CHRD 2024: Abstract Submission Form

Presenter Name
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Presenter Status
Masters Student

Role in the project
Perform Experiments
Analyze Data
Write Abstract

Research Category
Basic Science

Title
Effects of neomycin on neuromast cells and taste buds regeneration and development; Insights from Mexican tetra (Astyanax mexicanus).

Background
Neomycin is a broad spectrum antibiotic which is not widely used due to its negative adverse effects on the human body. It comes from a group of aminoglycosides, a family of antibiotics whose molecular structure interferes with protein synthesis, causing translational errors disrupting cell function and replication. Neomycin specifically has been shown to be ototoxic, causing damage to sensory hair cells of the vestibular and auditory system within humans. Fish models like the Mexican tetra (Astyanax mexicanus) contain similar types of hair cells called neuromast cells, useful for detecting water movement and currents in their surroundings located on their surface, concentrated within the lateral lines of the fish.

Objective
Due to Neomycins' cytotoxic effects on hair sensory cells it's been hypothesized that neomycin will have similar effects on neuromast cells, as well as cytotoxic effects upon the taste buds which has not been tested before.

Methods
This was tested through treating 20 day old Mexican tetra surface fish with 500uM Neomycin for 2 hours, and taking samples from time points 4, 12, 24 and 48 hours post antibiotic exposure.

Results
As 2-[4-(dimethylamino)styryl]-N-ethylpyridinium iodide (DASPEI) acts as a mitochondrial marker for live cells, post antibiotic exposure staining with DASPEI has shown a decrease in fluorescence within the lateral lines, indicating damage within the area containing neuromast cells and taste buds through cell death.

Conclusion
Future work aims to perform sagittal sectioning, confocal microscopy as well as PCR to obtain quantitative data and verify our hypothesis. While trying to establish Mexican tetra an organism for ototoxic studies in the field of auditory science.

Do you have a table/figure to upload?
No

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