

Supplementary Figure S1

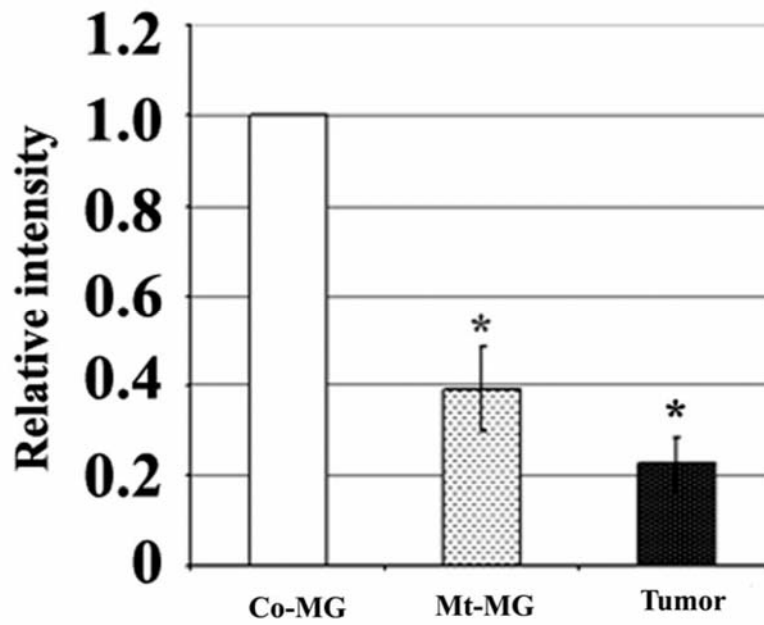


Figure S1 Quantification of methylation status in terms of 5-methylcytosine staining.

* represents $P < 0.05$ of Student's t -test.

