Cross-Talk between Human Mast Cells and Epithelial Cells by IgE-mediated Periostin Production in Eosinophilic Nasal Polyps

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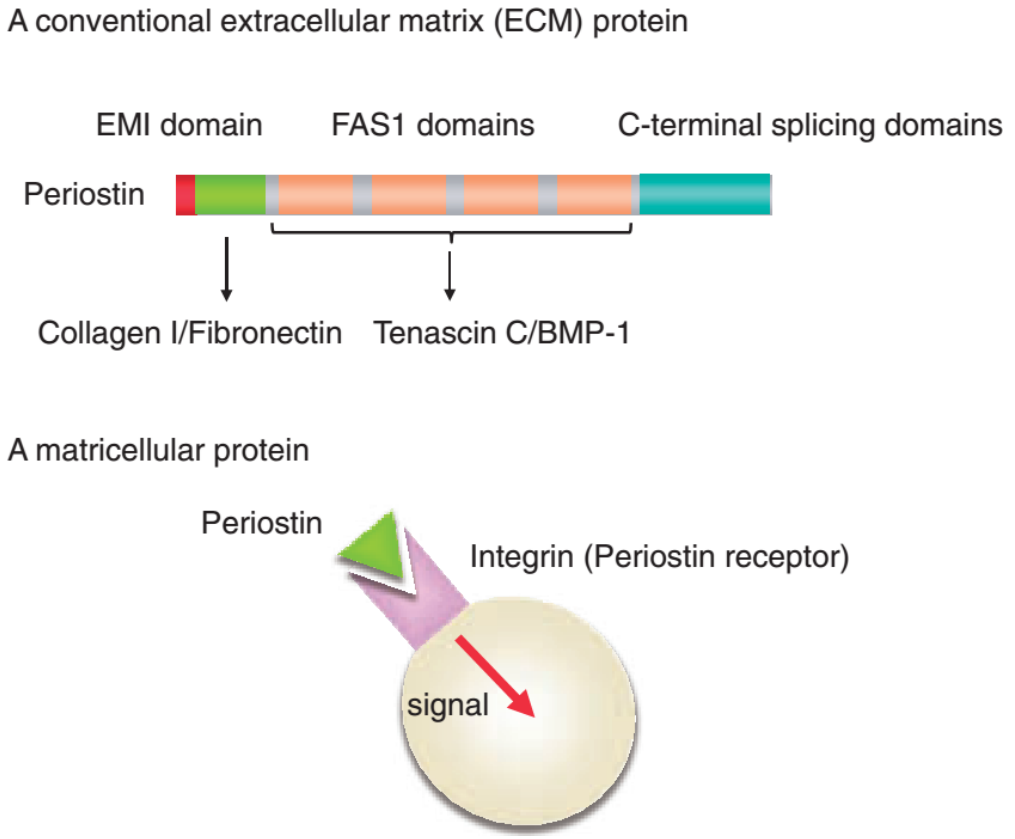
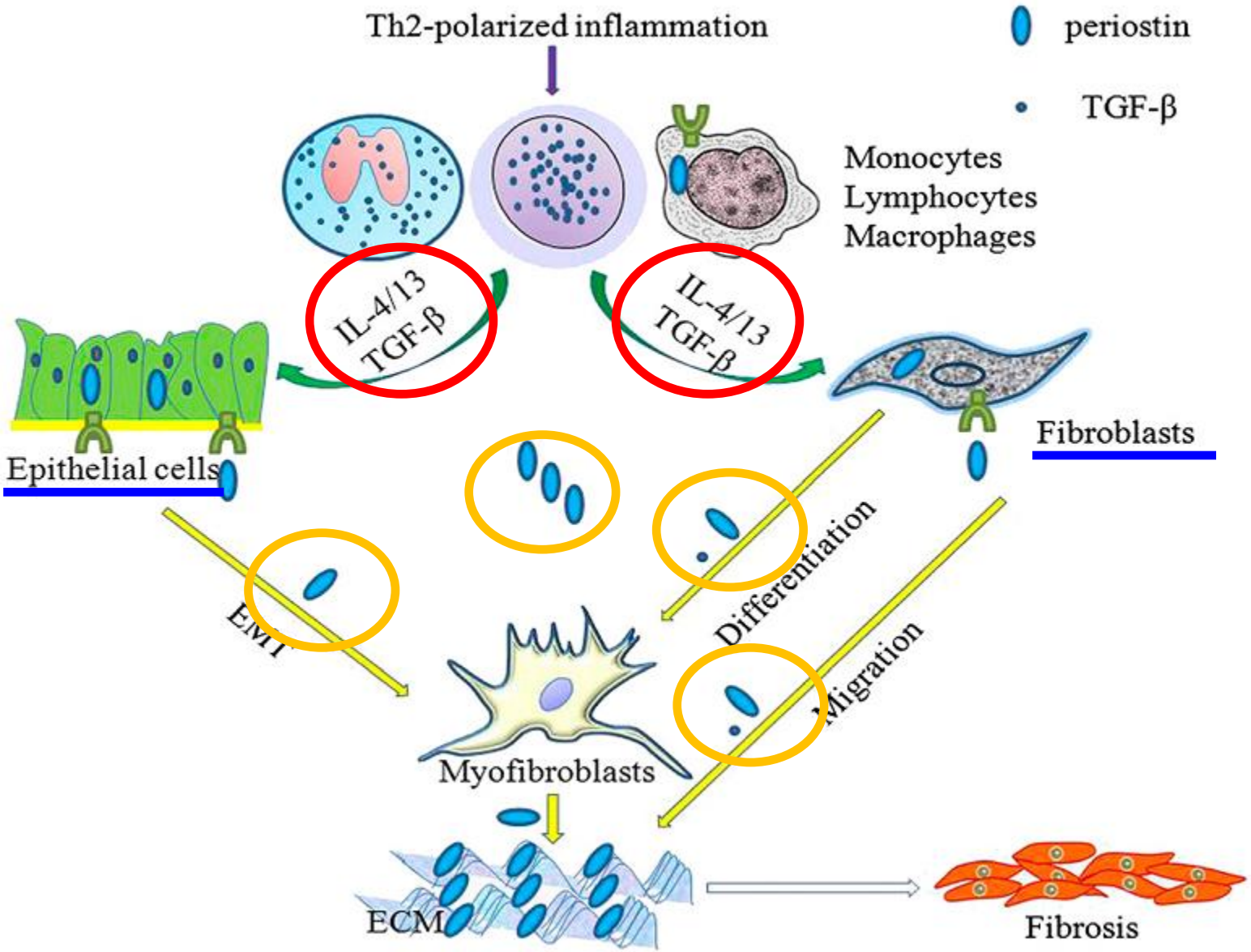
Introduction

- *Periostin, an extracellular protein, has emerged as a novel mediator of allergic diseases and plays an important role in tissue remodeling.*



