



# **GUSTAVE: GUS Technology for Analyse and Validate your plant Elicitor**

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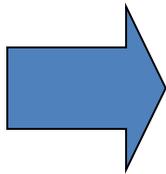
Head of the BIOTEAM and « Laboratory  
and Glasshouse Studies » Service

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Congress Center Basel



# STAPHYT: short overview of the leading company

- Annual average growth of **12%** : a dynamic company,
- **30 M€** of turn over in 2016,
- Over **330** employees,
- **12** European countries,
- **70 field testing stations**: trials on all the agriculture area,
- **5 000 trials set up in 2015**
- Reinvestment of **10 % of the turn-over in Innovation and R&D support**,
- Implication in national and international working groups (Biological Trials Committee, IBMA, PPFA...).



**Leading CRO  
on the market**

# STAPHYT Services

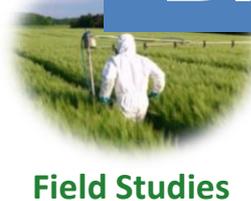
**Plant Breeding**  
*(Arable and vegetable crops)*

**Plant Nutrition**  
*(Conventional and biostimulants)*

**Plant Protection**  
*(Conventional and biocontrol)*



## BIOPRODUCTS



**Expertise & Excellence**

- Appropriate solutions for **bioproduct suppliers** : STAPHYT set up a unique service in Europe.
- BIOTEAM gathers experts in plant-physiology and phytopathology, agronomy and regulatory monitoring.
- Laboratory screening tests, field trials up to registration and marketing authorization dossiers.





**PLANT STIMULATOR**

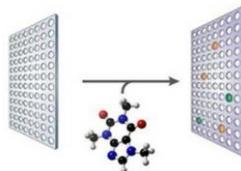
- Plant Biostimulant screening bioassays



- Plant defense stimulation tests



- Fungicide-like screening bioassays



- Plant protection efficacy / efficiency



- R&D



**NATURAL EXTRACTS**



RESEARCH & DEVELOPMENT

# GUS- TAVE PROJECT

In collaboration with : Dr L Rajou and Dr A Delaghi



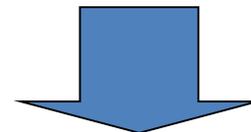
**Expertise  
& Excellence**



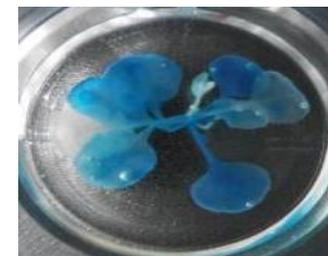


# WHO / WHAT is GUSTAVE ?

GUS Technology for Analyse and  
Validate your plant Elicitor



A Promising and Rapid *in vitro* screening  
test of elicitors / potentialisation activators  
(GUS plants strategy)

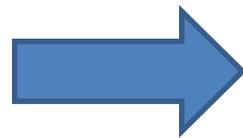




# THE Gus-TAVE TEST

Test for detecting induced immune responses in plants:

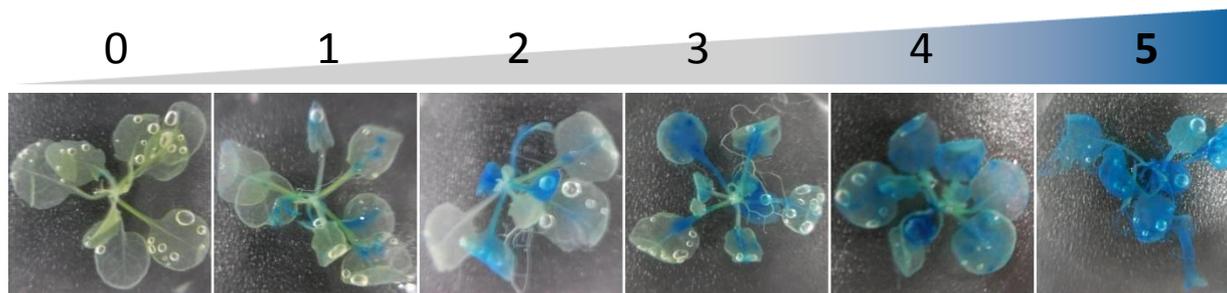
**Simple and reliable test, detecting** defense markers.



