Xanthomonas campestris pv. campestris (Xcc) is the causal agent of black rot on Brassicae and causes disease on crop plants such as cabbage or on the model plant Arabidopsis. The xopAC gene encodes a type III effector which is responsible for avirulence on Arabidopsis ecotype Col-0 exclusively when Xcc is inoculated in the leaf vasculature (1). PCRs and dot-blot hybridizations performed on a large collection of plant pathogenic bacteria revealed that avrAC is specific to Xc. 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. This correlation was experimentally confirmed by reverse genetic in several Xcc strains. In addition, xopAC is responsive for the appearance of necrotic lesions on nonhost pepper plants. We show that the “Leucine-Rich Repeat” (LRR) and “Filamentation induced by cAMP” (Fic) domains of XopAC are both required for avirulence on resistant Arabidopsis and necrosis on pepper. Interestingly, the Fic domains of the VopS and IbpA virulence factors from animal pathogens were recently shown to mediate protein adenylylation, a yet unknown protein posttranslational modification in plants (2,3). Strategies developed to dissect avrAC functions in planta and to study plant vascular immunity will be presented.

References:
1. Xu et al. 2008 J. Bact 190:343-355

Keywords:
Xanthomonas, effectome, Arabidopsis, pathogenicity, vascular immunity