IFNγ controls the monocyte to phagocyte transition during tissue inflammation

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Monocytes are members of the mononuclear phagocyte system (MPS) and together with neutrophils constitute the largest population of leukocytes in the peripheral blood. In response to inflammation, Ly6Chi monocytes are rapidly mobilized from the bone marrow (BM) and recruited into affected tissues. However the cues that guide the cellular transformation of monocytes into inflammatory tissue phagocytes are largely unknown and there is an ongoing debate as to what guides the transition of monocytes into inflammatory tissue phagocytes. In inflamed tissues, type I lymphocytes initiate the phenotypic and functional transformation of monocytes into tissue phagocytes, which in turn are the primary executors of tissue-immunopathology. Among the type I cytokines, GM-CSF is widely held to play a pivotal role in the monocyte to phagocyte transition, whereas IFN-γ is known to regulate the APC function of myeloid cells. Using reporter mice, high-dimensional single cell cytometry and unsupervised algorithm-guided analysis, we identified IFN-γ to be essential for monocytes to acquire a mature inflammatory phagocyte phenotype, whereas GM-CSF does not aid this transition but instead licenses their inflammatory signature to mediate immunopathology.

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