

Supplementary Material

Genetic Variation in Imprinted Genes is Associated with Risk of Late-Onset

Alzheimer's disease

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Supplementary Table 1: Results of single locus analysis and Versatile Gene-Based Association analysis in 93 imprinted genes

Gene	CHR ¹	Most significant SNP	Base Pair Location ²	OR ³	P-value ⁴	SNPs	Total SNPs	TagSNPs	P-Value Threshold for Significance	Gene Location ⁵	Test	P-value ⁶
						(P<0.05)						
<i>WT1</i>	11	rs5030328	32366048	0.632	0.0054	3	29	17	0.002941	32365897-32413657	105.576	0.01004
<i>ZC3H12C</i>	11	rs4754425	109547367	0.836	0.0084	16	30	11	0.004545	109469296-109547776	98.371	0.02273
<i>DLGAP2</i>	8	rs6992443	1637345	1.537	0.0009	17	95	60	0.000833	1436975-1644049	192.746	0.03648
<i>GPR1</i>	2	rs16838070	206775748	1.245	0.0058	4	17	14	0.003571	206748284-206791016	42.552	0.03711
<i>IGF2</i>	11	rs3741205	2126460	1.121	0.097	0	23	17	0.002941	2106922-2127409	77.281	0.05434
<i>PHACTR2</i>	6	rs6915880	144083752	0.829	0.0029	16	102	75	0.000667	143971009-144194015	172.908	0.05566
<i>CDKN1C</i>	11	rs452338	2864771	1.154	0.0324	1	3	2	0.025	2861023-2863571	7.806	0.07744
<i>SLC22A18AS</i>	11	rs452338	2864771	1.154	0.0324	2	17	14	0.003571	2865902-2881751	30.681	0.08135
<i>GNAS</i>	20	rs6092704	56901873	1.258	0.0366	2	53	30	0.001667	56848189-56919645	88.636	0.11100
<i>AXL</i>	19	rs4802111	46425899	0.879	0.0389	2	14	12	0.004167	46416947-46459511	23.756	0.12700
<i>KCNQ1</i>	11	rs2283155	2504751	1.218	0.0017	10	171	132	0.000379	2422796-2826916	217.203	0.12900
<i>DLX5</i>	7	rs12533469	96487458	0.859	0.0229	1	5	5	0.01	96487637-96492079	8.556	0.13700
<i>SLC22A2</i>	6	rs2450974	160558735	1.331	0.0088	7	45	8	0.00625	160557783-160599953	94.493	0.13900
<i>FAM50B</i>	6	rs3196512	3796544	1.17	0.0128	1	6	5	0.01	3794630-3796550	10.517	0.14100
<i>MIR371A</i>	19	rs12460972	58982309	0.877	0.065	0	4	4	0.0125	58982740-58982807	6.385	0.16500
<i>PRIM2</i>	6	rs1618210	57292838	1.141	0.0473	2	28	15	0.003333	57290380-57621335	41.679	0.16900
<i>NNAT</i>	20	rs3795148	35581911	0.91	0.1862	0	1	1	0.05	35583020-35585504	1.747	0.16900
<i>WIF1</i>	12	rs3782497	63746341	0.764	0.0442	1	18	7	0.007143	63730670-63801613	27.303	0.17200
<i>MAGI2</i>	7	rs1978326	78013532	0.658	0.0043	38	588	417	0.00012	77484309-78920826	2023.158	0.18400
<i>KLF14</i>	7	rs290804	130071412	1.131	0.0952	0	3	2	0.025	130067935-130069428	5.099	0.18700
<i>PLAGL1</i>	6	rs9403542	144347261	1.172	0.0133	4	41	34	0.001471	144303129-144427428	55.471	0.20000
<i>NDN</i>	15	rs699328	21480200	0.916	0.2142	0	1	1	0.05	21481646-21483543	1.543	0.20300
<i>BLCAP</i>	20	rs10854179	35589783	0.906	0.1684	0	3	2	0.025	35579232-35589747	4.529	0.20800
<i>ANO1</i>	11	rs3740722	69711744	0.764	0.003	2	61	43	0.001163	69602055-69713299	78.126	0.21200

