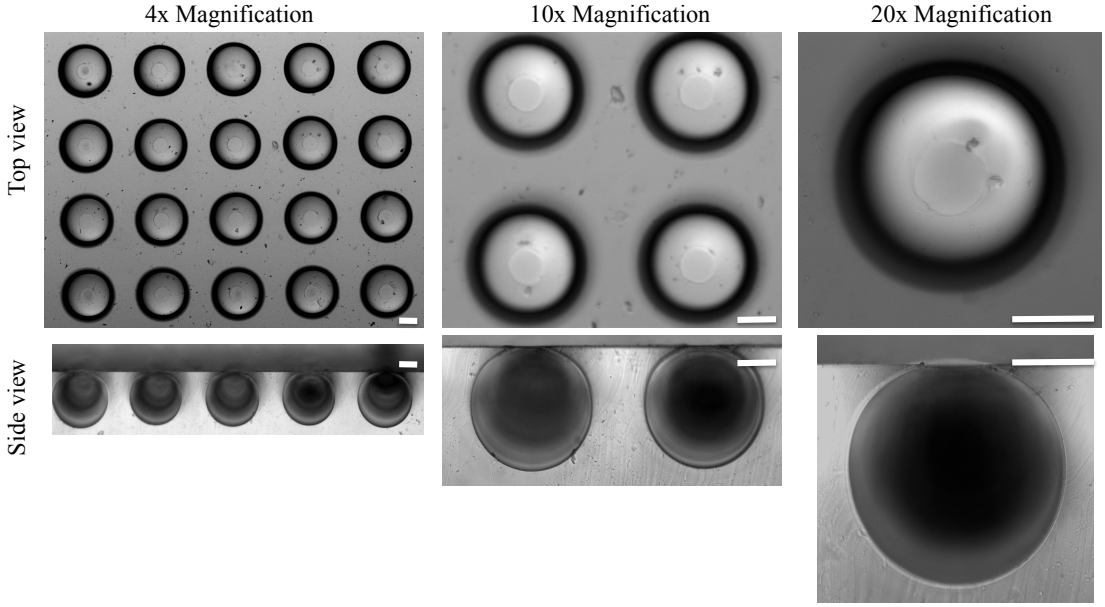
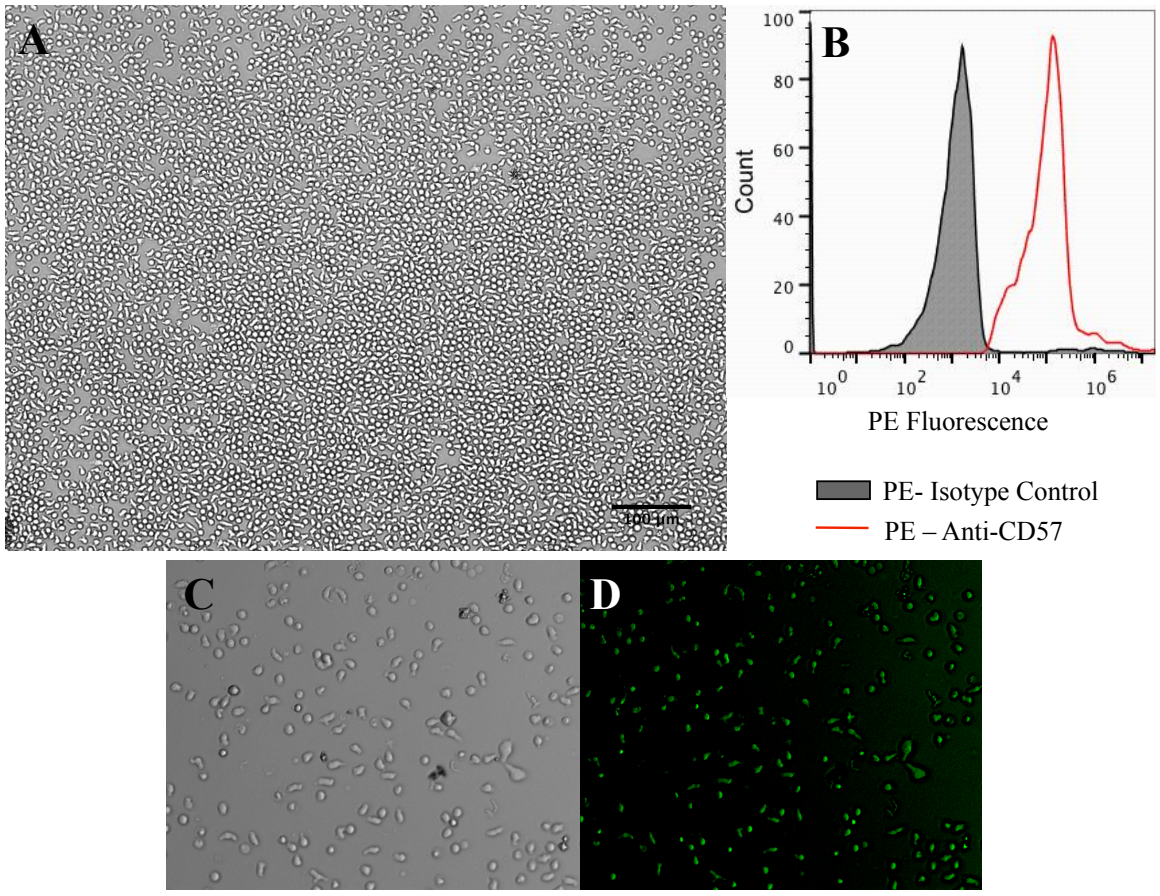
Supplementary Figure 1:

Top view and side view of microbubble (MB) arrays formed from 100 μm circular openings at different magnifications. Scale bar = 100 μm.



Supplementary Figure 2:

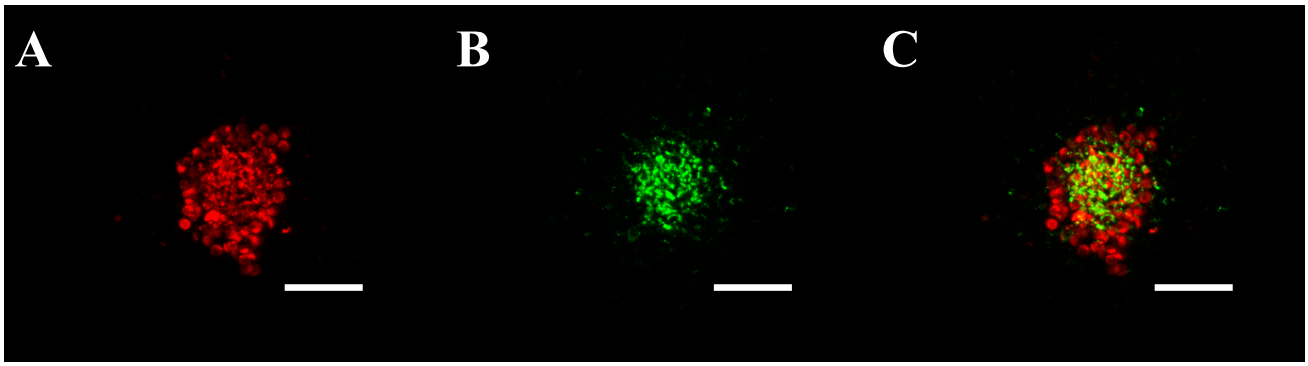
(A.) NK cells in culture 24 hours after isolation (B.) Expression of CD57 by NK cells (C.) Bright field image of NK cells conjugated to TRAIL functionalized liposomes (D.) Fluorescent field image of NK cells stained with Calcein-AM (Live cell marker) 24 hours after conjugation indicates that TRAIL functionalized liposomes did not have any detrimental effects on NK cells.



