PROJECT: Ca2+ signal in priming

Date: **28.09.2021** **REPORTING**

ID: 427

PROJECT TITLE

Investigating Ca2+ signaling in priming and Systemic Acquired Resistance

CONSORTIUM

P 1	Keiko Yoshioka		
P 2	Olga del Pozo		

SUMMARY OF THE REPORT

Ca^{2+} is a universal second messenger in all eukaryotes. Transient changes in cytosolic Ca^{2+} are rapidly generated upon a diverse range of stimuli such as drought, heat, wounding, and biotic stresses such as pathogen infection. To generate stimulus-specific signals that can elicit the appropriate responses, Ca^{2+} signals must contain unique information, and this will be decoded and transferred to downstream signaling cascades by Ca^{2+} sensor proteins such as calmodulins and Calcineurin B-like proteins (CBLs).

A genetically encoded Ca^{2+} reporter, GCaMP3, was introduced into Arabidopsis and *Nicotiana benthamiana* to measure changes in cytosolic Ca^{2+} upon treatment with two strains of the pathogen, *Pseudomonas syringae*, *Pseudomonas syringae* pv. *tomato* DC3000 (DC3000, for Arabidopsis) *or Pseudomonas syringae* pv. *tabaci* (*Pta*, for *N. benthamiana*) (deFalco et al., 2017)

In this project, several experiments were conducted to investigate:

a) the priming effect on immunity-related Ca^{2+} signals mainly using the priming agent pipecolic acid.

b) the role in immunity-related Ca^{2+} signaling of 1) Cyclic Nucleotide-gated Channels(CNGCs, using Arabidopsis knockout mutants), and 2) a set of newly identified immune signaling components, CBL-interacting protein kinases6(Cipk6, de la Torre et al., 2013) and a set of Cipk6-interactors (using Virus-induced gene silencing (VIGS) in *Nicotiana benthamiana*).