## GUS test



Activation of plant defenses is correlate with the **blue color** intensity

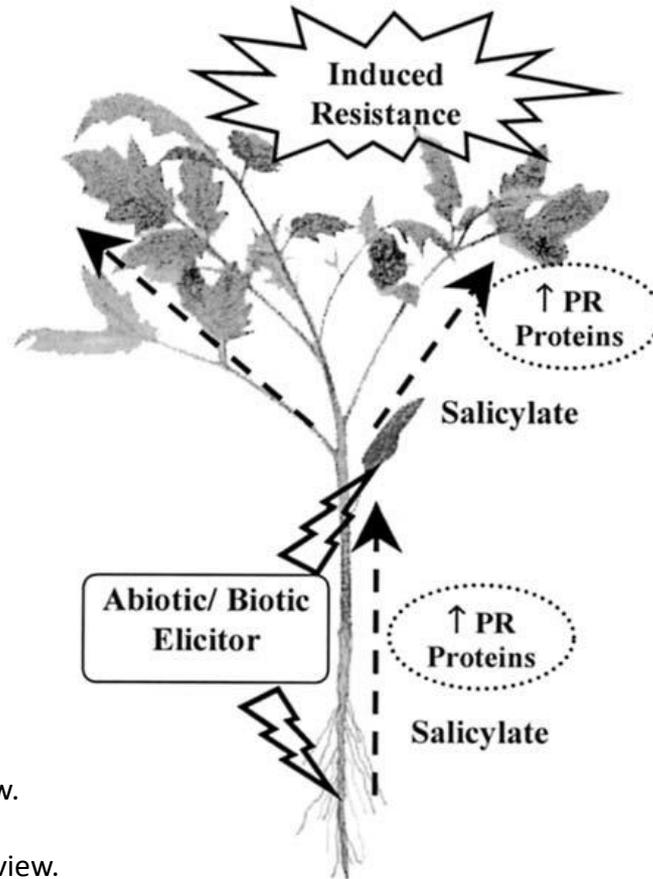


Visual scale of reference score



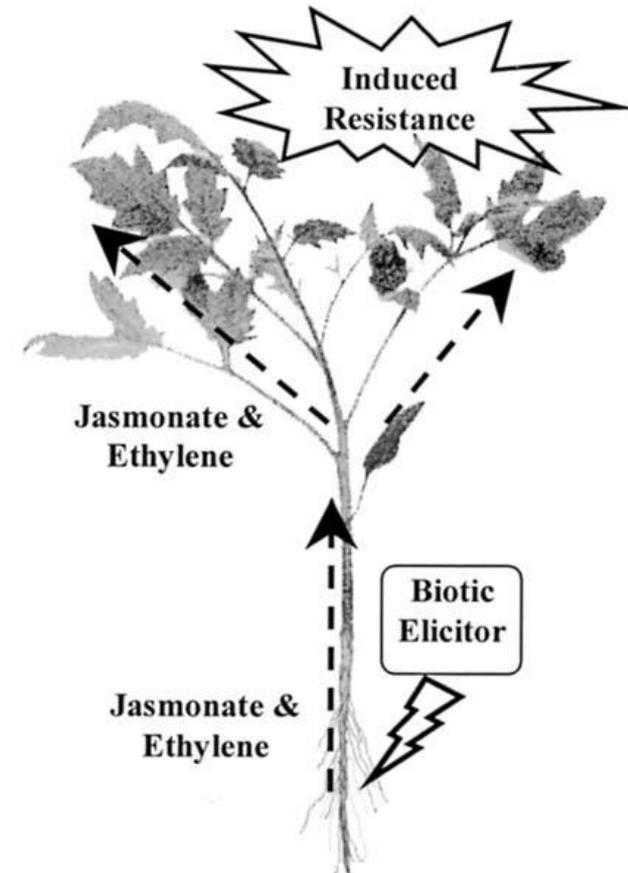
# DEFENSE ACTIVATION

Interaction plant/ pathogen



Systemic Acquired Resistance (SAR)

Interaction plant/ rhizobacteria



Induced Systemic Resistance (ISR)

Référence :  
*Molecules* **2014**, Review.  
Nieves Baenas *et al.*  
*Crop Science*, **2004**, Review.  
Vallad, *et al.*

