BigR, A TATA-BINDING TRANSCRIPTIONAL REPRESSOR FROM PLANT BACTERIA, REGULATES AN OPERON IMPLICATED IN BIOFILM GROWTH

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Xylella fastidiosa is a plant pathogen that colonizes the xylem vessels causing vascular occlusion due to biofilm growth. However, little is known about the molecular mechanisms driving biofilm formation in *Xylella*-plant interactions. Here, we show that BigR (biofilm growth-associated repressor), a novel helix-turn-helix regulator, controls transcription of an operon implicated in biofilm growth. This operon, which is restricted to some plant-associated bacteria, encodes BigR, membrane proteins and an unusual beta-lactamase-like hydrolase (BLH). Due to its uniqueness, we sought to understand its function and regulation in *X. fastidiosa* and *Agrobacterium tumefaciens*. We show that BigR binds to a palindromic TATA element located upstream the *blh* gene and strongly represses transcription of the operon, apparently by a mechanism involving competition with the RNA polymerase for access to the -10 region. Although BigR is similar to ArsR/SmtB repressors, our data suggest that it does not act as a metal sensor. Increased operon activity was observed in *Xylella* and *Agrobacterium* biofilms. *A. tumefaciens* mutated in the *bigR* gene showed constitutive expression of the operon and increased biofilm formation in glass surfaces and tobacco roots, indicating that the operon may play a role in cell adherence or biofilm development.