Supplementary Figure S2

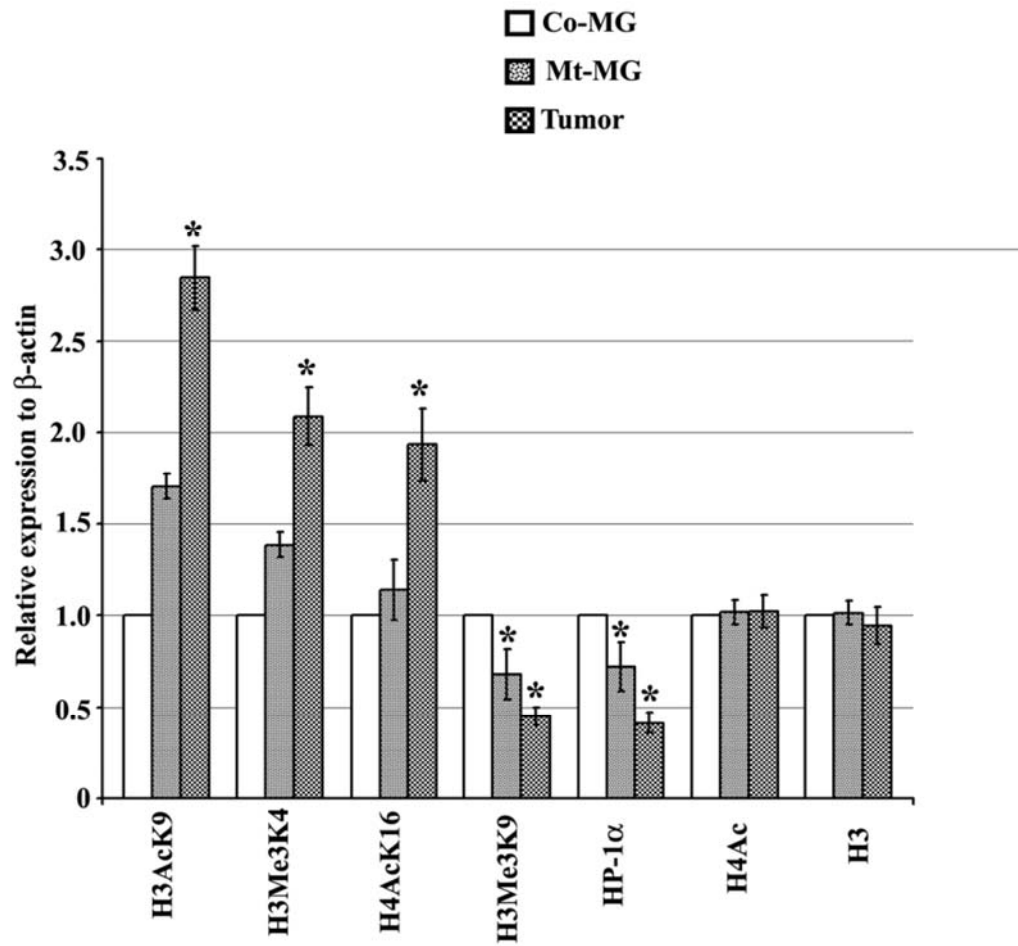


Figure S2 Quantification of epigenetic modifications in BRCA1 mutant mammary gland and mammary tumors revealed by western blots. * represents $P < 0.05$ of Student's t -test.

Supplementary Figure S3

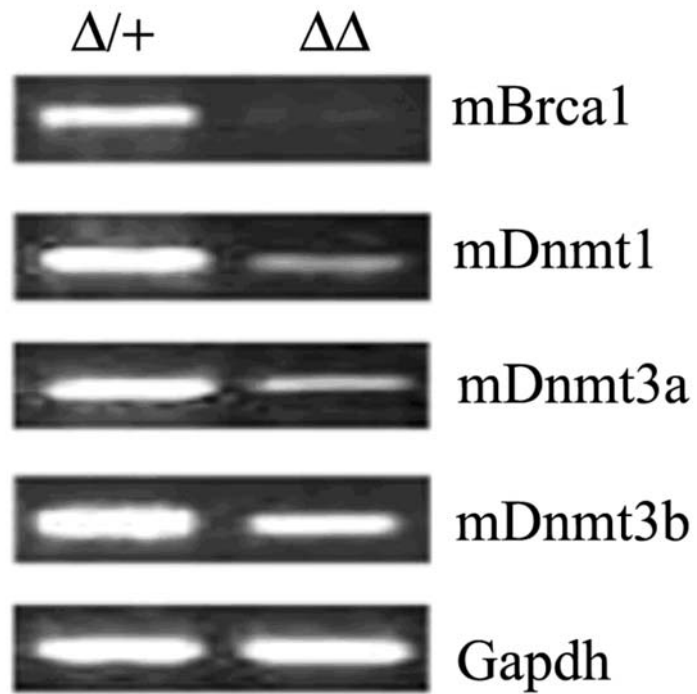


Figure 3 RT-PCR analysis of BRCA1 and DNMT expression in mouse liver samples (9 months old, Brca1 Δ/Δ or $\Delta/+$; p53 +/-).

