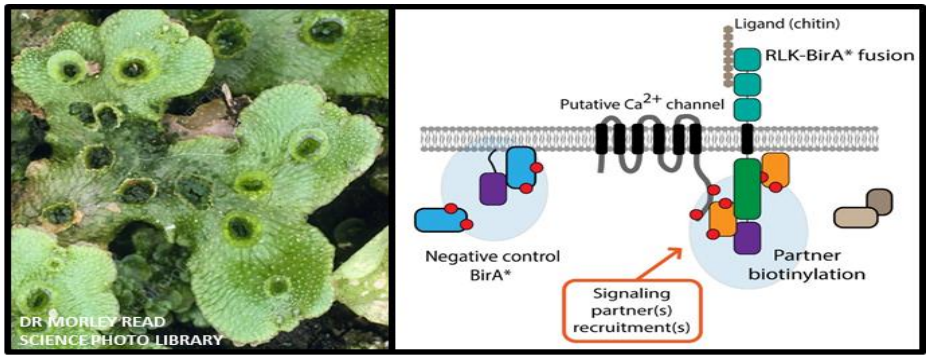
Proposition d'un sujet de stage au M2 ADAM (2020) -

(1 page max photo comprise)

Titre	**Architecture of a receptor complex and calcium signalling in plant defence**
Encadrant 1 (tel + mail)	Malick Mbengue (malick.mbengue@lrsv.ups-tlse.fr) Tel: 05 34 32 38 36
Encadrant 2	-
Equipe(s)	Signalisation calcique cytosolique et nucléaire chez les végétaux Sujet proposé à l'itinéraire PRO ? **OUI X NON ☐**
Résumé	***Scientific background:*** To fend off pathogens, plants evolved a surveillance system that perceives the presence or the activity of pathogens through surface-localized and intracellular immune receptors. Pathogen-Associated Molecular Pattern (PAMP)-triggered immunity constitutes the surface-sensing layer of immunity and relies on the recognition of molecular patterns from the pathogens by plasma membrane localized receptors. One of the earliest and critical response that follows pathogens recognition is a calcium influx across the plasma membrane into the cytosol. To date and despite its importance in signalling, the molecular actors that generate this calcium influx remain elusive and this is a primary focus of the calcium group at LRSV. Because signal transduction by RLKs often rely on a dynamic association with several components inside a protein complex, we hypothesize that the "calcium-machinery" is also part of this RLK-protein complex. Revealing the comprehensive architecture of an immune-RLK platform will therefore prove crucial to better understand signalling events leading to the activation of defence responses and will provide important mechanistic insights into the generation of the calcium signal. For that, I propose to benefit from *Marchantia polymorpha*, a simplified and tractable system that is yet underused in plant immunity related studies, in combination with a recent and exciting proximity labelling approach (BioID). ***Objectives and methods:*** During this internship, you will transform and/or characterize Marchantia *cerk1* mutants transformed with various chimeric CERK1 receptor constructs and a control. You will analyse the obtained transgenic lines for successful expression by western-blot and calcium measurements prior assessing their complementation phenotypes for chitin perception using calcium measurement and MAPK activation as readouts. In parallel, you will verify the subcellular localization of the BioID control constructs by confocal microscopy. After selection of the suitable biological material, you will define the best conditions to set up the proximity labelling of the CERK1 protein complex and perform partners purification. Depending on the progress made in this part, you might be able to submit your first batches of purified biotinylated proteins to the Mass Spectrometry Platform for protein identification. ***References:*** Proximity labeling of protein complexes and cell type-specific organellar proteomes in Arabidopsis enabled by TurboID https://www.biorxiv.org/content/10.1101/629675v1
Photo	

Proposition d'un sujet de stage au M2 ADAM (2020) -

(1 page max photo comprise)