Supplementary Figures

Figure 1. Engineering a metastatic breast cancer cell line and characteristics of breast-to-brain metastatic tumors. (**A**) Representative fluorescent image of MBr-FmC cells transduced with lentiviral vector encoding Fluc and mCherry. Plot showing the Fluc activity of tumor cells with different cell numbers. (**B**) Representative bioluminescent images of MBr-FmC tumors formed by intracranial injection and plot showing the tumor growth over time. (**C**) Representative composite fluorescent images of coronal brain sections of MBr-FmC tumors on d28 after intracranially injected. (**D**) Composite fluorescent images of a representative brain section after intracarotid injection of MBr-FmC tumor cells. Red: mCherry labeled tumor cells. (**E**) Arrow head points out the hemorrhage spots in the brain 35 days after intracarotid injection of MBr-FmC cells. (**F**) Representative fluorescent images of mCherry-labeled tumor cells (red) and GFAP-labeled reactive astrocytes (green), DAPI (blue) stained the nucleus (scale bar = 100 μm).

Figure 2. Assessment of two NSC lines for their survival ability. (**A**) Top: Representative fluorescent image of 1^{o}NSC transduced with LV-GFP-Fluc. Bottom: Plot showing the Fluc activity of 1^{o}NSC with different cell numbers. (**B**) Top: Representative fluorescent image of NSC transduced with LV-GFP-Fluc. Bottom: Plot showing the Fluc activity of NSC with different cell numbers. (**C**) Survival of NSC *in vivo*. Top: Representative bioluminescent images of 1^{o}NSC-GFl and NSC-GFl taken on day 0 and 7 after intracranial implantation. Bottom: Plot showing the Fluc activity of 1^{o}NSC-GFl or NSC-GFl *in vivo*.

Figure 3. Interaction of NSC, metastatic tumor cells and brain endothelial cells after intraparenchymal injection of NSC. Representative fluorescent images of NSC-GFP (green) and mCherry-labeled tumor cells (red), and brain endothelium labeled with CD31 (blue) (scale bar = 100 μm). Figure 4. Generation and functional characterization of NSC expressing S-TRAIL. (A) Viability of MBr-FmC cells in the presence of conditioned medium collected from NSC or NSC-S-TRAIL cells. (B) Top*:*

Representative bioluminescent images of MBr-FmC tumor growth in the presence of NSC-GFP or NSC-S-TRAIL taken on days 0, 2, 4, 6 and 32 after intracranial implantation. Bottom: Plot showing the Fluc activity of MBr-FmC tumors admixed with NSC-GFP or NSC-S-TRAIL at the time of implantation.

Figure 5. (A) Representative phase and fluorescent images of NSC-TR-TK-GFl in the presence or absence of 10 mg/ml GCV. Plot showing the Fluc activity of transduced cells in vitro. (B) Viability of MBr-FmC cells co-cultured with modified NSC at 1:1 ratio as measured by Fluc activity in vitro. The effects of NSC engineered with TK or TK-TR are shown. (C) Upper, outline of the experiment. Representative fluorescent images of metastatic MBr-RmC tumors in the mouse brain with or without NSC-TR-TK-GFl administration to show post-tumor treatment (scale bar = 100 μm).