<i>ZNF331</i>	19	rs2708771	58720819	0.803	0.006	2	38	24	0.002083	58715988-58775335	48.244	0.23400
<i>MEST1</i>	7	rs1990786	129912737	0.888	0.1677	0	2	0	0	129914133-129918249	2.566	0.24400
<i>SNORD64</i>	15	rs1991274	22781495	0.843	0.1919	0	2	1	0.05	22781339-22781406	2.612	0.24900
<i>KCNQ1OT1</i>	11	rs4930139	2587879	0.853	0.0424	2	33	23	0.002174	2586133-2677804	40.133	0.25500
<i>SNORD108</i>	15	rs1991274	22781495	0.843	0.1919	0	2	1	0.05	22783164-22783233	2.612	0.26000
<i>L3MBTL1</i>	20	SNP20-41598136	41598136	1.264	0.0304	2	13	11	0.004545	41569733-41603949	15.499	0.27000
<i>HYMAI</i>	6	rs9321957	144373184	0.912	0.1565	0	2	2	0.025	144365727-144371560	2.414	0.27900
<i>COPG2</i>	7	rs10128	129938930	0.826	0.0659	0	21	9	0.005556	129933315-130004138	24.069	0.29000
<i>SNORD109A</i>	15	rs1977036	23074798	1.004	0.9647	0	1	1	0.05	23074582-23074649	0.002	0.306
<i>MEST</i>	7	rs1990786	129912737	0.888	0.1677	0	5	1	0.05	129913251-129933374	5.444	0.30700
<i>SLC22A18</i>	11	rs427398	2895626	0.885	0.0451	1	24	20	0.0025	2877526-2903052	26.67	0.31300
<i>MIR296</i>	20	rs6026544	56827815	0.942	0.3293	0	1	1	0.05	56826064-56826144	0.952	0.315
<i>DLK1</i>	14	rs10132598	100269286	1.101	0.2304	0	3	3	0.016667	100262954-100271220	3.07	0.32000
<i>TFPI2</i>	7	rs4517	93353929	1.149	0.0474	1	5	5	0.01	93352644-93358239	5.626	0.32900
<i>IGF2-AS</i>	11	rs3741205	2126460	1.121	0.097	0	12	8	0.00625	2118333-2126472	13.351	0.33700
<i>NTM</i>	11	rs656644	131287579	0.812	0.0067	18	421	299	0.000167	130745580-131711926	450.612	0.34000
<i>MIR483</i>	11	rs3213223	2113506	0.906	0.1919	0	4	3	0.016667	2111939-2112015	4.265	0.34400
<i>WT1-AS</i>	11	rs7946086	32417666	0.906	0.1577	0	5	4	0.0125	32413860-32418196	4.887	0.35400
<i>GRB10</i>	7	rs11770199	50653096	0.748	0.0003	2	57	39	0.001282	50625253-50828653	57.645	0.37800
<i>ZNF215</i>	11	rs1388534	6923075	1.406	0.0245	1	18	11	0.004545	6904229-6935854	17.614	0.39300
<i>PEG3</i>	19	rs1010231	62026441	0.916	0.1642	0	11	5	0.01	62015659-62016973	12.39	0.40700
<i>PHLDA2</i>	11	rs4758535	2905210	0.894	0.2798	0	2	1	0.05	2906078-2907226	1.572	0.410
<i>MEG3</i>	14	rs4906024	100391479	0.803	0.0117	2	53	23	0.002174	100362197-100397113	48.32	0.42500
<i>ZFAT</i>	8	rs12541381	135719030	1.157	0.0487	1	111	77	0.000649	135559212-135794474	106.931	0.44700
<i>ZNF597</i>	16	rs12737	3426286	0.857	0.0619	0	9	5	0.01	3426110-3433491	7.82	0.45200
<i>ZIM2</i>	19	rs2286751	61985206	0.89	0.1217	0	18	10	0.005	61977739-62043909	15.906	0.45200
<i>LIN28B</i>	6	rs12215957	105511206	1.437	0.0195	1	14	11	0.004545	105511615-105637900	12.547	0.46200
<i>GLIS3</i>	9	rs1340252	4121657	1.241	0.0015	18	334	243	0.000206	3814127-4290035	665.281	0.46300
<i>SNURF</i>	15	rs2732020	22773397	0.775	0.0212	1	9	4	0.0125	22751227-22774822	7.133	0.48200

