

Table S2. Association between mid-childhood peripheral blood DNA methylation with mid-childhood atopic sensitization, environmental and food allergen sensitization (top 30 methylation sites are presented here sorted by meta-analysis p-values).

CpG	CHR	Gene	Model 1		Model 2	
			Estimate	P value	Estimate	P value
cg04983687	16	<i>ZFPM1</i>	-9.08	2.87E-11	-9.14	5.96E-11
cg02427831	19	<i>SIGLEC8</i>	-19.67	3.89E-11	-19.05	4.53E-10
cg26791242	1	<i>LOC339524</i>	-17.35	6.49E-11	-17.46	1.21E-10
cg11770323	13	<i>NDFIP2</i>	-15.68	7.33E-11	-16.3	2.38E-11
cg02970679	17	<i>EPX</i>	-20.11	1.56E-10	-20.18	2.25E-10
cg13628444	9	<i>MED27</i>	-19.24	6.41E-10	-19.65	6.90E-10
cg21220721	1	<i>ACOT7</i>	-8.15	6.65E-10	-8.21	1.48E-09
cg09212118	1	<i>GUCA2A</i>	-17.16	7.16E-10	-16.99	2.58E-09
cg08698681	3	<i>TNIK</i>	-21.66	8.01E-10	-21.43	4.02E-09
cg10433549	17	--	-18.29	9.79E-10	-19.76	7.46E-11
cg26396815	4	<i>BANK1</i>	-22.73	1.28E-09	-23.48	5.40E-10
cg07948085	10	--	-22.84	1.29E-09	-22.82	5.28E-09
cg04406620	16	<i>CYB5B</i>	-16.31	1.51E-09	-16.32	3.97E-09
cg19434937	12	<i>LPCAT3</i>	-13.09	1.56E-09	-12.96	6.42E-09
cg07819010	11	--	-14.81	1.58E-09	-15.18	1.04E-09
cg24491618	7	<i>KCNH2</i>	-15.68	1.68E-09	-16.29	8.99E-10
cg00114012	9	<i>SLC2A8</i>	-15.16	1.69E-09	-15.81	6.31E-10
cg11988722	20	--	-13.39	2.38E-09	-13.39	5.48E-09
cg09596645	3	--	-18.93	2.54E-09	-19.18	2.49E-09
cg25173129	17	<i>EPX</i>	-18.22	2.65E-09	-18.61	2.62E-09
cg06391412	3	<i>FOXP1</i>	-17.87	2.94E-09	-18.56	1.04E-09
cg10704177	1	<i>PATJ</i>	-14.43	2.96E-09	-14.82	3.60E-09
cg00944309	5	--	-14.98	3.03E-09	-14.99	5.04E-09
cg04497992	16	<i>NHLRC4</i>	-13.59	3.27E-09	-13.72	8.46E-09
cg01916918	8	<i>CLU</i>	-21.89	3.68E-09	-22.77	3.70E-09
cg11456013	6	--	-15.5	3.71E-09	-15.25	1.20E-08
cg14769121	7	<i>SMURF1</i>	-17.77	3.75E-09	-17.61	5.23E-09
cg13054523	17	--	-16.96	4.87E-09	-16.98	1.89E-08
cg20885063	17	<i>ATPAF2</i>	-16.75	5.54E-09	-16.95	6.55E-09
cg06528816	2	<i>TTC7A</i>	-14.08	5.60E-09	-13.87	2.23E-08

CpG	CHR	Gene	Model 1		Model 2	
			Estimate	P value	Estimate	P value
cg02427831	19	<i>SIGLEC8</i>	-26.31	1.37E-16	-26.23	1.97E-15
cg04983687	16	<i>ZFPM1</i>	-11.08	7.11E-15	-11.43	9.38E-15
cg11988722	20	--	-17.96	6.51E-14	-18.08	2.53E-13
cg02475695	16	<i>NHLRC4</i>	-20.12	9.60E-14	-20.5	4.06E-13
cg19434937	12	<i>LPCAT3</i>	-17.26	9.80E-14	-17.75	2.30E-13
cg09212118	1	<i>GUCA2A</i>	-21.62	2.02E-13	-21.93	4.43E-13

cg02970679	17	<i>EPX</i>	-23.92	2.06E-13	-24.45	2.45E-13
cg26791242	1	<i>LOC339524</i>	-20.53	2.10E-13	-21.09	2.10E-13
cg21220721	1	<i>ACOT7</i>	-10.02	3.76E-13	-10.4	3.89E-13
cg13628444	9	<i>MED27</i>	-22.97	6.61E-13	-23.94	4.45E-13
cg00114012	9	<i>SLC2A8</i>	-18.93	6.81E-13	-20.01	1.52E-13
cg24491618	7	<i>KCNH2</i>	-19.48	8.17E-13	-20.62	2.83E-13
cg04497992	16	<i>NHLRC4</i>	-17.33	9.92E-13	-17.85	2.19E-12
cg25173129	17	<i>EPX</i>	-22.64	1.22E-12	-23.49	6.38E-13
cg18666454	7	<i>KCNH2</i>	-18.07	1.36E-12	-18.02	1.07E-11
cg07970948	7	<i>ZNF862</i>	-15.37	1.41E-12	-15.72	1.38E-12
cg17988187	2	<i>LOC100189589</i>	-19.02	1.78E-12	-19.39	2.46E-12
cg10433549	17	--	-22.2	2.76E-12	-24.08	1.14E-13
cg10704177	1	<i>PATJ</i>	-17.83	2.84E-12	-18.68	2.47E-12
cg00944309	5	--	-18.33	3.16E-12	-18.55	4.78E-12
cg09596645	3	--	-22.69	3.26E-12	-23.12	3.96E-12
cg12614529	4	<i>MNDI</i>	-17.11	3.28E-12	-17.99	2.83E-12
cg26396815	4	<i>BANK1</i>	-26.71	3.52E-12	-27.89	1.01E-12
cg08698681	3	<i>TNIK</i>	-25.29	3.63E-12	-25.58	1.57E-11
cg10065736	12	<i>FBXW8</i>	-16.85	4.88E-12	-18.08	1.58E-12
cg16263722	1	<i>MECR</i>	-18.58	4.95E-12	-19.98	7.18E-13
cg06528816	2	<i>TTC7A</i>	-17.3	5.07E-12	-17.55	1.74E-11
cg11456013	6	--	-19.08	5.99E-12	-19.12	1.96E-11
cg18421167	17	<i>EPX</i>	-26.27	6.47E-12	-26.55	7.37E-11
cg20151107	10	<i>FAM53B</i>	-21.83	7.57E-12	-22.57	1.08E-11

