

Alexandra Castillo-Ruiz, Ph.D.

Neuroscience Institute
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EDUCATION

- Postdoctoral Fellow** - Georgia State University, Atlanta, GA 2014 - Present
Neuroscience Institute
Project: "The effects of birth on the development of the nervous system".
Mentor: Nancy G. Forger, Ph.D.
- Postdoctoral Fellow** - University of Massachusetts Medical School, Worcester, MA 2010 - 2014
Department of Neurology
Project: "Social cues and their effects on the circadian system".
Mentor: William Schwartz, M.D.
- Ph.D.** - Double Major: Psychology and Ecology, Evolutionary Biology and Behavior 2007 - 2010
Michigan State University, East Lansing, MI
Dissertation title: "Circadian and environmental modulation of arousal and reward systems of a diurnal brain".
Mentor: Antonio A. Nunez, Ph.D.
- M.A.** - Psychology 2004 - 2006
Michigan State University, East Lansing, MI
Thesis title: "Cholinergic projections to the suprachiasmatic nucleus and lower subparaventricular zone in diurnal and nocturnal rodents".
Mentor: Antonio A. Nunez, Ph.D.
- B.S.** - Biology 1996 - 2002
Agrarian La Molina University, Lima, Peru

RESEARCH

Publications (peer-reviewed)

- Castillo-Ruiz A**, Mosley M, George AJ, Mussaji LF, Fullerton EF, Ruzskowski EM, Jacobs AJ, Gewirtz AT, Chassaing B, Forger NG. The microbiota influences cell death and microglial colonization in the perinatal mouse brain. *Brain Behav Immun (In press)*.
- Mosley M, Weathington J, Cortes L, Bruggeman E, **Castillo-Ruiz A**, Xue B, Forger NG (2017) Neonatal inhibition of DNA methylation alters cell phenotype in sexually dimorphic regions of the mouse brain. *Endocrinology* 158(6):1838-1848.
- Forger NG, Strahan JA, **Castillo-Ruiz A** (2016) Cellular and molecular mechanisms of sexual differentiation in the nervous system. *Front Neurosci* 40: 67- 86.
- Castillo-Ruiz A**, Gall AJ, Smale L, Nunez AA (2013) Day-night differences in neural activation in histaminergic and serotonergic areas with putative projections to the cerebrospinal fluid in a diurnal brain. *Neuroscience* 250: 352–363.
- Castillo-Ruiz A**, Paul MJ, Schwartz WJ (2012) In search of a temporal niche: Social interactions. *Prog Brain Res* 199: 267- 280.

- Castillo-Ruiz A**, Nunez AA (2011) Fos expression in arousal and reward areas of the brain in grass rats following induced wakefulness. *Physiol Behav* 103 (3-4): 384-392.
- Castillo-Ruiz A**, Nixon JP, Smale L, Nunez AA (2010) Neural activation in arousal and reward areas of the brain in day-active and night-active grass rats. *Neuroscience* 165 (2): 337-349.
- Castillo-Ruiz A**, Lundrigan B (2007) "Lama pacos" (On-line), Animal Diversity Web.
http://animaldiversity.ummz.umich.edu/site/accounts/information/Lama_pacos.html
- Castillo-Ruiz A**, Nunez AA (2007) Cholinergic projections to the suprachiasmatic nucleus and lower subparaventricular zone in diurnal and nocturnal rodents. *Brain Res* 1151: 91-101.
- Williams de Castro M, **Castillo-Ruiz A**, Rosas C (2003) Observaciones preliminares sobre comportamiento prenatal y postnatal de *Rattus rattus* var. norvegicus (Linneo 1758) en laboratorio. *Ecologia Aplicada* (2): 23- 26.

Additional research experience

- Field Research Assistant** 2003
 Project: "Ecology of urban birds" of biologist Oscar Gonzalez, Lima, Peru.
- Undergraduate Research**, Department of Biology, Agrarian La Molina University, Lima, Peru 2001
 Project: "Preliminary study of the fauna in an Andean micro watershed: El Pachachaca (Huancavelica, Peru)".
- Undergraduate Internship**, Department of Entomology, International Potato Center, Lima, Peru 1999 - 2000
 Projects: "Effect of temperature on different solutions containing the *Phthorimaea operculella* Granulosis Virus (PoGV)" and "Effect of the concentration of the virus PoGV on the mortality of the potato moth, *Phthorimaea operculella*" of Dr. Marc Sporleder.

