

## Contribution of Phenotypic Heterogeneity to plant colonization by *Pseudomonas syringae*

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### RESUMEN

In bacterial clonal populations, cell to cell differences can be originated by the response to different stimuli present in the environment. However, the sources of variation may not always be directly correlated with stimuli. In some cases, these differences are merely a consequence of the noise in gene expression or in others, a programmed event under genetic or epigenetic control. The presence of different phenotypes can allow some individuals to survive sudden environmental changes (risk-spreading) and can also lead to the division of labour between individuals. The relevance of this process has been demonstrated in Salmonella and other human pathogens for the expression of virulence genes and has been linked to the establishment of a successful infection. However, little is known about the importance of this process in the colonization of the plant tissue. In the phytopathogenic bacteria *Pseudomonas syringae* we have demonstrated that the T3SS show phenotypic heterogeneity during the colonization of the plant. We have also established that flagella is expressed and displays phenotypic heterogeneity during colonization of the apoplast. These processes are counter-regulated. Nonetheless, all possible combinations for T3SS and flagella expression are formed within the apoplastic population, including T3SSON/FlagellaON and T3SSOFF/FlagellaOFF bacteria. We show that the expression and function of these virulence-relevant loci impact bacterial fitness and describe how plant defences modulate their expression at the population level. All these observations support the notion that the phenotypic heterogeneity is a relevant process for the adaptation of *P. syringae* to the plant host.