Supplementary Figure S4

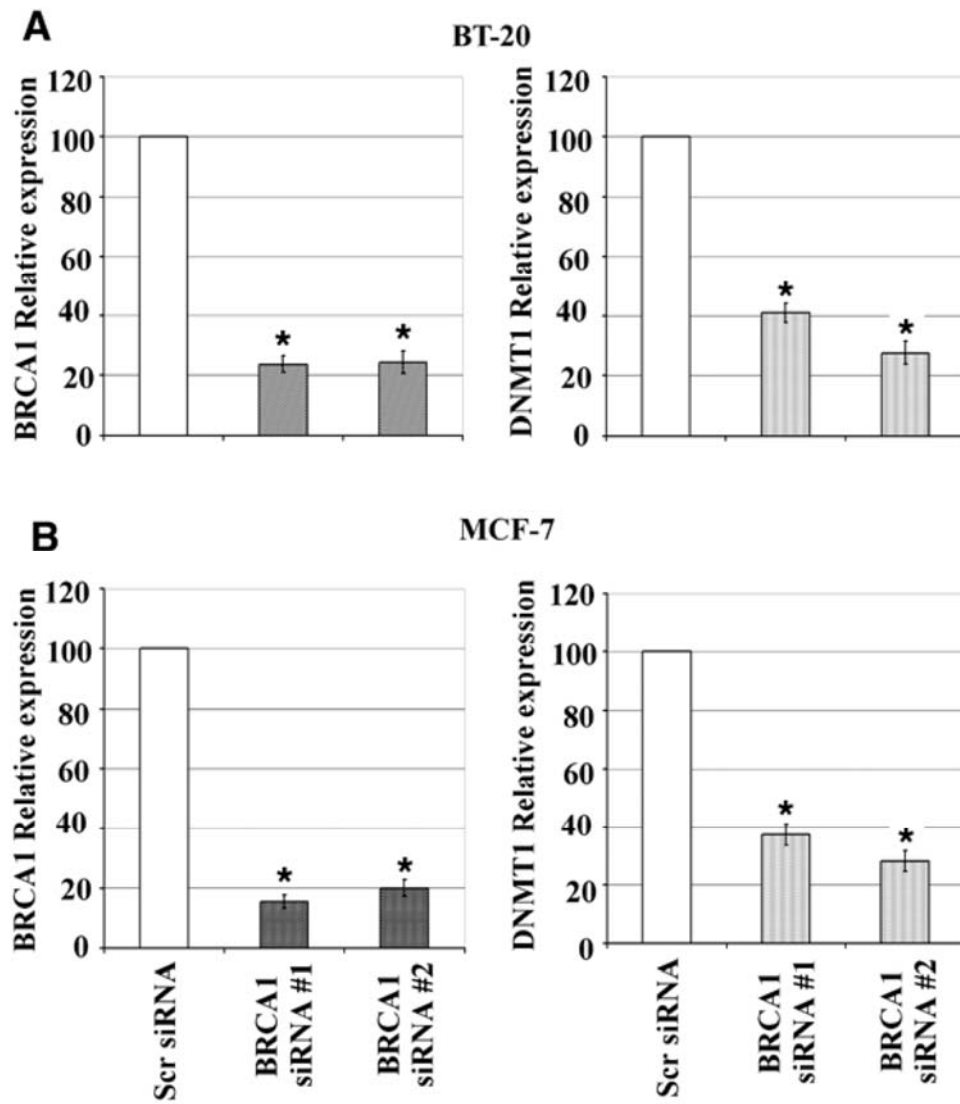


Figure 4 (A, B) Real time PCR analysis of *BRCA1* and *DNMT1* expression in human breast cancer BT-20 (**A**) and MCF-7 (**B**) cells.

Supplementary Figure S5

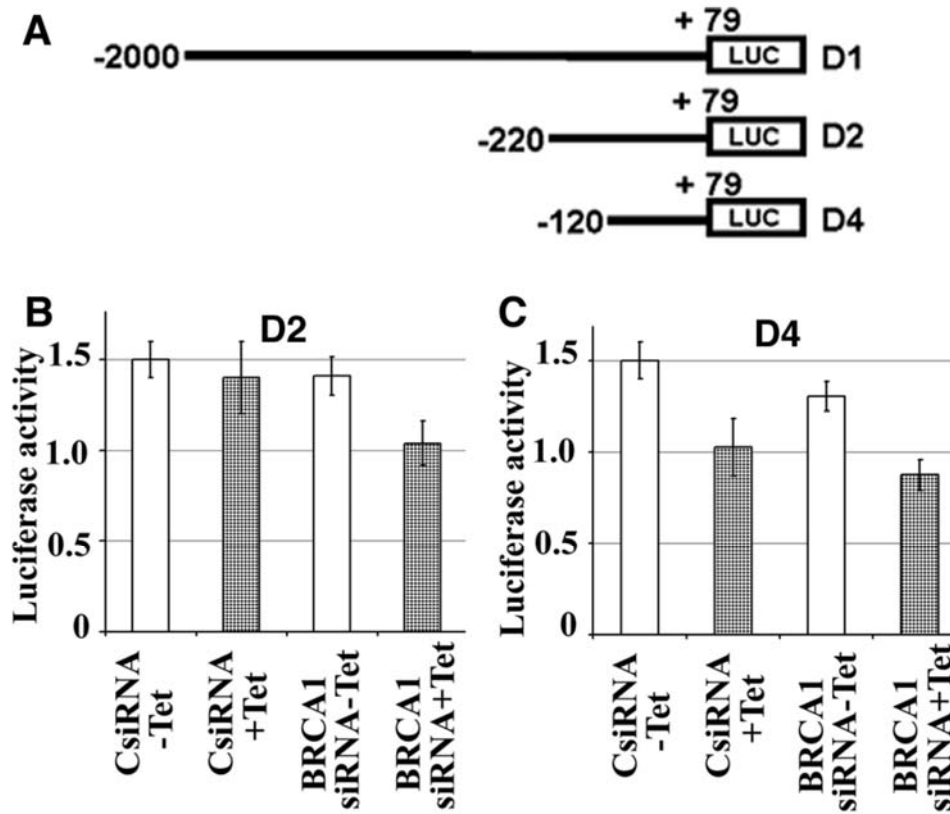


Figure S5 Luciferase reporter and their activities. (A) Three luciferase reporters for murine *Dnmt1*. (B, C) Luciferase activity of D2 (B) and D4 (C) reporters in Tet regulated UBR-60 cells.

