

Figure S1. *BIRC5* is overexpressed in tumor tissues of patients with different cancer types and upregulation of *BIRC5* correlates with poor prognostic outcomes in patients. (A) The expression of *BIRC5* mRNA in pan cancers was analyzed by using the online available software TNMplot (<https://tnmplot.com/analysis/>). Significant differences by Mann-Whitney U test are marked with a * $P < 0.0001$. AML, acute myeloid leukemia; Lung_AC, lung adenocarcinoma; Lung_SC, lung squamous cell carcinoma; Renal_CC, renal clear cell carcinoma; Renal_CH, renal chromophobe cell carcinoma; Renal_PA, renal papillary cell carcinoma; Uterus_SC, uterine carcinosarcoma, Uterus_EC, uterine corpus endometrial carcinoma. (B) Kaplan-Meier survival estimates of high (red line) or low (black line) *BIRC5* expression in lung, gastric, and the endocrine therapy-treated estrogen receptor-positive breast cancer. Analysis was performed using the online database and web tool Kaplan Meier plotter (<https://kmplot.com/analysis/>).

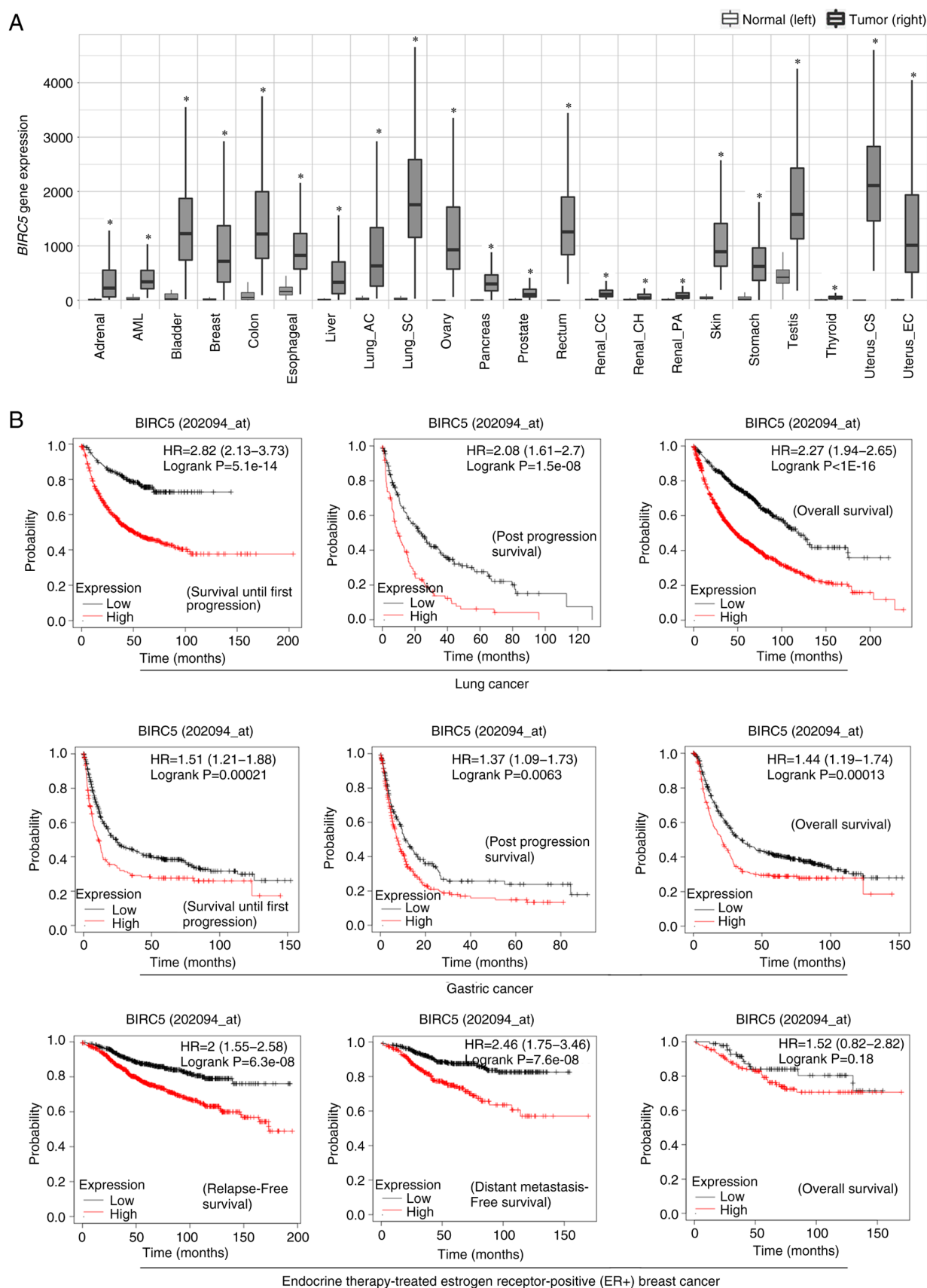


Figure S2. Expression of ABCB1 and BIRC5 and effects of pSur-125a in cells. (A) Expression of ABCB1 in cells was determined by western blotting. ACTA1 was used as an internal control. (B) Cells were liposomal transfected with pSur-125a for 48 h and the amount of miR-125a-5p present in cells was determined by qPCR analysis. (C) Relative amount of *BIRC5* mRNA transcripts present in cells was determined by qPCR analysis. (D) BIRC5 in cells was determined by western blotting. ACTA1 was used as an internal control. (E) HMEC-1 cells were liposomal transfected with pCMV6-AC-GFP for 48 h and the expression of GFP was observed using fluorescence microscopy. * $P < 0.05$ and ** $P < 0.01$. Nucleus were stained blue with DAPI. qPCR, quantitative PCR.

