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Antiviral Activity of Interleukin-11 in Response to Porcine Epidemic Diarrhea Virus Infection

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Abstract : Interleukin-11 (IL-11), a well-known anti-inflammatory factor, helps to protect against intestinal epithelium damage caused by physical or chemical factors. However, little is known about the role of IL-11 during viral infection. Herein, high mRNA and protein levels of IL-11 were found in epithelial cells and jejunum of piglets during porcine epidemic diarrhea virus (PEDV) infection, and IL-11 expression was positively correlated with the level of viral infection. Pretreatment with recombinant porcine IL-11 (pIL-11) suppressed PEDV replication in Vero E6 cells, while IL-11 knockdown promoted viral infection. Furthermore, pIL-11 inhibited viral infection by preventing PEDV-mediated apoptosis of cells through activating the IL-11/STAT3 signal pathway. Conversely, application of a STAT3 phosphorylation inhibitor significantly antagonized the anti-apoptosis function of pIL-11 and counteracted its inhibition of PEDV. Our data suggested that that IL-11 is a novel PEDV-inducible cytokine, and its production enhances the anti-apoptosis ability of epithelial cells against PEDV infection. The potential uses of IL-11 as a novel therapeutic against devastating viral diarrhea in piglets deserves more attention and study.

Keywords : Interleukin-11, Porcine epidemic diarrhea virus, STAT3, anti-apoptosis
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