CHRD 2021: Abstract & Poster Submission Form

Submitter Name

Alaina
First

Bagan
Last

Email

bagana@myumanitoba.ca

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

Flow Cytometry for Immunophenotyping of Lung Inflammation in a Pre-Clinical Murine Model of Allergic Asthma

Background

Asthma is the third most common chronic disease in Canada, affecting 12% of Canadian children. For pre-clinical research, animal models reflecting key clinical features are needed for new therapeutic development.

Objective

We proposed to optimize a protocol for efficient immunophenotype analysis using flow cytometry to assay immune cells in bronchoalveolar lavage fluid (BALF) and lung using a murine model of allergic asthma.

Methods

We used a house dust mite (HDM)-challenge murine model in which BALB/c mice (female, 8-10 weeks) were randomized into groups (n=6) for 2-weeks (5 days/week) HDM challenge (25 ug, intranasal instillation) or saline challenge (control). BALF and lung samples from each animal were collected 48 hrs after final challenge and assessed by 5-colour immunophenotyping with an Attune-NxT flow cytometer. We used two antibody panels for cell specific markers of Granulocytes (eosinophils, neutrophils, alveolar and interstitial macrophages) and Lymphocytes (CD3+, CD4+, CD8+, and B cells). The % frequency of live cells for each cell sub-type was determined using Flow-Jo. Data were analyzed by two-tailed t-test.

Results

For the Granulocyte panel, HDM challenge induced significant accumulation of eosinophils (38-fold in BALF and 8-fold in lung) and neutrophils (2-fold in BALF). Alveolar macrophages were marginally lower (17% in BALF and 3% in lung) in allergen challenged mice, whereas the fractional abundance of interstitial macrophages was similar in BALF (~1%) and lung tissue (~4%) from allergen- and saline-challenged mice. Lymphocyte panel analysis showed that allergen challenge significantly increased B cells (4-fold), CD3 cells (5-fold), and CD4 cells (7-fold) in BALF samples, but these changes were not evident in lung tissue.

Conclusion

Immunophenotyping by flow cytometry is an effective means of broadly and rapidly assessing immune cells in the mouse lung. Moreover, it discriminates the immune response to allergen challenge in lung tissue and the airway compartment.

Authors

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

Name	Email	Role	Profession
Alaina Bagan	bagana@myumanitoba.ca	Presenting Author	Undergraduate
Jignesh Vaghasiya	vaghasij@myumanitoba.ca	Co Author	Graduate
Sujata Basu	Sbasu@chrim.ca	Co Author	Graduate
Andrew Halayko	Andrew.Halayko@umanitoba.ca	Co Author	Full Professor