

**Supplemental Table 4.** SNV known or suggestive signals (P<7.0E-06).

phenotype	dbSNPID	chr:pos	SKATgene	snp annotation	Ref	Alt	N	EAF	beta	se	direction	pval
Epi low 2	rs12566888	1:156869047	<i>PEAR1</i>	intronic	G	T	3797	0.094	-0.291	0.040	---	2.98E-13
ADP low 1	rs12566888	1:156869047	<i>PEAR1</i>	intronic	G	T	4047	0.098	-0.271	0.038	---	1.26E-12
ADP low 2	rs12566888	1:156869047	<i>PEAR1</i>	intronic	G	T	3697	0.095	-0.283	0.040	---	2.53E-12
Epi hgh 2	rs12566888	1:156869047	<i>PEAR1</i>	intronic	G	T	3798	0.094	-0.275	0.040	---	6.15E-12
Epi low 1	rs12566888	1:156869047	<i>PEAR1</i>	intronic	G	T	3607	0.096	-0.269	0.041	---	3.27E-11
Collagen 1	rs1671152	19:55526345	<i>GP6</i>	nonsynonymous	T	G	3753	0.835	-0.199	0.033	++	1.01E-09
Collagen 2	rs1671152	19:55526345	<i>GP6</i>	nonsynonymous	T	G	3753	0.835	-0.198	0.033	---	1.44E-09
Collagen 4	rs1671152	19:55526345	<i>GP6</i>	nonsynonymous	T	G	3742	0.835	-0.194	0.033	++	2.71E-09
ADP high 2	rs12566888	1:156869047	<i>PEAR1</i>	intronic	G	T	3794	0.095	-0.232	0.040	---	5.84E-09
Epi low 1	rs4545476	10:112922409	<i>exm2249039</i> (nearest <i>ADRA2A</i> )	intergenic	C	T	3607	0.375	-0.144	0.025	---	1.44E-08
Collagen 1	rs1613662	19:55536595	<i>GP6</i>	nonsynonymous	G	A	3753	0.832	-0.181	0.032	++	1.82E-08
Collagen 3	rs1671152	19:55526345	<i>GP6</i>	nonsynonymous	T	G	3753	0.835	-0.181	0.032	++	2.33E-08
Collagen 2	rs1654413	19:55526359	<i>GP6</i>	nonsynonymous	A	T	3753	0.820	-0.173	0.032	---	4.55E-08
Collagen 1	rs1654413	19:55526359	<i>GP6</i>	nonsynonymous	A	T	3753	0.820	-0.170	0.031	++	6.25E-08
Collagen 2	rs2304167	19:55527081	<i>GP6</i>	nonsynonymous	C	T	3753	0.820	-0.170	0.032	---	6.66E-08
Epi low 1	rs869244	10:112909105	<i>exm-rs869244</i> (nearest <i>ADRA2A</i> )	intergenic	G	A	3607	0.330	-0.140	0.026	---	7.59E-08
Collagen 2	rs1613662	19:55536595	<i>GP6</i>	nonsynonymous	G	A	3753	0.832	-0.174	0.032	---	7.84E-08
Epi hgh 2	rs10761731	10:65027610	<i>JMJD1C</i>	intronic	A	T	3798	0.428	0.129	0.024	++	9.72E-08
Epi low 2	rs869244	10:112909105	<i>exm-rs869244</i> (nearest <i>ADRA2A</i> )	intergenic	G	A	3797	0.331	-0.135	0.025	---	9.77E-08
Collagen 1	rs2304167	19:55527081	<i>GP6</i>	nonsynonymous	C	T	3753	0.820	-0.167	0.031	++	1.06E-07
Collagen 4	rs1654413	19:55526359	<i>GP6</i>	nonsynonymous	A	T	3742	0.820	-0.165	0.031	++	1.51E-07

