

Sandra Jaramillo Poulson

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Academic Interests

My research focus is on the study neural circuits that drive behavior during the perception of pain in social companions. I have recently developed a mouse model of pain observation, based on a similar rat model of empathy, where I test for pain modulation after an observer mouse interacts with a demonstrator displaying overt pain behavior. My goal is to use this model to study the underlying neural circuitry using immunofluorescent techniques to compare receptor and protein activation, modulate behavior using DREADDs and optogenetics, and study neural function using GCaMP with fiber photometry. My research pursuit is impactful in terms of studying the neurobiological basis of sociability behavior (which in social mammals like humans is key behavior necessary to access resources) and empathy (or the ability to perceive and emulate states sensed in another), which can be disrupted through chronic drug abuse or in neuropsychiatric disorders like depression, schizophrenia and autism. These neuropsychiatric phenomena that affect sociability all can have varying comorbidity with abnormal pain conditions, which severely affect quality of life and burden health care systems. Through better understanding of the neural circuitry underlying the bidirectional modulation of pain and social interaction, new therapeutic targets can be tested with the goal of alleviating aberrant circuitry function in neuropsychiatric conditions and improving quality of life.

Academic History

Academic Degrees

Expected 2022	Doctor of Philosophy Behavioral Psychology, Neuroscience	University of Toronto, Canada
Sept 2018	Master of Arts Behavioral Psychology, Neuroscience Thesis title: <i>Characterizing neuropathic pain in the naked mole-rat (Heterocephalus glaber)</i>	University of Toronto, Canada
May 2013	Master of Arts Science Education	University of Texas at Austin, USA
May 2011	Bachelor of Science Biology	University of Texas at Austin, USA

Published Peer-reviewed Journal Articles

Jaramillo, S. L., Mehlerferber, E. and Moore, P. J. (2014), *Life-history trade-offs under different larval diets in *Drosophila suzukii* (Diptera: Drosophilidae)*. Physiological Entomology. Vol 40. Iss 1. Pages 2-9. doi: 10.1111/phen.12082

Submitted Journal Articles

Ramzan F, Hall M, Baumbach J, Wahdan M, **Poulson SJ**, Michailidis V, Stefanelli G, Narkaj K, Tao C, Creighton SD, Khan D, Steininger, Jr. C, Walters BJ, Monks AD, Martin LJ, Zovkic IB. (In submission), *Histone H2A.Z is required for androgen receptor-mediated effects on fear memory in males and exerts sex-specific effects on fear memory and pain hypersensitivity in mice.*

In Preparation Journal Articles

Poulson, SJ, Martin, LJ (2019), *African naked mole-rats lack cold sensitivity after nerve-injury.*

Peer-reviewed Conference Abstracts

Poulson, SJ, Holmes, MM and Martin, LJ (2019), *Characterizing neuropathic and nociceptive pain in the African naked mole-rat (*Heterocephalus glaber*)*. Research Poster Abstracts, Canadian Journal of Pain, Vol. 3 Iss. 1, pp. A73-A189. doi: 10.1080/24740527.2019.1599266

Conference Posters

Title: 826392 Observation of Social Companions in Pain Modulates the Pain Experience in Mice

Authors: **Poulson, Sandra J.**, Arain, Iqra, Motlana, Keza, Martin, Loren J.

Date and Location: June 28-July 2 2021 (delayed from Aug 2020) - International Association for the Study of Pain World Congress on Pain 2021 Amsterdam, Netherlands

Title: Medial prefrontal cortex activity during pain observation of social familiars in mice

Authors: **Poulson, Sandra J.**, Arain, Iqra, Martin, Loren J.

Date and Location: October 17-18 2019 - Society for Social Neuroscience 10th Anniversary Chicago

Title: Cold-Response is Reduced in the African Naked Mole-Rat

Authors: **Poulson, Sandra J.**, Holmes, Melissa M., Martin, Loren J.

Date and Location: August 2-3 2019 - The Inaugural Montreal Conference on Pain Circuits

Title: Characterizing neuropathic and nociceptive pain in the African naked mole-rat (*Heterocephalus glaber*)

Authors: **Poulson, Sandra J.**, Holmes, Melissa M., Martin, Loren J.

Date and Location: June 5th, 2019 - CPIN Annual Research Day 2019

Title: Chronic and acute pain sensory system of the African naked mole-rat - Poster ID 121122

Authors: **Poulson, Sandra J.**, Holmes, Melissa M., Martin, Loren J.

Date and Location: May 22-25th, 2019 - 13th Annual Meeting Canadian Association for Neuroscience

Title: Chronic and acute pain sensory system of the African naked mole-rat

Authors: **Poulson, Sandra J.**, Holmes, Melissa M., Martin, Loren J.

