Vita

Candidate's name: Rennei Beatrice Hernandez

Universities Attended:

University of New Brunswick (2023)
Bachelors of Science

University of New Brunswick (2025)
Masters of Science
Biology

Conference Presentations:

"Losing a sense of our surroundings: How the loss of social senses can modulate neuropeptide activity in the brain of zebrafish (*Danio rerio*)." Conference of Biological Studies (Fredericton, NB). April 2024.

"Losing a sense of our surroundings: How the loss of social senses can modulate neuropeptide activity in the brain of zebrafish (*Danio rerio*)." Canadian Society of Zoologists 63rd Annual Meeting (Moncton, NB). May 2024.

Making sense of their surroundings: How the loss of social senses can affect neuropeptide expression dynamics in the brain of zebrafish (*Danio rerio*)

UNIVERSITY OF NEW BRUNSWICK

THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of
Master of Science

by

Rennei B. Hernandez

in the Department of Biology

U.N.B., Fredericton, N.B.

Friday, October 31st, 2025
9:00 a.m.

Tilley Hall, Room 205

Examining Committee

Dr. Timothy Erickson	Supervisor
Dr. Tillmann Benfey	Internal Examiner
Dr. Biljana Stevanovski	External Examiner
Dr. Jason Addison	Chair of Oral Examination

Abstract

Social interactions, which rely on sensory information, are important for the wellbeing of social animals. Chronic sensory loss can alter neuropeptide activity in the brain, affecting how animals experience social interactions. In zebrafish, thalamic expression of the excitatory neuropeptide parathyroid hormone 2 (Pth2) decreases during social isolation. Furthermore, thalamic expression of *pth2* overlaps with that of the inhibitory neuropeptide somatostatin 6.1 (Sst6.1). The dynamics of these neuropeptides and how they are affected by social sensory loss has not fully been explored. I hypothesize that *pth2* and *sst6.1* thalamic expressions display a phenomenon called "transmitter switching" – which occurs when excitatory and inhibitory transmitters are co-expressed within a brain region – in response to changes in social environment or sensory loss. My findings support that conspecific detection via mechanical lateral line stimuli and vision contribute to *pth2* expression, with a loss of both senses leading to isolated *pth2* levels. I also show that *sst6.1* expression decreases with social isolation and social sensory loss. Finally, my research reveals that thalamic *pth2*- and *sst6.1*-expressing neurons within a heterogeneous population display a potential switching dynamic. These novel findings highlight the social sensory regulation of *pth2* and *sst6.1* and contribute to further understanding the social brain.