

**T-CELL RESPONSES IN CATTLE IMMUNISED WITH A
PROTOTYPE ANTI-SPOROZOITE SUB-UNIT VACCINE
AGAINST *Theileria parva***

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ABSTRACT

A prototype anti-sporozoite vaccine for the control of East Coast fever caused by a protozoan parasite *Theileria parva* has been developed based on a stage-specific surface protein of molecular weight 67 kilodalton, p67, formulated in an oil emulsion adjuvant. This vaccine induces high sporozoite neutralising antibody titres in all vaccinated cattle and provides 60-70% immunity. Earlier attempts to develop correlates of protection based on a number of immunological parameters including antibody titre, as measured by enzyme-linked immunosorbent assay and neutralisation assay, isotype and avidity have not yielded data predictive of immune status. In this study, p67-specific CD4⁺ T cell responses were investigated in immunised cattle before and after exposure to a challenge infection with *T. parva* sporozoites to determine whether T-cell reactivity can be predictive of protection. The level of proliferation of T cells from individual cattle to the immunising antigen, their epitope specificity as well as cytokine profiles were compared between cattle that resisted lethal challenge and those that succumbed to the infection. The majority of animals, 27 out of 28, in both groups mounted antigen-specific proliferative responses of varying magnitude, had similar epitope reactivity and exhibited a Th1/Th0 cytokine profile. These findings suggest that responses detected in immune and unprotected cattle are similar based on the CD4⁺ T cell proliferative data obtained, and therefore not a measure of immunity.