Role of periostin in the pathogenic process of subepithelial fibrosis



Introduction

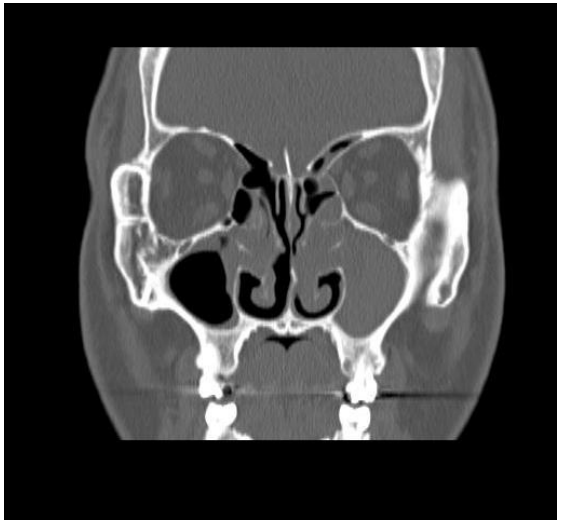
- *Serum periostin, as a biomarker, is elevated in severe eosinophilic asthma and aspirin-exacerbated respiratory disease and levels can predict the development of airflow limitation in asthmatic patients on an inhaled corticosteroid as well as responsiveness to omalizumab or lebrikizumab in uncontrolled severe allergic asthma.*

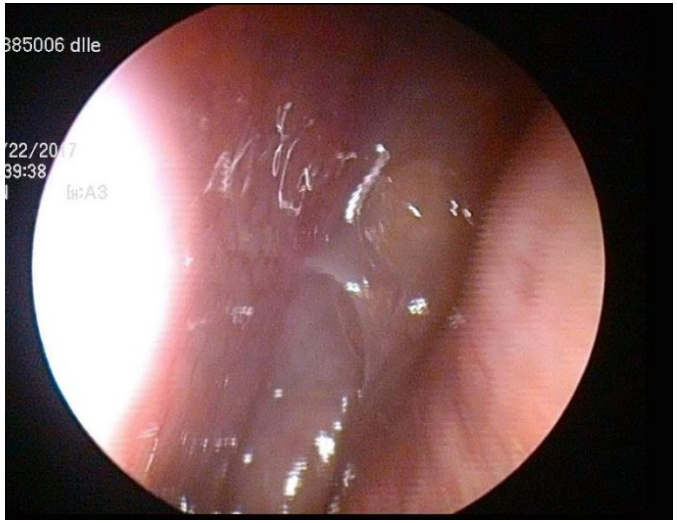
Introduction

- *However, despite its clinical significance, the mechanism by which periostin regulates inflammation remains poorly understood in the pathogenesis of airway inflammatory diseases.*

Introduction

- *Chronic rhinosinusitis (CRS) is one of the most common chronic rhinologic diseases and can significantly reduce the quality of life of affected subjects. Increased periostin production in sinonasal tissues occurs in subjects with CRS, particularly those with nasal polyps (NP) and allergic fungal sinusitis.*





Introduction

- *Periostin expression is also associated with CRS tissue eosinophil and disease severity. However, it is still unclear how periostin contributes to the pathophysiology of CRS with nasal polyps (CRSwNP).*

- *Therefore, **the expression, cellular origin and function of periostin in NP tissues** were investigated according to various subtypes of CRSwNP.*

Method

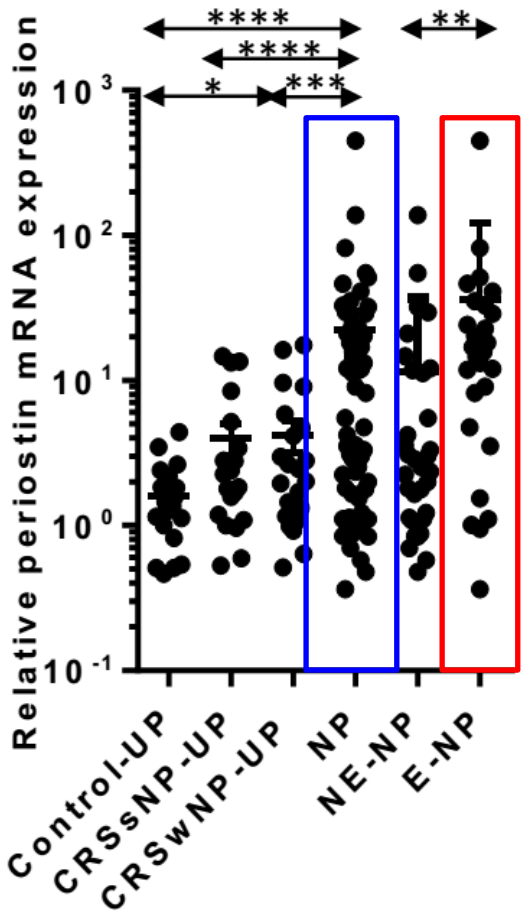
- *Group*
  - ***Control- Uncinate process (UP) : 22***
  - ***CRS without NP (CRSsNP)-Uncinate process (UP) : 62***
  - ***CRS with NP (CRSwNP)-Uncinate process (UP) : 68***
  - ***Nasal polyp (NP) : 34***

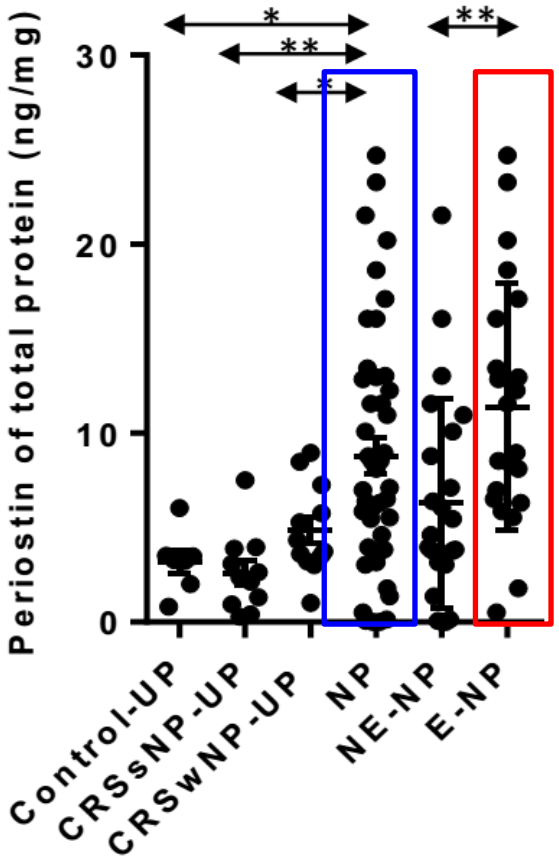
- *IHC, double IHC, qRT-PCR, ELISA, Confocal analysis*

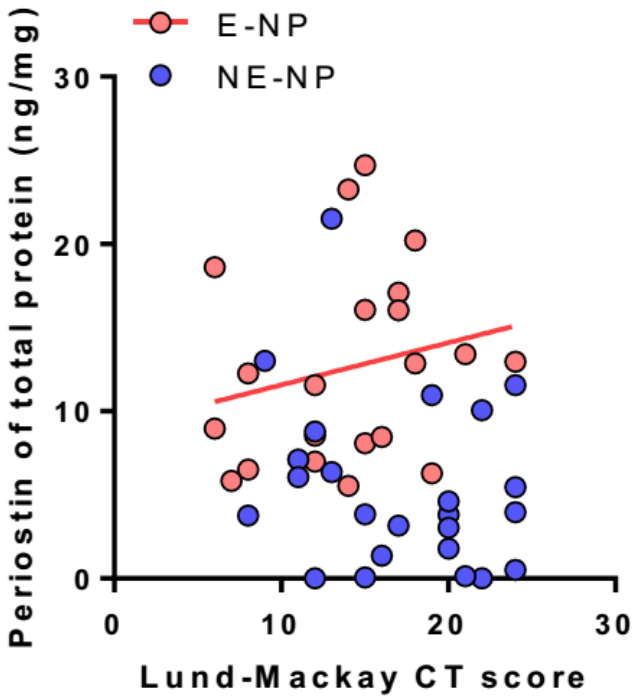
- *In vitro assay*
  - *Mast cell culture, hBronchial epithelial cell culture*

