacontingency Experiment. *Latin American Journal of Psychology*.
 - Baker, M. C. and Becker, A. M. 2002. Mobbing calls of black-capped chickadees: effects of urgency on call production. *Wilson Bulletin*, 114:510-516.

Posters & Presentations

- Mobbing call of the Black-Capped Chickadee: Relationship between call structure and predatory threat – CSU Undergraduate Research and Creativity Symposium 2002 Poster
- Mobbing call of the Black-Capped Chickadee and predator threat: A playback experiment – CSU Undergraduate Research and Creativity Symposium 2003 Poster
- Current Behavioral Research from ORCA – Texas Association for Behavior Analysis 2008 Poster

- Current Behavioral Research from Organization for Reinforcement Contingencies with Animals - 2008 IAATE Annual Conference Poster
- The Varied Behavioral Effects of Conditioned Reinforcers Intermittently Paired with Unconditioned Reinforcers – Association for Behavior Analysis, International 2008 Symposium Chair
- The Role of the Existing Repertoire in the Generation of Novel Behavior - Association for Behavior Analysis, International 2009 Poster
- “Psychological Appetite” or Schedule-Induced Deprivation - Association for Behavior Analysis, International 2010 Poster
- The Role of the Existing Repertoire in the Generation of Novel Behavior - Association for Behavior Analysis, International 2010 Poster
- Metacontingency control in an Iterated Prisoner’s Dilemma Game affects group behavior after the removal of the metacontingency. – Four Corners Association of Behavior Analysis 2010 Poster
- Metacontingencies imposed on prisoner's dilemma games select interlocking behavior - European Association for Behavior Analysis 2010 Presentation
- Cultural Consequences and the Iterated Prisoners' Dilemma Game: Understanding Metacontingency - Association for Behavior Analysis, International 2011 Presentation
- Schedule-Induced Deprivation: Maintaining Reinforcer Efficacy at High Body Weights - Association for Behavior Analysis, International AND Art and Science of Animal Training Private Seminar 2011 Presentations
- Selective activation of the nucleus accumbens shell to lateral hypothalamic pathway enhances “depressive-like” behavior on the forced swim test. – Society for Neuroscience 2012 Poster (second author)
- Behavioral Approaches to Complexity and Generativity – Association for Behavior Analysis, International 2013 Panel Member
- An automated reach task for mouse research in ischemic stroke – Society for Neuroscience 2013 Poster
- Experimental Data from Cultural Lab of Universidade de Brasilia: Inequality of Individual Reinforcer, Metacontingencies Concurrents and Nature of Individual and Cultural Consequences. – Association for Behavior Analysis, International 2014 Symposium Chair & Discussant
- The effects of targeted intracerebral saporin injection on recovery from stroke – Society for Neuroscience 2014 Dynamic Presentation Board
- Neuromodulation, Brain Plasticity and Behavior Analysis – Association for Behavior Analysis, International 2015 Symposium Presentation
- The necessity of cholinergic innervation from the Nucleus Basalis for stroke recovery – UT Southwestern Neuroscience Retreat 2015 Poster
- The automated reach task measures deficits in movement precision following photothrombotic stroke – UT Southwestern Neuroscience Retreat 2016 Poster
- The Concept of The 'Whole' Organism in Behavioral Neuroscience – Association for Behavior Analysis, International 2016 poster
- Strength vs precision: What does the mouse automated reach task assess? – Society for Neuroscience 2016 Poster
- Visualizing reorganization of cholinergic projections from the nucleus basalis after photothrombotic stroke. – Society for Neuroscience 2016 (Second author)
- Enhancing plasticity and recovery following spinal cord injury – Society for neuroscience 2016 Poster (Eighth Author)
- The automated reach task measures deficits in distal forelimb precision in mice following photothrombotic stroke – TxFreshAir Grand Challenges in Neuroscience Roundtable 2016 Poster
- Disseminating Behavior Analysis: Novel Applications and Additional Avenues – Association for Behavior Analysis, International 2017 Panel Member

