

1 **Supplementary information**

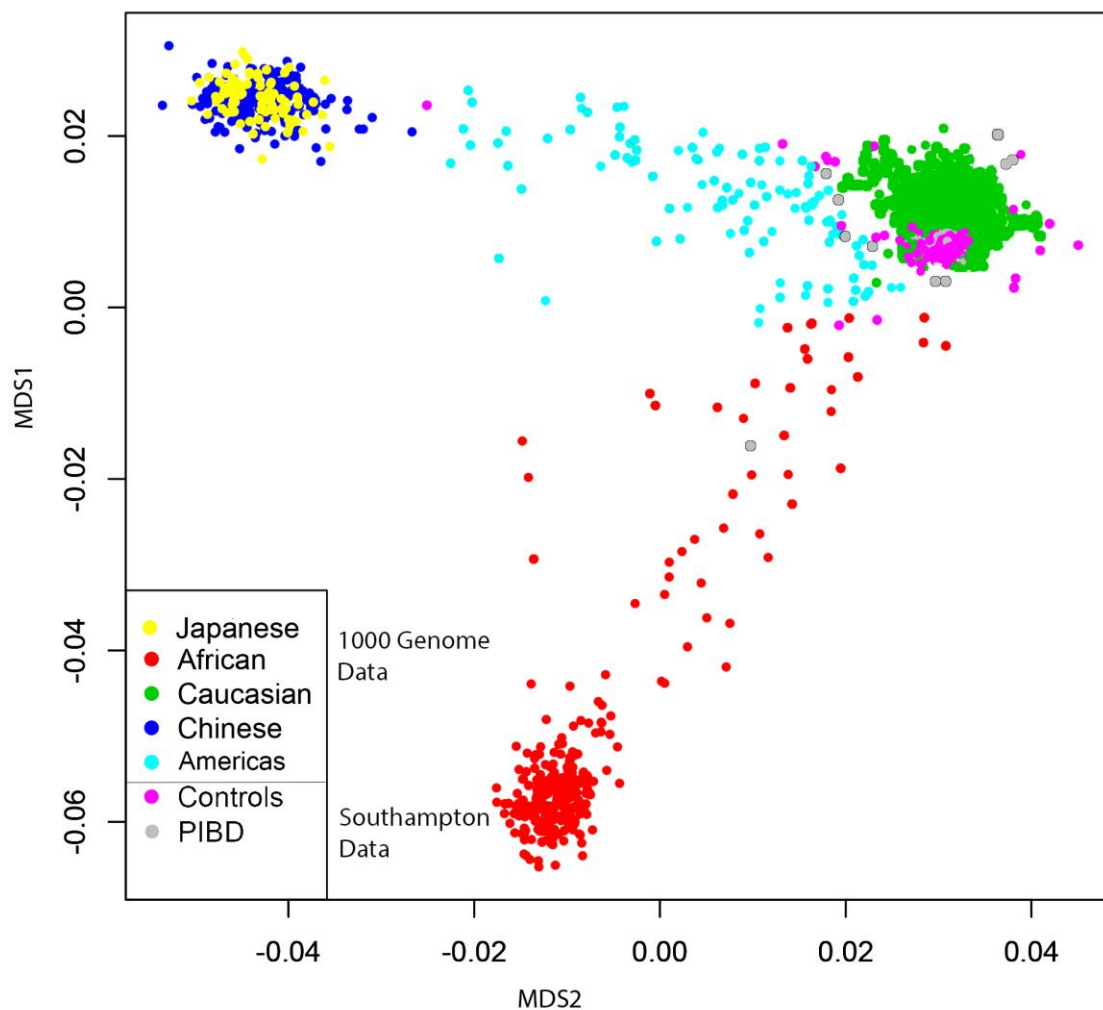
2 **Exome Analysis of Rare and Common Variants within the NOD Signaling**
3 **Pathway**

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7 Beattie, Sarah Ennis

8 Supplementary

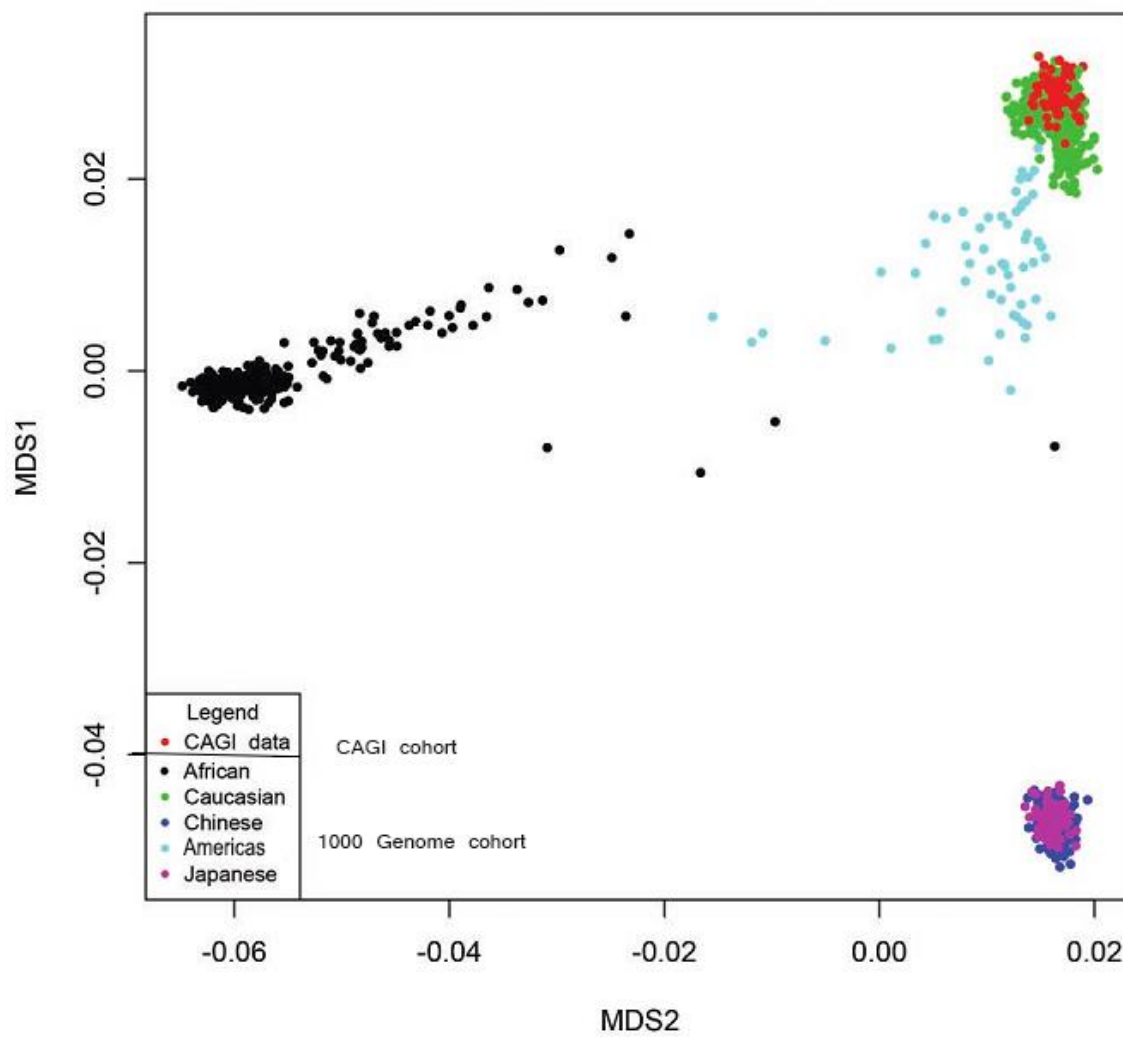
9 **Figure 1. Principle component analysis (PCA) across five ethnic groups from 1000**
10 **genome project and the discovery cohort (146 pediatric IBD cases and 126 non-IBD**
11 **controls).**



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13 The five ethnic groups from 1000 Genome are colored as indicated. The Southampton IBD cohort and
14 controls are in pink and light blue respectively. Southampton IBD samples excluded from the SKAT-
15 O test because of ethnic status are represented with a black outline.