<i>SNORD115-1</i>	15	rs2714732	22965530	1.075	0.2518	0	2	2	0.025	22966962-22967044	1.364	0.482
<i>KCNK9</i>	8	rs7828107	140756023	0.859	0.0159	1	46	34	0.001471	140693985-140784481	42.4	0.48300
<i>KCNQ1DN</i>	11	rs2239897	2848541	0.924	0.4892	0	1	1	0.05	2847838-2849911	0.478	0.490
<i>TP73</i>	1	rs7515164	3644607	0.768	0.0495	1	41	33	0.001515	3558988-3642625	77.825	0.50100
<i>RTL1</i>	14	rs11851174	100415257	0.911	0.2339	0	5	5	0.01	100416744-100420937	3.948	0.50400
<i>ZFAT-AS1</i>	8	rs879104	135678719	1.082	0.2413	0	11	2	0.025	135679495-135682114	7.34	0.51900
<i>MKRN3</i>	15	rs12148893	21364755	0.74	0.1799	0	5	4	0.0125	21361546-21364259	3.579	0.54200
<i>SGK2</i>	20	rs763227	41638475	0.868	0.0618	0	16	14	0.003571	41621048-41647687	12.722	0.55900
<i>MIR298</i>	20	rs6026544	56827815	0.942	0.3293	0	2	2	0.025	56826675-56826763	0.994	0.571
<i>DDC</i>	7	rs930707	50587172	1.667	0.0315	2	49	23	0.002174	50493627-50600648	39.746	0.57300
<i>PPP1R9A</i>	7	rs10233060	94642028	1.279	0.0218	4	111	41	0.00122	94374884-94763663	84.442	0.58200
<i>PEG10</i>	7	rs10239188	94137365	0.88	0.2355	0	5	4	0.0125	94123572-94136942	3.276	0.60000
<i>ATP10A</i>	15	rs11161237	23633521	1.689	0.0008	5	107	80	0.000625	23474952-23659442	93.622	0.60100
<i>MIMT1</i>	19	rs373361	62051244	1.058	0.5981	0	1	1	0.05	62044081-62051734	0.278	0.606
<i>SGCE</i>	7	rs10274271	94117082	0.887	0.1348	0	10	2	0.025	94052471-94123457	6.508	0.61100
<i>NPAP1</i>	15	rs12902137	22475756	1.08	0.2766	0	11	7	0.007143	22471633-22479686	6.508	0.618
<i>PSIMCT-1</i>	20	rs6059929	29601093	0.921	0.31	0	3	3	0.016667	29598845-29599680	1.317	0.626
<i>DIRAS3</i>	1	rs11801053	68284759	0.855	0.3727	0	5	3	0.016667	68284232-68289048	2.401	0.665
<i>IGF2R</i>	6	rs8191821	160391742	0.703	0.0237	3	93	48	0.001042	160310120-160447573	69.024	0.69600
<i>MAGEL2</i>	15	rs11161318	21439359	0.881	0.2069	0	5	3	0.016667	21439788-21444086	1.982	0.69900
<i>CTNNB1</i>	3	rs4135385	41254444	1.094	0.2173	0	7	5	0.01	41215945-41256943	3.576	0.71500
<i>NAA60</i>	16	rs17793994	3474832	1.605	0.0897	0	19	10	0.005	3433668-3476964	9.651	0.72300
<i>DGCR6</i>	22	rs2005883	17276464	0.862	0.0942	0	9	8	0.00625	17273735-17279601	5.003	0.72900
<i>PWRN1</i>	15	rs8025557	22377651	1.067	0.3095	0	4	3	0.016667	22354396-22384019	1.221	0.742
<i>UBE3A</i>	15	rs7167529	23198484	0.909	0.2036	0	13	9	0.005556	23133488-23235268	6.474	0.75700
<i>INPP5F</i>	10	rs3847492	121575588	1.102	0.1909	0	18	13	0.003846	121475548-121578652	8.873	0.75900
<i>OSBPL5</i>	11	rs7928630	3136036	1.151	0.0244	1	49	41	0.00122	3064921-3143158	32.886	0.76600
<i>RBP5</i>	12	rs3829815	7166783	1.113	0.1463	0	6	5	0.01	7167553-7172733	2.566	0.77400
<i>CPA4</i>	7	rs10253631	129736749	1.394	0.1121	0	18	10	0.005	129720209-129751256	6.953	0.78600
<i>GNAS-AS1</i>	20	rs6026560	56859923	0.921	0.2851	0	17	8	0.00625	56827367-56859353	4.977	0.820

<i>ZDBF2</i>	2	rs13000757	206854151	0.944	0.3494	0	11	5	0.01	206847767-206887393	1.899	0.827
<i>SNRPN</i>	15	rs2732020	22773397	0.775	0.0212	1	70	60	0.000833	22619886-22774822	50.596	0.82800
<i>DGCR6L</i>	22	rs1210829	18688800	1.112	0.5138	0	3	2	0.025	18681760-18687628	0.497	0.830
<i>RBI</i>	13	rs2854344	47895694	1.173	0.2371	0	25	8	0.00625	47775883-47954027	9.423	0.83900
<i>H19</i>	11	rs217228	1971285	1.062	0.3557	0	9	5	0.01	1972981-1975641	2.501	0.842
<i>NAPIL5</i>	4	rs2924358	89834752	1.191	0.3454	0	4	4	0.0125	89836088-89838046	1.353	0.846
<i>INS</i>	11	rs689	2138800	1.037	0.5978	0	3	3	0.016667	2137584-2139015	0.841	0.859
<i>NLRP2</i>	19	rs269913	60173481	0.915	0.1499	0	21	16	0.003125	60168463-60204322	8.976	0.86200
<i>LRRTM1</i>	2	SNP2-80383573	80383573	0.915	0.6406	0	2	2	0.025	80382513-80384998	0.218	0.889
<i>SLC22A3</i>	6	rs8187724	160777939	0.598	0.0285	1	97	20	0.0025	160689394-160793601	10.44	0.99700

