Supporting Information

Membrane-immobilized Gemcitabine for Cancer-Targetable NK cell Surface Engineering

Kyung Mu Noh[a], Ashok Kumar Jangid[a], Jaewon Park[a], Sungjun Kim[a], and Kyobum Kim[a,*]

[a]Department of Chemical & Biochemical Engineering, Dongguk University, Seoul 04620, Republic of Korea.

* Corresponding authors:

kyobum.kim@dongguk.edu (K. Kim).

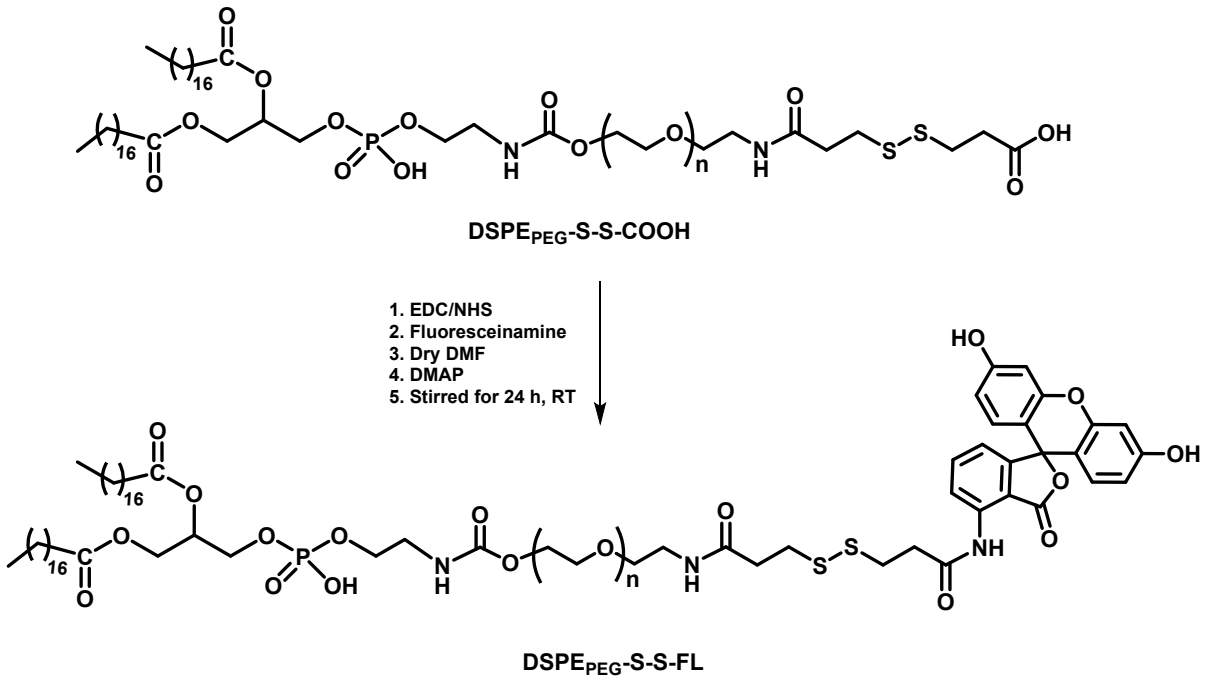

Fig. S1 Reaction scheme represents the synthesis of DSPE$_{PEG}$-s-s-FL conjugate for NK cell surface coating analysis.

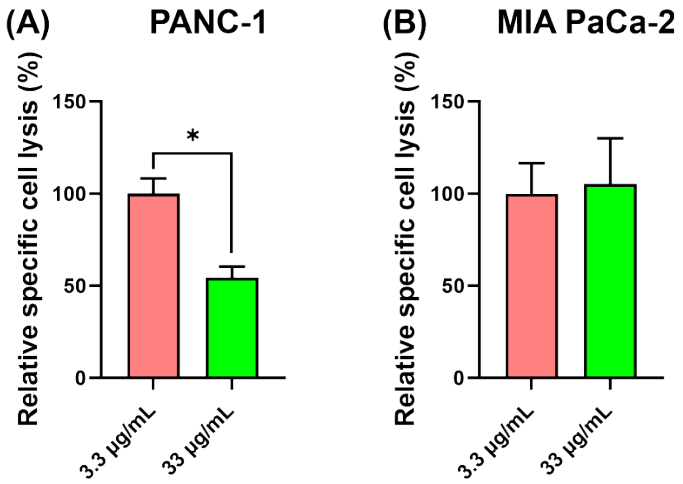

Fig. S2 Relative specific cell lysis of GCNK cells co-cultured with pancreatic cancer cells after 24 h. GCNK cells were surface coated with 3.3 or 33 µg/mL of lipid-Gem conjugates. The different target cancer cells (PANC-1 and MIA-PaCa-2) were co-cultured with 5:1 E:T ratios of GCNK cells. Percent of anticancer functionality (A) PANC-1 and (B) MIA PaCa-2 cancer cells. * $p < 0.05$.

