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Supplementary Information for

Oocytes can efficiently repair DNA double strand breaks to restore genetic integrity and protect offspring health.

Jessica M Stringer, Amy Winship, Nadeen Zerafa, Matthew Wakefield and Karla Hutt.

Karla Hutt
Email: karla.hutt@monash.edu

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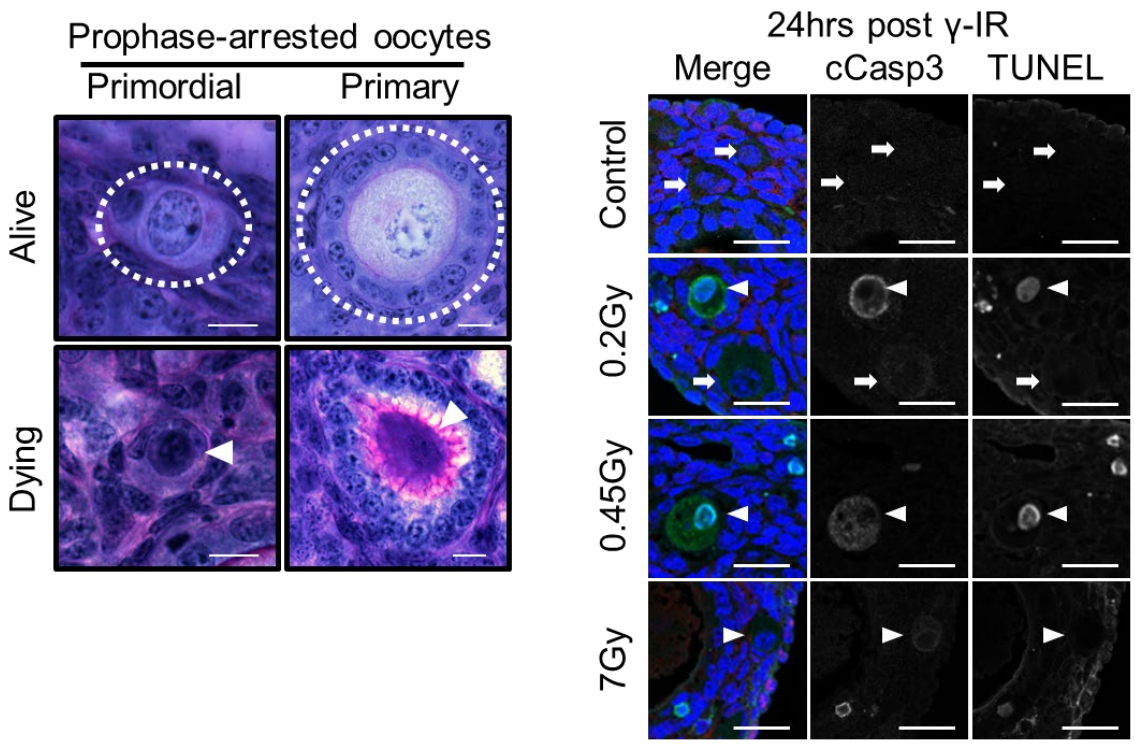

Fig. S1. WT mice (PN10) were exposed to whole body γ-irradiation at 0.1, 0.2, 4.5 or 7 Gy. Prophase-arrested oocytes in primordial and growing follicles were analysed 24 hours later. Follicles were classified as alive or dying based on standard criteria in PAS stained 20 μm thick histological sections, to allow depth in the z-axis and accurate assessment of morphology (A). An example of a morphologically normal primordial and growing follicle is shown (dotted lines). Dying oocytes in primordial follicles were characterised by condensed nuclei, while dying oocytes in growing follicles were of irregular shape or collapsed, typically with intense staining (white arrow heads). Sections were also stained for cleaved capase-3 (green) and TUNEL (cyan) to confirm apoptosis of oocytes (B). DNA is counterstained with DAPI (blue). Representative images are shown. Scale represents 10 μm.