Supplementary Figure S6

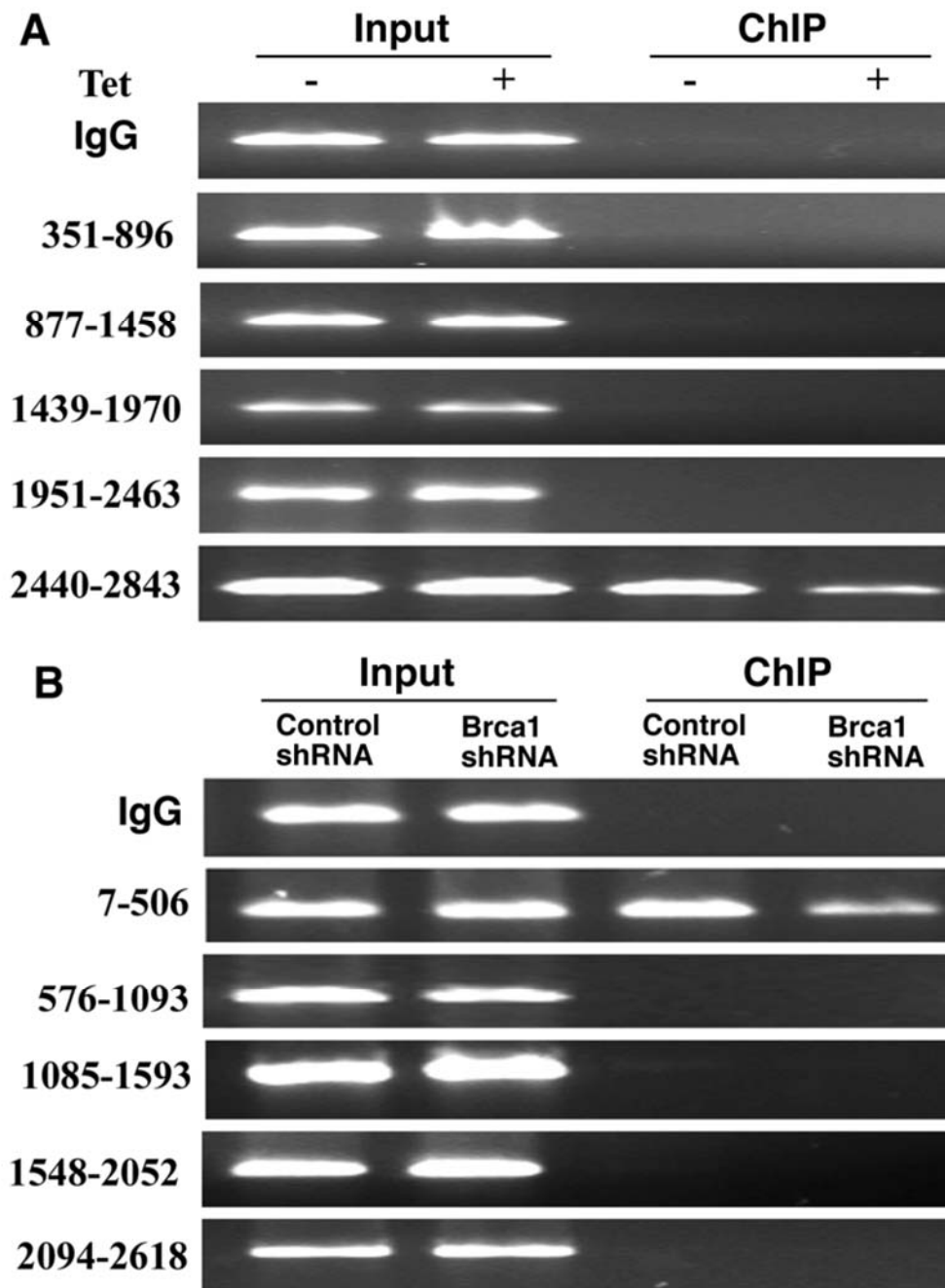
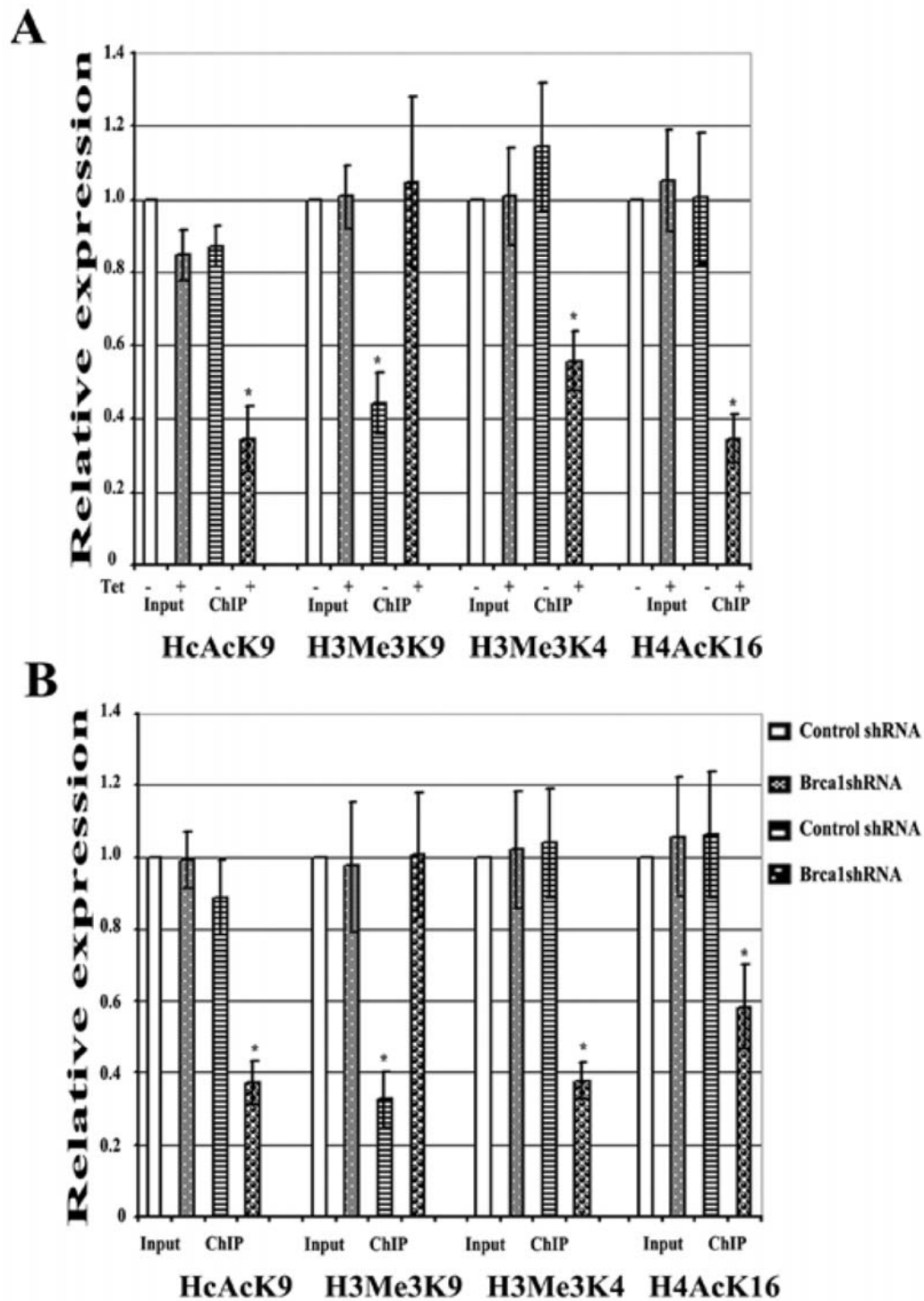


Figure S6 BRCA1 binds to the promoter of *DNMT1* revealed by ChIP assay. (**A**, **B**) ChIP analysis of human (**A**) and mouse (**B**) promoter showing that a fragment from -2440 to -2843 of human and a fragment from -7 to -506 of mouse *DNMT1* promoter interact with BRCA1.

