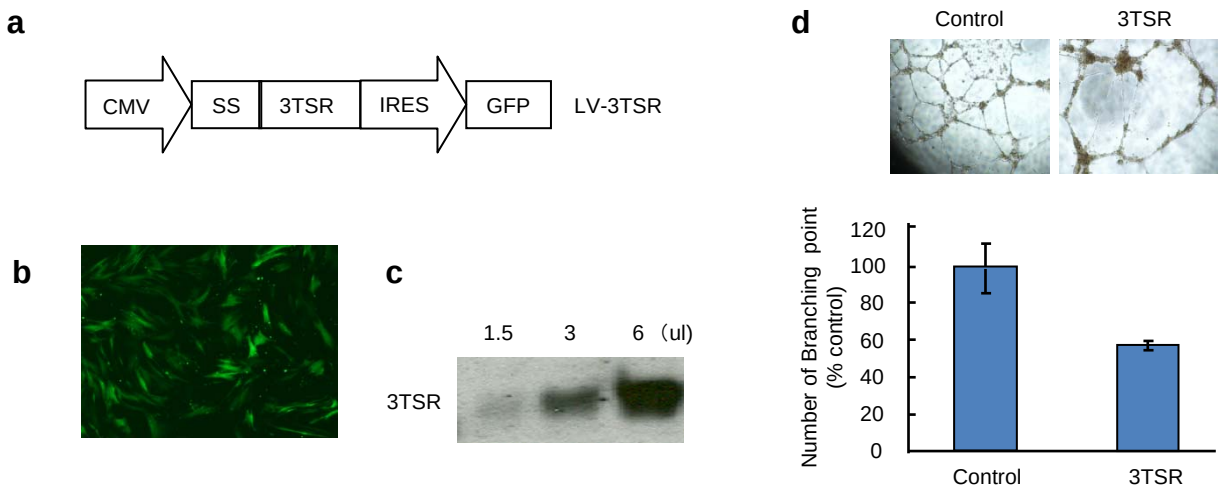
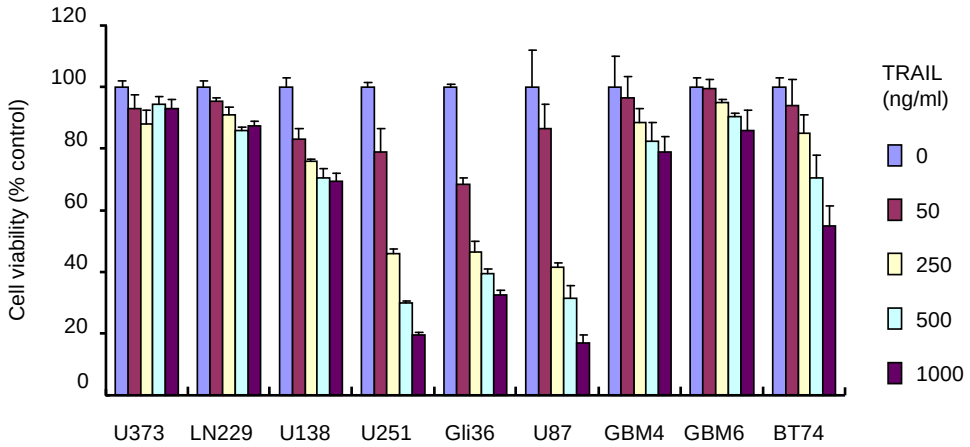
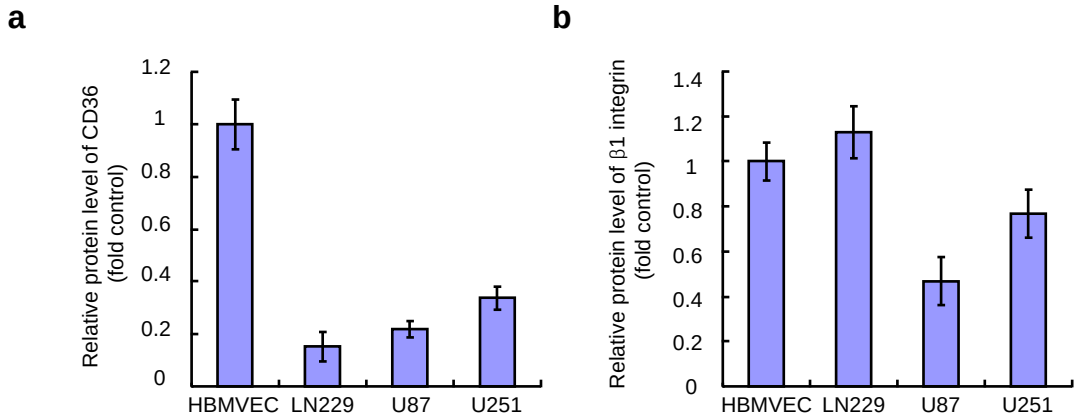


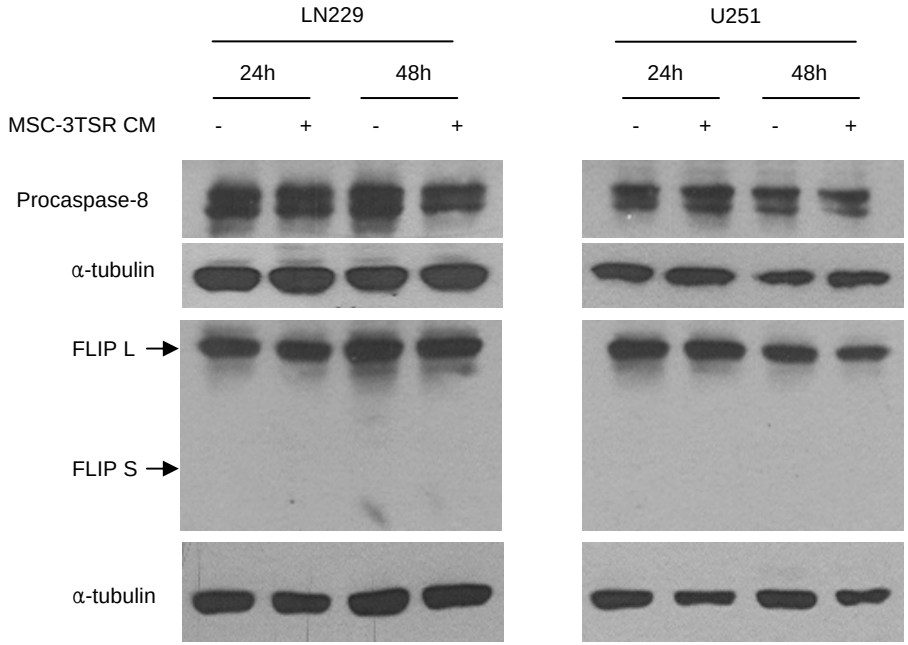
Supplementary Figure 1. Characterization of SS-3TSR lentiviral vector: (**a**) Design of lentiviral vectors (LV) expressing secretable 3TSR. Signal sequence of human Flt3 ligand (SS) was fused into N-terminus of 3TSR. The complementary DNA was cloned after the cytomegalovirus (CMV) promoter in LV-CSCIG, which also bears an internal ribosomal entry site (IRES) and GFP. (**b**) Representative GFP fluorescence image of human mesenchymal stem cells (MSCs) transduced with LV-3TSR. (**c**) 3TSR was detected by Western blot analysis from the conditioned medium of MSC-3TSR. (**d**) 3TSR has anti-angiogenic activity on human brain microvascular endothelial cells (HBMVECs). HBMVECs were plated on matrigel and treated with conditioned media from MSC-GFP (control) and MSC-3TSR for 48h. Images of branch points of HBMVECs (top). Comparison of the number of average branch point (bottom).



