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17TH ANNUAL CHILD HEALTH RESEARCH DAYS

Nutrition for a Changing World

The Science of Nourishing the Next Generation

CHRD 2021: Abstract & Poster Submission Form

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Research Category:

- Basic Science
- Clinical
- Community Health / Policy

What was your role in the project?

- Design
- Perform Experiments
- Analyze Data
- Write Abstract

Presenter Status:

- Undergraduate Students
- Masters Student
- PhD Student
- Post-Doctoral Fellows
- Residents
- Non-Trainee

Title

Does 19-HETE Reduce Human Airway Smooth Muscle Cell Proliferation?

Background

Hydroxyeicosatetraenoic acids are a family of lipid signaling molecules important in coordinating communication between cells. Airway smooth muscle (ASM) cells make a variety of HETEs. Specifically, including 19-HETE, which signals through the prostacyclin receptor. Activation of the prostacyclin receptor can modulate cellular proliferation, but whether 19-HETE alters cellular proliferation in ASM is currently unknown. Asthma, characterized by an increase in ASM around the airways, affects millions of Canadian children. Understanding if 19-HETE can reduce ASM cell proliferation may provide opportunities to use HETEs for asthma treatment. The objective is to measure the effect of 19-HETE on HASM cell proliferation.

Objective

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Methods

ASM immortalized with human telomerase (hTERT-ASM) (n=3) were seeded at 45,000 cells per well. Cells were pre-exposed to 1 μ M cicaprost or 19-HETE for 2 hours. DMSO was used as a vehicle control. Cells were then given 5% serum media to stimulate proliferation for 5 days. Cell numbers were assessed with traditional hemocytometer cell counts and AlamarBlue metabolic assay as a proxy for cell number. Data is reported as a percent reduction in proliferation (mean \pm SD) and significance determined as $p < 0.05$ in one-way ANOVA with Dunn's post-test.

Results

AlamarBlue results were mixed, potentially due to reduced metabolic activity in cells when confluence is reached. Cell count data showed a 39.5 \pm 24.1% reduction in cell number with cicaprost ($p < 0.05$) and a 17.1 \pm 10.3% reduction in cell number with 19-HETE ($p = 0.06$).

Conclusion

Activation of the prostacyclin receptor in ASM can reduce cell proliferation. 19-HETE treatment is trending towards an inhibitory effect, supporting the hypothesis. However, more data is needed for a definitive conclusion. Future research should assess the dose-dependent effect of 19-HETE on proliferation.

Authors

- For each author, please click "[+] Add Item" and provide the author's information

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