

Title: Chilling resilience: Decoding phosphatases in cold adaptation. (NCN/PRELUDIUM BIS)

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Project description:

Cold stress adaptation, vital for an organism's survival, is a complex process that remains inadequately understood. Our study, centered on the nematode *C. elegans*, seeks to decipher the pivotal roles of two evolutionarily conserved phosphatases, PAA-1 and VHP-1, in cold survival. Our research draws from a foundation laid by a genome-wide screen conducted by our collaborators, who will also support us in this project. Guided by their initial findings, we employed targeted RNAi screening to corroborate the involvement of the abovementioned phosphatases at distinct stages of cold adaptation. Our subsequent phosphoproteomic investigations shed light on the molecular mechanisms underpinning their distinct roles. We found that PAA-1 crucially regulates a specific set of phosphoproteins, including REGE-1—an endoribonuclease integral to fat metabolism—during the early stages of cold adaptation. In contrast, VHP-1 appears to exert its influence during the recovery phase, modulating proteins such as HSR-9—a homolog of human TP53BP1 implicated in transcription regulation and DNA repair.

Aim:

With this project, we aim to delve deeper into these insights, aiming for a comprehensive understanding of how these phosphatases contribute to phospho-signaling during cold adaptation. We plan to identify the pathways they affect in cold treatment, explore their distinct and autonomous roles, and discover the regulation of their evolutionarily conserved substrates.

Requirements:

- Master's degree in biology, biotechnology, biochemistry or related field
- Good knowledge of basics of molecular and cell biology
- Basic hands-on experience in at least one of the fields: molecular biology, cell biology, genetic engineering, fluorescent microscopy, proteomics
- Knowledge of the biology and maintenance of *C. elegans* will be an advantage
- Written and spoken fluency in English
- Willingness to learn and take new challenges, ability to work independently, analytical thinking
- Excellent interpersonal skills and a collaborative attitude

Number of positions available: 1

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