Table S1. Sequence of shRNA for H2AX

	Clone ID	Target Sequence
Human shH2AX	pGIPZ_V2LHS_191495	CCGTTGGCTTCTGAACTGGAAT
Mouse shH2AX	TRC_TRCN0000097005	CGAGTACCTCACTGCCGAGAT

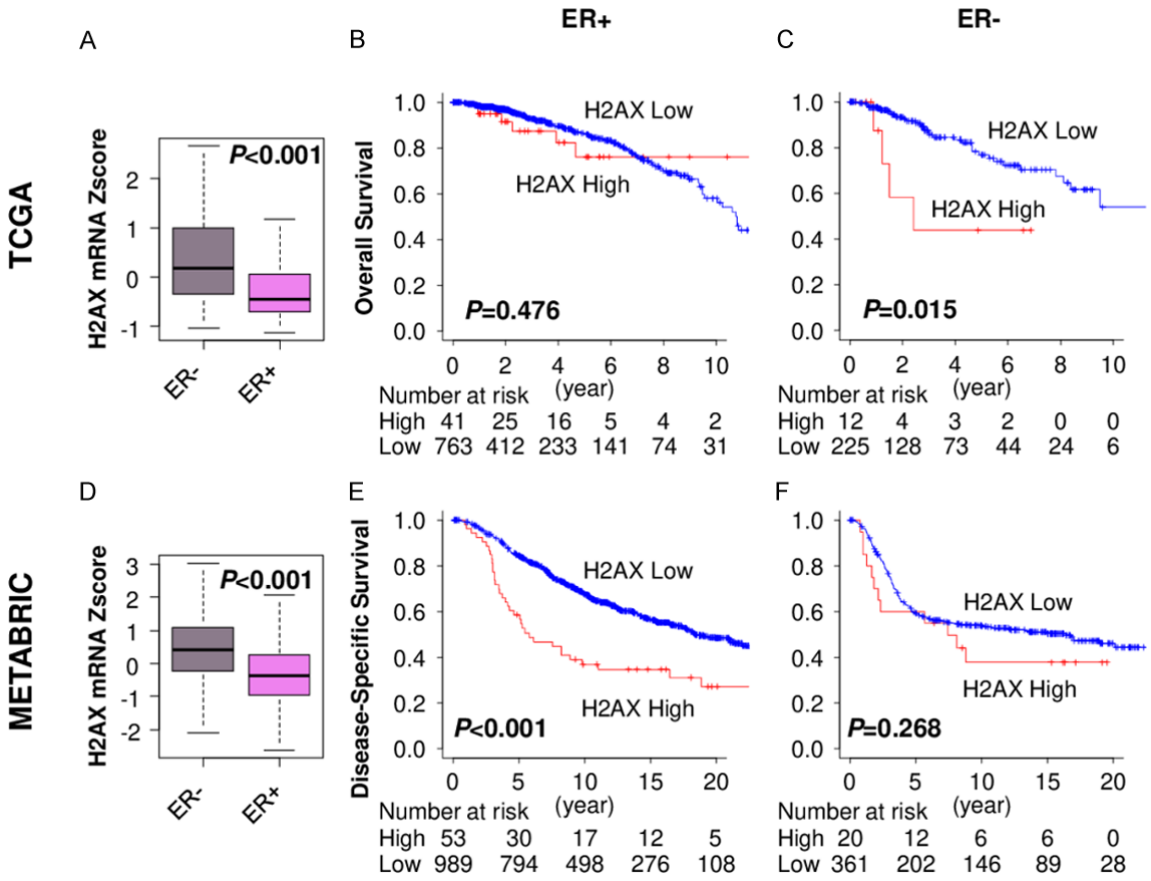

Figure S1. Impact of H2AX expression on breast cancer patient survival by ER status. (A) H2AX expression comparison between ER+ (n=804) and ER- (n=237) breast cancers in TCGA. Overall survival by H2AX expression in (B) ER+ (n=804) and (C) ER- (n=237) TCGA breast cancer cohort. (D) H2AX expression comparison between ER+ (n=1042) and ER- (n=381) breast cancers in METABRIC. Disease-specific survival by H2AX expression in (E) ER+ (n=1042) and (F) ER- (n=381) METABRIC cohort.

