

Table S1. Antibody used in this study

Antigen	Catalog number	Source	Application
USP1	8033	Cell Signaling	WB, IF, IP
USP1	14346-1-AP	Proteintech	WB, IHC, IF
EZH2	5246	Cell Signaling	WB, IHC, IF
EZH2	612666	BD Biosciences	WB, IF, IP, CHIP
Histone H3	4499	Cell Signaling	WB
Tri-Methyl-Histone H3 (Lys27)	9733	Cell Signaling	WB, CHIP
Di-Methyl-Histone H3 (Lys27)	9728	Cell Signaling	WB, CHIP
β -Catenin	8480S	Cell Signaling	WB, CHIP
WDR48	sc-99718	Santa Cruz Biotechnology	WB
Active- β -Catenin	05-665	Upstate	WB, IHC
TCF4	2569S	Cell Signaling	WB, CHIP
RUNX3	AP14667c-ev	ABGENT	WB
HOXA5	ab55239	Abcam	WB
P27	sc-528	Santa Cruz Biotechnology	WB
MYC-tag	2276	Cell Signaling	WB
FLAG-tag	F3165	Sigma-Aldrich	WB, IP
HA-tag	05-904	Upstate	WB, IP
Lamin B	sc-6216	Santa Cruz Biotechnology	WB
α -tubulin	sc-8035	Santa Cruz Biotechnology	WB
β -actin	Sc-47778	Santa Cruz Biotechnology	WB
EZH1	ABE281	Millipore	WB

Table S2. Primer sequences

Primers	sequence (5'->3')
Real-time PCR	
EZH2	F: CACAGTGCAACACCAAGCAG R: CGTCAGATGGTGCCAGCAAT
USP1	F: GCCACTCAGCCAAGGCGACTG R: CAGAATGCCTCATACTGTCCATCTCTATGC
HOXA5	F: ACCCACATCAGCAGCAGAG R: GAACTCCTTCTCCAGCTCCA
RUNX3	F: ATGACGAGAACTACTCCG R: TCAGGGTGAACTCTTCC
CDKN1B	F: AACCGACGATTCTTCTACTC R: TGTTTACGTTTGACGTCTTC
GAPDH	F: TGCACCACCAACTGCTTAGC R: GGCATGGACTGTGGTCATGAG
ChIP PCR	
RUNX3 promoter	F: TGTCCCGGGATCCTCTTCT R: TAGAGACGTTGGTGCGGAAAT
CDKN1B promoter	F: ACTGTGCTTGGGAAGGAAGATCC R: CAGTGGGCAATGGTTCGCTC
HOXA5 promoter	F: GAGAGACTGGGCTCTGTTGG R: AGGGGGTCTAAGAGCTGGAG
USP1 promoter	F: CGTTGGCTGTGCTCAAATATATC R: TGTAATCCCAGCTACTCCGGA
GAPDH locus	F: CGGGATTGTCTGCCCTAATTAT R: GCACGGAAGGTCACGATGT
CDS region clone PCR	
USP1	F: ATGCCTGGTGTACATACCTAGTG R: CTATAATTTCTTATAAAATAG
EZH2	F: ATGGGCCAGACTGGGAAG R: TCAAGGGATTTCATTTCTC

EZH2 fragments	
A	F: ATGGGCCAGACTGGGAAG R: TAGTTCTTCAATGAAAGTAC
B	F: ATAAAAAATTATGATGGGAA R: GTTGGGTGTTGCATGAAAAG
C	F: ACTTATAAGCGGAAGAACACA R: TGGAGCTATGATGCTAGATTC
D	F: GCTCCCGCTGAGGATGTGGAT R: TTTGGAGCCCCGCTGAATAC
E	F: AAGCATCTATTGCTGGCACC R: TCAAGGGATTTCCATTTCTC
USP1 promoter region clone PCR	
USP1-Pro-S	F: GGGGTACCGTCTCGAATTCCTGACCTCAAG R: CGACGCGTGCGCGCGAGTTGAGGG
USP1-Pro-L	F: GGGGTACCGCCACTCTGTGGTGCACAATG R: CGACGCGTGCGCGCGAGTTGAGGG
USP1-Pro-Mut1	F: TCAGGTTAAAAAAAATCGTTACTCGGTGCTT- TTTTTCTTTTTTCGGGTGGGAGGG R: CCCTCCCACCCGAAAAAAGAAAAAAGCACCGAG- TAACGATTTTTTTTTTAACCTGAG
USP1-Pro-Mut2	F: CTCAGGTTAAAAAAAATCGTTACTCGCTGGTT- TTTTTCTTTTTTCGGGTGGGAGGG R: CCCTCCCACCCGAAAAAAGAAAAAACCAGCGAG- TAACGATTTTTTTTTTAACCTGAG
EZH2 mutation	
K421R site	F:AGGTTCAATATTTGGCCTCATCTTTATTGGTGTTTGACACCG R:CGGTGTCAAACACCAATAAAGATGAGGCCAAATATTGAACCT
Y641F site	F:CTTGAGAAATAATCTCTCCACAGAATTCTGAGATGAATTCATTTTTCT R:AGAAAAATGAATTCATCTCAGAATTCTGTGGAGAGATTATTTCTCAAG