

CURRICULUM VITAE

Gabriela Manzano Nieves PhD MPA

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EDUCATION

2013-2019: PhD in Neuroscience, Brown University, Providence, RI.

2017-2019: Master's degree in Public Affairs, Brown University, Providence, RI.

2008-2013: BS in Biology with an emphasis in Molecular and Cellular Biology, Biology Department, University of Puerto Rico - Río Piedras (UPR-RP), San Juan, PR.

RESEARCH EXPERIENCE

2019 – Present: Postdoctoral Fellow at Weill Cornell Medicine

Advisor: Dr. Conor Liston.

- Using 2-photon imaging, computational analysis, and optogenetics / chemogenetics, I found that the adolescent mPFC has increase reward cue representation and activity, and a decreased ability to encode no-reward cues. Further, we find that the adolescent mPFC receives increased reward information from the ventral tegmental area. Together, my findings suggest that the adolescent mPFC preferentially encodes reward cues, which may explain adolescents' increased reward-motivated behavior.
- Pioneered new methods for prism-enabled 2P imaging in juvenile mice.
- Created custom made hardware and software for conducting behavioral experiments (active reward task, reward optimization task) and analyzing large 2-photon imaging datasets.
- Trained researchers of differing levels (BS to PhD) on fiber photometry data acquisition and experimental design, and on the creation of custom software for a cognitive flexibility task.

The first manuscript for this work is available in bioRxiv, and a second is in preparation. I have also co-authored a *Cell* article and a Nature News and Views. This work was funded through a K00 and a K99/R00 grant.

2014 – 2019: Graduate Student at Brown University

Advisor: Dr. Kevin G. Bath, Dr. Christopher Moore as co-advisor, with committee members Dr. Rebecca Burwell, and Dr. Gregory Quirk

- Thesis on the neuronal mechanisms by which early life stress alters fear learning and expression.
- I found that early life stress (ELS) accelerated the maturation of parvalbumin interneurons in the basolateral amygdala, leading to blunted fear expression in juvenile mice.
- Was one of the first researchers to use optogenetics to alter behavior in juvenile mice.
- Conducted numerous other studies showing that ELS can delay sexual maturation, blunt sex-specific behaviors in females, and accelerate hippocampal maturation, among other effects.

This work resulted in 10 scientific articles including 5 first-author publications. This work was funded through a NSF-GRFP award and a F99/K00 grant.

2012-2013: Undergraduate researcher at the University of Puerto Rico – Río Piedras

Advisor: Dr. Gregory Quirk.

- Demonstrated that the infralimbic cortex is necessary for learning, but not retrieval, of a conditioned fear extinction memory.
- Showed that optogenetic stimulation of the infralimbic cortex can decrease fear expression and enhance fear extinction.

This work resulted in a first author publication in JNeuro. This work was funded through the NIH-RISE program.

FELLOWSHIP GRANTS

2023-2028: NIH K99/R00 BRAIN Initiative Advanced Postdoctoral Career Transition Award
2018-2023: NIH F99/K00 Predoctoral to Postdoctoral Fellow Transition Award
2015-2018: NSF Graduate Research Fellowship Program grant
2013-2015: NIH T32 research training fellowship grant - awarded to Dr. Diane Lipscombe
2012-2013: NIH T32 undergraduate training grant through the Research Initiative for Scientific Enhancement (RISE) program

HONORS & AWARDS

2023, 2022: Travel award and invitation to serve as poster judge at ABRCMS NIH-sponsored conference
2022: Selected to form part of the Future Faculty Development Program at Virginia Tech
2022, 2016, 2015, 2014: Travel award to the International Society of Developmental Psychobiology annual conference
2021: Interviewed by the National Public Radio (NPR) for our Nature News and Views article titled "Psychedelics re-engineered for potential use in the clinic".
2019: Invited by Dr. Kay Tye to be the only graduate student speaker at the Gordon Amygdala Conference to present graduate thesis work on amygdala development and fear expression.
2021: Invitation to serve as a poster judge and a session moderator for ABRCMS NIH-sponsored conference
2012: Honored and awarded legislative recognition for my academic and civic work by the Caguas, P.R. municipal legislature
2012: Awarded poster presentation prize in the field of Neuroscience for; Manzano-Nieves G, Do Monte FHM, Quirk GJ (2012) Extinguishing Fear: Revisiting the Infralimbic Cortex with an Optogenetic Approach at the Annual Biomedical Research Conference for Minority Students (ABRCMS)
2012: Awarded poster presentation prize for interdisciplinary work for; Manzano-Nieves G, Do Monte FHM, Quirk GJ (2012) Extinguishing Fear: Revisiting the Infralimbic Cortex with an Optogenetic Approach at ABRCMS
2012, 2013: Awarded Conte Center for Research in Obsessive Compulsive Disorder 8-week undergraduate training program (Training and Stipend)
2011-2013: Honored for academic achievement, placement in UPR-RP Dean's List
2011: Travel award to the Caribbean HIV Conference: Strengthening Evidence to Achieve Sustainable Action. Sponsored by NIH, OAR, DHHS, University of Puerto Rico, and the Commonwealth of the Bahamas
2010-2011: Awarded the National Science & Mathematics Access to Retain Talent Grant (National SMART Grant), Awarded by the United States Federal Government

