Vaccines capable of eliciting long-term T cell immunity are required for combating many diseases. Live vectors can be unsafe whereas subunit vaccines often lack potency. We previously reported induction of CD8(+) T cells to Ag entrapped in archaeal glycerolipid vesicles (archaeosomes). In this study, we evaluated the priming, phenotype, and functionality of the CD8(+) T cells induced after immunization of mice with OVA-Methanobrevibacter smithii archaeosomes (MS-OVA). A single injection of MS-OVA evoked a profound primary response but the numbers of H-2K(b)OVA(257-264)-specific CD8(+) T cells declined by 14-21 days, and 300 days. CFSE-labeled naive OT-1 (OVA(257-264) TCR transgenic) cells transferred into MS-OVA-immunized recipients cycled profoundly (>90%) within the first week of immunization indicating potent Ag presentation. Moreover, approximately 25% cycling of Ag-specific cells was seen for >50 days, suggesting an Ag depot. In vivo, CD8(+) T cells evoked by MS-OVA killed >80% of specific targets, even at day 180. MS-OVA induced responses similar in magnitude to Listeria monocytogenes-OVA, a potent live vector. Furthermore, protective CD8(+) T cells were induced in TLR2-deficient mice, suggesting...
nonengagement of TLR2 by archaeal lipids. Thus, an archaeosome adjuvant vaccine represents an alternative to live vectors for inducing CD8(+) T cell memory.