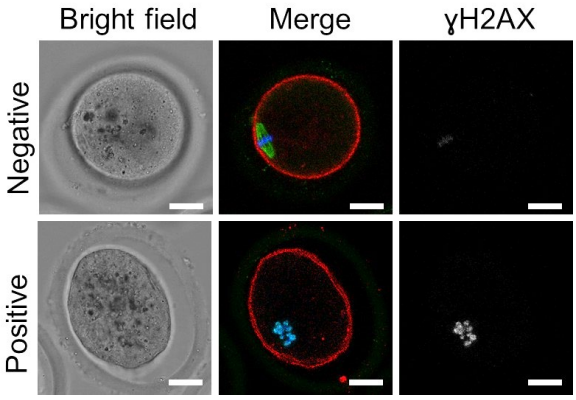

Fig. S2. γH2AX staining in oocytes harvested from the oviduct of γ-irradiated (0.1 and 0.45 Gy) TAp63-/- mice following exogenous hormonal stimulation. Representative images are shown of oocytes stained with f-actin (red) to mark the oolema, αβ-tubulin (green) to label the spindle, DAPI to label the DNA on the metaphase plate, and γH2AX (cyan) to indicate DNA damage. Overall, γH2AX staining was only rarely observed, with 2/107, 1/72 and 1/15, oocytes from un-irradiated controls, 0.1 and 0.45 Gy treated mice, respectively, positively staining for γH2AX.

