

MOL231: The link between osmoregulation and energetic metabolism in smolting Atlantic salmon



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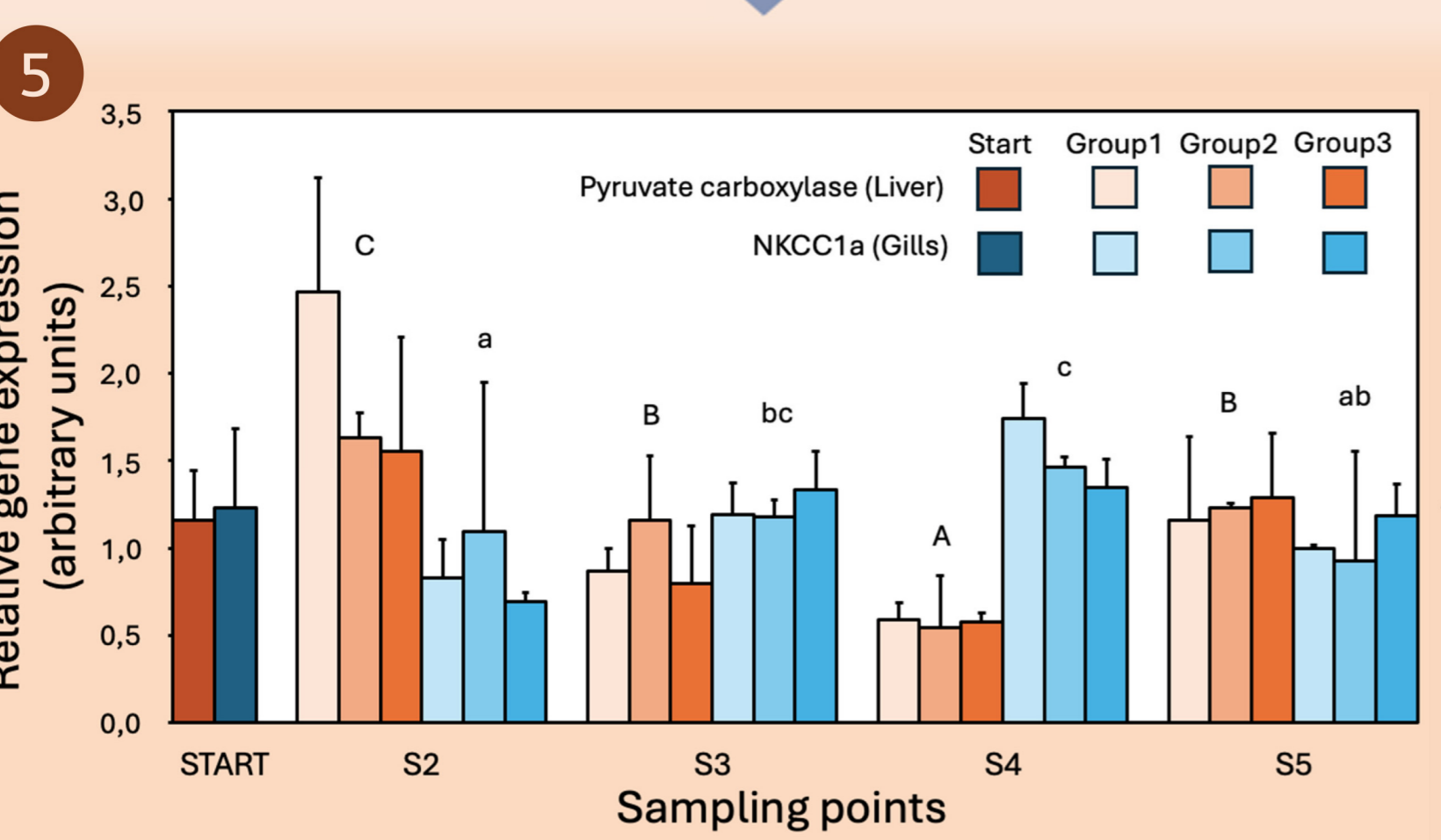
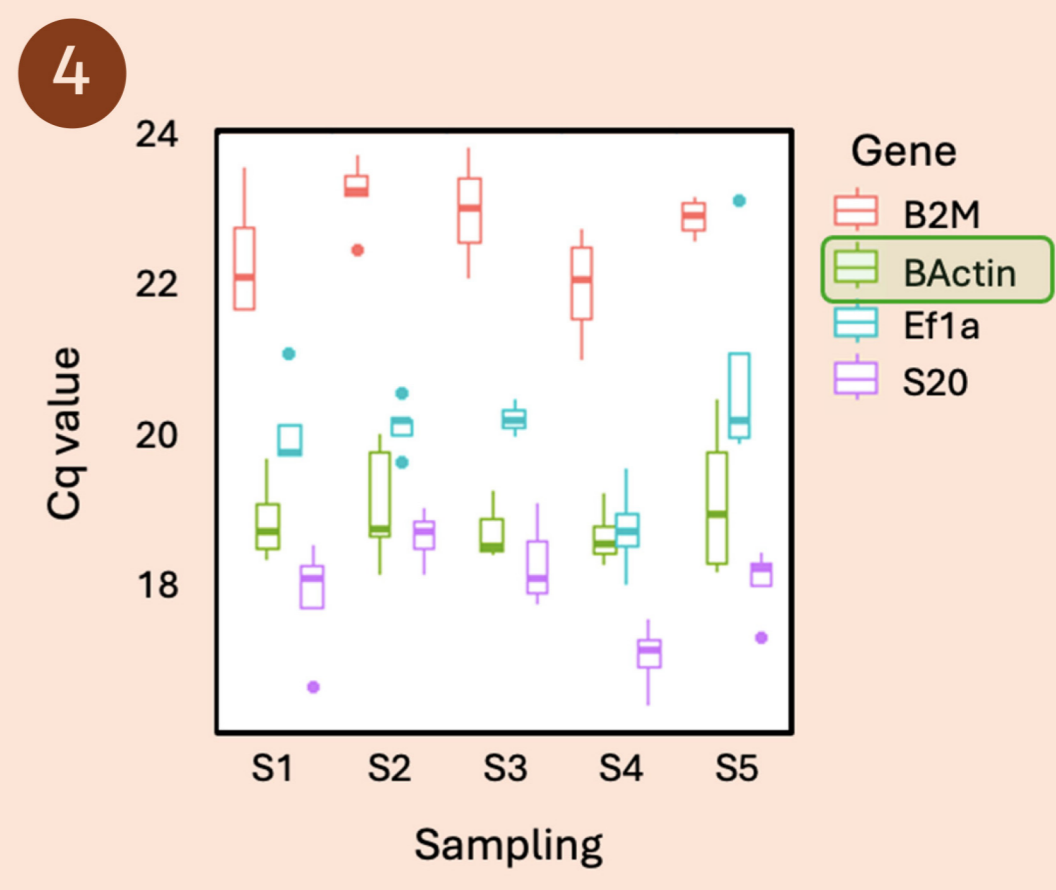
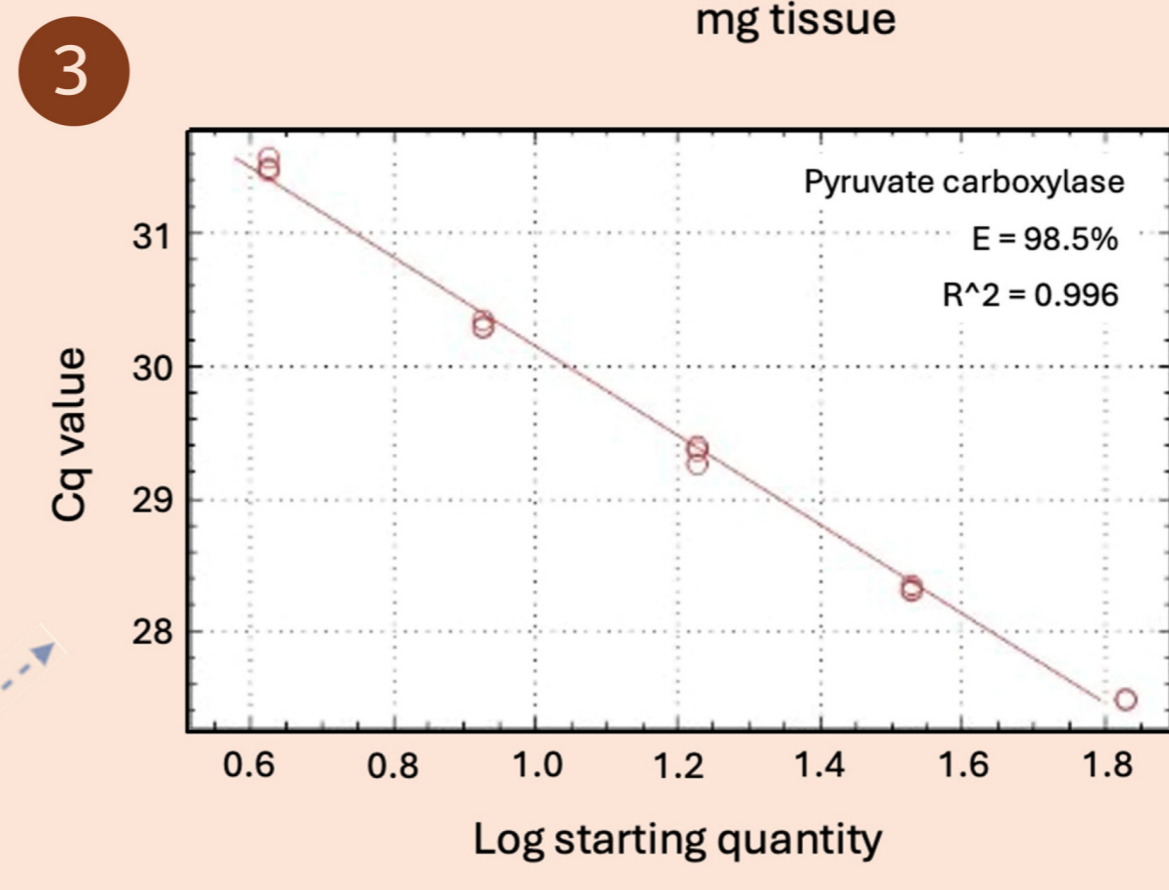
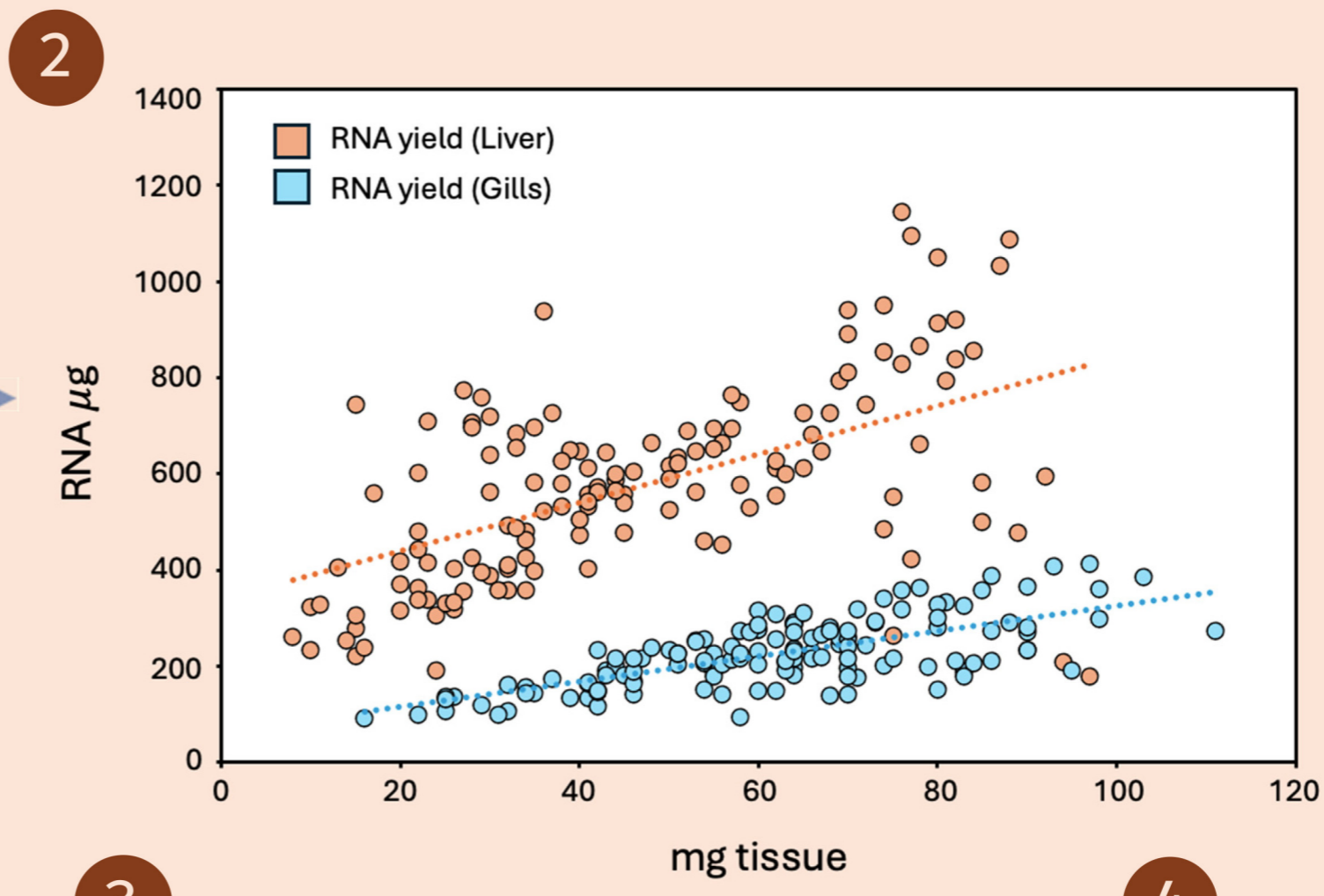
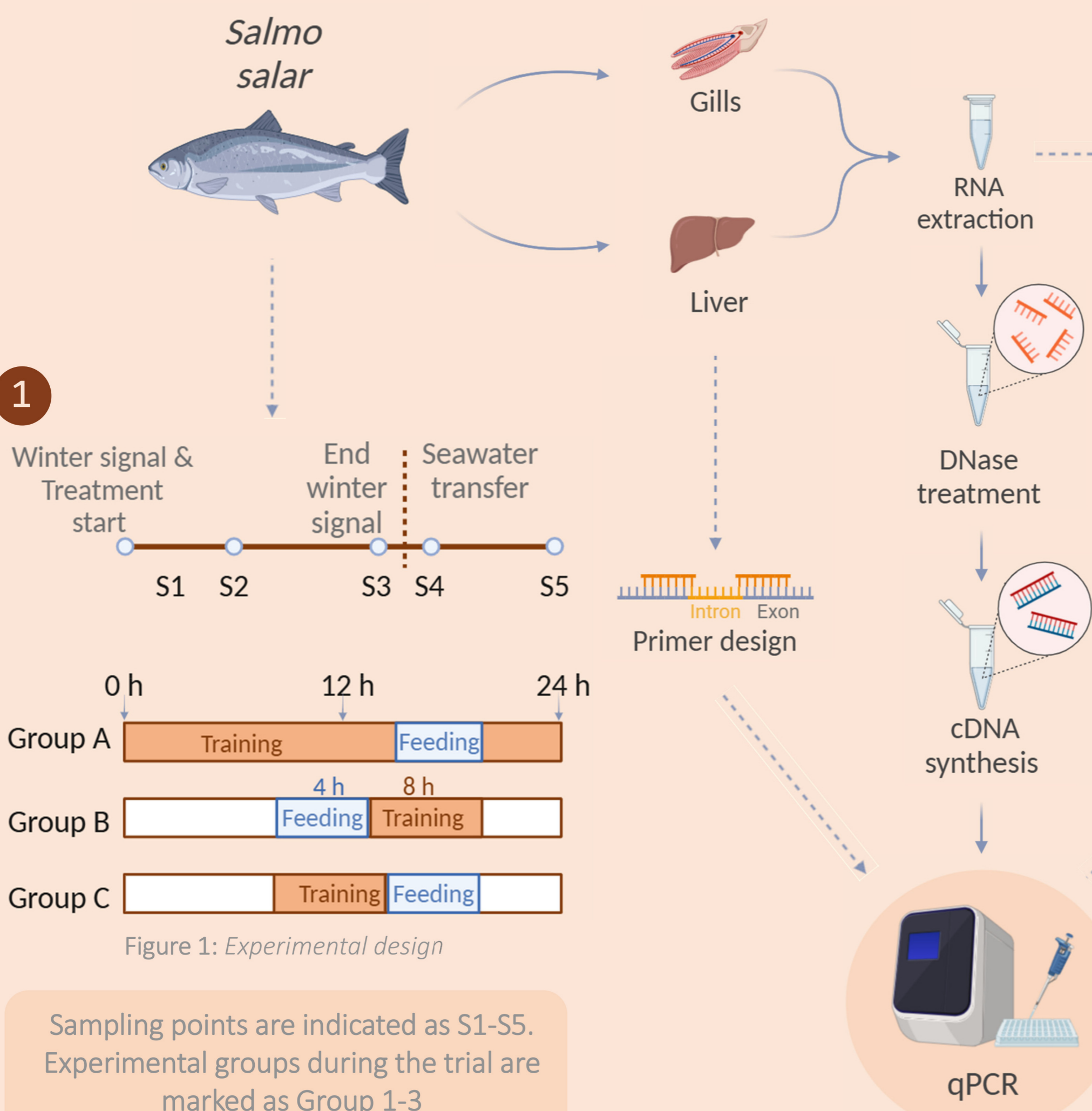
