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Hpa1 is a α -helix-dependent type III translocator in *Xanthomonas oryzae* pv. *oryzae***Xiaochen Chen, Xuan Wang and Hansong Dong**
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Pathogenic Gram-negative bacteria interact with their eukaryotic hosts by deploying the type III translocon. The translocon compositions, the number and biochemical characteristics of type III translocators in animal-pathogenic bacteria have been well elucidated, but not for plant-pathogenic bacteria. With extensive studies on biological functions of the Hpa1 protein secreted by the type III secretion system in *Xanthomonas oryzae* pv. *oryzae* (Xoo), we showed that Hpa1 is a type III translocator based on measurements of two proteins categorized as transcription activator-like (TAL) effector. Hpa1 was functionally associated with the TAL effector PthXo1 or AvrXa10 by genetic analysis of the wild-type Xoo strain and related mutants or recombinant strains. Inoculation experiments suggested that Hpa1 is required not only for the virulent role of PthXo1 in the susceptible rice variety Nipponbare, but also for the avirulent function of AvrXa10 on the resistant rice variety IRBB10. Hpa1 is unrelated to the secretion of PthXo1 and AvrXa10 out of bacterial cells. However, Hpa1 is critical for both TAL effectors to be translocated from bacterial cells into the cytosol of rice cells based on replicate experiments performed on the susceptible and resistant varieties, respectively. Hpa1-mediated translocation of PthXo1 is coincident with induced expression of rice SWEET11 gene regulatory target of PthXo1, resulting in the occurrence of the bacterial blight disease in the susceptible rice variety. By contrast, the immune hypersensitive response is induced in agreement with induced expression of rice Xa10 gene, which is the target of AvrXa10, only when AvrXa10 is translocated from bacteria into cells of the resistant rice variety. All the virulent or avirulent performances of the TAL effectors are nullified by directed mutation that removes the α -helix motif from the Hpa1 sequence. The effect of the directed mutation suggests that Hpa1 depends on its α -helical motif to fulfil the translocator function.

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