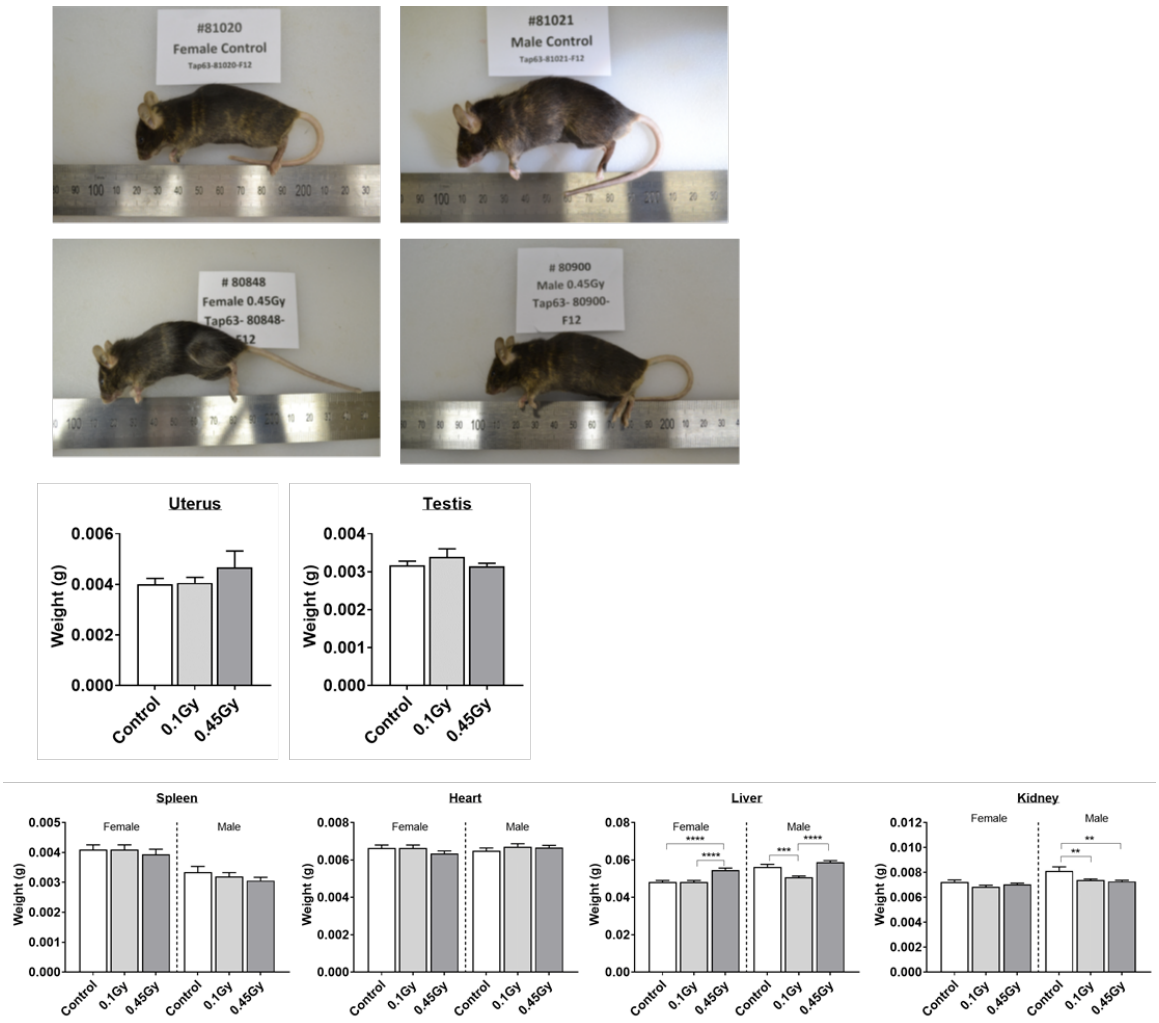

Fig. S3. Female TAp63-/- mice were untreated or exposed to whole body γ-irradiation at PN10. The females were allowed to reach sexual maturity and then mated with untreated C57Bl6 males. All offspring were of normal appearance. Uterus, testis, spleen, heart, liver and kidney weights (corrected for body weight) were determined for offspring 60-65 days of age. All data are expressed as mean +/- SEM and analysed by one-way ANOVA followed by Tukey's post-hoc test. ** p<0.005, ***p<0.0005, ****p<0.0001.

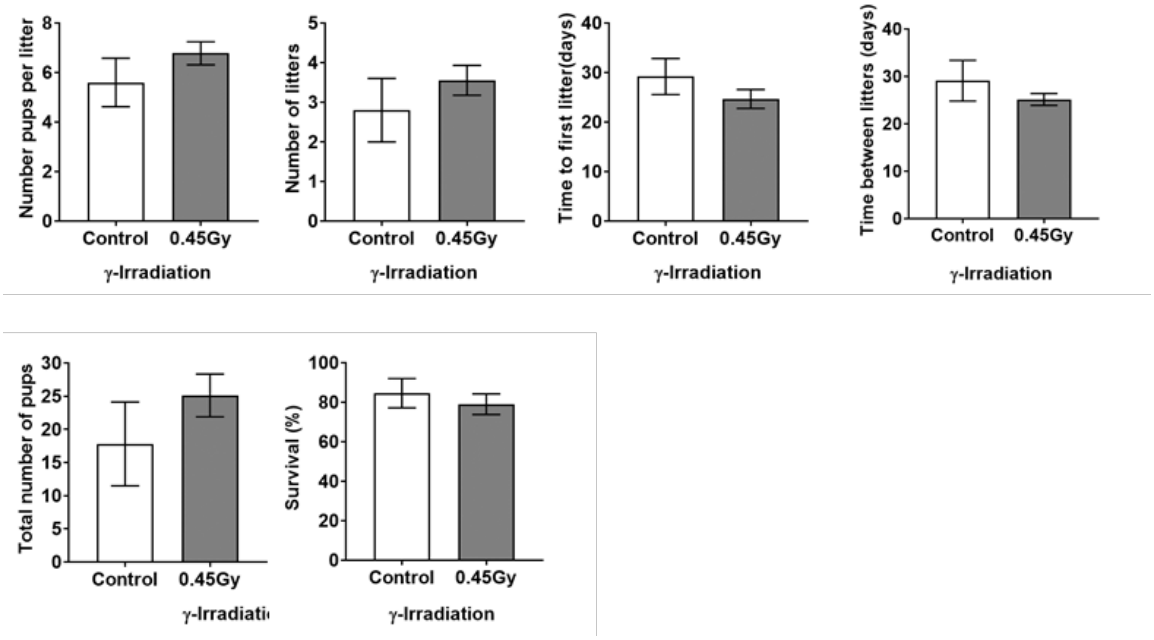

Fig. S4. Female *TAp63*$^{-/-}$ mice were untreated or exposed to whole body γ-irradiation (0.45Gy) at PN10. The females were allowed to reach sexual maturity and then mated with untreated C57Bl6 males for 4 months. The fertility of their offspring (n=5/9 control/irradiated) was subsequently determined once they reached sexual maturity. All data are expressed as mean +/- SEM and analysed t-test. No significant differences observed.

