

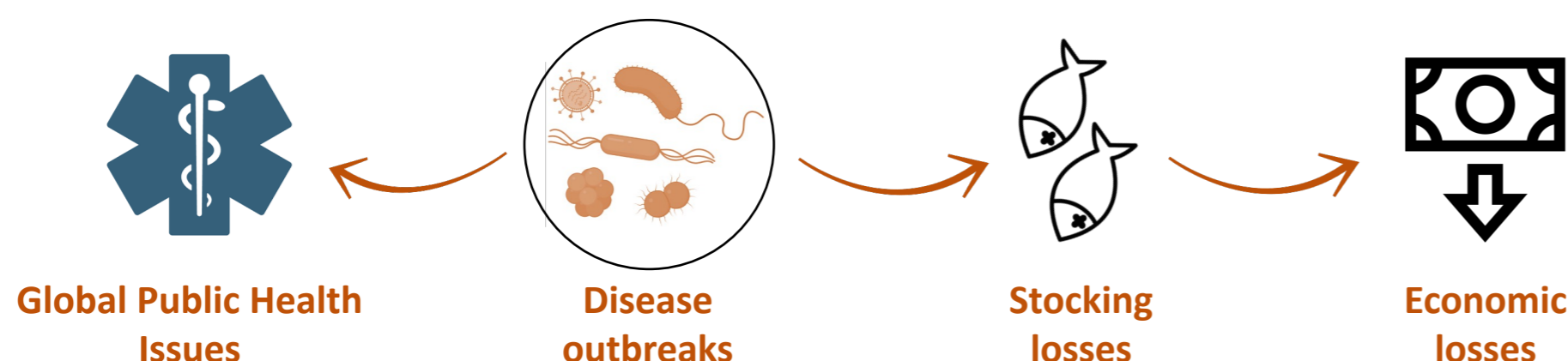
PROTEOMICS INSIGHTS INTO MOLECULAR RESPONSES IN THE SKIN OF THE COMMON OCTOPUS UPON BACTERIAL CHALLENGE

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BACKGROUND

- The importance of aquaculture in the global food industry is growing due to an increasing demand for protein production.
- The common octopus (*Octopus vulgaris*) is a species of significant interest due to its short life cycle and remarkable reproductive capacity.
- However, bacterial infections, particularly by multidrug-resistant pathogens e.g., *Vibrio parahaemolyticus* pose significant challenges, leading to:



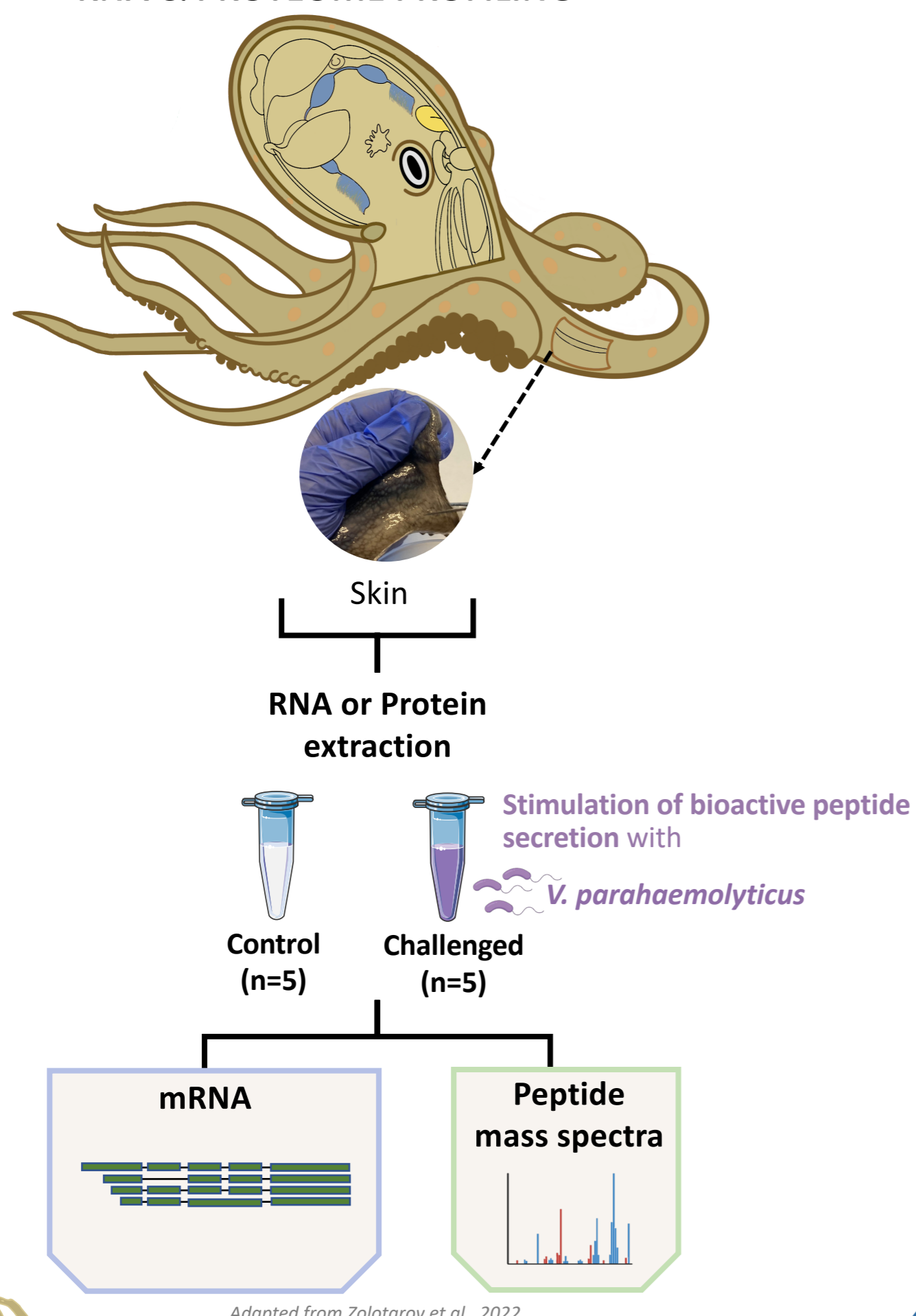
- Understanding *O. vulgaris*'s immune response to a dangerous bacterium (*V. parahaemolyticus*) is crucial for aquaculture and human consumption.
- In the **BIOPTAL project**, we hypothesize octopuses activate their immune system when exposed to this pathogen, involving complex molecular mechanisms.

OBJECTIVES

- Investigate the molecular functions of octopus skin in defense mechanisms against pathogens.
- Identify novel **antimicrobial peptides (AMPs)** from the skin of the common octopus for potential applications in healthcare and aquaculture.

EXPERIMENTAL DESIGN, ANALYSES & RESULTS

COMMON OCTOPUS RNA & PROTEOME PROFILING

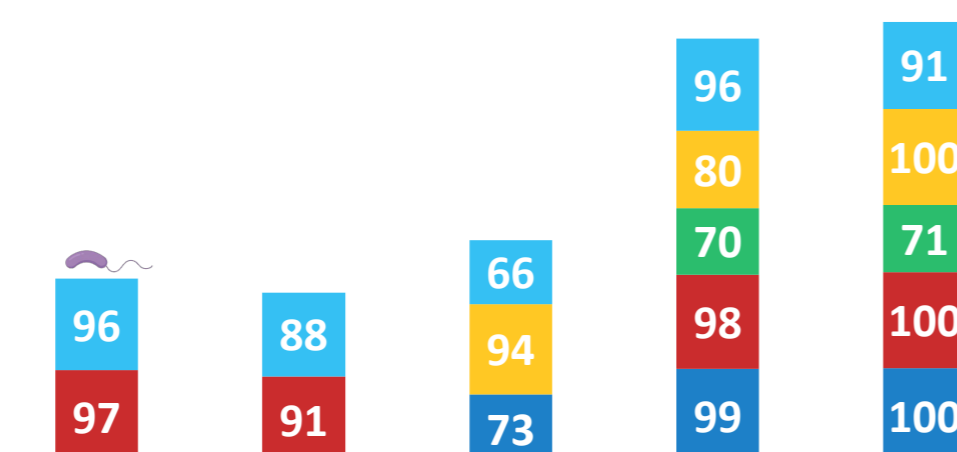


KEY FINDINGS

Molecular Mechanisms:

The activation of the **immune system** in response to bacterial challenge involves complex molecular processes, including the **differential expression of several uncharacterized protein-coding genes** and the **synthesis of proteins** that may serve as **potential sources of AMPs**.

