

Supplementary Table 3. Association between meat mutagen intake and colorectal adenoma and cancer risk stratified by UGT1A genotypes for which mutagen-SNP interactions were  $P < 0.05$ .

Mutagen	SNP	Geno type	adenoma						mutagen exposure		cancer							
			low		medium		high		$P_{trend}$	$P_{interact}$	low		medium		high		$P_{trend}$	$P_{interact}$
			Ca/Co	REF	Ca/Co	OR <sup>a</sup> (95% CI)	Ca/Co	OR <sup>a</sup> (95% CI)			Ca/Co	REF	Ca/Co	OR <sup>a</sup> (95% CI)	Ca/Co	OR <sup>a</sup> (95% CI)		
B[a]P	rs1105880	AA	184/221	REF	219/227	1.17 (0.89, 1.53)	110/144	0.95 (0.69, 1.31)	0.47	0.04	56/76	REF	57/62	1.24 (0.75, 2.05)	26/35	0.98 (0.52, 1.83)	0.78	0.86
		AG+GG	283/320	REF	267/342	0.90 (0.71, 1.13)	142/132	1.24 (0.93, 1.66)	0.07		88/95	REF	97/81	1.30 (0.86, 1.96)	40/45	1.02 (0.60, 1.75)		0.86
B[a]P	rs12623271	CC	151/184	REF	173/181	1.17 (0.87, 1.58)	89/123	0.91 (0.75, 1.15)	0.35	0.04	51/66	REF	45/51	1.12 (0.64, 1.94)	19/29	0.83 (0.41, 1.67)	0.52	0.72
		CG+GG	315/357	REF	313/388	0.93 (0.75, 1.15)	163/153	1.25 (0.95, 1.64)	0.06		93/105	REF	109/92	1.34 (0.91, 2.00)	47/51	1.10 (0.66, 1.81)		0.98
B[a]P	rs10168416	CC	198/245	REF	237/250	1.18 (0.91, 1.53)	114/149	0.98 (0.71, 1.34)	0.57	0.07	60/80	REF	70/64	1.47 (0.91, 2.38)	29/40	0.96 (0.53, 1.74)	0.56	0.78
		CG+GG	267/295	REF	249/319	0.87 (0.69, 1.10)	138/127	1.22 (0.91, 1.64)	0.08		84/91	REF	84/78	1.17 (0.76, 1.79)	37/40	1.07 (0.61, 1.86)		0.93
B[a]P	rs6714486	TT	396/480	REF	416/490	1.04 (0.87, 1.26)	218/236	1.15 (0.91, 1.45)	0.25	0.45	129/137	REF	135/114	1.26 (0.89, 1.78)	52/61	0.90 (0.57, 1.42)	0.45	0.06
		TA+AA	55/53	REF	55/68	0.77 (0.46, 1.30)	30/36	0.84 (0.45, 1.57)	0.79		7/18	REF	16/14	2.84 (0.84, 9.62)	12/8	4.21 (1.04, 17.1)		0.10
B[a]P	rs17868299	CC	408/480	REF	419/499	1.00 (0.83, 1.21)	219/237	1.12 (0.89, 1.41)	0.31	0.61	136/147	REF	135/125	1.18 (0.84, 1.66)	54/67	0.92 (0.59, 1.42)	0.52	0.05
		CT + TT	58/61	REF	67/69	1.02 (0.62, 1.67)	33/37	0.93 (0.52, 1.71)	0.79		6/19	REF	17/12	4.67 (1.31, 16.7)	12/8	6.04 (1.39, 24.2)		0.06
PhIP	rs871514	TT	134/165	REF	145/161	1.16 (0.83, 1.61)	66/103	0.83 (0.56, 1.24)	0.26	0.09	55/47	REF	38/48	0.66 (0.36, 1.18)	19/20	0.82 (0.39, 1.75)	0.68	0.63
		TC+CC	338/382	REF	346/396	0.99 (0.79, 1.22)	175/174	1.14 (0.88, 1.49)	0.28		107/115	REF	90/102	0.97 (0.65, 1.44)	52/55	1.04 (0.65, 1.66)		0.86
