Proposition d'un sujet de stage au M2 ADAM (2019)

Titre	**Study of CLE peptide genes invovled in Arbuscular Mycorrhizal Symbiosis**
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Equipe(s)	Symbiose mycorhizienne et Signalisation cellulaire (LRSV, Castanet Tolosan) Acceptez-vous que ce sujet soit également proposé à l'itinéraire PRO ? OUI
Résumé	Plant secreted peptides, such as CLE peptides, are key regulators of plant development. They control cell identity in defined cell types after being perceived by Leucine-Rich Repeat Receptor-like Kinase (LRR-RLK). In legumes, they also regulate nitrogen fixing symbiosis (NFS). Beside plants, CLEs are also found in some plant parasitic nematodes. Recently, we discovered CLE peptide genes in a subphylum of fungi, the Glomeromycotina (Le Marquer et al., 2019). These fungi are involved in the most widespread symbiosis in land plants: the arbuscular mycorrhizal symbiosis (AMS). We hypothesize that fungal CLE may mimick plant CLE activities in order to regulate symbiosis. One part of our project now aims at characterizing plant CLE genes that are similar to the fungal CLE gene. We produced promCLE:GUS constructs and identified promoter activities that co-localize with fungal colonization sites. The student involved in this project will characterize more into detail the expression pattern of these plant CLE promoters (expression in response to nutrient stresses or during NFS establishment). He/She will also analyse RNAi lines targeting these genes to determine their importance during AMS. The second part of the project focuses on the fungal CLE gene. It will be silenced through Host-Induced Gene Silencing to reveal at which step of the symbiosis this CLE peptide is critical. A novel type of assay will be developed in parallel to identify putative LRR-RLK involved in the perception of the fungal CLE peptide. Le Marquer M, Bécard G, Frei Dit Frey N. Arbuscular mycorrhizal fungi possess a CLAVATA3/embryo surrounding region-related gene that positively regulates symbiosis. New Phytol. 2019 Apr;222(2):1030-1042
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