Supplementary Figure S7



Supplementary Figure S8

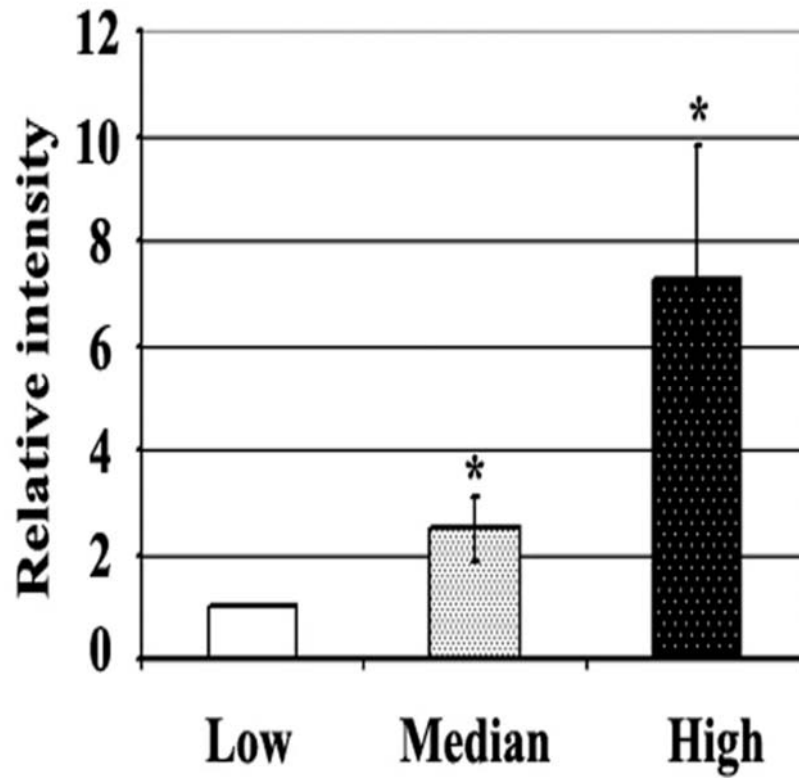


Figure S8 Quantification of immunofluorescent intensity of 5-methyl cytosine staining. * represents $P < 0.05$ of Student's t -test.

Supplementary Figure S9

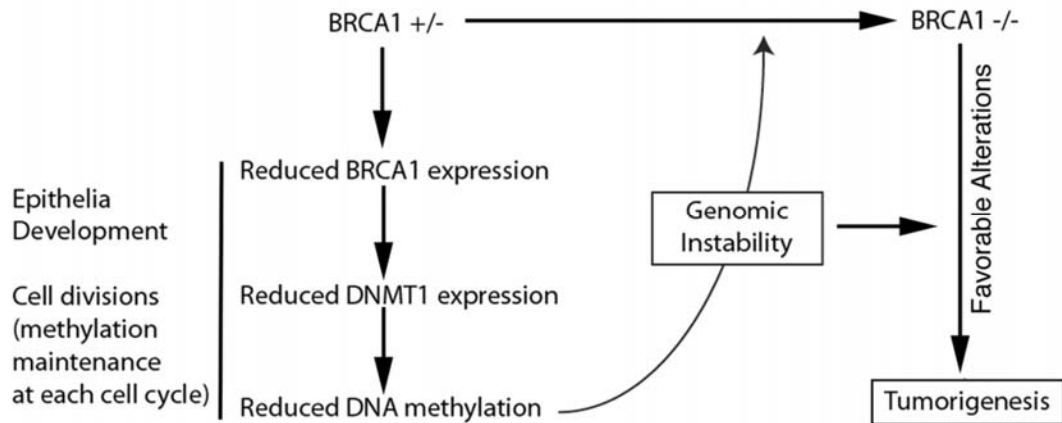


Figure S9 An integrity model for a role of BRCA1 and DNMT1 in genomic stability and tumorigenesis. Women with only one remaining BRCA1 allele are at risk of reduced DNMT1 levels and subsequent higher genomic instability. In the long term, this instability increases the chances to lose the second functional BRCA1 allele, and enrich further genetic alterations, or epigenetic modification that facilitate breast or ovarian tumorigenesis.

Supplementary Table S1 Primer information used in this study.

