Schilling Lab



Dr. Schilling is an Associate Professor with an independent laboratory and the Director of the Proteomics and Mass Spectrometry Core. She is directly involved in a large variety of research projects spanning neurodegenerative diseases, cancer, diabetes, and molecular mechanisms of aging. To date, Dr. Schilling's work has resulted in over 160+ peer-reviewed publications.

The Schilling lab has access to some of the most biologically diverse proteomics data on aging available. The data is used to identify molecular mechanisms of age-related diseases to understand disease progression for the development of novel and more-effective drug therapies.

<u>Project #1:</u> Isolation of exosomes (extracellular vesicles) from neurodegenerative diseases in the context of aging and senescence.

Description: This project implements the isolation of exosomes and quantitative proteomics for the analysis of exosomes from brain cells - neurons, microglia, astrocytes, organoids or co-cultures to identify key molecules that regulate and activate signaling pathways relevant to Alzheimer's disease and related dementias (ADRD). Proteins identified with significant changes will be subjected to protein ontology and pathway analysis to provide crucial and comprehensive molecular insights into the nature and regulation of cell-fate decisions and cellular senescence in ADRD.

<u>Project #2:</u> Analysis of skeletal bones using proteomics and the link to neurodegenerative diseases: Brain – Bone axis

Description: This project is aimed at determining the link between bone fragility (osteoarthritis) and neurodegenerative diseases through the investigation of bone and brain proteomes. Significantly altered proteins that overlap in brain and bone disease will be identified to determine molecular mechanisms of brain-bone interactions to further understand the comorbidity of brain and bone diseases.

Project #3: Osteoarthritis and Aging

Description: Osteoarthritis (OA) is a common disease during aging and bone and cartilage degradation and frailty in the elderly population has become an important socioeconomic problem. We are using proteomic technologies to decipher underlying mechanisms and linking OA to cellular senescence and we will also investigate co-morbidities during aging, and tissue to tissue signaling (crosstalk between bone, cartilage and muscle).

Desired Skills:

- Independent thinking, attention to detail, precision
- For computational projects -computer coding skills using 'R'
- For projects involving biological sample preparation attention to reproducibility and accuracy; experience with tissue culture.
- Interest in biology, chemistry and analytical technologies
- Mainly, enthusiasm for and engagement in projects; team player; desire to learn!

To learn more about the Schilling lab, <u>click HERE</u>.

To apply to the Schilling lab, return to the Internships Homepage.