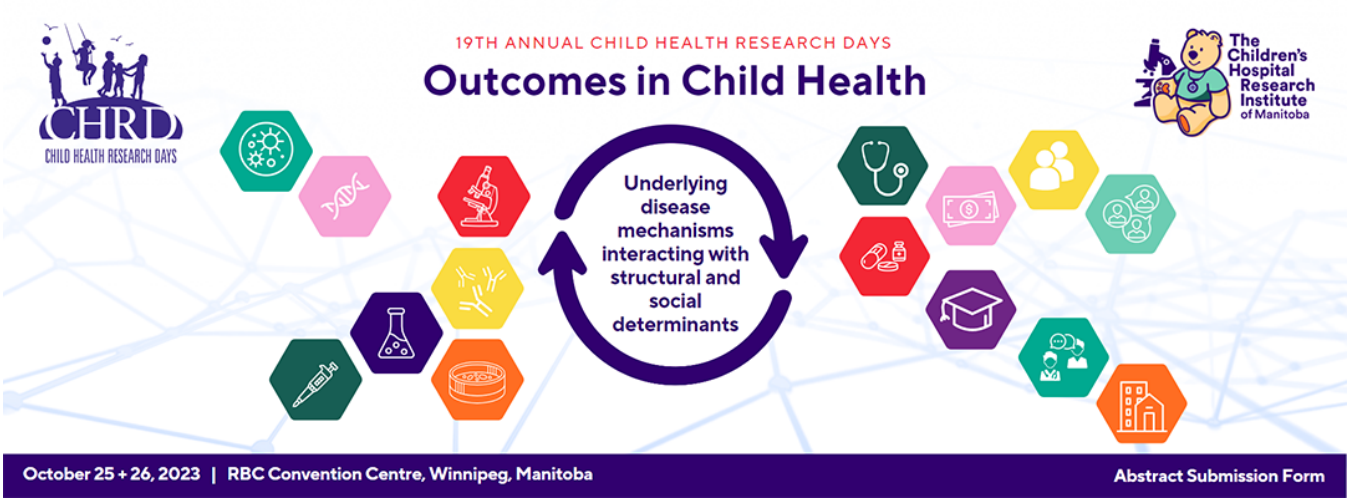

CHRD 2023: Abstract Submission Form

Submitter Name
Noor Imran

Presenter Name
Noor Imran

Presenter Status
Undergraduate Students

Research Category
Basic Science

Role in the project
Perform Experiments
Analyze Data
Write Abstract

Title
Neuronal and glial-specific phenotypes for conserved 22q11.2 deletion syndrome genes in Drosophila.

Background
22q11 deletion syndrome (22q11DS) is the most common microdeletion syndrome in humans, affecting up to 1 in 3,000 live births. 22q11DS is associated with many behavioural and psychiatric complications such as SCZ, autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), anxiety disorder, as well as intellectual and learning disabilities. About 70% of the genes implicated in the deletion are conserved in Drosophila melanogaster, offering an opportunity to determine the role of DS genes in the nervous system.

Objective
To determine the role of 22q11DS genes in neurons and glia in Drosophila.

Methods
We are using the well-established GAL4/UAS system to knock down 31 fly genes corresponding to 35 genes in the human 22q11.2 locus. We crossed 68 independent UAS-RNAi(interference) lines to neuronal-specific (nSyb) or glial-specific (Repo) GAL4 lines for tissue-specific knockdown. In the resulting offspring of the correct genotype, we assessed lethality, motor function (climbing), seizure-sensitivity (bang-sensitivity) and lifespan. All experiments were performed at 25ºC, with a minimum sample size of 10 per genotype, per sex.

Results
Our preliminary results indicate that RNAi-mediated knockdown of fly Rbp (human RIMBP3, RIMP3B,

RIMP3C) or Pi4KIIIα (PI4KA) caused lethality when knocked down in either neurons or glia indicating they are essential in flies. An additional five genes were identified as being either essential in neurons Med15 (MED15), sea (SLC25A1), and Snap29 (SNAP29) or glia Ufd-like (UFD1L) and CG1812 (KLHL22), but not both. For viable flies, lifespan and behavioural analysis are ongoing. Most genes fail to cause apparent phenotypes (climbing, bang-sensitivity, and lifespan) when knocked down in the nervous system.

Conclusion
Nervous system loss of Rbp (RIMBP3, RIMP3B, RIMP3C) or PI4KIIIalpha (PI4KA) is essential for the organism's development. Future studies will examine essential genes in the developing murine nervous system, and drugs will be explored for eventual translation to child health.

Authors

Name	Email	Role	Profession
Noor Imran	imrann@myumanitoba.ca	Presenting Author	Other
Alondra Griffiths	Alondra.Griffiths@umanitoba.ca	Co Author	Other
Bara Bashir	bashirb@myumanitoba.ca	Co Author	Other
Danica Dobson	dobsond1@myumanitoba.ca	Co Author	Other
Paul Marcogliese	Paul.Marcogliese@umanitoba.ca	Co Author	Assistant Professor
Robert Beattie	Robert.Beattie@umanitoba.ca	Co Author	Assistant Professor