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Structural lipid changes and Na+/K+-ATPase activity of gill cells'basolateral membranes during saltwater acclimation in sea lamprey (Petromyzon marinus, L.) juveniles

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Seawater acclimation is a critical period for anadromous species and a process yet to be understood in lampreys. Considering that changes in lipid composition of the gill cells' basolateral membranes may disrupt the major transporter Na^+K^+-ATPase, the goal of this study was to detect changes at this level during juvenile sea lamprey seawater acclimation. The results showed that saltwater acclimation has a direct effect on the fatty acid composition of gill cells basolateral membrane's phospholipids. When held in full-strength seawater, the fatty acid profile of basolateral membrane's phospholipids suffered a restructure by increasing either saturation or the ratio between oleic acid and eicosapentaenoic acid. Simultaneously, the activity of Na^+K^+-

ATPase revealed a significant and positive correlation with basolateral membrane's cholesterol content in the presence of highest salinity. Our results pointed out for lipid adjustments involving the functional transporter present on the gill cell basolateral membranes to ensure the role played by branchial Na^+K^+-ATPase in ion transport during saltwater acclimation process. The responses observed contributed to the strategy adopted by gill cell's basolateral membranes to compensate for osmotic and ionic stressors, to ensure the success of the process of seawater acclimation associated with the downstream trophic migration of juvenile sea lamprey.