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Glycosyl-phosphatidylinositol-anchored interleukin-2 expressed on tumor-derived exosomes induces antitumor immune response in vitro

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ABSTRACT

Aims and background. Tumor-derived exosomes (TEXs) have been considered as a new kind of cancer vaccine, but the antitumor effects are not satisfactory. In order to improve the efficacy of TEXs, we investigated whether exosomes derived from glycosyl-phosphatidylinositol-anchored interleukin 2 (GPI-IL-2) gene-modified bladder cancer cells can increase the antitumor effects.

Methods and study design. We transfected melanoma antigen-1 (MAGE-1)-expressing T24 tumor cells with a plasmid encoding GPI-IL-2 and prepared the TEXs. Exosomes expressing GPI-IL-2 were characterized by electron microscope and Western blot analysis.

Results. IL-2 was present on the cell surface in the GPI-anchored form as demonstrated by fluorescent microscope and ELISA analyses. Exosomes expressing GPI-IL-2 naturally contained bioactive GPI-IL-2 and tumor-associated antigen MAGE-1. Moreover, exosomes expressing GPI-IL-2-pulsed dendritic cells could induce the proliferation of T cells and the antigen-specific cytotoxic T-lymphocyte immune response more efficiently.

Conclusions. GPI-IL-2 gene-modified tumor cells can make the TEXs contain GPI-IL-2, resulting in increased antitumor effects. Our study provided a feasible approach for exosome-based tumor immunotherapy. Free full text available at www.tumori-online.it

Key words: exosomes, GPI, IL-2, cytotoxic T lymphocytes.

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