

LINKING BEHAVIOUR DISRUPTION TO EPIGENETICS, TRANSCRIPTOMICS AND OXIDATIVE STRESS IN JUVENILE SEABASS (*DICENTRARCHUS LABRAX*) EXPOSED TO CADMIUM AND CIPROFLOXACIN

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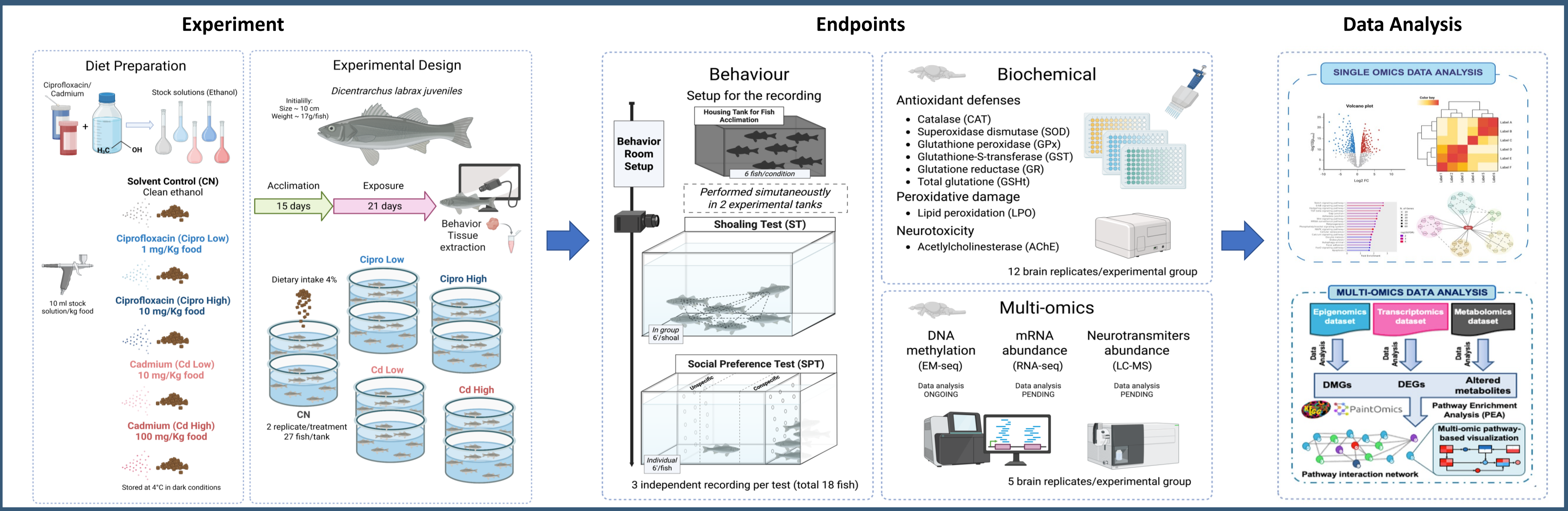
Background

Environmental contamination by heavy metals and pharmaceuticals poses significant risks to marine ecosystems, as they can alter the behaviour and survival of aquatic organisms. Cadmium (Cd) is a heavy metal recognized for its high neurotoxicity even at low concentrations such as those found in natural ecosystems [1]. Ciprofloxacin (Cipro) is a fluoroquinolone antibiotic. Increasingly detected in aquatic environments, it could alter microbial communities, affecting the gut health of fish and interfering with neuronal functions through the microbiota-gut-brain axis [2].



