Engineering the *Prunus* translation initiation factors in stone fruit trees for resistance to *Plum pox virus*

V. Decroocq, J. Rubio Astudillo, M. Acuña Soto, H. Prieto

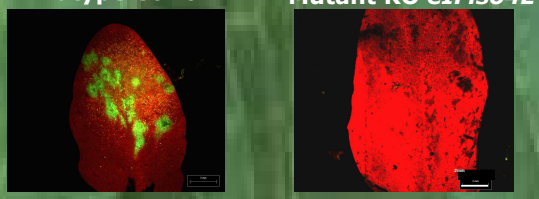
UMR GDPP, INRA Bordeaux – Université Bordeaux2, BP81, 33883 Villenave d'Ornon Cedex, France. INIA, La Platina Station, Santa Rosa 11610, La Pintana, SANTIAGO de Chile. decroocq@bordeaux.inra.fr

To infect plant tissues, the *Plum pox virus* (PPV) is recruiting host proteins such as the translation initiation factors, eIF4E and eIF4G (ref1)(ref2). In order to confirm the implication of these host factors in the development of sharka disease in stone fruit trees (*Prunus* species), orthologues were identified in peach and processed for silencing by genetic transformation via *Agrobacterium tumefasciens* .

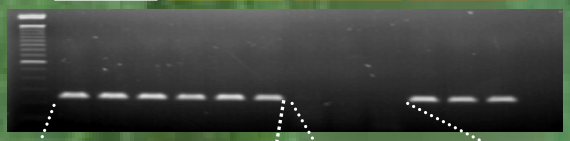
1) Functional copies of the *eIFiso4E* and *eIFiso4G1* genes are indispensable for PPV infection in *Arabidopsis thaliana*

Inoculation with pBINPPVnkGFP of

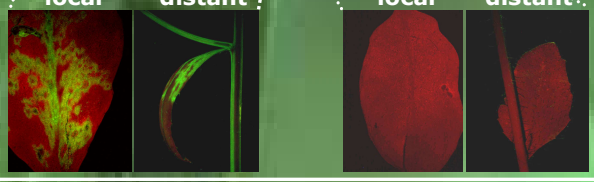
Wildtype Col-0 | Mutant KO *eIFiso4E*



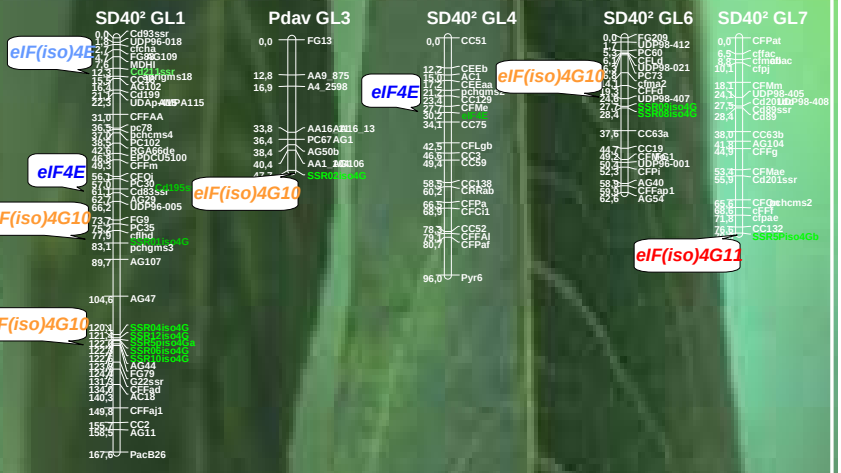
WT | 4G | iso4G1 | iso4G2



local | distant | local | distant



2) Several *eIF4E* and *eIF4G* copies and isoforms in the Peach genome (ref3)



3) Hairpin-based copy specific RNAi constructs in peach

4) European and japanese plum transformation with Agrobacterium (ref4)

eIFiso4E-hp-RNAi plantlets | *4E*-hp-RNAi plantlets

4 lines

36 lines

Regenerated plants verified by PCR, under molecular characterisation (level of gene expression etc…)

Resistance to sharka challenged by micrografting onto PPV-infected *P. insititia* rootstocks

References

Ref1: Decroocq et al., 2006. Molecular Plant-Microbe Interactions 19: 541-549
Ref2: Nicaise et al., 2007. FEBS Letters 581(5): 1041-1046
Ref3: Marandel et al., 2009. Molecular Plant Pathology 10(3): 347-360
Ref4: Urtubia et al., 2008. Plant Cell Report 27: 1333-1340.

Results: *P. domestica* and *P. salicina* plums were transformed with the eIF4E hairpin RNAi constructs with the aim to silence one or the other isoform and test for resistance to PPV. Similar hp-RNAi constructs are under completion, based on the *eIF4G* and *eIFiso4G* copies. This study is expected to provide clue on the translation initiation factors relevant for PPV, that should be later targeted for resistance to sharka disease.