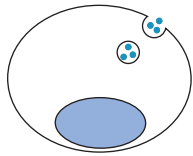


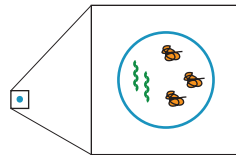
Project: Purifying exosomes for use as biomarkers

PI: John C. Tilton

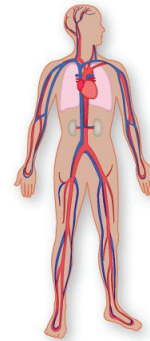
Hypothesis:



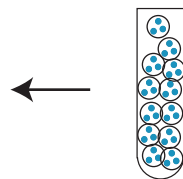
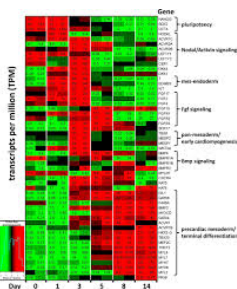
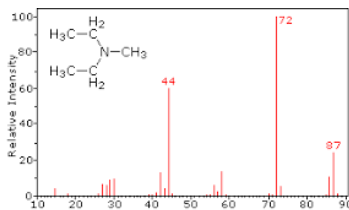
Cells produce several types of small extracellular vesicles: exosomes, microvesicles, and apoptotic bodies.



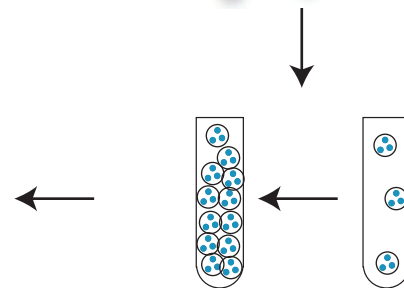
The **protein** and **RNAs** inside exosomes reflect the cell of origin and are of great interest as biomarkers for diseases such as cancer.



Exosomes are present in plasma, facilitating analysis of exosome contents.



Exosome preparations will be tested for purity as well as protein and RNA content.



However, exosomes are present at very low levels in plasma and must be enriched for analysis. We will test several enrichment strategies: ultracentrifugation, ultrafiltration, and sorting.

Requirements for Students: Students must be willing and able to commit to xx hours per week in the laboratory and to meet with the lab PI to discuss their project once a week. Previous research experience is beneficial but is not required.

Learning Objectives: Students will learn a variety of laboratory techniques, including polymerase chain reaction (PCR), Gibson assembly, bacterial DNA amplification, mammalian cell culture, transfection, purification of exosomes and other extracellular vesicles, and microscopy. Students will also learn the principles of flow cytometry, fluorescence-activated cell sorting (FACS), mass spectrometry and analysis of complex data sets.

Student Activities: The student engaged in this project will perform bench research (see learning objectives, above), will meet with the lab PI to discuss their projects, and will present their research at lab meetings and at poster presentations for the Department of Nutrition or School of Medicine.