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**Project title:** Investigating unexplored mechanisms of presentation in immune cells

**Project abstract:** Communication between different cells of the immune system is critical for surveillance and defense, and is vital for a functional adaptive immune system. Exosomes are small vesicles that are released from numerous cell types, and have potential roles in immune regulation, including antigen presentation, immune suppression and cancer progression. In addition to being released from cells, exosomes may also be retained and presented at the surface of cells as small clusters. These clusters of exosomes may help 'present' messages at the surface of cells, and this project aims to understand their function and regulation.

**Keywords:** Exosomes; tethering; antigen presentation; immune suppression; advanced microscopy.

**Full details:**

The Edgar lab study the interface between immunology and cell biology. We are specifically interested in how organelles transport cargo proteins between them, and how dysfunction in this transport processes can give rise to disease. Using advanced molecular and biochemical methods, and specialized imaging techniques such as electron microscopy, the Edgar lab investigate the function of exosomes. Exosomes are small extracellular vesicles that are released by various cell types and function in cell-cell communication. They are involved in immune regulation, cancer progression and have been of huge interest due to their potential as biomarkers for disease.

Until recently, it was thought that exosomes were released by one cell and acted upon another. However, the lab previously discovered that exosomes can remain tethered to the surface of cells where they act as modules for presentation. Tethered exosomes appear abundant on antigen presenting cells and may also be used by cancer cells to evade immune detection. The aim this project is to uncover what role tethered exosomes play in immune cell function.

This project will be based in the highly collaborative Edgar lab. The roles of tethered exosomes will be explored using a range of molecular (e.g. CRISPR/Cas9), biochemical, and cutting-edge microscopy techniques, including various electron microscopy techniques.