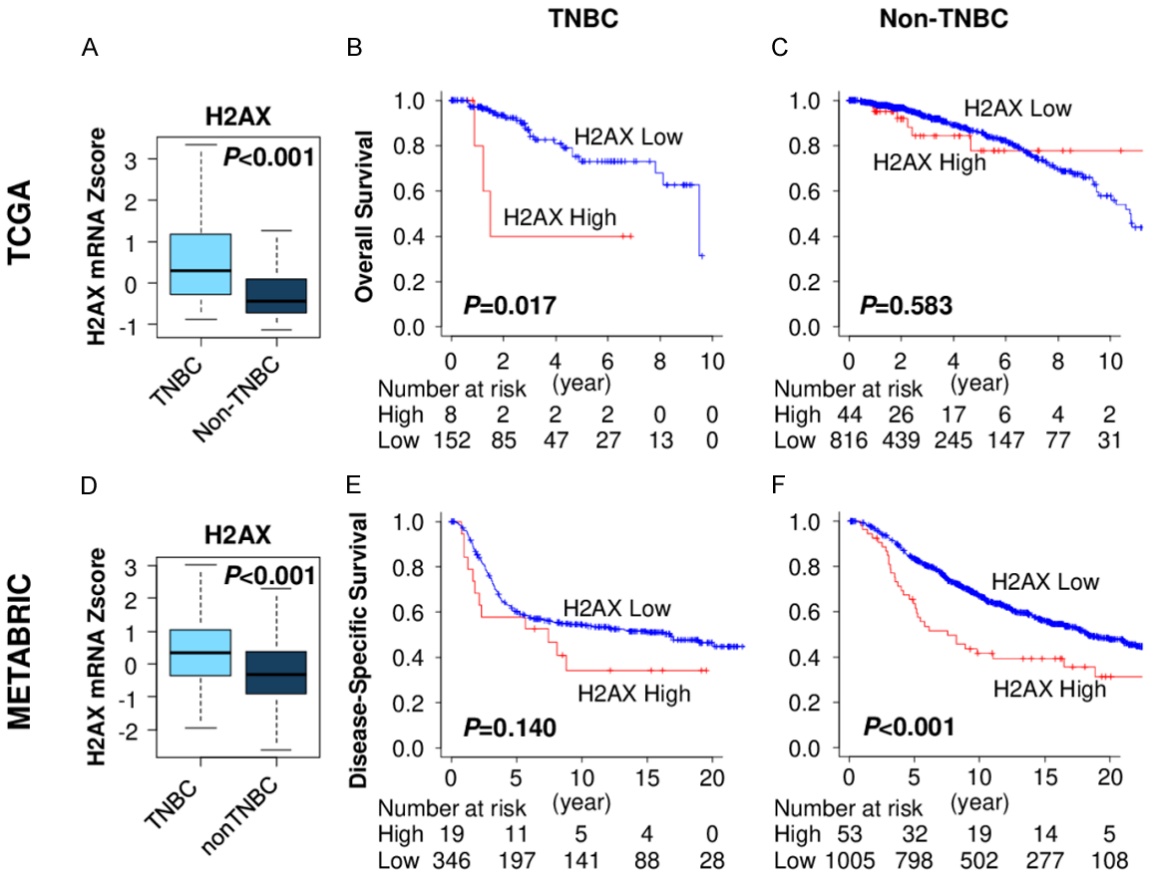

Figure S2. Impact of H2AX expression on breast cancer patient survival in triple-negative breast cancer (TNBC). (A) H2AX expression comparison between TNBC (n=160) and non-TNBC (n=860) breast cancers in TCGA. Overall survival by H2AX expression in (B) TNBC (n=160) and (C) non-TNBC (n=860) TCGA breast cancer cohort. (D) H2AX expression comparison between TNBC (n=365) and non-TNBC (n=1058) breast cancers in METABRIC. Disease-specific survival by H2AX expression in (E) TNBC (n=365) and (F) non-TNBC (n=1058) METABRIC cohort.