16 **Figure 2. Principle component analysis (PCA) across five ethnic groups from 1000 genome**
17 **project and the validation cohort (66 whole-exome data of the CAGI dataset).**



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19 The five ethnic groups from 1000 Genome are colored as indicated. The CAGI cohort is in red.

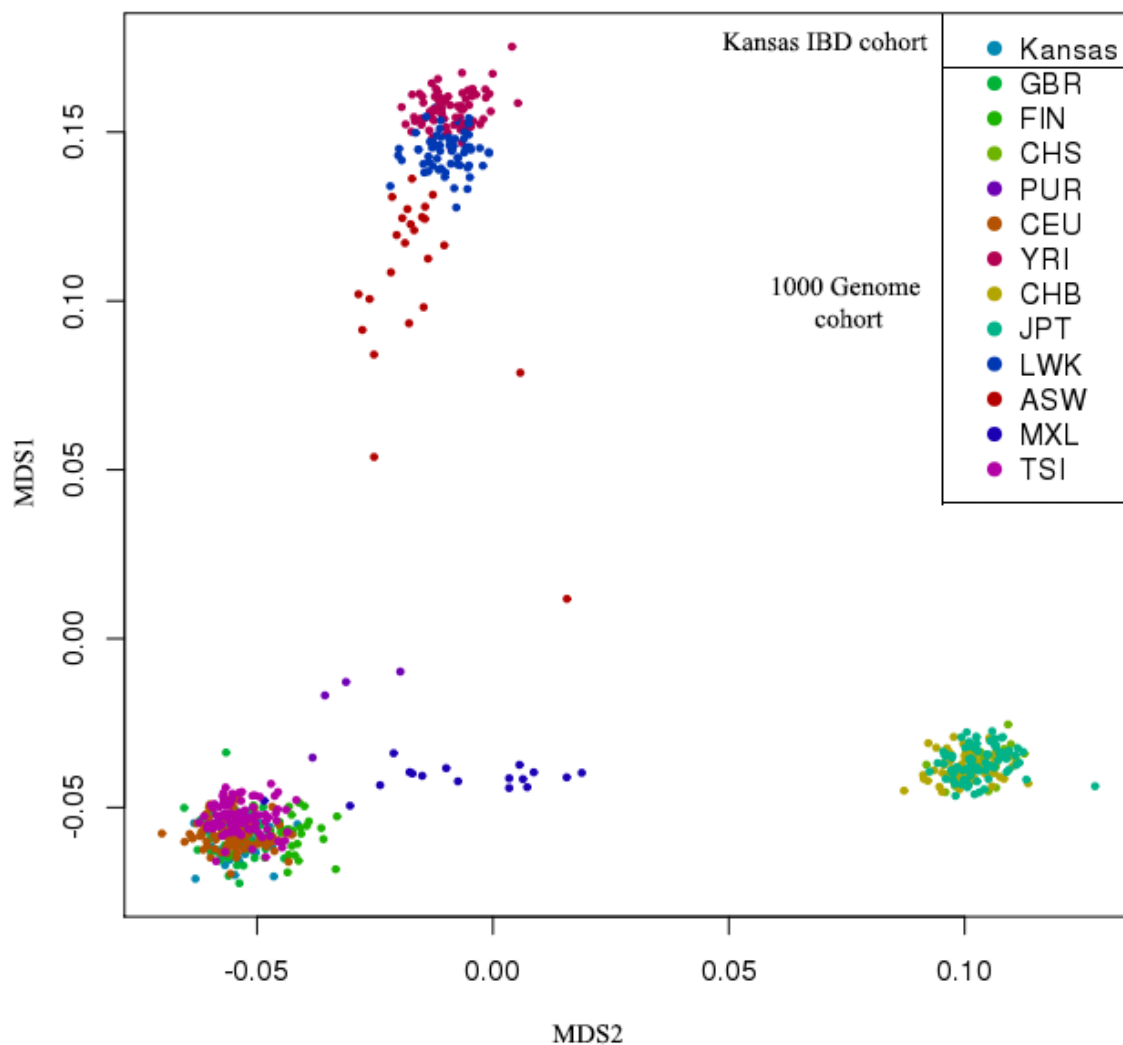
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23 **Figure 3. Principle component analysis (PCA) across ethnic groups from 1000 genome project**
24 **and the Kansas subgroup of the validation cohort (43 whole-exome data).**

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27 The ethnic groups from 1000 Genome are colored as indicated. The CAGI cohort is in blue.

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30 **Table S1. Percentage of gene coverage for each of the 40 genes involved in the NOD2**
 31 **pathway according to the Agilent SureSelect V4 and Agilent SureSelect V5 all Human**
 32 **exome capture kits.**

Gene	Protein	Agilent v4 % gene coverage	Agilent V5 % gene coverage
<i>BIRC2</i>	BIRC2 (cIAP1)	67.61	86.71
<i>BIRC3</i>	BIRC3 (cIAP2)	38.88	98.45
<i>CARD6</i>	CARD6	82.43	99.85
<i>CARD9</i>	CARD9	93.58	93.58
<i>CASP8</i>	CASP8	82.56	84.88
<i>CCL2*</i>	CCL2	75.64	100.00
<i>CCL5</i>	CCL5	45.00	80.39
<i>CHUK</i>	IKK α	72.19	100.00
<i>CXCL1*</i>	CXCL1	40.58	97.04
<i>CXCL2*</i>	CXCL2	38.90	100.00
<i>ERBB2IP</i>	LAP2	64.45	95.90
<i>IKBKB</i>	IKK β	76.52	88.15
<i>IKBKG</i>	NEMO	15.16	77.39
<i>IL6</i>	IL6	83.11	100.00
<i>IL8*</i>	IL8	43.64	100.00
<i>MAP3K7</i>	M3K7	43.22	98.78
<i>MAPK1*</i>	MK01	26.15	26.15
<i>MAPK10</i>	MK10	30.51	86.73
<i>MAPK11</i>	MK11	57.24	100.00
<i>MAPK12</i>	MK12	85.12	100.00
<i>MAPK13</i>	MK13	23.00	30.28
<i>MAPK14</i>	MK14	39.65	100.00
<i>MAPK3</i>	MK03	73.08	73.08
<i>MAPK8</i>	MK08	100.00	100.00

<i>MAPK9</i>	MK09	25.89	97.46
<i>NFKB1</i> *	NFKB1/p50	75.48	88.84
<i>NFKBIA</i>	IKB α	85.19	100.00
<i>NFKBIB</i>	IKBB	68.85	71.69
<i>NOD1</i>	NOD1	71.09	91.06
<i>NOD2</i> *	NOD2	77.79	100.00
<i>RELA</i> *	TF65	61.86	100.00
<i>RIPK2</i> *	RIPs2	73.81	100.00
<i>SUGT1</i>	SUGT1	73.74	98.32
<i>TAB1</i> *	TAB1	54.17	95.55
<i>TAB2</i>	TAB2	53.90	92.45
<i>TAB3</i>	TAB3	43.80	91.56
<i>TNF</i>	TNF α	9.72	12.84
<i>TNFAIP3</i> *	TNAP3	47.21	81.53
<i>TRAF6</i>	TRAF6	22.58	55.42
<i>TRIP6</i>	TRIP6	100.00	100.00
<i>XIAP</i>	XIAP	15.50	92.70

33 Genes with asterisks indicate genes previously identified by GWAS.

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35 Table S2. List of 250 variants found within the 40 genes of the NOD2 pathway in which variations was found across the entire cohort of 136 cases and 106 controls.

