SUPPLEMENTARY MATERIAL

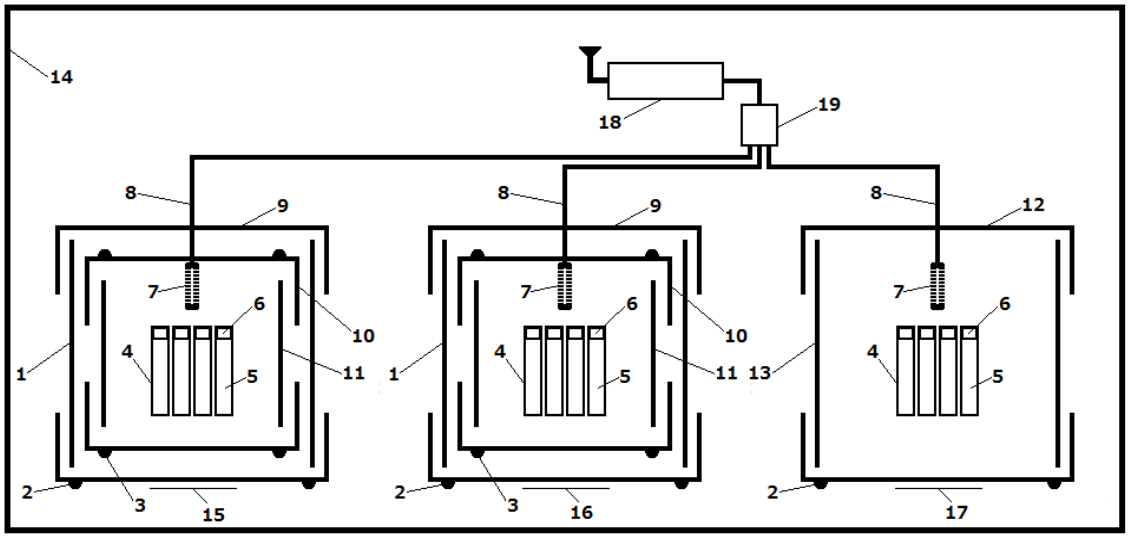

Figure A: Exposure System Diagram (BMF containers; Side View). 1: External Container, 2 & 3: Rubber Separators, 4: *D. melanogaster* Vials & Bottles, 5: *D. melanogaster*, 6: Cotton or Cardboard, 7: Diffuser Stone, 8: Air Hose, 9: External Circular Lid, 10: Internal Circular Lid, 11: Internal Container, 12: Plastic Circular Lid, 13: Cardboard Container, 14: Incubator, 15: μ-Metal Cylindrical Container, 16: Stainless Steel Cylindrical Container, 17: Plastic And Cardboard Cylindrical Container, 18: Air Pump, 19: Air Regulator.