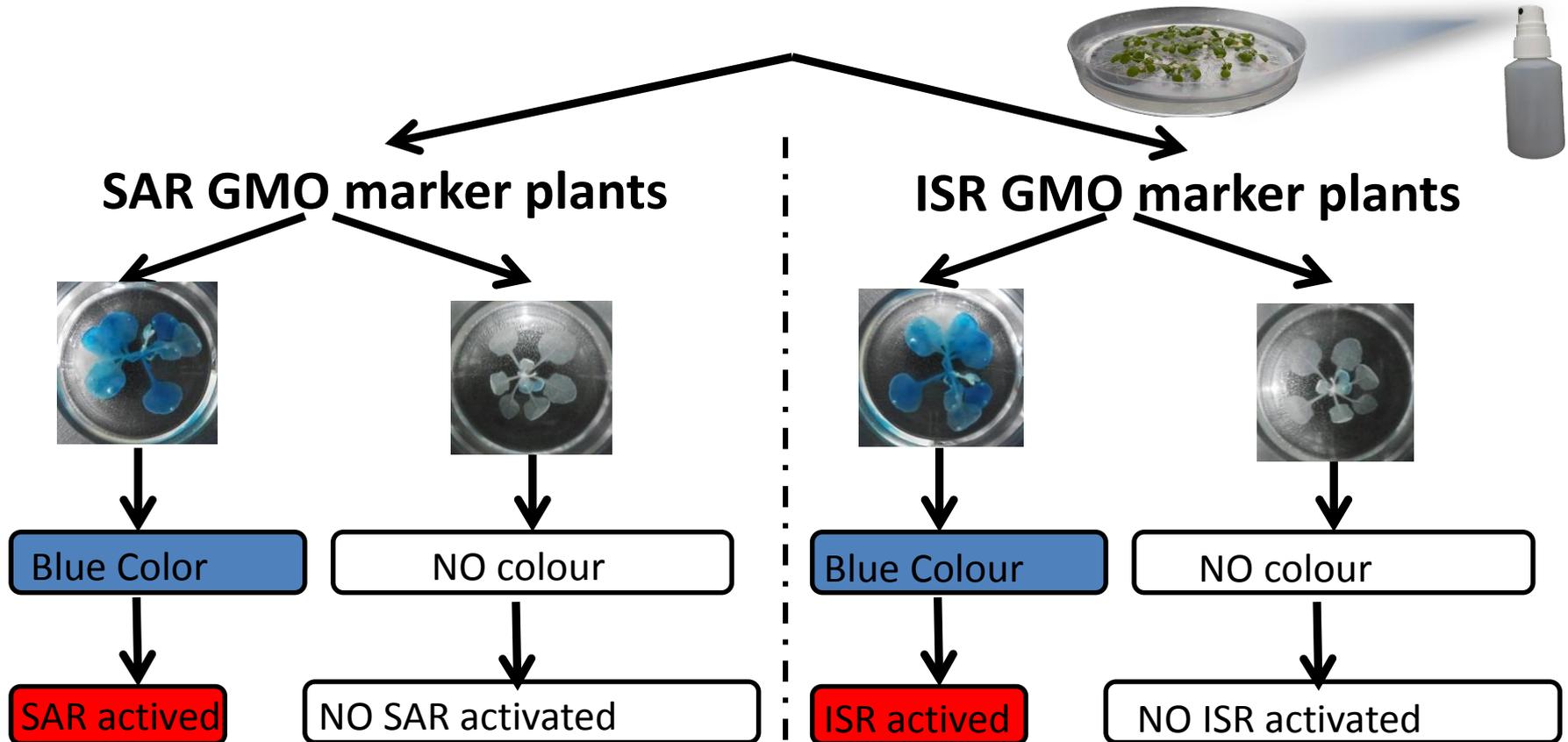


Use of 2 lineages of GMO *Arabidopsis thaliana* specific of the SAR or ISR.



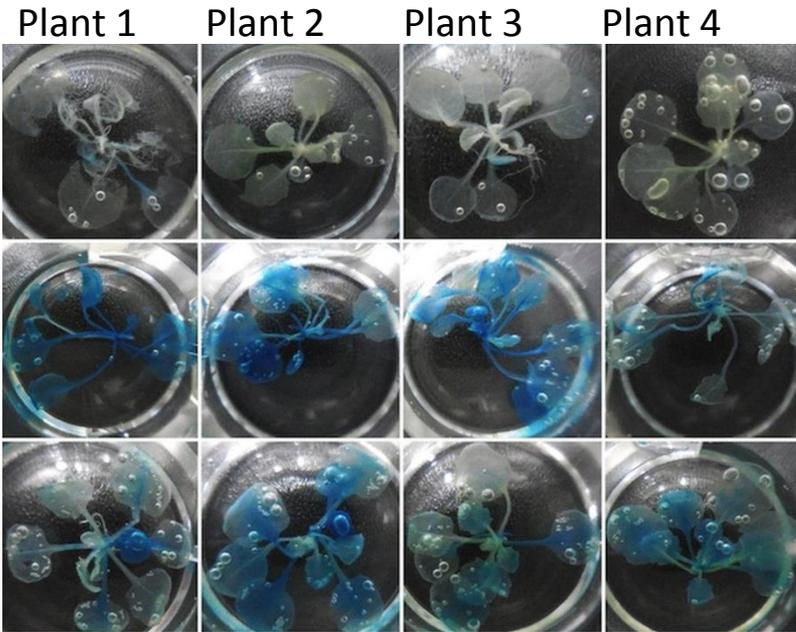
# Which way of Defense is activated ?