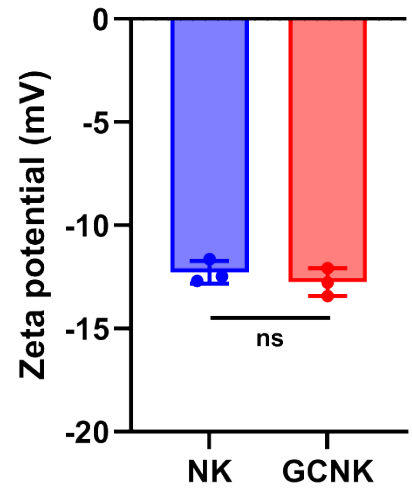

Fig. S3 Zeta-potential measurements of NK and GCNK cells. GCNK cells were surface engineered with 3.3 µg/mL of lipid-Gem conjugates. "ns" indicates statistically non-significant.

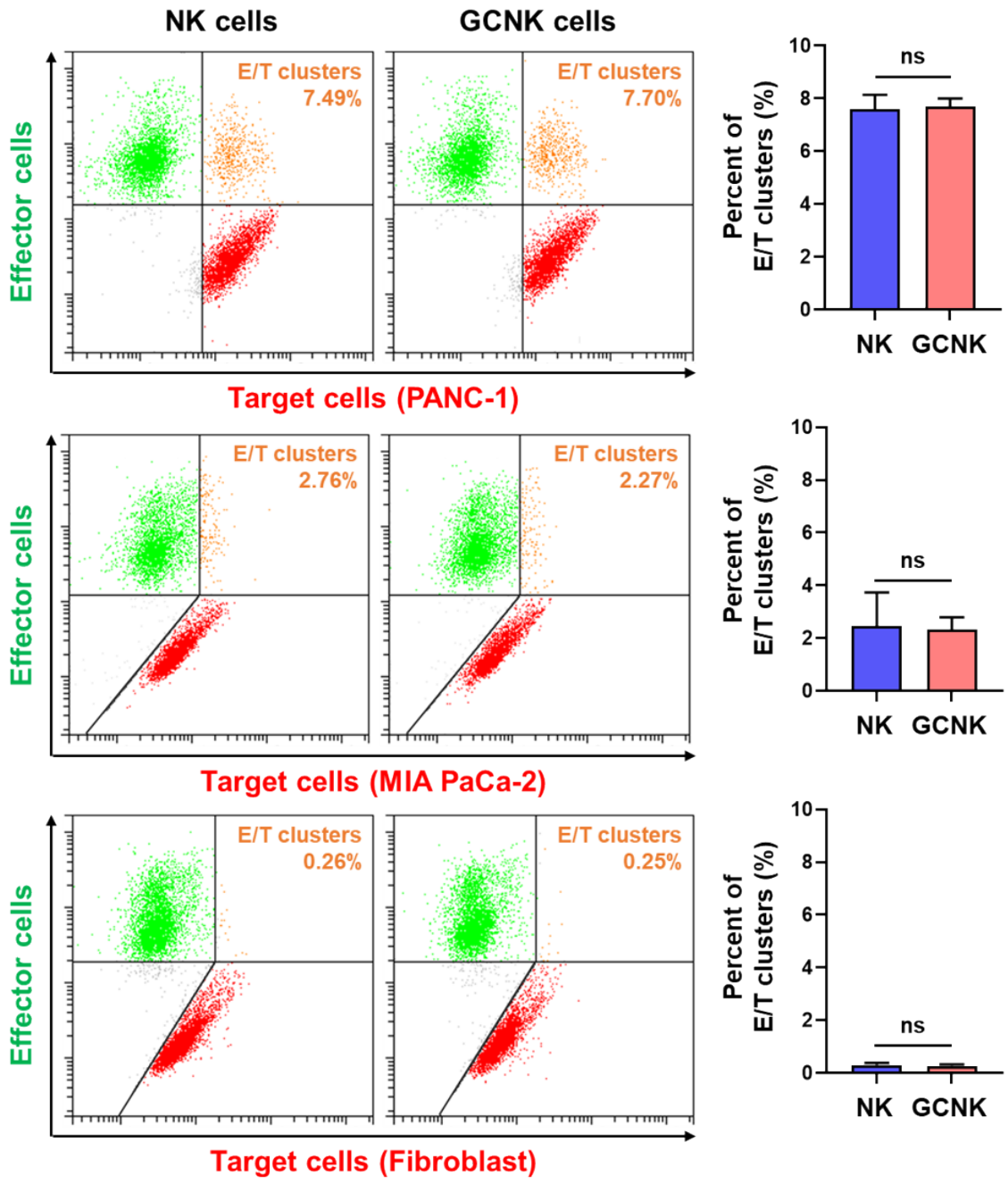

Fig. S4 Effector/target (E/T) clusters involving effector cells (NK or GCNK cells) and target cells (PANC-1, MIA PaCa-2, and fibroblasts). NK cells and target cells were stained with Calcein AM and CellTracker™ Red CMTPX Dye, respectively. Flow cytometry was used to detect the E/T clusters emitting both green and red fluorescence. "ns" indicates that statistically non-significant.

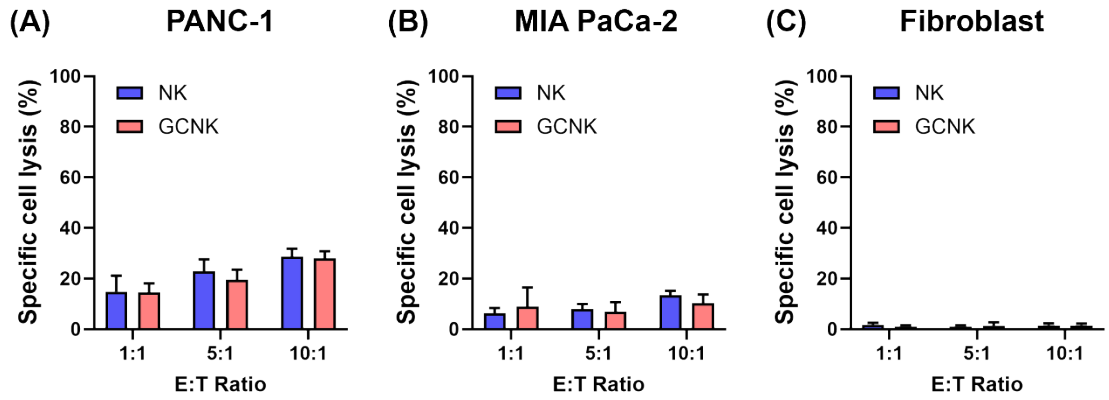