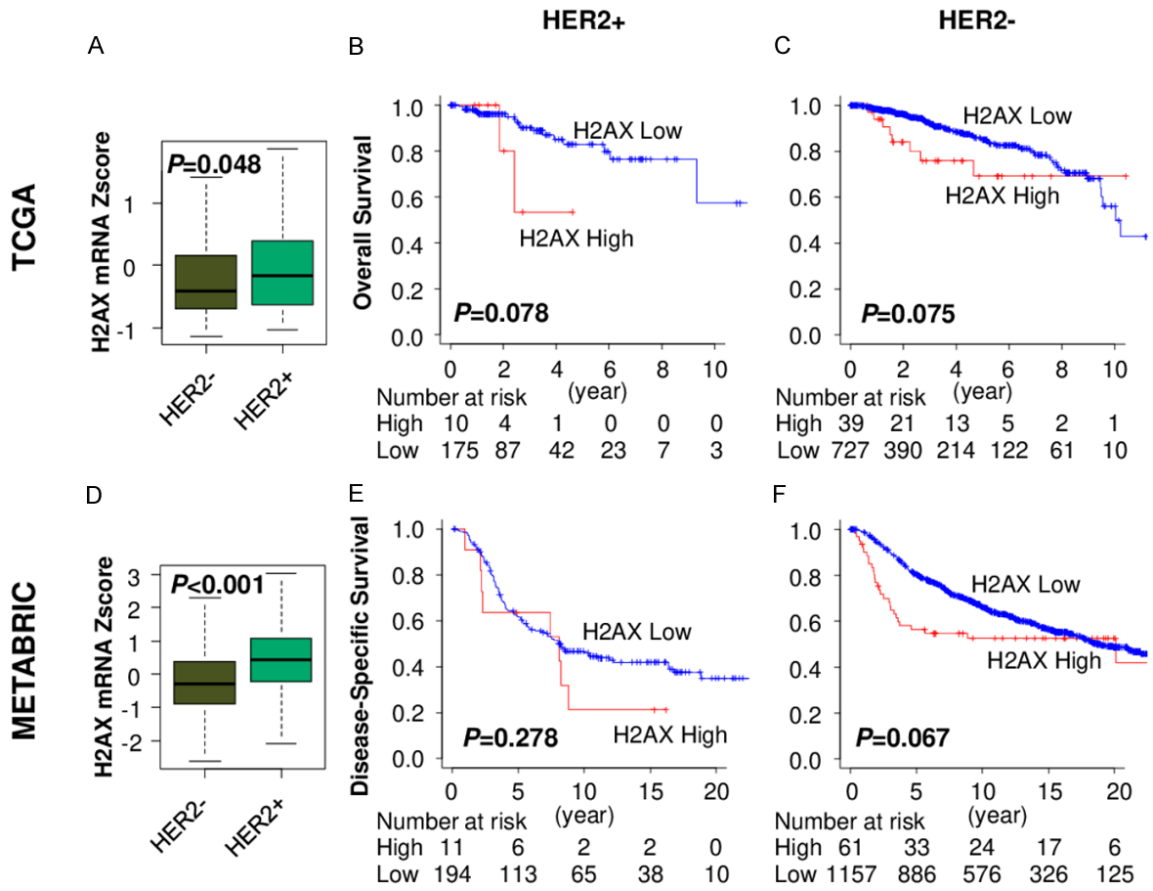

Figure S3. Impact of H2AX expression on breast cancer patient survival by HER2 status. (A) H2AX expression comparison between HER2+ (n=185) and HER2- (n=766) breast cancers in TCGA. Overall survival by H2AX expression in (B) HER2+ (n185) and (C) HER2- (n=766) TCGA breast cancer cohort. (D) H2AX expression comparison between HER2+ (n=205) and HER2- (n=1218) breast cancers in METABRIC. Disease-specific survival by H2AX ex-pression in (E) HER2+ (n=205) and (F) HER2- (n=1218) METABRIC cohort.

