

Mary “Allie” Holschbach
Associate Professor of Neuroscience
Department of Psychology and Neuroscience
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Education & Training

- 2015-2018 Postdoctoral Fellow in Biomedical Sciences, Colorado State University, Fort Collins, CO; Postdoctoral Advisor: Dr. Robert J. Handa
- 2017 NextProf Science: Future Faculty Workshop on Diversifying Academia
University of Michigan
- 2015 Ph.D. Neuroscience; Michigan State University, East Lansing, MI
Ph.D. Advisor: Dr. Joseph S. Lonstein
Dissertation: Peripartum plasticity in the serotonergic dorsal raphe: implications for postpartum socioemotional behavior & physiology
- 2015 Certificate in Diversity Inclusion and Sensitivity; Michigan State University, East Lansing, MI
- 2012 Congress MBL FAPESP USP Joint Course: “Neural Systems and Behavior,” University of São Paulo / Brazil with the support of FAPESP (São Paulo Research Foundation)
- 2008 Continuing Education Course: “Neuroanatomy: Dissection of the human brain and spinal cord”
College of Health Sciences, Marquette University, Milwaukee, WI
- 2006-2010 B.S. Biology with an Option in Neurobiology
B.S. Psychology with Honors
University of Wisconsin, Madison, WI
Honors Thesis: Androgen responsiveness in *Peromyscus californicus*.

Awards and Honors

- 2024-2026 Grant funded by Ed and Ethel Moore Alzheimer’s Disease Research Program through the Florida Department of Health: “*Elucidating the effects of motherhood and infant contact on neural and behavioral signs and symptoms of Alzheimer’s disease (AD) in a transgenic AD mouse model*” Grant #24A11 – PI, FLDOH, \$100,000
- 2022 Award-winning data blitz presentation – Society for NeuroSports
- 2019-2022 Faculty Research Fellowship - PI, College of Psychology, NSU
\$28,200 (\$9,000 in research funds + 3 course releases)
- 2020-2022 President’s Faculty Research and Development Grant – Col, NSU
\$15,000

2019-2020	President's Faculty Research and Development Grant - PI, NSU \$15,000
2015	Award-winning trainee presentation, Front Range Neuroscience
2013-2015	National Research Service Award Predoctoral Fellowship-PI, NIMH, tuition waiver and graduate stipend coverage
2014	Travel fellowship from MSU Graduate School to attend ICN/SBN
2014	Travel fellowship from MSU Neuroscience Program to attend IBNS
2013	Travel fellowship from MSU Graduate School to attend SBN
2012-2013	MSU Neuroscience Program Training Grant, Integrative Neurobiology of Social Processes – Predoctoral fellowship, NIH
2012	Travel fellowship MSU Council of Graduate Students to attend SfN
2012	Travel fellowship from MSU Neuroscience Program to attend SfN
2012	Graduate Research Fellowship Program - Honorable Mention, NSF
2011	Travel fellowship from MSU Neuroscience Program to attend SfN
2010-2012	MSU Neuroscience Program Training Grant, Interdisciplinary Training Program in Neuroscience – Predoctoral fellowship
2010	Early Start Fellowship, MSU
2009	Summer Senior Honors Thesis Grant, UW Madison
2007, 2009-2010	Dean's List, University of Wisconsin – Madison

Teaching Experience

2024- present	Associate Professor, Nova Southeastern University
2018-2023	Assistant Professor, Nova Southeastern University
	<u>Lead instructor for 11 unique preps</u>
	NEUR4990 Independent Study in Behavioral Neuroscience
	NEUR4880: Senior Seminar in Behavioral Neuroscience
	NEUR3200: Drugs and the Brain
	NEUR3100: Developmental Neuroscience
	NEUR3000: Behavioral Genetics
	NEUR2700 Research Methods in Behavioral Neuroscience - Lec
	NEUR2700XL Research Methods in Behavioral Neuroscience - Lab
	NEUR2500 Intro to Neuroscience - Lecture
	NEUR2500XL Intro to Neuroscience – Lab
	HONR2000R: The Misbehaving Brain
	PSYC4400: Hormones and Behavior

2017	Guest Lecturer, BMS 425 Intro to Systems Neurobiology, Colorado State University
2016	Guest Lecturer, BMS 503 Developmental Neurobiology, Colorado State University
2012	Guest Lecturer & Teaching Assistant, PSY 209 Brain and Behavior, Michigan State University