Expression of periostin

Result

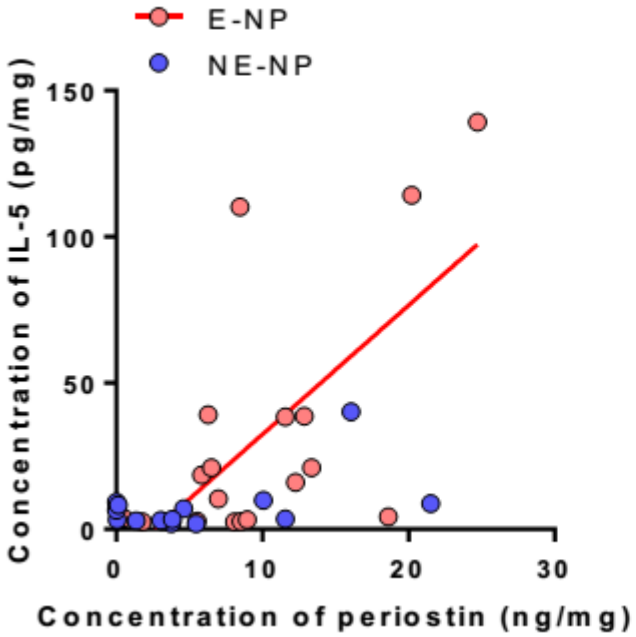


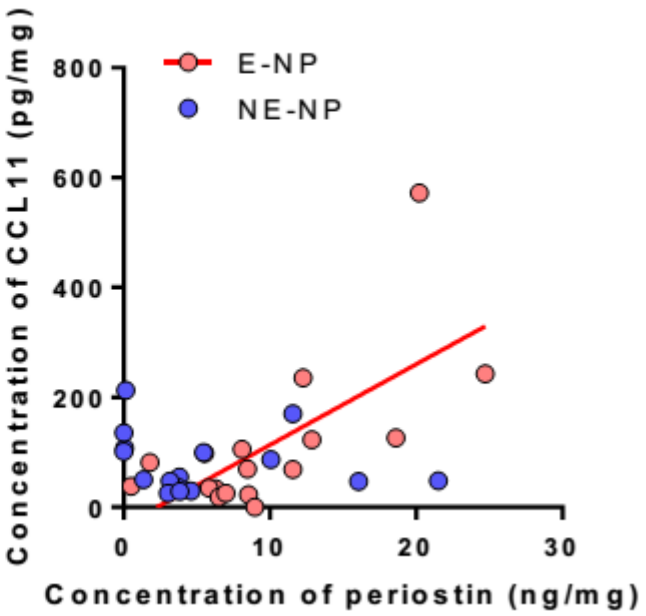


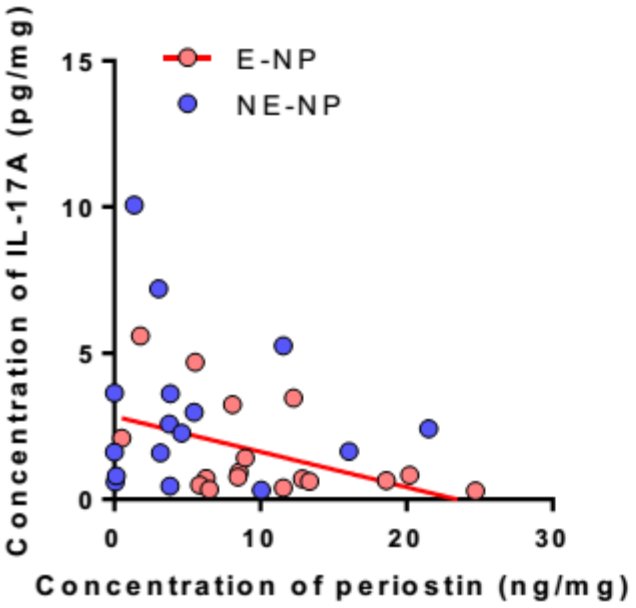


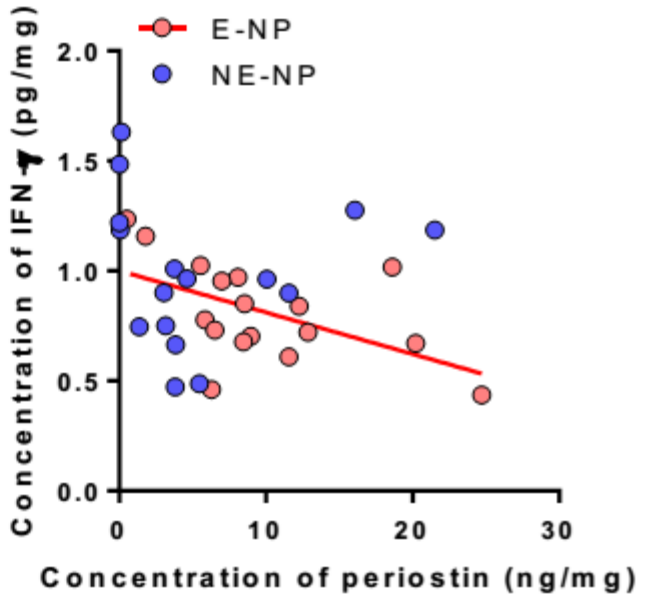
Relationship between periostin and major cytokines

