

IFN- λ enhances influenza immunity by stimulating TSLP release during intranasal immunization

Content

Interferon- λ (IFN- λ) acts on epithelial cells and mediates innate antiviral protection of mucosal surfaces. Here we report that IFN- λ can also enhance adaptive immunity following infection of the respiratory tract. Mice deficient in IFN- λ signaling showed an impaired antibody response after influenza virus infection. We further found that subunit vaccines enriched with IFN- λ induced strongly enhanced IgG1 and IgA antibody responses in wild-type mice compared with IFN- λ -free vaccines if administered by the intranasal route. No such adjuvant effect of IFN- λ was observed if the vaccines were administered by the subcutaneous or intraperitoneal routes. IFN- λ triggered the synthesis of thymic stromal lymphopoietin (TSLP) in epithelial cells of the upper airways which targeted migratory dendritic cells and boosted antigen-dependent germinal center reactions in draining lymph nodes and spleen. The IFN- λ /TSLP axis not only induced strongly increased responses to influenza subunit vaccines but also enhanced survival after lethal virus challenge. Thus, IFN- λ plays an important role in potentiating adaptive immune responses which initiate in the upper airways and it has great potential to increase the effectiveness of mucosal vaccines.

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