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### ► To cite this version:

Caroline Baroukh, Rémi Peyraud, Ludovic Cottret, Stéphane Genin. Metabolic modelling of trophic interactions between a plant pathogen and its host plant. *International Plant Systems Biology*, Sep 2018, Roscoff, France. , 2018. hal-02786492

**HAL Id: hal-02786492**

**<https://hal.inrae.fr/hal-02786492>**

Submitted on 5 Jun 2020

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# METABOLIC MODELLING OF TROPHIC INTERACTIONS BETWEEN A PLANT PATHOGEN AND ITS HOST PLANT

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Phytopathogens are responsible of at least 30% of agricultural crop loss. Understanding fundamental pathogenicity mechanisms is essential to find sustainable means of fight against them. Metabolic modeling allows to make a link between genome, physiology and environmental conditions, by integrating molecular biology data in the metabolic reconstruction process and at the same time by predicting quantitative concentrations of metabolites and biomass growth which depends on the environmental conditions applied (mainly substrate availability). Metabolic modeling has already proven useful in the field of bioprocesses, for understanding metabolism and optimizing growth and product yields. Applying metabolic modeling on plants and phytopathogens could help understanding the trophic interactions that occurs between them during an infection. This would ultimately help unraveling pathogens strategy.

In our team (Ralstonia Adaptation and Pathogenicity), we have recently developed a good quality metabolic model of the phytopathogen *Ralstonia solanaceum*. Even if the model was only focused on the pathogen, it has already shown that there is a huge trade-off between pathogenicity and growth, which was experimentally verified. This clearly illustrates that pathogens have to decide how to invest their resources between growth (hence proliferation) and virulence (thus defense/attack against the plant). The next step is to add the plant compartment, to model trophic interactions between the plant and the pathogen. I will present the advances towards the construction of this integrated model and the first experimental and modeling results obtained.