

In vivo immunostimulatory effects of a CpG oligodeoxynucleotide in cattle and sheep

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Oligodeoxynucleotides (ODN) containing CpG motifs have been shown to activate the innate immune system and protect mice and chicken against infection from intracellular/extracellular organisms. Similar studies in other veterinary species are lacking. In this study we assessed the *in vivo* immunostimulatory effects of CpG ODN 2007, an ODN with previously demonstrated *in vitro* biological activity, in cattle and sheep. The *in vivo* effects of ODN 2007 were compared in two closely related outbred species to determine if there were common biological responses. We have for the first time demonstrated that subcutaneous injection of CpG ODN induces an acute phase response characterized by a transient fever, an increase in number of circulating neutrophils and elevated serum haptoglobin in both sheep and cattle. Sheep, but not cattle also exhibited increased serum 2'5' oligoadenylate (2'5'-A) synthetase activity. ODN 2007 induced responses were significantly enhanced when CpG ODN was formulated in 30% emulsigen rather than phosphate buffer saline (PBS). These *in vivo* data demonstrate for the first time that a CpG ODN can induce different immunostimulatory effects in two closely related species. We also show that CpG ODN 2007 treatment induced an antiviral effector molecule in sheep and therefore conclude that immunostimulatory ODN might be used to prevent or treat viral infections.

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