

Lipo-chitooligosaccharidic Symbiotic Signals Are Recognized by LysM Receptor-Like Kinase LYR3 in the Legume *Medicago truncatula*

While chitooligosaccharides (COs) derived from fungal chitin are potent elicitors of defense reactions, structurally related signals produced by certain bacteria and fungi, called lipo-chitooligosaccharides (LCOs), play important roles in the establishment of symbioses with plants. Understanding how plants distinguish between friend and foe through the perception of these signals is a major challenge.

We report the synthesis of a range of COs and LCOs, including photoactivatable probes, to characterize a membrane protein from the legume *Medicago truncatula*. By

coupling photoaffinity labeling experiments with proteomics and transcriptomics, we identified the likely LCO-binding protein as LYR3, a lysin motif receptor-like kinase (LysM-RLK). LYR3, expressed heterologously, exhibits high-affinity binding to LCOs but not COs.

Homology modeling, based on the Arabidopsis CO-binding LysM-RLK AtCERK1, suggests that LYR3 could accommodate the LCO in a conserved binding site. The identification of LYR3 opens up ways for the molecular characterization of LCO/CO discrimination.

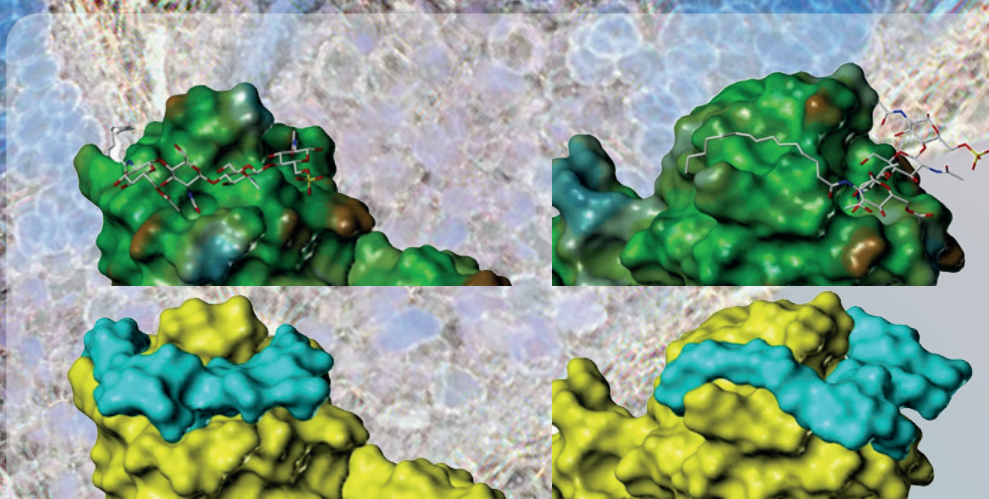


Fig.: The physical interaction between a symbiotic signal (blue) and its binding protein (yellow): a first step to go further?