RESEARCH ABSTRACT

SWINE HEALTH

Title: The adjuvant properties of *E. coli* 933D and bacterial DNA in promoting protective immunity to unrelated enteric pathogens – **NPB# 01-061**

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Abstract

Colonization of isolator piglets with a mild enterohemorrhage strain of *E. coli* (EHEC) results in a 2-3 fold increase in serum IgG and IgM levels compared to colonization with benign *E. coli* but does not influence serum IgA levels. Colonization with EHEC results in protection to lethal challenge with enterotoxigenic *E. coli* (ETEC) and partial protection against *Salmonella* as opposed to colonization with benign *E. coli*. We also show that colonization alone results in antibodies to fluorescein (FLU) and trinitrophenyl (TNP) even in piglets never exposed to these irrelevant antigens. The use of bacteria DNA (in the form of CpG ODN) in germfree piglets has little effect on serum Ig levels but a profound effect on the immune response to FLU and TNP although these piglets are not protected against ETEC. CpG ODN given to piglets colonized with benign *E. coli* have serum IgG levels approaching those in piglets colonized with EHEC but higher IgM and IgA levels. It is unclear as to whether they are protected against ETEC. Unexpectedly, LPS and colonization suppress the IgG anti-FLU and anti-TNP responses induced by CpG ODN administered i.p.

Our findings are relevant to the swine industry since they suggest that protection against enteric pathogens may depend on colonization with mild pathogens and that colonization stimulates innate immunity by raising the level of natural antibodies. Thus mild pathogens may serve a beneficial role in neonate survival and may have potential for providing protection in the absence of specific vaccines and antibiotics. Our data on bacterial products show they have profound immunoregulatory activity. Studies of this nature are in their infancy but in the future could greatly improve the efficacy of vaccines or colonization of the gut in reducing piglet mortality and morbidity.