ChIP assay primers for human DNMT1 promoter

Position	Forward	Reverse
Human DNMT1 ChIP 1F/R (351 - 896)	GGT TTG TGA GAG CCC TTG AG	TCT CCC AGG CTG GAA TGT AG
Human DNMT1 ChIP 2 (877 - 1458)	CTA CAT TCC AGC CTG GGA GA	GTG GAC TGC TTG AGG CTA GG
Human DNMT1 ChIP 3 (1439 - 1970)	CCT AGC CTC AAG CAG TCC AC	AGG GAT CAC AAG CAT GAA CC
Human DNMT1 ChIP 4 (1951 - 2463)	GGT TCA TGC TTG TGA TCC CT	ACC CAG CCC ATT TGC TCA TT
Human DNMT1 ChIP 5 (2440 - 2843)	AAT GAG CAA ATG GGC TGG GT	CTG TTT CTC ATA GCA GCT CC

ChIP assay primers for murine Dnmt1 promoter

Mouse Dnmt1 ChIP 1 (7 - 506)	GGT TGC AGA CGA CAG AAC AG	GAT CCT CTG GCT TTT GCA TT
Mouse Dnmt1 ChIP 2 (576 - 1093)	ATG CCT GCA GTC CCT TAC AC	AAG GGG AGG GGG ATA GAG TT
Mouse Dnmt1 ChIP 3 (1085 - 1593)	CTC CCC TTG CTC ATC TTT TG	GTG CGT GGG TAT GTG ATG TC
Mouse Dnmt1 ChIP 4 (1548 - 2052)	TCT CCC TCT GAC CAT GTG TG	ACT ACC GCT GGG CTC TTC TC
Mouse Dnmt1 ChIP 5 (2094 - 2618)	GCG GAT TTC TGA GTT CAA GG	CAA GAA ACC TGC CCA TCT GT

Oligo sequences for biotinylated Dnmt1 promoter

Biotin Dnmt1:1	[Biotin~5]TGG GCT CGT CCG TGC TGC GAC TGG CGC CAC CCA CCT CCC CCT TGC CTG AAG AGG TGG C	GCC ACC TCT TCA GGC AAG GGG GAG GTG GGT GGC GCC AGT CGA AGC ACG GAC GAG CCC A
Biotin Dnmt1 Mut	[Biotin~5]TGG CAT GCA TGC ATT TGA TTC CAG CAC TCA GGG CAC AAA AGC CAG AGG ATC TC	GAG ATC CTC TGG CTT TTG TGC CCT GAG TGC TGG AAT CAA ATG CAT GCA TGC CA

RT-PCR primers for murine samples

Gene	Forward	Reverse
β -actin	TGG AAT CCT GTG GCA TCC ATG AAA C	TAA AAC GCA GCT CAG TAA CAG TCC G
C-Fos	TGG CCT CCC TGG ATT TGA	TTG CCT TCT CTG ACT GCT CA
C-Myc	TGC GAC GAG GAA GAG AAT TT	GTG GAG AAG TTG CGG TCA AT
Vav1	GTC CTC TTG TGC CAA TTG CT	TAC TTC TCC TCC GTC TGC TG
Ha-Ras	CCA GCT GAT CCA GAA CCA CT	ACA GCA CAC ATT TGC AGC TC
C-Jun	ACG GAC CGT TCT ATG ACT GC	AGT TGC TGA GGT TGG CGT AG
Brcal	CTC AAG AAG CTG GAG ATG AAG G	CAA TAA ACT GCT GGT CTC AGG
Dnmt1	GGC TTC AGT GGC ATG AAC	CTG CAG CCA AGA TGA TGG
Dnmt3a	CCA TTC GAC CTG GTG ATT GG	TGG AGA CGT CTG TGT AGT GG
Dnmt3b	GCG ACA ACC GTC CAT TCT TC	CTC TGG GCA CTG GCT CTG ACC

