IN BRIEF

LYMPHOID ORGANOGENESIS

Lymph node stroma and adipocytes: the link

Adipocyte progenitors are derived from mesenchymal stem cells and express the transmembrane marker PREF1 (also known as DLK1). Imaging of embryonic lymph nodes and their associated fat pads revealed the presence of $PREF1^+$ cells co-expressing lymphoid stromal markers in lymph node anlagen. Moreover, embryonic adipocyte progenitors responded to lymphotoxin-β receptor (LTβR) stimulation, which has a key role in lymph node development, by downregulating their adipogenic transcriptional programme. LTβR-dependent reprogramming of adipocyte progenitors involved the non-canonical NF-κB pathway, and after LTβR stimulation both embryonic and adult adipocyte progenitors migrated from fat pads to lymph node anlagen and expressed lymphocyte pro-survival factors. So, adult adipocyte progenitors may also drive the formation of tertiary lymphoid structures in the presence of lymphotoxin.

ORIGINAL RESEARCH PAPER Bénézech, C. *et al.* Lymphotoxin-β receptor signaling through NF-κB2-RelB pathway reprograms adipocyte precursors as lymph node stromal cells. *Immunity* 30 Aug 2012 (doi:10.1016/j.immuni.2012.06.010)

LYMPHOID ARCHITECTURE

Immune cell cartography

A new technique of multiplex quantitative tissue imaging has now allowed the mapping of dendritic cell (DC) subsets in steady-state lymph nodes. Histo-cytometry involves the use of fluorescence-conjugated antibodies, three-dimensional confocal microscopy and mathematical algorithms to quantitatively visualize various cell populations. Imaging of lymphocyte populations and antigen-induced T cell activation in the lymph nodes established histo-cytometry as a powerful method. So, the authors then used it to trace DC subsets in lymph nodes. Migratory $CD11b^+$ DCs were found in the interfollicular zone, and resident $CD8^+$ DCs, Langerhans cells and migratory $CD103^+$ DCs localized in the T cell zone, whereas resident $CD11b^+$ DCs were more predominant in the lymphatic zone. The compartmentalization of DCs reflects their recruitment by specific local cues and may determine the nature of presented antigens and co-stimulation, thereby influencing the type of T cell responses triggered by each DC subset.

ORIGINAL RESEARCH PAPER Gerner, M. Y. *et al.* Histo-cytometry: a method for highly multiplex quantitative tissue imaging analysis applied to dendritic cell subset microanatomy in lymph nodes. *Immunity* **37**, 364–376 (2012)

INFECTION

T_{FH} cell dynamics in SIV and HIV infection

HIV targets $CD4^+$ T cells, but two studies now report an accumulation of $CD4^+$ T follicular helper (T_{FH}) cells in humans and primates with chronic HIV and SIV infection, respectively. The relative abundance of $CXCR5^+PD1^{hi}$ T_{FH} cells was increased in the lymph nodes of patients with HIV, with a large fraction of T_{FH} cells being HIV-specific. T_{FH} cell accumulation correlated with the presence of more germinal centre B cells and plasma cells, and increased IgG1 levels. Similarly, primates with chronic SIV infection had an increased percentage of $CCR7^{low}PD1^{hi}ICOS^{hi}CD150^{low}$ T_{FH} cells. T_{FH} cell accumulation resulted from the differentiation of naive $CD4^+$ T cells into T_{FH} cells, as a result of high IL-6 levels. T_{FH} cell accumulation in SIV-infected primates also correlated with high IgG levels, but how it may influence antibody maturation remains to be determined.

ORIGINAL RESEARCH PAPERS Lindqvist, M. *et al.* Expansion of HIV-specific T follicular helper cells in chronic HIV infection. *J. Clin. Invest.* **122**, 3271–3280 (2012) | Petrovas, C. *et al.* CD4 T follicular helper cell dynamics during SIV infection. *J. Clin. Invest.* **122**, 3281–3294 (2012)