

***Actinobacillus pleuropneumoniae* in Swine: Pathogenesis, Antigenes and Vaccination**

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Porcine pleuropneumoniae is an important disease in fattening pigs, caused by *A. pleuropneumoniae* (App). At present 13 different serotypes have been described, based on differences in CPS and LPS.

The 23 different App serotypes express one or two of three different RTX toxins, designated ApxI, ApxII and ApxIII (1). Within each serotype a remarkably consistent Apx toxin profile was found in field isolates from all over the world, both with regard to genotype and phenotype (2). Four different toxin profiles could be distinguished: 1) ApxI and ApxII in serotypes 1, 5a, 5b, 9 and 11; 2) ApxII and ApxIII in serotypes 2, 3, 4, 6 and 8; 3) ApxII in serotypes 7 and 12; 4) ApxI in serotype 10.

Besides an OMP-A homologous outer membrane protein (OMP), all App serotypes and 99% of field isolates express a common 42kDa-OMP. By sequence comparisons this 42kDa-OMP appeared to be homologous to the P2-OMP of *H. influenzae* type b (3).

A vaccine (ActinoporcTM) was composed by including purified ApxI, ApxII and ApxIII toxoids and purified 42kDa-OMP in an aqueous adjuvant formulation (DiluvacTM Forte). The vaccine appeared to induce almost complete protection in pigs with regard to morbidity, mortality and development of typical lung lesions, against aerosol challenge with several App serotypes. Since the vaccine was shown to induce protection against challenge with at least one representative of all 4 toxin profiles, it was concluded as very likely that the vaccine will protect against all App serotypes.

References

1. Frey, J. et al. 1993 - *Actinobacillus pleuropneumoniae* RTX-toxins: uniform designation of haemolysins, cytolysins, pleurotoxin and their genes. *J. Gen. Microbiol.* **139**, 1723–1728.
2. Beck, M., J. F. van den Bosch, I.M.C.A. Jongenelen, P.L.W. Loeffen, R. Nielsen, J. Nicolet and J. Frey, 1994 - RTX toxin genotypes and phenotypes in *Actinobacillus pleuropneumoniae* field strains. *J. Clin. Microbiol.* **32**, 2749–2754.

3. van den Bosch, J.F., A.N.B. Pubben, F.G.A. van Vugt and R.P.A.M. Segers, 1994. Synergistic effect of a P2-homologous outer membrane protein and ApxI toxin in protection against *Actinobacillus pleuropneumoniae*. In: H.A.P. '94, Edinburgh, p. 36.

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