CpG	CHR	Gene	Model 1		Model 2	
			Estimate	P value	Estimate	P value
cg13054523	17	--	-19.86	9.86E-09	-19.28	5.05E-08
cg06906869	13	<i>NEK3</i>	-20.41	2.40E-08	-20.17	3.60E-08
cg13829849	9	<i>MAMDC2</i>	-51.07	3.93E-08	-51.33	3.42E-08
cg23021241	1	<i>DMAPI</i>	14.31	9.32E-08	14.49	2.59E-08
cg21919729	8	<i>CTSB</i>	-12.62	1.15E-07	-12.5	2.80E-07
cg11456013	6	--	-16.27	1.18E-07	-15.81	3.80E-07
cg21220721	1	<i>ACOT7</i>	-8.27	1.23E-07	-8.04	4.29E-07
cg01916918	8	<i>CLU</i>	-22.38	2.40E-07	-21.72	7.67E-07
cg18372930	5	--	18.01	4.07E-07	18.41	5.35E-07
cg18543428	13	--	-16.37	4.21E-07	-15.88	7.16E-07
cg26791242	1	<i>LOC339524</i>	-15.59	4.90E-07	-15.1	1.28E-06
cg12198633	3	<i>KLHL24</i>	-26.13	4.93E-07	-25.99	8.39E-07
cg12819873	11	<i>PRG2</i>	-15.88	6.02E-07	-15.52	1.38E-06
cg26396815	4	<i>BANK1</i>	-18.98	6.49E-07	-18.83	9.78E-07
cg17521120	19	<i>SIGLEC8</i>	-15.44	7.00E-07	-14.96	1.79E-06
cg01901579	14	<i>DICER1</i>	-13.49	8.33E-07	-12.8	4.69E-06
cg02970679	17	<i>EPX</i>	-15.47	9.36E-07	-15.07	2.43E-06

cg13562011	9	<i>EXD3</i>	-16.76	9.67E-07	-16.26	2.77E-06
cg25758167	1	<i>AGL</i>	-29.58	1.24E-06	-29.49	6.78E-06
cg25738116	3	<i>PA2G4P4</i>	-13.5	1.52E-06	-13.82	1.09E-06
cg08284993	16	<i>ANKRD11</i>	18.73	1.67E-06	17.68	9.60E-06
cg06391412	3	<i>FOXP1</i>	-15.14	1.83E-06	-14.94	2.87E-06
cg23149249	6	--	-35.61	2.07E-06	-35.55	3.09E-06
cg08818866	2	<i>LTBP1</i>	-27.99	2.12E-06	-26.8	7.55E-06
cg14769121	7	<i>SMURF1</i>	-14.7	2.22E-06	-14.14	6.25E-06
cg25488567	6	<i>CALHM6</i>	-17.65	2.31E-06	-17.16	4.73E-06
cg15344640	5	<i>LMAN2</i>	-25.42	3.03E-06	-25.24	5.22E-06
cg05300717	11	<i>AP5B1</i>	-18.17	3.28E-06	-17.38	1.37E-05
cg08698681	3	<i>TNIK</i>	-17.32	3.31E-06	-16.56	1.13E-05
cg14937228	10	<i>FAM107B</i>	-20.31	3.36E-06	-19.02	1.24E-05

Model 1 adjusted for maternal covariates[age at enrollment (continuous), smoking status (never, former, or during pregnancy), education (college / graduate level or not college / graduate level), atopy history (asthma, eczema or hay fever)], child covariates [sex (female or male), race / ethnicity (white, black or others), gestational age (continuous)], and cell type proxies estimated for peripheral blood (percentages of monocytes, CD8T cells, CD4T cells, NK cells, and B cells).

Model 2 adjusted for maternal covariates[age at enrollment (continuous), smoking status (never, former, or during pregnancy), education (college / graduate level or not college / graduate level), atopy history (asthma, eczema or hay fever)], child covariates [sex (female or male), race / ethnicity (white, black or others), gestational age (continuous), current asthma (yes / no)], and cell type proxies estimated for peripheral blood (percentages of monocytes, CD8T cells, CD4T cells, NK cells, and B cells).

Table S4. Association between cord blood DNA methylation with mid-childhood atopic sensitization, environmental and food allergen sensitization (top 30 methylation sites are presented here sorted by p-values).

