



Human milk is not only food.

NEUROSCIENCE GRAND ROUNDS

SPEAKER

Sanoji Wijenayake , PhD

Assistant Professor of Cell and Molecular Biology,
Department of Biology, University of Winnipeg.

DATE

Friday, January 17th, 2025

9:00 AM - 10:00 AM

LOCATION

Psychiatry Bldg. 2nd Floor Rm PX236/238

BIO

Dr. Sanoji Wijenayake is an Assistant Professor of Cell and Molecular Biology in the Department of Biology at the University of Winnipeg. She completed her graduate work at Carleton University with Dr. Ken Storey studying the biochemical responses to stress followed by a post-doctoral fellowship at the University of Toronto and Sick Kids Research Institute studying Developmental Origins of Health and Disease with a special focus understanding how maternal obesity modulates neurodevelopment and neuroinflammation. Dr. Wijenayake established her research group at the Richardson College for the Environment and Sciences in January 2022 and studies the molecular and cellular underpinnings of how human milk shape offspring development and inflammatory responses, with a special focus on the brain. Specifically, she studies a group of lipid nanovesicles, known as milk-derived extracellular vesicles, that transport bioactive material, including microRNAs, lipids, and peptides, between mothers and their offspring during lactation. Dr. Wijenayake has shown that milk-derived extracellular vesicles readily get into the brain, localize in the cytoplasm of microglia, and have the potential to shape metabolism, immunity, inflammation, and brain development in neonates. She has also shown that MEV treatment during critical periods of early life can reverse the negative impacts of gestational nutrient stress. She is passionate about uncovering the therapeutic potential of milk-derived extracellular vesicles in the context of improving neonatal health. Dr. Wijenayake have received competitive funding from NSERC, CIHR, MITACs, CFI, Banting Foundation, and the Manitoba Medical Service Foundation. She is passionate about EDII and creating equitable and open spaces for trainees from underrepresented groups.

Check out her research at:



OBJECTIVES

Long-term research objectives

- Understand how milk-derived extracellular vesicles regulate neonatal development and inflammation.
- Explore if MEVs provide survival benefits to children, especially sick children.
- Applications: Use MEVs for drug delivery and therapeutics

Current Research Themes:

- Explore the mechanistic underpinning of MEV uptake across different cells of the neonatal brain and adult brain.
- Are there sex effects in uptake and localization of MEVs in the brain?
- Does stress impact uptake and localization?
- What are the functional outcomes of MEV uptake?
 - o Anti-inflammatory
 - o Anti-oxidative
 - o Immune
 - o Developmental
- Is MEV cargo sensitive to maternal stress? Diet, psychosocial health?
- Can MEVs remediate neonatal gestational exposure to obesity, diabetes, inflammation, and immune dysfunction?