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Tse1 mobilized by T6SS of *Pseudomonas* induces sporulation of *Bacillus* via σ^W

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Abstract:

The extracellular matrix and sporulation are defensive mechanisms used by *Bacillus* cells when they interact with *Pseudomonas* strains expressing a type VI secretion system (T6SS). Here, we define Tse1 as the main toxin mobilized by the *Pseudomonas* T6SS that triggers sporulation in *Bacillus*. We characterize Tse1 as a peptidoglycan hydrolase and electron microscopy analysis and the use of diverse chemical probes, let us visualize malfunction of the *Bacillus* cell membrane. By performing RNA-seq and immunocytochemistry analyses, we also delineate the response of *Bacillus* cells to Tse1, which through the coordinated actions of the extracellular sigma factor σ^W and the cytoplasmic histidine kinases KinA and KinB, culminates in activation of the sporulation cascade. We propose that this cellular developmental response is conserved in *Bacilli* to defend against the toxicity of T6SS-mobilized Tse1 effector.

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