

Supplementary Table 1. All metabolism SNPs sorted by position. UGT1A refers to multiple genes in the UGT1A cluster. UGT2 A1/A2 refers to the UGT2A1/UGT2A2 cluster.

RS ID	Chr	Position	Gene	Case/Control Association			CPD	LD Bin
				MAF	P-Value	OR (95% CI)	P-Value	
rs17355419	1	146581676	FMO5	0.26	0.2982	0.92 (0.79 - 1.08)	0.6497	
rs894469	1	146672906	FMO5	0.07	0.7460	1.05 (0.80 - 1.37)	0.5688	
rs1470261	1	146694922	FMO5	0.36	0.5884	0.96 (0.83 - 1.11)	0.9437	1
rs1470262	1	146694981	FMO5	0.36	0.5606	0.96 (0.83 - 1.11)	0.9030	1
rs17356024	1	146695015	FMO5	0.03	0.1000	1.45 (0.93 - 2.26)	0.0878	2
rs17356031	1	146696435	FMO5	0.03	0.0743	1.50 (0.96 - 2.35)	0.0652	2
rs11576360	1	146740576	FMO5	0.13	0.8320	0.98 (0.79 - 1.21)	0.7649	
rs4950415	1	146822702	FMO5	0.24	0.2124	0.90 (0.77 - 1.06)	0.5044	
rs7539416	1	146881586	FMO5	0.09	0.3863	0.90 (0.70 - 1.15)	0.7309	
rs10910879	1	171053153	FMO3	0.18	0.1593	1.14 (0.95 - 1.38)	0.1688	3
rs1736554	1	171058194	FMO3	0.06	0.0839	1.30 (0.97 - 1.74)	0.1876	4
rs17564210	1	171058236	FMO3	0.08	0.6740	0.95 (0.73 - 1.23)	0.1818	
rs3754487	1	171058251	FMO3	0.18	0.1711	1.14 (0.95 - 1.37)	0.1583	3
rs12404183	1	171058946	FMO3	0.07	0.8709	1.02 (0.77 - 1.35)	0.9242	5
rs1736560	1	171059150	FMO3	0.30	0.0307	1.18 (1.02 - 1.38)	0.0668	
rs12404218	1	171059257	FMO3	0.07	0.9894	1.00 (0.76 - 1.32)	0.7764	5
rs3754491	1	171059623	FMO3	0.07	0.8473	1.03 (0.78 - 1.36)	0.9947	5
rs11578281	1	171060104	FMO3	0.01	0.9374	0.97 (0.49 - 1.94)	0.7578	
rs1800822	1	171076935	FMO3	0.06	0.4693	1.11 (0.83 - 1.48)	0.3983	
rs2266782	1	171076966	FMO3	0.41	0.2757	1.08 (0.94 - 1.25)	0.7495	
rs1736557	1	171080080	FMO3	0.07	0.1326	1.23 (0.94 - 1.62)	0.2923	4
rs7061710	1	171080615	FMO3	0.22	0.4236	1.07 (0.90 - 1.27)	0.6629	6
rs909530	1	171083174	FMO3	0.25	0.4698	1.06 (0.90 - 1.25)	0.4988	6
rs2266780	1	171083242	FMO3	0.19	0.5067	1.06 (0.89 - 1.28)	0.7227	6
rs1795240	1	171091875	FMO3	0.47	0.1444	0.90 (0.79 - 1.04)	0.4568	
rs16864096	1	171105794	FMO3	0.25	0.4450	1.07 (0.90 - 1.26)	0.4869	6
rs9663011	1	171112621	FMO3	0.22	0.6269	1.04 (0.88 - 1.23)	0.8952	
rs11812044	1	171115567	FMO3	0.19	0.5517	1.06 (0.88 - 1.27)	0.8039	6
rs6657314	1	171155103	FMO2	0.43	0.6878	1.03 (0.89 - 1.19)	0.6667	7
rs11806072	1	171156997	FMO2	0.42	0.5235	1.05 (0.91 - 1.21)	0.5561	7