Gene	Chr	Bp position (hg19)	Variant	Coding change	Protein change	SIFT	Gerp	MaxEnt score	CADD	dbSNP	Frequency in 1KG	Frequency in NHLBI ESP	Frequency in Exac	HGMD	Frequency in cases (n=136)			Frequency in controls (n=106)		
															Homozygous reference	Heterozygous	Homozygous alternative	Homozygous reference	Heterozygous	Homozygous alternative
BIRC2	11	102220918	fr	c.335_339del	p.I12_113del	.	.	.	.	.	.	.	.	not listed	99.26	0.74	0	100	0	0
BIRC2	11	102221045	ns	c.460T>G	p.S154A	T	2.14	.	0.553713	.	.	.	0.00006	not listed	100	0	0	98.11	1.89	0
BIRC2	11	102221633	sn	c.954T>C	p.S318S	.	.	.	.	rs182906329	0.0014	0.001163	0.00133	not listed	99.26	0.74	0	98.11	1.89	0
BIRC2	11	102248377	ns	c.1517C>T	p.A506V	D	4.65	.	3.506238	rs34510872	0.03	0.052117	0.04900	not listed	92.65	7.35	0	100	0	0
BIRC2	11	102248406	ns	c.1546A>G	p.K516E	D	5.61	.	5.497399	rs61754131	0.0005	0.001745	0.00128	not listed	98.53	1.47	0	100	0	0
BIRC2	11	102248410	ns	c.1550G>A	p.G517E	D	5.61	.	4.831211	.	.	.	.	not listed	99.26	0.74	0	100	0	0
BIRC3	11	102195882	sn	c.642T>C	p.N214N	.	.	.	.	.	.	.	0.00005	not listed	99.26	0.74	0	100	0	0
BIRC3	11	102195897	sn	c.657T>C	p.D219D	.	.	.	.	.	.	.	.	not listed	99.26	0.74	0	98.11	1.89	0
BIRC3	11	102196019	ns	c.779A>G	p.K260R	T	-3.66	.	-0.04809	rs2276113	0.02	0.000814	0.01900	not listed	100	0	0	99.06	0.94	0
BIRC3	11	102201804	ns	c.1156G>A	p.V386M	D	2.37	.	0.619961	rs12222256	0.0023	.	0.00047	not listed	100	0	0	99.06	0.94	0
BIRC3	11	102201848	sn	c.1200G>A	p.Q400Q	.	.	.	.	rs17878663	0.07	0.001163	0.03400	not listed	100	0	0	99.06	0.94	0
BIRC3	11	102201850	ns	c.1202G>A	p.R401K	T	4.08	.	2.353145	rs17881197	0.0041	0.008258	0.00586	not listed	98.53	1.47	0	95.28	4.72	0
CARD6	5	40841561	ns	c.77C>G	p.P26R	D	3.66	.	1.550447	.	.	.	.	not listed	99.26	0.74	0	100	0	0
CARD6	5	40841571	fr	c.88_89del	p.30_30del	.	.	.	.	rs141244584	0.01	.	0.02000	not listed	95.59	4.41	0	97.17	2.83	0
CARD6	5	40841741	ns	c.257C>T	p.S86L	D	3.74	.	1.737134	rs10512747	0.06	0.120465	0.09100	not listed	76.47	21.32	2.21	77.36	19.81	2.83
CARD6	5	40843493	ns	c.523A>T	p.T175S	D	-2.97	.	-1.70298	rs61748215	0.0037	0.01	0.01200	not listed	98.53	1.47	0	99.06	0.94	0
CARD6	5	40843550	ns	c.580A>G	p.I194V	T	3.51	.	1.02021	rs61757654	0.01	0.013023	0.00872	not listed	97.79	2.21	0	100	0	0
CARD6	5	40843735	ns	c.765C>A	p.F255L	D	1.41	.	2.570366	rs35188876	0.01	0.018953	0.01400	not listed	97.06	2.94	0	99.06	0.94	0
CARD6	5	40852317	ns	c.883A>G	p.M295V	D	-0.882	.	1.770901	rs61748217	0.0009	0.00186	0.00158	not listed	97.79	2.21	0	100	0	0
CARD6	5	40852902	ns	c.1468G>A	p.D490N	T	4.85	.	.	.	.	.	.	not listed	100	0	0	99.06	0.94	0
CARD6	5	40853048	sn	c.1614C>T	p.S538S	.	.	.	.	rs16870407	0.15	0.092791	0.13800	not listed	83.82	15.44	0.74	80.19	18.87	0.94
CARD6	5	40853404	ns	c.1970T>C	p.V657A	D	4.18	.	4.484833	.	.	.	.	not listed	99.26	0.74	0	100	0	0
CARD9	9	139258779	ns	c.1586A>C	p.D529A	T	2.88	.	2.038243	.	.	.	.	not listed	99.26	0.74	0	100	0	0
CARD9	9	139258814	ns	c.1551G>C	p.Q517H	T	1.57	.	0.959136	.	.	.	0.00021	not listed	100	0	0	99.06	0.94	0
CARD9	9	139259644	sn	c.1383G>A	p.P461P	.	.	.	.	rs138344913	0.0018	0.003373	0.00002	not listed	100	0	0	99.06	0.94	0
CARD9	9	139262205	ns	c.1153G>C	p.V385L	T	1.37	.	0.261356	rs3124993	0.01	0.021567	0.01600	not listed	94.85	5.15	0	95.28	4.72	0
CARD9	9	139264888	ns	c.809A>T	p.E270V	T	2.85	.	0.381144	rs114895119	0.0032	0.004307	0.00350	not listed	100	0	0	99.06	0.94	0
CARD9	9	139265088	sn	c.693G>A	p.T231T	.	.	.	.	rs59902911	0.06	0.031177	0.03900	not listed	94.12	5.88	0	89.62	10.38	0
CARD9	9	139265801	sn	c.297G>A	p.P99P	.	.	.	.	rs115131813	0.03	0.017113	0.02500	not listed	95.59	4.41	0	97.17	2.83	0
CARD9	9	139265810	sn	c.288C>A	p.G96G	.	.	.	.	rs137986801	.	0.002096	0.00111	not listed	99.26	0.74	0	99.06	0.94	0

