

## **Dissecting mechanisms of antiviral immunity to coronaviruses in the gastrointestinal tract**

Coronaviruses cause lung, central nervous system (CNS), enteric and hepatic diseases. While human coronaviruses typically cause respiratory illness, epidemic strains affect multiple organs including the gastrointestinal tract and liver. The mechanisms and pathological consequences of coronavirus infection beyond the lungs are ill-defined. Studies using the mouse hepatitis virus (MHV), a murine coronavirus, have begun to shed light on the disease etiology in the CNS, lymphoid organs and liver, however the dynamics of viral spread and antiviral immunity in the gastrointestinal tract remain unknown. This project will examine the infection conditions and pathology of hepatic and gastrointestinal infection (Aim 1), and reveal the cellular and molecular mediators of antiviral immunity to enteric MHV infection (Aims 2, 3). Establishing the mechanisms of host defense against coronaviruses in extra-pulmonary organs will guide the understanding of patient risk factors predisposing multi-organ disease, reveal pathological consequences of enteric coronavirus infection, and help design new therapies.