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# Effect of Eosinophils in Purinergic Receptor P2X3 Expression in Mouse Sensory Neurons

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# Effect of Eosinophils on Purinergic Receptor $P2X_3$ Expression in Mouse Sensory Neurons

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## Introduction

- $P2X_3$ purinoceptors are activated by extracellular ATP released during cell stress.
- In asthma, sensitivity to inhaled ATP is increased.
- Airway eosinophilia, which is common in asthmatics, increases airway epithelial sensory nerve density.

## Research Question

**Do airway eosinophils increase $P2X_3$ expression in mouse sensory nerves?**

## Methods

Animals

1. WT: Normal level of eosinophils
2. PHIL: Transgenic absence of eosinophils
3. NJ16 (NJ1638 lineage): Transgenic chronic systemic eosinophilia
4. NJ17 (NJ1726 lineage): Transgenic chronic pulmonary eosinophilia

- Airway sensory ganglia and dorsal root ganglia (thoracic vertebrae 1-5) were labeled for $P2RX_3$ mRNA using RNAscope in situ hybridization and imaged using an ApoTome confocal microscope (40X, 1.3 N.A.).
- $P2X_3$ expression was determined by measuring the percentage of $P2X_3$ positive pixels within three, randomly assigned, non-overlapping 50x50 micron sections of neurons.
- Data was analyzed using one-way ANOVA tests.

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## Results

Figure 1: Nodose/Jugular Ganglia from WT and Chronic Airway Eosinophilic mice.
RED = $P2X_3$ mRNA

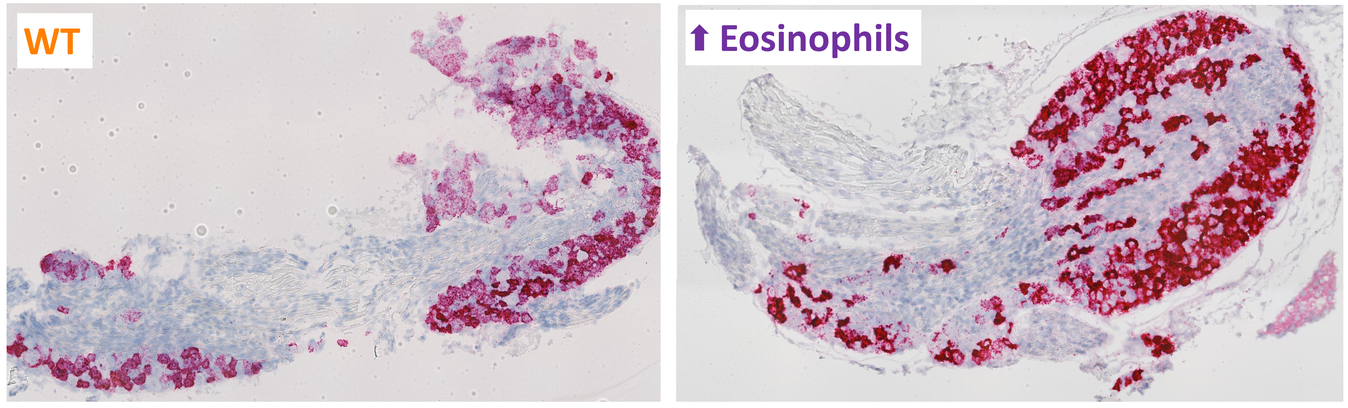



Figure 2: Dorsal Root Ganglia from WT and Chronic Airway Eosinophilic mice.
RED = $P2X_3$ mRNA

