Portland State University PDXScholar

Student Research Symposium

Student Research Symposium 2022

May 4th, 11:00 AM - 1:00 PM

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

Emily J. Mize Portland State University

Follow this and additional works at: https://pdxscholar.library.pdx.edu/studentsymposium

Part of the Life Sciences Commons Let us know how access to this document benefits you.

Mize, Emily J., "Effect of Eosinophils in Purinergic Receptor P2X3 Expression in Mouse Sensory Neurons" (2022). *Student Research Symposium*. 27. https://pdxscholar.library.pdx.edu/studentsymposium/2022/posters/27

This Poster is brought to you for free and open access. It has been accepted for inclusion in Student Research Symposium by an authorized administrator of PDXScholar. Please contact us if we can make this document more accessible: pdxscholar@pdx.edu.



Introduction

- P2X₃ 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 **P2X₃** 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.).
- P2X₃ expression was determined by measuring the Conclusions 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.

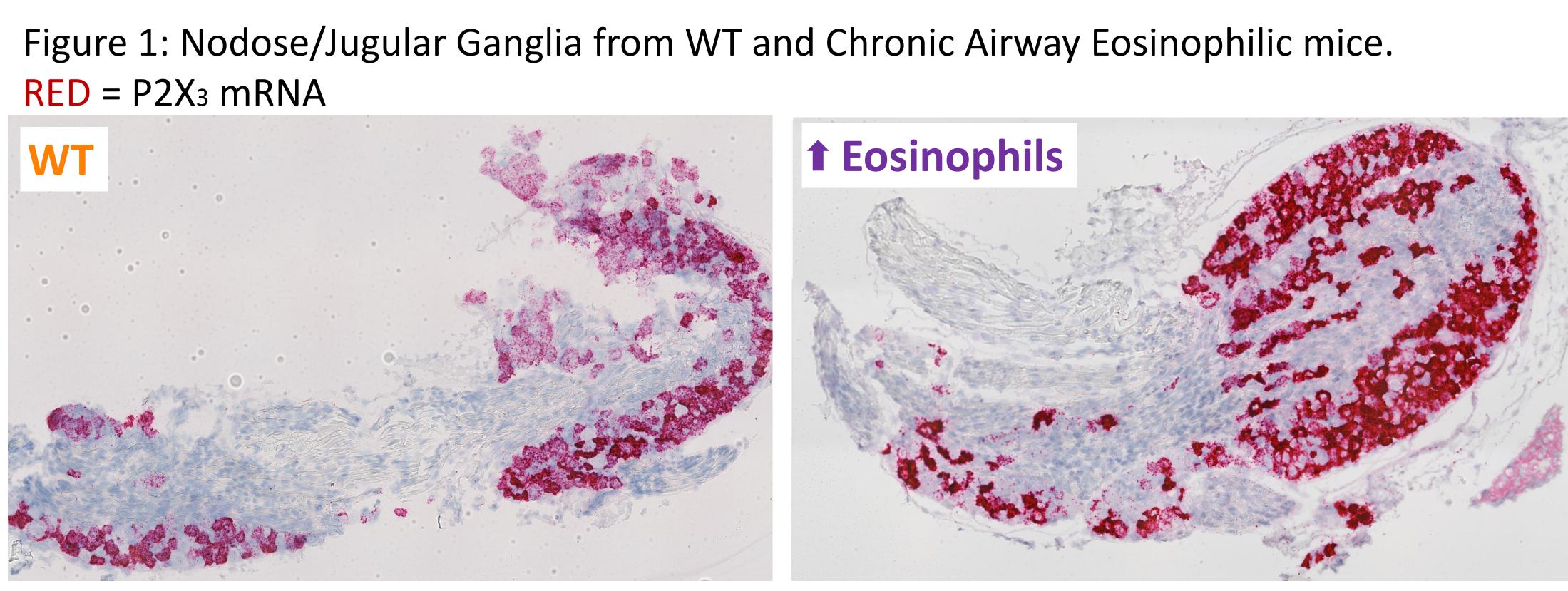
Funding

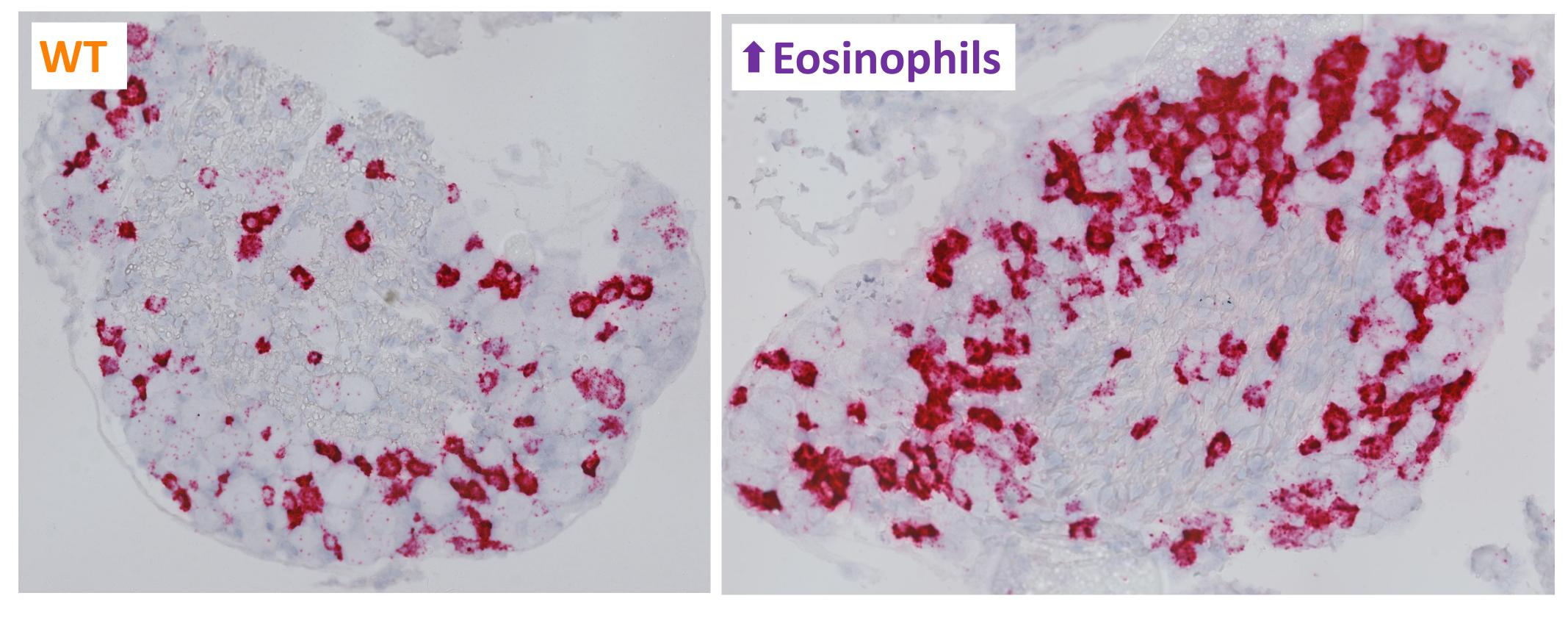
BUILD: Work reported in this poster was supported by the National Institutes of Health Common Fund and Office of Scientific Workforce Diversity under three awards UL1GM118964, RL5GM118963, and

TL4GM118965, administered by the National Institute of General Medical Sciences. The work is solely the responsibility of the authors and does not necessarily represent the official view of the National Institutes of Health.

