BETA GLUCAN-INDUCED IL-10 SECRETION BY MONOCYTES TRIGGERS PORCINE NK CELL CYTOTOXICITY

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Beta-glucans are naturally occurring polysaccharides present in cell walls of fungi, yeast, bacteria, cereals, seaweed and algae. These microbe-associated molecular patterns (MAMPs) possess immunomodulatory properties. In human, it has been suggested that NK cells can be activated by β-glucans. Here, we aimed to elucidate whether β-glucans modulate porcine NK cell responses in vitro and if so, how these effects are mediated. We investigated the effect of two β-glucans, Macrogard and Curdlan, which differ in solubility and structure. Direct addition of β-glucans to purified porcine NK cells did not affect cytotoxicity of these cells against K562 target cells. However, when using PBMC instead of purified NK cells, β-glucan addition significantly increased NK cell-mediated cytotoxicity. This effect depended on factors secreted by CD14+ monocytes upon β-glucan priming. Further analysis showed that monocytes secrete TNF-α, IL-6 and IL-10 upon β-glucan addition. Of these, IL-10 turned out to play a critical role in β-glucan-triggered NK cell cytotoxicity, since depletion of IL-10 completely abrogated the β-glucan-induced increase in cytotoxicity. Furthermore, addition of recombinant IL-10 to purified NK cells was sufficient to enhance cytotoxicity. In conclusion, we show that β-glucans trigger IL-10 secretion by porcine monocytes, which in turn leads to increased NK cell cytotoxicity, and thereby identify IL-10 as a potent stimulus of porcine NK cell cytotoxicity.