Result



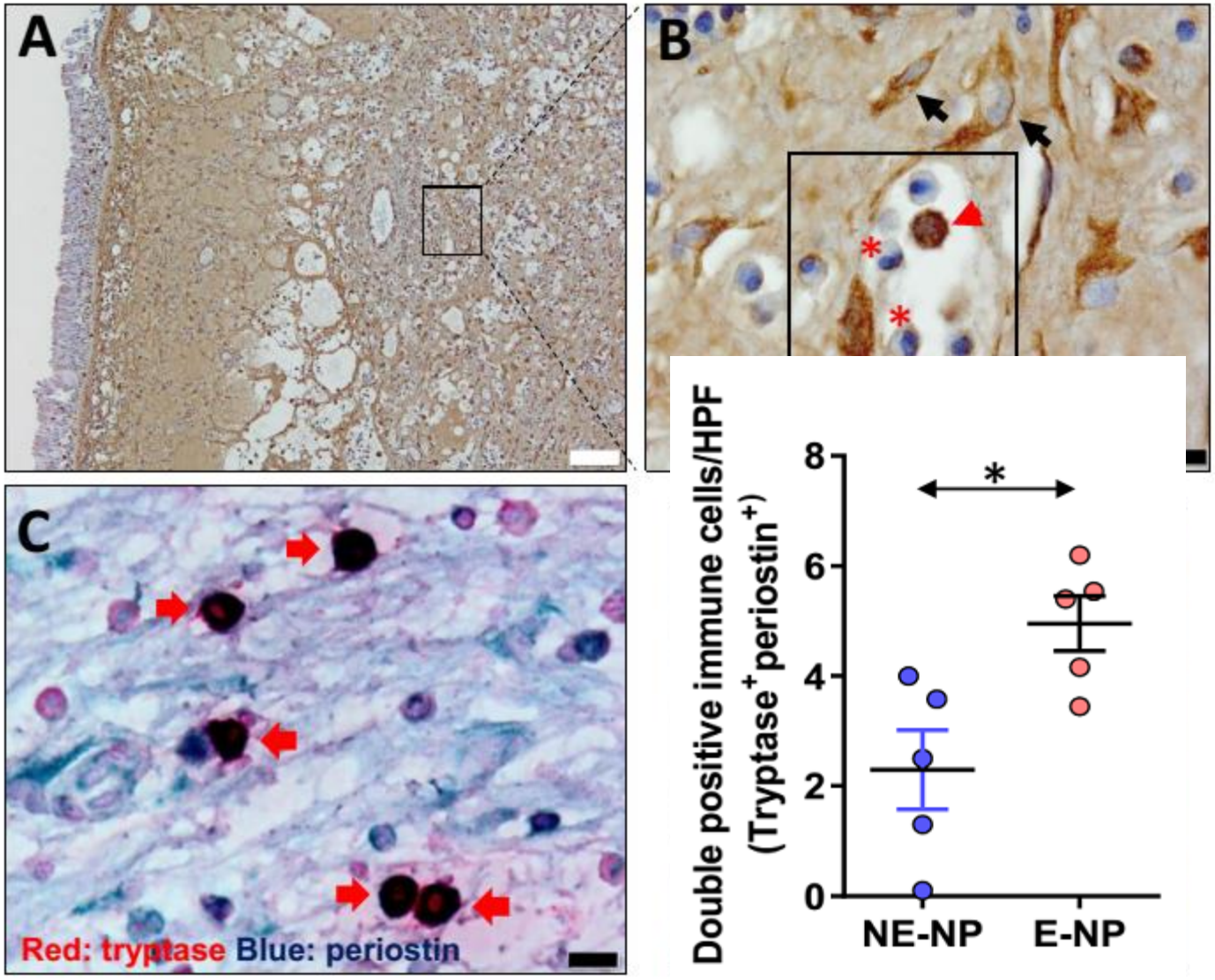






Cellular source of periostin

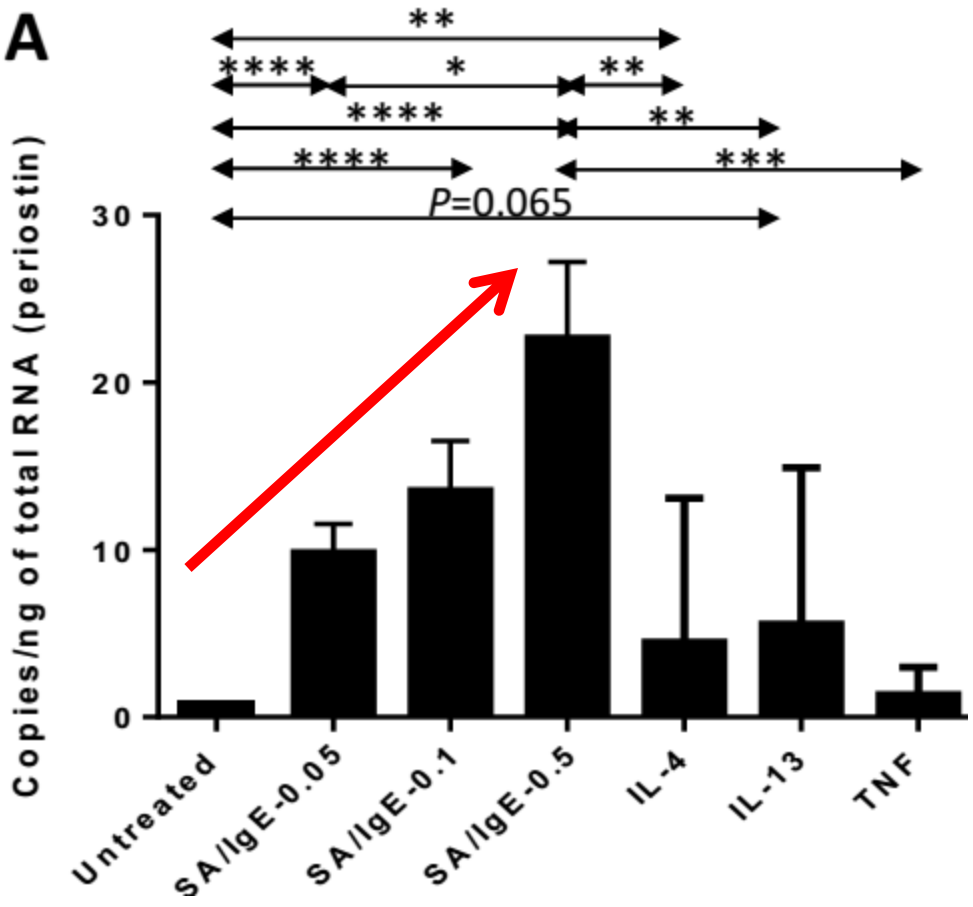
Result



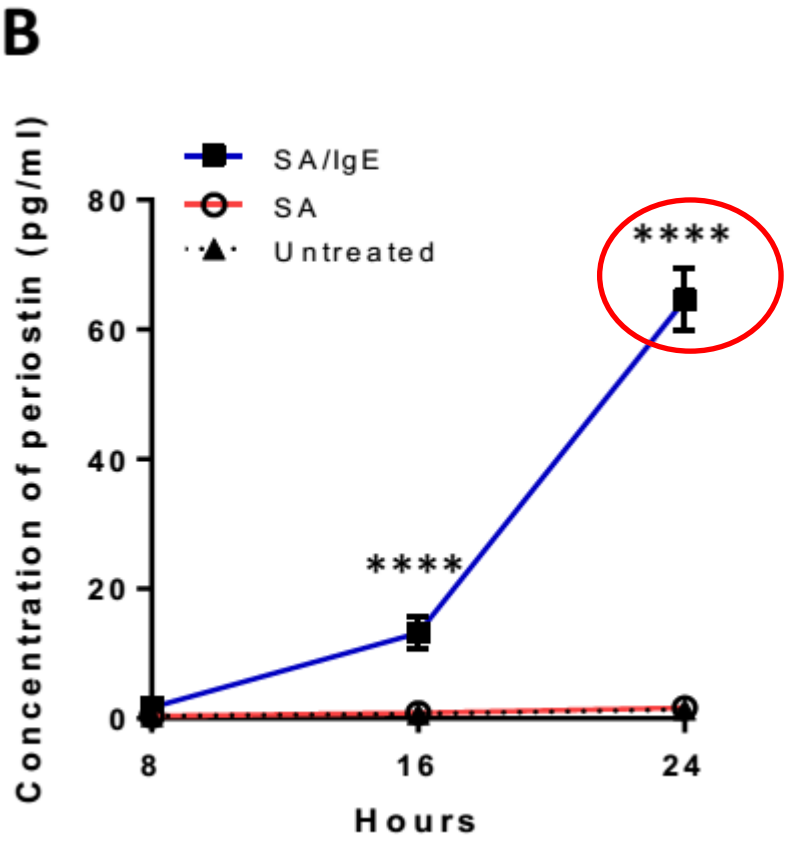
Periostin expression in human mast cell

