IUIS webinar by Donna Farber described respiratory immunity associated with COVID-19. Highlights from her talk include:

- The importance of T cell differentiation and tissue localisation, particularly development of tissue resident memory (TRM) cells, in the maintenance of protective immunity against respiratory viruses.
- Research by Zhao et al., that demonstrate that airway TRM CD4 T cells play an important role in protective immunity against SARS-CoV-1 infection.
- Description of two pathways that can induce lung immunopathology: (i) innate immune cell mediated cytokine release syndrome (CRS) which is very rapid, and (ii) T cell mediated immunopathology which is a delayed response.
- Immune responses associated with different stages of COVID-19 severity, and potential therapeutics that could be used to reduce pathology.
Studies that suggest that respiratory viral infections was associated high CD8:CD4 T cell ratios, which correlate with lung injury (ARDS) and inversely correlate with viral load.

Description of an ongoing study that aims to determine dynamics of respiratory and systematic immune responses to SARS-CoV-2 infection, as well determine potential immune correlates of lung injury or disease severity. Preliminary results are highlighted below.
Summary and Next Steps

- Local respiratory environment important for immunity and immunopathology to respiratory viruses
- In COVID-19, severe disease is characterized by a robust immune response: generate neutralizing antibodies
- The Respiratory immune response is dynamic in severe COVID-19, with significant populations of T cells and monocyte/macrophages
- Predominance of myeloid cells in the airways is associated with worse outcome, while increase in T cells is associated with recovery
- Airway T cells contain TRM and tissue Tregs, which may influence local immune responses.
- Determine which immune cell changes correlate with protection or immunopathology by comparison with viral load and clinical parameters

Summary by Cheleka Mpande