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A Natural Killer T Cell Subset That Protects against Airway Hyperreactivity

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Abstract : We examined characteristics of a Natural Killer T (NKT) cell subpopulation that developed during influenza infection in neonatal mice, and that suppressed the subsequent development of allergic asthma in a mouse model. This NKT cell subset expressed CD38 but not CD4, produced IFN-γ, but not IL-17, IL-4 or IL-13, and inhibited the development of airway hyperreactivity (AHR) through contact-dependent suppressive activity against helper CD4 T cells. The NKT subset expanded in the lungs of neonatal mice after infection with influenza, but also after treatment of neonatal mice with a Th1-biasing α-GalCer glycolipid analogue, Nu-α-GalCer. These results suggest that early/neonatal exposure to infection or to antigenic challenge can affect subsequent lung immunity by altering the profile of cells residing in the lung and that some subsets of NKT cells can have direct inhibitory activity against CD4+ T cells in allergic asthma. Importantly, our results also suggest a potential therapy for young children that might provide protection against the development of asthma.

Keywords : NKT subset, asthma, airway hyperreactivity, hygiene hypothesis, influenza
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