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

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Two phenotypically and functionally different populations of memory CD_4 were characterized in animals that survived infection with Mycoplasma mycoides mycoides small colony (MmmSC). The first population is CD45RO+CD45R-CD62L- and represents 2/3 of IFN-γ producing CD_4 after MmmSC recall stimulation in vitro. The second is CD45RO+CD45R-CD62L+ and comprises the majority of proliferating CD_4 after 7 days of stimulation with MmmSC. Cell sorting experiments confirmed that both CD_4+CD62L- and CD_4+CD62L+ are present in vivo and proliferate independently in vitro in response to MmmSC. In addition, MmmSC stimulation strongly decreased CCR_7 and increased CCR_5 transcripts levels in CD_4+CD62L- cells whereas CD_4+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 CCR_7), are characteristics of central memory CD_4, or CD_4+ 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.