The Children's Hospital of Philadelphia® | RESEARCH INSTITUTE

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 dysregulation of immune cell activation can drive immune mediated diseases such as autoimmunity and allergy. We focus our research efforts on defining and characterizing members of the ubiquitin pathway as this pathway regulates immune cell signaling and the half life of proteins that impact immune cell fate. Specifically, we focus on several catalytic and non-catalytic enzymes 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 identified a novel E3 ubiquitin ligase that is increased in activated T cells. We generated mice lacking this cullin E3 ligase in T cells. We found that this E3 ligase regulates T cell expansion and survival following activation. We posit that this ligase is required for T cells to mount protective memory responses. We will test this hypothesis over the summer analyzing mice infected with a natural mouse pathogen and analyzing pathogen specific T cell numbers and protective immune responses. Additionally, we will use mouse models of human autoimmune disease to test whether this cullin ligase is required for the development of autoimmune disease.

- **Students will learn one or more of the following techniques**:
  (1) Isolation of immune cells and analysis of proteins in or on cells using multiparameter flow cytometry; **(2)** Analysis of protective immune responses and antibody generation; **(3)** Analysis of cell death pathways in T cells.

Please click here to learn more about Dr. Oliver