

CHOP Research Institute Summer Scholars Program



Paula Oliver, Ph.D.
Pathology and Laboratory Medicine

Basic Research: Research most often conducted in a laboratory setting that is designed to enhance our scientific knowledge base (does not involve human subjects)

Ubiquitin Pathway Regulation of Immune System Function

My laboratory studies how the ubiquitin pathway regulates immune system function and the elimination of pathogens. Specifically, we focus on a small family of catalytic E3 ubiquitin ligases and their activating adaptors that are highly conserved structurally and functionally between mouse and man, making mouse genetic models a useful tool for understanding links between ligase function and protective immunity.

- **Potential summer research project:**

We recently found that deletion of an E3 ligase adaptor (known as Ndfip1) helps mice clear infection by a gram negative bacteria (*klebsiella pneumonia*) but makes the mice gain weight. This might reflect a key link between inflammation and obesity. Over the course of the summer we will perform experiments to analyze cells within fat. Additionally, we will use high resolution imaging to look at the localization of Ndfip1 in live macrophages as they eat bacteria. Our focus is on macrophages as they regulate bacterial clearance, inflammation, and metabolism.

- **Students will learn one or more of the following techniques:**

(1) Isolation of immune cells and analysis of proteins in or on cells using flow cytometry; (2) Analysis of immune cells in the fat using microscopy; and (3) Analysis of Ndfip1 localization using high resolution microscopy.

Please click [here](#) to learn more about Dr. Oliver