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Interstitial macrophages: immune cells that prevent asthma

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The continual presence in the air of the microbe-derived molecule LPS promotes asthma in some individuals. What prevents inhalation of LPS from promoting asthma in most individuals is not well understood. However, researchers have now ascribed this function in mice to a population of lung immune cells known as lung interstitial macrophages (IMs); this is the first in vivo function described for these cells.

Microbe-derived molecules able to stimulate the immune system are omnipresent in the air, and the presence of one such molecule (LPS) promotes asthma in some individuals. What prevents inhalation of LPS from promoting asthma in the majority of individuals is not well understood. However, Fabrice Bureau and colleagues, at the University of Ličge, Belgium, have now ascribed this function in mice to a population of lung immune cells known as lung interstitial macrophages (IMs). Surprisingly, this is the first in vivo function described for these cells.

The way in which airborne LPS promotes asthma is by inducing lung immune cells known as DCs to initiate Th2 immune responses towards normally innocuous allergens. In the study, mouse IMs were found to produce high levels of the soluble immune factor IL-10, to inhibit LPS-induced DC activation in an IL-10-dependent manner, and to prevent the induction of Th2 responses directed towards innocuous allergens following exposure to LPS and the allergen.

Importantly, mice in which IMs had been depleted developed severe

asthmatic reactions to innocuous airborne allergens inhaled with low doses of LPS. The authors therefore conclude that IMs help prevent airborne LPS from promoting allergy in mice and suggest that they might have a similar function in humans; determining whether inhibition or dysfunction of IMs contributes to the development of asthma in humans is likely to be an area of future investigation.

More information: Lung interstitial macrophages alter dendritic cell functions to prevent airway allergy in mice, *Journal of Clinical Investigation,* www.jci.org/articles/view/3971 … ilz1n88N1gsZL8Ogbs3d

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