

## Role of heat-labile and heat-stable enterotoxins in the induction of early immune responses in piglets after infection with enterotoxigenic *Escherichia coli*

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Enterotoxigenic *Escherichia coli* (ETEC) strains that produce heat-stable (ST) and/or heat-labile (LT) enterotoxins are cause of post-weaning diarrhea in piglets. However, the relative importance of the different enterotoxins in the pathogenesis of ETEC infection has been poorly defined. In the present study, several isogenic mutant strains of an O149:F4ac<sup>+</sup>, LT<sup>+</sup> STa<sup>+</sup> STb<sup>+</sup> ETEC strain were constructed that lack the expression of LT in combination with one or both types of ST enterotoxins (STa and/or STb). The small intestinal segment perfusion (SISP) technique and microarray analysis were used to study host early immune responses induced by these mutant strains 4h after infection in comparison to the wild type strain and a PBS control. Simultaneously, net fluid absorption of pig small intestinal mucosa was measured 4h after infection, allowing us to correlate enterotoxin secretion with gene regulation. Results were validated by qRT-PCR and demonstrated an important role for STb in small intestinal secretion early after infection as well as in the ETEC induced immune response by the significant differential regulation of immune mediators like matrix metalloproteinase 3, interleukin 1 and interleukin 17.