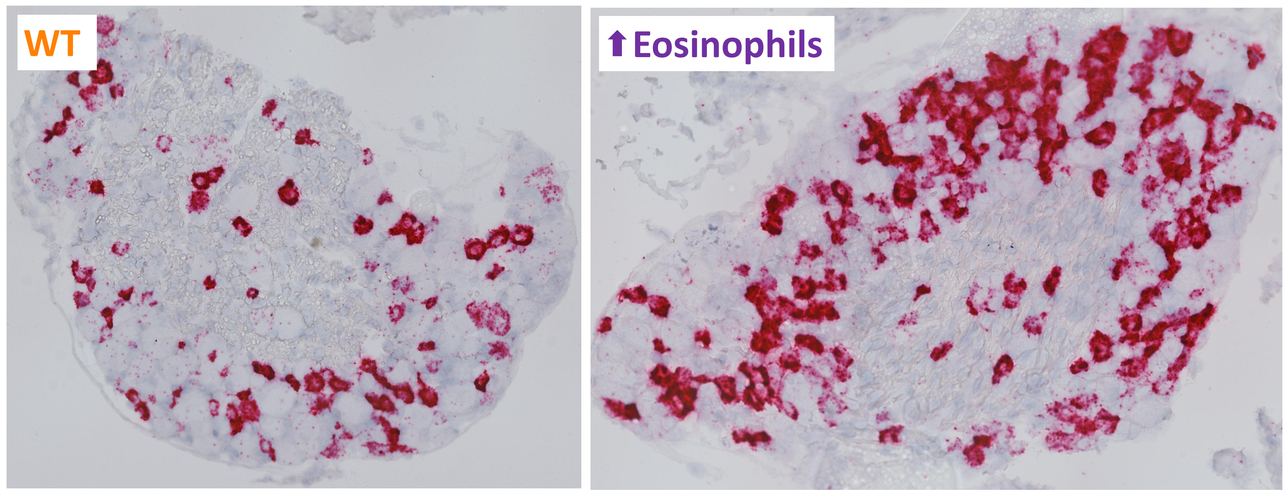



Figure 3: $P2X_3$ expression is increased in the nodose/jugular ganglia of mice with chronic eosinophilia

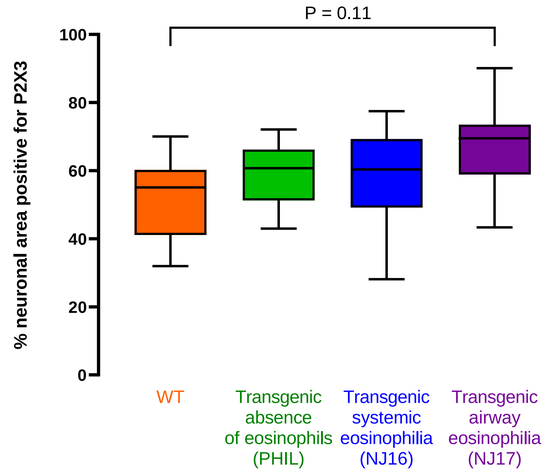
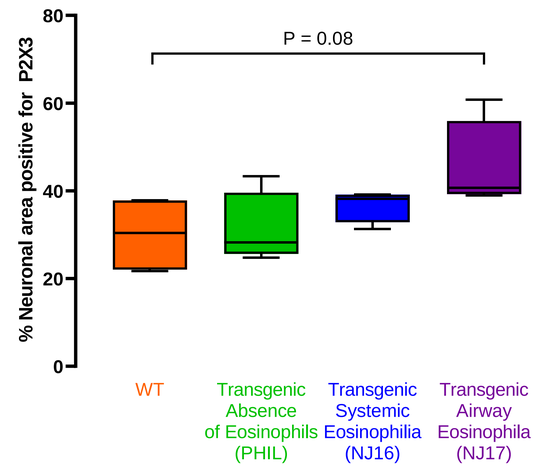



Figure 4: $P2X_3$ expression is increased in the dorsal root ganglia of mice with chronic eosinophilia




## Conclusions

- $P2X_3$ is highly expressed in airway sensory neurons.
- Eosinophils positively regulate sensory nerve $P2X_3$ expression.
- Eosinophils may increase neuronal ATP sensitivity in asthma.

Asthma Lab