PhIP	rs28969701	CC	449/512	REF	464/535	1.00 (0.84, 1.21)	238/264	1.05 (0.84, 1.31)	0.64	0.08	149/160	REF	119/145	0.89 (0.64, 1.25)	65/71	0.98 (0.65, 1.48)	0.99	0.38
		CT + TT	24/34	REF	26/24	1.33 (0.59, 3.01)	3/15	0.29 (0.07, 1.17)	0.09		14/4	REF	10/7	0.17 (0.02, 1.29)	7/5	0.21 (0.02, 2.03)		0.43
PhIP	rs2018985	AA	164/202	REF	177/199	1.15 (0.85, 1.55)	75/120	0.82 (0.57, 1.19)	0.21	0.05	60/57	REF	45/58	0.72 (0.42, 1.24)	24/29	0.78 (0.40, 1.51)	0.54	0.48
		AG+GG	309/345	REF	314/359	0.97 (0.77, 1.21)	164/159	1.15 (0.88, 0.52)	0.26		102/107	REF	84/94	0.94 (0.63, 1.43)	48/47	1.09 (0.66, 1.80)		0.70
PhIP	rs10197460	GG	169/197	REF	181/198	1.10 (0.82, 1.49)	75/112	0.82 (0.56, 1.19)	0.24	0.09	64/60	REF	47/62	0.68 (0.40, 1.15)	22/29	0.68 (0.34, 1.34)	0.31	0.43
		GT+TT	283/327	REF	281/329	0.97 (0.77, 1.23)	148/150	1.13 (0.84, 1.50)	0.36		97/93	REF	77/82	0.94 (0.61, 1.44)	46/44	1.05 (0.63, 1.75)		0.82
MeIQx	rs7571337	TT	10/144	REF	137/151	1.38 (0.97, 1.96)	79/70	1.78 (1.16, 2.73)	0.01	0.07	30/43	REF	32/37	1.24 (0.64, 2.42)	20/19	1.49 (0.65, 3.41)	0.36	0.09
		TC+CC	345/403	REF	360/401	1.06 (0.86, 1.30)	176/205	1.02 (0.79, 1.32)	0.9		113/112	REF	116/102	1.15 (0.79, 1.67)	40/57	0.71 (0.43, 1.17)		0.15
DiMeIQx	rs6717546	GG	198/215	REF	192/232	0.91 (0.69, 1.19)	103/97	1.18 (0.84, 1.67)	0.3	0.35	68/75	REF	60/66	1.04 (0.64, 1.70)	35/25	1.53 (0.82, 2.86)	0.16	0.04
		GA+AA	291/335	REF	269/326	0.94 (0.75, 1.19)	151/179	0.97 (0.73, 1.28)	0.86		90/89	REF	72/85	0.83 (0.53, 1.27)	34/50	0.68 (0.39, 1.16)		0.18
Combined nitrate and nitrite	rs12466997	TT	391/481	REF	439/477	1.13 (0.94, 1.38)	234/254	1.15 (0.91, 1.46)	0.31	0.41	117/121	REF	137/145	1.00 (0.70, 1.43)	65/62	1.14 (0.72, 1.80)	0.57	0.08
		CT+CC	43/77	REF	65/57	2.33 (1.34, 4.07)	29/32	1.98 (1.00, 3.94)	0.12		19/28	REF	11/24	0.71 (0.28, 1.83)	13/6	4.58 (1.29, 16.2)		0.03

Note: rs 2011404 did not meet the quality control measured in the adenoma dataset

Meat mutagens classified as low (0-39th percentile), medium (40th-79th percentile), and high  $\geq$ 80th percentile intake

<sup>a</sup> Assuming a dominant model, adjusted for age at selection, sex, ethnicity

<sup>b</sup> SNP located within 10 kb downstream of *TMEM63A*.

<sup>c</sup> SNP located within 10 kb upstream of *LEFTY3*.