



POSTER PRESENTATION

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Analyses reveal a novel avirulent *Streptococcus suis* Serotype 2 strain that induces protective immunity against challenge with the highly virulent strains

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Background

By comparative analysis of the bacterial genomes of *Streptococcus suis* serotype 2 both virulent and avirulent strains are instrumental in the development of vaccines and the functional characterization of important genetic determinants.

Methods

We isolated from a clinically healthy pig an avirulent strain, 05HAS68.

Results

By comparing the genomes of the virulent and avirulent strains, we observed massive genome rearrangements that may result in alterations in gene expression and, in turn, causing enormous single gene gain and loss for the *S. suis* 2 species. It is most interesting that both virulent and avirulent species feature a similarly structured genomic island (GEI) which carries different idiosyncratic systems as an adoptive evolutionary response. Strikingly, all of the animals vaccinated with the avirulent strain 05HAS68 were protected from challenge infection with the most virulent *S. suis* 2 strain, 05ZYH33, and, furthermore, the protective immunity could be transferred with T cells and plasma from the vaccinated pigs to unimmunized animals. Increased production of tumor necrosis factor alpha (TNF-alpha) and gamma interferon (IFN-gamma) in peripheral blood of the immunized animals may be attributed to the protective immunity elicited by the live vaccine.

Discussion

Since the *S. suis* 2 strains command large genetic diversity, it is almost impossible to achieve global protection for all *S. suis* 2 pathogenic strains by depending on one, or even several, virulence-related substances as vaccines. In view of our results, both humoral and cellular immunities induced by live 05HAS68-based vaccine are required for the specific protection against virulent *S. suis* strains; therefore, we suggest reconsideration of research strategy in terms of model strains to test for vaccine design.

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