CONTRIBUTIONS TO PAST FUNDED GRANTS

Research: March 2018–December 2022

Title of project: Early life stress effects on threat-learning

Principal Investigators: Kevin Bath, PhD; Brown University

NIH R01: approx. \$390,000 per year

Role: Co-author. My work on the effects of early life stress on fear conditioning on juvenile and pre-adolescent mice. The F99 titled "Effects of early life stress on functional development of prefrontal-amygdala connectivity" was used as the first draft of this R01. I provided preliminary data, co-developed aims, and wrote the initial draft with Dr. Bath.

Research: August 2018–April 2023

Title of project: Mechanisms driving sex differences in cognitive outcomes following early life stress

Principal Investigators: Kevin Bath, PhD; Brown University

NIH R01: approx. \$500,000 per year

Role: Contributor. I provided preliminary data of parvalbumin development across brain regions for aim 1, and brought the optogenetic technique to the lab, trained the graduate student who obtained the preliminary data for aim 2, and provided feedback on optogenetic experimental designs of aim 2.

SCIENTIFIC PUBLICATIONS

Publication Link: [Google Scholar Profile](#)

Pending publications:

1. **Manzano Nieves G**, Rahn RM, Baskoylu SN, Liston CM (2023) Divergent reward cue representations in the prefrontal Cortex drive reward-motivation in adolescence and adulthood. *bioRxiv*. doi: <https://doi.org/10.1101/2023.11.07.565069>

Peer-reviewed journal articles:

1. **Manzano Nieves G**, Bravo M, Bath KG. Early life adversity ablates sex differences in active versus passive threat responding in mice. *Stress*. 2023 Nov;26(1):2244598. doi: 10.1080/10253890.2023.2244598. PMC10529224.
2. Spellman T, Svei M, Kaminsky J, **Manzano-Nieves G**, Liston C. Prefrontal deep projection neurons enable cognitive flexibility via persistent feedback monitoring. *Cell*. 2021 May 13;184(10):2750-2766.e17. doi: 10.1016/j.cell.2021.03.047. Epub 2021 Apr 15. PMC8684294.
3. **Manzano Nieves G**, Bravo M, Bath KG. Early life adversity decreases pre-adolescent fear expression by accelerating amygdala PV cell development. *Elife*. 2020 Jul 21;9. doi: 10.7554/eLife.55263. PMC7413666.
4. Schilit Nitenson A*, **Manzano Nieves G***, Poeta DL, Bahar R, Rachofsky C, Mandairon N, Bath KG Acetylcholine Regulates Olfactory Perceptual Learning Through Effects on Adult Neurogenesis. *iScience*. 2019 Dec 20;22:544-556. doi: 10.1016/j.isci.2019.11.016. Epub 2019 Nov 14. PMC6926271.
* Co-first authors
5. **Manzano-Nieves G**, Schilit Nitenson A, Lee HI, Aguilar Z, Gallo M, Johnsen A, Bravo M, Bath KG. Early life stress delays sexual maturation in female mice. *Front Mol Neurosci*. 2019;12:27. doi: 10.3389/fnmol.2019.00027. eCollection 2019. PMC6399387.
6. Goodwill HL, **Manzano-Nieves G**, Gallo M, Lee HI, Oyerinde E, Serre T, Bath KG. Early life stress leads to sex differences in development of depressive-like outcomes in a mouse model. *Neuropsychopharmacology*. 2019 Mar;44(4):711-720. doi: 10.1038/s41386-018-0195-5. Epub 2018 Sep 6. PMC6372611.
7. Goodwill HL, **Manzano-Nieves G**, LaChance P, Teramoto S, Lin S, Lopez C, Stevenson RJ, Theyel BB, Moore CI, Connors BW, Bath KG. Early life stress drives sex selective impairments in reversal learning through effects on parvalbumin interneurons in the orbitofrontal cortex of mice. *Cell Rep*. 2018 Nov 27;25(9):2299-2307.e4. doi: 10.1016/j.celrep.2018.11.010. PMC6310486.
8. **Manzano-Nieves G**, Gaillard M, Gallo M, Bath KG. Early Life Stress decreases contextual fear expression in females, but not males. *Behav Neurosci*. 2018 Aug;132(4):247-257. doi: 10.1037/bne0000248. Epub 2018 May 21. PMC6062448.
9. Bath KG, Schilit Nitenson A, Lichtman E, Chen W, Gallo M, Goodwill H, **Manzano-Nieves G**. Early life stress leads to developmental and sex selective effects on performance in a novel object placement task. *Neurobiol Stress*. 2017 Dec;7:57-67. doi: 10.1016/j.ynstr.2017.04.001. eCollection 2017 Dec. PMC5408156.