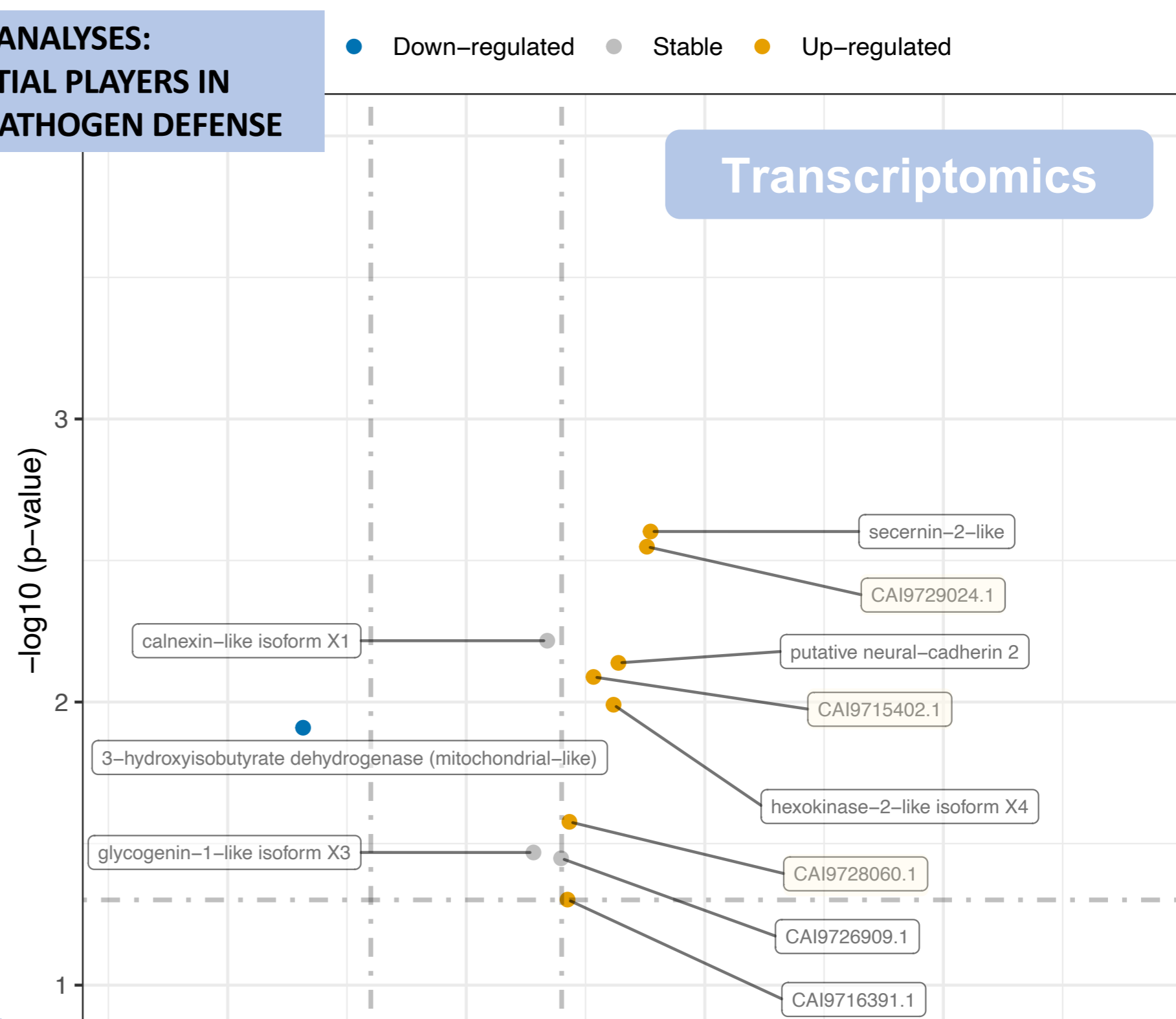
Potential AMPs: Identifying AMPs in the skin of *O. vulgaris* and their targets offers **potential candidates** for developing novel strategies for strengthening and **fighting antimicrobial resistance** in aquaculture and human health.