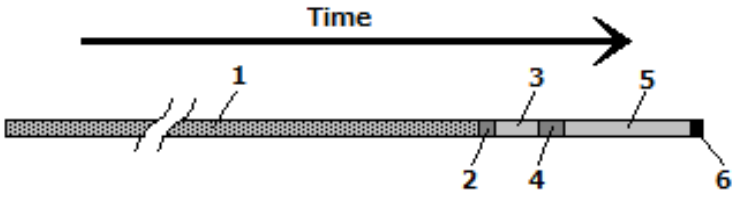

Figure B: Timeline of the *D. melanogaster* exposure to different BMF environments and IR. **1: Stock life**–Flies spent 12 to 18 months inside 177 ml polypropylene bottles that were inside the BMF containers (μ-metal, plastic and cardboard). During this time, the bottles were removed from the BMF containers and put onto the laboratory bench's BMF periodically (every 5-7 days) for only 20 min to renew the cornmeal-agar preparation; **2: Collection**–Adult flies were put in a new 177 ml polypropylene bottle with renewed cornmeal-agar preparation in order to stimulate egg deposition. The cornmeal-agar preparation was sprinkled with yeast to ferment the preparation, making it attractive to flies. After 5 h, adult flies were removed from these new bottles and returned to the old stock bottles, each of these still remaining in its respective BMF container; **3: Feeding stage**–The new bottles with eggs were left inside the different BMF containers for 5 days. This was enough time for larvae to age to feeding 3rd instar stage; **4: Sorting and IR exposure**–The contents of each bottle (cornmeal-agar preparation + *D. melanogaster* larvae) were scooped out and divided among 6 transparent plastic vials. Subsequently, each of the vials was exposed to a different IR doses (0, 20, 40, 60, 80 or 100 Gy). The total time for this step (sorting and IR exposure) took between 34-94 min, depending on the IR dose. During this time, *D. melanogaster* was exposed to the BMF present in the lab bench and in the X-ray generator; **-5: Post-IR exposure**–After IR exposure the vials were again placed in their corresponding BMF container and remained there for 7 days. After 7 days in the BMF containers, larvae should have crawled out of the cornmeal-agar preparation into the walls of the container, encapsulated into a pupal case, undergone metamorphosis, and then emerge from their pupal case into fully matured/viable adults (eclosed; all this under normal environmental conditions); **6: Freezing**–At day 7 the vials were frozen to halt development and allow for storage until the vials could be closely examined for detecting the number of eclosed vs. non-eclosed flies.

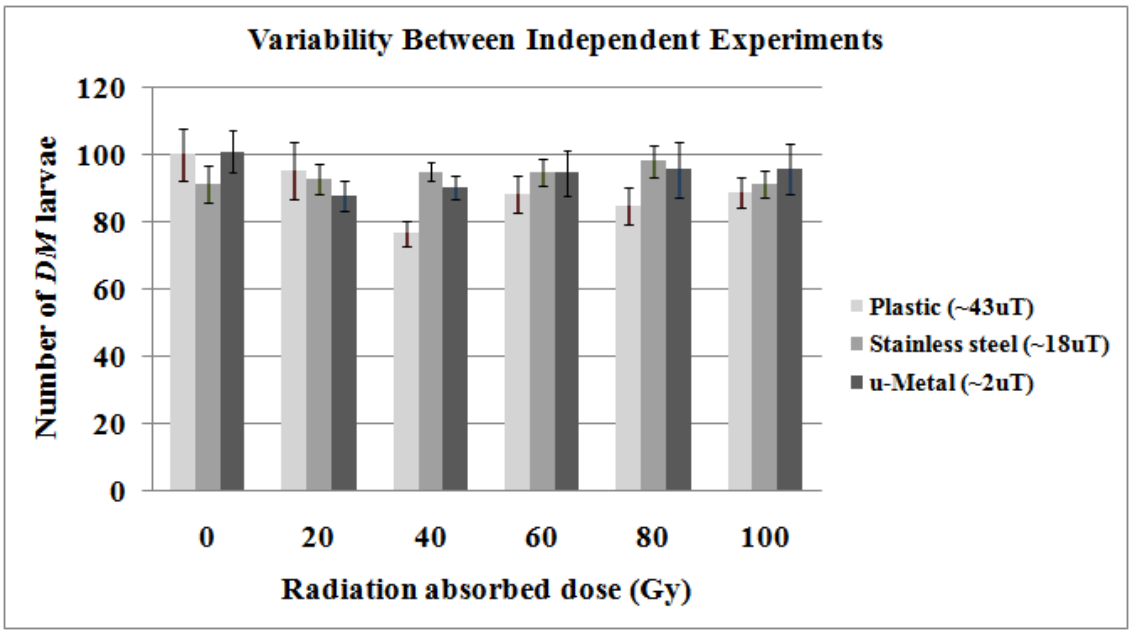

Figure C: Numbers of *D. melanogaster* pupae in each vial were between 50 and 155 pupae. The error bar length represents one standard error.