¹ Chromosomal location; ² Base-Pair Position of most significant SNP in single locus analysis; ³ Odds ratio; ⁴ *P*-value from single site analysis; ⁵ Gene start and stop position; ⁶ *P*-value from gene-based analysis

Supplementary Table 2. Significant windows in 3 genes in haplotype analysis

Gene	Window ¹	Haplotype	Control Frequency	Case Frequency	Total Frequency	Global P ²
<i>GPR1</i> (12) ³	rs2010572 rs16838070 rs6715398 rs16838083	AAAA	0.000789763	NA	0.000328235	0.024761
		AAGA	0.083084537	0.100445689	0.093065832	
		AAGC	0.034322224	0.037522488	0.036131902	
		AGAA	0.50912673	0.487606497	0.496781592	
		AGGA	0.309922317	0.306602026	0.307999252	
		AGGC	0.002733553	0.000433671	0.00144241	
		GAGA	0.059367059	0.06738962	0.063981113	
		GAGC	5.90E-07	NA	1.53E-08	
		GGAA	NA	NA	1.77E-11	
		GGGA	0.000653227	NA	0.00026965	
<i>ZC3H12C</i> (24)	rs10891068 rs10891069 rs622822 rs17110877	AAAA	0.000531259	0.001186979	0.00090704	0.009801
		AACA	NA	7.92E-10	2.29E-10	
		AACG	0.27347313	0.235063989	0.251425961	
		GACG	0.002091647	0.001161893	0.00155762	
		GGAA	0.705625951	0.736886981	0.723592859	
		GGAG	0.000522215	0.000388909	0.000445883	
		GGCA	0.000523374	0.004761051	0.002934515	
		GGCG	0.017232423	0.020550198	0.019136121	
	rs661171 rs648594 rs10891068 rs10891069	AAAA	0.001087091	NA	0.000449939	0.012049
		AAGG	0.020643165	0.015043506	0.017453215	
		AGAA	0.000934797	0.000674566	0.000786042	
		AGGG	0.26961052	0.276636366	0.273634948	
		CAAA	0.271982479	0.235576382	0.251097013	
		CAGA	0.002091679	0.001166899	0.001561587	
		CAGG	0.41870498	0.449945809	0.43661882	

		CGAA	4.73E-10	1.99E-08	3.33E-09	
		CGGG	0.014945287	0.020956451	0.018398434	
	rs1564011 rs1381466 rs610086 rs661171	AAAC	0.000524483	0.0003716	0.000443274	0.022271
		AAGA	5.29E-09	0.000752222	0.0004545	
		AAGC	0.276091077	0.243192226	0.257189348	
		AGAA	0.250227174	0.254779376	0.252834344	
		AGAC	0.007075217	0.011309129	0.009504191	
		AGGA	NA	0.00087843	0.000443665	
		AGGC	0.003660331	0.006559489	0.005377715	
		CAGA	0.000524309	NA	0.000181184	
		CAGC	NA	0.000807088	0.000498965	
		CGAA	0.000523856	NA	0.000223971	
		CGAC	NA	3.57E-09	3.99E-10	
		CGGA	0.041000229	0.035966036	0.038198384	
		CGGC	0.420373317	0.445384401	0.434650459	
	rs648594 rs10891068 rs10891069 rs622822	AAAA	0.000532446	0.000800246	0.000685131	0.022690
		AAAC	0.272543877	0.234761819	0.250857387	
		AGAC	0.002091658	0.001161894	0.001557621	
		AGGA	0.421544207	0.438840423	0.431510546	
		AGGC	0.017797207	0.025820311	0.022365303	
		GAAC	0.000928052	0.000688903	0.000790482	
		GGGA	0.284562549	0.297926405	0.29223353	
		GGGC	4.00E-09	2.21E-11	1.33E-10	
	rs7117957 rs1564011 rs1381466 rs610086	AAAG	NA	NA	3.01E-13	0.025141
		AAGG	NA	0.000394852	0.00022587	
		ACAG	9.23E-12	0.001177239	0.000565001	
		ACGA	0.00052379	NA	0.000267003	
		ACGG	0.438907991	0.465084017	0.454001881	
		CAAA	0.000523878	4.98E-09	0.000313083	

