

EVALUATING NON-INVASIVE BIOMARKERS FOR ASSESSING RESPONSES TO ACUTE TRANSPORT STRESS IN ATLANTIC SALMON *Salmo salar* SMOLTS.

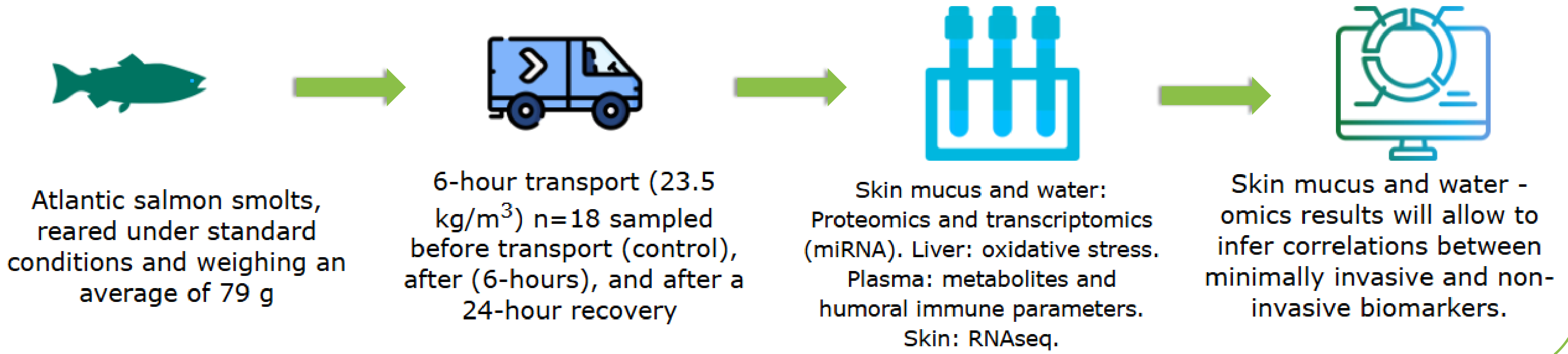
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Background

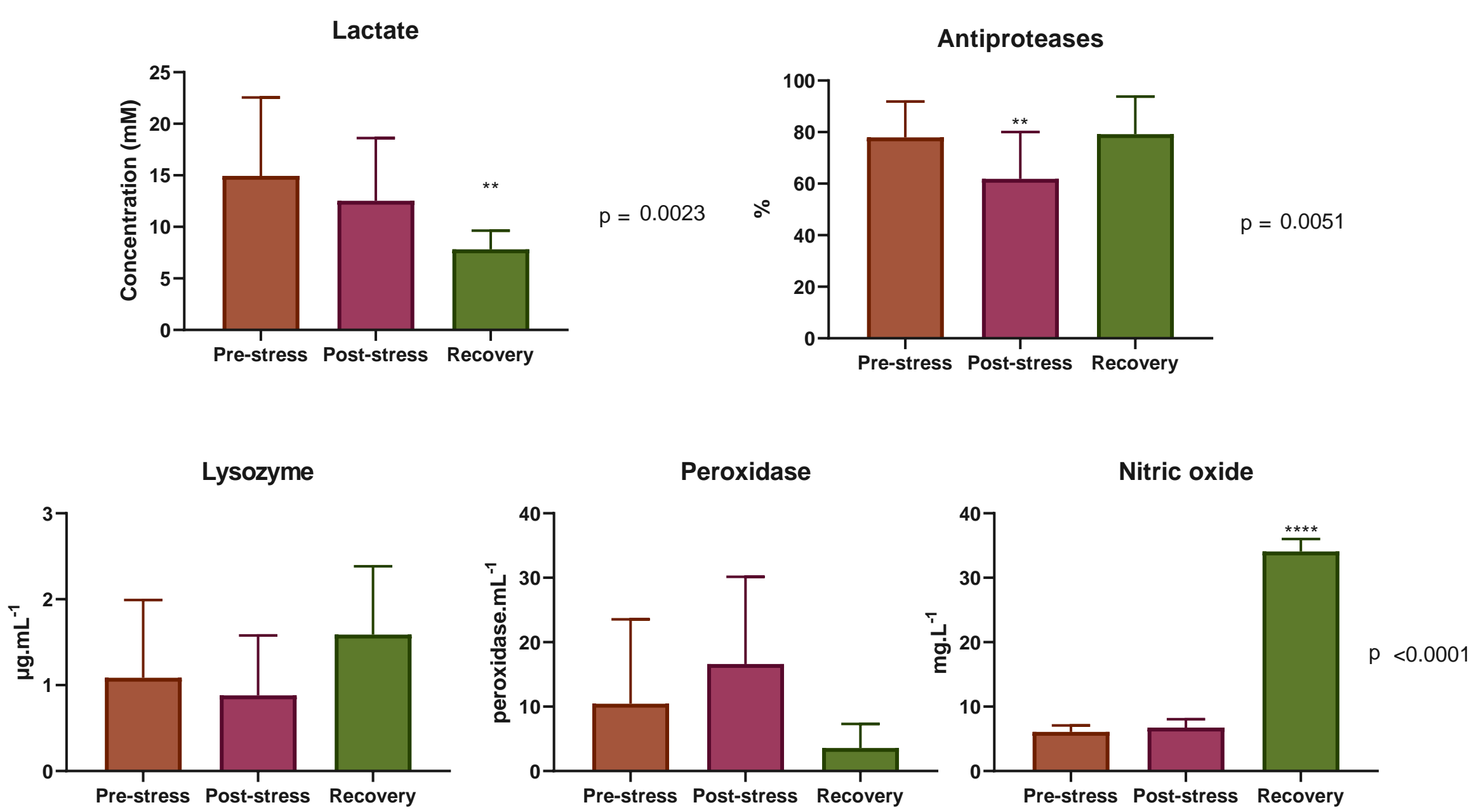
While current biomarkers remain scarce and invasive, we aim to use high-throughput genomic and proteomic screens and machine learning algorithms to identify new stress and health biomarkers. These discoveries will improve our understanding of how animals respond to environmental and biological challenges, namely transport. Importantly, we aim to develop of non-invasive technologies to assess animal health and meet consumer demand for sustainable, high-quality animal protein while prioritising animal welfare.

