**Supplemental Figure. 1 A)** Gating strategy for adaptive and conventional NK cells in healthy blood donors. **B)** Gating strategy for adaptive and conventional NK cells in MDS patients. %Cells presented in the plots represents frequency of conventional and adaptive NK cells of total NK cells.

**Supplemental Figure. 2 A)** Representative phenotype of in vitro induced MDSCs and freshly isolated monocytes. **B)** NK cells were cultured in the presence of IL-15 (10 ng/ml) for 5 days and representative histograms is showing of the expression of CD16 in conv vs adaptive NK cells. Mean fluoresces intensity (MFI) is shown. **C)** NK cells were cultured with autologous MDSCs or freshly isolated monocytes at 2:1 ratio in presence of IL-15 (10 ng/ml) for 5 days. Cells were stimulated with anti-CD16 6 hours prior staining and analyzed by flow cytometry. Representative histograms are shown as mean fluorescence intensity (MFI). **D)** Purified NK cells from healthy blood donors were co-cultured with MDSCs at a 2:1 ratio in the presence of IL-15 (10 ng/ml) for 5 days. IFN-γ production was evaluated following 6 hours of stimulation with anti-CD16 in TIGIT low- and high-expressing conventional NK cells by flow cytometry. Representative and cumulative data are shown from 8 experiments as mean ± SEM. Statistical analysis were done using the Student’s t test.

**Supplemental Figure. 3 A)** Healthy donor polyclonal-NK (n=4) cell cytotoxicity was analyzed by 51Cr release assays (4 hours) against p815 in the presence of anti-TIGIT (10 ug/ml) or an agonistic anti-CD158b (10 ug/ml, Biolegend). Accumulated data are shown as mean ± SD and statistical analysis were done on pooled data using the Mann-Whitney test. **B)** NK cells were cultured with monocytes or MDSCs in the presence of IL-15 and IgG (10 ug/ml) or blocking antibodies against TIGIT (10 ug/ml) for 5 days, alternatively, cells were co-blocked by anti-TIGIT and anti-DNAM-1(10 ug/ml) (n=6).Pooled data are shown as mean ± SEM, and the One-way ANOVA was used for statistical analysis. **C)** Purified NK cells (n=6) from healthy blood donors were co-cultured with autologous monocytes or allogeneic MDSCs enriched from the blood of MDS-patients at a 2:1 ratio in the presence of IL-15 (10 ng/ml) for 5 days. Following 6 hours stimulation by anti-CD16, TNFα-production was evaluated in conventional and adaptive NK cells by flow cytometry. Representative data are shown as mean ± SD and statistical analysis were done on pooled data using the Mann-Whitney test.