rs2020860	1	171162583	FMO2	0.05	0.7507	0.95 (0.68 - 1.31)	0.8312	8
rs7516877	1	171165661	FMO2	0.10	0.3451	0.90 (0.71 - 1.13)	0.3854	9
rs2307492	1	171168545	FMO2	0.10	0.3061	0.89 (0.70 - 1.12)	0.3482	9
rs10798263	1	171170209	FMO2	0.32	0.1325	1.12 (0.97 - 1.31)	0.1588	10

rs2236874	1 171170244 FMO2	0.42	0.4587	1.06 (0.92 - 1.22)	0.4741	7
rs2020863	1 171174531 FMO2	0.10	0.5935	0.94 (0.74 - 1.19)	0.6306	11
rs2020869	1 171178152 FMO2	0.14	0.1385	0.86 (0.71 - 1.05)	0.1746	
rs10912593	1 171188057 FMO2	0.32	0.2469	1.09 (0.94 - 1.27)	0.2068	10
rs2049922	1 171202927 FMO1	0.45	0.7306	1.03 (0.89 - 1.18)	0.6972	7
rs17350523	1 171217445 FMO1	0.39	0.8935	1.01 (0.88 - 1.17)	0.8774	7
rs12720462	1 171217691 FMO1	0.09	0.7833	0.97 (0.75 - 1.24)	0.7449	11
rs4916191	1 171218287 FMO1	0.44	0.9905	1.00 (0.87 - 1.15)	0.7920	7
rs4916192	1 171218366 FMO1	0.45	0.8602	1.01 (0.88 - 1.17)	0.7785	7
rs4480395	1 171218955 FMO1	0.38	0.7164	1.03 (0.89 - 1.18)	0.7711	7
rs6689616	1 171219803 FMO1	0.05	0.6087	0.92 (0.68 - 1.26)	0.9904	8
rs4073692	1 171221917 FMO1	0.17	0.9054	1.01 (0.84 - 1.22)	0.9051	
rs16864245	1 171222380 FMO1	0.06	0.6362	0.93 (0.68 - 1.27)	0.6233	8
rs4916273	1 171223134 FMO1	0.09	0.2441	0.86 (0.66 - 1.11)	0.5900	
rs12567338	1 171223747 FMO1	0.24	0.3128	1.09 (0.92 - 1.28)	0.6461	
rs4433435	1 171223951 FMO1	0.40	0.0094	0.83 (0.72 - 0.95)	0.0288	
rs10798294	1 171224087 FMO1	0.30	0.0875	0.88 (0.75 - 1.02)	0.2279	
rs10912675	1 171227216 FMO1	0.28	0.0065	0.80 (0.68 - 0.94)	0.0578	12
rs10912698	1 171238786 FMO1	0.13	0.2037	0.87 (0.71 - 1.08)	0.6052	13
rs742350	1 171250044 FMO1	0.14	0.0019	0.72 (0.58 - 0.88)	0.0083	14
rs12049309	1 171252013 FMO1	0.11	0.3247	0.89 (0.71 - 1.12)	0.4325	
rs1126692	1 171252287 FMO1	0.14	0.0014	0.71 (0.58 - 0.88)	0.0065	14
rs12954	1 171254794 FMO1	0.14	0.2123	0.88 (0.71 - 1.08)	0.4601	13
rs7877	1 171254890 FMO1	0.28	0.0011	0.77 (0.65 - 0.90)	0.0128	12
rs16864387	1 171283843 FMO4	0.14	0.0013	0.71 (0.58 - 0.88)	0.0070	14
rs3820170	1 171303925 FMO4	0.42	0.0786	0.88 (0.76 - 1.02)	0.7064	
rs12737633	1 171309619 FMO4	0.31	0.2349	0.91 (0.79 - 1.06)	0.9520	15
rs1042772	1 171311003 FMO4	0.47	0.0938	0.89 (0.77 - 1.02)	0.8090	16
rs1018390	1 171336342 FMO4	0.46	0.0890	0.88 (0.77 - 1.02)	0.9500	16
rs1018392	1 171353864 FMO4	0.33	0.4754	0.95 (0.82 - 1.10)	0.6322	15