CARD9	9	139265870	sn	c.228C>T	p.Y76Y	.	.	.	.	rs11145769	0.06	0.031585	0.03600	not listed	94.12	5.88	0	91.51	8.49	0
CARD9	9	139266405	sn	c.126C>T	p.P42P	.	.	.	.	rs10781499	0.37	0.423372	0.40100	not listed	34.56	43.38	22.06	34.91	49.06	16.04
CARD9	9	139266496	ns	c.35G>A	p.S12N	T	-0.646	.	0.446262	rs4077515	0.37	0.421512	0.39900	listed	34.56	43.38	22.06	37.74	46.23	16.04
CARD9	9	139266519	sn	c.12C>T	p.Y4Y	.	.	.	.	rs35051231	0.0005	0.001163	0.00054	not listed	99.26	0.74	0	100	0	0
CASP8	2	202122956	ns	c.2T>C	p.MIT	D	-0.239	.	0.151387	rs3769824	0.03	0.043705	0.04500	not listed	94.85	5.15	0	88.68	11.32	0
CASP8	2	202122995	ns	c.41A>G	p.K14R	D	2.94	.	0.164368	rs3769823	0.65	0.705882	0.66700	not listed	16.18	38.24	45.59	11.32	43.4	45.28
CASP8	2	202123108	sp	c.151+3G>A	.	.	.	0.85	.	rs202238412	.	0.001798	0.00076	not listed	99.26	0.74	0	100	0	0
CASP8	2	202136272	sn	c.339C>T	p.S113S	.	.	.	.	rs17860422	0.0023	0.00407	0.00360	not listed	98.53	1.47	0	100	0	0
CASP8	2	202137392	ns	c.443A>G	p.K148R	T	5.52	.	3.96662	rs148697064	.	0.000698	0.00033	not listed	100	0	0	99.06	0.94	0
CASP8	2	202149589	ns	c.808G>C	p.D270H	T	-4.55	.	-0.30191	rs1045485	0.07	0.129186	0.09100	listed	77.94	21.32	0.74	83.96	16.04	0
CASP8	2	202149696	sn	c.915G>A	p.K305K	.	.	.	.	rs1045487	0.15	0.051047	0.10200	not listed	91.91	8.09	0	85.85	14.15	0
CASP8	2	202149737	ns	c.956A>G	p.Y319C	D	-1.54	.	0.964215	.	.	.	0.00004	not listed	100	0	0	99.06	0.94	0
CCL2	17	32583269	sn	c.105T>C	p.C35C	.	.	.	.	rs4586	0.54	0.36093	0.44200	not listed	49.26	43.38	7.35	44.34	39.62	16.04
CHUK	10	101964267	sn	c.1503G>A	p.G501G	.	.	.	.	rs2862988	0.0018	0.00593	0.00666	not listed	99.26	0.74	0	97.17	2.83	0
CHUK	10	101964312	sn	c.1458C>T	p.S486S	.	.	.	.	rs17880383	0.04	0.061395	0.04000	not listed	87.5	11.03	1.47	94.34	5.66	0
CHUK	10	101964847	sn	c.1341A>G	p.G447G	.	.	.	.	rs34458357	0.0014	0.005465	0.00291	not listed	99.26	0.74	0	100	0	0
CHUK	10	101964950	ns	c.1238A>C	p.D413A	T	5.01	.	4.795139	.	.	.	.	not listed	99.26	0.74	0	100	0	0
CHUK	10	101977883	ns	c.802G>A	p.V268I	T	4.69	.	2.550085	rs2230804	0.56	0.501047	0.47900	not listed	21.32	52.21	26.47	28.3	50	21.7
CHUK	10	101980355	ns	c.464T>C	p.V155A	T	4.16	.	1.072682	rs2230803	0.02	0.001163	0.01300	not listed	100	0	0	99.06	0.94	0
CXCL1	4	74735244	sn	c.57A>G	p.A19A	.	.	.	.	rs2071425	0.34	0.186713	0.26500	not listed	54.41	40.44	5.15	72.64	26.42	0.94
CXCL1	4	74736235	sp	c.309-3C>T	.	.	.	1.03	.	rs1814092	0.05	0.001628	0.02000	not listed	98.53	1.47	0	100	0	0
CXCL2	4	74964625	ns	c.115A>G	p.T39A	T	-0.319	.	0.437763	rs142264518	0.0046	0.006977	0.00528	not listed	98.53	1.47	0	99.06	0.94	0
CXCL2	4	74964830	ns	c.8G>A	p.R3H	T	-5.75	.	-0.01658	rs186397980	0.02	0.015973	0.00546	not listed	97.79	1.47	0.74	97.17	2.83	0
ERBB2IP	5	65307924	ns	c.355A>G	p.I119V	T	-2.81	.	0.260566	rs61758158	0.01	0.01143	0.00962	not listed	95.59	3.68	0.74	97.17	2.83	0
ERBB2IP	5	65317181	sn	c.565C>T	p.L189L	.	.	.	.	rs706679	0.67	0.856478	0.77000	not listed	11.76	12.5	75.74	10.38	31.13	58.49
ERBB2IP	5	65317206	ns	c.590C>T	p.T197M	D	4.58	.	5.955216	rs146136641	0.0005	0.001512	0.00069	listed	99.26	0.74	0	100	0	0
ERBB2IP	5	65321311	ns	c.821C>T	p.S274L	T	2.41	.	1.987188	rs3213837	0.1	0.156315	0.15400	not listed	77.94	19.12	2.94	67.92	31.13	0.94
ERBB2IP	5	65349300	sn	c.2142A>G	p.E714E	.	.	.	.	.	.	.	.	not listed	99.26	0.74	0	100	0	0
ERBB2IP	5	65349887	ns	c.2729A>G	p.K910R	D	4.46	.	.	rs34521887	0.01	0.000116	0.00315	not listed	99.26	0.74	0	100	0	0
ERBB2IP	5	65350044	sn	c.2886A>G	p.Q962Q	.	.	.	.	rs35278406	0.02	0.039893	0.02800	not listed	90.44	9.56	0	91.51	8.49	0
ERBB2IP	5	65350279	ns	c.3121C>T	p.H1041Y	D	4.05	.	1.755784	rs142496054	0.01	0.008023	0.00705	not listed	99.26	0.74	0	96.23	2.83	0.94
ERBB2IP	5	65350374	sn	c.3216A>G	p.R1072R	.	.	.	.	rs36303	0.23	0.138488	0.19200	not listed	80.15	17.65	2.21	65.09	31.13	3.77
ERBB2IP	5	65350481	ns	c.3323C>T	p.S1108L	D	5.32	.	4.6549	rs3805466	0.1	0.047674	0.08500	not listed	91.18	6.62	2.21	76.42	22.64	0.94
ERBB2IP	5	65350527	sn	c.3369T>G	p.L1123L	.	.	.	0.161838	.	.	0.000581	0.00034	not listed	99.26	0.74	0	100	0	0

ERBB2IP	5	65370927	ns	c.3697C>G	p.Q1233E	D	5.34	.	2.367375	rs201285970	.	.	0.00003	not listed	99.26	0.74	0	100	0	0
ERBB2IP	5	65372200	sn	c.3885C>T	p.V1295V	.	.	.	.	.	.	.	0.00002	not listed	100	0	0	98.11	1.89	0
IKBKB	8	42128942	sn	c.54C>T	p.F18F	.	.	.	.	rs12545246	0.03	.	0.01100	not listed	97.06	2.94	0	99.06	0.94	0
IKBKB	8	42128970	ns	c.82C>T	p.P28S	.	.	.	0.730313	.	.	.	0.00012	not listed	100	0	0	99.06	0.94	0
IKBKB	8	42163863	sn	c.303A>G	p.L101L	.	.	.	.	rs17875704	0.0009	.	0.00037	not listed	99.26	0.74	0	100	0	0
IKBKB	8	42174380	sn	c.1077G>A	p.L359L	.	.	.	.	rs56230731	0.01	0.014884	0.00956	not listed	97.06	2.94	0	100	0	0
IKBKB	8	42178343	ns	c.1663G>A	p.G555R	T	4.96	.	3.028211	rs149701177	.	0.000465	0.00002	not listed	100	0	0	98.11	1.89	0
IKBKB	8	42179427	sn	c.1696A>C	p.R566R	.	.	.	.	rs151057347	0.0023	0.003837	0.00159	not listed	99.26	0.74	0	99.06	0.94	0
IKBKG	X	153780386	ns	c.169G>A	p.E57K	D	5.17	.	2.125638	rs148695964	.	0.001784	0.00113	listed	99.26	0.74	0	100	0	0
IL6	7	22771038	ns	c.485A>T	p.D162V	T	0.258	.	-0.30563	rs2069860	0.0018	0.00814	0.00612	not listed	97.79	2.21	0	98.11	1.89	0
IL6	7	22771039	ns	c.486T>A	p.D162E	T	-2.22	.	0.028822	rs13306435	0.03	0.008837	0.02500	not listed	99.26	0.74	0	98.11	1.89	0
IL6	7	22771156	sn	c.603C>T	p.F201F	.	.	.	.	rs2069849	0.06	0.023605	0.04400	not listed	96.32	3.68	0	92.45	6.6	0.94
IL8	4	74606393	sn	c.18C>T	p.A6A	.	.	.	.	rs1803205	.	0.001977	0.00129	not listed	100	0	0	98.11	1.89	0
IL8	4	74607328	ns	c.134A>G	p.H45R	D	3.7	.	.	rs139503118	.	.	0.00024	not listed	99.26	0.74	0	100	0	0
MAP3K7	6	91256978	sn	c.1209A>G	p.T403T	.	.	.	.	.	.	0.000116	0.00003	not listed	100	0	0	100	0	0
MAP3K7	6	91266350	sp	c.483-7T>A	.	.	.	2.01	.	rs45625637	0.06	.	0.08900	not listed	100	0	0	100	0	0
MAPK1	22	22123519	ns	c.1057A>G	p.R353G	T	4.04	.	2.942178	.	.	.	.	not listed	100	0	0	99.06	0.94	0
MAPK1	22	22142659	sg	c.743C>A	p.S248X	.	5.57	.	2.569548	.	.	.	.	not listed	100	0	0	99.06	0.94	0
MAPK1	22	22160301	sn	c.330A>G	p.T110T	.	.	.	.	rs150378600	0.0009	0.001163	0.00192	not listed	99.26	0.74	0	100	0	0
MAPK1	22	22162126	sn	c.129T>C	p.Y43Y	.	.	.	.	rs3729910	0.04	0.060698	0.04500	not listed	88.24	11.03	0.74	85.85	14.15	0
MAPK1	22	22221708	nonfi	c.2_3insGGC	p.M1delinsMA	.	.	.	.	.	.	.	.	not listed	99.26	0.74	0	100	0	0
MAPK10	4	86952589	sp	c.1111-5GA	.	.	.	1.08	.	rs200643314	.	.	.	not listed	99.26	0.74	0	100	0	0
MAPK10	4	86952590	sp	c.1111-6CT	.	.	.	0.61	.	rs13103861	0.14	0.179884	0.15700	not listed	64.71	33.09	2.21	66.98	30.19	2.83
MAPK11	22	50703796	sn	c.969T>C	p.Y323Y	.	.	.	.	rs139548825	.	0.000581	0.00021	not listed	99.26	0.74	0	100	0	0
MAPK11	22	50704028	ns	c.824G>A	p.R275H	T	-3.93	.	1.290414	rs33932986	0.02	0.019419	0.01800	not listed	97.79	1.47	0.74	98.11	1.89	0
MAPK11	22	50704661	sn	c.756A>G	p.S252S	.	.	.	.	rs2076139	0.7	0.762116	0.71500	not listed	5.88	37.5	56.62	18.87	27.36	53.77
MAPK11	22	50705466	sn	c.507T>C	p.F169F	.	.	.	.	rs760748	0.97	0.994416	0.99700	not listed	0	2.21	97.79	5.66	0.94	93.4
MAPK11	22	50705821	sn	c.396C>T	p.Y132Y	.	.	.	.	rs2066762	0.03	0.002214	0.01100	not listed	99.26	0.74	0	100	0	0
MAPK11	22	50705830	sn	c.387C>T	p.F129F	.	.	.	.	rs140519122	.	0.002098	0.00176	not listed	99.26	0.74	0	100	0	0
MAPK11	22	50706381	sp	c.117-3C>T	.	.	.	0.57	.	rs36083586	0.12	0.112509	0.11700	not listed	72.06	25	2.94	84.91	13.21	1.89
MAPK12	22	50691870	ns	c.1064G>A	p.R355Q	T	0.925	.	.	rs138582408	0.0027	0.002749	0.00299	not listed	100	0	0	97.17	2.83	0
MAPK12	22	50691914	sp	c.1025-5GC	.	.	.	1.14	.	.	.	.	.	not listed	97.79	2.21	0	97.17	2.83	0
MAPK12	22	50691915	sp	c.1025-6CT	.	.	.	0.07	.	.	.	.	0.00001	not listed	100	0	0	98.11	1.89	0
MAPK12	22	50693619	sp	c.1024+7GT	.	.	.	0.92	.	.	.	.	0.00007	not listed	99.26	0.74	0	100	0	0