CpG	CHR	Gene	Atopic sensitization		GenR		Meta-analysis		
			Viva		GenR		Meta-analysis		
			Estimate	P value	Estimate	P value	Estimate	P value	FDR
cg18049299	2	--	21.35	1.70E-03	10.91	6.23E-04	12.79	9.44E-06	7.56E-01
cg14444710	16	<i>PDPK1</i>	19.71	3.53E-01	19.76	2.85E-05	19.76	1.81E-05	7.56E-01
cg18426014	12	<i>SMUG1</i>	-14.22	6.84E-01	-22.30	2.36E-05	-22.12	2.23E-05	7.56E-01
cg09823543	6	<i>SRF</i>	12.41	1.60E-02	9.71	4.48E-04	10.32	2.31E-05	7.56E-01
cg23746577	18	<i>ZBTB7C</i>	32.58	6.08E-03	13.15	3.59E-04	14.86	2.43E-05	7.56E-01
cg12991050	5	<i>LINC00461</i>	2.32	9.50E-01	14.41	2.79E-05	14.31	2.95E-05	7.56E-01
cg23377395	11	--	4.27	9.40E-02	6.81	9.88E-05	6.00	3.21E-05	7.56E-01
cg21855205	11	<i>PPP1CA</i>	19.44	7.02E-03	10.36	8.21E-04	11.77	3.51E-05	7.56E-01
cg04240548	22	<i>TTLL8</i>	-6.56	1.22E-01	-8.44	1.32E-04	-8.04	4.03E-05	7.56E-01
cg09069072	1	<i>TMEM51</i>	3.57	2.61E-01	6.07	6.20E-05	5.61	4.16E-05	7.56E-01
cg25881344	12	<i>ETNK1</i>	-22.84	8.09E-01	38.02	3.96E-05	37.44	4.77E-05	7.56E-01
cg24033122	16	<i>ITGAL</i>	-1.82	4.89E-01	-5.98	2.38E-05	-5.05	5.16E-05	7.56E-01
cg19846318	17	<i>PYCR1</i>	17.60	4.51E-01	18.67	7.44E-05	18.62	5.52E-05	7.56E-01
cg14127347	20	<i>NAPB</i>	-19.45	8.30E-01	-42.86	5.78E-05	-42.54	5.84E-05	7.56E-01
cg11617818	17	<i>B9D1</i>	9.38	1.51E-01	11.69	1.71E-04	11.26	6.04E-05	7.56E-01
cg13160528	6	--	15.23	8.72E-02	13.74	3.22E-04	13.97	6.90E-05	7.56E-01
cg08805241	17	--	29.10	8.93E-02	17.14	2.52E-04	17.97	6.92E-05	7.56E-01
cg13814693	12	<i>YBX3</i>	-4.75	9.15E-01	-20.76	6.81E-05	-20.55	7.24E-05	7.56E-01
cg13875807	9	<i>KDM4C</i>	22.90	3.91E-01	-24.42	2.34E-05	-22.31	7.71E-05	7.56E-01
cg26558749	5	<i>ANKRD33B</i>	-184.55	4.75E-02	-62.01	2.56E-04	-65.94	7.75E-05	7.56E-01
cg18275445	14	<i>ELMSAN1</i>	-159.77	3.39E-02	-47.06	2.68E-04	-50.28	7.80E-05	7.56E-01
cg06684321	11	<i>ACTN3</i>	7.63	1.58E-01	9.75	2.33E-04	9.34	8.63E-05	7.56E-01
cg00782707	19	<i>APC2</i>	4.38	9.12E-01	16.26	8.54E-05	16.14	8.89E-05	7.56E-01
cg04813787	6	--	9.07	4.77E-02	9.05	7.25E-04	9.05	8.97E-05	7.56E-01
cg15286905	10	<i>ACBD5</i>	-21.52	5.14E-01	-16.60	1.12E-04	-16.68	9.00E-05	7.56E-01
cg07304186	6	<i>ZFAND3</i>	24.39	1.57E-01	19.12	2.53E-04	19.56	9.16E-05	7.56E-01
cg06139794	10	--	-13.33	3.71E-01	-9.19	1.36E-04	-9.30	9.27E-05	7.56E-01
cg07084345	15	--	2.41	1.28E-03	1.36	1.30E-02	1.73	9.40E-05	7.56E-01
cg22112918	6	<i>KIFC1</i>	-30.84	1.75E-03	-12.81	4.13E-03	-15.88	9.45E-05	7.56E-01
cg10215507	20	<i>LINC00261</i>	-14.79	2.04E-02	-7.91	9.92E-04	-8.76	9.66E-05	7.56E-01

CpG	CHR	Gene	Environmental allergen sensitization		GenR		Meta-analysis		
			Viva		GenR		Meta-analysis		
			Estimate	P value	Estimate	P value	Estimate	P value	FDR
cg23377395	11	--	9.65	1.02E-03	6.83	1.10E-04	7.58	5.54E-07	1.79E-01
cg18049299	2	--	23.01	8.33E-04	11.74	2.57E-04	13.76	2.30E-06	3.72E-01