Research Experience

2018-pres	Faculty Research, Research in Behavioral Neuroendocrinology: (1) Neuroendocrine underpinnings and consequences of social and emotional behavior and stress; (2) Neuroendocrine and neuroimmune interactions in stress-related disorders (e.g. PTSD and chronic fatigue syndrome); (3) Impacts of motherhood on neurocognitive aging and Alzheimer's disease
2015-2018	Postdoctoral Research Assistant to Dr. Bob Handa, Biomedical Sciences, Colorado State University
2015-2018	Research Mentor to undergraduate trainees in the Handa laboratory, Colorado State University
2010-2015	Research Assistant to Dr. Joe Lonstein, Neuroscience Program, Michigan State University
2010-2015	Research Mentor to undergraduate trainees in the Lonstein laboratory, Michigan State University
2010	Research Assistant to Dr. Cheryl Sisk, Neuroscience Program, Michigan State University
2008-2010	Undergraduate Research Assistant to Dr. Catherine Marler, Dept. of Psychology and Neuroscience Training Program, University of Wisconsin
2006-2008	Laboratory Intern, DuPont Danisco, Waukesha, WI 53186
2007	Undergraduate Research Assistant to Dr. Thomas Sutula, Dept. of Neurology, University of Wisconsin

Publications

*indicates mentored student coauthors

Carrera Arias FJ, Aenlle K, Abreu M, **Holschbach MA**, Michalovicz LT, Kelly KA, Klimas N, O'Callaghan JP, Craddock TJA (2021). Modeling Neuroimmune Interactions in Human Subjects and Animal Models to Predict Subtype-Specific Multidrug Treatments for Gulf War Illness. *International Journal of Molecular Sciences*. 22(16):8546.

Moguel M*, George A*, **Holschbach MA** (2020). How to make a winner: how hormones and experience shape the brain of the victor. *Journal of the Society for Neurosports*.

Coley, E.J.L., Demaestri, C., Ganguly, P., Honeycutt, J.A., Peterzell, S., Ahmed, N., **Holschbach, MA**, Trivedi, M., Brenhouse, H.C. (2019). Cross generational transmission of early life stress effects on HPA regulators and *bdnf* are mediated by sex, lineage, and upbringing. *Frontiers in Behavioral Neuroscience*

Holschbach MA¹, Grieb Z.A.¹, Lonstein J.S. (2018). Interaction between postpartum stage and litter age on maternal caregiving and medial preoptic area orexin. *Physiology and Behavior* 194: 430-436. Cofirst authors¹

Holschbach MA, Vitale E.M., Lonstein J.S. (2018). Serotonin-specific lesions of the dorsal raphe disrupt maternal aggression and caregiving in postpartum rats. *Behavioral Brain Research* 348:53-64.

Holschbach MA, Borrow A.P., Handa R.J. (2017). Honing in on hormone sensitive neural targets for therapeutic intervention: Mission impossible? *Future Science OA* 3(3).

Holschbach, MA, Lonstein, J.S. (2017). Motherhood and infant contact regulate neuroplasticity in the serotonergic midbrain dorsal raphe. *Psychoneuroendocrinology* (76) 97-106.

Holschbach MA, Handa R.J. Androgen Action and Stress. In: Fink G., ed. *Stress: Neuroendocrinology and Neurobiology* (2017) 227–235. Academic Press.

Rosetti, M.F., Cambiasso, M.J., **Holschbach, MA**, Cabrera, R. (2016). Oestrogens and progestagens: synthesis and action in the brain. *Journal of Neuroendocrinology* 28(7).

Smith, C.D., **Holschbach, MA**, Olsewicz, J., Lonstein, J.S. (2012). Noradrenergic alpha-2 receptor antagonism in the ventral bed nucleus of the stria terminalis and medial preoptic area impairs maternal care in female rats. *Psychopharmacology* 224(2):263-276.

Gleason, E.D., **Holschbach, MA**, Marler, C.A. (2012). Females investigate males with higher testosterone, but compatibility drives female preference and reproductive success in the monogamous California mouse (*Peromyscus californicus*). *Hormones and Behavior* 61(1):100-107.

Oral Presentations

Holschbach, MA. How Hormones and Experience Shape the Brain of the Victor. International Society for Sports and Nutrition. Fort Lauderdale, FL. June 2022.