MAPK12	22	50693705	sn	c.945C>T	p.H315H	.	.	.	.	rs45606035	0.0018	0.005349	0.00277	not listed	100	0	0	99.06	0.94	0
MAPK12	22	50693889	sn	c.843C>T	p.S281S	.	.	.	.	rs2066770	0.04	0.018721	0.02800	not listed	95.59	4.41	0	97.17	2.83	0
MAPK12	22	50693919	sn	c.813G>A	p.K271K	.	.	.	.	rs55861809	0.01	.	0.00206	not listed	100	0	0	99.06	0.94	0
MAPK12	22	50693934	sn	c.798C>T	p.P266P	.	.	.	.	rs62239359	0.0009	0.005116	0.00311	not listed	98.53	1.47	0	100	0	0
MAPK12	22	50694084	ns	c.731C>T	p.T244M	D	4.2	.	.	rs2066776	.	0.002209	0.00109	not listed	99.26	0.74	0	100	0	0
MAPK12	22	50694297	sn	c.633T>C	p.S211S	.	.	.	.	rs1129880	0.79	0.704281	0.77300	not listed	8.09	41.18	50.74	20.75	33.02	46.23
MAPK12	22	50694542	sn	c.591C>T	p.I197I	.	.	.	.	.	.	.	0.00006	not listed	99.26	0.74	0	100	0	0
MAPK12	22	50694578	sn	c.555C>T	p.Y185Y	.	.	.	.	.	.	.	0.00003	not listed	100	0	0	99.06	0.94	0
MAPK12	22	50695370	sn	c.450C>T	p.I150I	.	.	.	.	rs2072876	0.04	0.023166	0.03400	not listed	94.12	5.15	0.74	95.28	4.72	0
MAPK12	22	50696678	ns	c.308C>T	p.T103M	T	2.11	.	.	rs34422484	0.09	0.031047	0.06100	not listed	89.71	10.29	0	95.28	4.72	0
MAPK12	22	50699668	sn	c.183T>C	p.P61P	.	.	.	.	rs2272857	0.68	0.769446	0.71100	not listed	5.88	36.76	57.35	24.53	26.42	49.06
MAPK13	6	36098410	sn	c.51A>C	p.T17T	.	.	.	.	rs1059227	0.77	0.660191	0.68300	not listed	8.09	46.32	45.59	21.7	36.79	41.51
MAPK13	6	36098434	sg	c.75C>A	p.Y25X	NA	-0.985	.	2.114124	rs151226715	0.0014	0.000698	0.00082	not listed	99.26	0.74	0	99.06	0.94	0
MAPK13	6	36098481	sp	c.119+3>GA	.	.	.	2.78	.	rs140374075	0.01	0.001865	0.00471	not listed	99.26	0.74	0	100	0	0
MAPK13	6	36099050	ns	c.122C>T	p.S41L	D	2.66	.	2.103868	rs55776345	0.01	0.012907	0.00946	not listed	99.26	0.74	0	97.17	2.83	0
MAPK13	6	36100425	ns	c.277C>T	p.P93S	T	1.67	.	2.505966	rs148256444	.	.	0.00005	not listed	99.26	0.74	0	100	0	0
MAPK13	6	36104430	sp	c.496-3>TC	.	.	.	0.27	.	rs55732669	0.02	0.000349	0.00398	not listed	99.26	0.74	0	98.11	1.89	0
MAPK13	6	36104455	ns	c.518G>A	p.R173Q	D	4.53	.	1.817101	.	.	.	0.00007	not listed	99.26	0.74	0	100	0	0
MAPK13	6	36104502	sg	c.565C>T	p.R189X	NA	4.53	.	2.531246	rs148572287	.	0.000116	0.00004	not listed	99.26	0.74	0	100	0	0
MAPK13	6	36107131	ns	c.1079G>A	p.R360Q	T	2.53	.	2.12748	rs150915766	.	0.001744	0.00125	not listed	99.26	0.74	0	100	0	0
MAPK14	6	36063793	ns	c.712C>T	p.L238F	D	4.75	.	2.393865	rs139802452	.	0.000465	0.00037	not listed	98.53	1.47	0	100	0	0
MAPK14	6	36068038	sn	c.756C>T	p.S252S	.	.	.	.	.	.	.	.	not listed	99.26	0.74	0	100	0	0
MAPK14	6	36068041	sn	c.759T>C	p.H253H	.	.	.	.	rs2815805	0.04	0.016512	0.02100	not listed	95.59	4.41	0	97.17	2.83	0
MAPK14	6	36075286	ns	c.896C>T	p.A299V	NA	5.61	.	5.494333	.	.	.	.	not listed	99.26	0.74	0	100	0	0
MAPK3	16	30128224	sn	c.1008G>A	p.P336P	.	.	.	.	rs1143695	0.0032	0.003023	0.00314	not listed	99.26	0.74	0	100	0	0
MAPK3	16	30128580	ns	c.802G>A	p.D268N	D	5.35	.	2.862978	.	.	.	.	not listed	100	0	0	99.06	0.94	0
MAPK3	16	30129377	sn	c.651G>T	p.L217L	.	.	.	2.257118	rs139957276	0.0005	0.000465	0.00045	not listed	99.26	0.74	0	100	0	0
MAPK3	16	30134507	sn	c.24G>A	p.G8G	.	.	.	.	.	.	.	.	not listed	100	0	0	98.11	1.89	0
MAPK8	10	49609720	ns	c.17G>A	p.R6H	T	4.25	.	3.151268	.	.	.	0.00001	not listed	100	0	0	98.11	1.89	0
MAPK8	10	49632183	sn	c.669C>T	p.I223I	.	.	.	.	.	.	.	0.00002	not listed	100	0	0	99.06	0.94	0
MAPK8	10	49642974	ns	c.1186G>A	p.V396I	T	5.46	.	1.599793	.	.	.	.	not listed	99.26	0.74	0	100	0	0
MAPK9	5	179665354	sn	c.1110T>C	p.G370G	.	.	.	.	rs138473736	.	0.000465	0.00013	not listed	99.26	0.74	0	100	0	0
MAPK9	5	179676062	ns	c.527C>T	p.A176V	T	4.11	.	2.462092	.	.	.	.	not listed	100	0	0	99.06	0.94	0
NFKB1	4	103488139	sp	c.256-5>TC	.	.	.	0.25	.	.	.	.	0.00001	not listed	99.26	0.74	0	100	0	0

