Developing placental CD34\textsuperscript+ derived natural killer cells with high affinity cleavage resistant CD16 (CYNK-101) and Cetuximab for enhancing therapy of EGFR\textsuperscript+ non-small cell lung and head and neck cancers

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ABSTRACT

CD34\textsuperscript+ placental-derived natural killer cells (pDCIKs) are a promising treatment for EGFR\textsuperscript+ non-small cell lung cancer (NSCLC) and head and neck cancer (HNC). Cetuximab is a monoclonal antibody against EGFR that is widely used in cancer therapy. However, cetuximab-resistant cells are known to emerge. To enhance the therapeutic efficacy of cetuximab, we sought to develop a cetuximab-resistant (Cetuximab-resistant Orphan Drug (CDROD)) CD16\textsuperscript+ natural killer cells (CD16\textsuperscript+ pDCIKs) with cetuximab-resistant ADCC (Cetuximab-resistant ADCC Natural Killer Cell (Cetuxin-resistant NK cell) or CD16\textsuperscript+ pDCIKs). 

RESULTS

CD16\textsuperscript+ pDCIKs were co-cultured with Cetuximab-resistant CD16\textsuperscript+ pDCIKs (Cetuximab-resistant CD16\textsuperscript+ pDCIKs) to enhance their cetuximab activity. The CD16\textsuperscript+ pDCIKs were assessed by IgG activity (CD16\textsuperscript+ pDCIKs), ADCC activity (ADCC Natural Killer Cell (ADCC NK cell)), and FACS analyses (FACS Natural Killer Cell (FACS NK cell)). The co-cultured CD16\textsuperscript+ pDCIKs demonstrated enhanced cetuximab-dependent ADCC activity against Cetuximab-resistant CD16\textsuperscript+ pDCIKs and ADCC NK cells. These findings suggest that CD16\textsuperscript+ pDCIKs can be used as a potential therapy for cetuximab-resistant CD16\textsuperscript+ pDCIKs, providing a promising strategy for the treatment of EGFR\textsuperscript+ cancers.

INTRODUCTION

CD16\textsuperscript+ placental-derived natural killer cells (pDCIKs) are a promising treatment for EGFR\textsuperscript+ non-small cell lung cancer (NSCLC) and head and neck cancer (HNC). Cetuximab is a monoclonal antibody against EGFR that is widely used in cancer therapy. However, cetuximab-resistant cells are known to emerge. To enhance the therapeutic efficacy of cetuximab, we sought to develop a cetuximab-resistant (Cetuximab-resistant Orphan Drug (CDROD)) CD16\textsuperscript+ natural killer cells (CD16\textsuperscript+ pDCIKs). 

Materials and Methods

CD16\textsuperscript+ pDCIKs were co-cultured with Cetuximab-resistant CD16\textsuperscript+ pDCIKs to enhance their cetuximab activity. The CD16\textsuperscript+ pDCIKs were assessed by IgG activity (CD16\textsuperscript+ pDCIKs), ADCC activity (ADCC Natural Killer Cell (ADCC NK cell)), and FACS analyses (FACS Natural Killer Cell (FACS NK cell)). The co-cultured CD16\textsuperscript+ pDCIKs demonstrated enhanced cetuximab-dependent ADCC activity against Cetuximab-resistant CD16\textsuperscript+ pDCIKs and ADCC NK cells. These findings suggest that CD16\textsuperscript+ pDCIKs can be used as a potential therapy for cetuximab-resistant CD16\textsuperscript+ pDCIKs, providing a promising strategy for the treatment of EGFR\textsuperscript+ cancers.

SUMMARY

CD16\textsuperscript+ placental-derived natural killer cells (pDCIKs) are a promising treatment for EGFR\textsuperscript+ non-small cell lung cancer (NSCLC) and head and neck cancer (HNC). Cetuximab is a monoclonal antibody against EGFR that is widely used in cancer therapy. However, cetuximab-resistant cells are known to emerge. To enhance the therapeutic efficacy of cetuximab, we sought to develop a cetuximab-resistant (Cetuximab-resistant Orphan Drug (CDROD)) CD16\textsuperscript+ natural killer cells (CD16\textsuperscript+ pDCIKs). 

The CD16\textsuperscript+ pDCIKs were co-cultured with Cetuximab-resistant CD16\textsuperscript+ pDCIKs to enhance their cetuximab activity. The CD16\textsuperscript+ pDCIKs were assessed by IgG activity (CD16\textsuperscript+ pDCIKs), ADCC activity (ADCC Natural Killer Cell (ADCC NK cell)), and FACS analyses (FACS Natural Killer Cell (FACS NK cell)). The co-cultured CD16\textsuperscript+ pDCIKs demonstrated enhanced cetuximab-dependent ADCC activity against Cetuximab-resistant CD16\textsuperscript+ pDCIKs and ADCC NK cells. These findings suggest that CD16\textsuperscript+ pDCIKs can be used as a potential therapy for cetuximab-resistant CD16\textsuperscript+ pDCIKs, providing a promising strategy for the treatment of EGFR\textsuperscript+ cancers.