Invited Talks

- Neuroscience Institute Breakfast and Lecture group, Georgia State University, Atlanta, GA. *Socio-sexual cues and the circadian system: "Does the early (and in love) grass rat get the worm?"*. 2015.
- XV Latin American Congress on Sleep Medicine, Mexico City, Mexico. *Wakefulness and chronotype: lessons from diurnal brain*. 2014.
- Midwestern Chronobiology Seminar. Michigan State University, East Lansing, MI. *Socio-sexual cues affect the circadian system of the gregarious grass rat*. 2013.
- Data blitz talk presented at the XII Latin American Symposium on Chronobiology, Mendoza, Argentina. *Socio-sexual cues affect the circadian system of the gregarious grass rat*. 2013.
- Animal Medicine "All-hands" seminar series. University of Massachusetts Medical School, Worcester, MA. *The grass rat: an interesting model to study the brain and the behavior*. 2013.
- Chronobiology Group Journal Club, University of Groningen, Groningen, Netherlands. *The diurnal grass rat: an attractive model to study circadian rhythmicity at the organismal and supraorganismal levels*. 2012.
- Seminar for the Hayes Lab, Brandeis University, Waltham, MA. *Circadian rhythms and the Nile grass rat*. 2011.
- Seminar for the Behavioral Biology Group, Michigan State University, East Lansing, MI. *Voluntary wheel running in the grass rat, *Arvicanthis niloticus**. 2008.
- Integrative Neurobiology of Social Processes class, Michigan State University, East Lansing, MI. *Cholinergic projections to the suprachiasmatic nucleus and lower subparaventricular zone in diurnal and nocturnal rodents*. 2006.

Posters

- Castillo-Ruiz A**, Mosley M, Jacobs A, Davila-Vazquez Y, Forger NG (2016) Effects of birth mode on developmental cell death in the mouse brain. 46th annual meeting of the Society for Neuroscience, San Diego, CA.
- Castillo-Ruiz A**, Mosley M, Jacobs A, Davila-Vazquez Y, Forger NG (2016) Effects of birth mode on developmental cell death in the mouse brain. Atlanta Chapter of the Society for Neuroscience, Atlanta, GA.
- Castillo-Ruiz A**, Mosley M, Forger NG (2016) Birth: An overlooked event in the development of brain and behavior? 23th annual Animal Behavior Conference, Bloomington, IN.
- Castillo-Ruiz A**, Mosley M, Forger NG (2015) Birth: An overlooked event in brain development? 45th annual meeting of the Society for Neuroscience, Chicago, IL.
- Holder MK, Peters NV, **Castillo-Ruiz A**, Mosley M, Chassaing B, Gewirtz AT, Forger NG, de Vries GJ. Development of microglia in germ free and conventionally colonized mice. 45th annual meeting of the Society for Neuroscience, Chicago, IL.
- Mosley M, Weathington JM, **Castillo-Ruiz A**, Forger NG. Effects of DNA methyltransferase inhibition on sexually dimorphic cell groups in the preoptic area. 45th annual meeting of the Society for Neuroscience, Chicago, IL.
- Castillo-Ruiz A**, Mosley M, Forger NG (2015) Birth: An overlooked event in brain development? 1st annual metro Atlanta postdoc festival, Georgia State University, Atlanta.
- Castillo-Ruiz A**, Mosley M, Forger NG (2015) Birth: An overlooked event in brain development? Brains and Behavior Retreat, Georgia State University, Atlanta, GA.
- Castillo-Ruiz A**, Schwartz WJ (2013) Socio-sexual cues affect the circadian system of the gregarious grass rat. XII Latin American Symposium on Chronobiology, Mendoza, Argentina.
- Castillo-Ruiz A**, Schwartz WJ (2013) Socio-sexual cues affect the circadian system of the gregarious grass rat. Gordon Research Conference on Chronobiology, Newport, RI.
- Castillo-Ruiz A**, Schwartz WJ (2012) Patterns of c-Fos expression in the lateral habenula and their relation to locomotion and circadian phase in the diurnal grass rat. 13th biennial meeting of the Society for Research on Biological Rhythms, Sandestin, FL.
- Castillo-Ruiz A**, Schwartz WJ (2012) The grass rat: an attractive model to study the effects of social cues on circadian rhythmicity. Workshop on "The diversity, evolution and mechanisms controlling activity patterns", Ein Gedi, Israel.
- Castillo-Ruiz A**, Smale L, Nunez AA (2010) Rhythms of neural activity in serotonergic cells with access to the cerebrospinal fluid in a diurnal brain. 40th annual meeting of the Society for Neuroscience, San Diego, CA.
- Castillo-Ruiz A**, Smale L, Nunez AA (2010) Differential effects of voluntary and induced wakefulness in arousal and reward areas in a diurnal brain. 12th biennial meeting of the Society for Research on Biological Rhythms, Sandestin, FL.
- Castillo-Ruiz A**, Nixon JP, Smale L, and Nunez AA (2009) Wheel-running in day-active and night-active grass rats is related to increased Fos expression in non-dopaminergic cells of the reward system. 39th annual meeting of the Society for Neuroscience, Chicago, IL.
- Castillo-Ruiz A**, Ramanathan C, Smale L, and Nunez AA (2008) Evidence that neurons of the suprachiasmatic nucleus have access to the cerebrospinal fluid in the diurnal grass rat. 38th annual meeting of the Society for Neuroscience, Washington D.C.
- Castillo-Ruiz A**, Nixon JP, Smale L, Nunez AA (2008) Basal forebrain activation in day-active and night-active grass rats. 11th biennial meeting of the Society for Research on Biological Rhythms, Sandestin, FL.
- Castillo-Ruiz A**, Schwartz MD, Smale L, and Nunez AA (2007) Sources of cholinergic projections to the suprachiasmatic nucleus in the diurnal grass rat. 37th annual meeting of the Society for Neuroscience, San Diego, CA.
- Castillo-Ruiz A**, Smale L, Nunez AA (2006) Cholinergic projections to the suprachiasmatic nucleus (SCN) of the diurnal grass rat. 10th biennial meeting of the Society for Research on Biological Rhythms, Sandestin, FL.