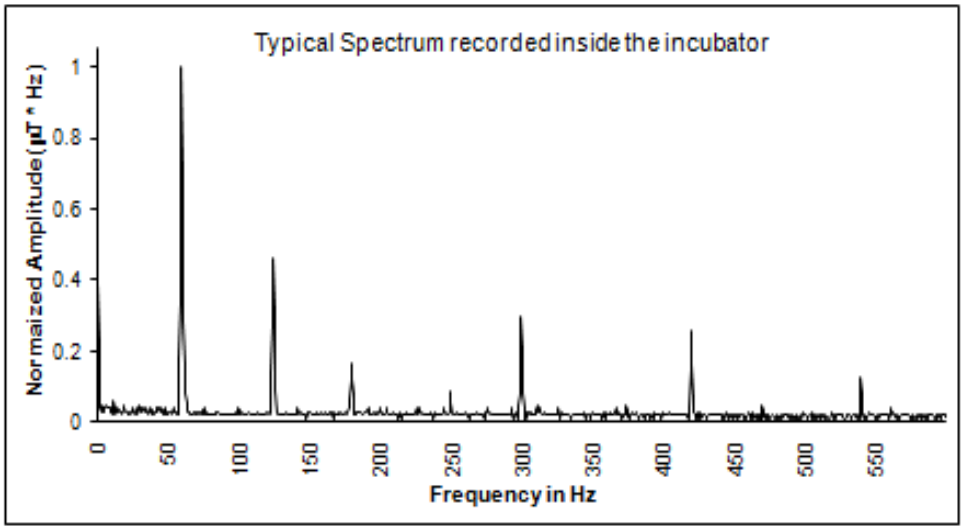

Figure D: Spectrums recorded for the different exposure systems. The incubator and X-ray generator (off) had the same general form: a 60 Hz main frequency and its harmonics. The harmonic amplitudes were always of lower magnitude than that of the 60 Hz. In this representation, the vertical scale is in µT*Hz to facilitate the observation of the harmonics.

Radiation Dose								
mGy/sec	(Rad/sec)	TES	TEM	TER	Rads	Rads (rounded)	Gy	Rads (rounded)
24	2.4	833	13.88	14	1999.2	2000	19.992	20
24	2.4	1667	27.78	28	4000.8	4000	40.008	40
24	2.4	2500	41.67	42	6000	6000	60	60
24	2.4	3333	55.55	56	7999.2	8000	79.992	80
24	2.4	4166	69.43	70	9998.4	10000	99.984	100

Table A: IR dose and calculation of exposure time. TES = Time of exposure (s); TEM = Time of exposure (min); TER = Time of exposure (min)-rounded up.

		SSN		SSP	
		TTT	OVA	TTT	OVA
100 Gy	u-metal & plastic	**1.14E-12**		**7.14E-09**	
	plastic & stainless steel	7.55E-01	**4.10E-05**	7.02E-01	**1.04E-06**
	u-metal & stainless steel	**2.43E-06**		**3.89E-04**	
80 Gy	u-metal & plastic	**7.12E-07**		**2.63E-05**	
	plastic & stainless steel	6.26E-01	**2.11E-03**	1.65E-01	**4.43E-05**
	u-metal & stainless steel	**2.15E-05**		**1.55E-03**	
60 Gy	u-metal & plastic	**6.63E-03**		**2.16E-02**	
	plastic & stainless steel	3.60E-01	**4.98E-02**	8.27E-01	**3.55E-02**
	u-metal & stainless steel	**2.46E-03**		**3.16E-02**	
40 Gy	u-metal & plastic	2.91E-01		**1.04E-02**	
	plastic & stainless steel	3.45E-01	7.20E-01	**2.40E-02**	8.48E-02
	u-metal & stainless steel	7.88E-01		7.17E-01	
20 Gy	u-metal & plastic	5.78E-01		2.68E-01	
	plastic & stainless steel	7.92E-01	7.56E-01	8.79E-01	4.06E-01
	u-metal & stainless steel	6.63E-01		1.83E-01	
0 Gy	u-metal & plastic	7.17E-01		**7.98E-03**	
	plastic & stainless steel	2.23E-01	4.86E-01	1.15E-02	**1.19E-02**
	u-metal & stainless steel	2.93E-01		6.63E-01	

Table B: Two-tailed t-test results for 80 and 100 Gy. Asterisk (*) denotes significance (p-value < 0.01). The difference between the μ-metal container (1.70 μT) and the rest of the containers tested was statistically significant. SSN = Statistical analysis on raw survival numbers (p-value); SSP = Statistical analysis on raw survival percentages (p-value); TTT = Two-tailed t-test; OWA = One-way ANOVA.

