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Title: Nonhost Resistance of Tomato to the Bean Pathogen *Pseudomonas syringae* pv. *syringae* B728a Is Due to a Defective E3 Ubiquitin Ligase Domain in AvrPtoBB728a
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Abstract: The bean pathogen *Pseudomonas syringae* pv. *syringae* B728a expresses homologs of the type III effectors AvrPto and AvrPtoB, either of which can trigger resistance in tomato cultivars expressing Pto and Prf genes. We found that strain B728a also elicits nonhost resistance in tomato cultivars VFNT Cherry and Moneymaker that lack Pto but express other members of the Pto family (e.g., SIFen and SIPToC). Here, we show that the AvrPtoB homolog from B728a, termed AvrPtoBB728a (also known as HopAB1), is recognized by 'VFNT Cherry' and 'Moneymaker' when the effector is expressed in *P. syringae* pv. *syringae* 61, a strain lacking the avrPto or avrPtoB homolog. Using a gene-silencing approach, this recognition was shown to involve one or more Pto family members and Prf. AvrPtoBB728a interacted with SIFen, SIPToC, and SIPToD, in addition to Pto, in a yeast two-hybrid assay. In *P. syringae* pv. tomato DC3000, the C-terminal domain of AvrPtoB is an E3 ubiquitin ligase that ubiquitinates Fen, causing its degradation and leading to disease susceptibility. Although the C-terminal domain of AvrPtoBB728a shares 69% amino acid identity with that of AvrPtoB, we found that it has greatly reduced E3 ligase activity and is unable to ubiquitinate Fen in an in vitro ubiquitination assay. Thus, the nonhost resistance of 'VFNT Cherry' and 'Moneymaker' to B728a appears to be due to recognition of AvrPtoBB728a as a result of the effector's reduced E3 ligase activity, which prevents it from facilitating degradation of a Pto family member. We speculate that the primary plant host of B728a lacks a Fen-like protein and that, therefore, the E3 ligase of AvrPtoBB728a was unnecessary for pathogenicity and has diverged and become ineffective.

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