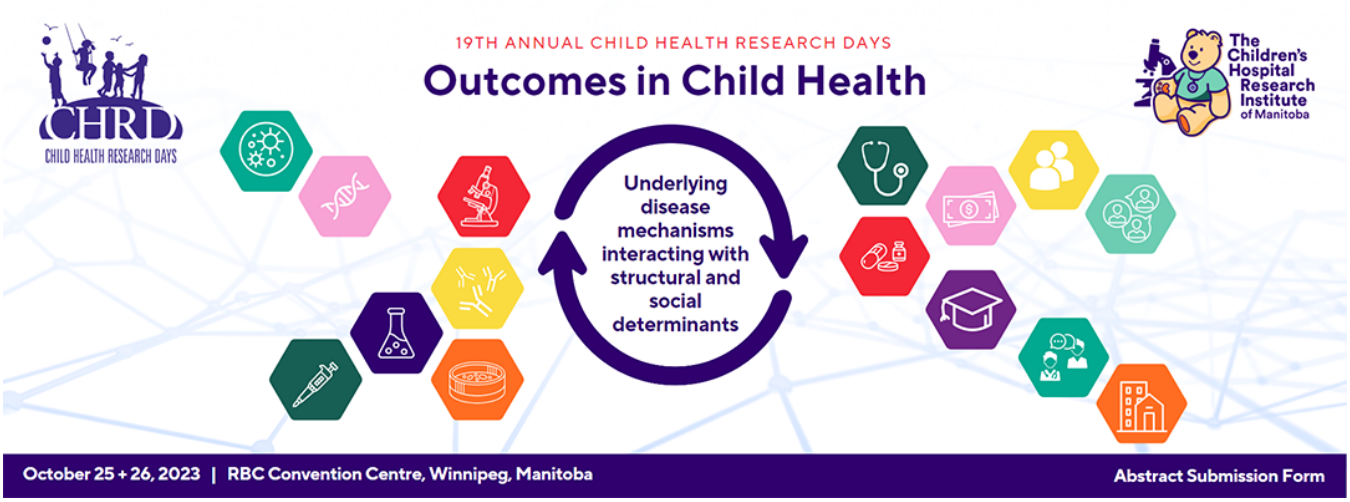

CHRD 2023: Abstract Submission Form

Submitter Name
Huda Fatima Rajani

Presenter Name
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Presenter Status
Masters Student

Research Category
Basic Science

Role in the project
Perform Experiments
Analyze Data
Write Abstract

Title
Regulation and role of Semaphorin 3E in epithelial mesenchymal transition in allergic asthma

Background
Standard asthma therapies include corticosteroids, long acting β2 agonists, and leukotriene antagonists. While these therapies effectively reduce inflammation, they fail to prevent and reverse airway remodeling. We previously showed that bronchial epithelial cells are major producers of Semaphorin3E (Sema3E) in the airways and its expression is downregulated following allergen challenge in mice and in bronchial biopsies of severe asthmatics compared to healthy donors. Epithelial mesenchymal transition (EMT) is considered a major mechanism of remodeling in asthma. Our lab has revealed the role of Sema3E/plexinD1 axis in downregulating airway hyperresponsiveness, collagen deposition, and excessive mucous production in allergic asthma. However, the role of this pathway in EMT is not clear

Objective
Investigate the regulation of EMT with Sema3E and whether Sema3E inhibits the reprogramming of primary human epithelial cells that are associated with EMT in allergic asthma.

Methods
Human primary bronchial epithelial cells (BEC) (N=3), obtained from healthy controls were grown under air liquid interface (ALI) and submerged cell culture. Following 28 days of ALI, these were stimulated with HDM, TGF-β, Sema3E and combination of Sema3E and HDM and Sema3E and TGF-β and RNA was obtained to evaluate the expression of EMT markers like E-cadherin, TWIST, SNAI, vimentin, SMAD and ZEB1. The same was repeated for primary BEC in submerged cell culture. The cells grown on transwells are subjected to proteomic analysis to obtain differentially expressed genes upon HDM and TGF-β

stimulation and Sema3E treatment.

Results
TGF-β significantly upregulates the expression of Sema3E in immortalized lung epithelial cells, A549. Furthermore, we expect to see an increase in mesenchymal markers upon TGF-β and HDM and downregulation of those with the treatment of Sema3E.

Conclusion
TGF induces Sema3E expression in lung epithelial cells suggesting a negative autocrine loop that may involve regulation of EMT markers in BECs.

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