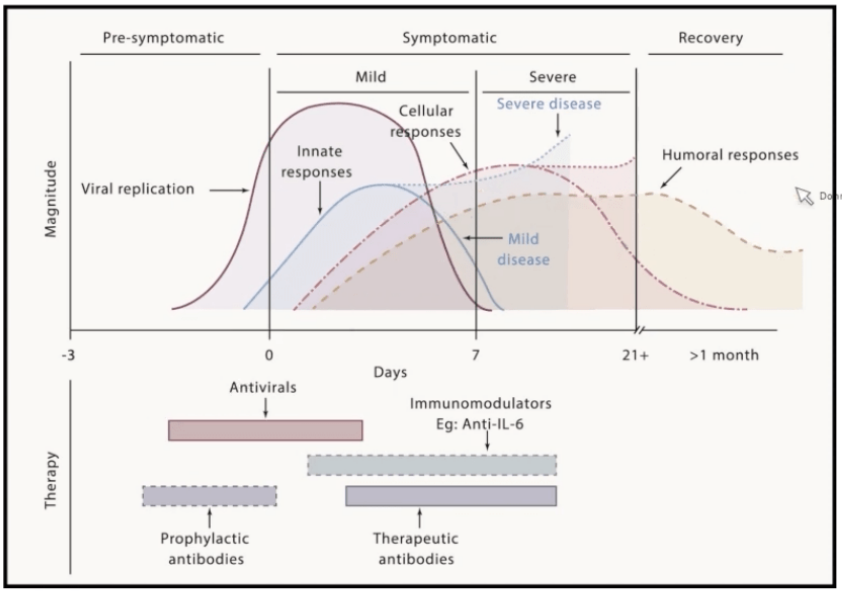
IUIS Webinar: Respiratory Immunity and COVID-19

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 in 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.

COVID-19 Disease: longitudinal course



Subbarao and Mahanty, *Immunity*, 2020

- 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