**Supplementary Figure Legends**

**Supplementary SFig. 1**. **hAMSCs-BMP4 decrease migration of BTICs *in vitro*.** (A) Western blot was performed using conditioned media from 1 million hAMSCs-Vector (MSC-Vector) cells, 1 million hAMSCs-BMP4 (MSC-BMP4) cells, and various amount of recombinant human BMP4 proteins (0, 50, 100 ,150, and 200 ng). (B) Transwell assay of 612 BTICs were cultured in hAMSC-CM or control media for different time periods (0-72 hours) (C) Transwell assay of 612 BTICs were treated with different doses of BMP4 (0 ng/ml, 50 ng/ml, and 100 ng/ml) for different time periods (24 hours and 48 hours). (D) Transwell assay of 612 BTICs were cultured in hAMSC-BMP4-CM or control media for 24 hours. (E) Nanopattern assay of 276 BTICs cultured in hAMSC-CM or control media and assessed for migration speed. (F) Nanopattern assay of 276 BTICs cultured in hAMSC-BMP4-CM or control media, or treated with different doses BMP4 (50 ng/ml and 100 ng/ml) and assessed for migration speed. \*p<0.05, \*\*p<0.01, \*\*\*p<0.001.

**Supplementary SFig. 2. hAMSCs-BMP4 decrease BTIC proliferation *in vitro*.** MTS assay of 612 BTICs cultured in(A) hAMSC-CM or (B) BMP4 treated media (100 ng/ml) for 2 weeks. (C) EdU assay of GFP-276 BTICs co-cultured with hAMSCs for 13 days. Results were normalized and compared to BTIC condition. (D) EdU assay of GFP-612 BTICs were treated with BMP4 (100 ng/ml) for 48 hours. Results were normalized and compared to BTIC condition. (E) EdU assay of GFP-612 BTICs co-cultured with hAMSCs-BMP4 for 5 days. Results were normalized and compared to BTIC condition. \*p<0.05, \*\*\*p<0.001.

**Supplementary SFig. 3. hAMSCs-BMP4 promote differentiation of BTICs *in vitro*.** (A) 612 BTICs were cultured in hAMSC-vector-CM, hAMSC-BMP4-CM, or treated with 100 ng/ml BMP4 for 2 weeks, and immunofluorescence staining was performed. Cells cultured in 10% FBS or control media served as positive or negative controls, respectively. (B) The percentages of Tuj1+/DAPI and GFAP+/DAPI for 612 BTICs in (A) were counted from 5 random fields. Scale bar, 200 µm. \*p<0.05, \*\*\*p<0.001.

**Supplementary SFig. 4. hAMSCs retain proliferation capacity when exposed to BTIC-CM *in vitro*.** (A) MTS assay of hAMSCs were cultured in 612 BTIC-CM for 2 weeks. (B) EdU assay of td-tomato-hAMSCs co-cultured with 612 BTICs for 5 days to measure hAMSC proliferation. N.S., not significant.

**Supplemental SFig. 5. hAMSCs do not form tumors *in vivo*.** (A) Schematic of the experiment where PBS, GFP-BTICs, GFP/bioluminescent-hAMSCs (GFP-hAMSCs), or GFP-BTICs mixed with td-tomato-hAMSCs were injected into mice and sacrificed 3 months later for various assays (same cartoon as in Figure 5C).(B)DAPI and GFP stain for GFP-hAMSCs and PBS groups (n=5). No observable GFP signal or tumors in the GFP-hAMSCs or PBS group. Brain sections are outlined. Scale bar, 1mm. (C) Quantification of mean migratory cell distance from the tumor margin in the GFP-BTIC and co-injection groups. N.S., not significant.

**Supplemental SFig. 6. hAMSCs-BMP4 decrease TNF-α and VEGF in tumor mass *in vivo*.** (A) BTICs were intracranially injected into 6-8 week-old nude mice. At 4 weeks post-injection, GFP-hAMSCs-vector (n=7), GFP-hAMSCs-BMP4 (n=5), or equal volumes of PBS (n=5) were injected intracardially. Mice were sacrificed 2 weeks later (same cartoon as in Figure 6A). TNF-α (B) and VEGF (C) secretion in the tumor environment of all groups were evaluated by immunofluorescence staining. Positive cells were quantified and normalized by DAPI+ cells. Scale bar, 200 µm. \*p<0.05.