UNIVERSITY of GUELPH

COLLEGE of BIOLOGICAL SCIENCE

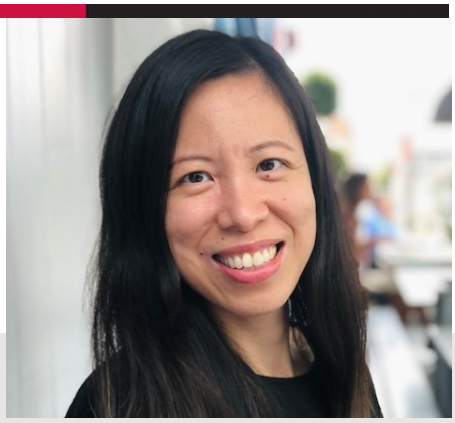
DEPARTMENT OF MOLECULAR AND CELLULAR BIOLOGY

Seminar SPEAKER SERIES

2023-2024

OCT WED 25 10 30 AM | SSC 1511

DR. SHELLEY LUMBA



Assistant Professor,
Department of Cells and Systems Biology,
UNIVERSITY OF TORONTO

Topic: One signal, two modes of perception: How strigolactones are perceived by plants and fungi

Shelley Lumba joined the Department of Cell and Systems Biology at the University of Toronto as Assistant Professor in September 2016. Shelley received her B.Sc. Honours degree and Ph.D. in Plant Molecular Genetics from the University of Toronto. She conducted post-doctoral studies and became a research associate at the University of Toronto from 2007 to 2016. Overall, her collective research has been cited over 4300 times and her h-index is 19. Due to the potential of her research to become world leading, she has been awarded highly competitive grants such as the New Frontiers in Research Fund and an NSERC Discovery Accelerator Supplement (DAS). The DAS Program aims to provide additional funding to researchers with superior, highly innovative and original research programs. She has published in top journals including Science, Nature Plants, PNAS, Nature Chemical Biology, and Developmental Cell.

Strigolactones (SLs) are a group of molecules that act as both plant hormones and as environmental communication cues for plants and fungi in the rhizosphere. In my presentation, I will discuss the central role of the strigolactone/karrikin (SL/KAR) signalling pathway in germination. We demonstrate that activation of the SL/KAR pathway can replace the light requirement for germination. Our cell biology studies reveal that the downstream target, SMAX1, is stabilized in the dark. Beyond the role of SL as a plant hormone, they act as important signals to mediate plant-fungal symbioses. A longstanding question is how and why fungi respond to SLs. By using the fungal model system, Saccharomyces cerevisiae, we demonstrate that SL inhibits a high-affinity phosphate (Pi) transporter, which depletes Pi in the fungi. SL-regulated Pi responses are conserved in a plant endophytic fungus called Serendipita indica and the pathogen, Fusarium graminearum. Through genetic and structure-function analyses, we have identified a potential binding pocket for SL in the Pi transporter. Intriguingly, this binding pocket is ubiquitous in Pi transporters across the fungal kingdom. Our results address longstanding evolutionary questions about the molecular dialogue between plants and fungi.

All welcome to attend

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