		CAAG	0.276092295	0.243945009	0.257688	
		CAGA	0.257303063	0.266460103	0.262425955	
		CAGG	0.003659052	0.007028372	0.005586511	
		CCAG	0.000523702	NA	0.000203041	
		CCGG	0.02246623	0.015910403	0.018723654	
	rs660222 rs7117957 rs1564011 rs1381466	ACAA	0.274263179	0.242164154	0.255906401	0.026424
		ACAG	0.259661664	0.270950199	0.26606435	
		ACCA	0.000703994	NA	0.000277696	
		ACCG	0.022260515	0.014771007	0.017991659	
		GAAA	NA	0.000393878	0.000225483	
		GAAG	NA	2.70E-07	1.47E-06	
		GACA	4.90E-10	0.00108491	0.000641326	
		GACG	0.438935281	0.465206835	0.453997466	
		GCAA	0.002172701	0.001435262	0.001719676	
		GCAG	0.001480744	0.002876945	0.002318614	
		GCCG	0.000521921	0.001116539	0.00085586	
	rs10891069 rs622822 rs17110877 rs1026608	AAAG	0.000538708	0.001194559	0.000916111	0.028373
		ACAG	NA	7.89E-10	7.89E-11	
		ACGA	0.003664211	0.001163247	0.002227643	
		ACGG	0.271861943	0.235024397	0.250715614	
		GAAA	0.704586832	0.735746614	0.722495012	
		GAAG	0.001031667	0.001132623	0.001088714	
		GAGG	0.000522214	0.000388893	0.000445877	
		GCAA	0.000523377	0.004761214	0.002934577	
		GCGA	NA	0.000388152	0.000222758	
		GCGG	0.017271047	0.0202003	0.018953693	
	rs622822 rs17110877 rs1026608 rs1026607	AAAA	0.704063682	0.735802853	0.722291882	0.032253
		AAAG	0.000521926	NA	0.000222471	
		AAGG	0.001571615	0.002327447	0.002005877	

		AGGG	0.000523141	0.000389416	0.000446459	
		CAAA	0.000523362	0.00238093	0.001580339	
		CAAG	NA	0.002323782	0.001333846	
		CAGG	NA	1.01E-10	2.22E-11	
		CGAA	0.003659303	0.001552854	0.002450519	
		CGGG	0.289136971	0.255222719	0.269668607	
<i>DLGAP2</i> (89)	rs4256621 rs4876115 rs6558504 rs17064153	AAAG	NA	3.26E-08	9.68E-09	
		AAGA	0.259394572	0.265298218	0.262783459	
		GAAA	0.482961391	0.503016646	0.494491506	
		GAAG	NA	0.000435714	0.000247163	0.003875
		GAGA	0.058270342	0.047283471	0.051948737	
		GAGG	NA	4.08E-11	1.46E-11	
		GGGA	0.096555324	0.109653407	0.104071095	
		GGGG	0.102818372	0.074312511	0.086458029	
	rs4876115 rs6558504 rs17064153 rs4552929	AAAA	2.92E-10	0.000550166	0.000317278	
		AAAG	0.482195107	0.503431042	0.494384376	
		AAGG	NA	0.00038842	0.000223062	
		AGAA	0.056245577	0.045678253	0.05014931	
		AGAG	0.26218562	0.265986201	0.264396851	0.0052
		GAAA	5.61E-13	NA	2.27E-13	16
		GAAG	7.78E-10	5.86E-11	1.34E-10	
		GGAA	0.094897272	0.106753765	0.101700774	
		GGAG	0.001658051	0.002852316	0.00234621	
		GGGA	7.39E-11	2.01E-10	1.33E-10	
		GGGG	0.102818372	0.074359837	0.08648214	
	rs7005715 rs2977176 rs11987205	AAAA	7.00E-09	NA	4.23E-11	0.0053
		AAGA	0.168347284	0.150857208	0.158265968	73
		AAGA	0.070307861	0.073735342	0.072244	

	rs2977177	ATAA	2.49E-08	7.21E-08	2.57E-08	
		ATAG	0.188437509	0.237702668	0.217006193	
		ATGA	0.033241344	0.019114469	0.024916005	
		ATGG	0.014846863	0.016088459	0.015600306	
		GAGA	0.002708366	0.004111216	0.003498548	
		GTAA	0.438963801	0.418357159	0.426893211	
		GTGA	0.08314694	0.080033406	0.081575743	
		GTGG				
	rs2293909 rs11787218 rs7825359 rs4876123	AAGA	NA	9.61E-11	1.30E-12	
		AAGG	NA	0.00192106	0.001072747	
		AGAA	0.525895602	0.503977424	0.512992596	
		AGAG	0.174275339	0.195792624	0.186960332	
		AGGA	9.47E-06	0.000492771	0.00037037	
		AGGG	0.034150955	0.046073286	0.040929137	0.0080
		GAAA	NA	1.09E-10	2.44E-11	83
		GAGA	NA	NA	4.33E-10	
		GAGG	0.049039034	0.058204437	0.054363128	
		GGAA	0.004957086	0.009037917	0.007504073	
		GGAG	0.002074478	0.00110683	0.001302448	
		GGA	0.003905288	0.003316213	0.003480985	
		GGG	0.205692746	0.180077437	0.191024184	
	rs7465223 rs2293909 rs11787218 rs7825359	AAAG	NA	0.001931515	0.00105125	
		AAGA	0.694030766	0.690741419	0.692096333	
		AAGG	0.004584529	0.007830218	0.006453557	
		AAGG	0.04953923	0.058101122	0.05456069	
		AGAG	NA	0.000407168	0.000233204	0.0136
		AGGA	0.00287662	0.00201661	0.002366335	38
		AGGG	0.006284655	0.008946127	0.007887492	
		GAGA	0.029442431	0.038807886	0.034841142	
		GAGG	8.75E-05	3.45E-09	1.12E-08	
		GGAG	0.006887085	0.009820081	0.00854242	