Environment Tested	CPM
u-metal	<50
stainless steel	<50
plastic	<50
room/lab bench	<50

Table C: Background/ambient IR measurements

keV	nickel	Iron	Chromium	Difference between nickel and iron (percentage)	Difference between nickel and iron (percentage)
	cm2/g	cm2/g	cm2/g		
100	4.44E-01	3.72E-01	3.17E-01	17.40%	19.45%
150	2.21E-01	1.96E-01	1.79E-01	9.84%	12.42%
200	1.58E-01	1.46E-01	1.38E-01	5.95%	8.36%
300	1.15E-01	1.10E-01	1.07E-01	3.00%	5.00%
400	9.77E-02	9.40E-02	9.21E-02	2.03%	3.88%
500	8.70E-02	8.41E-02	8.28E-02	1.61%	3.38%
600	7.94E-02	7.70E-02	7.60E-02	1.40%	3.12%
800	6.89E-02	6.70E-02	6.62E-02	1.19%	2.87%
1000	6.16E-02	6.00E-02	5.93E-02	1.10%	2.75%
1250	5.49E-02	5.35E-02	5.30E-02	1.04%	2.69%
1500	5.02E-02	4.88E-02	4.83E-02	1.06%	2.70%
2000	4.39E-02	4.27E-02	4.21E-02	1.23%	2.86%
3000	3.75E-02	3.62E-02	3.56E-02	1.74%	3.42%
4000	3.44E-02	3.31E-02	3.24E-02	2.38%	3.99%
5000	3.29E-02	3.15E-02	3.06E-02	2.91%	4.55%
6000	3.21E-02	3.06E-02	2.96E-02	3.42%	5.00%
8000	3.16E-02	2.99E-02	2.87E-02	4.25%	5.78%
10000	3.19E-02	2.99E-02	2.86E-02	4.87%	6.38%
15000	3.32E-02	3.09E-02	2.92E-02	5.89%	7.37%
20000	3.48E-02	3.22E-02	3.03E-02	6.54%	7.82%

Table D: Mass attenuation coefficients for elements forming the containers, obtained from http://physics.nist.gov/PhysRefData/XrayMassCoef/tab3.html

u-Metal											
Gy	#	SD	SE	COV	Mean of surviving flies	SD	SE	COV	Percentage of Survival	SD	SE
0	100.90	19.29	6.10	19.12%	96.4	17.31	5.47	17.96%	95.54	2.01	0.64
20	87.70	13.64	4.31	15.55%	81.3	13.32	4.21	16.38%	92.70	1.15	0.36
40	90.30	11.40	3.61	12.63%	70.6	8.86	2.80	12.55%	78.18	5.24	1.66
60	94.50	21.16	6.69	22.39%	49.2	8.72	2.76	17.71%	52.06	10.97	3.47
80	95.50	25.92	8.20	27.14%	31.9	9.01	2.85	28.25%	33.40	9.33	2.95
100	95.60	23.86	7.54	24.96%	15.5	4.09	1.29	26.38%	16.21	4.33	1.37

Plastic											
Gy	#	SD	SE	COV	Mean of surviving flies	SD	SE	COV	Percentage of Survival	SD	SE
0	100.00	25.13	7.95	25.13%	97.9	24.53	7.76	25.06%	97.90	0.83	0.26
20	95.10	26.46	8.37	27.82%	87.3	25.18	7.96	28.84%	91.80	2.21	0.70
40	76.50	10.60	3.75	13.86%	77.4	9.09	3.21	11.74%	83.95	2.48	0.88
60	88.20	16.81	5.32	19.06%	56.7	9.68	3.06	17.08%	64.29	10.05	3.18
80	84.70	17.95	5.68	21.19%	49.6	11.45	3.62	23.09%	58.56	10.16	3.21
100	88.70	14.36	4.54	16.19%	37.4	7.95	2.51	21.25%	42.16	6.02	1.90

