

**Supplementary Table 1. Primer sequences and PCR conditions for the mutation analysis**

Name	Sequence	MgCl <sub>2</sub> (mM)	Annealing temperature	Extension time	PCR cycles
Egfr_Forward	5'-GAACCAAGGGAGTTTGTGGA-3'	2.0	60°C	60 s	38
Egfr_Reverse	5'-TGGACCCAAAGGTCATCAGT-3'				
Kras_Forward	5'-AGGCCTGCTGAAAATGACTG-3'	2.5	60°C	20 s	36
Kras_Reverse	5'-TGCTGAGGTCTCAATGAACG-3'				
Braf_Forward	5'-ACTCTACTGGGCCCCAAATC-3'	1.5	60°C	60 s	38
Braf_Reverse	5'-TTTGAGGCACTCTGCCATTA-3'				
Trp53_Forward	5'-AGTTCTCTAGCTTCAGTTCATTGGGACCAT-3'	1.5	60°C	60 s	38
Trp53_Reverse	5'-CCAGCAGAGACCTGACAACCTAT-3'				
Cdkn2b_Forward	5'-CAGGCTGTAGCAATCTCACG-3'	1.0	60°C	30 s	38
Cdkn2b_Reverse	5'-GCTGGGGAGAAAGAAGTCCT-3'				

**Supplementary Table 2. *Braf*, *Kras* and *Egfr* mutations in radiation-induced lung adenocarcinomas**

Group	Sample no.	Dose (Gy)	Pathological type	Mutation	DNA	Exon	Amino acid change
Spontaneous	1	0	Papillary				
	2	0	Papillary	<i>Braf</i> (Val>Glu (637))	c.1910T>A	18	p. Val637Glu
	3	0	Papillary	<i>Kras</i> (Gly>Val (12)) with amplification	c.35G>T	2	p. Gly12Val
	4	0	Solid				
	5	0	Papillary				
Gamma-rays	6	0.2	Papillary	<i>Kras</i> (Gly>Asp (12))	c.35G>A	2	p. Gly12Asp
	7	2	Papillary				
	8	4	Papillary				
	9	0.5	Papillary				
	10	1	Papillary>Solid				
	11	0.2	Papillary	<i>Egfr</i> (Gly>Gly (575)) (silent) with deletion	c.1725A>G	15	p. Gly575Gly (silent)
	12	1	Solid	<i>Kras</i> (Gln>His (61)) with amplification	c.183A>C	3	p. Gln61His
Carbon ions	13	2	Papillary	<i>Braf</i> (Val>Glu (637))	c.1910T>A	18	p. Val637Glu
	14	0.5	Papillary	<i>Kras</i> (Gly>Asp (12)) with amplification	c.35G>A	2	p. Gly12Asp
	15	0.2	Papillary				
	16	1	Solid/papillary	<i>Egfr</i> (Ins A, frameshift)	c.2264 Ins A	19	p. Pro755Gln
	17	1	Papillary	<i>Kras</i> (Gln>His (61)) with amplification	c.183A>C	3	p. Gln61His
	18	1	Solid				
Neutrons	19	0.5	Papillary				
	20	0.2	Papillary	<i>Kras</i> (Ins A, frameshift) with amplification	c.87 Ins A	2	p. Asp29Lys
	21	2	Papillary				
	22	1	Papillary				
	23	1	Papillary	<i>Kras</i> (Gly>Cys (12))	c.34G>T	2	p. Gly12Cys
	24	1	Papillary				

c, coding DNA; p, protein.