**Supplementary Figure 1**



**Supplementary Figure 1.** Schematic diagram of TfR-BiTE construction. ASTGS or (G4S)3, short linker; *NheI* and *BamHI*, restriction sites. ①②, indicates the process.

**Supplementary Figure 2**



**Supplementary Figure 2.** Mass Spectrometry (LC-MS/MS) analysis of the unique peptide sequence “ASGYTFTNYYMHWVR” of purified protein.

**Supplementary Figure 3**



**Supplementary Figure 3:** (A, B) Binding of bispecific antibodies with HepG2 cells (TfR+) and PBMCs (CD3+) were detected using anti-His tag mAb by flow cytometry analysis. PBS and blank controls were set as the negative controls. (C) CFSE-stained PBMCs and HepG2 cells (E:T=10:1) were incubated with antibodies indicated for 24 h. Then cells were stained with 7-AAD. CFSE- 7-AAD+ cells were calculated as the lysed tumor cells.