Castillo-Ruiz A, Smale, L, Nunez AA (2006) Cholinergic projections to the suprachiasmatic nucleus (SCN) of the diurnal grass rat. Society for Neuroscience, Michigan Chapter, Michigan State University, East Lansing, MI.

TEACHING

Course Instructor

Georgia State University

BIOL 8888 – *Non-Thesis Research Paper*, Department of Biology Spring 2017

- Mentor of two Master students, advising them through the process of executing and completing their non-thesis research papers.

BIOL 4241/6241 NEUR 4420/6420 - *Hormones and Behavior*, Fall 2016, Spring 2017
Department of Biology and Neuroscience Institute

PSYC 4110 - *Physiological Psychology*, Department of Psychology Spring 2016

- Full responsibility for course design, delivery, and assessment for both courses.
- Supervision of a graduate teaching assistant which included providing feedback on performance and management of teaching duties and responsibilities.
- Class sizes: 26 (PSYC 4110), 55 (BIOL 4241, Fall 2016), 62 students (BIOL 4241, Spring 2017). Undergraduate and graduate students (Master and PhD) were enrolled in my classes (see appendix).
- Feedback from students is provided in the attached appendix.

Michigan State University

PSY 209 - *Brain and Behavior*, Department of Psychology Summer 2009, Spring 2010

- Full responsibility for course design, delivery, and assessment. Also supervision of a graduate teaching assistant which included providing feedback on performance and management of teaching duties and responsibilities.
- Class size: 148 (Spring 2010) and 11 (Summer 2009) undergraduate students.
- Classes were observed and evaluated by faculty in the Department of Psychology. Feedback from faculty and students is provided in the attached appendix.

Teaching Assistant

Michigan State University

Brain and Behavior, Human Sexuality, Introductory Psychology, Abnormal Behavior, Developmental Psychology;
Department of Psychology 2004-2009

- Delivered 1-3 lectures/semester. Additional responsibilities included preparing exams, grading exams and assignments, keeping grade book, tutoring students, holding review sessions, and supervising undergraduate teaching assistants.
- Class sizes ranged from 93 - 571 students.
- Performance was rated highly by instructors as well as students.

