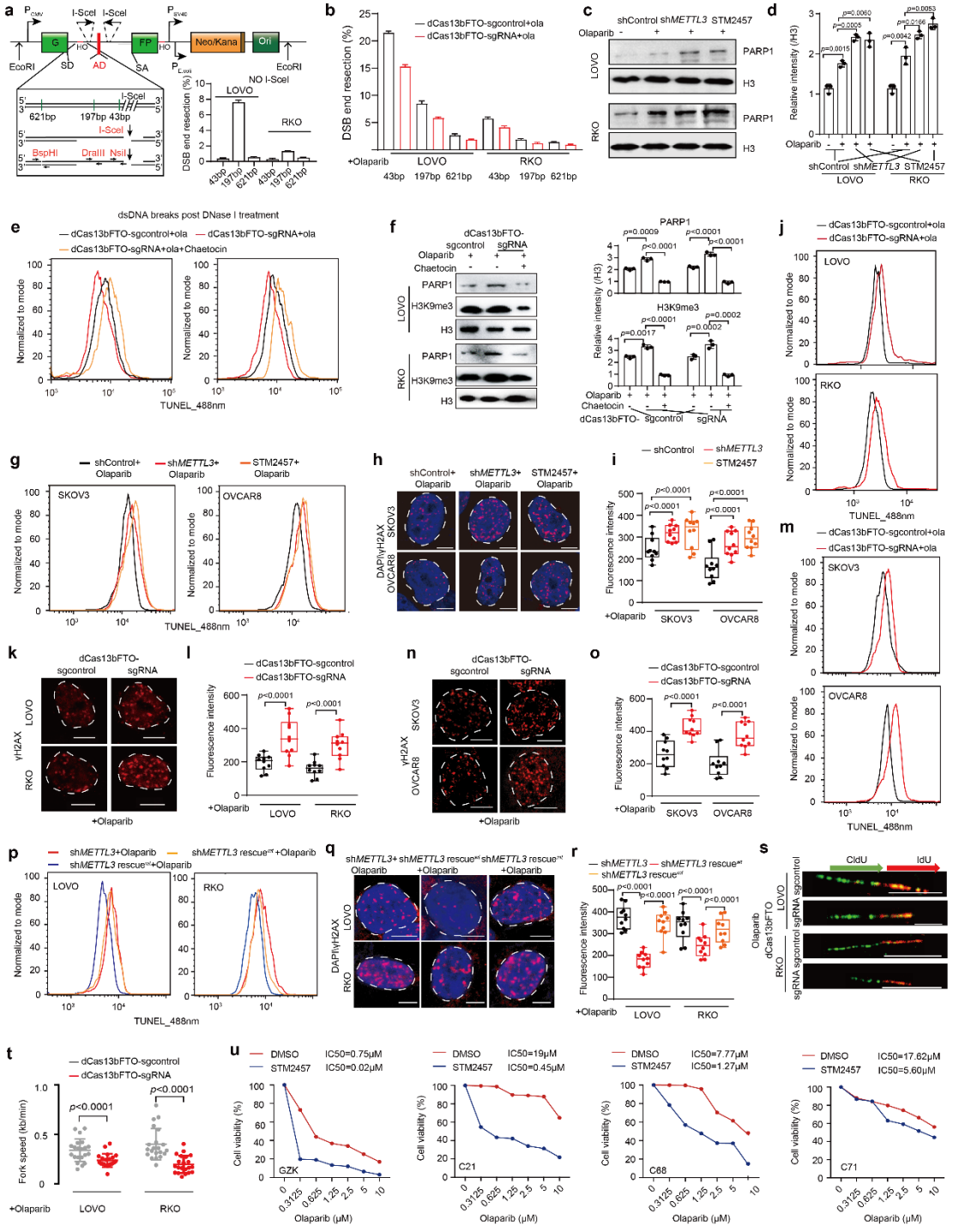

Fig. S6 m^{6}A-marked L1 regulates DSB end-resected repair and PARP1 dissociation from DSB sites in *BRCA*^{wt} and *BRCA*$^{-/-}$ cells. (a) Model diagram for end resection efficiency detection, untransfected I-SceI expression plasmid detection, and measurement of ssDNA generation ratio at different distances from a DSB. **(b)** End resection efficiency of dCas13b-FTO targeting LOVO and RKO cells was measured at different distances from a DSB. **(c)** Western blot analysis of chromatin-bound PARP1 in olaparib-treated control, *METTL3* knockdown, and STM2457-treated LOVO and RKO cells. **(d)** Quantification of the results shown in **(c)**. **(e)** Genome-wide chromatin accessibility changes following H3K9me3 inhibitor treatment in the context of

dCas13b-mediated m^{6}A removal on L1PA elements were analyzed by TUNEL-DNase I assay combined with flow cytometry. **(f)** Western blot detection of chromatin-bound PARP1 and H3K9me3 protein levels following H3K9me3 inhibitor treatment in the context of dCas13b-mediated m^{6}A removal on L1PA elements. The left panel shows representative western blot images; the right panel displays quantitative statistical results. **(g)** Detection of DNA strand breaks by TUNEL assay in SKOV3 and OVCAR8 cells (control, *METTL3* knockdown, and STM2457 treatment groups) under olaparib treatment conditions. **(h)** Immunofluorescence staining of DNA damage marker γ-H2AX (red) foci formation in SKOV3 and OVCAR8 cells (control, *METTL3* knockdown, and STM2457 treatment groups) under olaparib treatment conditions; scale bar: 5 μm. **(i)** Quantitative analysis of DNA damage levels shown in panel **(h)**. Fluorescence signal intensity was measured using ImageJ software. **(j)** DNA damage was assessed by TUNEL assay in olaparib-treated dCas13b-FTO targeting LOVO and RKO cells. **(k, l)** Detection **(k)** and quantitation **(l)** of γH2AX fluorescence intensity in olaparib-treated dCas13b-FTO targeting LOVO and RKO cells; scale bars, 5 μm. **(m)** DNA damage was assessed by TUNEL assay in olaparib-treated dCas13b-FTO targeting SKOV3 and OVCAR8 cells. **(n, o)** Detection **(n)** and quantitation **(o)** of γH2AX fluorescence intensity in olaparib-treated dCas13b-FTO targeting SKOV3 and OVCAR8 cells; scale bars, 5 μm. **(p)** Detection of DNA strand break levels by TUNEL assay in LOVO and RKO cells with *METTL3* knockdown rescued with either wild-type or catalytically dead mutant METTL3 under olaparib treatment conditions. **(q)** Detection of DNA damage marker γ-H2AX (red) foci formation by immunofluorescence staining in LOVO and RKO cells with *METTL3* knockdown rescued with either wild-type or catalytically dead mutant METTL3 under olaparib treatment conditions. Scale bar: 5 μm. **(r)** Quantitative analysis of DNA damage levels shown in panel **(q)**. Fluorescence signal intensity was measured using ImageJ software. **(s, t)** Replication rate measured by DNA fiber experiments in olaparib-treated dCas13b-FTO targeting LOVO and RKO cells **(s)** and quantitative results **(t)**; scale bar, 5 μm. **(u)** Organoid vitality was monitored after drug treatment, and curves under different drug concentrations were then generated. **(d, f, i, l, o, r, t)** Statistical analyses were performed using a *t* test. $n = 3$ biological replicates. Data are shown as mean ± SEM.