

Conference Series LLC Joint International Event on
5th European Immunology & Innate Immunity
July 21-23, 2016 Berlin, Germany



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Natural killer receptor 1 dampens the development of allergic eosinophilic airway inflammation

The function of NCR1 was studied in a model of experimental asthma, classified as a type 1 hypersensitivity reaction, in mice. IgE levels were significantly increased in the serum of OVA immunized NCR1 deficient ($NCR1^{gfp/gfp}$) mice in comparison to OVA immunized wild type ($NCR1^{+/+}$) and adjuvant immunized mice. Histological analysis of OVA immunized $NCR1^{gfp/gfp}$ mice revealed no preservation of the lung structure and overwhelming peribronchial and perivascular granulocytes together with mononuclear cells infiltration. OVA immunized $NCR1^{+/+}$ mice demonstrated preserved lung structure and peribronchial and perivascular immune cell infiltration to a lower extent than that in $NCR1^{gfp/gfp}$ mice. Adjuvant immunized mice demonstrated lung structure preservation and no immune cell infiltration. OVA immunization caused an increase in PAS production independently of NCR1 presence. Bronchoalveolar lavage (BAL) revealed NCR1 dependent decreased percentages of eosinophils and increased percentages of lymphocytes and macrophages following OVA immunization. In the OVA immunized $NCR1^{gfp/gfp}$ mice the protein levels of eosinophils' (CCL24) and Th2 CD4⁺ T-cells' chemo attractants (CCL17 and CCL24) in the BAL are increased in comparison with OVA immunized $NCR1^{+/+}$ mice. In the presence of NCR1, OVA immunization caused an increase in NK cells numbers and NCR1 ligand expression on CD11c⁺GR1⁺ cells but a decreased NCR1 mRNA expression in the BAL. OVA immunization resulted in significantly increased IL-13, IL-4 and CCL17mRNA expression in $NCR1^{+/+}$ and $NCR1^{gfp/gfp}$ mice. IL-17 and TNF α expression increased only in OVA-immunized $NCR1^{+/+}$ mice. IL-6 mRNA increased only in OVA immunized $NCR1^{gfp/gfp}$ mice. Collectively, it is demonstrated that NCR1 dampens allergic eosinophilic airway inflammation.

Biography

Yaffa Mizrachi Nebenzahl has completed her PhD at The Weizmann Institute, Israel in 1985. She is the Head of the Molecular Microbiology Laboratory in The Shraga Segal Department of Microbiology, Immunology and Genetics at the Faculty of Health Sciences in Ben Gurion University of the Negev, Israel.