

Poster

Characterization and function of the ssu-1 gene in the hormonal pathway that controls neurodegenerative diseases



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ABSTRACT

Aging and the consequences that this entails for health, such as neurodegenerative diseases like Parkinson's and Alzheimer, are problems that are increasingly present in today's society. Hormones play an important role in cell communication and in tissues. They are also involved in different pathways that coordinate aging and regulate longevity (Lapierre & Hansen, 2012). De novo synthesis of hormones is energetically expensive for organisms. As a general rule, sulfated hormones are considered inactive, so they are regulated by enzymes that sulfate or desulfate them when necessary.

On one hand *C. elegans* have the sul-2 gene that encodes a steroid hormone sulfatase that is expressed in four sensory neurons, this protein is homologous to human STS. The loss of function of sul-2 provides a longer life to the organism and alleviates the symptoms of neurodegenerative diseases. In addition, the STX64 compound is an inhibitor of these proteins, which mimics the loss of function of sul-2 (Pérez-Jiménez et al, 2021).

On the other hand, the ssu-1 gene which encodes a steroid hormone sulfotransferase is also expressed in sensory neurons (Carroll et al, 2006). We wonder if the expression of this key gene is regulated under different conditions.

Preliminary results indicate that the expression of ssu-1 is higher at elevated temperatures, suggesting an increase in expression when the environmental conditions are adverse. We also observed that when sul-2 is inhibited by mutation or by treatment of the specific inhibitor STX64 the expression of ssu-1 is reduced suggesting that accumulation of product can inhibit the function of the enzyme. We have demonstrated that idea with the treatments with different sulfated hormones (Dehydroepiandrosterone, testosterone sulfate, epitestosterone sulfate) which also decrease the expression of ssu-1, as expected. Interestingly the long-lived mutant without germline (glp-1 mutant) showed a higher expression, suggesting that non-sulfated hormones are generated in this genetic background.

In this project we have demonstrated that ssu-1 expression can be regulated by different conditions and could be interesting to learn more about the molecular mechanisms that control this pathway.

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