		GGA GGG	0.206267199	0.181397851	0.191967565	
	rs17064153 rs4552929 rs9644313 rs9644258	AAAG AAGA AGAA AGAG AGGA AGGG GAAA GGAA GGGA	6.51E-10 0.152821949 0.000532901 0.259915877 0.482866444 0.001044456 3.16E-09 0.102290829 0.000527539	1.07E-09 0.152982182 0.000389204 0.263361013 0.508131602 0.000387742 1.29E-09 0.074748256 NA	3.21E-10 0.152890459 0.000449768 0.261893482 0.497393516 0.000667573 1.08E-09 0.086481059 0.000224142	0.0154 21
	rs17749622 rs6992443 rs7005715 rs2977176	AAAA AAAT AAGA AAGT ATAA ATAT GAAA GAAT GAGA GAGT GTAA GTAT GTGT	0.06406239 0.013705466 0.00804555 0.044144806 3.51E-08 NA 0.104274142 0.222720879 0.006812005 0.479755133 3.25E-08 0.055571085 0.000908477	0.054010459 0.008545343 0.010078203 0.032233084 NA 9.03E-05 0.096099242 0.24815894 0.006249232 0.470029722 0.000600924 0.073904543 NA	0.058315376 0.010609415 0.009240011 0.037442122 6.89E-09 5.40E-09 0.099547241 0.23751017 0.006622238 0.473846776 0.000198898 0.066251079 0.000416661	0.015489
	rs7836020 rs4471073 rs11136419 rs2235114	AAGA AAGG AGAA	1.11E-08 0.000861324 0.36710215 0.052182652	2.17E-09 4.55E-10 0.364698572 0.070235585	4.56E-09 0.000394057 0.365905144 0.062335743	0.017812

		AGAG	NA	0.000837047	0.000366445	
		GAAA	0.003679751	0.001103112	0.002313039	
		GAAG	0.005330661	0.005053639	0.005165353	
		GAGA	0.114867292	0.092545119	0.102035699	
		GAGG	0.28757968	0.302816374	0.296315652	
		GGAA	0.16574817	0.16271055	0.164048158	
		GGAG	0.001260984	NA	0.000503837	
		GGGA	0.001387324	NA	0.000616869	
		GGGG				
	rs7825359 rs4876123 rs17749622 rs6992443	AAAA	0.028099135	0.017196391	0.022125645	
		AAGA	0.502151677	0.493553113	0.496791485	
		AAGT	NA	0.002266193	0.001402281	
		AGAA	0.007262265	0.004276532	0.005298481	
		AGAT	6.74E-06	0.000678394	0.000361527	
		AGGA	0.158170862	0.181489627	0.171855248	
		AGGT	0.011511826	0.010454545	0.010924781	0.018923
		GAAA	0.000432509	NA	0.000100999	
		GAGA	0.003503231	0.003817102	0.003771448	
		GAGT	NA	NA	1.74E-11	
		GGAA	0.094157598	0.082806079	0.087720284	
		GGAT	NA	2.10E-09	3.35E-10	
		GGGA	0.149777514	0.142520568	0.145641885	
		GGGT	0.044926643	0.060941454	0.054005935	
	rs6558504 rs17064153 rs4552929 rs9644313	AAAG	0.002153503	0.000818349	0.000451947	
		AAGA	0.481110189	0.001128631	0.001596985	
		AAGG	NA	0.500774551	0.492382156	
		AGGA	8.51E-08	0.000391458	0.000225016	0.023393
		GAAA	0.1503212	2.40E-05	4.39E-07	
		GAAG	0.258460132	0.15213988	0.151399814	
		GAGA	0.005136519	0.262602136	0.26078272	
				0.00776424	0.006680738	