NFKB1	4	103505961	sn	c.1047C>T	p.Y349Y	.	.	.	.	rs4648039	0.01	0.024535	0.01500	not listed	88.97	11.03	0	97.17	2.83	0
NFKB1	4	103514658	sn	c.1140T>C	p.A380A	.	.	.	.	rs1609993	0.96	0.919186	0.94000	not listed	0.74	16.18	83.09	2.83	16.98	80.19
NFKB1	4	103516146	sp	c.1297+8>AG	.	.	.	0.27	.	.	.	.	0.00006	not listed	99.26	0.74	0	100	0	0
NFKB1	4	103517301	ns	c.1304T>C	p.M435T	T	4.6	.	1.092039	.	.	.	0.00004	not listed	99.26	0.74	0	100	0	0
NFKB1	4	103518700	ns	c.1516A>G	p.M506V	T	-4.82	.	-0.21319	rs4648072	0.01	0.008023	0.00973	not listed	97.79	2.21	0	99.06	0.94	0
NFKB1	4	103527654	ns	c.1751C>T	p.T584M	D	4.59	.	5.152581	.	.	.		not listed	100	0	0	99.06	0.94	0
NFKB1	4	103527745	ns	c.1842G>T	p.L614F	T	1.05	.	1.308065	rs149211506	0.0027	0.003023	0.00194	not listed	98.53	1.47	0	100	0	0
NFKB1	4	103534701	sn	c.2709G>A	p.S903S	.	.	.	.	rs4648119	.	0.001047	0.00037	not listed	99.26	0.74	0	100	0	0
NFKB1	4	103537672	ns	c.2828C>A	p.T943N	T	2	.	1.290152	rs143882681	.	0.000581	0.00036	not listed	99.26	0.74	0	100	0	0
NFKBIA	14	35872068	sp	c.548-3>CT	.	.	.	0.18	.	rs2233418	0.0018	0.008488	0.00652	not listed	98.53	1.47	0	99.06	0.94	0
NFKBIA	14	35872414	sn	c.489G>A	p.L163L	.	.	.	.	.	.	.		not listed	99.26	0.74	0	100	0	0
NFKBIA	14	35872926	sn	c.306C>T	p.A102A	.	.	.	.	rs1050851	0.12	0.227791	0.16800	not listed	52.94	41.18	5.88	60.38	34.91	4.72
NFKBIA	14	35873770	sn	c.81C>T	p.D27D	.	.	.	.	rs1957106	0.24	0.275911	0.27700	not listed	58.09	33.09	8.82	57.55	33.96	8.49
NFKBIB	19	39395836	sp	c.28-6>CT	.	.	.	0.67	.	rs200550654	.	.	0.00002	not listed	99.26	0.74	0	100	0	0
NFKBIB	19	39396013	ns	c.199C>T	p.R67C	T	-7.16	.	0.67979	.	0.0046	0.007286	0.00524	not listed	96.32	2.94	0.74	97.17	2.83	0
NFKBIB	19	39398188	sn	c.600C>T	p.N200N	.	.	.	.	.	.	.	0.00001	not listed	99.26	0.74	0	100	0	0
NFKBIB	19	39398201	ns	c.613C>T	p.R205C	D	-0.188	.	2.135488	rs187346322	0.0023	0.000818	0.00029	not listed	99.26	0.74	0	100	0	0
NOD1	7	30487954	ns	c.2245A>G	p.S749G	D	-2.15	.	.	.	.	.		not listed	99.26	0.74	0	100	0	0
NOD1	7	30490919	ns	c.2114G>A	p.R705Q	T	-3.79	.	0.13785	rs144684378	.	0.002093	0.00085	not listed	99.26	0.74	0	100	0	0
NOD1	7	30491123	ns	c.1910G>A	p.R637H	T	5.26	.	3.830579	rs5743347	0.0018	0.002791	0.00138	not listed	99.26	0.74	0	100	0	0
NOD1	7	30491143	sn	c.1890C>T	p.G630G	.	.	.	.	.	.	.		not listed	99.26	0.74	0	100	0	0
NOD1	7	30491311	sn	c.1722G>A	p.A574A	.	.	.	.	rs2075821	0.29	0.258953	0.27500	not listed	46.32	45.59	8.09	57.55	33.96	8.49
NOD1	7	30491693	ns	c.1340G>A	p.R447H	T	3.22	.	3.31794	rs2975634	0.02	0.000349	0.00001	not listed	99.26	0.74	0	100	0	0
NOD1	7	30491837	ns	c.1196G>A	p.R399Q	T	1.4	.	3.429291	rs141422065	0.0009	0.000465		not listed	100	0	0	99.06	0.94	0
NOD1	7	30492086	ns	c.947A>G	p.N316S	D	-3.6	.	-1.23484	.	.	.	0.00005	not listed	100	0	0	99.06	0.94	0
NOD1	7	30492142	sn	c.891C>T	p.R297R	.	.	.	.	rs3020208	0.02	0.000349	0.00758	not listed	99.26	0.74	0	100	0	0
NOD1	7	30492237	ns	c.796G>A	p.E266K	D	5.19	.	4.169	rs2075820	0.3	0.245349	0.27700	listed	50	44.12	5.88	61.32	31.13	7.55
NOD1	7	30492246	ns	c.787C>A	p.R263R	.	.	.	0.862199	.	.	0.000116	0.00002	not listed	99.26	0.74	0	100	0	0
NOD1	7	30492550	sn	c.483C>T	p.D161D	.	.	.	.	rs2235099	0.3	0.246395	0.27800	not listed	50	44.12	5.88	60.38	32.08	7.55
NOD1	7	30492598	sn	c.435G>T	p.L145L	.	.	.	.	rs5743340	0.0046	0.018256	0.01200	not listed	97.06	2.94	0	95.28	4.72	0
NOD1	7	30494802	sn	c.327C>T	p.F109F	.	.	.	.	.	.	.	0.00534	not listed	100	0	0	99.06	0.94	0
NOD1	7	30494866	ns	c.263A>G	p.Y88C	T	3.72	.	2.589497	.	.	.		not listed	99.26	0.74	0	100	0	0
NOD1	7	30496382	sn	c.156C>G	p.A52A	.	.	.	.	rs2075818	0.32	0.248488	0.28900	not listed	48.53	45.59	5.88	62.26	31.13	6.6
NOD1	7	30496518	ns	c.20G>A	p.S7N	T	1.17	.	0.755481	rs61757653	.	.	0.00026	not listed	99.26	0.74	0	100	0	0