Holschbach, MA. Winning increases aggression in females. Society for Neurosports. Deerfield Beach, FL. January 2022. *1st place prize

Holschbach, MA. Whether moms or men, Winners fight harder. Society for Neurosports. Deerfield Beach, FL. March 2021.

Holschbach, MA. Mother's Milk: Distinctions with differences. Bigger, Smarter, Sexier Science Data Blitz. Fort Lauderdale, FL. September 2018.

Holschbach, MA, Lonstein, JS. Lesioning the serotonergic dorsal raphe reduces postpartum aggression and alters caregiving behaviors in postpartum rats. Front Range Neuroscience Group. Fort Collins, CO. December 2015.

Holschbach, MA, Lonstein, JS. "Postpartum neuroplasticity in the midbrain serotonergic dorsal raphe: potential mechanism for adaptations in maternal behavior and physiology." Society for Neuroscience. Washington D.C. November 2014.

Holschbach, MA, Lonstein, JS. "Social and endocrine factors drive postpartum neuroplasticity in the serotonergic dorsal raphe." Society for Behavioral Neuroendocrinology / International Congress of Neuroendocrinology. Sydney, Australia. August 2014.

Poster Presentations *indicates mentored student coauthors

Fileni, R*, Lee, A*, Mageswaran, M*, Craddock, T, **Holschbach, MA.** Developing a better animal model of Myalgic Encephalitis / Chronic Fatigue Syndrome (ME/CFS). Undergraduate Student Symposium. Davie, FL. April 2024 *Honorable Mention

Vogel, C*, Gorthy, A*, Noto, N*, Robison, LA, **Holschbach, MA.** Reproductive experience protects against cognitive decline in a mouse model of dementia. Undergraduate Student Symposium. Davie, FL. April 2024 *Award-Winning

Motiwala, Z*, Ganti, N*, **Holschbach, MA.** Do intruders behave differently when encountering an experienced winner vs a naive fighter? Undergraduate Student Symposium. Davie, FL. April 2023

Vogel, C*, Gorthy, A*, dos Santos, I*, **Holschbach, MA.** Understanding the Link Between Parity and Dementia. Undergraduate Student Symposium. Davie, FL. April 2023

Gorthy, A*, **Holschbach, MA.** Modeling Childhood Adversity Using Social Stress. Undergraduate Student Symposium. Davie, FL. April 2023

Balardin, G*, Ganti, N*, **Holschbach, MA.** Winning increases aggression in postpartum female rats. Organization for Studying Sex Differences. Marina Del Rey, CA. May 2022.

Vazquez, J*, Garling, H*, **Holschbach, MA,** Kochen, WA. The Effect of Social Defeat on Mild Traumatic Brain Injury in Rats. Society for Neurosports. Deerfield Beach, FL. March 2021.

Moguel, M*, George, A*, **Holschbach, MA.** "How to make a winner: how hormones and experience shape the brain of the victor." Society for Neurosports. Deerfield Beach, FL. November 2019.

Holschbach, MA, Turnidge, AL, Handa, RJ. “Acute Activation of Glucocorticoid Receptors Increases Transcription of Serotonin-Related mRNA Transcripts in the Dorsal Raphe.” *Endocrinology*. Orlando, FL. April 2017.

Holschbach, MA, Handa, RJ. Developmental expression of Estrogen Receptor Beta in the dorsal raphe and prefrontal cortex of male and female mice. Society for Neuroscience. San Diego, CA. November 2016.

Vitale, EV, **Holschbach, MA**, Lonstein, JS. Lesioning the serotonergic dorsal raphe alters various aspects of maternal behavior. Society for Neuroscience. San Diego, CA. November 2016.

Holschbach, MA, Handa, RJ. Previous anxiogenic experience buffers effects of forced swim test: potential role for Estrogen Receptor Beta in the Dorsal Raphe. *Neurobiology of Stress*. Newport Beach, CA. April 2016.

Holschbach, MA, Vitale, EV, Lonstein, JS. Postpartum lesions targeting serotonergic neurons in the dorsal raphe alter various aspects of maternal behavior. Society for Neuroscience. Chicago, IL. October 2015.

Holschbach, MA, Vitale, EV, Lonstein, JS. Serotonin-specific lesions of the dorsal raphe alter nursing, reduce licking, and reduce aggression in postpartum rats. International Workshop on Neuroendocrinology. Mendoza, Argentina. August 2015.

Holschbach, MA, Vitale, EV, Lonstein, JS. Serotonin-specific lesions of the dorsal raphe impair caregiving, increase anxiety, and reduce aggression in postpartum rats. Society for Behavioral Neuroendocrinology. Pacific Grove, CA. June 2015.