rs2602363	2 234520525 UGT1A	0.29	0.3457	0.93 (0.80 - 1.08)	0.2846	17
rs13400017	2 234529391 UGT1A	0.25	0.6885	0.97 (0.83 - 1.14)	0.8323	18
rs2741034	2 234548814 UGT1A	0.29	0.3137	0.92 (0.79 - 1.08)	0.2570	17
rs12327959	2 234556326 UGT1A	0.25	0.8482	0.98 (0.84 - 1.16)	0.9608	18
rs2248733	2 234564737 UGT1A	0.16	0.3968	1.09 (0.90 - 1.32)	0.9950	
rs1453322	2 234565438 UGT1A	0.25	0.7820	0.98 (0.83 - 1.15)	0.9026	18
rs13418420	2 234578762 UGT1A	0.25	0.5389	0.95 (0.81 - 1.12)	0.5707	18
rs10176426	2 234579915 UGT1A	0.11	0.4212	0.91 (0.73 - 1.14)	0.4679	
rs2741045	2 234580140 UGT1A	0.29	0.2891	0.92 (0.79 - 1.07)	0.3026	19
rs6714486	2 234580305 UGT1A	0.06	0.1973	1.23 (0.90 - 1.67)	0.2443	20
rs4663871	2 234581587 UGT1A	0.22	0.2289	1.11 (0.94 - 1.32)	0.8251	21
rs2602377	2 234582212 UGT1A	0.38	0.4441	0.94 (0.82 - 1.09)	0.7536	22

rs12053462	2	234587639	UGT1A	0.22	0.2488	1.11	(0.93 - 1.31)	0.8607	21
rs6736743	2	234595950	UGT1A	0.40	0.7933	0.98	(0.85 - 1.13)	0.6077	23
rs4485562	2	234597566	UGT1A	0.22	0.1664	1.13	(0.95 - 1.34)	0.7524	21
rs6707947	2	234597915	UGT1A	0.38	0.4886	0.95	(0.82 - 1.10)	0.7839	22
rs6759892	2	234601669	UGT1A	0.40	0.7748	0.98	(0.85 - 1.13)	0.6474	23
rs1105880	2	234601965	UGT1A	0.34	0.3189	0.93	(0.80 - 1.07)	0.2730	19
rs2070959	2	234602191	UGT1A	0.32	0.2263	0.91	(0.78 - 1.06)	0.1938	19
rs1105879	2	234602202	UGT1A	0.34	0.2398	0.92	(0.79 - 1.06)	0.1908	19
rs7592624	2	234602906	UGT1A	0.44	0.9210	0.99	(0.86 - 1.15)	0.4107	
rs6751673	2	234604903	UGT1A	0.31	0.0791	1.14	(0.98 - 1.33)	0.4214	
rs7572563	2	234617236	UGT1A	0.47	0.9158	1.01	(0.88 - 1.16)	0.4836	24
rs4233633	2	234619937	UGT1A	0.12	0.7724	1.03	(0.84 - 1.27)	0.4743	
rs17862867	2	234622310	UGT1A	0.09	0.7042	1.05	(0.82 - 1.34)	0.8207	25
rs4663945	2	234623117	UGT1A	0.08	0.5169	1.08	(0.85 - 1.38)	0.6769	25
rs1875263	2	234625622	UGT1A	0.36	0.8554	1.01	(0.87 - 1.18)	0.5399	23
rs869283	2	234626287	UGT1A	0.38	0.7036	0.97	(0.84 - 1.12)	0.3784	23
rs3732218	2	234627304	UGT1A	0.08	0.8408	1.03	(0.80 - 1.31)	0.9828	25
rs6755571	2	234627536	UGT1A	0.06	0.1313	1.27	(0.93 - 1.75)	0.1925	20
rs2011404	2	234627937	UGT1A	0.18	0.9543	0.99	(0.83 - 1.20)	0.1720	
rs871514	2	234628529	UGT1A	0.44	0.5066	0.95	(0.83 - 1.10)	0.1744	24
rs904855	2	234628576	UGT1A	0.05	0.6230	1.08	(0.80 - 1.47)	0.9746	26