Educational Field Guide

Natural World Program, Peru Verde Non-profit Organization, Lima, Peru 2000-2001

- Guided groups of elementary and high school students (ages 6-14) in educational visits to protected areas of Lima, which included implementing interactive experiments.
- Designed and executed an educational field visit for high school students to a Mountain Valley in Lima, which involved assessment of the field area, design of field experiments – in the topics of: fauna, flora, water, soil, man, and pollution –, the preparation of a field workbook, and testing of the project with high school students.

Mentoring**Michigan State, University of Massachusetts Medical School, Georgia State University**

To date I have trained and mentored one high school student, one science teacher, eight undergraduate research assistants, four domestic graduate students, and two visiting graduate students, from Kyoto University and the University of Groningen. Two current undergraduates have successfully given poster and oral presentations of their research projects. Their work has also been included in a peer-reviewed article that we recently published.

Awards and funding

2nd Place in Poster Competition, Atlanta Chapter of the Society for Neuroscience (2016)
Travel Award, Animal Behavior Conference, Indiana University (2016)
College of Arts and Sciences Staff Development Fund, Georgia State University (2015)
Travel Fellowship, Latin American Symposium on Chronobiology (2013)
Trainee Award, Society for Research on Biological Rhythms (SRBR) (2010)
Summer Retention Fellowship, Department of Psychology, Michigan State University (2008)
Travel Fellowship, Department of Psychology, Michigan State University (2007, 2008)
Graduate School Travel Fellowship, Michigan State University (2006, 2007, 2008, 2009)
Graduate School Research Enhancement Award, Michigan State University (2005)

Professional Memberships

Organization for the Study of Sex Differences
Society for Behavioral Neuroendocrinology
Society for Neuroscience
Society for Research on Biological Rhythms

Popular Media

2015 Interview about my research to Brain Decoder, a website devoted to cover news on Neuroscience research. <https://www.braindecoder.com/vaginal-birth-cesarean-brain-development-1458553654.html>
This interview was featured on other science and health related websites.
2015 Research included in the Society for Neuroscience 2015 Hot Topic's book, which was distributed to the media and featured in the Neuroscience 2015 online press room.

Leadership Experience

Founding member of the Clocks Club of New England, a club that seeks to bring together circadian biologists from interdisciplinary fields in the New England area. To the date we have organized two successful meetings (2014).
Chairperson for the workshop: *Asking the right questions in a biological rhythms project*, Society for Research on Biological Rhythms Trainee Day, Sandestin, FL (2012).
Assistant coordinator of the Great Lakes Meeting of Chronobiology, Michigan State University, East Lansing, MI (2008).
Assistant coordinator of the VI Congress of Latinoamerican Herpetologists, Agrarian La Molina University, Lima, Peru (2003).
Assistant coordinator of the Preparatory Meeting: Peru, a country of Mountains to 2020: Water, Life and Production, Agrarian La Molina University, Lima, Peru (2002).

Professional and community service

Reviewer, Journal of Biological Rhythms, Plos One (2017).
Lecturer for The Neuroscience School, Short Courses for Summer, Georgia State University, Atlanta, GA (2017).
Lecturer for the Institute On Neuroscience Summer Research Program, Georgia State University, Atlanta, GA (2017).

Advisor for an undergraduate Pre-Optometry Club Charter, Georgia State University, Atlanta, GA (2016).

Mentor for the Institute On Neuroscience Summer Research Program, Georgia State University, Atlanta, GA (2016).

Informal Education and Training Mentor for the Atlanta's Neuroscience Education and Training Program (NET/work) for undergraduates, Georgia State University, Atlanta, GA (2016).

Panelist member for a discussion on: "Why lab animals are essential to my research focus/interests/projects", Becker College, Leicester, MA (2012).

Volunteer in the Mammalogy section of the Darwin Discovery Day at the Michigan State University Museum, East Lansing, MI (2007- 2010).

Guest lecture on "Circadian Rhythms" for a class on Animal Physiology, Agrarian La Molina University, Lima, Peru (2008).

Participant in the Brain Awareness Week, Lansing, MI (2008).

Participant for Community Volunteers for International Programs Speakers Bureau for school children and seniors in the Lansing area, MI (2004-2008).