Lonstein, JS, **Holschbach, MA**, Grieb, ZA. “Maternal and litter factors interact to influence postpartum caregiving, anxiety, and midbrain tryptophan hydroxylase 2 expression.” Society for Neuroscience. Washington D.C. November 2014.

Ragan, CM, **Holschbach, MA**, Lonstein, JS. “Association between brain delta FosB protein expression and maternal experience in female rats.” Society for Neuroscience. Washington D.C. November 2014.

Holschbach, MA, Grieb, ZA, Lonstein, JS. “Postpartum stage and litter age interact to affect postpartum socioemotional behaviors and midbrain tryptophan hydroxylase 2 expression.” Society for Behavioral Neuroendocrinology. Sydney, Australia. August 2014.

Ragan, CM, **Holschbach, MA**, Lonstein, JS. “Differential expression of Fos-family proteins in maternal and nonmaternal brain.” Society for Behavioral Neuroendocrinology. Sydney, Australia. August 2014.

Holschbach, MA, Lonstein, JS. “Reproduction and maternal experience alter neuroplasticity in the midbrain dorsal raphe.” International Behavioral Neuroscience Society. Las Vegas, Nevada. June 2014.

Ragan, CM, **Holschbach, MA**, Lonstein, JS. “Differential expression of Fos-family proteins in maternal and nonmaternal brain.” International Behavioral Neuroscience Society. Las Vegas, Nevada. June 2014.

Holschbach, MA, Lonstein, JS. “Effects of reproductive experience on cell proliferation and survival in the midbrain of adult, female rats.” Society for Neuroscience. New Orleans, Louisiana. Oct 2012.

Holschbach, MA, Lonstein, JS. “Cell proliferation/survival in the dorsal raphe across reproductive states in female rats.” Society for Behavioral Neuroendocrinology. Madison, WI. June 2012.

Holschbach, MA, Lonstein, JS. “Diminished norepinephrine release in the BSTv decreases anxiety but does not promote maternal behavior in nulliparous female rats.” Society for Neuroscience. Washington DC. Nov 2011.

Holschbach, MA, Lonstein, JS. “Cell proliferation in the dorsal raphe of pregnant and lactating rats.” Workshop on Prosocial Behavior. Atlanta, Georgia. Oct 2011.

Leadership Experience and Professional Service

2024	Member of Search Committee for new Neuroscience Faculty
2023	Chair of Search Committee for new Neuroscience Faculty
2020-2022	Member of Search Committee for new Neuroscience Faculty
2022	Panel Chair for reviewing Presidential Faculty Research Development Grant (PFRDG) submissions
2021	Reviewer of internal grant submissions (PFRDGs)
2019- pres	Faculty Mentor for Nu Rho Psi-Beta in Florida, local chapter of a national honors society in neuroscience
2018-pres	Behavioral Neuroscience Curriculum Committee
2018-pres	Brain Awareness Committee
2019	Ad hoc reviewer for Aggression and Violent Behaviors
2017	Hosted invited speaker for CSU Postdoctoral Association’s seminar series
2016	Interviewer in search for Associate Dean of the Graduate School, Colorado State University
2016	Presenter, Brain Awareness Week, Colorado State University
2015-2018	Founding Member and Vice President of Advocacy for Colorado State University’s Postdoctoral Association
2015-2018	Poster judge for 4 internal CSU conferences
2015-2016	Poster judge for Front Range Neuroscience Group (SfN local chapter) conference
2014-2015	President, MSU Neuroscience Program Graduate Student Council
2010-2015	Presenter, Brain Awareness Week, Michigan State University

2010-2015	Hosted 3 invited speakers for the Neuroscience Program's seminar series at Michigan State University
2010-2013	Presenter, Brain Bee, Michigan State University
2011-2013	Neuroscience Program Representative, Council of Graduate Students at Michigan State University
2010-2012	Class Representative, Neuroscience Program Graduate Student Council at Michigan State University

Memberships in Professional Societies

2019-present	Society of NeuroSports
2019-present	Nu Rho Psi, National Honor Society in Neuroscience
2017-present	Endocrine Society
2015-present	International Workshop for Neuroendocrinology
2013-present	International Behavioral Neuroscience Society
2011-present	Society for Behavioral Neuroendocrinology
2010-present	Society for Neuroscience