

## **Evaluation of the Role of the Bvg Intermediate Phase in Bordetella pertussis during Experimental Respiratory Infection.**

The BvgAS system of *Bordetella pertussis* was traditionally considered to mediate a transition between two phenotypic phases (Bvg(+)) and Bvg(-)) in response to environmental signals. We characterized a third state, the intermediate (Bvg(i)) phase, which can be induced by introducing a 1-bp substitution into *bvgS* (the *bvgS*-I1 mutation) or by growing *B. pertussis* under conditions intermediate between those leading to the Bvg(+) and Bvg(-) phases. Like *B. bronchiseptica*, *B. pertussis* displays in its Bvg(i) phase a characteristic colony morphology and hemolytic activity and expresses a Bvg(i)-phase-specific polypeptide called BipA, whose synthesis is regulated by *bvgAS* at the transcriptional level. Based on our results, we hypothesize that the Bvg(i) phase of *B. pertussis* may be involved in facilitating transmission between hosts. Thus, a *B. pertussis* mutant carrying the *bvgS*-I1 mutation (GMT1i) persisted at wild-type levels only in the upper murine respiratory tract. Interestingly, a *bipA* deletion derivative of GMT1i displayed a reduced ability to colonize the nasal cavity of mice compared with GMT1i. However, in experimental mixed infections GMT1i expressing the Bvg(i) phase could establish an initial colonization in the nose and trachea of mice as efficiently as GMT1, but the wild-type strain outcompeted GMT1i at a later time point at all sites of the respiratory tract, suggesting that the Bvg(i) phase does not serve as a phenotypic phase specialized in colonization. Finally, even though *B. pertussis* expresses *in vitro* the Bvg(i) phase at the human nasal temperature, anti-BipA antibodies were undetectable in a large collection of sera from pertussis patients.

Más información: *Infect Immun* 2005; 73: 748-760