Recycling of IgE-Ag complexes in human B cells facilitates transfer of Ag to dendritic cells for Ag presentation

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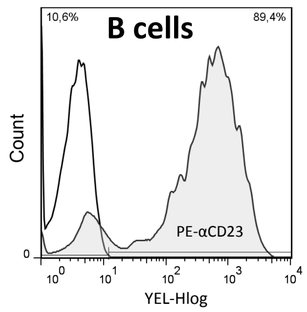
Introduction

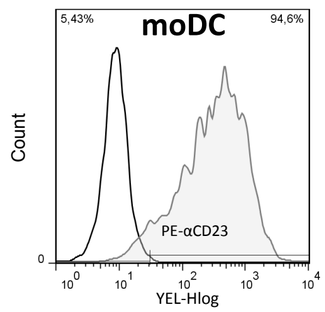
- CD23, the low affinity receptor for IgE is involved in IgE regulation and expressed in a variety of immune cells.
- The two isoforms, CD23a and CD23b only differ in intracellular domain
- B cells are the main cells expressing CD23a while myeloid cells can only express CD23b
- IgE-Antigen(IgE-Ag) handling, processing and Ag presentation in CD23 expressing cells is poorly understood
- Here, we compared primary human B cells and monocyte-derived DCs (moDC) in regards to IgE-Ag binding, uptake and processing
- A NIP-specific IgE antibody and NIP-BSA or NIP-TT were used as IgE-Ag complexes

The two isoforms of CD23

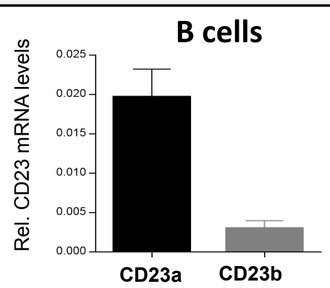
MEEGQYSEIEE → **CD23a**
MNPPSQEIEE → **CD23b**

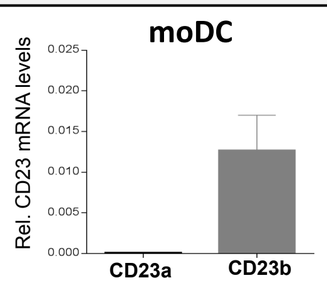
CD23 expression in human B cells and moDC





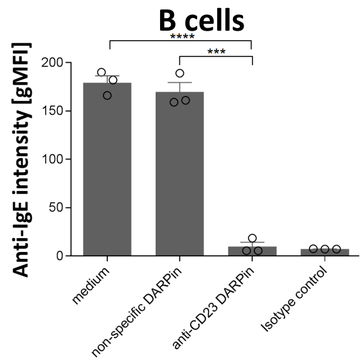
- CD23 is upregulated by IL-4 in B cells and moDCs

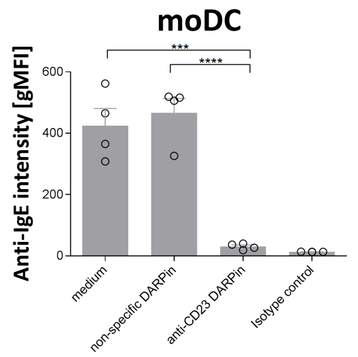




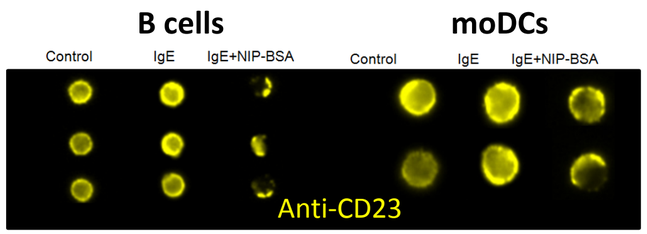
- B cells mainly express CD23a while moDCs only express CD23b

IgE-Ag binding is CD23-dependent



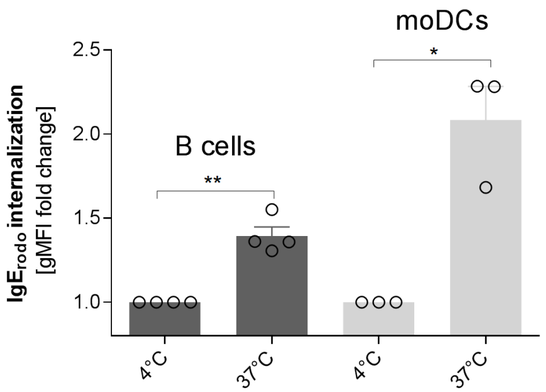


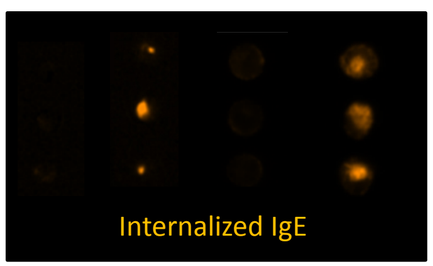
- IgE-Ag binding can be blocked with an anti-CD23 DARPin®



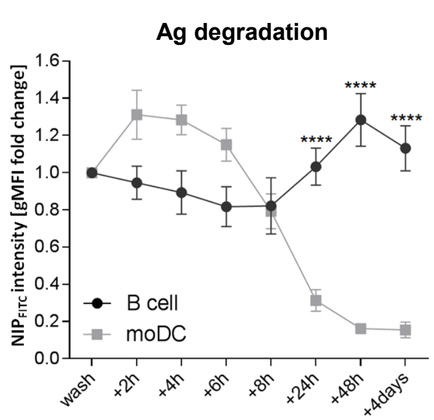
- IgE-Ag complexes induce aggregation of CD23

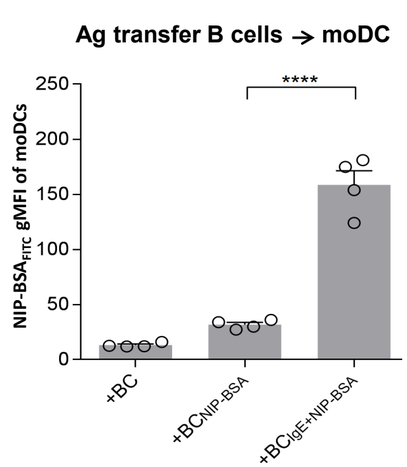
IgE-Ag is internalized in both cell types





Ag is degraded in moDCs but retained in B cells

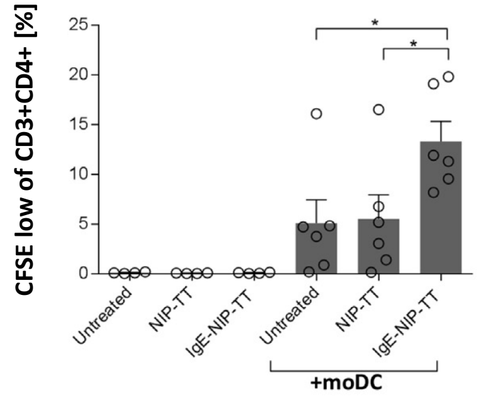




- In B cells, IgE-Ag stays intact over multiple days protected from degradation but In moDCs, the IgE-Ag complexes are completely degraded within 24h
- B cell- bound IgE-Ag is transferred to moDCs in co-culture

B cells do not present Ag without presence of DCs

- NIP was coupled to Tetanus Toxoid (TT) to study proliferation of autologous T cells.
- IgE+TT-NIP pulsed B cells only induce T cell proliferation in presence of moDCs



Working hypothesis