# CHRD 2024: Abstract Submission Form

**Presenter Name**
Yvonne Paglicauan

**Presenter Status**
Undergraduate Students

**Role in the project**
Perform Experiments
Analyze Data
Write Abstract

**Research Category**
Basic Science

**Title**
Determining the Mechanism for EpOMEs- and DiHOMEs-Induced Contraction in Airway Smooth Muscle

**Background**
Asthma, the most common chronic disease in Canadian children, is characterized by breathing difficulties due to airway smooth muscle (ASM) contraction. Oxylipins are a diverse family of bioactive lipid mediators, some of which regulate ASM contraction. Lesser known oxylipins like epoxyoctadecamonoenoic acids (EpOME) and dihydroxyoctadecamonoenoic acids (DiHOME) are present in the lungs of people with asthma but have unknown impacts on ASM contraction. We have determined that EpOMEs and DiHOMEs trigger calcium release in ASM through extracellular channels, but it is unclear whether this leads to ASM contraction.

**Objective**
EpOMEs- and DiHOMEs-induced ASM contraction is dependent on extracellular channels, specifically transient receptor potential V1 (TRPV1).

**Methods**
Immortalized human ASM cells were grown to confluence and serum deprived for 5 days, then treated with 10μM of 9,10-EpOME/DiHOME and 12,13-EpOME/DiHOME. Exposures were conducted in buffer with or without calcium to test dependency of the response on extracellular calcium channels. AMG517 (10μM) was used to block TRPV1. Phosphorylated myosin light chain (p-MLC) was probed as a contractile biomarker via Western Blotting. Data were analyzed via two-Way ANOVA and GraphPad, with significance set at $p<0.05$.

**Results**
Treating cells with EpOMEs and DiHOMEs in calcium-containing buffer increased p-MLC abundance relative to control: 9,10-EpOME (1.7-fold, n=4), 9,10-DiHOME (1.3-fold, n=2), 12,13-EpOME (1.4-fold, n=7), 12,13-DiHOME (1.5-fold, n=7). Calcium-free buffer significantly reduced p-MLC abundance (two-way ANOVA, calcium $p<0.05$, Figure 1). Specifically, 9,10-EpOME (2.3-fold decrease, n=4), 9,10-DiHOME (3.3-fold decrease, n=2), 12,13-DiHOME (1.7-fold decrease, n=7) were significant on post-hoc analysis, but not 12,13-EpOME (1.3-fold decrease, n=7). Preliminary results (n=2) suggest that AMG517 reduces p-MLC abundance relative to vehicle: 12,13-EpOME (1.2-fold decrease), 12,13-DiHOME (2.4-fold decrease).

**Conclusion**
EpOMEs and DiHOMEs-induced contraction (p-MLC) is dependent on calcium flux through extracellular channels, possibly TRPV1. Understanding how these oxylipins regulate ASM contraction will support our understanding of their potential role in health and disease.

**Do you have a table/figure to upload?**
Yes

## Authors


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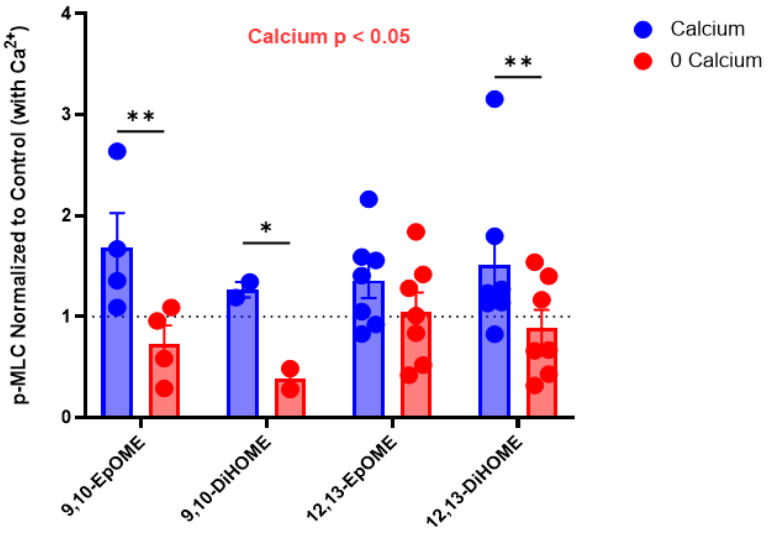


**Figure 1.** p-MLC abundance after addition of EpOMEs and DiHOMEs (10µM) to human ASM. Exposures were conducted in calcium-containing (blue) VS calcium-free (red) buffer. Dotted line indicates control response. *p<0.05.

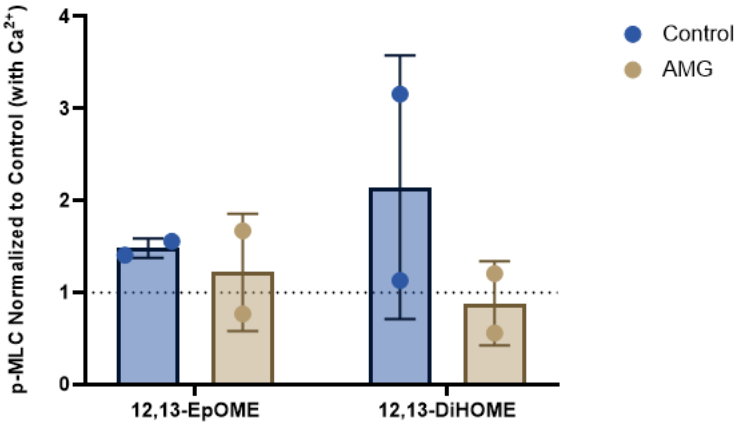


**Figure 2.** p-MLC abundance after addition of 12,13-EpOME/DiHOME (10µM) to human ASM. Cells were exposed to vehicle (blue) VS AMG517 (10µM, brown). Dotted line indicates control response.