Electronic Supplementary Material (ESI) for Lab on a Chip

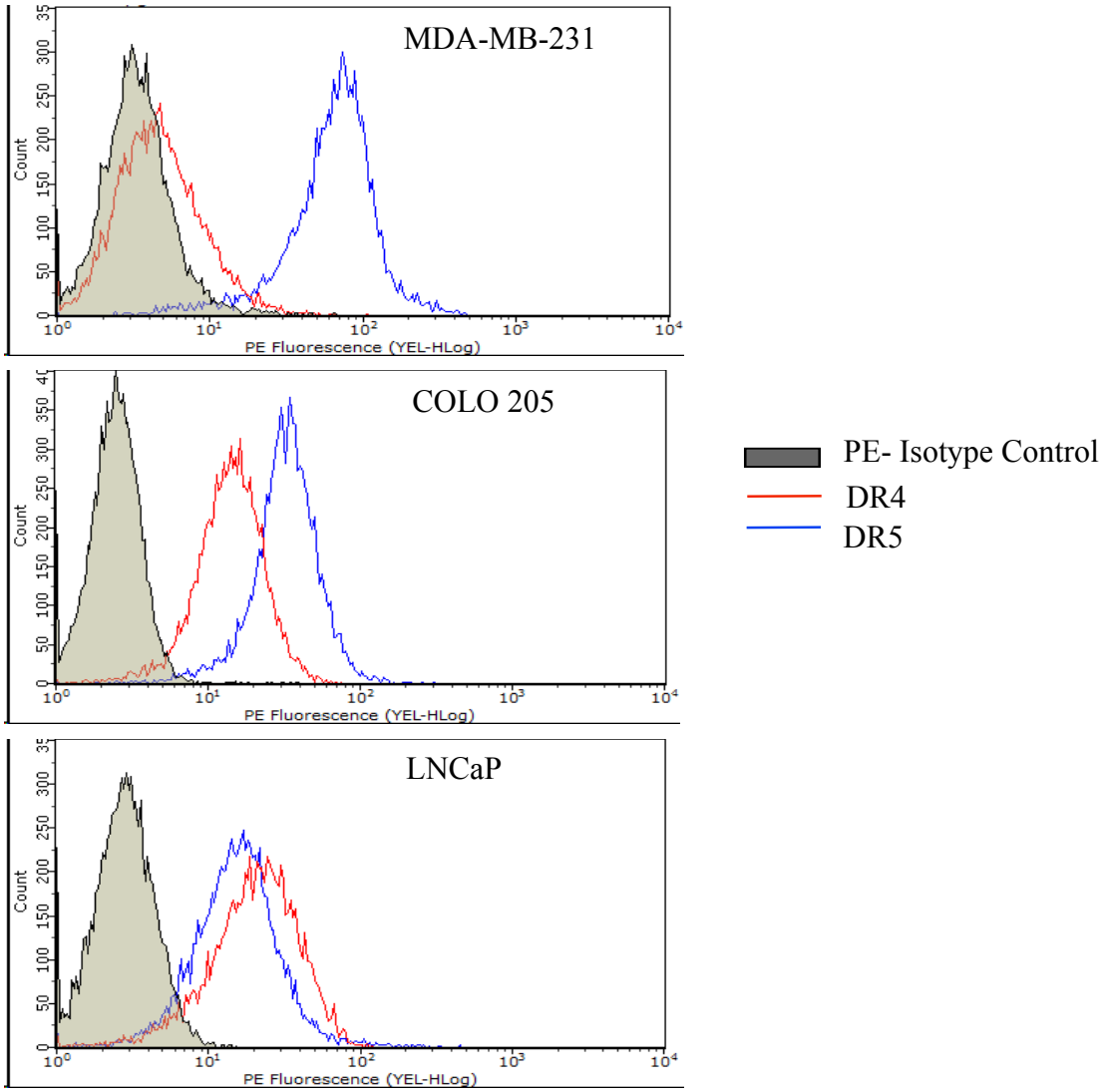
Supplementary Figure 3:

Confocal micrographs of (A.) LNCaP cells, (B.) super NK cells and (C.) LNCaP (Red) and super NK cells (Green) cells seeded in a single MB. Scale bar = 100 μm



Supplementary Figure 4:

