

## Phenotypic heterogeneity during plant colonization

Nieves López-Pagán<sup>1</sup>, Maria Antonia Sánchez-Romero<sup>2</sup>, José Rufián<sup>1,3</sup>, Laurent Ausset<sup>4</sup>, Fernando Govantes<sup>5</sup>, Adam Schikora<sup>6</sup>, Javier Ruiz-Albert<sup>1</sup>, Carmen R. Beuzón<sup>1</sup>

<sup>1</sup>Instituto de Hortofruticultura Subtropical y Mediterránea "La Mayora" (IHSM-UMA-CSIC). Departamento de Biología Celular, Genética y Fisiología. Facultad de Ciencias. Universidad de Málaga. 29071, Málaga, Spain. <sup>2</sup>Departamento de Genética, Universidad de Sevilla, Sevilla, Spain. <sup>3</sup>Shanghai Center for Plant Stress Biology, Shanghai Institutes of Biological Sciences, Chinese Academy of Sciences, Shanghai 201602, China. <sup>4</sup>Aix Marseille Université, CNRS, LCB UMR, 7283, IMM, Marseille, France. <sup>5</sup>Universidad Pablo de Olavide. <sup>6</sup>Centro Andaluz de Biología del Desarrollo, (Universidad Pablo de Olavide, Consejo Superior de Investigaciones Científicas and Junta de Andalucía), Sevilla, Spain. <sup>6</sup>Julius Kühn-Institut, Braunschweig, Germany

Isogenic bacterial populations can display phenotypic differences. Cell-to-cell phenotypic differences can be a consequence of noisy gene expression, or a programmed event under genetic or epigenetic control. Bistability occurs when populations splits into subpopulations showing distinct phenotypes. This heterogeneity can allow individuals to survive environmental changes or can lead to cooperation between individuals. This is highly relevant for some animal pathogens, but little is known about it for plant colonizing bacteria.

We have reported that T3SS expression in *Pseudomonas syringae* is bistable in *hrp-induction medium* and displays phenotypic heterogeneity during plant colonization. This bistability generates two subpopulations that show differences in virulence. Flagella is also an important virulence determinant for *Pseudomonas syringae* colonization that displays a degree of counter-regulation with the T3SS. *Salmonella enterica* serovar typhimurium SPI-1 T3SS is also expressed bistably and counter-regulates with flagella. SPI-1 bistable expression is a important asset during mouse infection as it leads to cooperative virulence. But although *S. enterica* colonize plants as alternative hosts and requires SPI-1 to do so efficiently, little is know about the expression of this system during plant colonization

We present our newest findings regarding phenotypic heterogeneity of virulence relevant traits of *P. syringae* and *S. enterica* during plant colonization.