Collagen 4	rs1613662	19:55536595	<i>GP6</i>	nonsynonymous	G	A	3742	0.832	-0.169	0.032	---	1.58E-07
Collagen 4	rs2304167	19:55527081	<i>GP6</i>	nonsynonymous	C	T	3742	0.820	-0.162	0.031	---	2.72E-07
Epi hgh 2	rs342293	7:106372219	<i>exm-rs342293</i> (nearest <i>PIK3CG</i> )	intergenic	C	G	3798	0.435	-0.121	0.024	---	3.24E-07
Epi low 2	rs342293	7:106372219	<i>exm-rs342293</i> (nearest <i>PIK3CG</i> )	intergenic	C	G	3797	0.435	-0.121	0.024	---	3.33E-07
Epi low 2	rs10761731	10:65027610	<i>JMJD1C</i>	intronic	A	T	3797	0.428	0.123	0.024	++-	3.35E-07
Epi low 2	rs4545476	10:112922409	<i>exm2249039</i> (nearest <i>ADRA2A</i> )	intergenic	C	T	3797	0.377	-0.126	0.025	---	3.78E-07
Collagen 3	rs1613662	19:55536595	<i>GP6</i>	nonsynonymous	G	A	3753	0.832	-0.161	0.032	---	5.29E-07
Epi high 1	rs4909945	11:10673739	<i>MRVII</i>	nonsynonymous	T	C	2730	0.659	-0.149	0.030	---	6.28E-07
Collagen 3	rs1654413	19:55526359	<i>GP6</i>	nonsynonymous	A	T	3753	0.820	-0.155	0.031	---	7.45E-07
Epi low 1	rs2914908	5:117982046	<i>exm2270115</i> (nearest <i>RPL11-2N5.2</i> )	intergenic	C	T	3607	0.490	0.120	0.024	+++	7.57E-07
Epi hgh 2	rs4909945	11:10673739	<i>MRVII</i>	nonsynonymous	T	C	3798	0.665	-0.126	0.026	---	7.87E-07
Epi high 1	rs7940646	11:10669228	<i>MRVII</i>	intronic	T	C	2730	0.658	-0.148	0.030	---	7.88E-07
ADP high 2	rs6943029	7:155762157	<i>exm-rs6943029</i> (nearest <i>SHH</i> )	intergenic	G	A	3794	0.072	0.222	0.046	+++	1.13E-06
ADP high 2	rs2263316	6:31421297	<i>HCP5</i>	intergenic	A	G	3794	0.650	0.123	0.025	+++	1.15E-06
Collagen 3	rs2304167	19:55527081	<i>GP6</i>	nonsynonymous	C	T	3753	0.820	-0.152	0.031	---	1.20E-06
Epi hgh 2	rs7940646	11:10669228	<i>MRVII</i>	intronic	T	C	3798	0.664	-0.124	0.025	---	1.25E-06
Epi hgh 2	rs10761779	10:65274927	<i>JMJD1C</i>	intergenic	A	G	3798	0.500	0.115	0.024	+++	1.82E-06
ADP high 1	rs7940646	11:10669228	<i>MRVII</i>	intronic	T	C	3275	0.662	-0.131	0.027	---	1.84E-06
Epi hgh 2	rs12355784	10:65121565	<i>JMJD1C</i>	intronic	C	A	3798	0.500	0.113	0.024	+++	2.54E-06
Epi hgh 2	rs869244	10:112909105	<i>exm-rs869244</i> (nearest <i>ADRA2A</i> )	intergenic	G	A	3798	0.330	-0.120	0.025	---	2.61E-06

Epi hgh 2	rs4545476	10:112922409	<i>exm2249039</i> (nearest <i>ADRA2A</i> )	intergenic	C	T	3798	0.377	-0.116	0.025	---	2.61E-06
Epi low 2	rs10761779	10:65274927	<i>JMJD1C</i>	intergenic	A	G	3797	0.501	0.113	0.024	+++	2.67E-06
ADP high 1	rs4909945	11:10673739	<i>MRVII</i>	nonsynonymous	T	C	3275	0.662	-0.129	0.027	---	2.72E-06
ADP high 1	rs1052763	22:19119751	<i>TSSK2</i>	nonsynonymous	C	T	3275	0.183	-0.154	0.033	---	3.08E-06
Epi low 2	rs4909945	11:10673739	<i>MRVII</i>	nonsynonymous	T	C	3797	0.665	-0.118	0.025	---	3.71E-06
Epi low 2	rs12355784	10:65121565	<i>JMJD1C</i>	intronic	C	A	3797	0.500	0.110	0.024	+++	4.26E-06
Collagen 3	rs7832232	8:38469303	<i>exm-rs7832232</i> (nearest <i>RNF5P1</i> )	intergenic	A	G	3753	0.474	0.109	0.024	+++	4.48E-06
Collagen 4	rs7832232	8:38469303	<i>exm-rs7832232</i> (nearest <i>RNF5P1</i> )	intergenic	A	G	3742	0.474	0.109	0.024	+++	4.70E-06
Epi low 1	rs144150699	3:54952554	<i>LRTM1</i>	nonsynonymous	G	C	3058	0.001	2.073	0.455	=++	5.26E-06
ADP low 1	rs4909945	11:10673739	<i>MRVII</i>	nonsynonymous	T	C	4047	0.668	-0.113	0.025	---	5.81E-06
ADP low 1	rs7940646	11:10669228	<i>MRVII</i>	intronic	T	C	4047	0.667	-0.112	0.025	---	6.28E-06
Epi low 2	rs7940646	11:10669228	<i>MRVII</i>	intronic	T	C	3797	0.664	-0.115	0.025	---	6.29E-06
Epi low 2	rs115780313	1:34254272	<i>CSMD2</i>	nonsynonymous	T	C	3797	0.002	1.300	0.288	++=	6.45E-06
Collagen 1	rs9267673	6:31883679	<i>C2</i>	intronic	C	T	3753	0.114	-0.173	0.039	---	6.88E-06