Teaching & Mentorship

Teaching Assistant

2007 – 2009 The University of North Texas Denton, TX

- Taught 3 courses for first year students at the University of North Texas
 - BIOL 1730 Principles of Biology I (for biology majors)
 - BIOL 1740 Principles of Biology II (for biology majors)
 - BIOL 1112 (BIOL 1413) Contemporary Biology (for non-biology-majors)
- For 2 courses, designed lectures and activity plans and elaborated on minimal curriculum requirements
- For all courses, served as the sole provider of in-class and out-of-class instruction
- High evaluation scores throughout all 3 years, increased evaluation scores in later 2 years.

Academic Research Mentor

- Primary mentor for project design, techniques, analysis, writing and weekly topic reading and discussions for 4 students
- 2 undergraduate theses supervised
- One Green Fellowship
- One student planning to submit for publication within the year

Honors

Graduate

- MS: 4.0 GPA
- PhD: 3.7 GPA
- Lucille Merchison Graduate Scholarship 2007
- Donald L. Whaley Memorial Scholarship 2007
- University of North Texas Graduate/Summer Tuition Scholarships 2007, 2008
- IAATE Annual Conference Best Poster Award 2008
- UNT Scholarships 2008, 2009
- UNT Grant 2008, 2009
- Society for the Advancement of Behavior Analysis Master's Thesis Grant 2010
- Douglas P. Field Graduate Research Scholarship 2010
- Outstanding Graduate Student in Behavior Analysis Award 2010
- 2015 2nd place Poster Presentation: UT Southwestern Neuroscience Retreat
- Phi Kappa Phi Honors Society
- Numerous Travel Grant awards for research presentation

Undergraduate

- Magna Cum Laude
- University Honors Scholar distinction
- 3.9 GPA
- Deans List for all semesters
- Phi Beta Kappa Honor Society
- National Society of Collegiate Scholars
- Golden Key International Honour Society
- Distinguished Scholars Award: Colorado State University (annual, 4 years)
- Colorado Scholars Award: College of Natural Sciences, Colorado State University
- Hughes Undergraduate Research Scholar's Scholarship (annual, 3 years)
- Presidential Scholarship: Colorado State University (annual, 3 years)
- University Scholars Award: College of Natural Sciences, Colorado State University
- College of Natural Sciences Dean's Scholars Award, College of Natural Sciences

- Alumni Merit Scholarship
- College of Natural Sciences Students First Scholarship
- Dean's Scholars Award
- Highest Distinction: Undergraduate Research and Creativity Symposium 2002, Colorado State University

Experience & Activities

Organization for Reinforcement Contingencies with Animals

- President (2008-2009), Secretary (2007-2008), and member (2007-2011)
- Helped to found behavior consultation program for captive exotic animals at the Heard Wildlife Sanctuary in McKinney, TX
- Developed after school program teaching behavior analysis and animal training to children in coordination with America Reads
- Founding organizer of annual spring conference of animal trainers and behavior scientists at UNT: "The Art and Science of Animal Training"

Behavior Analysis Student and Alumni Association, University of North Texas

- Secretary (2007-2008) and member

Behavioral Consultant to the Heard Museum in McKinney, TX 2008 - 2010

- Help to found a consultation and volunteer program between the ORCA research group at University of North Texas and the Heard Museum.
- Actively train staff at the museum to manage behavior and also directly train animal husbandry behaviors for the Museum.

Seasonal Keeper & Educator, Denver Zoo Wildlife Show. 2006

Overnight Programs & Summer Safari Instructor, Denver Zoo Education Dept. 2004-2005

Seasonal Show Staff, Natural Encounters Satellite World of Birds Shows 2003

Minnesota Zoo World of Birds Show Intern, 2001-2002 (show seasons)

Larimer Humane Society Volunteer, Rocky Mountain Raptor Center, 2001-2002 (off-show seasons)