

August 19, 2025 (Tue) 2:00pm - 3:00pm

Venue: Nitori Hall, Bristol Myers Squibb Building



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“Highly multiplex volumetric imaging Ce3D-IBEX reveals commensal-induced immune clustering along sensory nerves in the lung”

The airway mucosa is a primary site of the immune response to inhaled antigens. However, how immune homeostasis is maintained in this organ during continuous exposure to airborne particles and microbial antigens is not known. Previous studies have shown that the spatial organization of immune components in relationship to each other and to non-hematopoietic components in tissues is critical to their proper function. To interrogate such relationships in the lung, 3D information is required. However, current methods for fluorescence 3D imaging do not provide the marker depth afforded by high-content 2D imaging. To overcome this constraint, I created Ce3D-IBEX, which enables the visualization of 40+ markers in an optically cleared 3D sample. Using Ce3D-IBEX, I have identified a previously uncharacterized immune cluster in the lung of naïve SPF mice that is enriched with T cells and dendritic cells (DCs) and is localized in close proximity to vagal sensory nerves. Agonistic denervation of the sensory nerves as well as vagotomy reduced the number of clusters, and that cluster formation was disrupted in germ-free mice as well as OT-I and OT-II TCR transgenic mice. These findings indicate that the clustering requires sensory nerve-derived signals and TCR-mediated recognition of bacterial antigens. Functional studies in virus-infected animals suggest that the T cells in these clusters behave like tissue resident memory T cells, providing acute antigen-independent effector activity. In the presentation I will showcase the versatility of Ce3D-IBEX and discuss the biological role of commensal-neuro-immune interaction in the lung.



Admission free
No advance registration required.
Mark your calendar and join us!

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