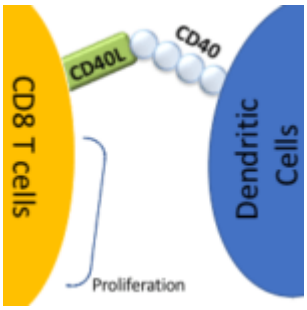
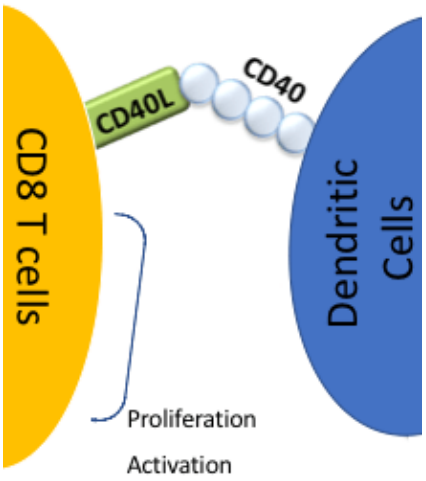
Expression of CD40L by CD8 T cells promotes autologous activation and differentiation





Adaptation of T-cell dependent CD40L activation (Altaileopard, Wikimedia Commons)

CD40L plays an essential role during DC licensing – T cell mediated activation of Dendritic Cells (DC) and monocytes-, a process required for DCs to sufficiently prime CD8+ T cell responses. CD40L is primarily expressed on CD4 T cells, as a result CD4 T cells indirectly via DCs or directly via CD8 T cells contribute to CD8 T cell priming and are the main source

of CD40L.

Studies have shown that CD40L is not necessary for priming CD8 T cells responses, however lack of CD40L results in lower numbers of primed CD8+ T cells. Highlighting a major role of CD40L in induction of robust CD8+ T cell immunity. Growing evidence suggests that CD8 T cells can also express CD40L, though observed CD40L expression has been transient. However, the exact role CD8 T cell CD40L expression plays in DC licensing and CD8 T cell priming is unknown.

Researchers from the National University of Singapore utilised adoptive transfer and listeria spp. and influenza spp. infections models of CD40L-/- and wild type C57BL/6J mice to determine the role of CD40L expression on CD8+ T cell in CD8 T cell priming and immunity. Tay *et al.* observed at least half of functional antigen-specific CD8+ T cells –determined by expression of IFNg after antigen stimulation- expressed CD40L. Comparison of CD8+ T cell phenotypes between influenza infected CD40L-deficient and wild type mice, showed, that wild type mice expressed higher levels of CD25 and low levels of CD62L, respectively, and higher levels on KLRG1 than CD8+ T cells from CD40L deficient mice. This highlights the importance of CD40L in priming of activated CD8+ T cells.

Using an adoptive transfer model, where wild type mice (CD45.1+) received CD40L-deficient CD8+ T cells (CD45.2+), Tay *et al.* demonstrated that expression of CD40L on CD8+ T cells is necessary for T cell differentiation and secondary T cell expansion after secondary infection challenge. Additionally, they illustrated that the mechanism of expansion is dependent on CD40-CD40L interaction with antigen presenting cells

In summary, Tay *et al.* successfully illustrated that expression of CD40L by CD8 T cells provides autologous signal that allows CD8 T cells to promote their own expansion, proliferation into effector memory cells and improve their

functional capacity.

Journal Article: Tay *et al.* 2017. CD40L expression allows CD8+ T cells to Promote Their Own Expansion and Differentiation through Dendritic cells. Frontiers in Immunology.

Article by Cheleka AM Mpande