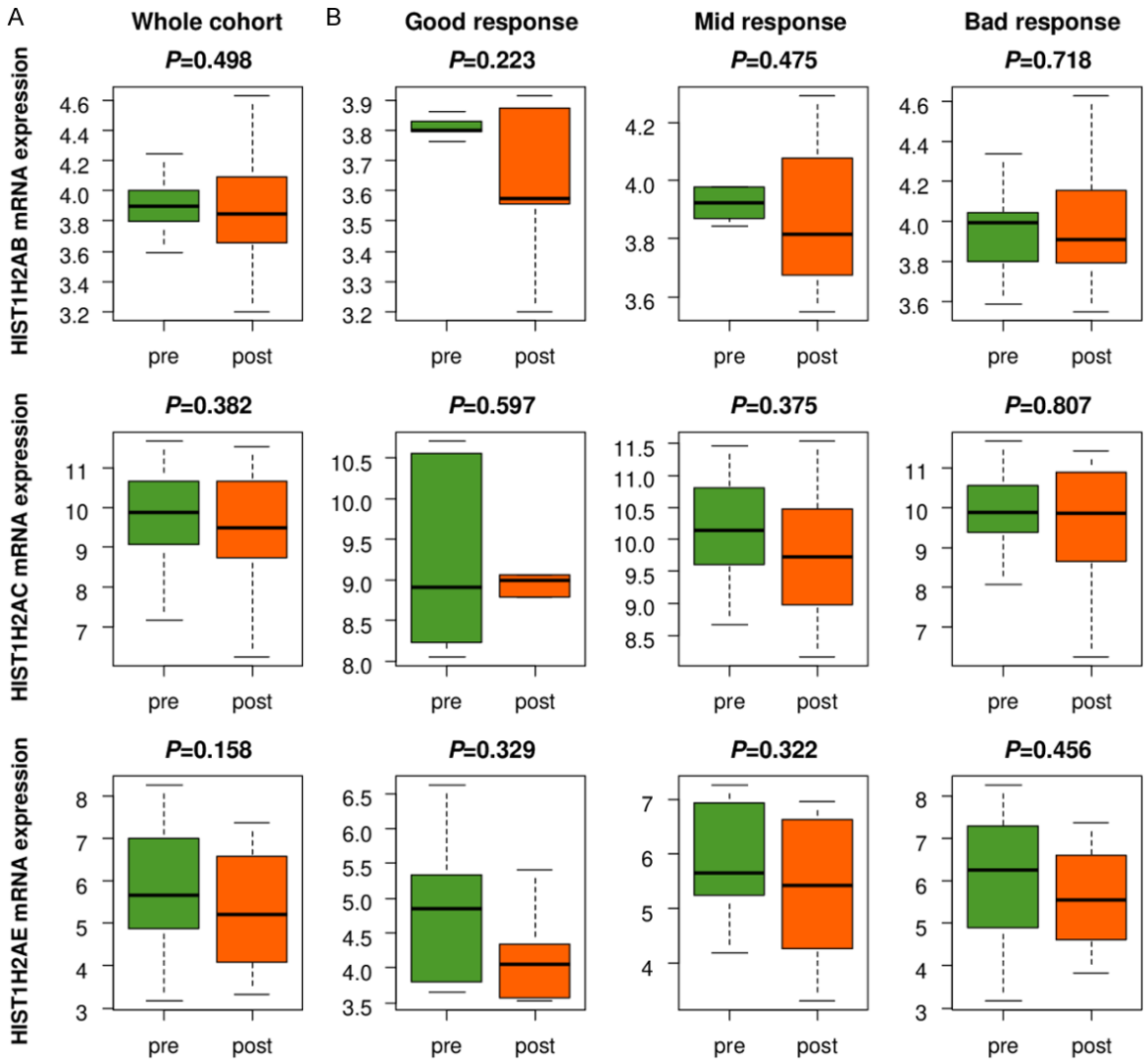

Figure S4. The association of other H2A1 coding genes and chemotherapy in breast cancer. H2A1 coding gene expression comparison between pre- and post-chemotherapy tumors in (A) whole cohort (n=28), (B) good (n=5), mid (n=10), and bad (n=13) response group in GSE28844 breast cancer cohort.

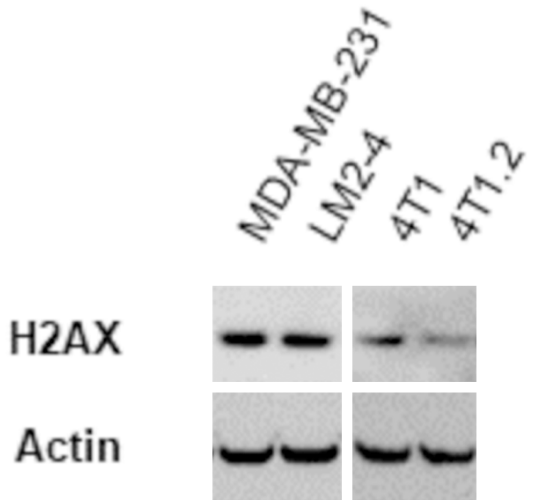

Figure S5. Immunoblot of H2AX and Actin in MDA-MB-231 and its metastatic clone, LM2-4, as well as 4T1 and its metastatic line 4T1.2.