cg24033122	16	<i>ITGAL</i>	-3.08	2.48E-01	-6.29	8.72E-06	-5.59	7.82E-06	6.10E-01
cg14444710	16	<i>PDPK1</i>	32.90	1.28E-01	19.94	2.87E-05	20.55	1.02E-05	6.10E-01
cg09069072	1	<i>TMEM51</i>	4.45	1.70E-01	6.33	3.78E-05	5.99	1.62E-05	6.10E-01
cg18275445	14	<i>ELMSAN1</i>	-91.02	2.12E-01	-51.86	3.31E-05	-52.98	1.69E-05	6.10E-01
cg23768510	6	<i>TAPBP</i>	-89.99	1.28E-03	-31.83	6.02E-04	-37.60	1.95E-05	6.10E-01
cg23746577	18	<i>ZBTB7C</i>	33.03	6.86E-03	13.37	3.53E-04	15.06	2.58E-05	6.10E-01
cg06684321	11	<i>ACTN3</i>	6.06	2.67E-01	10.65	4.18E-05	9.80	2.96E-05	6.10E-01
cg06139794	10	--	-26.43	7.85E-02	-9.38	1.05E-04	-9.81	3.99E-05	6.10E-01
cg18167921	1	<i>DEPDC1</i>	6.84	8.06E-03	4.08	1.04E-03	4.60	4.05E-05	6.10E-01
cg26558749	5	<i>ANKRD33B</i>	-180.11	5.79E-02	-65.43	1.32E-04	-69.04	4.15E-05	6.10E-01
cg18426014	12	<i>SMUG1</i>	3.47	9.21E-01	-21.82	3.22E-05	-21.27	4.19E-05	6.10E-01
cg15286905	10	<i>ACBD5</i>	-9.75	7.72E-01	-17.64	4.30E-05	-17.51	4.24E-05	6.10E-01
cg12991050	5	<i>LINC00461</i>	-4.11	9.12E-01	14.22	3.88E-05	14.06	4.37E-05	6.10E-01
cg08799394	10	<i>PDLIM1</i>	13.88	1.10E-03	8.36	8.09E-03	10.32	4.66E-05	6.10E-01
cg14330737	10	<i>PFKP</i>	-38.31	3.35E-01	23.73	2.19E-05	22.53	4.73E-05	6.10E-01
cg09823543	6	<i>SRF</i>	11.85	1.75E-02	9.20	8.78E-04	9.82	4.88E-05	6.10E-01
cg02117884	6	<i>LY6G6D</i>	22.93	6.18E-04	11.31	9.76E-03	14.79	5.43E-05	6.10E-01
cg25482786	3	<i>CHL1</i>	-180.52	4.41E-02	-40.79	1.43E-04	-42.76	5.94E-05	6.10E-01
cg19466160	17	<i>DLG4</i>	5.55	8.25E-03	4.58	2.34E-03	4.91	6.03E-05	6.10E-01
cg14127347	20	<i>NAPB</i>	12.02	8.95E-01	-43.06	5.09E-05	-42.33	6.09E-05	6.10E-01
cg19846318	17	<i>PYCR1</i>	28.05	2.46E-01	18.17	1.17E-04	18.53	6.23E-05	6.10E-01
cg03926166	12	<i>HRK</i>	58.03	3.36E-01	40.91	1.02E-04	41.42	6.50E-05	6.10E-01
cg07784986	12	<i>DNAH10</i>	18.26	2.18E-02	10.07	6.90E-04	11.07	6.85E-05	6.10E-01
cg21349849	8	--	50.68	5.73E-04	13.66	1.83E-03	16.67	7.19E-05	6.10E-01
cg08805241	17	--	38.94	2.93E-02	16.60	4.18E-04	18.05	7.28E-05	6.10E-01
cg13875807	9	<i>KDM4C</i>	32.37	2.26E-01	-25.19	1.55E-05	-22.58	7.36E-05	6.10E-01
cg00782707	19	<i>APC2</i>	-3.79	9.24E-01	16.49	6.56E-05	16.28	7.49E-05	6.10E-01
cg04117455	14	<i>ZFYVE21</i>	7.75	8.24E-01	20.24	7.26E-05	19.97	7.56E-05	6.10E-01

CpG	CHR	Gene	Food allergen sensitization						
			Viva		GenR		Meta-analysis		
			Estimate	P value	Estimate	P value	Estimate	P value	FDR
cg05068730	6	<i>RPS6KA2</i>	11.38	7.21E-01	46.51	7.35E-08	44.10	1.24E-07	3.54E-02
cg05767015	1	<i>CHIT1</i>	10.71	4.10E-01	-15.87	3.95E-08	-14.62	2.19E-07	3.54E-02
cg27359629	6	--	-13.49	1.23E-01	-23.54	1.76E-05	-20.71	8.31E-06	5.15E-01
cg04288241	2	<i>AGAP1</i>	-29.70	3.82E-01	-37.14	1.36E-05	-36.70	9.34E-06	5.15E-01
cg24395801	1	<i>COL24A1</i>	-16.20	8.61E-01	77.32	5.71E-06	74.23	9.44E-06	5.15E-01
cg15169257	19	--	-1.49	8.94E-01	-24.77	1.73E-06	-20.64	1.11E-05	5.15E-01
cg22737917	5	<i>ENC1</i>	-40.47	5.08E-01	35.64	1.02E-05	34.33	1.79E-05	5.15E-01
cg08209104	14	<i>MYH7</i>	20.17	1.66E-03	14.88	3.15E-03	16.90	1.99E-05	5.15E-01
cg10782019	1	--	-6.24	5.48E-03	-7.50	1.16E-03	-6.85	2.08E-05	5.15E-01
cg07316263	16	<i>TRADD;FBXL8</i>	9.90	8.53E-01	48.62	1.65E-05	46.97	2.11E-05	5.15E-01

