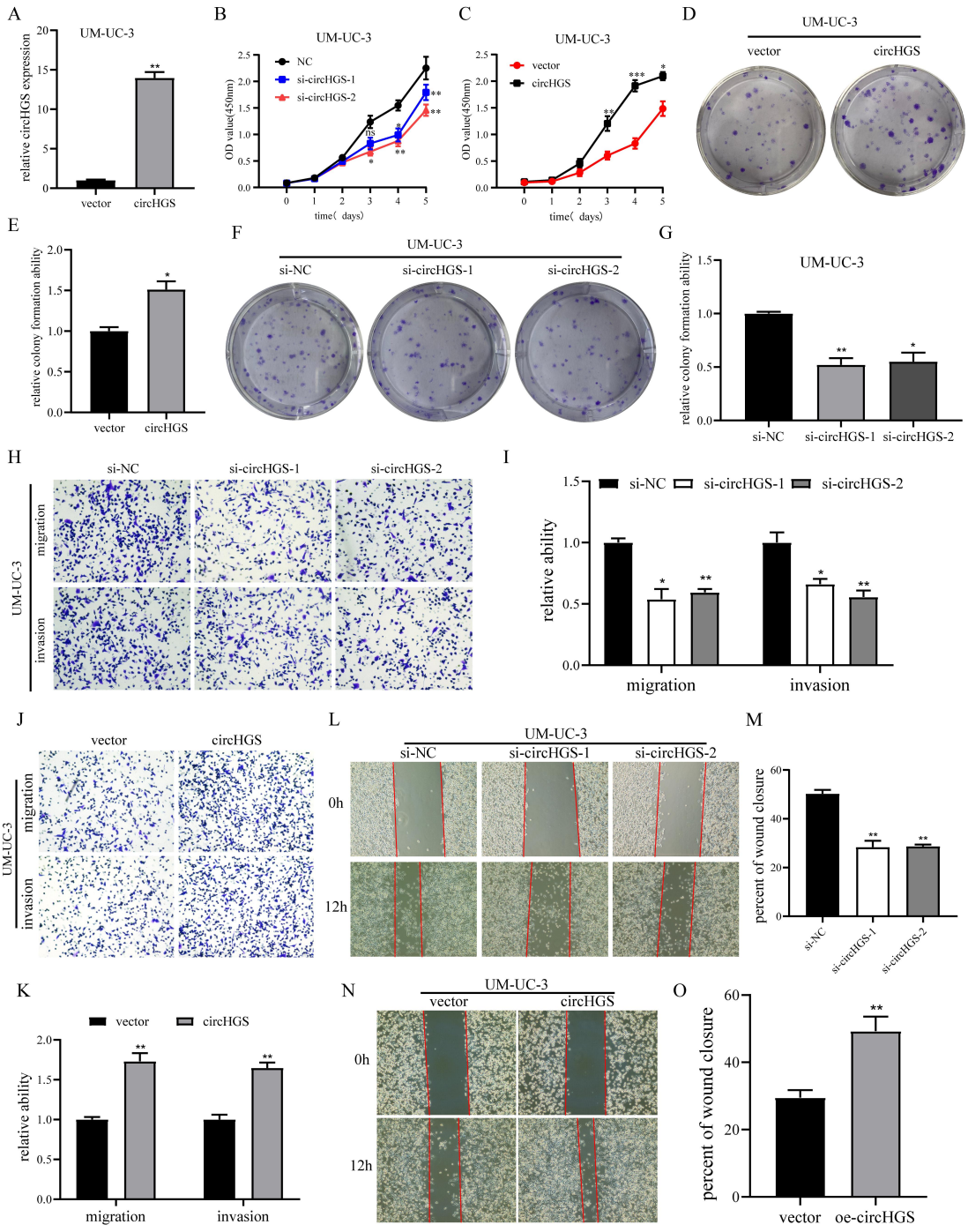

Fig. S1 CircHGS plays a tumor-promoting role in BCa. **A** The expression of circHGS in UM-UC-3 cells treated with circHGS overexpression plasmid was detected by qRT–PCR. **B-G** The proliferation abilities of UM-UC-3 cells treated with siRNA targeting circHGS or circHGS overexpression plasmid were detected by CCK8 and colony formation assays. **H-K** The migration and invasion abilities of UM-UC-3 cells transfected with siRNA targeting circHGS or circHGS overexpression plasmid were

measured by Transwell assay. **L-O** Wound healing assays were applied to detect the migration abilities of UM-UC-3 cells treated with siRNA targeting circHGS or circHGS overexpression plasmid. Data are shown as the means ± SD of three independent experiments, * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

