Instituto de Medicina Molecular João Lobo Antunes

Master Project Proposal

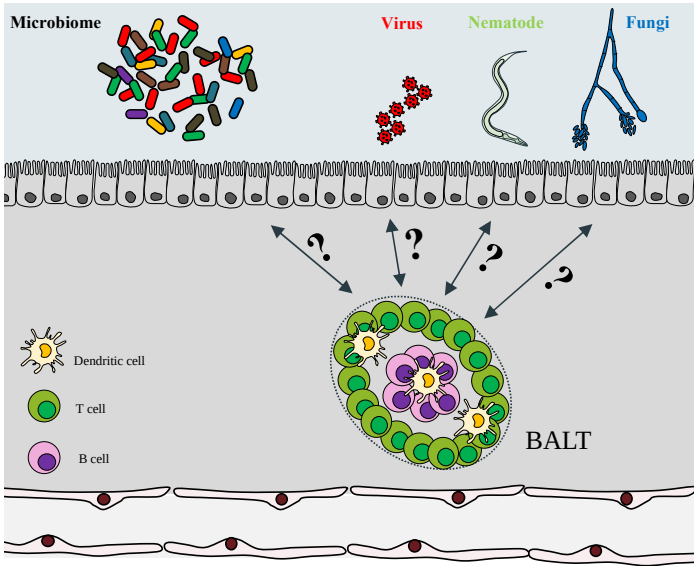
Title: BALTing the Lung Immune Response

Synopsis:

Bronchus-associated lymphoid tissue (BALT) is an ectopic lymphoid tissue found in the lungs. It plays a crucial role in immune defense against respiratory infections such as *Influenza* virus. BALTs contain a variety of immune cells, including T cells, B cells, and dendritic cells.

Studies in rodents have shown that upon lung infection, T cells can infiltrate the lungs and form inducible BALTs, which respond to this immune challenges.

However, the precise mechanisms by which BALTs control tissular immune responses remain unclear.



To develop more effective vaccination strategies, it is essential to understand the role of CD4 T cells, particularly follicular helper T cells (T_{FH}), in BALTs. We identified the polarization of T_{FH} cells in response to type 1 and type 2 infections. We hypothesize that BALTs may extend this polarization to include all three types of infections. In addition, BALTs may also play a role in regulating the lung microbiome.

Experiment:

We aim at understanding how BALTs respond to various pathogen challenges. To achieve this, we plan to use different models of infection such as *Influenza*, *Aspergillus*, and *Nippostrongillus* to induce type 1, 2, or 3 responses. We will analyse the cellular composition and cytokine profile of BALTs cells in mice at various time points following infection using flow cytometry. Additionally, we will explore the potential impact of BALTs on the lung microbiome through techniques such as qPCR or 16S gene sequencing.

Student profile:

We are looking for a biologist that shows interest in immunology and a willingness to work with mice.

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