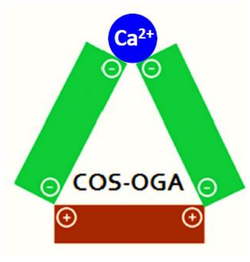
Does COS-OGA induce resistance to plant viruses?

Moreau Sophie (1), Van Aubel Géraldine (2), Janky Rekin's (3) and Van Cutsem Pierre (1)

(1) University of Namur, 61 rue de Bruxelles, 5000 Namur - Belgium
(2) Fytofend SA Rue Phocas Lejeune, 25-6 B-5032 Isnes - Belgium
(3) VIB Nucleomics Core, Campus Gasthuisberg Herestraat 49, 3000 Leuven - Belgium

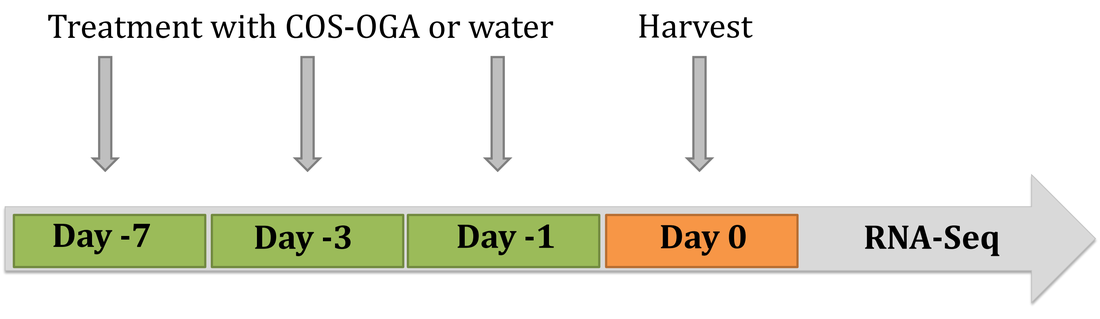
Introduction

Plant viruses induce a wide range of both macroscopic and microscopic symptoms which can lead to **significant yield losses** in terms of quantity and/or quality of products. As they cannot be controlled chemically, plant virus management is based on the use of pesticides to reduce vector population and the selection of crop genetic resistances. However, the extensive use of agrochemicals is also linked with undesirable effects on health, environment and on crop protection itself as far as it can lead to widespread pest resistances. Moreover, plant viruses often acquire the ability to overcome resistance employed by breeders. Therefore, protecting **crops against viruses** requires an alternative approach based on a **durable resistance** and on the **reduction of pesticide** applications.

