

Research Topic for the ParisTech/CSC PhD Program
(one page maximum)

Subfield: (Applied Physics, Chemistry, Mathematics, Mech. Eng. etc...) microbiology, food bacteria, starter, stress resistance, redox, transcription, regulon

ParisTech School: ABIES

Title: Role of regulators of Spx-family in *Lactococcus lactis* response to stress

Advisor(s): (name, email, website)
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Short description of possible research topics for a PhD:

Lactococcus lactis is a lactic acid bacteria widely used in dairy industry and biotechnology. However its industrial applications are often restricted by fragility of this bacterium in stress conditions. The two INRA groups proposing this project have a longstanding interest in *L. lactis* response to cell wall and oxidative stress. They have discovered the regulons, mediated by regulators of redox Spx family, which respond to temperature and cell wall stress in lactococci. The thesis project is related to studies of functioning of the Spx-regulon and its role in lactococcal response to multiple stress conditions. In particular, we expect i) to define the role of redox motif CxxC in interaction of Spx proteins and alpha-subunit of RNA polymerase, ii) identify the genes regulated by different Spx proteins, iii) to define the role of different Spx regulators in response to different stress conditions, first of all to oxidative stress. Results obtained during realization of this project should allow to improve robustness of lactococci and thus to optimize their use in industrial settings.

Required background of the student:

Skills: microbiology, molecular genetic, biochemistry.
Language: fluent English

A list of 5(max.) representative publications of the group: (Related to the research topic)

Sadovskaya I et al. MBio. 2017 Sep 12;8(5). pii: e01303-17
Solopova A, et al. J BiolChem. 2016 291(21):11323-36
Pérez-Pascual D, et al. MBio. 2015 6(1). pii: e02306-14
Ballal SA, et al. Proc Natl AcadSci U S A. 2015 112(25):7803-8
Roussel C, et al. BMC Microbiol. 2015 15:246.