



**Supplementary Figure S1: Representative gating strategy for NK cell identification and activation marker analysis**

Peripheral blood mononuclear cells (PBMCs) were first gated on singlets (FSC-A versus FSC-H) to exclude doublets, followed by exclusion of dead cells using a live/dead viability dye. Within the viable lymphocyte population, CD3<sup>-</sup>CD56<sup>+</sup> natural killer (NK) cells were defined and subsequently analyzed for expression of activation and degranulation markers (CDXX = CD69, CD25, or CD107a). A minimum of 100,000 events were acquired per sample. Unstained, single-stained, and fluorescence-minus-one (FMO) controls were included to ensure accurate gating and marker discrimination.