NOD2	16	50733392	sp	c.74-7>TA	.	.	1.83	.	rs104895421	0.0014	0.001861	0.00001	listed	100	0	0	99.06	0.94	0	
NOD2	16	50733423	ns	c.98C>A	p.A33D	T	1.13	.	1.402571	.	0.000008	.	0.00001	not listed	99.26	0.74	0	100	0	0
NOD2	16	50733661	sn	c.336C>T	p.A112A	.	.	.	.	.	0.00002	.	0.00003	not listed	100	0	0	99.06	0.94	0
NOD2	16	50733785	ns	c.460G>A	p.D154N	T	0.958	.	0.410941	rs146054564	.	0.002093	0.00064	not listed	100	0	0	99.06	0.94	0
NOD2	16	50733859	sn	c.534C>G	p.S178S	.	.	.	.	rs2067085	0.26	0.409302	0.33400	not listed	38.97	54.41	6.62	47.17	37.74	15.09
NOD2	16	50741791	ns	c.566C>T	p.T189M	T	3.48	.	2.334887	rs61755182	0.0014	0.004419	0.00259	listed	98.53	1.47	0	100	0	0
NOD2	16	50741800	ns	c.575C>T	p.A192V	D	0.916	.	0.885309	rs149071116	0.00004	.	0.00005	not listed	100	0	0	99.06	0.94	0
NOD2	16	50741858	sn	c.633C>T	p.A211A	.	.	.	.	rs5743269	0.0009	0.001744	0.00080	not listed	100	0	0	99.06	0.94	0
NOD2	16	50744624	ns	c.802C>T	p.P268S	T	-9.98	.	-0.27189	rs2066842	0.12	0.26907	0.18400	listed	42.65	47.06	10.29	55.66	34.91	9.43
NOD2	16	50744688	ns	c.866A>G	p.N289S	D	4.56	.	0.444188	rs5743271	0.01	0.006279	0.00425	listed	98.53	1.47	0	98.11	1.89	0
NOD2	16	50744850	ns	c.1028T>C	p.L343P	D	5.4	.	0.517926	.	.	0.000116	0.00001	not listed	100	0	0	99.06	0.94	0
NOD2	16	50745114	ns	c.1292C>T	p.S431L	D	3.64	.	0.851472	rs104895431	0.0005	0.001395	0.00082	listed	99.26	0.74	0	100	0	0
NOD2	16	50745199	sn	c.1377C>T	p.R459R	.	.	.	.	rs2066843	0.13	0.270993	0.18500	not listed	41.91	47.79	10.29	50	39.62	10.38
NOD2	16	50745316	sn	c.1494A>G	p.E498E	.	.	.	.	.	.	.	.	not listed	100	0	0	99.06	0.94	0
NOD2	16	50745511	sn	c.1689C>T	p.Y563Y	.	.	.	.	rs111608429	0.0005	.	0.00007	not listed	99.26	0.74	0	100	0	0
NOD2	16	50745583	sn	c.1761T>G	p.R587R	.	.	.	.	rs1861759	0.25	0.402558	0.32800	not listed	39.71	53.68	6.62	47.17	38.68	14.15
NOD2	16	50745655	sn	c.1833C>T	p.A611A	.	.	.	.	rs61736932	0.0046	0.010698	0.00983	not listed	98.53	1.47	0	100	0	0
NOD2	16	50745751	sn	c.1929C>T	p.L643L	.	.	.	.	.	0.000008	.	0.00001	not listed	100	0	0	99.06	0.94	0
NOD2	16	50745926	ns	c.2104C>T	p.R702W	D	2.42	.	1.736582	rs2066844	0.02	0.043488	0.02300	listed	88.24	10.29	1.47	86.79	13.21	0
NOD2	16	50745929	ns	c.2107C>T	p.R703C	D	2.89	.	1.788325	rs5743277	0.0023	0.006977	0.00002	listed	97.79	2.21	0	100	0	0
NOD2	16	50745960	ns	c.2138G>A	p.R713H	T	4.13	0.75	2.225724	rs104895483	.	0.000233	0.00034	listed	98.53	1.47	0	100	0	0
NOD2	16	50746086	ns	c.2264C>T	p.A755V	D	5.12	.	1.225314	rs61747625	0.0005	0.004651	0.00231	listed	98.53	1.47	0	100	0	0
NOD2	16	50746199	ns	c.2377G>A	p.V793M	D	3.51	.	1.544959	rs104895444	0.0005	0.001628	0.00105	listed	99.26	0.74	0	98.11	1.89	0
NOD2	16	50746228	sn	c.2406G>T	p.V802V	.	.	.	1.92838	rs104895495	.	0.00186	0.00196	not listed	98.53	1.47	0	99.06	0.94	0
NOD2	16	50746291	sp	c.2462+7>GT	.	.	0.83	.	.	rs202111813	0.0005	0.000581	0.00016	not listed	99.26	0.74	0	100	0	0
NOD2	16	50750842	ns	c.2587A>G	p.M863V	T	-9.48	.	0.558526	rs104895447	.	0.00186	0.00120	listed	99.26	0.74	0	100	0	0
NOD2	16	50756540	ns	c.2722G>C	p.G908R	D	5.56	.	5.54325	rs2066845	0.01	0.014535	0.00992	listed	96.32	3.68	0	96.23	3.77	0
NOD2	16	50756571	ns	c.2753C>A	p.A918D	D	5.56	.	5.735298	rs104895452	0.0009	0.000814	0.00040	listed	100	0	0	99.06	0.94	0
NOD2	16	50757276	ns	c.2863G>A	p.V955I	T	-9.14	.	-0.87026	rs5743291	0.05	0.096047	0.06100	listed	83.09	16.91	0	81.13	18.87	0
NOD2	16	50759405	ns	c.288A8>G	p.E963G	T	5.29	.	4.950708	.	.	.	.	not listed	99.26	0.74	0	100	0	0
NOD2	16	50763778	fr	c.3019dupC	p.L1007fs	.	.	.	.	rs2066847	0.006	.	.	listed	89.71	8.82	1.47	99.06	0.94	0
RELA	11	65422007	ns	c.1498A>G	p.I500V	D	3.39	1.83	2.237479	.	.	.	.	not listed	99.26	0.74	0	100	0	0
RELA	11	65425764	ns	c.871G>A	p.D291N	T	4.76	.	3.374902	rs61759893	0.0046	0.004655	0.00346	not listed	98.53	1.47	0	99.06	0.94	0
RELA	11	65425804	sn	c.831C>T	p.D277D	.	.	.	.	rs147357241	.	0.000233	0.00016	not listed	99.26	0.74	0	100	0	0

