New insight to the rol of α-enolase (Eno-1) as immunological marker in rainbow trout fry

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Abstract

α-Enolase is an enzyme of the glycolytic pathway that has also been involved in vertebrate inflammatory processes through its interaction with plasminogen. However, its participation in the immune response of lower vertebrates during early life development is unknown. Opportunistic pathogens in salmon farming are the principal cause of mortality in the fry stage. For that reason, molecular indicators of their immunological status are required to ensure the success of the large-scale cultivation. Thus, the objective of this work was to analyze if ENO-1 is involved in the immune response of rainbow trout fry. For this purpose, the coding sequence of trout ENO-1 was characterized, identifying the plasminogen-binding domain that has been described for homologs of this enzyme in higher vertebrates. A peptide-epitope of α-enolase was used for producing mice antiserum. The specificity of polyclonal antibodies was confirmed by dot blot, ELISA and Western blot. Then, the antiserum was used to evaluate α-enolase expression in fry between 152 and 264 degree-days post-hatching after 2, 8, and 12 h of challenge with lipopolysaccharide from Pseudomona auroginosa. The expression of α-enolase at both transcriptional (RT-qPCR) and protein (ELISA) levels was significantly increased after 8 h post-challenge with lipopolysaccharide. These results were confirmed by proteomic analysis by 2D-difference gel electrophoresis (DIGE). This work provides the first evidence of the involvement of α-enolase in the early immune response of salmonids. Future research will be required to understand the possible interaction of α-enolase with plasminogen in cells and tissues of the salmonid immune system. © 2021 Elsevier Ltd