10. Bath KG, **Manzano-Nieves G**, Haley Goodwill. Early life stress accelerates behavioral and neural maturation of the hippocampus in male mice. *Horm Behav.* 2016 Jun;82:64-71. doi: 10.1016/j.yhbeh.2016.04.010. Epub 2016 May 4. PMC5308418.
 11. Do Monte FHM*, **Manzano-Nieves G***, Quiñones-Laracuente K, Ramos-Medina L, Quirk GJ. Revisiting the role of the infralimbic cortex in fear extinction with an optogenetic approach. *J Neurosci.* 2015 Feb 25;35(8):3607-15. doi: 10.1523/JNEUROSCI.3137-14.2015. PMC4339362.
- * Co-first authors

Commentaries:

1. **Manzano Nieves G**, Liston C. Psychedelics re-engineered for potential use in the clinic. *Nature.* 2021 Jan;589(7842):358-359. doi: 10.1038/d41586-020-03404-z. PMID: 33299163.

SCIENTIFIC TALKS

Manzano Nieves G (2025) Distinct reward representations in prefrontal cortex underlie differences in adolescent and adult motivation. *International Behavioral Neuroscience Society.*

Manzano Nieves G (2024) Divergent prefrontal cortex reward cue representations underlie differences in reward motivation between adolescents and adults. *The Korean Society for Brain and Neural Sciences.*

Manzano Nieves G (2024) Divergent reward cue representation in prefrontal cortex underlie differences in reward motivation between adolescents and adults. *The International Society for Developmental Psychobiology.*

Manzano Nieves G (2024) Divergent representations of reward in adolescents and adults. *Hope For Depression Annual Meeting.*

Manzano Nieves G (2023) Playing at Coding: Having fun while learning to code for science and salary. *Annual Biomedical Research Conference for Minoritized Scientists (ABRCMS).*

Manzano Nieves G, Liston C (2023) Adolescent: Brain Processing of Reward and Control. *American Psychological Society.*

Manzano Nieves G, Liston C (2022) Adolescent: Reward and Control. *Virginia Tech.*

Manzano Nieves G, Bath KG (2019) Effects of Early life stress on the amygdala. *Gordon Amygdala Conference.*

Manzano Nieves G, Johnsen A, Bravo M, Aponte-Rivera RA, Bath KG (2018) Early life stress alters the development of the fear circuit and fear expression in pre-adolescent mice. *SACNAS annual conference.*

TEACHING EXPERIENCE

2022: Adjunct Professor at Hunter College for Psychology department course "Brain and Behavior". A large lecture course for approximately 70 students, taught students from varying academic backgrounds (from biology to music) and academic year (from freshman to seniors).

2022: Instructor for Summer at Brown course "*Coding to Read and Control the Brain*"; In this 1-week (3 hours a day) course. Students developed a scientific question and created a behavioral apparatus they could use to test their question in mice or human populations. Multiple apparatuses were created to aid in reaction time tasks and discrimination tasks.