HL155623 (MGD), AI152498 (DBJ), HL144008 (DBJ)

Results







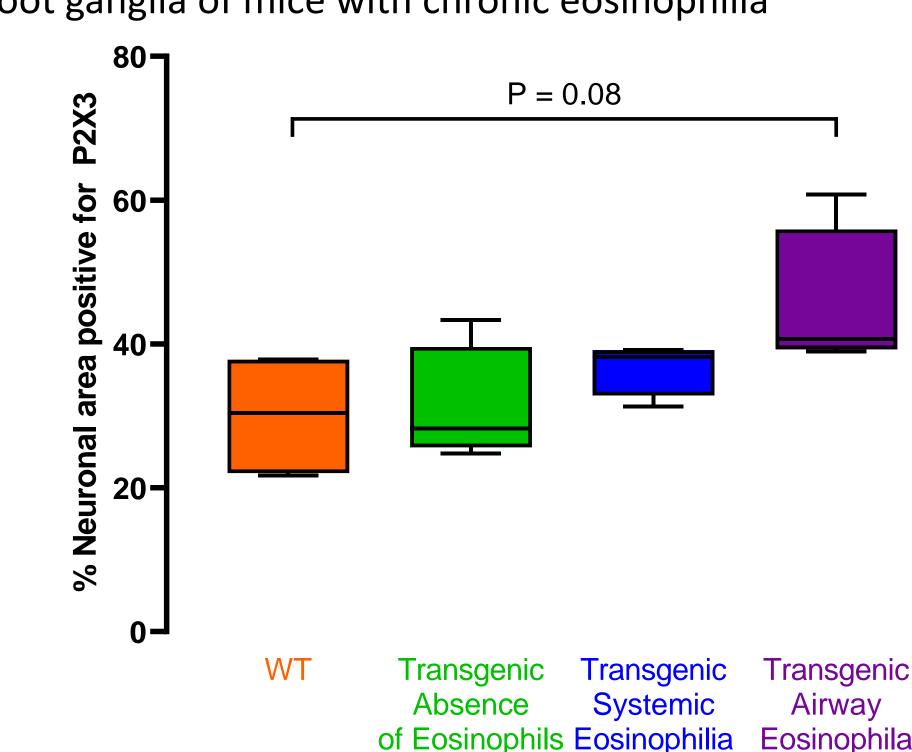


• P2X₃ is highly expressed in airway sensory neurons. • Eosinophils positively regulate sensory nerve P2X₃ expression. • Eosinophils may increase neuronal ATP sensitivity in asthma.

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

Emily J. Mize^{1,2}, Becky J. Proskocil¹, Allison D. Fryer¹, David B. Jacoby¹, Matthew G. Drake¹ ¹Oregon Health and Science University, Portland, OR 97239; ²Portland State University, Portland, OR 97201

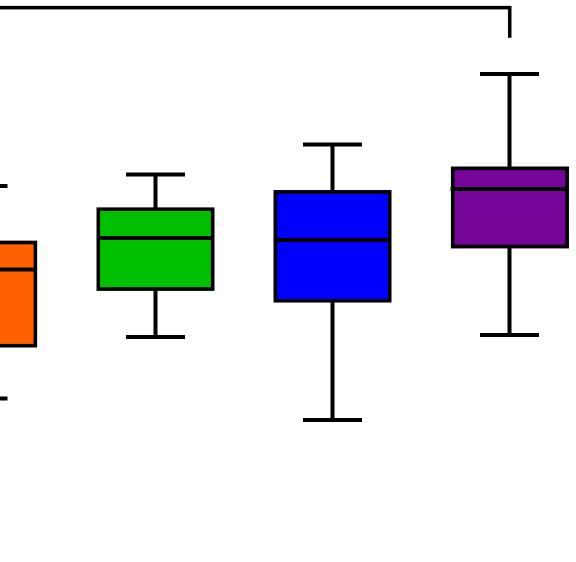
Figure 2: Dorsal Root Ganglia from WT and Chronic Airway Eosinophilic mice. $RED = P2X_3 mRNA$



40

Figure 3: P2X₃ expression is increased in the nodose/jugular ganglia of mice with chronic eosinophilia P = 0.1180-





eosinophilia (NJ17)

Figure 4: P2X₃ expression is increased in the dorsal root ganglia of mice with chronic eosinophilia



(NJ17)