cg00731458	16	--	21.59	1.10E-01	27.36	7.80E-05	26.16	2.19E-05	5.15E-01
cg27607583	16	<i>TRAP1</i>	-23.23	2.60E-01	-40.34	3.25E-05	-37.23	2.25E-05	5.15E-01
cg20115508	4	--	53.88	4.63E-01	-10.58	2.32E-05	-10.50	2.62E-05	5.15E-01
cg06952751	18	<i>RMCI</i>	-21.29	7.90E-01	48.80	1.89E-05	47.40	2.71E-05	5.15E-01
cg19873602	6	--	23.65	5.57E-02	22.45	2.19E-04	22.68	3.16E-05	5.15E-01
cg21393885	17	--	22.66	4.66E-02	26.26	2.58E-04	25.24	3.29E-05	5.15E-01
cg05458842	5	--	10.50	7.32E-01	-41.11	9.05E-06	-36.80	3.31E-05	5.15E-01
cg01908690	16	<i>ZNF646</i>	-93.97	4.31E-01	12.57	3.40E-05	12.50	3.74E-05	5.15E-01
cg18503234	11	<i>TPCN2</i>	-7.42	4.69E-02	-12.28	1.87E-04	-10.16	3.84E-05	5.15E-01
cg03950590	15	<i>CCNB2</i>	-34.42	2.92E-01	-36.10	7.62E-05	-35.98	4.24E-05	5.15E-01
cg13330341	11	<i>ASCL2</i>	24.91	3.95E-01	40.46	5.67E-05	38.82	4.42E-05	5.15E-01
cg12251075	17	<i>NME2</i>	7.52	2.28E-01	12.74	7.52E-05	11.64	4.67E-05	5.15E-01
cg10571951	5	<i>MEF2C</i>	-87.47	9.90E-02	-46.45	1.46E-04	-48.52	4.68E-05	5.15E-01
cg08303283	9	--	25.61	6.02E-05	10.54	5.55E-02	16.97	4.69E-05	5.15E-01
cg14477767	4	--	-8.69	5.15E-03	-6.89	2.77E-03	-7.53	4.70E-05	5.15E-01
cg13267264	8	<i>PRDM14</i>	-15.44	7.19E-01	-48.34	3.78E-05	-46.06	4.70E-05	5.15E-01
cg16743070	8	<i>KAT6A</i>	-99.01	4.96E-02	-63.52	2.90E-04	-67.35	4.75E-05	5.15E-01
cg14940705	8	<i>SGK3</i>	-52.67	3.10E-01	-69.63	7.86E-05	-67.87	4.80E-05	5.15E-01
cg01222168	2	<i>D2HGDH</i>	-16.70	1.10E-01	-16.37	1.99E-04	-16.42	5.16E-05	5.15E-01
cg00093058	16	<i>RHOT2</i>	-15.41	5.98E-01	-53.00	3.09E-05	-47.03	5.54E-05	5.15E-01

Models adjusted for maternal covariates [age at enrollment (continuous), smoking status (never, former, or during pregnancy), education (college / graduate level or not college / graduate level), atopy history (asthma, eczema or hay fever)], child covariates [sex (female or male), race / ethnicity (white, black or others), gestational age (continuous)], and cell type proxies estimated for cord blood (percentages of monocytes, CD8T cells, CD4T cells, NK cells, B cells and nucleated red blood cells (nRBC)).

Table S6. Among methylation sites that showed nominal significance ($p < 0.05$) in the cord blood analysis, and epigenome-wide significance ($FDR < 0.05$) in the mid-childhood analysis, we selected (1) top differentially methylation sites sorted by cord blood p-values; (2) methylation sites previously shown to be associated with asthma. We performed mixed-effects models and introduced a methylation—time interaction.

Atopic sensitization						
CpG	CHR	Gene	Main effect		Time interaction	
			Effect estimate (95% CI)	P-value	Effect estimate (95% CI)	P-value
cg08799394	10	<i>PDLIM1</i>	0.0004 (-0.0001; 0.0008)	0.096	-0.0003 (-0.0004; -0.0002)	<0.0001
cg24108508	1	<i>FAM20B</i>	0.0003 (-0.0001; 0.0006)	0.151	-0.0002 (-0.0003; -0.0001)	<0.0001
cg13628444	9	<i>MED27</i>	0.0009 (-0.0001; 0.0019)	0.088	-0.0004 (-0.0005; -0.0002)	<0.0001
cg22083166	17	<i>EPN2</i>	0.0017 (0.0003; 0.0031)	0.018	-0.0003 (-0.0006; -0.0001)	0.008
cg26787239	5	<i>IL4</i>	0.0012 (-0.0003; 0.0027)	0.113	-0.0005 (-0.0007; -0.0002)	0.0003
cg21220721	1	<i>ACOT7</i>	0.0009 (-0.0004; 0.0022)	0.175	-0.0003 (-0.0004; -0.0001)	0.005
cg08404225	3	<i>IL5RA</i>	0.0006 (0.0002; 0.0011)	0.010	-0.0002 (-0.0003; -0.0001)	0.003
cg25643253	7	<i>VKORC1L1</i>	0 (-0.0004; 0.0004)	0.978	-0.0001 (-0.0002; -0.0001)	0.0006

