**Supplementary Table 1 for Figure 1. Characterization of neuroblastoma cell lines**

Phenotypical characterization of the different neuroblastoma cell lines used in this study, including phenotype and GD2 expression levels. GD2 surface expression was established by flow cytometry (**Supplementary Figure 2**).

**Supplementary Figure 1. Multimodal treatment protocol for high-risk neuroblastoma patients**

Scheme showing the different phases (induction, consolidation and maintenance) of the treatment for high-risk neuroblastoma patients. The immunotherapy regimen, as approved in Northern America, is subdivided in alternating cycles of dinutuximab combined with GM-CSF or IL-2, and isotretinoin (13-cis-retinoic acid). Each cycle consists of 28 days. Figure adapted from Smith, V.; Foster, J. High-Risk Neuroblastoma Treatment Review.[1] ASCT, autologous stem cell transplantation.

**Supplementary Figure 2 for Figure 1. Binding capacity of dinutuximab to GD2 on neuroblastoma cell lines and ADCC of GD2-negative neuroblastoma cell lines**

**(A, B, C)** Binding capacity of increasing concentrations of dinutuximab (dimab) to GD2 (expressed as MFI) as measured by flow cytometry on GD2-positive cell lines (A) NMB (light grey triangles), IMR-32 (black squares) and LAN-1 (dark grey circles) and on cell lines expressing lower or none GD2 (B) SHEP-2 (light grey triangles), SK-N-AS (dark grey circles), SH-SY5Y (dark grey diamonds) and SK-N-BE (black squares), and on the GD2-positive primary patient-derived 691B cell line (light grey diamonds) (C). NMB, IMR-32 and LAN-1 n=1, of 2 individual experiments. SHEP-1, SK-N-AS, SH-SY5Y and SK-N-BE n=2, of 2 individual experiments. 691B n=3, of 3 individual experiments. **(D)** ADCC of GD2-negative cell lines SH-SY5Y and SK-N-BE opsonized with (+) or without (-) dinutuximab (dimab) by *in vitro* stimulated neutrophils with GM-CSF (light grey bars) or G-CSF (dark grey bars). SH-SY5Y and SK-N-BE n=2, of 1 individual experiment. Statistical differences were tested with unpaired T-test used to test statistical differences.

**Supplementary Figure 3 for Figure 1. Area under the curve for statistics of Figure 1B-D**

Areas under the curve (AUC) of ADCCs of NMB, IMR-32 and LAN-1 cells with dinutuximab titration **(A)**, with increasing T:E ratios **(B)**, or with cytokines titration **(C)**, by neutrophils stimulated *in vitro* with GM-CSF (light grey bars) or G-CSF (dark grey bars). NMB n=4, IMR-32 n=4-6, LAN-1 n=4-6, of 3 individual experiments. Statistical significance was tested with unpaired T-test to test the difference of the AUC.

**Supplementary Figure 4 for Figure 4. Effect of G-CSF treatment on proliferation rate and GD2 expression**

**(A-B)** Representative flow cytometry plots of intracellular total STAT3 plotted against intracellular pSTAT3 (A) and pSTAT3 intracellular expression levels relative to total STAT3 in IMR-32 cell line and neutrophils over the course of G-CSF exposure (0 to 20 minutes). N=2, of 2 individual experiments (B). **(C)** GD2 expression (expressed as MFI) measured over time on IMR-32 cells cultured in absence (control) or presence of G-CSF for 7, 14 and 21 days detected with 1 µg/mL of dinutuximab. N=3-13, of 6 individual experiments. Statistical significances were tested with ordinary one-way ANOVA with post-hoc Sidak test. **(D)** GD2 expression (expressed as MFI) measured over time on 691B cells cultured in absence (control) or presence of G-CSF for 7, 14 and 21 days detected with 2.5 µg/mL of dinutuximab. N=4-14, of 6 individual experiments. Statistical differences were assessed with ordinary one-way ANOVA with post-hoc Sidak test. **(E-F)** G-CSF receptor expression (expressed as MFI) measured over time on IMR-32 and 691B cells cultured in absence (control) or presence of G-CSF for 7, 14 and 21 days. IMR-32 n=2-3, 691B: n= 3-4, of 3 and 4 individual experiments, respectively. Statistical significance was assessed with ordinary one-way ANOVA with post-hoc Sidak test. **(G-H)** Area under the curve (AUC) of one-week proliferation rates of IMR-32 cultures (G) and 691B cultures (H) treated without (white bars) or with G-CSF (dark grey bars). IMR-32 n=4, 691B n=3, of 3 and 4 individual experiments, respectively. Statistical significance was tested with unpaired T-test to test the difference of the AUC. **(I)** Population doubling time (PDT, expressed in days) of IMR-

32 cells upon being cultured in the absence (control, white symbols) or presence of G-CSF for 7 (circles), 14 (triangle) and 21 (squares) days. N=1-6, of 6 individual experiments. Statistical significances were tested with ordinary one-way ANOVA with post-hoc Sidak test. **(J)** PDT (expressed in days) of patient-derived 691B cells upon being cultured in the absence (control, white symbols) or presence of G-CSF for 7 (circles) days. N=3, of 3 individual experiments. Statistical significance was assessed with paired T-test.

**Supplementary Table 2 for Figure 5. GM-CSF injected patient characteristics**

GM-CSF injected patient characteristics, including disease stage as determined by the INRG, age at time of blood sampling (months), gender and treatment cycle 1-5.

**Supplementary Figure 5 for Figure 5. *In vivo* GM-CSF stimulated neutrophils show enhanced *ex vivo* killing of IMR-32 neuroblastoma cells**

ADCC of IMR-32 cells opsonized with (+) or without (-) dinutuximab (dimab) by control neutrophils from healthy donors (white bars) or by neutrophils from neuroblastoma patients that were injected with GM-CSF (striped light grey bars). N=10 healthy donors, n=8 patients, of 4 individual experiments. Statistical differences were tested with ordinary one-way ANOVA with post-hoc Sidak test.