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# IRF4-dependent mucosal CD24$^+$CD11b$^+$ dendritic cells control Th17 responses

**Andreas Schlitzer, Pearline Teo, Koji Atarashi, Teresa Zelante, Peter Chi Ee See, Adrian Ho, Donovan Low, Amanda Shin, E. Richard Stanley, David Michael Kemeny, Lai Guan Ng, Paola Castagnoli, Sivansankar Baalasubramanian, Kenya Honda and Florent Ginhoux**

Florent Ginhoux lab, Singapore Immunology Network, A*star, Singapore

**Abstract**

Dendritic cells are crucial for the initiation of adaptive immunity and can be delineated into functionally different subsets of DCs in lymphoid as well as non-lymphoid organs. Two major non-lymphoid tissue dendritic cell subsets were recently identified in steady state, CD103$^+$ DCs and CD11b$^+$ DCs. CD103$^+$ DCs have been characterized extensively for their origin, growth and transcription factor requirements as well as function. However, similar data for CD11b$^+$ DCs, albeit present in greater numbers, remain sparse. Using mixed bone marrow chimeras, we show that the CD11c$^+$MHCII$^+$CD11b$^+$ population in the lung and gut lamina propria is composed out of 2 populations, Flt3-dependent CD24$^+$CD64$^-$ bona fide DCs and CSF-1R-dependent CD24$^-$CD64$^+$ macrophages. In the lung, only the CD11b$^+$CD24$^+$ DCs capture antigen and migrate to the draining lymph node where they potently induce T-cell proliferation. Furthermore, DC-specific ablation of IRF4 leads to selective loss of the CD11b$^+$CD24$^+$ DC subset in the lung as well as the CD11b$^+$CD103$^+$ DC subset in the small intestine, thereby identifying an IRF4-dependent CD24$^+$CD11b$^+$ DC lineage with a common gene expression profile in mucosal tissues. Functionally, loss of lung and small intestinal CD24$^+$CD11b$^+$ DCs leads to abrogation of IL-17 production and concomitant elevation of IFNγ production by CD4$^+$ T cells in the lung and small intestine during steady state as well as during pathogen challenge. Taken together, our data identify an IRF4-dependent CD11b$^+$ DC population with functional specialization to instruct mucosal IL-17 responses during steady state and infection.

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