Environmental allergen sensitization						
CpG	CHR	Gene	Main effect		Time interaction	
			Effect estimate (95% CI)	P-value	Effect estimate (95% CI)	P-value
cg08799394	10	<i>PDLIM1</i>	0.0003 (-0.0001; 0.0008)	0.155	-0.0003 (-0.0004; -0.0002)	<0.0001
cg15134174	4	<i>SH3RF1</i>	0.0003 (-0.0001; 0.0006)	0.135	-0.0003 (-0.0005; -0.0002)	<0.0001
cg07819010	11	--	0.0002 (-0.0002; 0.0006)	0.449	-0.0002 (-0.0003; -0.0001)	0.0004
cg24108508	1	<i>FAM20B</i>	0.0002 (-0.0001; 0.0006)	0.196	-0.0002 (-0.0003; -0.0001)	<0.0001
cg26787239	5	<i>IL4</i>	0.0009 (-0.0007; 0.0024)	0.268	-0.0005 (-0.0008; -0.0003)	0.0001
cg21220721	1	<i>ACOT7</i>	0.0005 (-0.0008; 0.0019)	0.438	-0.0002 (-0.0004; -0.0001)	0.017
cg08404225	3	<i>IL5RA</i>	0.0007 (0.0002; 0.0011)	0.008	-0.0002 (-0.0004; -0.0001)	0.0003
cg25643253	7	<i>VKORC1L1</i>	-0.0001 (-0.0005; 0.0003)	0.634	-0.0001 (-0.0002; -0.0001)	0.0002

Food allergen sensitization						
CpG	CHR	Gene	Main effect		Time interaction	
			Effect estimate (95% CI)	P-value	Effect estimate (95% CI)	P-value
cg25488567	6	<i>FAM26F</i>	-0.0013 (-0.0029; 0.0004)	0.129	0 (-0.0002; 0.0003)	0.922
cg08818866	2	<i>LTBP1</i>	0.0013 (0; 0.0026)	0.050	-0.006 (-0.0010; -0.0002)	0.006
cg13562011	9	<i>EXD3</i>	0.0007 (-0.0009; 0.0023)	0.414	-0.0003 (-0.0005; 0)	0.021

Models adjusted for maternal covariates [age at enrollment (continuous), smoking status (never, former, or during pregnancy), education (college / graduate level or not college / graduate level), atopy history (asthma, eczema or hay fever)], child covariates [sex (female or male), race / ethnicity (white, black or others), gestational age (continuous)], and cell type proxies estimated for cord blood (percentages of monocytes, CD8T cells, CD4T cells, NK cells, B cells and nucleated red blood cells (nRBC)).

Table S7. Association between mid-childhood peripheral blood DNA methylation with mid-childhood atopic sensitization, environmental and food allergen sensitization (top 30 methylation sites are presented here sorted by p-values). Model 1: Project Viva mid-childhood analysis (N=396); Model 2: Project Viva mid-childhood analysis, with additional adjustment for cord blood methylation (N=211).

Atopic sensitization				
CpG	CHR	Gene	Model 1 estimate	Model 2 estimate
cg04983687	16	<i>ZFPM1</i>	-9.67	-10.72
cg02427831	19	<i>SIGLEC8</i>	-17.31	-23.52
cg26791242	1	<i>LOC339524</i>	-21.08	-16.18
cg11770323	13	<i>NDFIP2</i>	-15.39	-14.40
cg02970679	17	<i>EPX</i>	-22.82	-32.81
cg13628444	9	<i>MED27</i>	-19.84	-25.08
cg21220721	1	<i>ACOT7</i>	-10.67	-12.13
cg09212118	1	<i>GUCA2A</i>	-16.59	-16.65
cg08698681	3	<i>TNIK</i>	-24.72	-29.27
cg10433549	17	--	-20.79	-22.85
cg26396815	4	<i>BANK1</i>	-25.48	-44.75
cg07948085	10	--	-30.67	-31.76
cg04406620	16	<i>CYB5B</i>	-22.41	-14.01
cg19434937	12	<i>LPCAT3</i>	-14.65	-18.57
cg07819010	11	--	-19.61	-14.31
cg24491618	7	<i>KCNH2</i>	-17.84	-23.31
cg00114012	9	<i>SLC2A8</i>	-14.65	-16.08
cg11988722	20	--	-10.46	-16.35
cg09596645	3	--	-20.27	-37.96
cg25173129	17	<i>EPX</i>	-18.99	-19.31
cg06391412	3	<i>FOXP1</i>	-21.66	-27.93
cg10704177	1	<i>PATJ</i>	-17.58	-23.99
cg00944309	5	--	-15.98	-23.88
cg04497992	16	<i>NHLRC4</i>	-15.50	-18.84
cg01916918	8	<i>CLU</i>	-24.05	-25.59
cg11456013	6	--	-17.49	-23.75
cg14769121	7	<i>SMURF1</i>	-19.43	-23.18
cg13054523	17	--	-29.77	-46.14
cg20885063	17	<i>ATPAF2</i>	-19.50	-36.71
cg06528816	2	<i>TTC7A</i>	-14.87	-17.06

Environmental allergen sensitization				
CpG	CHR	Gene	Model 1 estimate	Model 2 estimate
cg02427831	19	<i>SIGLEC8</i>	-27.44	-33.46
cg04983687	16	<i>ZFPM1</i>	-13.89	-14.44
cg11988722	20	--	-16.75	-18.57

