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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

MicroRNA-200b Deficiency Exacerbates House Dust Mite Induced Airway Dysfunction in Female Mice

Background

Asthma is the most prevalent chronic disease among children. MicroRNAs, which control gene expression like a dimmer switch on a light, may be important in the pathophysiology and treatment of asthma. Micro RNA-200b (miR-200b) abundance is reduced in people with asthma and delivery of a miR-200b mimetic alleviates allergic inflammation in mice. However, it is unknown whether miR-200b deficiency directly contributes to asthma pathophysiology, and whether the impact of this deficiency is related to sex.

Objective

Mice lacking miR-200b will have increased reactivity to house dust mite (HDM) challenge, which will be influenced by mouse sex.

Methods

MiR-200b transgenic C57BL/6 mice were exposed to house dust mite (HDM) to induce airway inflammation and airway dysfunction. Changes in lung function and methacholine responsiveness were measured using the Scireq flexiVent. Total cells in the lung lavage were counted as a marker of inflammation. Knockout (KO) and wild-type (WT) animals were compared in a sex-specific manner. Results were analyzed with a two-way ANOVA. Significance set at $p < 0.05$.

Results

HDM challenged KO female mice had elevated baseline airway resistance compared to HDM challenged WT mice. Female KO animals also had elevated methacholine responsiveness following HDM challenge, but no change in sensitivity. No differences in lung function were seen in male KO mice after HDM challenge. There were also no significant difference in total inflammatory cell count in WT and KO animals.

Conclusion

Mir-200b deficiency increases airway resistance in female mice following HDM challenge, but not male mice. Therefore, loss of miR-200b may contribute to asthma pathophysiology of asthma in a sex-specific manner. Analysis of cytokine array data from the lung lavage samples, more lung function data and cell counts will be done further in this project.

Authors

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

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