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RNA-seq analysis reveals significant transcriptome changes in the fine flounder (*Paralichthys adspersus*) and the red cusk-eel (*Genypterus chilensis*) under stress

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In the last years next generation sequencing technologies (NGS) and RNA-seq have revolutionized the fields of transcriptomics, providing the possibility to investigate gene expression and pathways involved in countless biological processes of non-model aquatic animals. In recent years, there is a trend towards diversifying breeding species to maintain the sustainability of the global aquaculture industry. Among the cultivated marine species are the red cusk-eel (*Genypterus chilensis*) and fine flounder (*Paralichthys adspersus*). These marine fishes are highly valued in national and international markets due to exceptional flesh quality and high nutritional value. However, these species in captivity are susceptible to stress, showing low growth and high mortality rates, which could be due to alteration in the compensatory response to stress. In this work, we studied the effect of handling stress (acute stress) and high density stress (chronic stress) on the metabolic and growth response of *G. chilensis* and *P. adspersus*. Using Illumina RNA-seq technology, skeletal muscle and liver transcriptomes were analyzed, revealing a significant up-regulation of genes associated with liver angiogenesis and skeletal muscle atrophy under stress. Conversely, the down-regulated genes were associated with liver steatosis and skeletal muscle contraction. This work will not only allow consolidating the red cusk-eel and fine flounder's commercial cultivation but also lay the foundation of marine aquaculture industry having a significant impact on national economic development.

Biography

Juan Antonio Valdés is working as an Associate Professor of the Faculty of Biological Sciences at the Andres Bello University, Chile and Associate Researcher of the Interdisciplinary Center for Aquaculture Research (INCAR), where he leads the Molecular Biotechnology laboratory. His research is focused on the understanding the molecular mechanisms regulating skeletal muscle growth in teleost. The application of this expertise has provided new insights in the field of stress response in marine fishes. Currently, he is focusing on the identification and characterization of cortisol-mediated non-genomic signaling in the stress response of salmonids, by using next-generation transcriptomic and proteomic tools.

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