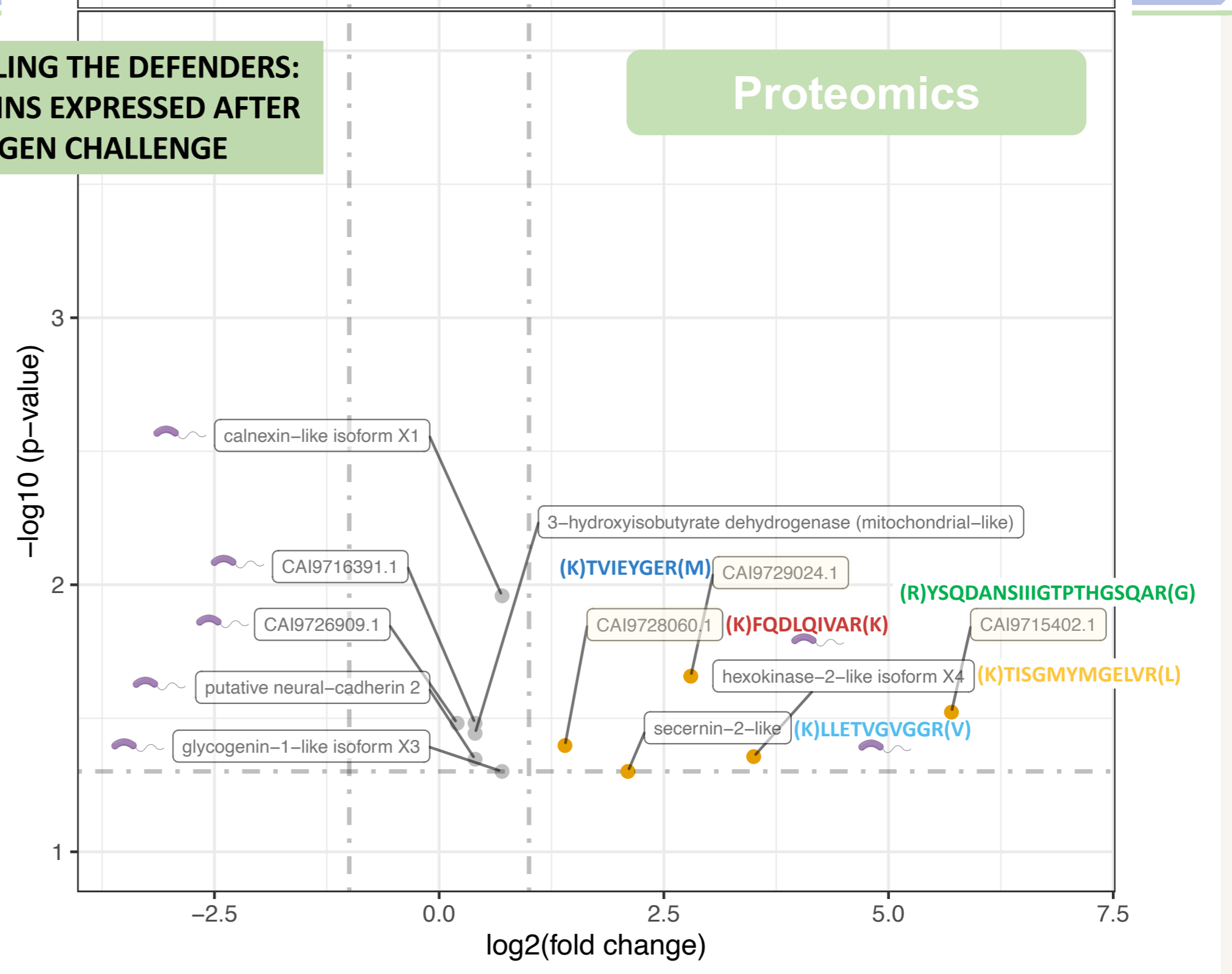
AMP's targets (%) : Gram- Gram+ Fungus Cancer cells Virus

AMPs screening of *O. vulgaris* skin after a bacterial challenge

mRNA ANALYSES: POTENTIAL PLAYERS IN HOST-PATHOGEN DEFENSE



UNVEILING THE DEFENDERS: PROTEINS EXPRESSED AFTER PATHOGEN CHALLENGE



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Upcoming scientific articles: Almeida et al., 2024.

Further exploration of immune-related bioactive compounds and potential applications in aquaculture and human health.

Affiliations:



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