CD62L is a marker for pathogen specific central memory CD4 in cattle

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Two phenotypically and functionally different populations of memory CD4 were characterized in animals that survived infection with Mycoplasma mycoides mycoides small colony (MmSc). The first population is CD45RO+CD45R-CD62L- and represents 1/3 of IFN-γ producing CD4 after MmSc recall stimulation in vitro. The second is CD45RO+CD45R+CD62L+ and comprises the majority of proliferating CD4 after 7 days of stimulation with MmSc. Cell sorting experiments confirmed that both CD4+CD62L- and CD4+CD62L+ are present in vivo and proliferate independently in vitro in response to MmSc. In addition, MmSc stimulation strongly decreased CCR7 and increased CCR5 transcripts levels in CD4+CD62L-cells whereas CD4+CD62L+ were only slightly affected. Sustained proliferation but low IFN-γ production in response to antigenic stimulation, together with the capacity to preferentially migrate through the lymph nodes (i.e., expression of CD62L and CCR7), are characteristics of central memory CD4, or CD4+ Tcm, in mice and humans. Tcm are associated with long term immune memory and a privileged target for vaccine development. Our results demonstrate the existence of Tcm in cattle and suggest that CD62L may serve as a marker to monitor Tcm in infections and vaccine development studies.