



DESCRIPTION

α HFc-CL-DMDM is anti-human IgG Fc specific antibody conjugated to duocarmycin DM (DMDM) with a cleavable linker. The antibody portion is a polyclonal antibody which is specific to the Fc region of human IgGs. Duocarmycin is a cytotoxic small molecule which causes cell death by binding to the minor groove of DNA and alkylating the adenine. The cleavable linker connecting duocarmycin to the antibody is stable in extracellular fluid, but is cleaved by cathepsin in endosome once the conjugate has entered a cell via endocytosis.

APPLICATIONS

Antibody-drug conjugates (ADCs), which have become a new targeted therapy against cancer, consist of an antibody linked to a cytotoxic drug. The ADCs bind selectively to the target cancer cells via the monoclonal antibody portion. Internalization of the ADCs releases the drug to do its damage. Prior to testing the function of ADCs in cell-based assays, each monoclonal antibody is typically conjugated directly with a cytotoxic drug. This step is time consuming and expensive, requiring milligram quantities of purified antibody, separate conjugation of each antibody, and further isolation of the ADC from the unconjugated drug. Using secondary antibody-drug conjugates (2^oADC) in a cell-based cytotoxic assay is a quick and economical alternative to pre-screening monoclonal antibodies as ADC candidates against tumor cells. Instead of conjugating the monoclonal antibody with a cytotoxic drug, the naked monoclonal antibody is added directly to the cells in the presence of the 2^oADC. Internalization of the monoclonal antibody/2^oADC complex can achieve a similar effect of targeted drug release within the cells as the monoclonal antibody-drug conjugate. Furthermore, the 2^oADC can also be applied to screen protein ligands for receptor-mediated cell targeting.

α HFc-CL-DMDM is a 2^oADC for pre-screening antibodies with a human IgG Fc moiety or recombinant human IgG Fc fusion proteins to determine their cytotoxicity as duocarmycin bioconjugates. **α HFc-CL-DMDM** alone displays no obvious toxicity against multiple cell lines at 1 μ g/ml (6.6 nM) or lower concentration. When applied in combination with tumor specific monoclonal antibodies or recombinant Fc fusion proteins, **α HFc-CL-DMDM** can help determine the cytotoxic potential for these antibodies or proteins against target cell lines.

EXAMPLE DATA

It has been demonstrated that Herceptin antibody-drug conjugate (T-DM1) displayed potent killing activity against Her2-overexpressing tumor cells but not normal Her2 expression or Her2 negative cells¹. Here cytotoxicity of naked Herceptin was tested in four breast cancer tumor cell lines expressing different amount of Her2 marker in the presence and absence of **α HFc-CL-DMDM**. SKBR3 and HCC1954 are Her2 overexpressing cells, MCF7 has normal Her2 expression, and MDA-MB468 is Her2 negative. *In vitro* SKBR3 is slightly sensitive to unconjugated Herceptin treatment, while HCC1954, MCF7, and MDA-MB468 are resistant to unconjugated Herceptin¹. The unconjugated anti-human IgG Fc antibody (α HFc) does not change the apparent effect of Herceptin against these cell lines (Fig A). In contrast, in the presence of 6.6 nM **α HFc-CL-DMDM**, Herceptin displays potent cytotoxicity against both Her2-overexpressing SKBR3 and HCC1954 cells, while shows no killing of MCF7 or MDA-MB468 cells (Fig B).

Fig A. Cytotoxic Profile of Herceptin in the Presence of Unconjugated α HFc Secondary IgG

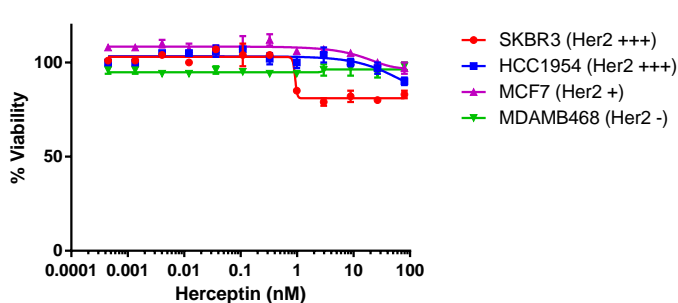
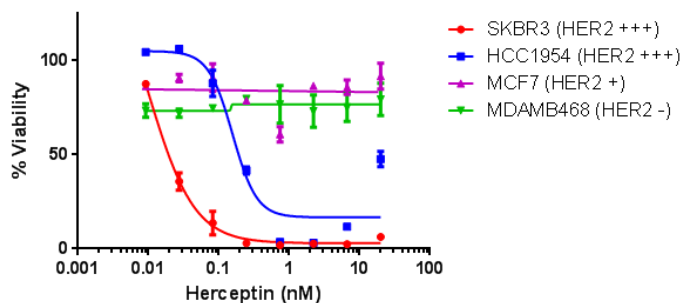


Fig B. Cytotoxic Profile of Herceptin in the Presence of 6.6nM α HFc-CL-DMDM



STORAGE

Store in -20°C or -70°C manual defrosted freezer. Avoid repeated freeze-thaw cycle.

REFERENCE

1. Lewis Phillips GD, et al. Targeting Her2-positive breast cancer with trastuzumab-DM1, an antibody-cytotoxic drug conjugate. (2008), Cancer Res, **68(22)**, page 9280-90.