Result

mRNA

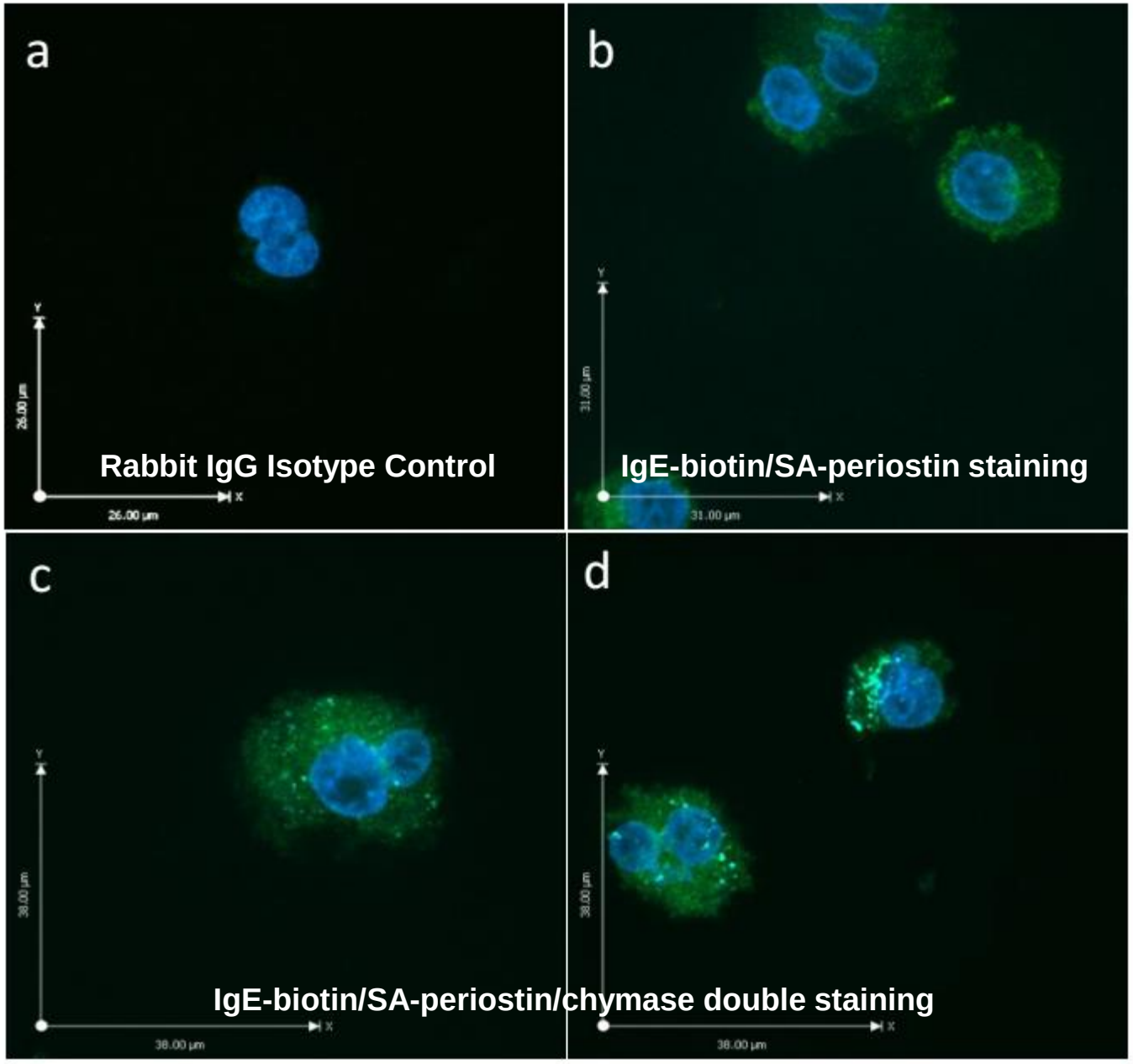


Protein



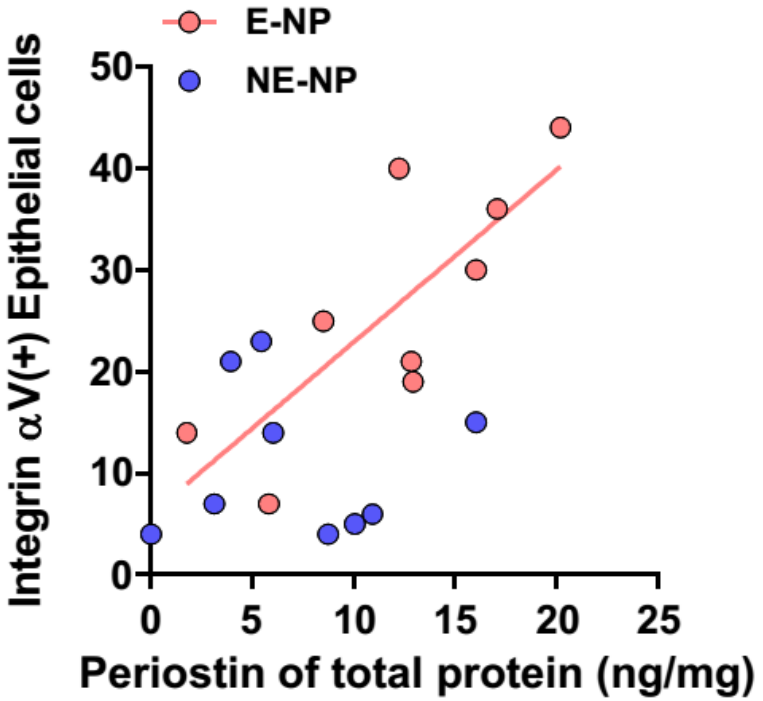
Periostin expression in human mast cell

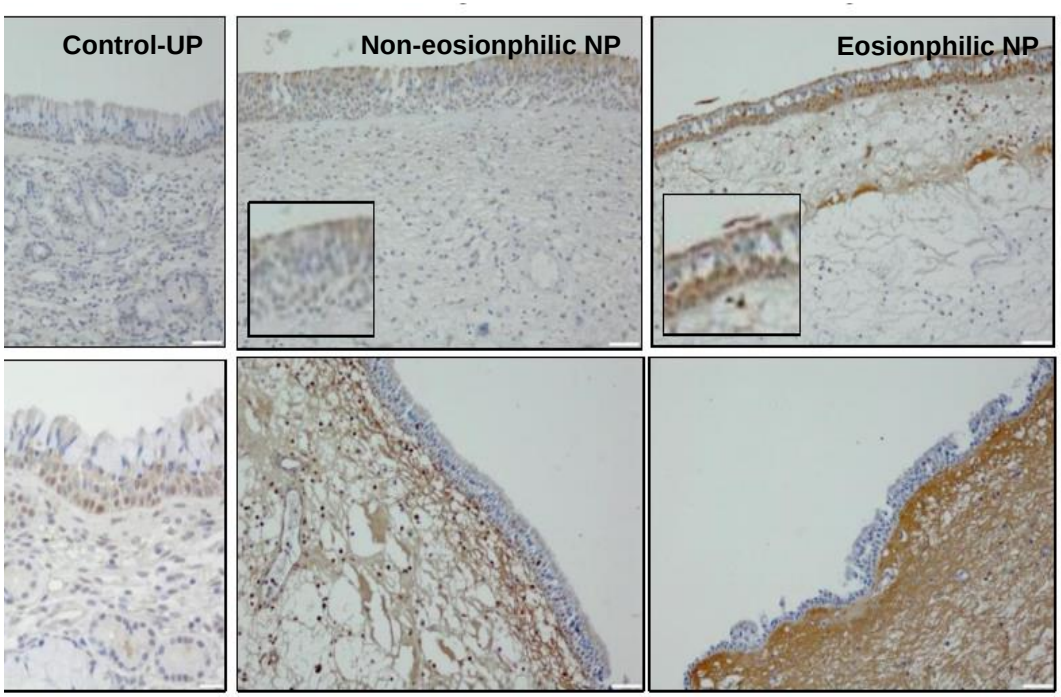
Result



Expression of periostin receptor (integrin aV)

