

Supplementary Table S1. List of primers used in this study

ZNF251 gRNA oligos

gRNA1Forward: 5'-CACCGCGTGTACTTCTCTCAGGCGG (Exon 3)

gRNA1Reverse: 5'-AAACCCGCCTGAGAGAAGTACACGC

gRNA2Forward: 5'-CACCGGGGAGATCAACTCCGGCTTA(Exon 4)

gRNA2Reverse: 5'-AAACTAAGCCGGAGTTGATCTCCCC

gRNA3Forward: 5'-CACCGGGCAAACCTCAAAGAGCGCGT (Exon 5)

gRNA3Reverse: 5'-AAACACGCGCTCTTTGAGTTTGCCC

T7E1 primers

gRNA1 Forward: 5'-CTGGGTCCCCGTGTAGCTGAAGTT

gRNA1 Reverse: 5'-CATCAGCTCTCCTGCCACTGGAGG

gRNA2 Forward: 5'-CTCCTTCAGTACTTAGTCTCAGCCC

gRNA2 Reverse: 5'-TGTGGTAGAAGCTCCTATAAACCATCA

gRNA3 Forward: 5'-ATTCTGAGGTTGGGACCAAGAAGG

gRNA3 Reverse: 5'-CACCGGCCACATTTCGTACGGCTTC

ZNF251 RT-PCR primers

ZNF251 REV Set 1

CCACAGTCACACAGTCATAG

ZNF251 FWD Set 4

GGAGAAAGAACCCAAGAGTGTAG

ZNF251 REV Set 4

GAAGACGGAGGTGAGAATTGAG

ZNF251 FWD Set 5

GGAACCTTGGGTCCTGAATCT

ZNF251 REV Set 5

GCACTACACTCTTGGGTTCTT

Supplementary Table S2. List of DSB repair genes with differential expression (DE) in *ZNF251* KD3 breast cancer cells compared with *ZNF251* WT control.

Vehicle-treated *ZNF251* KD vs. wildtype (WT)

Gene ID	Gene symbol	Up or down regulation	p value	FDR
ENSG00000242802	AP5Z1	Up	3.83E-04	0.0485669
ENSG00000069275	NUCKS1	Down	2.22E-05	0.010884

Olaparib-treated *ZNF251* KD3 vs. wildtype (WT)

None.