rs904856	2	234628647	UGT1A	0.05	0.9305	1.01	(0.73 - 1.41)	0.7540	26
rs6715325	2	234635241	UGT1A	0.41	0.8130	0.98	(0.85 - 1.13)	0.2711	24
rs4663969	2	234655313	UGT1A	0.41	0.8300	0.98	(0.85 - 1.14)	0.2306	24
rs7556676	2	234658250	UGT1A	0.41	0.9206	0.99	(0.86 - 1.15)	0.2736	24
rs2221198	2	234658623	UGT1A	0.41	0.8009	0.98	(0.85 - 1.13)	0.2044	24
rs2003569	2	234667937	UGT1A	0.11	0.0643	1.23	(0.99 - 1.54)	0.1415	
rs887829	2	234668570	UGT1A	0.32	0.0764	0.87	(0.75 - 1.01)	0.0198	
rs2302538	2	234676413	UGT1A	0.13	0.1868	1.16	(0.93 - 1.44)	0.2207	
rs4148328	2	234677659	UGT1A	0.37	0.6943	1.03	(0.89 - 1.19)	0.6956	
rs11563251	2	234679384	UGT1A	0.11	0.2412	1.15	(0.91 - 1.44)	0.4628	
rs1042640	2	234681544	UGT1A	0.20	0.3268	0.92	(0.77 - 1.09)	0.6905	27
rs8330	2	234681645	UGT1A	0.23	0.6094	0.96	(0.81 - 1.13)	0.8475	27
rs1319289	4	69631668	UGT2B10	0.13	0.7655	0.97	(0.79 - 1.19)	0.8821	28
rs12645539	4	69640718	UGT2B10	0.23	0.1920	0.90	(0.76 - 1.06)	0.2536	
rs11726322	4	69691521	UGT2B10	0.12	0.0977	0.83	(0.67 - 1.03)	0.1287	29
rs4694358	4	69696648	UGT2B10	0.12	0.7501	0.97	(0.79 - 1.19)	0.8530	28
rs11737566	4	69701067	UGT2B10	0.12	0.0977	0.83	(0.67 - 1.03)	0.1287	29
rs6843220	4	69706273	UGT2B10	0.12	0.0977	0.83	(0.67 - 1.03)	0.1287	29
rs6836520	4	69710615	UGT2B10	0.09	0.1696	0.84	(0.66 - 1.08)	0.1555	30
rs1841046	4	69717920	UGT2B10	0.13	0.7233	0.96	(0.79 - 1.18)	0.8345	28
rs6600855	4	69725006	UGT2B10	0.09	0.1939	0.85	(0.66 - 1.09)	0.2356	30

rs7665996	4	69731469	UGT2B10	0.09	0.1939	0.85	(0.66 - 1.09)	0.2356	30
rs11726946	4	69737036	UGT2B10	0.12	0.1281	0.84	(0.68 - 1.05)	0.2112	29
rs17146967	4	69756897	UGT2B10	0.12	0.6821	0.96	(0.78 - 1.18)	0.8239	28
rs6851328	4	69763587	UGT2B10	0.12	0.1178	0.84	(0.67 - 1.05)	0.1978	29
rs6827243	4	69763910	UGT2B10	0.12	0.1178	0.84	(0.67 - 1.05)	0.1978	29
rs7682207	4	69771283	UGT2A3	0.13	0.0432	0.80	(0.64 - 0.99)	0.1146	29
rs12651295	4	69771935	UGT2A3	0.13	0.0390	0.80	(0.64 - 0.99)	0.0981	29
rs6847539	4	69772694	UGT2A3	0.14	0.4260	0.92	(0.76 - 1.13)	0.5062	28
rs13128843	4	69789855	UGT2A3	0.15	0.2425	0.89	(0.74 - 1.08)	0.4617	28
rs17147016	4	69795226	UGT2A3	0.19	0.8401	0.98	(0.82 - 1.17)	0.9398	
rs1458246	4	69818082	UGT2A3	0.15	0.2748	0.90	(0.74 - 1.09)	0.4902	28
rs11931604	4	69928547	UGT2B7	0.14	0.6140	0.95	(0.78 - 1.16)	0.7589	28