2017, 2018, 2021, 2022: Instructor for Summer at Brown course "*How our experiences shape our brains: an experimental approach*"; this 2-week (3 hours a day) course introduced students to the basics of behavioral and molecular neuroscience. Students attended lectures, designed a testable hypothesis, and used a databank to curate and analyze their data, and present it as a scientific poster.

2017: Instructor for Summer at Brown course “*Computational Modeling of the Brain*”; re-designed and lectured a 2-week class on basic computational modeling of neuronal firing in MATLAB with Dr. Hyeyoung Shin.

2016: Teaching Assistant for Summer at Brown course “*Computational Modeling of the Brain*”; TA’d and guest lectured a 2-week class on basic computational modeling using MATLAB.

2015: Teaching Assistant for “Neurogenetics” course. Attended all classes, ran study sessions, graded assignments, and tests, and helped troubleshoot exam questions.

POSTER PRESENTATION

Orr T, **Manzano Nieves G**, Liston C (2024) What happens when we stimulate the VTA to mPFC projection? *Hunter College Undergraduate STEM+ Research Conference*.

Rahn R, **Manzano Nieves G**, Block V, Johnson K, Liston C (2024) Neurobiological mechanisms mediating cognitive deficits in a 2-hit immune activation chronic stress model. *Molecular Psychiatry Conference*.

Manzano Nieves G, Liston C (2023) Age driven changes in networks controlling reward seeking states. *NIH Brain Initiative Annual Conference*.

Manzano Nieves G, Liston C (2022) Implications of prefrontal cortex development for adolescent reward seeking behavior. *Neuroscience 2022 sponsored by the Society for Neuroscience*.

Manzano Nieves G, Liston C (2022) Implications of prefrontal cortex development for adolescent reward seeking behavior. *International Society for Developmental Psychobiology*.

Manzano Nieves G, Bravo M, Johnsen A, Shin H, Aponte-Rivera RA, Bath KG (2018) Early life stress accelerates amygdala development while delaying prefrontal connectivity. *Neuroscience 2018 sponsored by the Society for Neuroscience*.

Aponte-Rivera RA, Johnsen A, **Manzano Nieves G**, Baskoylu SN, Bath KG (2018) Effects of early life stress on infantile amnesia and early development. *Neuroscience 2018 sponsored by the Society for Neuroscience*.

Manzano Nieves G, Bravo M, Bath KG (2018) Early life stress is associated with precocious amygdala development and delayed prefrontal development. *The International Society for Developmental Psychobiology*.

Manzano Nieves G, Johnsen A, Bravo M, Bath KG (2018) Early life stress is associated with precocious amygdala development but delayed prefrontal development. *Pavlovian society annual meeting*.

Manzano Nieves G, Bravo M, Johnsen A, Bath KG (2018) Early life stress is associated with precocious amygdala development and delayed prefrontal development. *FLUX Society annual conference*.

Bravo M, **Manzano Nieves G**, Bath KG (2018) Development of the Neural Circuit of Fear-Associated Learning in Adolescent Mice. *SACNAS annual conference*.

Johnsen A, **Manzano Nieves G**, Baskoylu SN, Bath KG (2018) Translational implications on memory formation in the traumatized brain: a study on infantile amnesia in early life stress mouse models. *SACNAS annual conference*.

Manzano-Nieves G, Huntzicker KB, Hajdarovic KH, Bath KG (2017) Brain-derived neurotrophic factor: A potential driver of the accelerated neurobehavioral development induced by early-life stress. *Neuroscience 2017 sponsored by the Society for Neuroscience*.

Bath KG, Johnsen A, Bravo M, Shin H, **Manzano-Nieves G** (2017) ELS is associated with precocious amygdala development and an unexpected dip in threat-associated freezing. *Neuroscience 2017 sponsored by the Society for Neuroscience*.

Manzano-Nieves G, Johnsen A, Bravo M, Bath KG (2017) Effects of early life stress on early behavioral and neural development. Presented at the International Society for Developmental Psychobiology.

Bath KG, Huntzicker KB, Johnsen A, Bravo M, & **Manzano-Nieves G** (2017) Orchids and dandelions: BDNF as a moderator of accelerated neurobehavioral development following early life stress. *International Society for Developmental Psychobiology*.

Gallo ME, Goodwill H, **Manzano Nieves G**, Lopez C, & Bath KG (2017) Early life stress alters sexual development and expression of proinflammatory cytokines. *International Society for Developmental Psychobiology*.

