University of Zurich[UZH]

Institute of Physiology

PhD Thesis Defense

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Sources of Pulmonary GM-CSF and Its Roles in Myeloid Cell Homeostasis

Granulocyte-macrophage colony-stimulating factor (GM-CSF, encoded by *Csf2*) is a pro-inflammatory cytokine essential for the development, maintenance, and maturation of specific myeloid cells. In the lung, GM-CSF serves as a critical local environmental cue that defines the identity of tissue-resident macrophages. Utilizing newly developed transgenic *Csf2*-reporter mice, we aimed to profile GM-CSF expression in various barrier tissues, including the lung and skin. In the lung, we detected *Csf2*-reporter expression in immune cells such as group 2 innate lymphoid cells and γδ T cells, as well as in surfactant-secreting alveolar type 2 epithelial cells (AT2s). Lineage-specific constitutive and inducible *Csf2* deletion underscored the indispensable role of AT2-derived GM-CSF in directing alveolar macrophage (AM) fate, establishing the postnatal AM compartment, and sustaining AMs in adult lungs. We observed that, unlike other barrier tissues, non-hematopoietic *Csf2* expression in the lung was associated with AT2 identity. Although AT2-derived GM-CSF was crucial for supporting pulmonary conventional dendritic cells (cDCs), their dependence on it was less stringent compared to AMs, and could be partially compensated by hematopoietic sources of GM-CSF. In contrast, *Csf2* expression in the skin and colon was predominantly observed in distinct lymphoid compartments, such as ILC2s and γδ T cells. Overall, our studies reveal that diverse epithelial and lymphoid sources of GM-CSF differentially regulate the homeostasis of tissue myeloid cells in a tissue-specific manner.

Friday, July 5, 2024, 14:00
Lecture Room: Y16-G-05
via Zoom: Meeting ID: 783 558 2432 Passcode: 1234

After the defense, you are cordially invited to an Apéro.

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