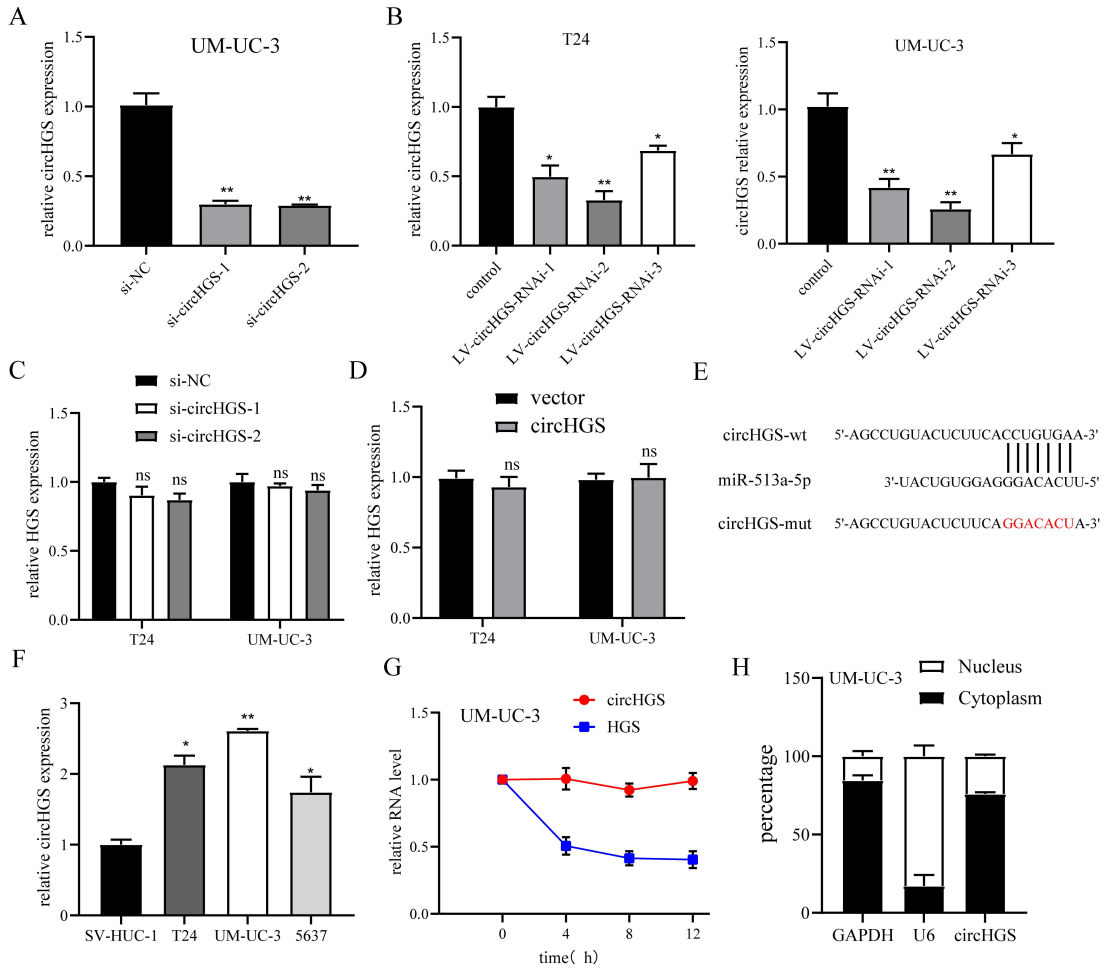

Fig. S2 A The expression of circHGS in UM-UC-3 cells treated with circHGS-siRNA. **B** Stable knockdown efficiencies of circHGS in T24 and UM-UC-3 cells. **C, D** The effects of silencing or overexpressing circHGS on HGS expression in T24 and UM-UC-3 cells. **E** The binding sites of miR-513a-5p and circHGS-wt. **F** The expression levels of circHGS in BCa cells and SV-HUC-1 cells. **G** qRT–PCR was performed to measure relative circHGS and HGS mRNA expression levels at 4 different time points in UM-UC-3 cells treated with actinomycin D. **H** The expression levels of circHGS in the cytoplasm and nucleus of UM-UC-3 cells; GAPDH and U6 were used as internal references. Data are shown as the means ± SD of three

independent experiments, * $P < 0.05$, ** $P < 0.01$.