Bath KG, **Manzano-Nieves G**, Huntzicker KB, Moss TM, Goodwill H (2016) Mechanisms supporting accelerated hippocampus maturation following early life stress. *Neuroscience 2016 sponsored by the Society for Neuroscience*.

Manzano-Nieves G, Bath KG (2016) Early life stress alters the development of fear recall and expression in pre-adolescent mice. *Neuroscience 2016 sponsored by the Society for Neuroscience*.

Huntzicker KB, **Manzano-Nieves G**, Moss TM, Bath KG (2016) Brain-derived neurotrophic factor: a potential driver of the accelerated neurobehavioral development induced by early-life stress. *Neuroscience 2016 sponsored by the Society for Neuroscience*.

Goodwill H, Lin S, **Manzano-Nieves G**, Cohen A, Bath KG (2016) Sex specific cognitive deficits following early life stress: a role for parvalbumin in the orbitofrontal cortex. *Neuroscience 2016 sponsored by the Society for Neuroscience*.

Huntzicker KB, **Manzano-Nieves G**, Bath KG (2016) Brain-derived neurotrophic factor: a potential driver of the accelerated neurobehavioral development induced by early-life stress. *The International Society for Developmental Psychobiology*.

Manzano-Nieves G, Bath KG (2016) effects of early life stress on parvalbumin positive neuron maturation and circuit development. *The International Society for Developmental Psychobiology*.

Gallo M, Gaillard M, **Manzano-Nieves G**, Bath KG (2016) Sex Selective effects of early life stress on Behavioral phenotypes: implications of the estrous cycle. *The 24th annual hospital research celebration*.

Manzano-Nieves G, Bath KG (2016) Early life stress alters the development of fear recall and expression in pre-adolescent mice. *The Society for Behavioral Neuroendocrinology annual conference*.

Goodwill H, Lin S, **Manzano-Nieves G**, Cohen A, Bath KG (2016) Sex specific cognitive deficits following early life stress: a role for parvalbumin in the orbitofrontal cortex. *The Society for Behavioral Neuroendocrinology annual conference*.

Bath KG, **Manzano-Nieves G**, Huntzicker K, Moss T, Goodwill H (2016) Mechanisms regulating early life stress induced acceleration of neurobehavioral development. *The Society for Behavioral Neuroendocrinology annual conference*.

Manzano-Nieves G, Bath KG (2015) Early life stress alters the development of the fear circuit and fear learning in mice. *Neuroscience 2015 sponsored by the Society for Neuroscience*.

Bath KG, **Manzano-Nieves G**, Goodwill H (2015) Early life stress accelerates behavioral and neural maturation of the hippocampus. *Neuroscience 2015 sponsored by the Society for Neuroscience*.

Huntzicker KB, **Manzano-Nieves G**, Bath KG (2015) BDNF: A potential driver of early life stress associated accelerated neurobehavioral development. *Brown Undergraduate Research Symposium*.

Manzano-Nieves G, Bath KG (2015) The effect of early life adversity on emotional memories during development. *The International Society for Developmental Psychobiology*.

Manzano-Nieves G, Bath KG (2014) Early Life Stress impairment of select hippocampus dependent functions is sex and age specific. *The International Society for Developmental Psychobiology*.

Bath KG, **Manzano-Nieves G** (2014) Early life stress accelerates neurobehavioral development. *The International Society for Developmental Psychobiology*.

Lee HI, **Manzano-Nieves G**, Bath KG (2014) Effects of fragmented maternal care on anxiety and stress responding in mice. *Brown Undergraduate Research Symposium*.

Manzano-Nieves G, Do Monte FHM, Quirk GJ (2013) Extinguishing Fear: Revisiting the Infralimbic Cortex with an Optogenetic Approach. *Neuroscience 2013 sponsored by the Society for Neuroscience*.

Do Monte FHM, Quiñones-Laracuenta K, **Manzano-Nieves G**, Quirk GJ (2013) Optogenetic silencing of prelimbic inputs to paraventricular thalamus impairs long-term fear retrieval. *Neuroscience 2013 sponsored by the Society for Neuroscience*.

Manzano-Nieves G, Do Monte FHM, Quirk GJ (2012) Extinguishing Fear: Revisiting the Infralimbic Cortex with an Optogenetic Approach. *The Annual Biomedical Research Conference for Minority Students*.