cg02475695	16	<i>NHLRC4</i>	-23.33	-24.38
cg19434937	12	<i>LPCAT3</i>	-23.39	-23.91
cg09212118	1	<i>GUCA2A</i>	-25.48	-20.55
cg02970679	17	<i>EPX</i>	-30.45	-39.95
cg26791242	1	<i>LOC339524</i>	-27.95	-17.97
cg21220721	1	<i>ACOT7</i>	-15.29	-14.93
cg13628444	9	<i>MED27</i>	-25.68	-25.08
cg00114012	9	<i>SLC2A8</i>	-20.98	-20.49
cg24491618	7	<i>KCNH2</i>	-25.12	-30.22
cg04497992	16	<i>NHLRC4</i>	-23.49	-23.65
cg25173129	17	<i>EPX</i>	-28.04	-25.40
cg18666454	7	<i>KCNH2</i>	-24.13	-25.10
cg07970948	7	<i>ZNF862</i>	-22.19	-29.05
cg17988187	2	<i>LOC100189589</i>	-21.27	-23.40
cg10433549	17	--	-27.98	-23.51
cg10704177	1	<i>PATJ</i>	-24.75	-28.08
cg00944309	5	--	-21.73	-27.13
cg09596645	3	--	-27.51	-46.67
cg12614529	4	<i>MND1</i>	-23.08	-13.04
cg26396815	4	<i>BANK1</i>	-34.91	-49.07
cg08698681	3	<i>TNIK</i>	-31.66	-33.08
cg10065736	12	<i>FBXW8</i>	-23.77	-27.74
cg16263722	1	<i>MECR</i>	-22.84	-22.02
cg06528816	2	<i>TTC7A</i>	-20.09	-21.26
cg11456013	6	--	-24.21	-24.91
cg18421167	17	<i>EPX</i>	-35.36	-42.68
cg20151107	10	<i>FAM53B</i>	-26.45	-23.21

Food allergen sensitization				
CpG	CHR	Gene	Model 1 estimate	Model 2 estimate
cg13054523	17	--	-20.37	-26.74
cg06906869	13	<i>NEK3</i>	-19.45	-22.83
cg13829849	9	<i>MAMDC2</i>	-55.37	-81.56
cg23021241	1	<i>DMAP1</i>	66.23	144.21
cg21919729	8	<i>CTSB</i>	-11.70	-14.38
cg11456013	6	--	-14.31	-15.82
cg21220721	1	<i>ACOT7</i>	-7.65	-7.21
cg01916918	8	<i>CLU</i>	-22.68	-18.86
cg18372930	5	--	17.40	9.77
cg18543428	13	--	-14.64	-9.42
cg26791242	1	<i>LOC339524</i>	-15.02	-12.09
cg12198633	3	<i>KLHL24</i>	-30.03	-19.82

cg12819873	11	<i>PRG2</i>	-16.15	-16.98
cg26396815	4	<i>BANK1</i>	-16.91	-25.18
cg17521120	19	<i>SIGLEC8</i>	-13.65	-13.60
cg01901579	14	<i>DICER1</i>	-12.01	-13.96
cg02970679	17	<i>EPX</i>	-13.75	-17.14
cg13562011	9	<i>EXD3</i>	-15.63	-12.17
cg25758167	1	<i>AGL</i>	-22.07	-17.37
cg25738116	3	<i>PA2G4P4</i>	-13.46	-5.75
cg08284993	16	<i>ANKRD11</i>	20.86	13.88
cg06391412	3	<i>FOXP1</i>	-14.57	-14.78
cg23149249	6	--	-36.76	-50.37
cg08818866	2	<i>LTBP1</i>	-27.55	-27.34
cg14769121	7	<i>SMURF1</i>	-12.69	-12.27
cg25488567	6	<i>CALHM6</i>	-17.32	-12.37
cg15344640	5	<i>LMAN2</i>	-24.37	-28.01
cg05300717	11	<i>AP5B1</i>	-18.35	-19.44
cg08698681	3	<i>TNIK</i>	-16.27	-17.67
cg14937228	10	<i>FAM107B</i>	-17.36	-16.54

Models adjusted for maternal covariates [age at enrollment (continuous), smoking status (never, former, or during pregnancy), education (college / graduate level or not college / graduate level), atopy history (asthma, eczema or hay fever)], child covariates [sex (female or male), race / ethnicity (white, black or others), gestational age (continuous)], and cell type proxies estimated for peripheral blood (percentages of monocytes, CD8T cells, CD4T cells, NK cells, and B cells). Model 2 additionally adjusted for cord blood DNA methylation of the same site.

Table S8. Association between mid-childhood peripheral blood DNA methylation with mid-childhood atopic sensitization, environmental and food allergen sensitization (top 30 methylation sites are presented here sorted by meta-analysis p-values). We compared analysis using two methods to adjust for cellular heterogeneity (left column—Houseman estimation; right column—ReFACTor, a PCA based method).

