

CHRD 2024: Abstract Submission Form

Presenter Name

Runqi Lin

Presenter Status

Masters Student

Role in the project

Design
Perform Experiments
Analyze Data
Write Abstract

Research Category

Basic Science

Title

Investigating the antiviral mechanisms of disulfiram against respiratory syncytial virus infection

Background

Accounting for over 2% of all deaths of children under 5 years old, respiratory syncytial virus (RSV) poses significant burdens to global pediatric health. Children born preterm or with chronic lung diseases have an increased risk of developing severe RSV infection. Despite this, there is a lack of safe and effective antiviral treatments against RSV for young children. Disulfiram is an FDA approved drug used to treat alcoholism that was shown to inhibit a proinflammatory mode of cell death, called pyroptosis, which has been associated with immunopathology.

Objective

The goal of this project is to investigate the potential antiviral mechanism of disulfiram against RSV. We hypothesize that disulfiram has antiviral and protective effects against RSV infection in vivo by inhibiting pyroptosis and inflammation.

Methods

The baseline antiviral and inflammatory effects of disulfiram will be evaluated by treating mice with disulfiram or vehicle in the absence of infection. Mice will be euthanized, bronchoalveolar lavage (BAL) will be collected for cytokine analysis and differential cell counting. Lung tissue will be used to determine pyroptosis related protein expression by western blot; and lung RNA will be extracted for interferon stimulated genes expression and kinome analysis.

Disulfiram's antiviral and protective effects against RSV infection will be evaluated by infecting BALB/c mice with RSV, treating with either vehicle or disulfiram prophylactically or therapeutically. Use of anti-IFNAR will help to determine type 1 interferon's role in disulfiram-mediated RSV protection. Mice will be weighed daily and euthanized on day 5 post infection. BAL will be collected for cytokine analysis and differential cell counting, lung will be removed and stained for RSV related immunopathology. Lung homogenates will be used to determine RSV viral load via plaque assay.

Results

N/A

Conclusion

This project could potentially present disulfiram as a safe and effective treatment option for RSV in children.

Do you have a table/figure to upload?

No

Authors

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