Supplementary Table I~IV

Table I Extended survival of Brca1 mutant embryos by inactivation of Chk2

Crosses	**$Brca1^{+/\Delta}Chk2^{+/-}$** x **$Brca1^{+/\Delta}Chk2^{+/-}$**		
Total offspring	221		
Genotypes	$Brca1^{\Delta/\Delta}Chk2^{+/+}$	$Brca1^{\Delta/\Delta}Chk2^{+/-}$	$Brca1^{\Delta/\Delta}Chk2^{-/-}$
Predicted number	14	28	14
Observed number	0	9	15

Table II Extended survival of Brca1 mutant embryos by inactivation of Chk1

Crosses	**$Brca1^{+/\Delta}Chk1^{+/-}$** x **$Brca1^{+/\Delta}Chk1^{+/-}$**		
Total offspring	264		
Genotypes	$Brca1^{\Delta/\Delta}Chk1^{+/+}$	$Brca1^{\Delta/\Delta}Chk1^{+/-}$	$Brca1^{\Delta/\Delta}Chk1^{-/-}$
Predicted number	17	33	17
Observed number	2	27[a]	0

a: Died 24 hrs after birth

Table III Aging and tumorigenesis of Brca1$^{\Delta/\Delta}$p53$^{+/-}$ and Brca1$^{\Delta/\Delta}$Chk2$^{-/-}$ mice

Phenotypes	Mice	
	Brca1$^{\Delta/\Delta}$p53$^{+/-}$	Brca1$^{\Delta/\Delta}$Chk2$^{-/-}$
Aging-related changes:[a]		
Decreasing of Skin thickness	75%	<10%
Decreasing of Bone density	70%	<10%
Intestinal villi atrophy	80%	<10%
Tumorigenesis:		
Spectrum	Mammary, Thymus, Spleen, Lung, Liver, Brain, Soft tissue	Mammary, Ovarian, Liver, Thymus
Frequency	High in mammary and thymus	High in mammary and ovarian
Histology	Highly diverse histologic morphology	Less diverse
Cytogenetic	Aneuploid (% high)	Aneuploid (% Low)

a: Histological analysis was performed on 8 months old mice. At 18 months of age 47% males and 12.5% of females of *Brca1$^{\Delta/\Delta}$Chk2$^{-/-}$* mice exhibited premature aging.

Table IV Extended survival of Brca1 mutant embryos by inactivation of ATM

Crosses	**Brca1$^{+/\Delta}$Atm$^{+/-}$** x **Brca1$^{+/\Delta}$Atm$^{+/-}$**		
Total offspring		180	
Genotypes	Brca1$^{\Delta/\Delta}$Atm$^{+/+}$	Brca1$^{\Delta/\Delta}$Atm$^{+/-}$	Brca1$^{\Delta/\Delta}$Atm$^{-/-}$
Predicted number	11	23	11
Observed number	0	17 (3)[a]	10

a: Died 24 hrs after birth