Stainless steel											
Gy	#	SD	SE	COV	Mean of surviving flies	SD	SE	COV	Percentage of Survival	SD	SE
0	91.20	17.20	5.44	18.86%	87.8	17.30	5.47	19.70%	96.27	1.76	0.56
20	92.90	14.11	4.46	15.18%	85	12.62	3.99	14.85%	91.50	2.10	0.66
40	94.80	8.40	2.66	8.86%	73	6.51	2.06	8.92%	77.00	7.59	2.40
60	94.80	12.22	3.86	12.89%	63.1	16.20	5.12	25.68%	66.56	13.77	4.36
80	98.00	15.56	4.92	15.87%	51.7	15.56	4.92	30.09%	52.76	11.38	3.60
100	91.20	12.53	3.96	13.74%	37.3	15.42	4.88	41.34%	40.90	13.99	4.42

Table E: Variability in the data. # = Mean of total (total # of flies in vial (dead (non-eclosed) + alive (eclosed))).

EXPERIMENT #		1		2		3		4		5		6		7		8		9		10	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
100 Gy	mu metal	9	6.34	17	21.11	21	20.39	10	18.52	18	18.56	14	18.42	19	15.04	16	14.81	12	15.38	19	20.00
	plastic	32	33.33	34	51.19	29	37.18	37	34.58	48	48.48	29	43.94	43	39.08	52	46.85	38	45.24	32	42.67
	stainless	19	20.21	22	50.96	17	23.94	30	30.61	65	57.52	40	53.33	53	24.72	44	51.16	43	45.74	40	45.45
80 Gy	mu metal	16	10.60	39	34.57	42	45.16	24	35.29	42	38.89	24	34.29	28	32.50	41	39.42	31	40.79	32	38.10
	plastic	44	46.32	45	70.13	48	44.86	49	52.69	75	71.43	31	64.58	54	48.91	58	67.44	49	64.47	43	63.24
	stainless	40	37.04	38	65.31	29	43.94	42	41.18	79	65.29	70	62.50	64	38.38	52	61.90	49	55.68	54	52.94
60 Gy	mu metal	46	32.86	44	75.95	41	56.94	36	48.00	65	55.08	51	51.52	60	44.90	53	57.61	51	54.84	45	56.96
	plastic	43	48.31	66	74.14	65	59.09	52	51.49	68	74.73	54	79.41	43	64.08	65	69.15	49	68.06	62	64.58
	stainless	39	39.00	66	75.25	52	68.42	40	45.45	91	77.78	61	79.22	76	68.75	74	77.89	70	67.96	62	65.26
40 Gy	mu metal	64	66.67	67	82.35	57	83.82	66	78.57	88	79.28	66	78.57	70	72.04	80	81.63	72	81.82	76	79.17
	plastic	144	75.39	82	81.82	91	86.67	64	82.05	78	82.98	67	88.16	18	83.67	69	82.14	80	85.11	81	81.00
	stainless	58	69.05	72	83.16	69	66.99	75	68.81	74	88.10	78	86.67	79	72.73	80	80.00	76	78.35	69	79.31
20 Gy	mu metal	83	92.22	70	92.31	80	93.02	60	92.31	109	94.78	73	93.59	84	90.91	81	91.01	79	92.94	94	93.07
	plastic	146	94.19	110	89.77	79	88.76	81	88.04	73	94.81	51	92.73	79	91.67	88	92.63	85	92.39	81	92.05
	stainless	57	91.94	96	93.33	72	90.00	98	88.29	89	88.12	82	93.18	84	92.31	93	93.94	95	93.14	84	91.30
0 Gy	mu metal	124	91.18	101	97.89	76	96.20	67	95.71	117	97.50	86	96.63	93	93.52	105	95.45	100	97.09	95	95.96
	plastic	150	98.04	108	97.47	119	96.75	95	97.94	87	98.86	60	96.77	77	97.30	101	98.06	96	98.97	86	98.85
	stainless	102	94.44	76	96.59	50	92.59	94	94.95	102	97.14	91	96.81	85	96.20	74	96.10	108	99.08	96	96.97

Table F: Raw data. # = Number of flies that survived (eclosed); % = Percentage of flies that survived (eclosed), with respect to total number of flies in each vial (eclosed + non-eclosed).