Result

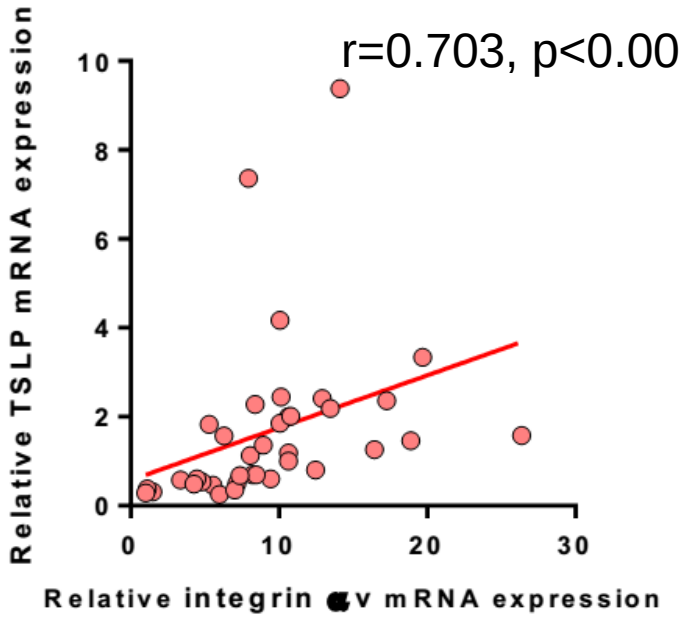


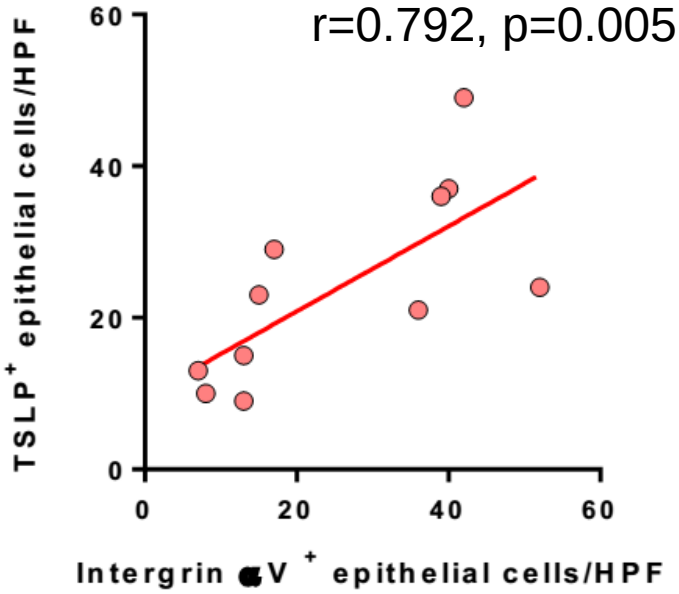


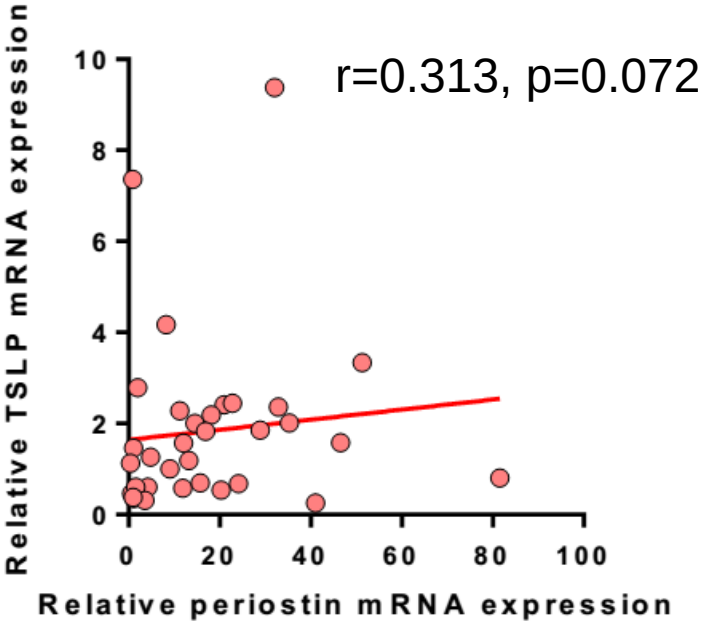
Correlation between periostin/integrin aV and innate Th2 cytokines

