



PhD offer

MEchanismes of protection of bacterial membrane Lipids by OligosacchariDes (MELODy)

Context and objective

Lactic acid bacteria (LAB) are widely used for many food, chemical and pharmaceutical applications. During production and long term stabilization of LAB concentrates, cells undergo different kinds of environmental stresses affecting both their viability and their technological properties. The cell membrane is the main target of stress injury and protective molecules such as simple disaccharides are often added to limit membrane damage. Recently, oligosaccharides with different polymerization degree have been reported as promising molecules but their mechanisms of protection need to be elucidated. The proposed work will investigate the interactions between fractions of oligosaccharides of different polymerization degree and biomimetic membranes of lactic acid bacteria. This PhD project is a part of a European project PREMIUM (MSCA-RISE n°777657) aiming at preserving micro-organisms by using oligosaccharides and eco-friendly processes.

Proposed work

The PhD student will have to:

- ./ Perform a literature review of studies of lipid membrane degradation of bacterial cells when facing environmental stresses and the mechanisms of protection by oligosaccharides. Focus on relevant methods for characterizing membrane properties.
- ./ Plan and perform appropriate experimental investigations for producing bacterial cells and biomimetic membranes
- ./ Implement and adapt methods for characterizing the interactions between membranes (real and biomimetic) and oligosaccharides in environmental stressful conditions taking place during production/stabilization processes.

Desired skills

- ./ Master or engineering degree is mandatory to apply for a PhD
- ./ Biochemistry and biophysics of lipids.
- ./ Applied microbiology, chemical/process engineering. Knowledge on process of production and preservation of microorganisms will be a plus.
- ./ Basic knowledge on Cryobiology
- ./ Ability to perform experimental lab work
- ./ Ability to work in a multi-disciplinary team
- ./ Fluent English for communication and writing mandatory. Knowledge of French will be a plus

Salary

Standard INRA contract for PhD students: 1760 € per month (gross)

Places of work

UMR782 INRA / AgroParisTech, Food Process Engineering and Microbiology unit (Génie et Microbiologie des Procédés Alimentaires – GMPA), F-78850 Thiverval-Grignon, France.

Some activities at IJPB (INRA Versailles) and BIA (INRA Nantes);

In the frame of PREMIUM project: 6 months in CIDCA-CONICET (Argentina) and 3 months in Asymptote-GE Healthcare (UK).

Application

Please send application letter, CV, grade sheets and recommendations to:

Fernanda FONSECA, fernanda.fonseca@inra.fr

Yann GOHON, yann.gohon@inra.fr