Spray on *A. thaliana* (Water, positive control, Elicitor ...)

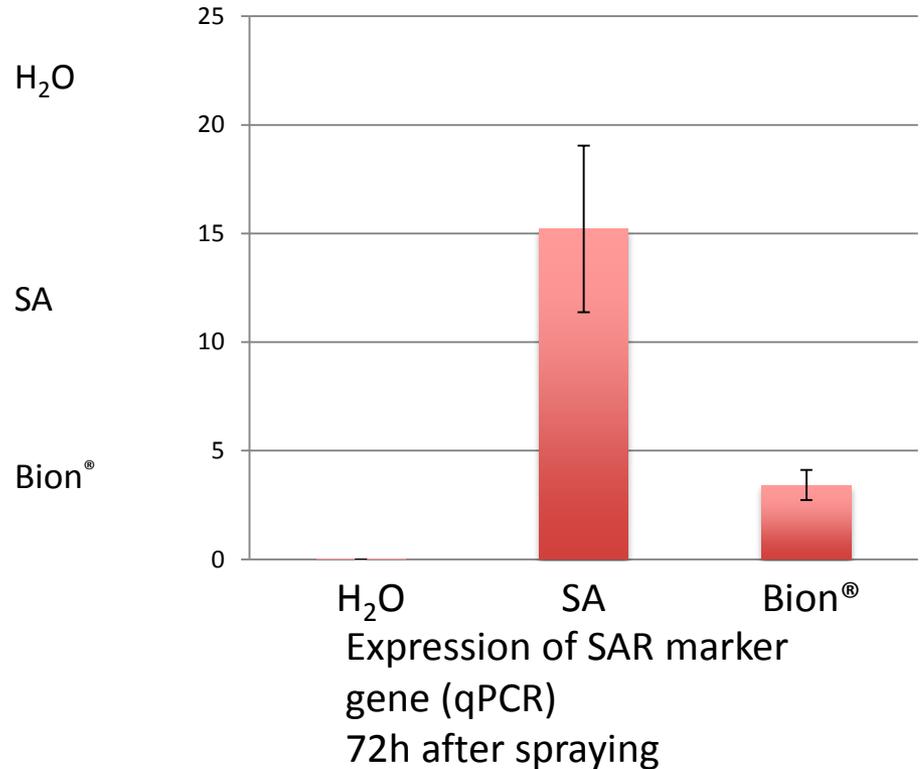




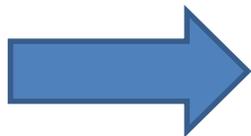
# Test VALIDATION USING qPCR



Expression of SAR marker gene (test GUS) 72h after spraying



Expression of SAR marker gene only in the plants treated with SA and Bion<sup>®</sup>



**ELICITATION of the plant DEFENSE**



# Others possibilities of GUS-TAVE

**Gus-TAVE, the « blue » elicitor test gives information on:**

- **The physiology statute of the plant (MoA),**
  - The defense responses (SAR or ISR) following a product application.
  - The type of responses induced by the product: elicitor or potentialisator.
- **The mode of application of the product,**
  - **The delay** between spraying and plant defense activation.
  - The action **persistence**.
  - **The rate of the bioproduct.**

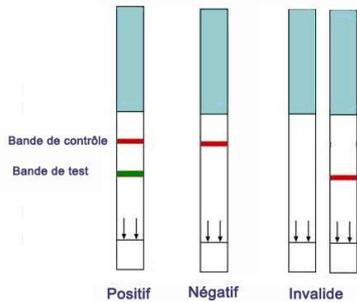


## Next step for R&D : Field studies and Strategy



### ELICITEST: Development of a field diagnosis tool for elicitors evaluation

Development of test for general immune responses activation in plants (SAR and ISR).  
= A simple and reliable immunoassay for the detection *in situ* of a plant natural defense marker.



## ELISA KIT



Your contact for  
ABIM / Bioteam



Many thanks  
for your attention