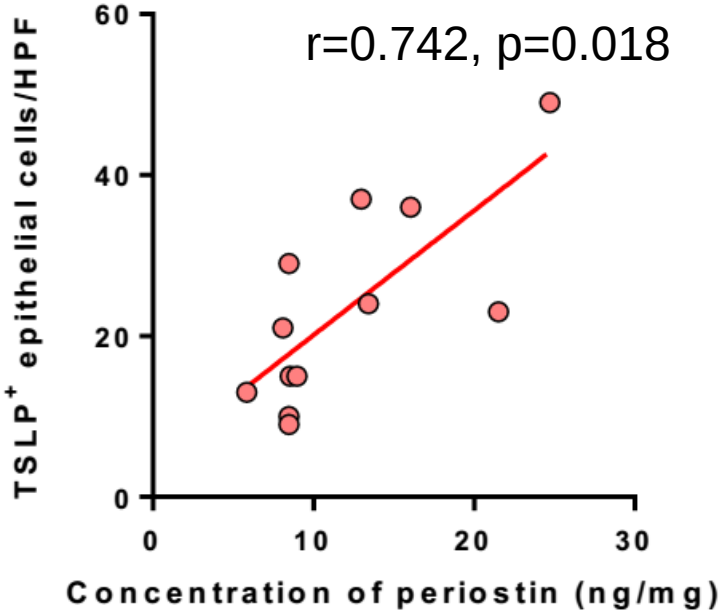
Result

TSLP



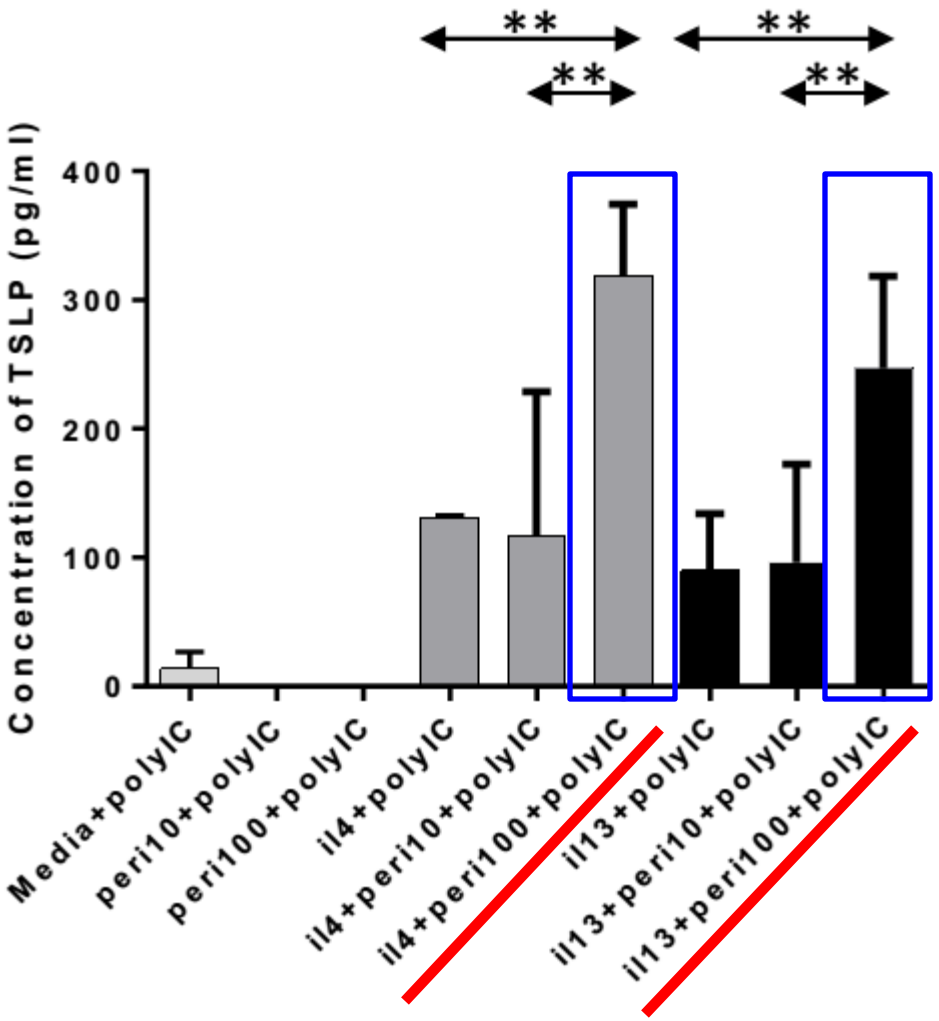


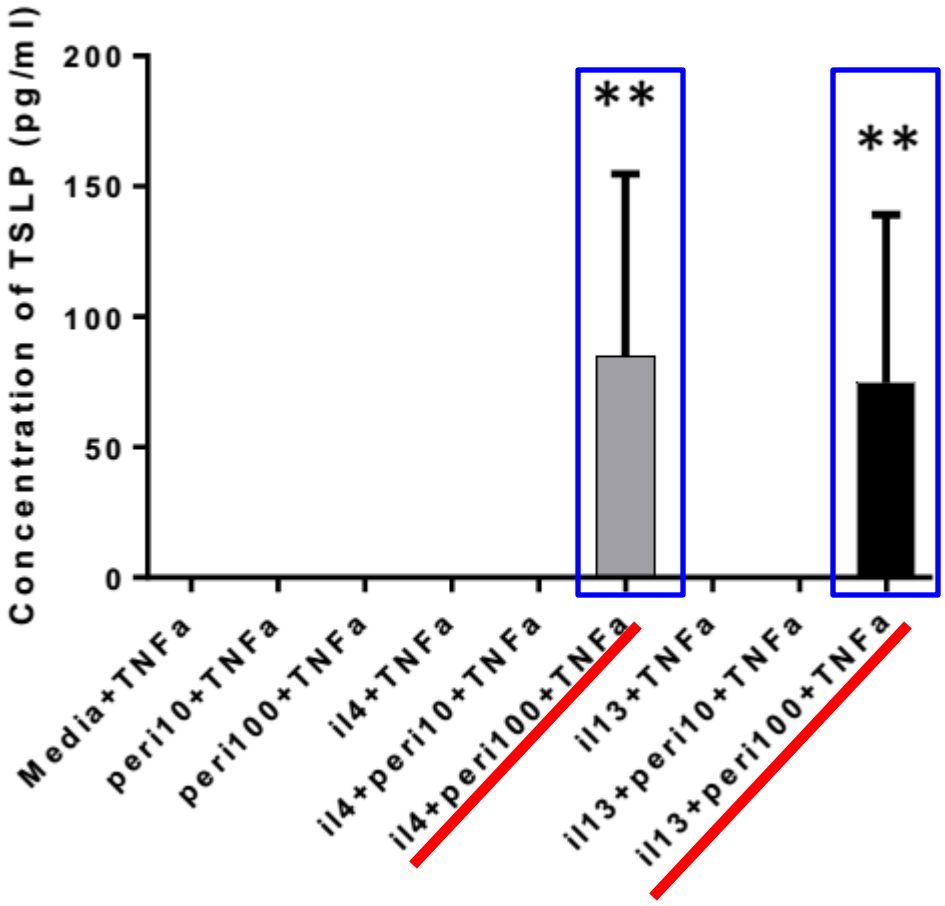




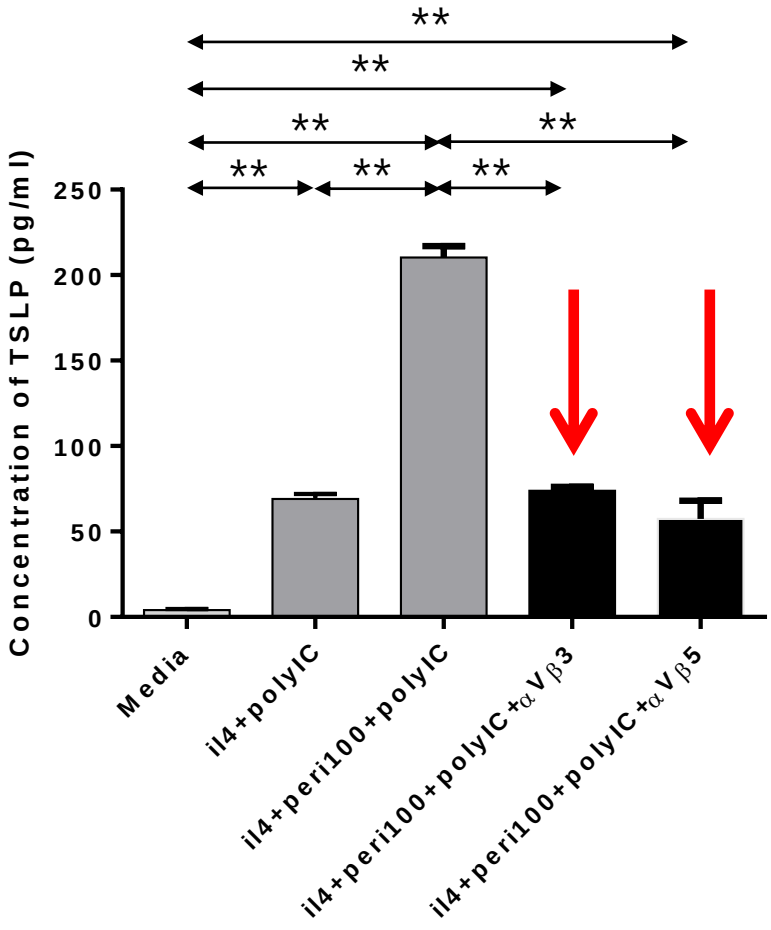
Periostin induced TSLP production in airway epithelium

