Rebekka Matheson

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# Education

**MD** University of Rochester School of Medicine and Dentistry May 2013

W*ith additional graduate coursework in Neurobiology and Anatomy*

*Particular coursework and clinical emphasis in psychiatry and neurology*

**BS** Brigham Young University, Neuroscience, *Cum Laude* April 2006

*Also met graduation requirements in Biophysics*

# Current Position

**Assistant Professor,** Professional Track,Brigham Young University August 2017-

* Neuroscience Center, Psychology Department
* Courses taught:
  + Neuro 205 (Neurobiology)
  + Neuro 316 (Neuroscience Advanced Writing)
  + Neuro 360 (Neuroanatomy)
  + Neuro 380 (Behavioral Neuroscience)
  + Neuro 601 (Graduate Cellular Neuroscience)
  + Psych 370 (Sensation Perception)
  + Psych 375 (Cognition)
  + Psych 499R (Teaching Practicum)
  + Neuro 689R (Graduate Teaching Practicum)
* Courses developed:
  + Neuro 316 pilot sections
  + Neuro 602 (Graduate Behavioral Neuroscience)
* Department and Center Service includes:
  + Neuroscience Center Scholarship and Valedictorian Committee (Chair, current)
  + Neuroscience Student Association Advisor (current)
  + Neuroscience Honors Representative (current)
  + Neuroscience Undergraduate Curriculum Committee (current)
  + Neuroscience Steering Committee (ad hoc, summer 2021)
  + Online Cognition Course Team
  + Psychology Department Awards Committee
  + Psychology Department Teaching Committee
  + Neuroscience Center Mary Lou Fulton Undergraduate Research Fair judge
  + Psychology Department Grants Committee
  + Instituting the annual Neuroscience Visual Arts Competition

# Papers submitted for Publication in 2021

*The Brain is Adaptive not Triune: How the Brain Responds to Threat, Challenge, and Change* (with Dawson Hedges and Patrick Steffen)

# Student Research Supervision

Advisor to **Trevor Lloyd** (undergraduate Neuroscience Student), completing a project in cooperation with collaborators at Stanford: *Current Management of Retinopathy of Prematurity in Sub-Saharan Africa.* Abstract presented at The Association for Research in Vision and Ophthalmology conference

Advisor to **Ethan Ouzts** for Utah Conference for Undergraduate Research:

*Serotonergic Hallucinogens’ Antidepressant Potential: A Comparative Review of Serotonergic*

*Hallucinogens and Ketamine*

**Graduate committees (current)**

*Hillary Wadsworth*

*Michael Von Gunten*

*Seth Hoffman*

**Honors student thesis defense committees (completed defenses)**

Tia Thomas, November 29 2017: *Eye-Movement Latency in Infants Shows a Trend toward*

*Correlation with Maternal Consumption of Omega-3 Fatty Acids*

Katrina Hillam, March 8 2019: *Where was I? Linguistic Reprocessing in Distracted Reading*

Mandy Parsons, March 8 2019: *Sex Differences in Ethanol Modulation of Dopamine Release in the*

*Mesolimbic Reward System*

Hänel Watkins, July 26 2019: *An Event-Related Potential Study of Inhibition to Sugar-Sweetened*

*Beverages*

Jenica Barker, June 2 2021: *Tendu to Tango Across the Lifespan: An Argument for Prioritizing Fixed Ballet Instruction as a Contemplative Practice for the Adolescent Mind and Social Dance Instruction for Healthy Aging in the Elderly Population*

Joshua Rhead, June 8 2021: *Preventing Alzheimer’s Disease: Effects of Second Language Acquisition in Older Populations*

Sarah Kamhout, July 27 2021: *Facing Fears when Fearing Faces: Binocular Rivalry Perceptual Alternation and Approach-Avoidance in College-aged Women with Autistic Traits and a History of Adverse Experiences*

Emily Baldwin, December 6 2021: *Effects of Catharanthine on Dopamine Release in the Nucleus Accumbens and Ethanol Consumption*

**Additional advisory roles for student research**

Chris Cardenas, *Neuroscientific substrate for analyzing efficacy outcomes of standard pedagogical*

*practice.* Chris is a master’s student in Instructional Psychology and Technology in the McKay

School of Education. He solicited my help in applying for grants for a multidisciplinary study of neuroscience and pedagogy.

# Previous Educational Work Experience

**Faculty/Course Mentor,** Western Governors University 2013-2017

* Served as team lead for biochemistry and nutrition courses
* Dedicated subject matter expert for anatomy, physiology, and biochemistry
* Quality Improvement Team
* Course Development Pilot Task Force

# Honors and Awards

**Early Career Teaching Award, BYU** 2021

**Excellent in Teaching citation, Health Professions, WGU** 2015

**Mind, Brain, and Behavior: Top 10% scholar** 2009

**Honors Citations:** Neurology, Psychiatry, Pediatrics, Emergency Medicine 2013

**Mallinckrodt Scholar** 2005

*Research fellowship from the Mallinckrodt Institute of Radiology, Washington University*