RELA	11	65427183	ns	c.513G>T	p.R171S	T	4.36	.	3.419675	.	.	.	0.00001	not listed	100	0	0	99.06	0.94	0	
RIPK2	8	90770315	sn	c.27C>T	p.A9A	.	.	.	.	rs2293809	0.09	0.031789	0.06200	not listed	92.65	6.62	0.74	94.34	5.66	0
RIPK2	8	90784979	ns	c.776T>C	p.L259T	T	4.45	.	3.648531	rs2230801	0.08	0.07907	0.06800	not listed	84.56	15.44	0	78.3	21.7	0	
RIPK2	8	90801670	sn	c.1245T>C	p.S415S	.	.	.	.	rs56109184	0.0005	0.000698	0.00025	not listed	100	0	0	99.06	0.94	0
RIPK2	8	90802491	sn	c.1470A>G	p.L490L	.	.	.	.	rs16900617	0.08	0.002558	0.02400	not listed	99.26	0.74	0	100	0	0
RIPK2	8	90802611	sn	c.1590A>G	p.P530P	.	.	.	.	rs186397742	0.0009	.	0.00012	not listed	100	0	0	99.06	0.94	0
SUGT1	13	53231709	ns	c.139T>A	p.Y47N	D	4.12	.	.	.	.	.	.	not listed	99.26	0.74	0	100	0	0
SUGT1	13	53239767	sp	c.519-5>AT	.	.	.	1.07	0.00001	not listed	100	0	0	98.11	1.89	0
SUGT1	13	53240958	ns	c.627G>T	p.L209F	D	2.93	.	2.604733	rs61756205	0.0018	0.005119	0.00252	not listed	100	0	0	99.06	0.94	0	
SUGT1	13	53254116	ns	c.822G>T	p.K274N	T	3.92	.	2.817749	rs202155148	.	0.000116	0.00008	not listed	99.26	0.74	0	99.06	0.94	0	
SUGT1	13	53254296	sp	c.996+6>AG	.	.	.	0.75	.	rs7986540	0.97	0.946395	0.95200	not listed	1.47	7.35	91.18	4.72	11.32	83.96	
SUGT1	13	53261936	nonfd	c.1069_1071del	p.357_357del	.	.	.	.	.	.	.	.	not listed	100	0	0	99.06	0.94	0
TAB1	22	39795831	sn	c.24G>A	p.L8L	0.00003	not listed	99.26	0.74	0	100	0	0
TAB1	22	39814746	ns	c.560G>A	p.R187H	D	4.45	.	6.166536	rs140879164	0.0009	0.000233	0.00058	not listed	99.26	0.74	0	100	0	0	
TAB1	22	39814802	ns	c.616G>A	p.D206N	T	4.45	.	4.232386	rs148869940	.	0.000698	0.00012	not listed	99.26	0.74	0	100	0	0	
TAB1	22	39826049	ns	c.1337C>T	p.T446I	T	4.67	.	5.706612	rs118074217	0.0005	0.001163	0.00055	not listed	100	0	0	99.06	0.94	0	
TAB1	22	39826137	sn	c.1425C>T	p.D475D	.	.	.	.	rs147601362	0.0009	0.001395	0.00094	not listed	100	0	0	99.06	0.94	0
TAB1	22	39832516	sn	c.1329C>T	p.S443S	.	.	.	.	.	.	0.000116	0.00004	not listed	99.26	0.74	0	100	0	0
TAB2	6	149699333	sn	c.282A>G	p.G94G	.	.	.	.	rs13215304	0.02	0.031163	0.02000	not listed	100	0	0	100	0	0
TAB2	6	149699483	sn	c.432T>C	p.S144S	.	.	.	.	.	.	.	.	not listed	100	0	0	100	0	0
TAB2	6	149699483	sn	c.432T>C	p.S144S	.	.	.	.	.	.	.	.	not listed	100	0	0	100	0	0
TAB2	6	149700128	sn	c.1077C>T	p.T359T	.	.	.	.	rs138731123	.	.	0.00019	not listed	100	0	0	100	0	0
TAB2	6	149700491	sn	c.1440G>A	p.V480V	.	.	.	.	rs3734296	0.21	0.105698	0.17100	not listed	100	0	0	100	0	0
TAB2	6	149730846	sn	c.2073G>A	p.R691R	.	.	.	.	rs652921	0.21	0.105698	0.17100	not listed	100	0	0	100	0	0
TAB3	X	30849697	sp	c.1991-5>CT	.	.	.	0.12	.	rs202074143	.	0.000595	0.00047	not listed	100	0	0	99.06	0.94	0	
TAB3	X	30870971	ns	c.1634C>G	p.S545C	T	4.31	.	2.179871	.	.	.	0.00090	not listed	100	0	0	99.06	0	0.94	
TAB3	X	30873039	ns	c.743C>T	p.T248M	D	2.53	.	0.808718	.	.	.	0.00021	not listed	99.26	0	0.74	100	0	0	
TAB3	X	30873245	sn	c.537G>A	p.P179P	.	.	.	.	rs146319957	0.0018	0.00431	0.00340	not listed	98.53	1.47	0	100	0	0
TNF	6	31544562	ns	c.251C>T	p.P84L	T	0.92	.	1.458155	rs4645843	.	0.002953	0.00235	not listed	98.53	1.47	0	100	0	0	
TNFAIP3	6	138196066	ns	c.380T>G	p.F127C	T	0.836	.	1.667118	rs2230926	0.12	0.032093	0.06100	listed	100	0	0	100	0	0	
TNFAIP3	6	138196817	sp	c.487-8>CG	.	.	.	0.45	.	rs5029947	0.02	0.00093	0.00562	not listed	100	0	0	100	0	0	
TNFAIP3	6	138199644	sn	c.1062G>A	p.K354K	.	.	.	.	.	.	0.000233	0.00018	not listed	100	0	0	100	0	0
TNFAIP3	6	138199950	sn	c.1368G>C	p.G456G	.	.	.	.	rs201600532	0.0005	.	0.00012	not listed	100	0	0	100	0	0
TNFAIP3	6	138201240	ns	c.1939T>C	p.S647P	T	0.362	.	1.04551	rs142253225	0.0009	0.002791	0.00188	not listed	100	0	0	100	0	0	

TNFAIP3	6	138202258	sn	c.2175G>A	p.L725L	.	.	.	.	rs140354477	0.0018	0.002442	0.00180	not listed	100	0	0	100	0	0
TNFAIP3	6	138202378	sn	c.2295C>T	p.P765P	.	.	.	.	rs5029956	0.02	0.000465	0.00827	not listed	100	0	0	100	0	0
TRAF6	11	36514122	ns	c.735T>A	p.S245R	T	3.02	.	2.144458	.	.	0.000116	0.00002	not listed	99.26	0.74	0	100	0	0
TRIP6	7	100465128	sn	c.9G>A	p.G3G	.	.	.	.	.	.	.	.	not listed	100	0	0	99.06	0.94	0
TRIP6	7	100465747	ns	c.255G>T	p.R85S	T	-5.88	.	0.195055	rs139351872	0.0014	0.000698	.	not listed	99.26	0.74	0	100	0	0
TRIP6	7	100465807	sn	c.315C>T	p.A105A	.	.	.	.	rs144580285	0.0014	0.003605	0.00230	not listed	99.26	0.74	0	100	0	0
TRIP6	7	100465824	ns	c.332G>A	p.R111Q	T	3.13	.	1.472456	rs2437100	0.01	0.020465	0.01600	not listed	96.32	3.68	0	95.28	4.72	0
TRIP6	7	100466176	sn	c.423C>T	p.A141A	.	.	1.07	.	.	.	.	0.00001	not listed	99.26	0.74	0	100	0	0
TRIP6	7	100466441	ns	c.688G>A	p.V230I	T	4.66	.	1.751354	rs2075756	0.28	0.269014	0.28500	not listed	55.15	38.97	5.88	66.98	27.36	5.66
TRIP6	7	100466457	ns	c.704G>C	p.G235A	T	2.36	.	1.995768	.	.	.	0.00001	not listed	100	0	0	99.06	0.94	0
TRIP6	7	100468284	sn	c.918a>G	p.V306V	.	.	.	2.457742	rs1054391	0.57	0.523372	0.56200	not listed	25.74	49.26	25	27.36	47.17	25.47
TRIP6	7	100468345	ns	c.979T>C	p.Y327H	D	5.47	.	2.389748	.	.	.	.	not listed	98.53	1.47	0	100	0	0
TRIP6	7	100469219	ns	c.1054C>T	p.R352W	D	3.04	.	2.48622	.	.	.	0.00001	not listed	100	0	0	99.06	0.94	0
TRIP6	7	100469223	ns	c.1058C>T	p.A353V	D	4.21	.	2.699637	rs147492293	.	0.000349	0.00012	not listed	99.26	0.74	0	100	0	0
XIAP	X	123034511	ns	c.1268A>C	p.Q423P	T	4.26	.	0.733377	rs5956583	0.261	0.33	0.33000	listed	52.21	24.26	23.53	60.38	16.04	23.58
XIAP	X	123040945	ns	c.1408A>T	p.T470S	T	4.11	.	1.624093	rs143165174	.	0.000595	0.00048	listed	99.26	0	0.74	100	0	0

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37 ns, non-synonymous; sn, synonymous; fi, frameshift insertion, fd, frameshift deletion; sp, splicing; nfi, non-frameshift insertion; nfd, non-frameshift deletion,sp, splicing

38 B, benign; C, Conservative; D, deleterious; MC, moderately Conservative; MR, moderately Radical; NR, not reported; P, possibly damaging; R

39 **Table S3 Joint variant test (SKAT-O) result for the NOD2 gene in which variations was found across the entire discovery cohort.**

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Gene	Chromosome	Total number of samples (136 cases; 106 controls)	bp position (hg19)	Fraction of individuals who carry rare variants under the MAF thresholds (MAF < 0.05)*	Number of all variants defined in the group file	Number of variant defined as rare (MAF < 0.05)*	P-value unadjusted
<i>NOD2</i>	16	242	50745926-50763778	0.098765	3 ⁺	2	0.016861
			50733392-50759405	0.13992	28 [•]	23	0.5441

41 + gene based test conducted on only the three NOD2 biomarkers: Arg702Trp, Gly908Arg and Leu1007fsinsC

42 • gene based test conducted excluding three NOD2 biomarkers: Arg702Trp, Gly908Arg and Leu1007fsinsC

43 * These variants received different weights in the SKAT-O joint test. Genes are ordered by p-value

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