CpG-DNA aided cross-priming by cross-presenting B cells.

Abstract:
Covalent linkage of immunostimulatory CpG-DNA to OVA (CpG-OVA complex) results in CpG-DNA-aided cross-presentation of OVA by dendritic cells (DCs). In this study, we analyzed the thesis that CpG-OVA complexes may be cross-presented by B cells to route internalized Ag into the class I MHC presentation pathway. First, we describe that conjugation of CpG-DNA to OVA enhances up to 40-fold internalization of OVA by B cells, which in turn generate the CD8 T cell epitope SIINFEKL complexed to MHC class I, albeit less efficiently than DCs. Furthermore, upon internalization, CpG-DNA conjugated to OVA stimulates B cells to up-regulate costimulatory molecules and cytokines including IL-12. Adoptive transfer of CpG-OVA complex-loaded wild-type B cells cross-primes naive CD8 T cells both in wild-type mice and in MyD88-deficient mice. Overall, these findings disclose attributes of B cells, including cross-presentation of exogenous Ag and cross-priming of naive CD8 T cells that hitherto have been considered as hallmarks restricted to DCs.