

Abstract

Antigen cross-presentation is a process, when dendritic cells present exogenous antigens in context of MHC-I to CD8+ T lymphocytes. Unlike classical antigen presentation, this one goes crosswise, because exogenous antigens are otherwise usually presented on MHC-II and endogenous antigens on MHC-I glycoproteins. Molecular mechanism of cross-presentation has not been well established yet. Two major pathways are considered - vacuolar and cytosolic. In the vacuolar pathway, the internalised antigens are cleaved in the endosome by proteases and then loaded onto MHC-I. In the cytosolic pathway, the internalised antigens leave the endosome to be cleaved by the proteasome in the cytosol. They are then imported into the endoplasmic reticulum (ER) to be loaded onto MHC-I as in classical antigen presentation, or they go back into the endosome where the MHC-I loading machinery is trafficked. This process is mediated by ER proteins including those participating in ERAD, by Rab GTPases regulating vesicular transport, and by structures important for endosome maturation. Cross-presentation is important in medicine, because it ensures activation of CD8+ T lymphocytes against intracellular pathogens and cancer cells, and induction of tolerance at the periphery.

Key words: Antigen presentation; Cross-presentation; Dendritic cell; MHC-I; CD8+ T lymphocyte