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Inflammatory monocytes infiltrating into allergen-exposed allergic skin acquire anti-inflammatory property through basophil-derived IL-4

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Abstract

Monocytes and macrophages are important effectors and regulators of inflammation. Two distinct subsets of monocytes have been identified in mice, Ly-6C^{+}CCR2^{+} inflammatory monocytes and Ly-6C^{-}CCR2^{-} resident monocytes, that are generally thought to differentiate into M1 and M2 macrophages, respectively. Here we show that *Ccr2*$^{-/-}$ mice unexpectedly displayed an exacerbation rather than alleviation of IgE-mediated chronic allergic inflammation, in spite of the fact that the recruitment of inflammatory-type monocytes to skin lesions was abolished in *Ccr2*$^{-/-}$ mice. Adoptive transfer experiments revealed a previously unappreciated mode of monocyte-to-macrophage transition, in that inflammatory monocytes recruited to allergen-exposed skin acquire an M2-like phenotype and exert an anti-inflammatory function, in an IL-4 receptor-dependent manner, responding to IL-4 produced by allergen/IgE-stimulated basophils.