rs12506592	4	69956736	UGT2B7	0.14	0.7102	0.96	(0.79 - 1.17)	0.7848	28
rs4554144	4	69960555	UGT2B7	0.48	0.7696	1.02	(0.89 - 1.17)	0.7615	31
rs11940316	4	69961127	UGT2B7	0.46	0.5910	1.04	(0.90 - 1.20)	0.5595	31
rs7438135	4	69961339	UGT2B7	0.46	0.5920	1.04	(0.90 - 1.20)	0.5563	31
rs7662029	4	69961912	UGT2B7	0.46	0.5917	1.04	(0.90 - 1.20)	0.5562	31
rs1131878	4	70345904	UGT2B4	0.31	0.7241	1.03	(0.88 - 1.20)	0.8083	
rs10518061	4	70359160	UGT2B4	0.25	0.0897	1.15	(0.98 - 1.36)	0.4855	
rs2642872	4	70367212	UGT2B4	0.19	0.8970	0.99	(0.82 - 1.18)	0.7746	32
rs11732823	4	70403615	UGT2B4	0.19	0.8820	0.99	(0.82 - 1.18)	0.7940	32
rs17672601	4	70407499	UGT2B4	0.19	0.8387	0.98	(0.82 - 1.18)	0.8336	32
rs17147416	4	70438392	UGT2 A1/A2	0.18	0.6057	0.95	(0.79 - 1.15)	0.9408	33
rs13145826	4	70443405	UGT2 A1/A2	0.20	0.0759	0.85	(0.71 - 1.02)	0.2880	34
rs10004047	4	70445500	UGT2 A1/A2	0.40	0.5224	1.05	(0.91 - 1.21)	0.2881	35
rs6843815	4	70448870	UGT2 A1/A2	0.22	0.3220	1.09	(0.92 - 1.28)	0.3616	36
rs1432317	4	70450981	UGT2 A1/A2	0.40	0.5485	1.05	(0.90 - 1.21)	0.3286	35
rs2288741	4	70455478	UGT2 A1/A2	0.22	0.3483	1.08	(0.92 - 1.28)	0.3821	36
rs2288740	4	70455579	UGT2 A1/A2	0.40	0.2482	1.09	(0.94 - 1.26)	0.9251	37
rs1432324	4	70458182	UGT2 A1/A2	0.40	0.3434	1.07	(0.93 - 1.24)	0.9352	37
rs4148304	4	70460328	UGT2 A1/A2	0.18	0.6994	0.96	(0.80 - 1.16)	0.8908	33
rs4148301	4	70462042	UGT2 A1/A2	0.09	0.6537	0.94	(0.74 - 1.21)	0.6774	
rs1319811	4	70462893	UGT2 A1/A2	0.40	0.6243	1.04	(0.90 - 1.20)	0.3501	35
rs1432314	4	70463663	UGT2 A1/A2	0.15	0.6486	1.05	(0.86 - 1.27)	0.3239	
rs3775783	4	70463854	UGT2 A1/A2	0.20	0.0362	0.82	(0.69 - 0.99)	0.1889	34
rs17617467	4	70463872	UGT2 A1/A2	0.25	0.3276	1.09	(0.92 - 1.28)	0.556	
rs4401516	4	70476723	UGT2 A1/A2	0.38	0.0552	0.86	(0.74 - 1.00)	0.3663	
rs7670819	4	70481880	UGT2 A1/A2	0.44	0.2724	1.08	(0.94 - 1.25)	0.3546	
rs11249452	4	70488360	UGT2 A1/A2	0.34	0.2239	0.91	(0.78 - 1.06)	0.1578	38
rs11249453	4	70488786	UGT2 A1/A2	0.30	0.4251	0.94	(0.80 - 1.10)	0.2311	38
rs10903210	4	70488849	UGT2 A1/A2	0.34	0.2239	0.91	(0.78 - 1.06)	0.1578	38
rs10001991	4	70491970	UGT2 A1/A2	0.34	0.2239	0.91	(0.78 - 1.06)	0.1578	38

rs6854350	4	70494901	UGT2 A1/A2	0.30	0.3778	0.93	(0.80 - 1.09)	0.2041	38
rs17618178	4	70495961	UGT2 A1/A2	0.26	0.9753	1.00	(0.85 - 1.18)	0.4753	39