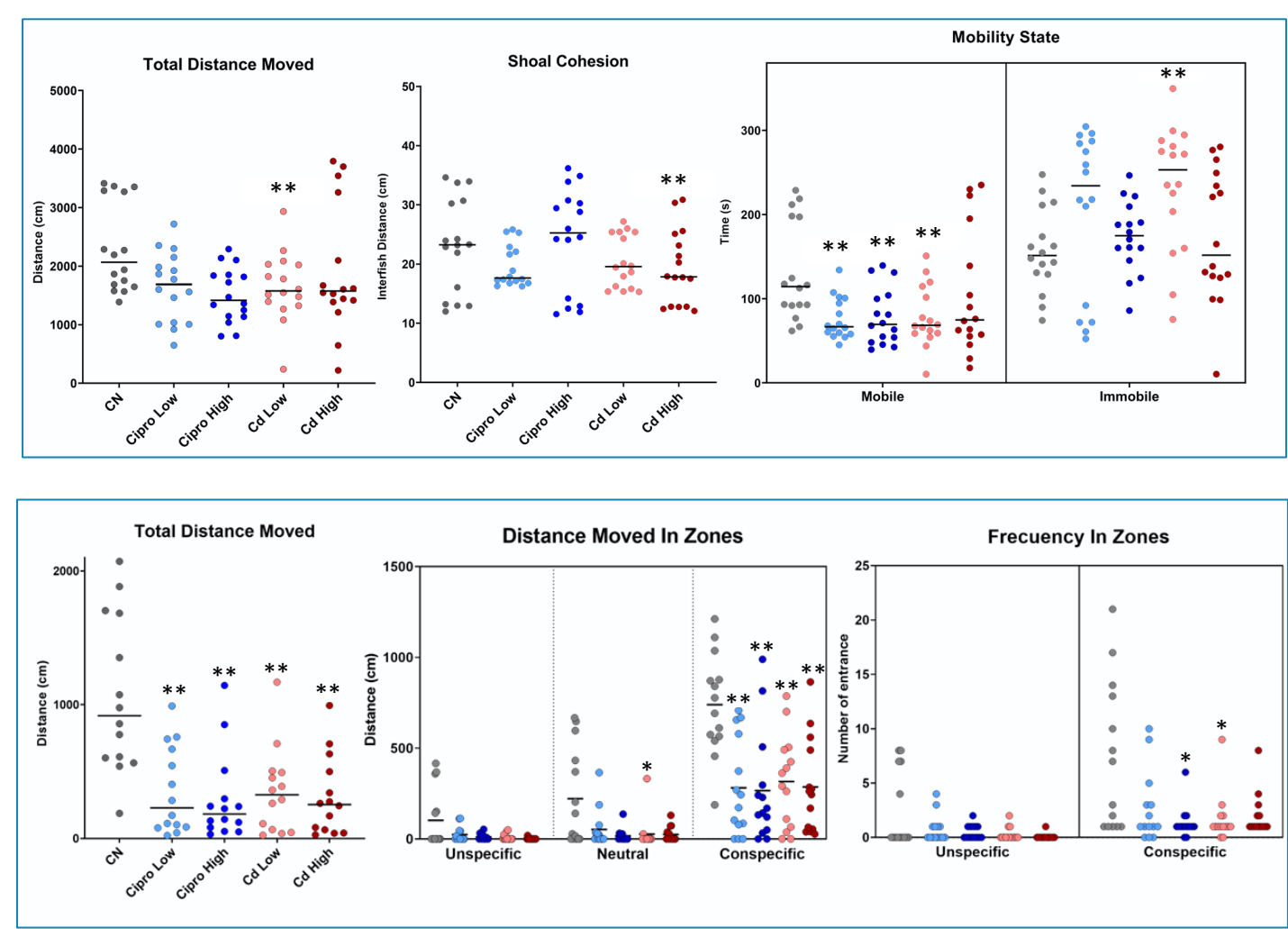
AIM: To elucidate the neurotoxicity of Cadmium and Ciprofloxacin in juvenile seabass (*Dicentrarchus labrax*) upon chronic dietary exposure (21 days)

