



MUCOSAL IMMUNITY & INFECTION MASTER POSITION – INVESTIGATING B CELL AND STROMAL CELL INTER- ACTIONS IN THE LUNGS DURING BACTERIAL INFECTION

Contact

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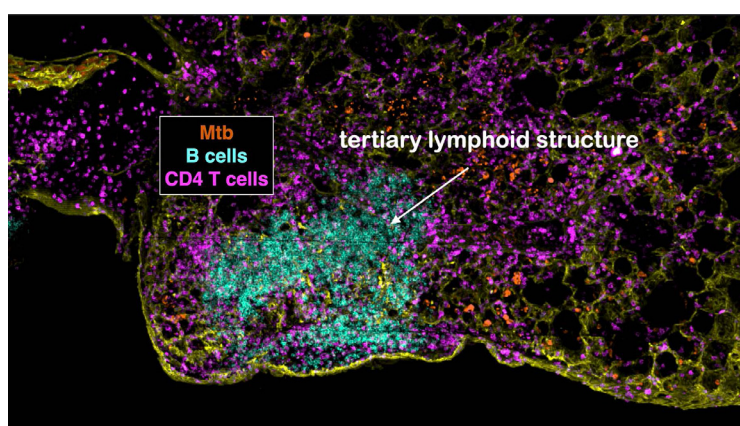
Project background

Tuberculosis (TB), an infectious disease caused by the bacterium *Mycobacterium tuberculosis* (Mtb), affects approximately a quarter of the world's population and causes over a million deaths every year. Despite the significant societal and ethical impacts of TB, there is only one available vaccine, developed over 100 years ago and largely ineffective against pulmonary TB in adults. A critical barrier to the development of a new vaccine is our incomplete understanding of what protective immunity should look like.

Respiratory infections promote the formation of tertiary lymphoid structures (TLS) in the lungs, in which B cells aggregate in well-organized areas interspersed with T cells, dendritic cells and stromal cells. The development of TLS correlates with bacterial control in Mtb infected mice, monkeys and humans. Although TLS appear to be a site for ongoing B cell differentiation and mucosal antibody production, the role of B cells in TB remains controversial. Recently, B cells and TLS have been implicated in remodeling stromal - epithelial cell interactions in gut and lymphoid organs. The goal of this project is to investigate a potential role for B cells in remodeling the lung stromal compartment during Mtb infection.

Short project description

B cell / TLS function will be manipulated using a variety of interventions in Mtb infected mice (e.g. B cell depletion, TLS disruption). The student will use combined fluorescence microscopy and image analysis to visualize the interaction of B cells, TLS, stromal cells (epithelial cells, endothelial cells and fibroblasts) and bacteria in infected lungs.



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- opportunity to develop skills in flow cytometry & immunofluorescence microscopy
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