Treatment and Diagnosis of Cancer or Infectious Disease using Recognition Mechanism of TCR

TCR-IgFc work as an NK cell function enhancer

MHC class I molecule Down modulation | NK Cell | Fc receptor | MHC class I molecule

Cancer cell — Cancer cell

NK cells' intrinsic cytotoxic activity — **TCR-IgFc chimeric protein** — TDCC activity

Overview

While NK cells have been expected to be used in the treatment of cancer and infectious diseases, their limitations in medical applications have been pointed out because they can not recognize cancer cells or infected cells having MHC class I molecules expressed therein.
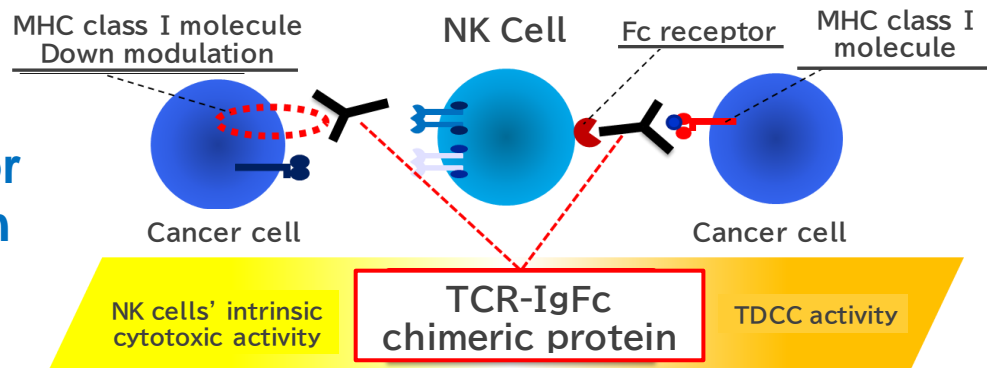
The present invention is about the use of chimeric proteins comprising a variable region of a T-cell receptor and an Fc region of an immunoglobulin, which can make NK cells easily recognize target cells.

It was found that by using the chimeric proteins of the present invention, in addition to the previously reported T-cell receptor chimeric protein-dependent cellular cytotoxicity (TDCC) activity, down-modulation of MHC complexes on the target cells: the expression of MHC class I molecules can be reduced and converted into the target of NK cells' intrinsic cytotoxic activity (see the right figure).

The combination of T-cell receptor repertoire analysis (see WO 2016/136716) enables rapid chimeric protein development and the design of NK cell-based therapies tailored to individual cancers, viral infections, autoimmune diseases, allergies and other clinical manifestations.

Down-Modulation of MHC Complex on Cell Surface

MHCI

MHCI + TCR-IgFc

incubation 6 h

MHCI + TCR-IgFc
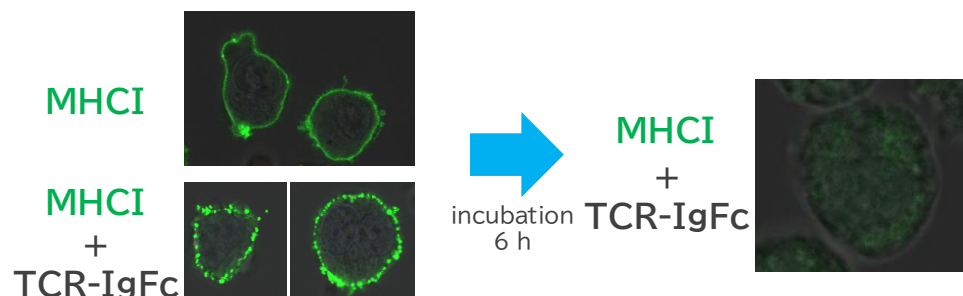
Product Application

☐ Therapeutic agents for cancers, viral infections, autoimmune diseases, allergies

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