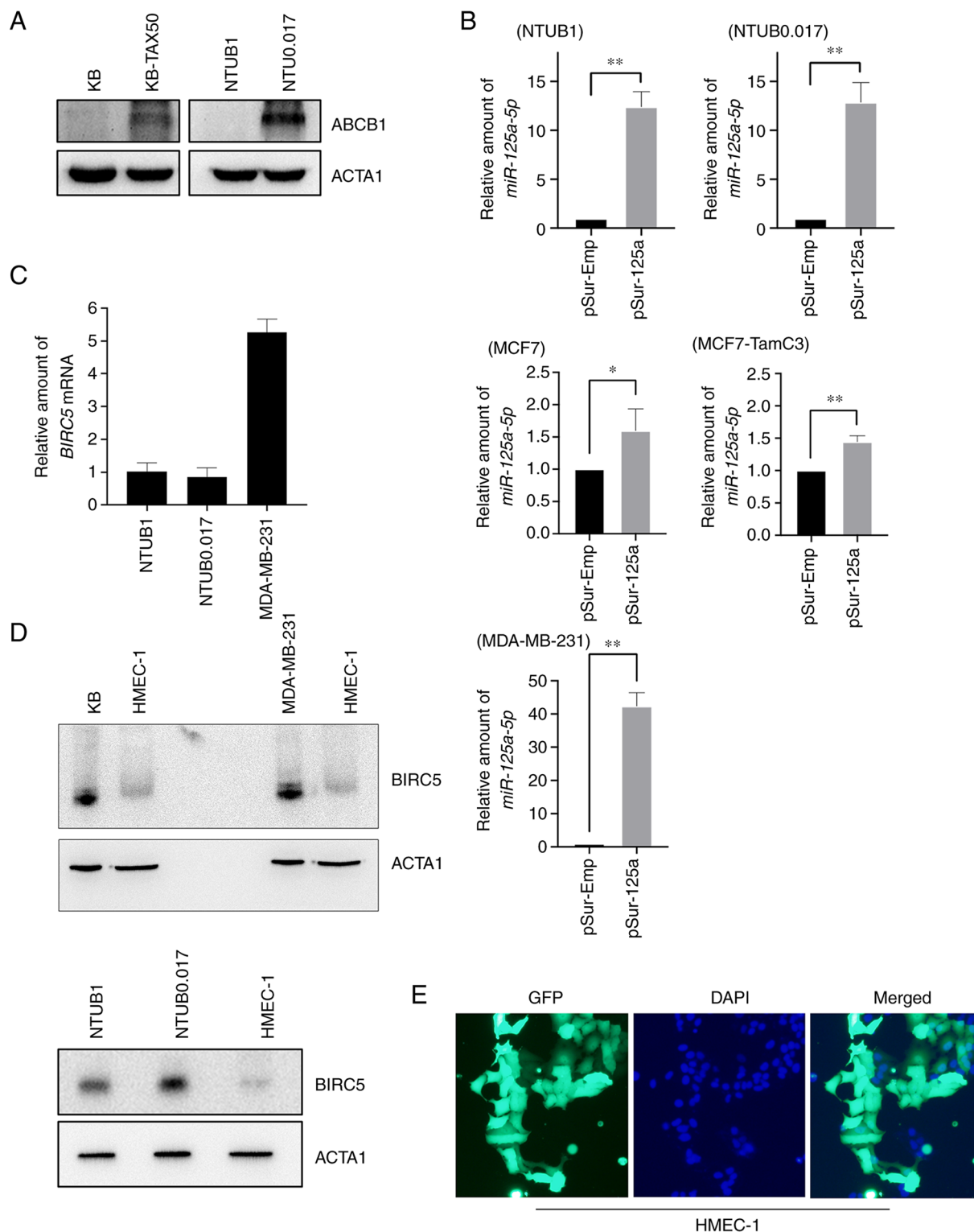


Figure S3. Molecular and cellular effects of pL-MNP-pSur-125a in cancer cells. (A) KB-TAX50 cells were treated with pL-MNP-pSur-Emp or pL-MNP-pSur-125a for 48 h. Expression of HDAC5 was determined by western blotting. (B) KB cells were treated with pL-MNP-pSur-Emp, pL-MNP-pSur-125a, or liposomal transfected with or without miR-125a-5p for 48 h. Expression of TDO2 in cells was determined by western blotting. (C) Cancer cells were treated with either pL-MNP-pSur-Emp or pL-MNP-pSur-125a for 96 h and the cell viability was determined using the MTT assay. A statistically significant difference in the cell viability between the testing groups is denoted by * $P < 0.05$ and **** $P < 0.0001$. miR, microRNA; HDAC, histone deacetylase 5.