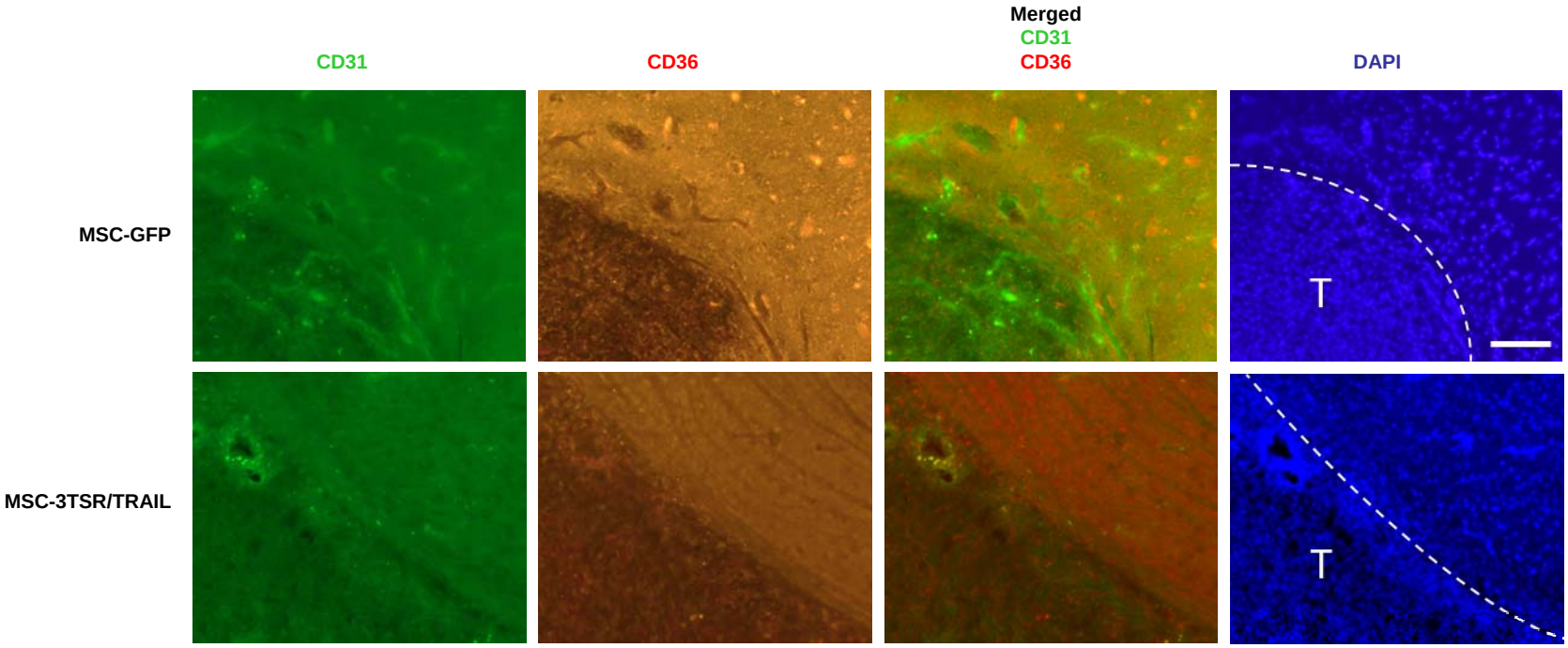
Supplementary Figure 2. S-TRAIL sensitivity was estimated using Celltiter-Glow cell viability assay in established and patient-derived primary GBM lines incubated with different dose of S-TRAIL for 48h.



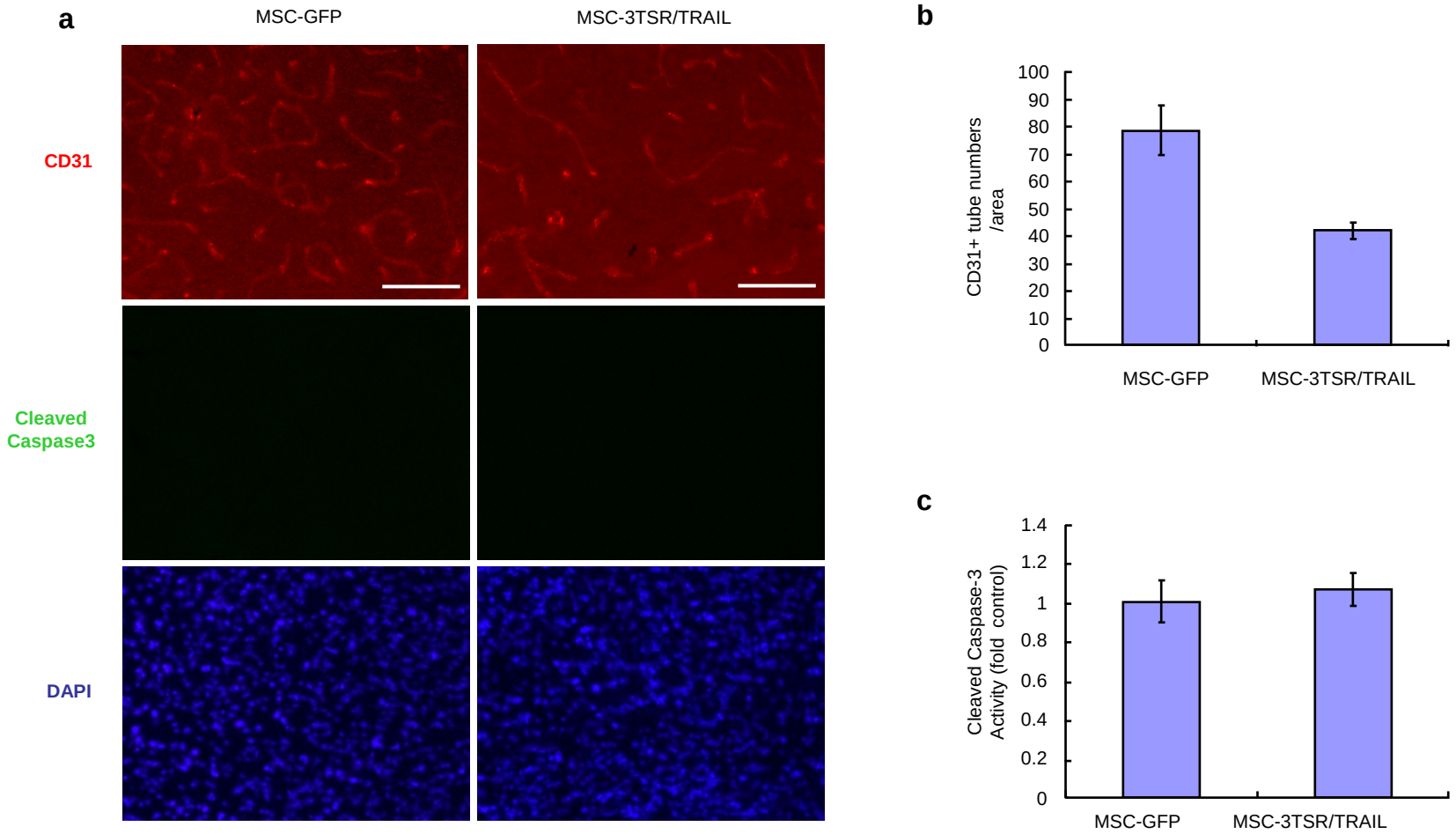
Supplementary Figure 3. Relative protein levels of CD36 (a) and β1 integrin (b) were estimated by normalizing band intensity of CD36 and β1 integrin by that of loading control β-actin and ERK as shown in Figure 1f. Western blotting was performed three times and Image J was used to measure the intensity of protein bands.



Supplementary Figure 4. LN229 and U251 were incubated with MSC-3TSR conditioned media for indicated time and protein levels of procaspase-8 and FLIP L were detected by western blotting.



Supplementary Figure 5. Immunofluorescence staining images of CD36 and endothelial cell marker CD31 on brain sections from LN229-Fluc-mCherry GBM-bearing mice treated with MSC-GFP or MSC-3TSR/TRAIL. MSCs were intratumorally injected 10 days after tumor implantation. Brain sections were prepared from mice sacrificed at day 5 after MSC injection. Scale bar represents 100 μm. Tumor area is shown as “T” on DAPI stained images.



Supplementary Figure 6. MSC-GFP and MSC-3TSR/TRAIL were implanted intracranially into normal mice brain (n=3) and brain sections were prepared from mice sacrificed at day 5 after MSC injection. (a) Immunofluorescence images of endothelial cells stained by anti-CD31. Apoptotic cells were stained by cleaved caspase-8. Images was taken from area of brain section around MSCs (about 200μm apart from MSCs). Scale bar represents 200μm. (b) the number of branched tubes were compared in the area (890μm X 752μm , n=9 each) ($p<0.01$) (c) Signal intensity of cleaved caspase-3 was compared between two MSCs (p=0,69). ImageJ was used to measure fluorescent intensity of cleaved caspase-3.