Methods

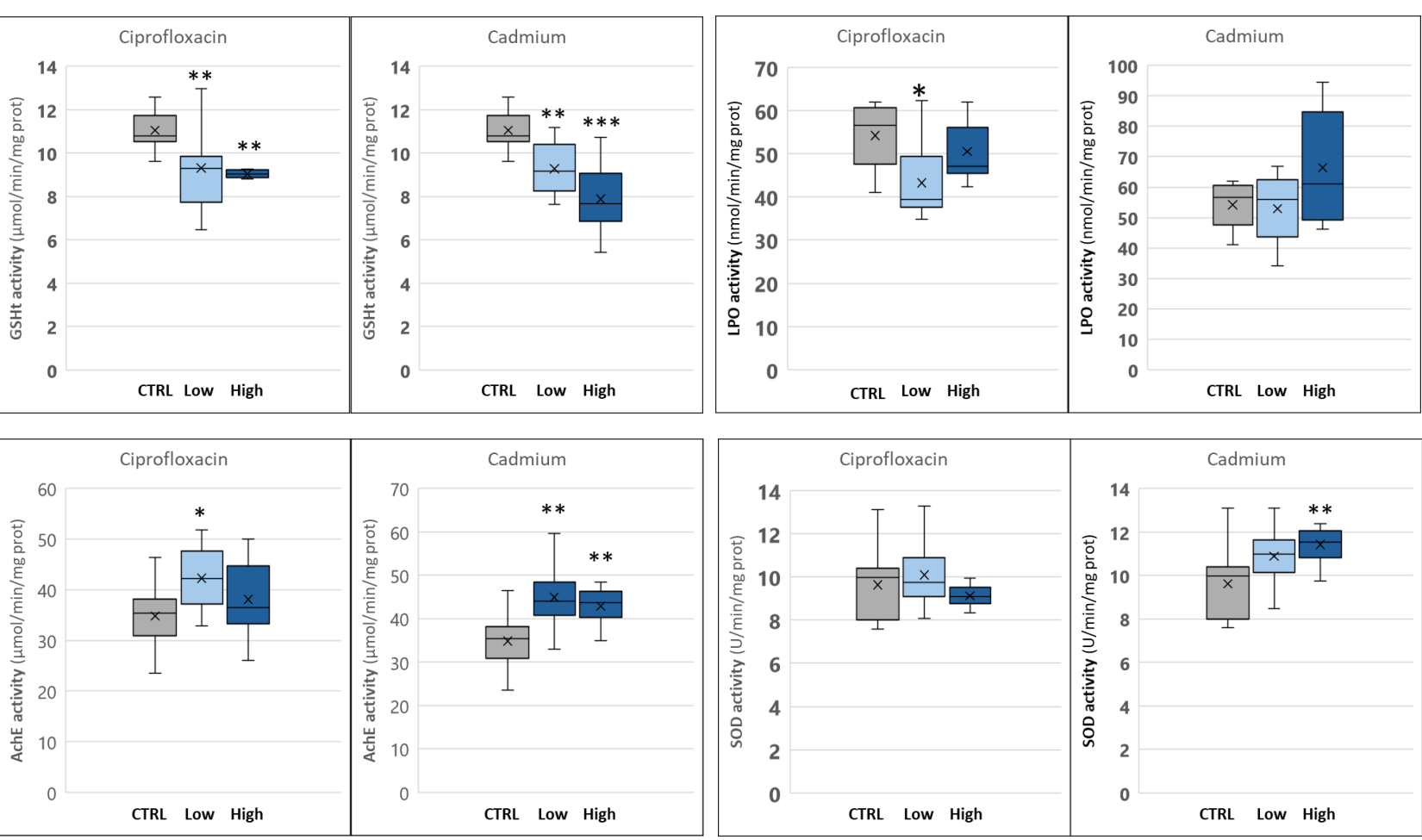


Results and Discussion

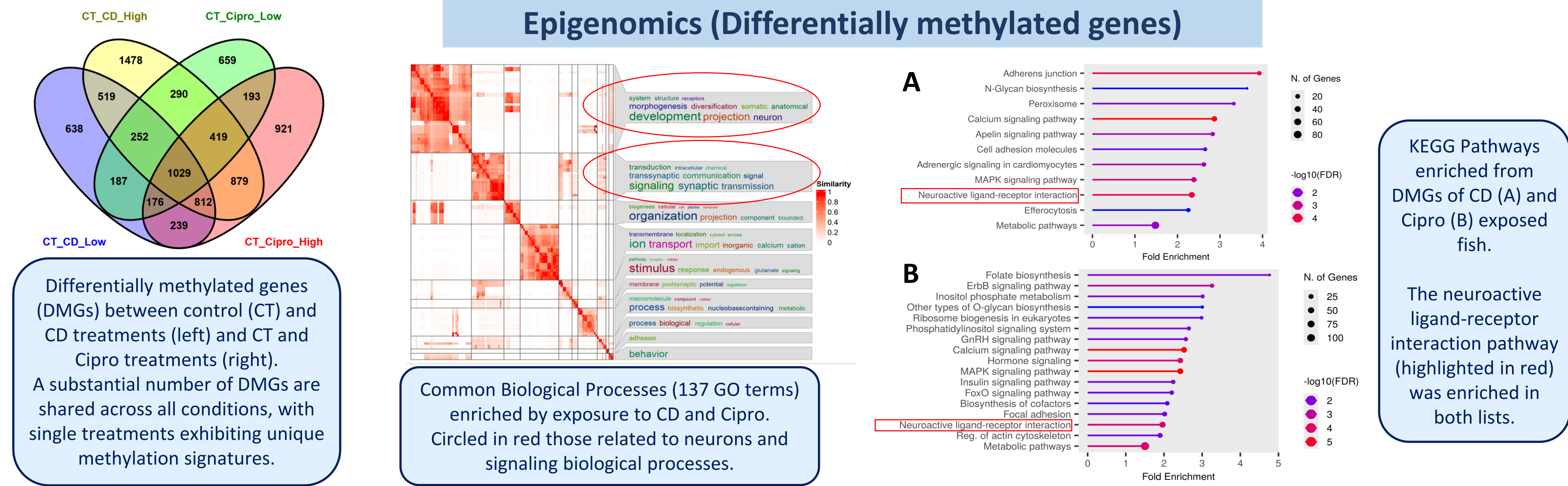
Behaviour results



Biochemical results



Epigenomics (Differentially methylated genes)



Takeaway Message: Dietary exposure to cadmium and ciprofloxacin in juvenile seabass induced neurotoxic effects, reflected in behavioural alterations (increased shoal cohesion and reduced social interaction), oxidative stress responses (antioxidant defense activation and glutathione depletion), and DNA methylation changes in neuron related genes. To further elucidate the mechanisms underlying these effects, transcriptomics (RNA-seq) and neurotransmitter analyses are underway. Multi-omics integration will be applied to identify novel biomarkers providing mechanistic insights and strengthening environmental risk assessment frameworks for aquatic toxicants.

Acknowledgements

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References

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[2] Green, A. J., & Planchart, A. (2018). The neurological toxicity of heavy metals: A fish perspective. *Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology*, 208, 12–19. <https://doi.org/10.1016/j.cbpc.2017.11.008>