Flow cytometry and single cell RNA sequencing reveal tissue eosinophils highly express ST2 and IL-13 in eosinophilic esophagitis patients

The IL-33 receptor ST2 is highly induced on IL-13-expressing tissue eosinophils in eosinophilic esophagitis

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**RATIONAL:**
- Eosinophilic esophagitis (EoE) is an increasingly common allergic disease characterized by esophageal eosinophilia.
- IL-33 is elevated in EoE patients and IL-33 signaling, through its receptor ST2, is recognized as a potent initiator of type 2 inflammatory responses implicated in atopic diseases like EoE.

**METHODS:**
- Collected blood and esophageal biopsies from EoE and healthy patients.
- Performed flow cytometry on 43 EoE patients.
- Performed single cell RNA sequencing and immunofluorescence on 3 EoE patients.
- Measured ST2, IL-5 and IL-13 on blood and tissue immune cells.

**RESULTS:**
- Blood eosinophils have low expression of ST2.
- ST2 is highly expressed on esophageal eosinophils from EoE patients.
- ST2+ esophageal eosinophils highly express IL-5 and IL-13.

**CONCLUSIONS:**
- Increased ST2 transcription on tissue eosinophils & mast cells in EoE.
- ST2 is low in blood eosinophils regardless of disease state or activity.

**Flow Cytometry:**
- % ST2+ of cell type of all CD45+ cells

**Histology:**
- Active EoE: Cell type as % of all CD45%

**Flow Cytometry:**
- % IL-5+ IL-13+ cells of cell type

**RNA Sequencing:**
- Eosinophils highly express IL-5 and IL-13

[Flow Cytometry and single cell RNA sequencing results]

**Autoradiography:**
- Increased ST2 transcription on tissue eosinophils & mast cells in EoE.

**Histology:**
- Active EoE: Cell type as % of all CD45%

**Flow Cytometry:**
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[Flow Cytometry and single cell RNA sequencing results]