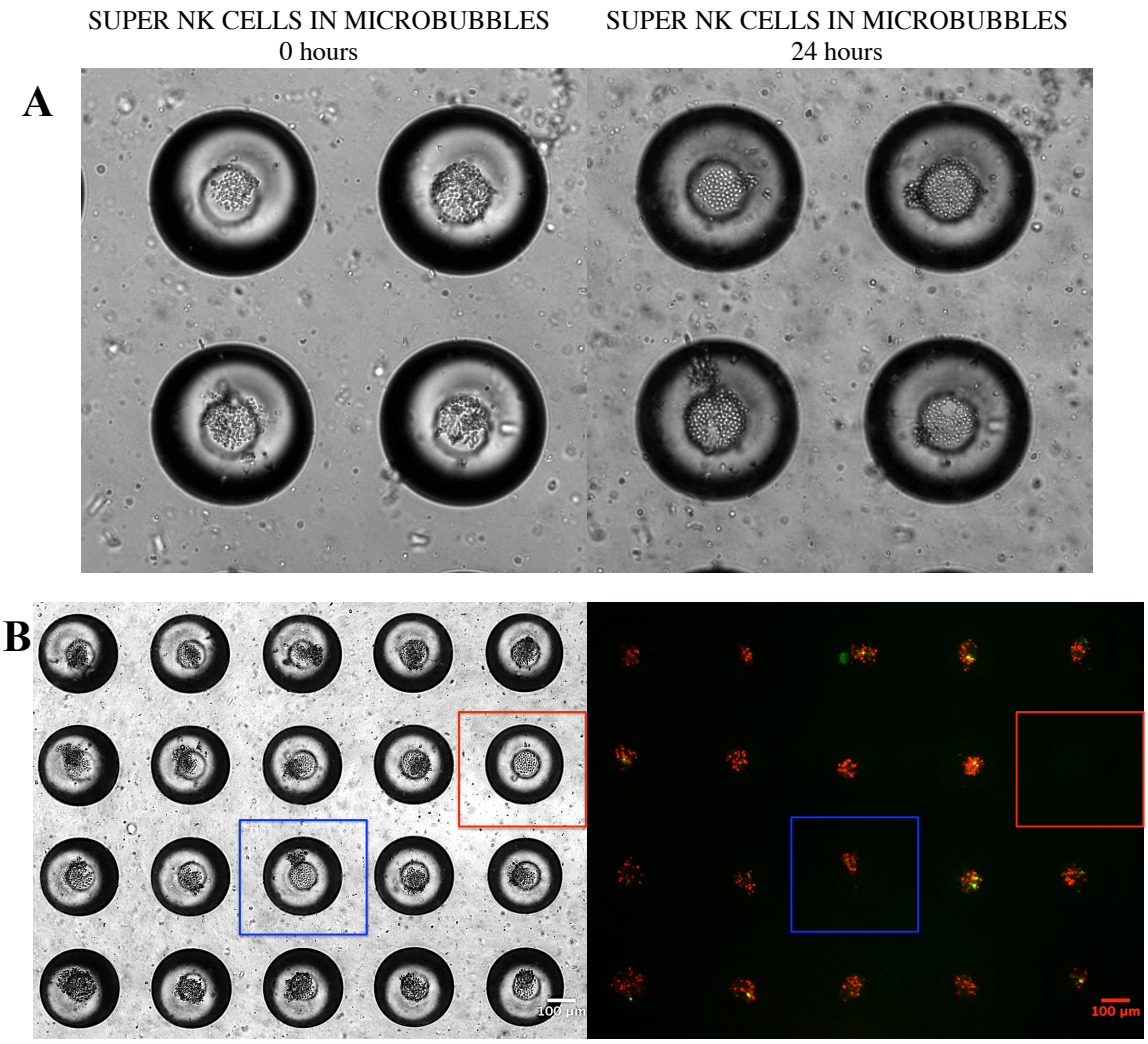
Flow cytometry histograms indicating the expression of death receptors in the cancer cell lines used in this study. The shift in fluorescent intensity indicates the amount of expression of DR4 (red) and DR5 (blue) on the surface of cancer cells.



Supplementary Figure 5:

A. Super NK cells cultured in MB arrays do not form aggregates unlike when they are cultured with cancer cells. They mostly remain as single cells 24 hours after culture.

B. Cells that stained positive for Annexin-V FITC and PI are cancer cells and not super NK cells as evidenced by the bright field and fluorescent images that indicate that in MB well without cancer cells (Red box) there is no signal for either Annexin-V FITC or PI from that particular MB. In MB wells where cancer cells form separate aggregates (Blue box) it is evident that cancer cells stain positive for Annexin-V FITC and PI and not the super NK cells.



Supplementary Figure 6:

Bright field and fluorescent images of MB stained with PI after 24 hours in culture. MB that were incubated with liposome buffer, naked liposomes, TRAIL functionalized liposomes, NK cells or super NK cells prior to seeding cancer cells (COLO 205, LNCaP).