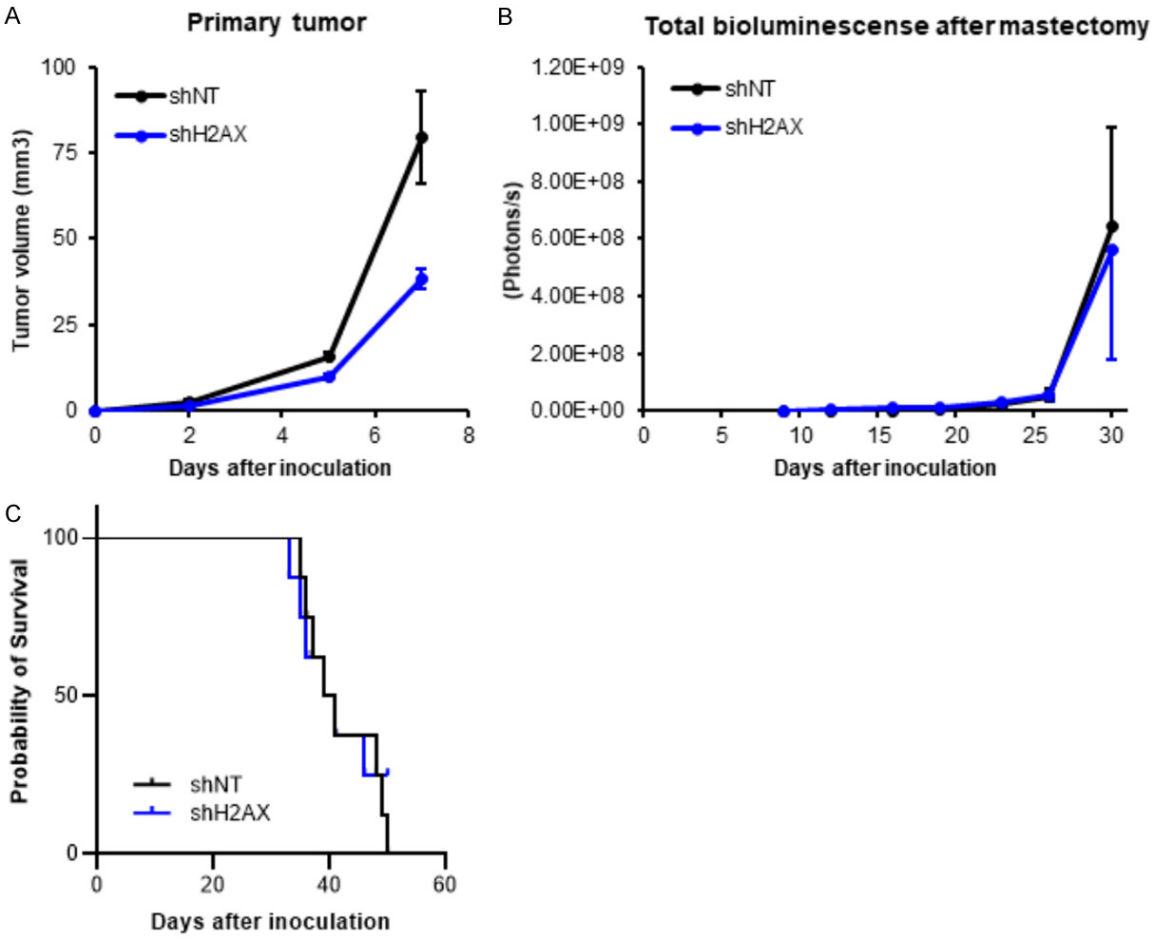

Figure S6. H2AX knockdown 4T1 syngeneic tumor with mastectomy. A. Primary tumor growth before mastectomy. B. Total bioluminescence after mastectomy. C. Survival curve of mice (n=8, each group).