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A Type VI Secretion System contributes to the virulence of *Salmonella enterica* serotype Gallinarum

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The recently described Type VI Secretion System (T6SS) represents a new paradigm of bacterial protein secretion. We have recently identified a putative T6SS encoded in the *Salmonella* Pathogenicity Island 19 (SPI-19), a genomic island present in a subset of serotypes of *Salmonella enterica* including the avian adapted *S*. Gallinarum. To assess the contribution of SPI-19 in the colonization of chickens by *S*. Gallinarum, non-polar deletion mutants of the whole SPI-19 and the *clpV* gene (encoding an essential T6SS component) were constructed in the *S*. Gallinarum strain 287/91 background. These mutants were tested in competitive infection assays against the wild-type parental strain. Oral infection of four-day-old White Leghorn chicks revealed that both T6SS mutants colonized the ileum, ceca, liver and spleen poorly compared to the wild-type strain. Restitution of SPI-19 to the ΔSPI-19 mutant, using VEX-Capture, complemented this colonization defect. To further characterize the contribution of the SPI-19 T6SS to *S*. Gallinarum virulence, *in vitro* infection assays using epithelial and macrophage cell lines were performed. Our data indicate that SPI-19 T6SS is not involved in the invasion of HeLa epithelial cells by *S*. Gallinarum strain 287/91. On the other hand, SPI-19 T6SS was required for the intracellular survival of this strain within RAW264.7 macrophages at 20 hours after infection. Altogether the data indicate that SPI-19 and the T6SS encoded therein contributes to macrophage intracellular survival and colonization of the gastrointestinal tract and internal organs of chicks infected by *S*. Gallinarum. We are currently evaluating the secretion and translocation of T6SS components into the host-cell cytosol and the molecular mechanisms behind the phenotypes observed.

Keywords: T6SS, SPI-19, Salmonella, Colonization