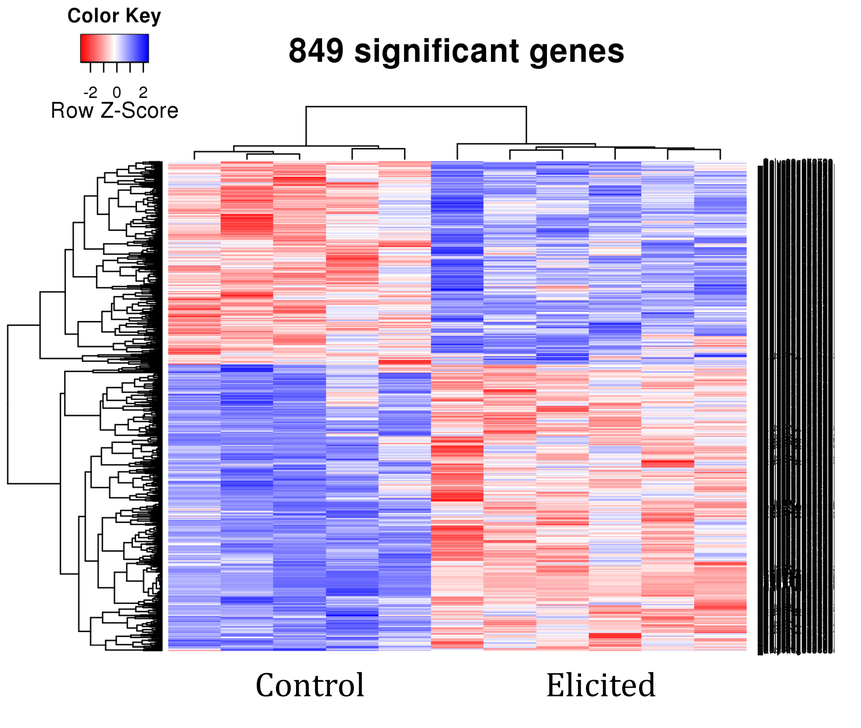


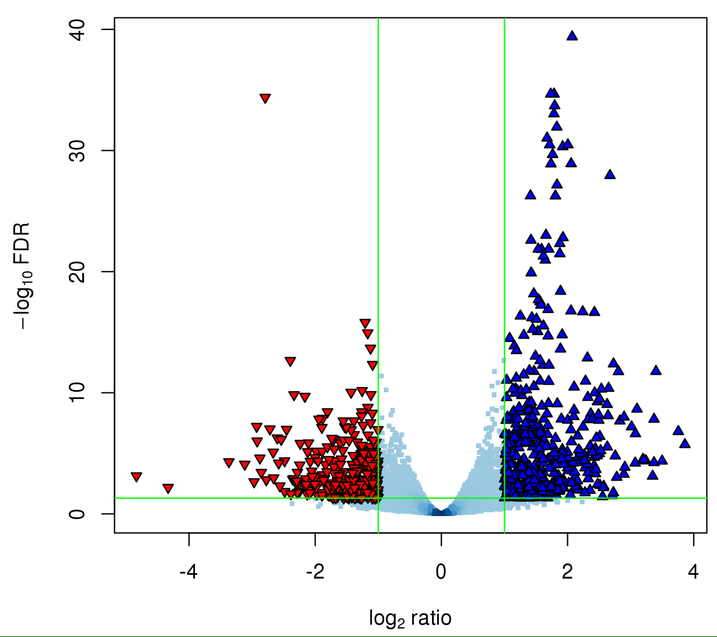
In this view, this research focuses on an elicitor, FytoSave®, developed at the University of Namur, whose physicochemical characteristics **mimic the natural plant-pathogen interactions**. The so-called "COS-OGA" active substance of this product combines plant non self-molecules, i.e. **chitooligosaccharides (COS)**, and plant self-compounds called **oligogalacturonides (OGA).**

Mode of Action



- Tomatoes (*Solanum lycopersicum*) were sprayed 3 times
- Elicited plants: 12.5 g/l COS-OGA
- Control: distilled water with 0.1% Tween
- RNA-Seq analysis to investigate plant transcriptome





Preliminary results

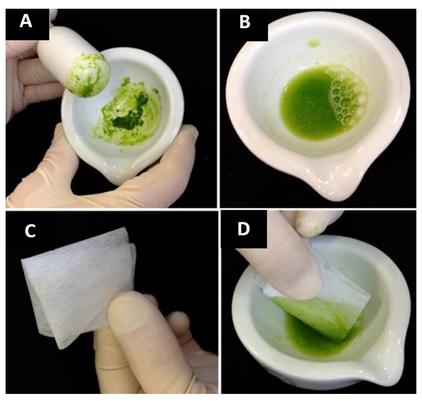
The results of RNA-Seq analysis confirm that tomato plants undergo large changes after elicitation.

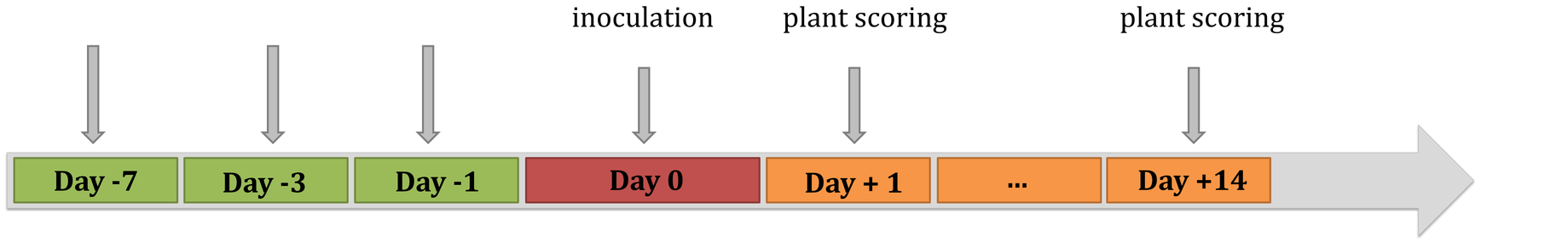
The heatmap shows that 849 genes were differentially expressed between the control and elicited plants.

Perspectives

- Identification of involved metabolic pathways
- Kinetic analysis by qRT-PCR
- Phytohormone quantification with GCMS and HPLC

Protection against plant viruses





Preliminary results

- Virus Selection: Tobacco Mosaic Virus
- Development of inoculating methods
- Identification of local and systemic symptoms

Perspectives

- Evaluation of protection following elicitation
- Transcriptomic analysis of immunity against viruses (RNA-Seq)
- Kinetic analysis by qRT-PCR
- Phytohormone quantification with GCMS and HPLC

Tobacco mosaic virus

Mock

Systemic symptoms

Local symptoms