Fig. S5 Anticancer efficacy of NK or GCNK cells co-cultured with pancreatic cancer cells and normal fibroblasts after 4 h. GCNK cells were surface engineered with 3.3 μg/mL of lipid-Gem conjugates. The different target cells (PANC-1, MIA-PaCa-2, and fibroblast) were co-cultured with different E:T ratios of NK or GCNK cells. Percent specific cell lysis of (A) PANC-1, (B) MIA-PaCa-2 cancer cells, and (C) normal fibroblasts.

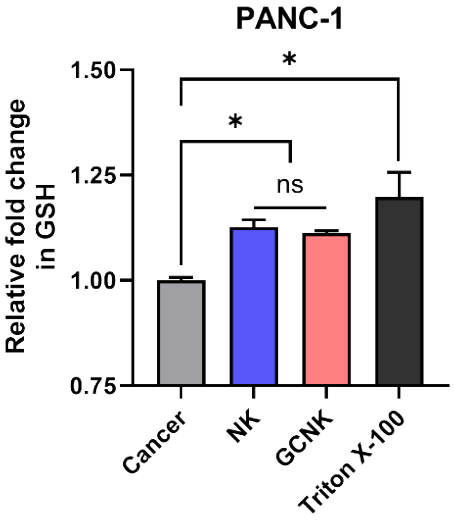

Fig. S6 Quantification of GSH leakage from damaged target cells. NK cells were co-cultured with target cells at a 5:1 E:T ratio for 24 h and the amount of GSH released in the collected supernatant was determined. Triton-X was used for the complete cancer cell destruction group. * $p < 0.05$. "ns" indicates statistically non-significant.