Real time RT-PCR primers for murine samples

Gene	Forward	Reverse
Brcal	CGT GGG CTA CCG GAA CC	TCT TCA CTG ATC TCA CGA TTC CA
C-Fos	TGG CCT CCC TGG ATT TGA	CCA CGT TGC TGA TGC TCT TG
C-Myc	CTG GAT TTC CTT TGG GCG TT	TGG TGA AGT TCA CGT TGA GGG
Vav1	CCT GTC TGC TCT GTC ATG GA	AAG CGC ATT AGG TCC TCG TA
Ha-Ras	CCA GCT GAT CCA GAA CCA CT	TGG TGT TGT TGA TGG CAA AT
C-Jun	ACG GAC CGT TCT ATG ACT GC	GAC GTG AGA AGG TCC GAG TT
Dnmt1	CCT AGT TCC GTG GCT ACG AGG AGA A	TCT CTC TCC TCT GCA GCC GAC TCA
Dnmt3a	GCC GAA TTG TGT CTT GGT GGA TGA CA	CCT GGT GGA ATG CAC TGC AGA AGG A
Dnmt3b	TTC AGT GAC CAG TCC TCA GAC ACG AA	TCA GAA GGC TGG AGA CCT CCC TCT T

Real time RT-PCR primers for human samples

Gene	Forward	Reverse
BRCA1	CAG CTT GAC ACA GGT TTG GAG	GGC ATG AGT ATT TGT GCC AC
DNMT1	TAC CTG GAC GAC CCT GAC CTC	CGT TGG CAT CAA AGA TGG ACA
DNMT3a	TAT TGA TGA GCG CAC AAG AGA GC	GGG TGT TCC AGG GTA ACA TTG AG
DNMT3b	GGC AAG TTC TCC GAG GTC TCT G	TGG TAC ATG GCT TTT CGA TAG GA

RT-PCR primers for human samples

Gene	Forward	Reverse
BRCA1	CAG CTT GAC ACA GGT TTG GAG	GGC ATG AGT ATT TGT GCC AC
GAPDH	ACA GCC GCA TCT TCT TGT GC	TTT GAT GTT AGA GGG GTC TGC
DNMT1	GGT TCT TCC TCC TGG AGA ATG TC	GTC TGG GCC ACG CCG TAC TG
DNMT3a	GAC GTC CGA AGC GTC ACA CAG	GCC ACC ACA TTC TCA AAG AG
DNMT3b	ACC ACC TGC TGA ATT ACT CAC GC	GAT GGC ATC AAT CAT CAC TGG ATT

Primers for unmethylation murine samples

Gene	Forward	Reverse
Ha-Ras	GCG ACC GGG GTG AGC GTG CAA	AGA GCC TCC ACC CTG CAG CCT
C-Jun	GGG TTG TAA TAG TGT GTT GGG AA	CCC CTC CCC CTC ACA ACA AA
C-Fos	AGG ATG TTT ATA TTA GGA TAT TTG TG	CAA CAA AAA ATC CAA AAA TAA ACA CT
C-Myc	GGT TTT GTT GAT GTT TGG TGG GA	AAA AAA CAC TAT CCC AAA TAA ACA
Vav1	TTT AGT GTA GGT GGA GAA AGA TG	TAA CTA AAA AAC AAC ACC CAA CAC T

Primers for imprinting gene expression

Gene	Forward	Reverse
Dcn	CATACTCAAATAAGGCTTCACCAA	AAAGTTGTCTGTAGTTGTGAACTGA
Peg1	GCTGCCGCGGTCCACAGTGTCG	GTCACCCTTAGAGATGAGGTGGAC
Peg3	ATGTACCATCACGGAGACGACACC	CTCGGCATCCTGGGATCGAGACTC
Cdkn1c	GCCTCAAACCCTTTCACCT	CGTTACGGGTCCTCTGAT
Tapal	GAGGGCTGCACGAGGGGCTGCAC	AGTACACGGAGCTGTTCCGG
Sgce	GGGGTGGCAGAGTGCCGCTTCC	GGCAGCACATGATATAAGCGAG

siRNA oligo sequences

Gene	Oligo Sequence
Control siRNA	5' CUG CGA AGA AAG UGC GCC GUU 3'
BRCA1 siRNA	5' GAGAC AGUAA CUAAG CCAG TT 3' TT CUCUG UCAUU GAUUC GGUC
GFP shRNA	pBS-U6-RNAi(GFP)
Brca1 shRNA (Mixture of 2shRNA from Open Biosystems)	Catalog No. RMM1766-9105788 Catalog No. RMM1766-9106072
Scrambled siRNA	5' GUC ACG AUA AGA CAA UGA UAU 3'
BRCA1 siRNA#1	5' UCA CAG UGU CCU UUA UGU AUU3'
BRCA1 siRNA #2	5' AAU GCC AAA GUA GCA AAU GUA 3'