# Master 2 Internship in microbiology- 6 months

**Project title:** From metataxonomic data to plant health: identifying microbial candidates and designing a microbial simplified community for effective biocontrol in wheat

**Host Laboratory** : RIBP, Université de Reims Champagne-Ardenne

**Key words**: Wheat, Septoria tritici blotch, *Bacillus*, Consortium Biocontrol

## Project description

*Zymoseptoria tritici*, responsible for Septoria tritici blotch, stands as one of the most destructive wheat pathogens globally, particularly prevalent in France. To address this issue, there's an urgent need to develop integrated, sustainable agricultural practices. Utilizing plant-associated microbes has gained attention for their potential in enhancing plant growth, promoting biological control, and improving agriculture sustainability. In the WheatSimpCom project, we propose to prove the concept of the BCMicrobiome project by first providing a list of putative bacterial antagonists of the wheat pathogen *Z. tritici* using a panel of network inference methods. The project will then validate experimentally these putative antagonistic interactions and design a generic multi-function bacterial consortium that will create a stable association with wheat to improve its tolerance against *Z. tritici*. The project will deliver outreach guidelines giving tips and recommendations regarding the application of microbial network models to the screening of biocontrol candidate agents.

## Internship Goals:

The internship will primarily focus on contributing to Objective 2 of the WheatSimpCom project. Specifically, the intern will participate in validating the antagonist activity of *Bacillus* strains identified in objective 1 through *in vitro* methods. The selected intern will engage in the following tasks:

1- Isolating strains belonging to *Bacillus* genus from asymptomatic wheat leaves collected from different fields in the Nord East of France. Specific culture media to isolate representatives of this genus will be employed to isolate representatives of this genus, aiming to establish a collection of *Bacillus* phyllosphere isolates
2- Conducting taxonomic identification of *Bacillus* strains and evaluating their *in vitro* antagonist activity against *Z. tritici*.

## Requirements:

We are looking for a master's level intern for a 6-months (February-August 2024). The ideal candidate should possess technical skills in microbiology and laboratory techniques. Applicants with prior experience in bioinformatic are highly encouraged to apply. We are seeking a highly motivated and enthusiastic student with excellent writing and communication skills. The qualified candidate will benefit from having access to state-of-the-art research facilities, growth chambers, and equipment within RIBP lab. She/he will receive guidance from experienced researchers and experts involved in the project, offering mentorship and support throughout the internship. This internship presents a unique opportunity to contribute to a cutting-edge project that aims to enhance wheat's resistance to a prevalent pathogen, benefiting both the agricultural and research communities.

## How to Apply:

Interested applicants should submit a letter of interest and a curriculum vitae to Qassim ESMAEEL(qassim.esmaeel@univ-reims.fr) and Cédric Jacquard (cedric.jacquard@univ-reims.fr)