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AvrAC, a Xanthomonas campestris pv. campestris-specific type III effector, triggers ETI in Arabidopsis vasculature
ENDRICK GUY1, MATTHIEU CHABANNES1, AHMED HAJRI2, TRISTAN BOUREAU2, STEPHANE POUSSIER2, MATTHIEU ARLAT1, LAURENT D. NOËL1
1Laboratoire des Interactions Plantes Micro-organismes, UMR CNRS-INRA 2594-441, Chemin de Borde Rouge, F-31326 Castanet-Tolosan, France; 2UMR PaVé INRA/AGROCAMPUS OUEST-INHP/UA, 2, rue le Nôtre, F-49045, Angers, France
http://www.newphytologist.org/effectors/default.htm

Xanthomonas campestris pv. campestris (Xcc) is the causal agent of black rot on Brassicae and causes disease on cabbage and Arabidopsis for instance. The avrAC gene encodes an Xcc-specific type III effector which is responsible for avirulence on Arabidopsis ecotype Col-0 exclusively when Xcc is inoculated in the leaf vasculature. PCR and dot-blot hybridization performed on a large collection of plant pathogenic bacteria revealed that avrAC is specific to Xcc. The analysis of more than 50 Xcc strains reveals that avrAC displays a very low allelic diversity and belongs to the Xcc variable effectome. Moreover, the presence of avrAC is tightly correlated with an increase in Xcc aggressiveness on susceptible Arabidopsis and nonhost pepper plants. We show that the “Leucine-Rich Repeat” (LRR) and “Filamentation induced by cAMP” (Fic) domains are both required for avirulence on resistant Arabidopsis and aggressiveness on pepper. Interestingly, the Fic domains of the VopS and IbpA effectors from animal pathogens were recently shown to mediate protein adenylylation, a yet unknown protein posttranslational modification. Strategies developed to dissect avrAC functions in planta and to study plant vascular immunity will be presented.