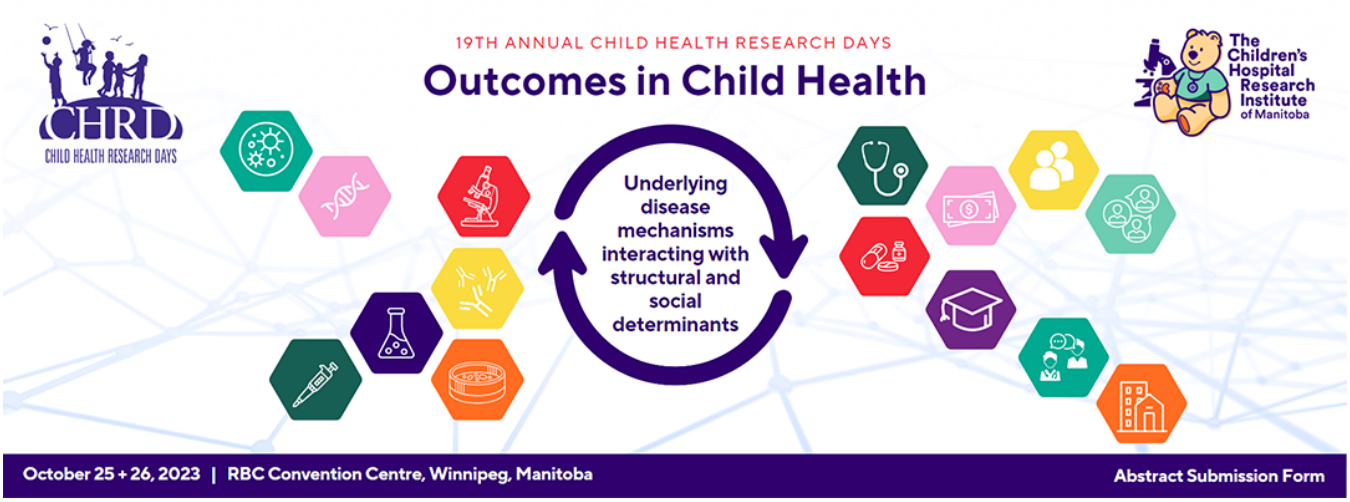

CHRD 2023: Abstract Submission Form

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Presenter Name
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Presenter Status
Masters Student

Research Category
Basic Science

Role in the project
Design
Perform Experiments
Analyze Data
Write Abstract

Title
THE IMPACT OF SEMA3E/PLEXIND1 DEFICIENCY ON IL-10 EXPRESSION IN MACROPHAGES

Background
Asthma is a chronic inflammatory disease of the lungs, affecting more than 300 million individuals worldwide. It has numerous phenotypes, including airway inflammation, remodelling, and hyperresponsiveness. Our lab has data demonstrating that semaphorin3E and its receptor plexinD1 regulate critical features of allergic inflammatory response and remodelling in the airways. We recently found that a deficiency of the plexinD1 receptor in interstitial macrophages (IMs) affects the IL-10 pathway, limiting the host immune response.

As IMs are replenished from the bone marrow, it is essential to investigate whether Sema3E/plexinD1 in bone marrow-derived macrophages (BMDMs) impact IL-10 expression. Further investigation is warranted to evaluate molecular signalling mediated by the Sema3E/plexinD1 axis and how this affects macrophage function.

Objective
Sema3E/plexinD1 deficiency in BMDMs down-regulates airway allergic disease phenotypes via the IL-10 pathway.

Methods
Sema3E knockout mice and WT mice were subjected to an HDM acute allergen challenge. Bone marrow cells were collected, cultured, and stimulated with LPS or vehicle. IL-10 levels in the supernatant were

measured using mesoscale and ELISA. Relative IL-10 expression was investigated using Real-time PCR. In addition, macrophage cell-specific plexinD1 KO mice (CX3CR1creERT2-Plxnd1fl/fl) bone marrow cells were cultured, followed by tamoxifen treatment and LPS stimulation. ELISA and PCR were used to quantify IL-10 levels.

Results
At baseline, Sema3E KO BMDMs display a reduction in IL-10 levels; however, these levels significantly increase following HDM exposure. Sema3E KO and WT BMDMs exposed to HDM before LPS exposure demonstrated a significant decrease in IL-10 levels. IL-10 expression increased in Sema3E KO and plexinD1 KO BMDMs following exposure to LPS.

Conclusion
Our data provides evidence for adaptive features in BMDMs and demonstrates that the Sema3E/plexinD1 pathway regulates IL-10 in macrophages, shaping the early immune response.

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