

Table S1: Deleterious missense *RAD50* variants with CADD score ≥ 25

Chr5 (hg19)	Mutation (DNA) ^a	CADD 1.4	Exon	Protein change	FH+ cases (n=2088)	Sporadic cases (n=2148)	Controls (n=2342)	gnomAD ^b		
								East Asian (n=19954)	European (n=129034)	All (n=282716)
131911608	c.T353C	27.7	3	p.I118T	0	0	2 (8.5×10^{-4})	17 (9.3×10^{-4})	0	17 (6.0×10^{-5})
131931472	c.G2177A	25.8	13	p.R726H	1 (4.8×10^{-4})	0	0	0	15 (1.2×10^{-4})	30 (1.1×10^{-4})
131939071	c.C2287T	25.2	14	p.R763C	1 (4.8×10^{-4})	0	0	0	1 (8.8×10^{-6})	2 (7.0×10^{-6})
131976391	c.G3646T	32	24	p.A1216S	0	1 (4.7×10^{-4})	0	Not reported	Not Reported	Not Reported
131976461	c.G3716A	34	24	p.R1239Q	1 (4.8×10^{-4})	0	0	1 (5.4×10^{-5})	0	7 (2.5×10^{-5})
131977907	c.C3790T	30	25	p.L1264F	4 (1.9×10^{-3})	4 (1.9×10^{-3})	3 (1.3×10^{-3})	80 (4.0×10^{-3})	0	81 (2.9×10^{-4})

n is the number of alleles.

Table S2: The IC₅₀ of various genotoxic compounds in U2OS overexpressing vector alone (VA), *RAD50*^{WT}, *RAD50*^{Q672X} and *RAD50*^{L1264F}.

	IC ₅₀			
	VA	WT	L1264F	Q672X
Cisplatin (nM)	125.6 (117.0-134.8)	115.4 (108.9-122.4)	116.2 (105.2-130.5)	115.5 (106.5-125.4)
Olaparib(nM)	100.2 (98.1-103.6)	105.2 (103.2-108.6)	103.8 (99.8-107.9)	100.1 (95.2-104.7)
AZD7762 (nM)	64.53 (55.47-75.07)	66.49 (51.86-85.26)	40.72 (37.8-44.2)	28.91 (26.01-32.13)
Formaldehyde(uM)	107.6 (105.1-110.2)	113.1 (103.0-124.2)	80.12 (73.47-87.37)	76.47 (68.03- 85.96)