Ecole Doctorale - 104

Sciences de la Matière, du Rayonnement et de l'Environnement

EDSMRE

ESTABLISHMENT : University of Lille

Laboratory(ies) of affiliation : UMRt BioEcoAgro

Scientific field, Speciality:

❒ **DS10 | Food Biotechnology, Food Science, Physiology**

Thesis director: LECLERE Valérie, Professeur, valerie.leclere@univ-lille.fr

Co-director: *(Name, First name, position, e-mail)*

Co-supervisor (non HDR): ROCHEX Alice, Maître de conférences, alice.rochex@univ-lille.fr

Affiliate programme(s): *ANR Heteroclip*

Planned (co)-funding *(mention: in progress/obtained)* **:**

Title of the thesis : Synthesis and structure/activity relationships of new lipopeptides from *Pseudomonas* bacteria for biocontrol applications

THESIS SUBJECT (ABOUT 1/2 PAGE)

Lipopeptides are secondary metabolites produced by several bacterial genera, including Bacillus and Pseudomonas. These molecules, composed of a hydrophobic fatty acid linked to a peptide chain, have a wide diversity of biological activities and are good candidates for applications in biocontrol (method of plant protection based on microorganisms and natural substances whose development will help limit the use of chemical pesticides).

The MOM team at the UMRt, in collaboration with INRAE in Avignon, is interested in the bacteria *Pseudomonas syringae*. Recent work carried out at the UMRt has made it possible to discover more than 40 new lipopeptides from *P. syringae* (Bricout et al., 2022). Variations in the composition of lipopeptides are likely to influence their level of activity, but the activities of *P. syringae* lipopeptides remain poorly documented.

The objectives of this project are to study the activities of new lipopeptides and to investigate whether the structural diversity of *P. syringae* lipopeptides generates a diversity of activity. The thesis program includes:
- the production of new lipopeptides from *P. syringae* by fermentation
- the study of their activity profile, mainly their antimicrobial activities and biocontrol activities
- the study of new structures using bioinformatics, mass spectrometry and NMR approaches

Expected date of recruitment : October 2024

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Additional remarks/comments: The candidate must have completed training in biological engineering and must have theoretical and practical knowledge in microbiology and biochemistry

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