

May 30, 2025

To,
The Selection Committee
Canadian Council of University Biology Chairs

Re: Nomination of Dr. Shane Taylor for the CCUBC Graduate Student Research Prize

Dear Selection Committee,

It is with great enthusiasm that I nominate my former Ph.D. student, Dr. Shane Taylor, for the CCUBC Graduate Student Research Prize. Shane completed his doctoral studies in 2024 at McMaster University under my supervision and is currently pursuing postdoctoral research at the University of British Columbia. His recently published first-author article in the *Proceedings of the National Academy of Sciences of the USA (PNAS)*, titled "*The Neurotrophic Factor MANF Regulates Autophagy and Lysosome Function to Promote Proteostasis in C. elegans*", is a remarkable piece of graduate research that exemplifies scholarly excellence in biological science.

Contributions to knowledge in cellular homeostasis and aging

Shane's publication addresses a fundamental question in biology, specifically how cells maintain protein homeostasis, especially under stress and during aging. Using the nematode *C. elegans* as a model system, his research revealed that the neurotrophic factor MANF is not only essential for maintaining the function of endoplasmic reticulum (ER) but also plays a critical role in autophagy and lysosomal activity. His work has uncovered a novel mechanism whereby MANF is essential for maintaining proteostasis and aging via a conserved TFEB family of transcription factor HLH-30. These results offer significant insights into the biology of neurodegeneration, stress response maintenance, and longevity.

The article provides mechanistic insights into how MANF regulates autophagic flux, lysosomal integrity, and lifespan, positioning this factor as a central node in stress response and cellular rejuvenation pathways. The findings are timely and innovative, especially considering the growing interest in the roles of lysosomes and autophagy in age-associated diseases. One potential application of Shane's work is the therapeutic modulation of MANF to promote healthy aging.

Innovation and impact of research work

What sets Shane's article apart is its conceptual depth and experimental rigor. His work elegantly connects multiple domains of neurobiology, cell biology, stress response pathways, lysosomal signaling, and aging biology. He demonstrated not only the localization of MANF

to lysosomes but also its dependence on endosomal trafficking and its ability to modulate HLH-30/TFEB activity. These discoveries substantially advance the field and suggest therapeutic avenues for age-related proteopathies.

Since its publication, Shane's work has generated significant interest among researchers in neurobiology and aging communities. The work was featured on several science communication platforms. The work promises future investigations into cellular resilience mechanisms and translational aging research.

Leadership and scholarly merit

Throughout his Ph.D., Shane consistently demonstrated excellence, creativity, and independence. He led the research, designed and executed experiments, developed new techniques to address some of the questions, analyzed data, and wrote the initial draft of the manuscript. His publication demonstrates persistence, dedication to excellence, and combines molecular biology, genetics, microscopy, and transcriptomics.

In my 20+ years of supervising graduate students, Shane stands out as one of the most talented and driven individuals I have had the pleasure of mentoring. His intellectual curiosity, scientific maturity, and passion for discovery are commendable and appreciated by many at McMaster and our collaborators.

In closing, Shane's article is a powerful testament to the caliber of graduate research conducted at Canadian institutions. It reflects the best qualities the CCUBC Graduate Student Research Prize aims to recognize innovation, scholarly excellence, and scientific advancement. I wholeheartedly support this nomination and firmly believe that Shane is a most deserving candidate for this prestigious award.

Thank you for your consideration. Please do not hesitate to contact me for any further information.

Sincerely,



Bhagwati P. Gupta