**Elva May Pederson Jorgenson Memorial Scholar** 2004-2006

**Brigham Young Bicentennial Scholar** 2001-2003

**Outstanding research paper in the Religious Studies Department, BYU** 2001, 2005

# Research Experience

**Neuroanatomical modeling of reward circuitry** 2007-2010

* Neuroanatomical reconstruction and 3D rendering of dopaminergic reward system elements, specifically the lateral habenular nucleus, with construction of a hypothetical model tracing a pathway involved in processing lack of expected reward, supported by electrophysiological studies in trained non-human primates as well as tracer-guided anatomical studies. This included characterization of a novel set of cells in pallidum as well as outlining a direct sensory input to higher dopaminergic centers. Provided a communicating clinical lab with anatomical guidance for deep brain stimulator placement in patients with intractable depression and obsessive-compulsive disorder
* Funding through Medical Scientist Training Program and through the National Institute of Mental Health, Silvio O. Conte Center

**Characteristics of visual cortex in non-human primates** 2007

Advisor: Tania Pasternack, PhD, University of Rochester

* Electrophysiological studies in behaving non-human primates characterizing populations of cells in higher visual cortex and their responses to attributes of rapidly shifting visual stimuli

**Pharmacologic challenge fMRI using arterial spin labeling** 2005

Advisor: Kevin J. Black, MD, Washington University in St. Louis

* Designing and optimizing arterial spin labeling fMRI techniques for drug challenge studies in Parkinsonian patients, among others
* Mallinckrodt Institute of Radiology fellowship

**Membrane proteins in synaptic vessel fusion** 2004 to 2006

Advisors: Dixon Woodbury, PhD; David Busath, MD, Brigham Young University

* Use of an artificial bilayer system and biophysical techniques to examine the roles and architecture of SNAP-25, vSNARE, and other synaptic proteins in vessel fusion
* Lab team leader; student trainer

**Effects of dietary soy phytoestrogens** 2003 to 2004

Advisor: Edwin Lephart, PhD, Brigham Young University

* Molecular biology techniques applied to the effects of dietary soy phytoestrogens on memory tasks in rats and neuroanatomy of sexually dimorphic areas

# Selected Presentations and Case Studies

*Curiosity gave the cat nine lives* 2020

BYU Women’s Services and Resources Conference Keynote

Including online version

*A history—and future?—of psychosurgery* 2018

BYU Honors Symposium

*Women in the health professions*  2018

Presentation to a women’s issues in careers course at BYU

*Deep brain stimulation for psychiatric disease* 2017

Lecture at Brigham Young University

*Using data analytics to optimize instructor-advisor communication in remote learning* 2016

Presentation at university-wide WGU annual meeting in Anaheim, CA

*Presenting a new model for course development and student support* 2016

Presentation to all faculty in the WGU College of Health Professions

*Passion for our work: finding meaning in our everyday interactions with students*  2015

Nominated by peers to give university-wide training lecture for thousands of WGU faculty

*Structure and support of health education in the 21st century*  2015

Presentation to WGU board and accreditation officials at WGU headquarters in Salt Lake City

*Public health approaches to smoking cessation in the mentally ill*  2013

Community Health Clerkship rounds capstone project defense

*Drugs of abuse, their mechanisms, symptoms, and treatment approaches*  2012

Presentation to the pediatrics house staff of Rochester General Hospital

*A case study of mass hysteria? Tics among the LeRoy teenagers*  2011

Neurology clerkship presentation reporting involvement in workup, diagnosis,

and treatment of now-famous case of a “tics outbreak” in LeRoy, New York

*Treating pain in the opioid addict: case studies and best practice* 2011

Grand rounds presentation to the Sawgrass Pain Medicine Clinic

*Surgical considerations of deep-brain stimulator placement* 2011

Presentation to the University of Rochester neurosurgery department

*The role of physician-scientist trainees in undergraduate outreach* 2010

To the annual Physician Scientist Association public relations caucus in Chicago, Illinois

*Substantia Nigra as a reward predicition error detector* 2009, 2010

University of Rochester Department of Neurscience symposium, abstract, poster

*The role of the lateral habenular nucleus in the dopaminergic reward circuit* 2009, 2010

Annual Meeting of the Society for Neuroscience; abstract, poster

*The cortcio-basal ganglia-thalamic system in incentive learning and decision making* 2009

University of Rochester Department of Neuroscience Symposium

*Advocating personal agency as spiritual balm in the chronically ill*  2007

Address to the University of Rochester Spirituality in Medicine conference

*Pilot studies for pharmacologic challenge paradigms in ASL fMRI*  2006

Center for Imaging Research Symposium, Washington University in St. Louis; poser, abstract

*Membrane interactions with nystatin and SNAP-25*  2006

Annual Meeting of the Biophysical Society; poster

*Dietary soy phytoestrogens and performance on memory-based tasks* 2004

Brigham Young University research fair; poster and abstract

# Additional Graduate Coursework

Neuroscience Journal Club, 2007-2009

Scientific Reasoning in Medicine, 2006-2008

Systems Neuroscience, 2008

Ethics in Medical Research, 2007

Cellular Neuroscience, 2007

# Previous Academic Service

**American Physician Scientist Association** 2008-2010

* Institutional representative elect and institutional representative
* National Public Relations Committee

**Medical Scientist Training Program**

* Student Council, Public Relations Chair, 2008
* Transforming Tomorrow’s Thinkers Conference (for students interested in medical science), *co-founder, planning committee, public relations*
* MSTP outreach, *presenting interactive lectures and educational activities to area high school science classes*

**UR Well,** *a student-run clinic for the underinsured; Health team member* 2006-2009