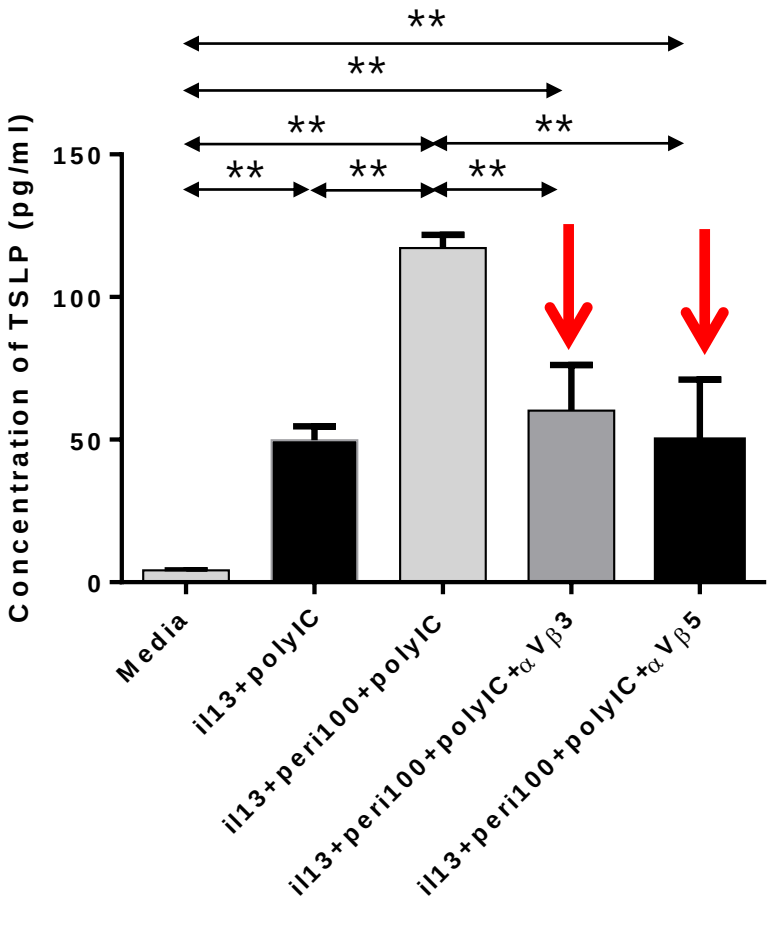
Result



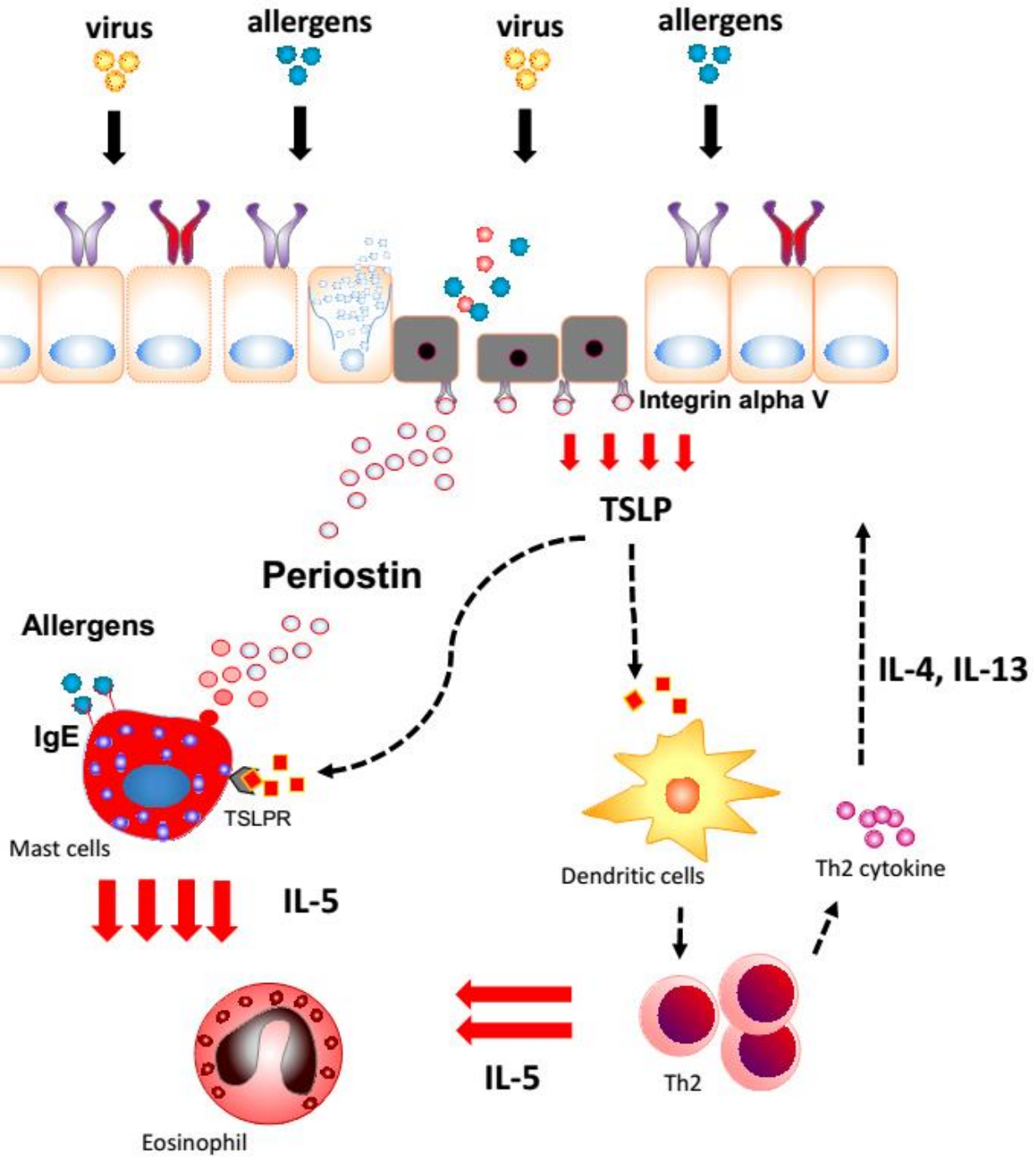


Periostin induced TSLP production in airway epithelium





Conclusion


virus
allergens
virus
allergens
Integrin alpha V
TSLP
Periostin
Allergens
IgE
TSLPR
Mast cells
IL-5
Dendritic cells
IL-4, IL-13
Th2 cytokine
IL-5
Th2
Eosinophil