Enterotoxigenic *Escherichia coli* induce pro-inflammatory responses in porcine intestinal epithelial cells

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$F4^+$ enterotoxigenic *Escherichia coli* (ETEC) cause severe diarrhoea in both neonatal and weaning piglets, resulting in morbidity and mortality. F4 fimbriae are a key virulence factor involved in the attachment of $F4^+$ ETEC to the intestinal epithelium. Intestinal epithelial cells (IEC) are recently being recognized as important regulators of the intestinal immune system through the secretion of cytokines, however, data on how $F4^+$ ETEC affect this cytokine secretion are scarce. By using ETEC strains expressing either polymeric, monomeric or F4 fimbriae with a reduced polymeric stability, we demonstrated that polymeric fimbriae are essential for the adhesion of ETEC to porcine IEC as well as for the secretion of IL-6 and IL-8 by ETEC-stimulated intestinal epithelial cells. Remarkably, this cytokine secretion was not abrogated following stimulation with an F4-negative strain. As this ETEC strain expresses flagellin, TLR5 mediated signalling could be involved. Indeed, porcine IEC express TLR5 and purified flagellin induced IL-6 and IL-8 secretion, indicating that, as for other pathogens, flagellin seems to be the dominant virulence factor involved in the induction of proinflammatory responses in IEC upon ETEC infection. These results indicate a potential mucosal adjuvant capacity of ETEC-derived flagellin and may improve rational vaccine design against $F4^+$ ETEC infections.