



Università degli Studi di Napoli Federico II

PhD in Biotechnology - 39<sup>th</sup> cycle

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**Towards the industrial use of *Pseudoalteromonas haloplanktis* TAC125 as cell factory of difficult-to-express proteins: development of novel genetic tools, improved strains, and more effective production processes**

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Nowadays high-quality recombinant production of proteins remains one of the most challenging biotechnological fields<sup>1</sup>. Recombinant synthesis is never a straightforward process and this is even more true with difficult-to-express proteins<sup>1</sup>. These kinds of proteins are prone to proteolytic degradation, misfolding, formation of inclusion bodies, and aggregation. In this scenario, the exploitation of unconventional hosts as cell factories to produce such hardship recombinant products is a fascinating opportunity<sup>1,2</sup>. *Pseudoalteromonas haloplanktis* TAC125 is a psychrophilic bacteria that fall in such a category<sup>1,2,3</sup>. It has shown great potential as a recombinant host for such difficult-to-express protein<sup>1,2,3</sup>. Despite such promising results, the application at an industrial level of *Ph*TAC125 is still far. Implementation of cutting-edge technologies and analytical tools is the keystone to reach more effective production conditions and improved strains so that such an ambitious goal can be reached.

**References**

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- 3) Colarusso, A., Lauro, C., Calvanese, M., Parrilli, E. & Tutino, M. L. Active human full-length CDKL5 produced in the Antarctic bacterium *Pseudoalteromonas haloplanktis* TAC125. *Microb Cell Fact* **21**, (2022).