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Introduction

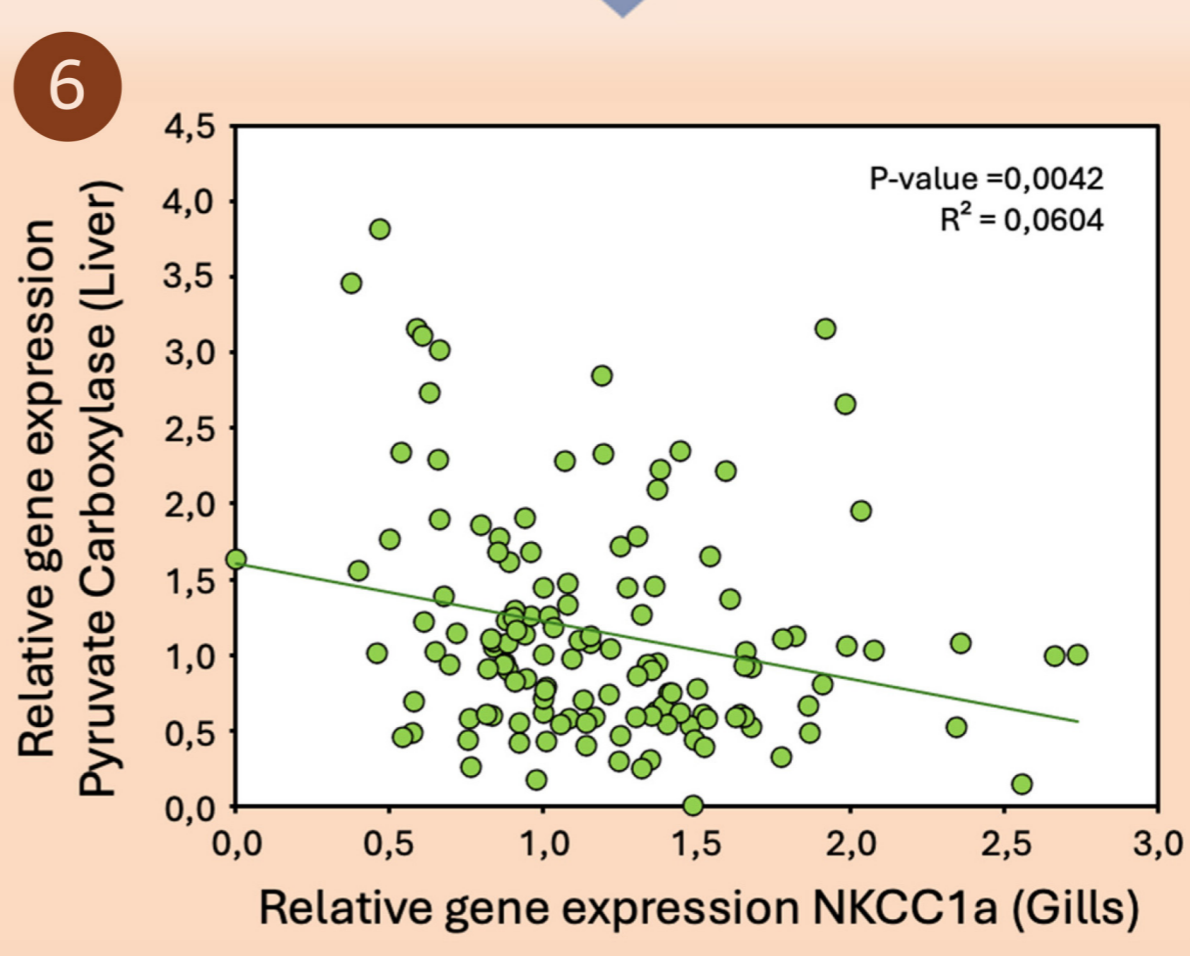
Smolting is a crucial and highly energy-demanding physiological process that prepares for downstream migration and seawater entry¹. Studies have shown that training increases growth and disease resistance in *Salmo salar*². The gills are the primary organs in osmotic and ionic regulation, where the Na⁺, K⁺, 2Cl⁻ cotransporter (NKCC) utilizes an electrochemical gradient for ion transport across gill epithelia³, while the liver is responsible for metabolic functions, in which pyruvate carboxylase is a key regulatory enzyme in energy storage⁴.

We aim to investigate the link between energetic allocation and osmoregulation, and to what extent different training and feeding regimes affect the gene expression of pyruvate carboxylase and NKCC isoform 1a (NKCC1a) during smoltification and seawater adaptation

Methods and results



Sampling points, but not treatment, had significant effect on both genes



Conclusion

Different training and feeding regimes showed no significant effect on gene expression. However, different sampling points do have significant effect on the gene expression of pyruvate carboxylase and NKCC1a correlating with physiological changes during smoltification. The osmoregulatory changes in the gills during smoltification correlated negatively with energy storage metabolism in the liver. Further work includes the analysis of additional genes associated with osmoregulatory capacity and energy utilization in order to confirm the effect of training and feeding regimes during smoltification.

References

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