

4th International Conference on **Vaccines & Vaccination**

September 24-26, 2014 Valencia Convention Centre, Spain

Targeting aminopeptidase N on enterocytes rapidly induces an IgA response in a pig model

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Enterotoxigenic *Escherichia coli* (ETEC) are a major cause of diarrhea in human and animal. In piglets, ETEC having F4 fimbriae (F4 + ETEC) induce severe diarrhea, dependent on the presence of receptors for F4 (F4R). We demonstrated that oral immunization with purified F4 fimbriae resulted in a serum and intestinal IgA response. The fimbriae become taken up by clathrin-mediated endocytosis. Porcine aminopeptidase N (pAPN) was identified as one of the receptors recognized by F4 fimbriae by comparative proteomic analysis of brush border proteins of F4R+ and F4R- pigs and by adherence/internalization experiments on pAPN-transfected cells. Binding of F4 fimbriae to pAPN depended on sialic acid containing carbohydrate moieties. Endocytosis via pAPN was not restricted to F4 fimbriae, but was also observed for anti-pAPN antibodies. Oral immunization with these antibodies induced a rapid immunoglobulin A and G response. In conclusion, we identified pAPN as an endocytotic receptor for F4 fimbriae and highlight the opportunity to target vaccine antigens to this epithelial receptor.

Biography

Eric Cox completed his PhD at the University of Ghent in 1991. He became Assistant Professor at the Laboratory of Immunology in 1993, full Professor in 1999 and Director in 2008. Since 1993, he has performed research on intestinal immune responses in pigs using infections with enterotoxigenic *E. coli* (ETEC) as a model. This resulted in the discovery that pigs can be orally immunized with the purified fimbriae of F4+ETEC. He is promoter of the UGent valorisation consortium PROVAXS. He has published more than 200 papers in peer-reviewed journals and serving as associated-editor of *Frontiers in Mucosal Immunity*.

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