		GAGG GGGA GGGG	0.102158636 0.000659735	0.074356799 NA	0.08623286 0.000247326	
	rs9644258 rs9644315 rs10448097 rs7836020	AAAA AAAG AAGA AAGG ACAG ACGA ACGG GAAA GAAG GAGA GAGG GCAG GCGA	NA 0.1021026 0.009165058 0.144034679 0.000632141 0.403695827 0.079409361 0.00381786 0.25357266 0.000774658 0.000102422 NA 0.002692734	0.000513822 0.073873467 0.008655355 0.146166664 0.001319561 0.424408831 0.081398178 0.000514124 0.261889018 0.000414893 0.000418952 1.39E-10 0.000427134	0.000292547 0.085857054 0.008968036 0.145009759 0.001042293 0.415806385 0.080517575 0.001850125 0.258445753 0.000529444 0.000492618 1.71E-10 0.001188412	0.024353
	rs9644313 rs9644258 rs9644315 rs10448097	AAAA AAAG AGAA AGAG AGCG GAAA GAAG GACA GACG GGAG GGCA GGCG	0.102141561 0.000818629 0.257460398 0.001691833 0.000630861 NA 0.151457516 0.000523301 0.484098659 NA 1.06E-09 0.001177241	0.074108461 0.001142672 0.262446073 0.000266082 0.000533047 0.000390083 0.15256013 0.001165374 0.506969531 0.000418546 NA NA	0.086030231 0.001021102 0.260341228 0.000880697 0.000551937 0.000224621 0.152067913 0.000891693 0.497258303 0.000243321 1.61E-12 0.000488955	0.024726
	rs4552929		0.000298347	NA	3.00E-05	0.026559

	rs9644313 rs9644258 rs9644315	AAGA AGAA AGAC GAAA GAGA GAGC GGAA GGAC GGGA GGGC	0.150023025 5.67E-09 0.102936149 0.258729072 0.000755484 0.001583344 0.484497142 NA 0.001177431	0.152982184 NA 0.075259907 0.262836941 0.000390909 0.001899078 0.50619601 0.000434971 NA	0.151816511 5.60E-10 0.087044426 0.261091518 0.000642532 0.001762564 0.496870727 0.000253072 0.000488664	
	rs11787218 rs7825359 rs4876123 rs17749622	AGAG AGGA AGGG GAAA GAAG GAGA GAGG GGAA GGAG GGGA GGGG	1.01E-08 0.000627594 0.048565142 0.028451248 0.502438329 0.006301601 0.170011328 0.000437506 0.003505203 0.094140298 0.145521741	NA NA 0.060145862 0.017724161 0.495264264 0.003757772 0.193168598 NA 0.003835286 0.083475464 0.142628593	1.49E-12 0.000266421 0.055238937 0.022594432 0.497927244 0.004584971 0.183652802 0.000100279 0.00378505 0.088060834 0.143789031	0.026743
	rs4471073 rs11136419 rs2235114 rs4876121	AAAG AAGA AAGG AGAG AGGA AGGG GAAA GAAG GAGA	2.72E-10 0.001701839 0.001968812 0.005014851 0.001105556 0.114947981 NA 0.655465079 0.156044187	0.000594598 0.000246078 0.001096748 0.004877615 0.000980664 0.091740481 4.94E-12 0.667826881 0.159501376	0.000325712 0.000862145 0.00148738 0.004931386 0.001038891 0.101627033 3.16E-12 0.66258532 0.158028417	0.027863

		GAGG	0.061086307	0.073135558	0.067990929	
		GGAG	0.000793557	NA	0.000340749	
		GGGA	0.000334221	NA	0.000141689	
		GGGG	0.001537609	NA	0.00064035	
	rs7837154 rs6980953 rs7839980 rs4876113	CAAG	5.83E-07	7.14E-12	6.59E-10	0.028939
		CACG	NA	2.30E-10	1.64E-10	
		CGAA	0.388080993	0.419727625	0.406245251	
		CGCA	NA	3.47E-11	3.97E-11	
		CGCG	NA	0.000387299	0.0002225	
		GAAA	NA	1.76E-09	1.06E-12	
		GAAG	0.00052348	0.001658729	0.001155731	
		GACA	0.00052299	0.000774594	0.00066758	
		GACG	0.254694074	0.22955738	0.240284114	
		GGAA	0.35617788	0.347111624	0.350977138	
		GGCA	NA	0.000782747	0.000447685	
	rs35821406 rs13280292 rs11988994 rs7837154	CAAC	NA	4.59E-07	2.70E-06	0.032271
		CAAG	NA	0.000393778	0.000223394	
		CAGG	0.19516877	0.178063409	0.18535265	
		CGAC	0.000522263	0.001458089	0.001005019	
		CGAG	1.25E-06	0.000492568	0.000336437	
		CGGG	0.002110048	0.003537959	0.002929517	
		GAAG	NA	0.000383598	0.000220677	
		GAGG	0.002117243	0.003569071	0.00294817	
		GGAC	0.386978538	0.418595799	0.405119342	
		GGAG	0.412079044	0.392382698	0.400782873	
		GGGC	0.000522626	NA	0.000280514	
		GGGG	0.000500216	0.001122574	0.000798712	
	rs11136415 rs736235	AAAA	NA	0.000167098		
		AAGA	0.001635554	0.001815054	1.75E-07	