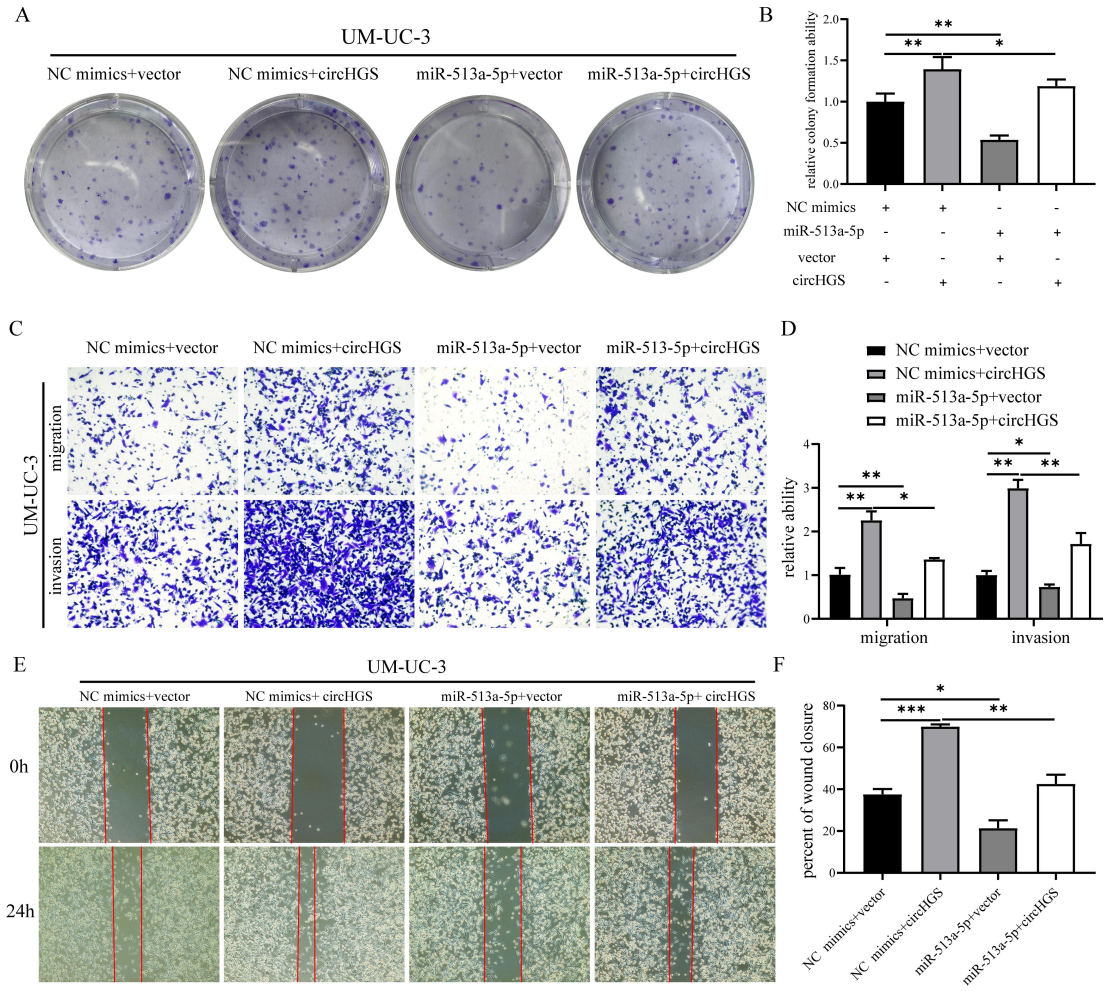

Fig. S3 MiR-513a-5p reversed the oncogenic roles of circHGS in vitro. **A, B** A colony formation assay indicated that the cell proliferation ability of UM-UC-3 cells transfected with circHGS overexpression plasmid was abolished after cotransfection with miR-513a-5p mimics. **C, D** Transwell migration and Matrigel invasion assays showed that the cell migration and invasion capabilities of UM-UC-3 cells transfected with the circHGS overexpression plasmid were abrogated after cotransfection with miR-513a-5p mimics. **E, F** Wound healing assays demonstrated that the cell migration ability of UM-UC-3 cells transfected with circHGS overexpression plasmid was abrogated after cotransfection with miR-513a-5p mimics. Data are shown as the means ± SD of three independent experiments, * $P < 0.05$, ** $P < 0.01$.