Table S1. Mutations in offspring from control and 0.45 Gy exposed *TAp63*$^{-/-}$ dams

Sample ID	Chr	Start	Ref	Alt	Type
Ctrl-2	chr1	142424013	GA	G	DEL
	chr2	21234564	GTA	G	DEL
	chr2	33285092	AC	A	DEL
	chr3	159031012	ATC	A	DEL
	chr9	95197567	GA	TC	MNV
	chr10	47670088	GC	AG	MNV
	chr13	114878937	CTGGCGACTGTCGAATCAGCTG	C	DEL
	chr16	43342482	GA	G	DEL
Ctrl-4	chr2	44977928	GA	G	DEL
	chr4	137632351	AGT	A	DEL
	chr6	113301851	CAACTTTCCCCTGCTTTCTTAGGAGAATGG	C	DEL
	chr7	63901624	AAGCAGCCGAG	A	DEL
	chr11	12462970	TA	T	DEL
	chr14	74602993	TG	T	DEL
	chr16	50787510	TA	T	DEL
45Gy-1	chr4	143354948	AA	TT	MNV*
	chr10	35338260	TG	T	DEL
	chr19	25515196	GCA	G	DEL
45Gy-2	chr1	192985984	ATCTT	A	DEL
	chr3	125203310	AG	A	DEL
	chr3	153530566	CT	C	DEL
	chr8	128472818	CAGATCTATCA	C	DEL
45Gy-4	chr8	124164289	AG	A	DEL
45Gy-5	chr2	113771324	CT	C	DEL
	chr3	123511384	GCACGGTGGCA	G	DEL*
	chr15	50424849	G	T	SNV
45Gy-6	chr1	44210408	ATAT	A	DEL
	chr1	175733357	TGTTAA	T	DEL*
	chr14	63871659	TTGT	GGGG	MNV
	chr15	38432167	TT	GG	MNV
45Gy-7	chr7	61561029	AA	TT	MNV*
	chr14	101768349	ATGGGAAAGAATT	A	DEL
45Gy-8	chr11	105452979	GGACACCGGCTCTGAGCT	G	DEL
45Gy-9	chr15	21542393	CTGATTCATTTATCACA	C	DEL
	chrX	75759372	TC	AT	MNV
45Gy-10	chr2	22846313	AG	A	DEL
45Gy-11	chr4	25328233	TTAA	T	DEL
	chr13	40021517	ACC	A	DEL*
45Gy-12	chr8	49726705	TA	T	DEL
	chr14	89208425	TG	CT	MNV
	chr15	38303626	CA	C	DEL
45Gy-13	chr1	112547472	TC	T	DEL
	chr2	116100098	TCTCAAAGATCAACGG	T	DEL
	chr4	27931005	TA	T	DEL
	chr14	99600450	TGA	T	DEL*
45Gy-15	chr2	99531568	TAA	T	DEL
45Gy-16	chr18	50065881	AGTACTT	A	DEL
45Gy-17	chr7	29538444	TG	T	DEL*
	chr17	73243897	ACCAC	A	DEL
45Gy-18	chr9	118777509	A	AT	INS
45Gy-19	chr1	178884650	ACAGCCCTAAGCTGT	A	DEL
	chr3	130524636	GA	TT	MNV *
45Gy-20	chr9	105204821	CTG	C	DEL$^{\#}$
	chr13	63416304	TCAC	CAAG	MNV
	chr15	14022182	CAT	C	DEL

*excluded on manual review – PCR duplicates
#frameshift variant impacting Nek11 (ENSMUSG00000035032) Nek11:p.A527X

Table S2. Summary of mutation rates in offspring from control and 0.45 Gy exposed *TAp63*$^{-/-}$ dams

TAp63$^{-/-}$ dams	**# Offspring**	**Total mutations**	**Mutation rate (per base per generation)**
Control (n=2)	2 (female)	15	$5.2 \times 10^{-9} \pm 2.7 \times 10^{-9}$
0.45Gy (n=5)	18 (9 female; 9 male)	32	$1.2 \times 10^{-9} \pm 0.44 \times 10^{-9}$