Date and Location: April 30th, 2019 - UTM Graduate Research Colloquium

Title: Characterizing neuropathic and nociceptive pain in the African naked mole-rat (*Heterocephalus glaber*)

Authors: **Poulson, Sandra J.**, Holmes, Melissa M., Martin, Loren J.

Date and Location: April 4th, 2019 - 40th Annual Meeting Canadian Pain Society

Title: Characterizing pain behavior from nerve injury in a rodent that feels no spicy heat

Authors: **Poulson, Sandra J.**, Holmes, Melissa M., Martin, Loren J.
 Date and Location: June 14th, 2018 - CPIN Annual Research Day 2018

Title: Characterizing pain behavior from nerve injury in a rodent that feels no spicy heat
 Authors: **Poulson, Sandra J.**, Holmes, Melissa M., Martin, Loren J.
 Date and Location: May 4th, 2018 - Cell & Systems Biology Grad Research Day

Title: Characterizing pain behavior from nerve injury in a rodent that feels no spicy heat
 Authors: **Poulson, Sandra J.**, Holmes, Melissa M., Martin, Loren J.
 Date and Location: April 30th, 2018 - UTM Graduate Research Colloquium

Research Awards

UTM Office of the VP, Acad. & Dean Conf. Travel Grant	Amount: \$500 CAD	Date: Sep 2019
UofT School of Graduate Studies Conference Travel Grant	Amount: \$410 CAD	Date: Aug 2019
UTM Psychology Dept GEF Graduate Student Travel Grant	Amount: \$1800 CAD	Date: May 2019-Apr 2020
UTM Psychology Dept GEF Group Dev. Equip. Award	Amount: \$1506.29 CAD	Date: Apr 2019
UTM Psychology Dept GEF Graduate Student Travel Grant	Amount: \$535.15 CAD	Date: Apr 2019
UTM Office of the VP, Acad. & Dean Conf. Travel Grant	Amount: \$400 CAD	Date: Mar 2019
UTM Psychology Dept GEF Group Dev. Equip. Award	Amount: \$1405 CAD	Date: Oct 2018

Research Appointments - Experience

09/18 - curr.	Graduate Research Assistant	Martin Lab	University of Toronto
09/17 - 09/18	Graduate Research Assistant	Holmes & Martin Labs	University of Toronto
08/16 - 07/17	Life Sci. Research Profnl I (staff)	Rockson Lab	Stanford University
11/15 - 07/16	Life Sci. Research Profnl I (staff)	Xiaoke Chen Lab	Stanford University
10/14 - 11/15	Life Sci. Research Asst I (staff)	Xiaoke Chen Lab	Stanford University
07/13 - 07/14	Graduate Research Assistant	Trish Moore Lab	University of Georgia
08/08 - 05/09	Student Assistant	Media Kitchen	University of Texas at Austin
01/09 - 05/09	Undergrad Research Assistant	ICMB	University of Texas at Austin
05/07 - 05/08	Undergrad Research Assistant	Janice Fischer Lab	University of Texas at Austin

Teaching Experience

Undergraduate Students Mentored In Research

Iqra Arain	Project: Paper cap tube rescue in CD1 and C57 mice	09/19 - current
Rachel Riley	Project: Naked mole-rat nociceptive behavior scoring	05/19 - 08/19
Justine Ziolkowski	Project: RNAscope staining for naked mole-rat probes	06/18 - 03/19
Careen Foord	Project: <i>in situ</i> hybridization in mouse brain for GAD1 and GAD2	05/16 - 07/16
Meagan Wu	Project: Social concern in wild type and Oprm1 knockout mice	07/15 - 08/15
Eli Mehlferber	Project: Does diet affect body size in the Spotted Wing Drosophila?	07/13 - 05/14

Classroom Teaching

Graduate Level:

Teaching Assistant, BIO202H5S - Intro Animal Physiology	UTM	Spring 2019
Teaching Assistant, PSY391H5S - Psychology of Pain	UTM	Spring 2019
Teaching Assistant, PSY395H5F - Hormones and Behaviour	UTM	Spring 2018
Teaching Assistant, BIO 311D Intro Biology II	UT Austin	Spring 2013
Teaching Assistant, BIO 311C Intro Biology I	UT Austin	Fall 2012

Pre-Graduate:

UTeach Outreach Graduate Research Assistant	UT Austin	Summer 2012
Graduate Teaching Assistant, Freshman Research Initiative	UT Austin	Spring 2012
Apprentice Student Teacher- 8th Grade Earth Science	Kealing Magnet MS	Spring 2012
Tutor, UTeach Intern, Austin Urban Scholars (grades 6-8)	Kealing Magnet MS	01/11 - 05/11
Tutor, UTeach Intern (grades 8-12)	Breakthrough Austin	09/10 - 12/10

Last updated: April 10, 2020