EuroMicropH

Acidic Fridays

6th Acidic Friday 2021-05-21 16:00 CEST

Open discussion platform of the COST action EuromicropH. This discussion series is intended to stimulate an exchange on the different aspects of how microorganisms react to low pH conditions and why people are interested to investigate this subject.

Please register here for the upcoming meeting. To access the meeting please follow the Zoom link beneath.

Join Zoom-Meeting

https://tuwien.zoom.us/j/93241125049?pwd=b0puNXczblBPNTJjRkJTTXB2anltUT09

Agenda

Chairs

Matthias Steiger, TU Wien, Austria

Sofia Pauleta, NOVA school of science and technology | FCT NOVA, Portugal

Programm

16:00 Welcome

16:05 Matic Kisovec, National Institute of Chemistry, Slovenia

Pore-forming activity of listeriolysin O is pH dependent: The whys and hows

16:25 Duarte Guerreio, National University of Ireland, Galway, Ireland

Role of the Listeria monocytogenes stressosome in sensing and responding to acid stress.

Questions and Discussion

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Abstracts

Matic Kisovec, National Institute of Chemistry, Slovenia

Pore-forming activity of listeriolysin O is pH dependent: The whys and hows

Listeriolysin O (LLO) is a major virulence factor of the food-borne intracellular bacterium *Listeria monocytogenes*. LLO is a pore-forming protein that can specifically perforate cholesterol-rich host membranes. The pore-forming activity (and stability) of LLO is pH dependent since it is more active (and more stable) at low pH values. In concert with other virulence factors LLO enables the escape of *L. monocytogenes* from the low pH environment of the late phagosomes and is also crucial for spread from cell to cell.
Our group set out to further explain the molecular mechanism of this pH dependence and show how could this be utilized in bionanotechnology and also medicine. Structural properties of the LLO Y406A mutant and pH dependence mechanism will be presented together with possible use cases.

Duarte Guerreio, National University of Ireland, Galway, Ireland

Role of the Listeria monocytogenes stressosome in sensing and responding to acid stress.

The food borne *Listeria monocytogenes* is a gram-positive bacterium capable of surviving the low pH imposed by the gastrointestinal (GI) tract and invade the human body. The alternative sigma factor B (σ^B) is responsible for *L. monocytogenes* stress resistance by upregulating approximately 300 genes, many of which encode protective and homeostatic functions to counteract environmental changes. σ^B is controlled by a signal cascade, which in turn is activated by a multi-protein complex designated as the stressosome. In this study, we constructed several mutations in the stressosome, which resulted in either its inactivation or over activation. We also determinate that the stressosome is responsible for the triggering of σ^B at mild acidic conditions (pH 5), resulting in the upregulation of the σ^B regulon, virulence factors and increased resistance towards lethal acidic stress (pH 2.5). Our results help shed light on the molecular mechanism of the signal transduction that lead to the activation of the general stress response in *L. monocytogenes*.