

MASTER
BMC LYON
Biologie
Moléculaire
Cellulaire



Université Claude Bernard



Lyon 1

MASTER 2 BMC PARCOURS GENOPATH ANNÉE 2021-2022

Internship title:

Study of the cell wall function of the phytopathogen fungus *Botrytis cinerea*.

Nom, adresse de l'Unité d'accueil :

BAYER S.A.S., 14, impasse Pierre Baizet, BP 99163, 69263 Lyon Cedex 09

Nom, adresse de l'Equipe d'accueil / Nom du responsable d'équipe :

Laboratoire Mixte, Equipe de Génomique Fonctionnelle des Champignons
Phytopathogènes

Responsable : Nathalie POUSSEREAU

Nom, tel, adresse e-mail des encadrants de stage :

Mathias CHOQUER, tel : 0472852282, E-mail : mathias.choquer@univ-lyon1.fr

Virginie LEMPEREUR, tel : 0472852327, E-mail : virginie.lempereur@bayer.com

Internship description:

The fungal cell wall is a rigid exoskeleton that surrounds the fungal cell and is responsible of the shape of the cell. This structure also ensures a role of protection of the cell from environmental stresses. It is a fibrous envelop constituted mainly by many polysaccharides such as beta-1,3-glucan and chitin. It is now accepted that the fungal wall is a dynamic structure, continuously remodeled by the action of multiple enzymes involved in its biosynthesis, modification or degradation. This molecular plasticity allows the mycelium to ensure its growth by an apical elongation mechanism, but also to adapt to the many environmental biotic, or abiotic stresses. In pathogenic fungi, the cell wall is directly in contact with the host and is involved in the communication between both.

Our model in the lab is the necrotrophic fungus *Botrytis cinerea*, which is responsible for gray mold on more than 1000 plants, including many agronomic crops (vines, market garden plants, etc.). It has a high capacity for disseminating its spores in the environment and its genetic manipulation requires L2 type confinement.

During this internship, a gene involved in cell wall biosynthesis will be studied according to 4 objectives:

- 1) **Monitoring of the spatio-temporal expression of this gene *in vitro* and *in planta*:** A GFP reporter strain will be constructed by transcriptional fusion and observed under a confocal microscope to address this objective.
- 2) **Determination of the function of this gene:** A deletion mutant will be engineered, and its phenotype will be observed to address this objective.
- 3) **Localization of the protein encoded by this gene:** To localize the protein produced by this gene, a translational fusion with GFP will be carried out.
- 4) **Localization of a cell wall component:** Fluorescent labeling will also be developed to localize a component of the wall of *B. cinerea*.

Technics involved :

Molecular biology, Fungal genetic transformation, Labelling with antibody, Confocal microscopy, Pathogeny assays.

Key words :

Microbiology, Plant-pathogen interaction, Fungal genetic, Cell wall.