

Vita

Candidate's name: Kadri Rainne Pearce-Lawrence

Universities

Attended: Carleton University (2019)
Bachelors of Arts

University of New Brunswick (2023)
Masters of Science
Biology

Conference Presentations:

Atlantic Regional Developmental Biology Symposium 2023, Halifax, NS. Kadri Lawrence, Timothy Erickson. Lost in Inflation: Exploring Mortality Factors among Hypoinflated Zebrafish Larvae (*Danio rerio*). 23 June, 2023.

Conference of Biological Sciences (COBS) 2023, Fredericton, NB. Kadri Lawrence, Timothy Erickson. A Fishy Situation: The Curious Case of Larval Mortality among Hypoinflated Zebrafish (*Danio rerio*). 20 April, 2023.

Graduate Research Conference (GRC) 2023, Fredericton, NB. Kadri Lawrence, Timothy Erickson. A Fishy Situation: The Curious Case of Larval Mortality among Hypoinflated Zebrafish (*Danio rerio*). 23 March, 2023.

Atlantic Regional Comparative Physiology (ARCP) Workshop, St. Andrews, NB. Kadri Lawrence, Timothy Erickson. The Mechanisms of Mortality in Hypoinflated Larval Zebrafish (*Danio rerio*). 16 October, 2022.

International Zebrafish Society (IZFS) Annual Conference, Montreal, QC. Kadri Lawrence, Caroline Blakely, Timothy Erickson. Investigating the Critical Period of Initial Swim Bladder Inflation in Larval Zebrafish (*Danio rerio*). 25 June, 2022.

Swim Bladder Hypoinflation is Associated with Gut Dysfunction and Increased Mortality in Larval 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

Kadri R. Pearce-Lawrence

in the Department of Biology

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

Wednesday, December 6th, 2023
10:00 a.m.

Bailey Hall, Room 27

Examining Committee

Dr. Timothy Erickson

Dr. Aurora Nedelcu

Dr. Yang Qu

Dr. Shawn MacLellan

Supervisor

Internal Examiner

External Examiner

Chair of Oral Examination

Abstract

The swim bladder is a vital gas-filled organ in most bony fishes that allows them to maintain neutral buoyancy. Despite its significance, the consequences of inadequate initial inflation of this organ remain poorly understood. Previous research has suggested a connection between hypoinflation and mortality, but the underlying mechanisms remain unclear. Contrary to the theory that physostomes can inflate their swim bladders at any point after 4 dpf, I found significant increases in mortality associated with non-inflation, suggesting inflation must occur within a critical developmental period. Additionally, analysis of exogenous feeding in hypoinflated larvae challenges the contention that feeding is limited in this phenotype. I do however observe significant gut barrier degradation, gross morphological differences, and compromised lysosome activity in hypoinflated larvae. These discoveries offer crucial insight into the effects of hypoinflation on larval fish.