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Heat-labile enterotoxin enhances small intestinal colonization with F18ac+ verotoxigenic *E. coli*

Enterotoxigenic *E. coli* (ETEC) play a major role in post-weaning diarrhea in pigs. Upon weaning, F4+ETEC rapidly colonize the small intestinal mucosa and produce LT enterotoxin which enhances fluid secretion leading to clinical signs. F18+ verotoxigenic *E. coli* (VTEC) mainly cause edema disease, which peaks the second week post-weaning. We postulated that exposure to LT, even in subclinical concentrations, changes the intestinal mucosa, enhancing colonization with F18+VTEC. Whereas 10 µg LT (6 hours in 20 cm long small intestinal segment) was the lowest dose consistently inducing fluid secretion (56±70 g fluid/cm² mucosa) and removing some mucus (76±7% mucus coverage), 30 µg had a clearer effect (60±7%; control segments 89±5%). Inoculating the loops with 10⁸ CFU F4ac+ETEC (LT+STa+STb+) induced a comparable fluid loss (356±133 mg fluid/cm²) and mucus coverage (68±8%). To analyze the effect of LT *in vivo*, the small intestinal tract of 4-week-old piglets was injected at 5 sites with different doses of LT, of which 350 µg showed intermediate fluid and mucus loss and 250 µg had no effect. Both latter doses were injected intraluminal in 7 and 4 pigs, respectively, to see if LT could enhance colonization of F18ab+VTEC strain (STx2e+) (10¹¹ CFU in 10 ml PBS, 6 hours later, intragastrically) in comparison with placebo injected animals (n=7). Either 250 µg or 350 µg LT prolonged the duration of VTEC excretion and significantly increased the VTEC colonization between 4 and 7 days after the inoculation, supporting our hypothesis and the importance of vaccination against LT.

Biography

Eric Cox has completed his PhD in 1991 at University of Ghent, Belgium. After completing his Post doctorate, he became Assistant Professor of Immunology at the Faculty of Veterinary Medicine, Gent University, Belgium. He is currently a full Professor and Head of the Lab of Immunology as well as Promotor of Provaxs a consortium of Gent University labs working on immunization and prophylaxis. He has published more than 200 papers in reputed journals. He has been serving as an Associated Editor of *Frontiers in Mucosal Immunity*.

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