**Supplementary Figure legends**

Suppl. Fig. 1. **NKG2D cell surface expression on transduced T cells**. T cells from C57BL/6 (left) or VM/Dk (right) mice were transduced to express chNKG2D or wtNKG2D and the cell surface expression of NKG2D was assessed for CD4+ and CD8+ T cells by flow cytometry. Mean and SD of mean fluorescence intensity (MFI) are shown from 2 independent experiments.

Suppl. Fig. 2. **wtNKG2D T cells migrate to intracranially growing gliomas after systemic administration.** wtNKG2D T cells were labeled with CellBrite NIR790. GL-261 tumor-bearing mice were treated with a single i.v. injection of 5 x 106 wtNKG2D T cells at day 5 after tumor cell implantation. The near-infrared signal was acquired at the tumor site by FMT at the indicated time points after injection. The color scale indicates the signal intensities.

Suppl. Fig. 3. **Gating strategy of tumor-infiltrating lymphocytes.** Five x 106 CD45.1+ chNKG2D T cells were injected intratumorally at a single time point in CD45.2+ tumor-bearing mice at day 5 after tumor implantation. Three days later, tumor-infiltrating immune cells were isolated from the tumor-bearing hemisphere. Detailed gating strategy of tumor-infiltrating lymphocytes comprises detection of single living, CD45.1+ or CD45.2+ cells.

Suppl. Fig. 4. **NKG2DL mRNA expression in normal mouse tissues.** A. The mouse gene expression database (http://www.informatics.jax.org/expression.shtml) was assessed for the expression of the main NKG2DL RAEt1a in normal mouse tissues. Blue color indicates clearly detected expression by RT-PCR and Northern blot, grey color indicates ambiguous expression. B. The BioGPS database (http://biogps.org) (B) was assessed for the expression of the RAEt1a in normal mouse tissues. Different organ systems are color coded and displayed on the y-axis, expression levels are indicated on the x-axis.

Suppl. Fig. 5. **Brain-resident CD8 T cells from long-term surviving mice predominantly recognize GL-261 cells**. Long-term surviving mice (CH\_survivor) or naïve control (naïve) mice were (re-)challenged with GL-261 cells. Three days later, splenocytes were isolated and brain-infiltrating CD4+ or CD8+ T cells were FACS-sorted. Five x 103 CD4+ (black) or CD8+ (dark grey) T cells or 5 x 104 splenocytes (grey) from long-term surviving or naïve control mice were co-cultured with 2.5 x 103 (in case of brain-infiltrating T cells) or 2.5 x 104 (in case of splenocytes) GL-261 or EL-4 cells (MHC-matched non-glioma cells). After 72 h, IFN- production within cell-free-media was assessed by ELISA). P value was calculated with 2-way ANOVA (\*\*p < 0.01).

Supp. Fig. 6. **Local irradiation increases the effector function of chNKG2D T cells *in vivo* and induces NKG2DL**. A. Gating strategy to detect IFN- expression in CD45.1+ chNKG2D or wtNKG2D T cells. T cells were injected intravenously at days 5, 7 and 10 after implantation of GL-261 tumor cells with or without local irradiation of 4 Gy at day 7, and brain-infiltrating immune cells were isolated at day 12 after tumor implantation. B. GL-261 tumor-bearing mice received local irradiation with 4 Gy at day 7 after tumor implantation. At day 12, cells from the tumor-bearing hemisphere were isolated and NKG2DL expression was assessed by flow cytometry. MFI and SD from 3 mice per group is shown (\*\*p < 0.01).