

## **SUPPLEMENTARY MATERIALS**

**Supplementary Table 1. List of oligonucleotide sequences used in this study.**

**Supplementary Table 2. List of primary antibodies used in this study.**

**Supplementary Table 1. List of oligonucleotides sequences used in this study.**

<b>Gene</b>	<b>Sequence (5' to 3')</b>
<i>NHEJ1</i> – sgRNA 1	ctcttaggagctgaacaag
<i>NHEJ1</i> – sgRNA 2	ggagaaggtagctcgcta
<i>PRKDC</i> – sgRNA 1	tccccctctggcatctgcg
<i>PRKDC</i> – sgRNA 2	gaaacgtccgcttatagagc
<i>LIG4</i> – sgRNA 1	agaacaccactggaactca
<i>LIG4</i> – sgRNA 2	ttgctaatttacctagaga
<i>LIG4</i> – sgRNA 3	gaaagagagagaatggccta
<i>TP53BP1</i> – sgRNA 1	cagaatcatcctctagaacc
<i>TP53BP1</i> – sgRNA 2	acgaggagacggtaatagt
<i>POLQ</i> – sgRNA 1	gtagagttcagcattcaacc
<i>POLQ</i> – sgRNA 2	ctgactccaaaagcggta
<i>RAD52</i> – sgRNA 1	gtgctacattgagggtcatc
<i>RAD52</i> – sgRNA 2	tccatcacgcagcagaatgt
<i>RAD54L</i> – sgRNA 1	gtcaccagtcggcgcatccc
<i>RAD54L</i> – sgRNA 2	gtgcaagccagaaattgaca
<i>NBN</i> – sgRNA 1	caagaagagcatgcaaccaa
<i>NBN</i> – sgRNA 2	agaatgcactcaccttgta
<i>NHEJ1</i> – primer 1	ccttcgtgtaaccagggct
<i>NHEJ1</i> – primer 2	accatccaggggtctacctca
<i>PRKDC</i> – primer 1	taaacattgctgacctctggt
<i>PRKDC</i> – primer 2	tcttccctttgtgaaagactacg
<i>LIG4</i> – primer 1	tcagacacttcaggggaattttaga
<i>LIG4</i> – primer 2	tgctcaagtgctgaactctga
<i>TP53BP1</i> – primer 1	cattccaggggagcagatgg
<i>TP53BP1</i> – primer 2	cgcagataccacagtaggctt
<i>POLQ</i> – primer 1	gttggcatgagtgtacctt
<i>POLQ</i> – primer 2	cttcaactgtagcatgggc
<i>RAD52</i> – primer 1	gtgtggtaaggaattaacacagctt
<i>RAD52</i> – primer 2	gcagcaggtctactccatcc
<i>RAD54L</i> – primer 1	aacgaggtatgggctatggg
<i>RAD54L</i> – primer 2	gccatctttgttagggctcc
<i>NBN</i> – primer 1	gccatctctgcaactctgatac
<i>NBN</i> – primer 2	tgtcataaccttctcggtgga
Control – siRNA	CUACAUCCGAUCGAUGAUdTdT
<i>XLF</i> – siRNA1	GCAUUACAGUGCCAAGUGAdTdT
<i>XLF</i> – siRNA2	CGCUGAUUCGAGAUCGAUUGAdTdT

**Supplementary Table 2. List of primary antibodies used in this study.**

<b>Antibody</b>	<b>Source</b>
XLF	Cell Signaling 2854
DNA-PKcs	Abcam ab44815 (a gift from Benjamin Chen)
DNA Ligase IV	Cell Signaling 14649
53BP1	Novus NB100-304
RAD52	Santa Cruz sc-365341
RAD54	Cell Signaling 15016
NBS1	Cell Signaling 14956
$\alpha$ -Tubulin	Cell Signaling 3873
Histone H2A.X (phospho S139)	Cell Signaling 2577
Histone H2A.X (phospho S139)	Millipore 05-636
FLAG	Sigma F1804
GFP	Cell Signaling 2555
mCherry	Cell Signaling 43590S