	rs7009291 rs2956943	AAGG ACAG ACGA ACGG GAAA GCAA GCAG GCGA GCGG	0.25880286 0.000532583 0.300058497 2.68E-09 NA 0.056747842 0.00176657 0.366607309 0.013848783	0.241627437 NA 0.286052459 0.003645466 1.66E-08 0.050120653 0.001652107 0.410855511 0.0040642	0.001838838 0.248939111 0.000254667 0.292017818 0.002011636 5.70E-12 0.05287629 0.001835001 0.392106988 0.008119477	
	rs4876123 rs17749622 rs6992443 rs7005715	AAAA AAAG AGAA AGAG AGTA GAAA GAAG GATA GGAA GGAG GGTA GGTG	0.008435813 0.017760032 0.091439309 0.417462839 1.81E-09 0.06633984 0.037422558 3.74E-09 0.238429691 0.066175769 0.055689372 0.000844773	0.005591544 0.011936561 0.078265248 0.41847067 0.002430287 0.057991923 0.029437349 2.10E-08 0.265293143 0.05874566 0.071837594 NA	0.006862141 0.014411174 0.083456069 0.41815666 0.00154133 0.06142596 0.032907655 5.13E-09 0.254400778 0.061676969 0.064745909 0.00041535	0.036296
	rs4876086 rs1990126 rs9918795 rs7815979	AAAG AAGG AGGA AGGG GAAG GAGA GAGG GGAA	NA 0.218679491 0.00123304 0.000863835 0.100729343 NA 0.002616219 1.19E-09	5.09E-12 0.240484643 0.002223069 0.00245108 0.082106892 0.00044257 0.004226813 NA	6.12E-13 0.231267 0.00181124 0.001695204 0.08997081 0.00025667 0.003536755 4.76E-11	0.041505

		GGAG	0.000523266	1.53E-09	0.000291529	
		GGGA	0.490938149	0.496947064	0.494374954	
		GGGG	0.184416658	0.171117867	0.176795839	
	rs17748677 rs4876086 rs1990126 rs9918795	AAAG	0.218680848	0.240484947	0.231249099	0.043754
		AAGG	0.00122247	0.003485327	0.002443969	
		AGAA	0.100728083	0.08210689	0.089989027	
		AGAG	0.002416561	0.00348187	0.002958109	
		AGGA	0.000524526	NA	0.000273311	
		AGGG	0.500018326	0.505263822	0.503121886	
		CAAG	1.60E-09	3.86E-09	1.61E-09	
		CAGG	0.000874122	0.00118851	0.00108147	
		CGAG	0.000199558	0.001189089	0.000836085	
		CGGG	0.175335504	0.162799538	0.16804704	
	rs6558479 rs17748677 rs4876086 rs1990126	AAAA	0.00179726	0.000461026	0.0010416	0.044639
		AAAG	NA	NA	8.15E-11	
		AAGA	0.00092919	1.02E-09	0.000389786	
		AAGG	0.354283559	0.336537023	0.344097586	
		ACGG	0.00154949	0.001111942	0.001291837	
		GAAA	0.216977309	0.240037509	0.230196868	
		GAAG	0.001619112	0.003466077	0.002701906	
		GAGA	0.102321267	0.085688446	0.092777208	
		GAGG	0.145663118	0.168630694	0.158827006	
		GCAA	NA	NA	2.30E-10	
		GCAG	0.00073915	0.00119418	0.000992826	
		GCGA	2.59E-08	0.001203683	0.000707287	
		GCGG	0.17412052	0.161669419	0.166976091	
	rs10448097 rs7836020 rs4471073	AAGA	0.003469337	0.001005137	0.002037272	0.045250
		AGAA	0.001773597	0.001939499	0.00171978	

	rs11136419	AGAG	0.116132009	0.088895374	0.100432356	
		AGGA	0.236770224	0.246269983	0.24246273	
		AGGG	0.001980094	NA	0.000835633	
		GAAA	2.21E-09	NA	1.21E-10	
		GAAG	0.000872994	NA	0.000403953	
		GAGA	0.415803805	0.433929023	0.426193724	
		GGAA	0.001897522	1.11E-08	0.000957275	
		GGAG	0.004062915	0.008703387	0.006760406	
		GGGA	0.2165658	0.219257587	0.217911185	
		GGGG	0.0006717	NA	0.000285686	

¹Four SNPs represented in the haplotype window; ²P value for association of all haplotypes at corresponding four SNPs tested; ³Number of windows tested in gene.