Methodology



Results

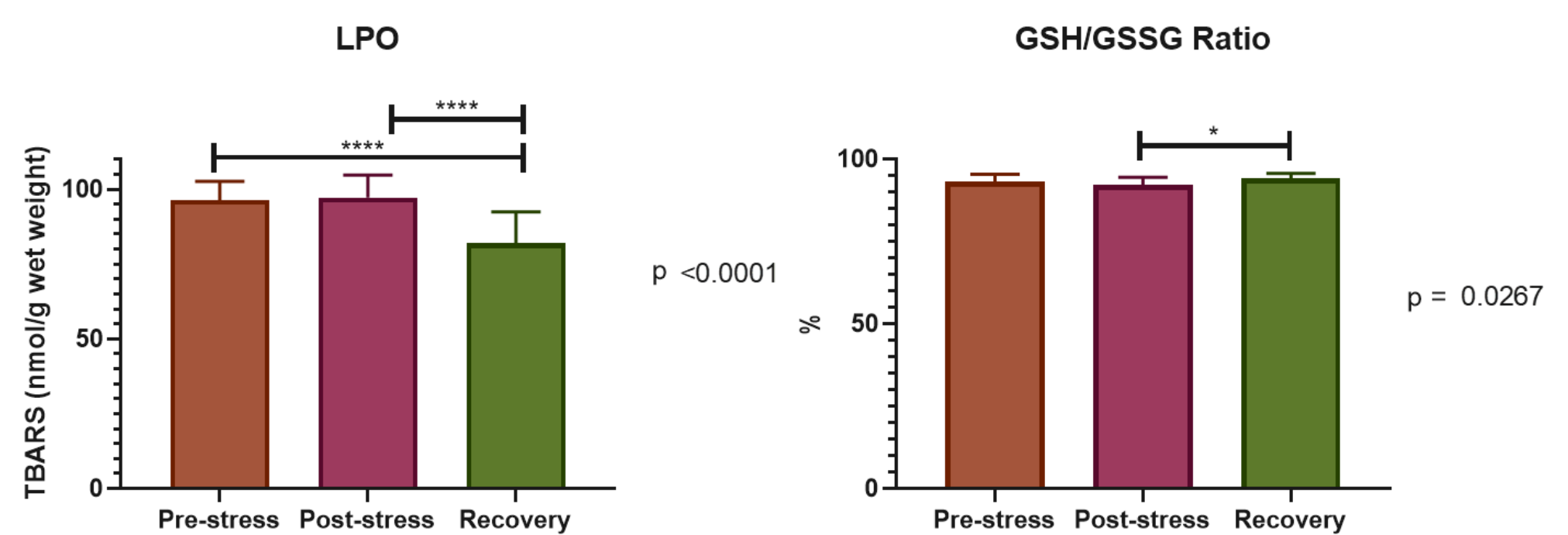
Plasma



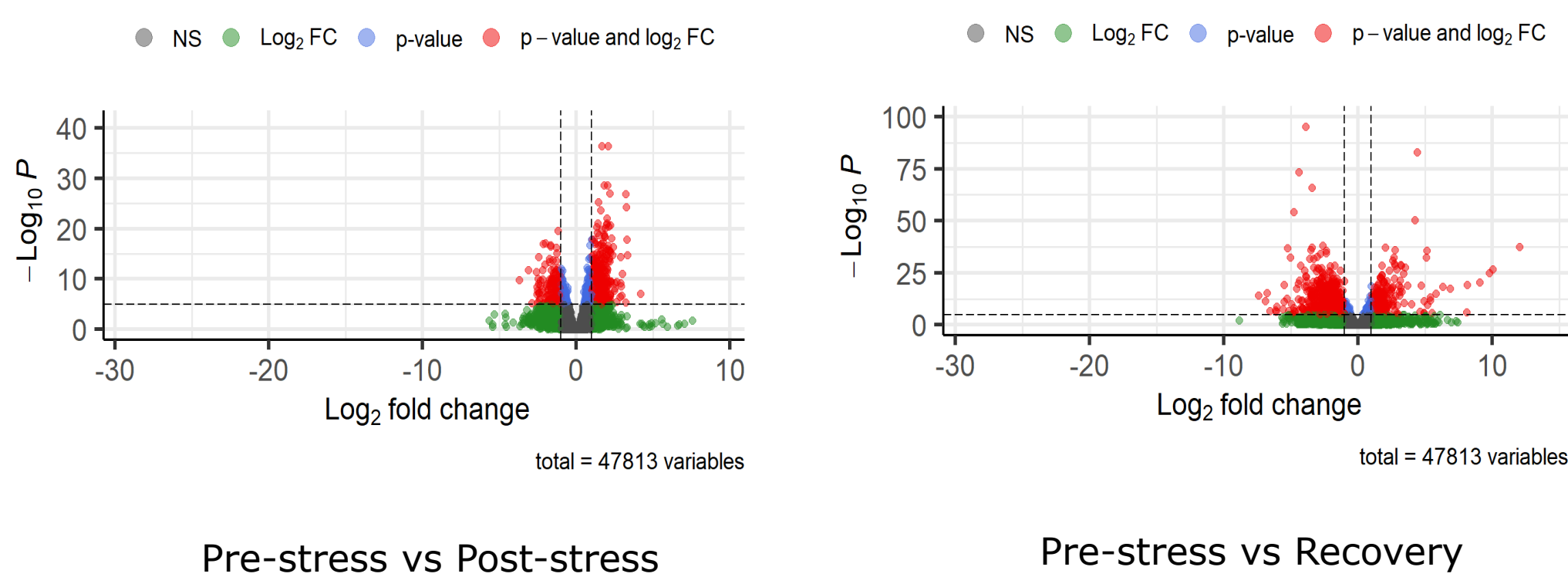
24 hours after transport, plasma lactate levels decreased indicating normal physiological activity and healthy liver function. Post-stress, immune measures showed a decrease in plasma antiprotease activity. Data also showed increased post-transport lysozyme and nitric oxide levels, suggesting an active innate immune response after acute stress. The reduction in peroxidase levels indicates a shift from an acute stress response to a recovery phase and reflects a decreased demand for oxidative damage management regarding the oxidative and immunological balance.

Liver

24h Post-stress, oxidative stress biomarkers in the liver showed significantly decrease in lipid peroxidation, indicating tissue recovery and reduced cell damage. Data also showed higher redox equilibrium and balance between protective molecules at recovery.



Skin



Skin sequencing analysis revealed higher significance at recovery with more variables showing substantial changes in metabolic and immune activity at 24 h post-stress. The data showed that skin undergoes significant changes immediately after stress, continuing to show substantial activity during the recovery phase, particularly in genes related to metabolism and immunity.

Take home message

The data presented sheds light on the physiological and immunological processes underlying Atlantic salmon's ability to withstand acute transport stress and to adapt accordingly. The correlation between these results and the proteome and transcriptome (miRNA) results in mucus and water will be thoroughly scrutinized to uncover non-invasive stress and health biomarkers.



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