rs7665571	4	70497601	UGT2 A1/A2	0.26	0.8780	1.01	(0.86 - 1.19)	0.5169	39
rs11249454	4	70499234	UGT2 A1/A2	0.13	0.7536	0.97	(0.78 - 1.20)	0.8112	
rs11931365	4	70500527	UGT2 A1/A2	0.26	0.8628	1.01	(0.86 - 1.20)	0.5332	39
rs6842466	4	70500986	UGT2 A1/A2	0.26	0.8634	1.01	(0.86 - 1.20)	0.4794	39
rs7662915	4	70502282	UGT2 A1/A2	0.26	0.8400	1.02	(0.86 - 1.20)	0.5451	39
rs10518063	4	70503978	UGT2 A1/A2	0.25	0.8021	1.02	(0.87 - 1.20)	0.5782	39
rs9992698	4	70504313	UGT2 A1/A2	0.37	0.9630	1.00	(0.87 - 1.16)	0.3949	40
rs988671	4	70506828	UGT2A1	0.26	0.7690	1.02	(0.87 - 1.21)	0.5574	39
rs1432329	4	70513710	UGT2A1	0.27	0.8596	1.01	(0.87 - 1.19)	0.9427	
rs4148277	4	70514829	UGT2A1	0.37	0.6932	0.97	(0.84 - 1.13)	0.7231	40
rs4148276	4	70514903	UGT2A1	0.25	0.4937	1.06	(0.90 - 1.25)	0.9578	39
rs7668703	4	70517952	UGT2A1	0.46	0.7286	1.03	(0.89 - 1.18)	0.3790	
rs4280808	4	70519460	UGT2A1	0.23	0.4249	0.93	(0.79 - 1.10)	0.4357	
rs10518065	4	70520597	UGT2A1	0.17	0.6352	1.05	(0.87 - 1.26)	0.4493	
rs11249456	4	70540563	UGT2A1	0.46	0.4938	0.95	(0.82 - 1.10)	0.8690	
rs10516603	4	115467459	UGT8	0.13	0.4016	1.10	(0.88 - 1.37)	0.1192	
rs28399435	19	41356246	CYP2A6	0.04	0.9855	1.00	(0.70 - 1.43)	0.4711	
rs1137115	19	41356281	CYP2A6	0.25	0.8328	1.02	(0.87 - 1.19)	0.4687	
rs4062238	19	41451576	CYP2B6	0.36	0.6985	1.03	(0.89 - 1.20)	0.8945	41
rs3889806	19	41459241	CYP2B6	0.36	0.6902	1.03	(0.89 - 1.20)	0.9286	41
rs8109525	19	41491918	CYP2B6	0.33	0.0954	0.88	(0.75 - 1.02)	0.1027	42
rs3760657	19	41495433	CYP2B6	0.09	0.1612	1.19	(0.93 - 1.52)	0.3816	43
rs4802100	19	41496025	CYP2B6	0.09	0.1711	1.19	(0.93 - 1.51)	0.4200	43
rs2099361	19	41498348	CYP2B6	0.36	0.5864	1.04	(0.90 - 1.21)	0.9101	41
rs16974790	19	41498946	CYP2B6	0.01	0.2264	1.46	(0.79 - 2.70)	0.4655	
rs8100458	19	41500213	CYP2B6	0.33	0.0945	0.88	(0.75 - 1.02)	0.1016	42
rs3745274	19	41512841	CYP2B6	0.24	0.7326	1.03	(0.87 - 1.21)	0.2952	44
rs8192719	19	41518773	CYP2B6	0.24	0.7244	1.03	(0.87 - 1.21)	0.2545	44
rs3786552	19	41521757	CYP2B6	0.30	0.0797	0.87	(0.75 - 1.02)	0.1446	42
rs1042389	19	41524153	CYP2B6	0.21	0.2303	0.90	(0.75 - 1.07)	0.7188	
rs7257703	19	41536622	CYP2B6	0.36	0.3545	1.07	(0.92 - 1.24)	0.8028	45
rs10404959	19	41537538	CYP2B6	0.36	0.3646	1.07	(0.92 - 1.24)	0.7636	45

CPD = Cigarettes per day