Atopic sensitization						
CpG	CHR	Gene	Houseman adjustment		ReFACTor adjustment	
			Estimate	P value	Estimate	P value
cg04983687	16	<i>ZFPM1</i>	-9.67	3.36E-07	-11.91	1.84E-08
cg02427831	19	<i>SIGLEC8</i>	-17.31	5.07E-06	-17.94	7.33E-06
cg26791242	1	<i>LOC339524</i>	-21.08	5.23E-09	-22.79	8.87E-09
cg11770323	13	<i>NDFIP2</i>	-15.39	3.88E-08	-16.91	1.63E-08
cg02970679	17	<i>EPX</i>	-22.82	6.99E-08	-23.78	7.72E-08
cg13628444	9	<i>MED27</i>	-19.84	3.66E-07	-20.60	9.43E-07
cg21220721	1	<i>ACOT7</i>	-10.67	7.09E-09	-11.70	1.83E-09
cg09212118	1	<i>GUCA2A</i>	-16.59	7.89E-06	-17.78	5.99E-06
cg08698681	3	<i>TNIK</i>	-24.72	7.21E-08	-26.25	7.80E-08
cg10433549	17	--	-20.79	9.25E-08	-26.01	7.80E-09
cg26396815	4	<i>BANK1</i>	-25.48	1.46E-06	-25.65	4.82E-06
cg07948085	10	--	-30.67	5.47E-08	-31.26	3.95E-07
cg04406620	16	<i>CYB5B</i>	-22.41	4.69E-08	-20.15	1.09E-06
cg19434937	12	<i>LPCAT3</i>	-14.65	3.57E-07	-15.42	7.94E-07
cg07819010	11	--	-19.61	4.16E-09	-22.14	3.29E-09
cg24491618	7	<i>KCNH2</i>	-17.84	1.22E-07	-20.39	1.50E-08
cg00114012	9	<i>SLC2A8</i>	-14.65	2.44E-06	-15.43	3.34E-06
cg11988722	20	--	-10.46	1.12E-04	-10.97	1.28E-04
cg09596645	3	--	-20.27	1.78E-06	-19.41	9.15E-06
cg25173129	17	<i>EPX</i>	-18.99	4.56E-06	-21.89	7.63E-07
cg06391412	3	<i>FOXP1</i>	-21.66	2.35E-08	-24.97	1.98E-08
cg10704177	1	<i>PATJ</i>	-17.58	5.38E-08	-18.48	1.02E-07
cg00944309	5	--	-15.98	5.00E-07	-16.30	3.54E-06
cg04497992	16	<i>NHLRC4</i>	-15.50	4.05E-07	-18.57	4.81E-08
cg01916918	8	<i>CLU</i>	-24.05	9.18E-07	-25.24	1.94E-06
cg11456013	6	--	-17.49	1.25E-07	-18.08	4.77E-07
cg14769121	7	<i>SMURF1</i>	-19.43	1.16E-06	-19.26	7.40E-06
cg13054523	17	--	-29.77	1.58E-06	-34.52	4.94E-07
cg20885063	17	<i>ATPAF2</i>	-19.50	1.17E-06	-19.55	2.38E-06
cg06528816	2	<i>TTC7A</i>	-14.87	1.02E-06	-18.23	9.48E-08

Environmental allergen sensitization						
CpG	CHR	Gene	Houseman adjustment		ReFACTor adjustment	
			Estimate	P value	Estimate	P value
cg02427831	19	<i>SIGLEC8</i>	-27.44	7.40E-11	-26.87	5.66E-10

cg04983687	16	<i>ZFPM1</i>	-13.89	1.21E-11	-16.13	2.05E-12
cg11988722	20	--	-16.75	1.78E-08	-16.94	5.09E-08
cg02475695	16	<i>NHLRC4</i>	-23.33	1.96E-10	-26.27	7.24E-11
cg19434937	12	<i>LPCAT3</i>	-23.39	7.11E-13	-24.69	2.91E-12
cg09212118	1	<i>GUCA2A</i>	-25.48	6.19E-10	-25.40	2.16E-09
cg02970679	17	<i>EPX</i>	-30.45	1.50E-11	-30.90	2.94E-11
cg26791242	1	<i>LOC339524</i>	-27.95	1.40E-12	-28.44	1.18E-11
cg21220721	1	<i>ACOT7</i>	-15.29	3.83E-14	-16.54	1.68E-14
cg13628444	9	<i>MED27</i>	-25.68	3.43E-10	-26.12	1.90E-09
cg00114012	9	<i>SLC2A8</i>	-20.98	3.78E-10	-21.35	1.18E-09
cg24491618	7	<i>KCNH2</i>	-25.12	6.04E-12	-27.14	2.46E-12
cg04497992	16	<i>NHLRC4</i>	-23.49	4.89E-12	-26.16	2.45E-12
cg25173129	17	<i>EPX</i>	-28.04	3.84E-10	-29.71	2.45E-10
cg18666454	7	<i>KCNH2</i>	-24.13	4.05E-11	-24.39	1.32E-10
cg07970948	7	<i>ZNF862</i>	-22.19	3.41E-11	-23.43	2.56E-11
cg17988187	2	<i>LOC100189589</i>	-21.27	4.00E-10	-22.41	4.74E-10
cg10433549	17	--	-27.98	5.51E-11	-32.36	1.55E-11
cg10704177	1	<i>PATJ</i>	-24.75	2.47E-12	-25.46	8.96E-12
cg00944309	5	--	-21.73	1.49E-10	-22.49	1.45E-09
cg09596645	3	--	-27.51	5.28E-10	-27.22	2.90E-09
cg12614529	4	<i>MND1</i>	-23.08	1.31E-11	-26.00	2.07E-12
cg26396815	4	<i>BANK1</i>	-34.91	4.40E-10	-35.18	2.07E-09
cg08698681	3	<i>TNIK</i>	-31.66	6.67E-11	-32.67	1.39E-10
cg10065736	12	<i>FBXW8</i>	-23.77	3.85E-12	-27.11	1.70E-12
cg16263722	1	<i>MECR</i>	-22.84	9.35E-11	-24.07	1.82E-10
cg06528816	2	<i>TTC7A</i>	-20.09	4.76E-10	-22.81	1.67E-10
cg11456013	6	--	-24.21	2.12E-11	-24.50	1.84E-10
cg18421167	17	<i>EPX</i>	-35.36	4.19E-10	-34.06	5.45E-09
cg20151107	10	<i>FAM53B</i>	-26.45	3.87E-09	-26.53	2.27E-08

Food allergen sensitization						
CpG	CHR	Gene	Houseman adjustment		ReFACTor adjustment	
			Estimate	P value	Estimate	P value
cg13054523	17	--	-20.37	2.28E-05	-21.94	1.02E-05
cg06906869	13	<i>NEK3</i>	-19.45	1.24E-06	-20.77	5.71E-07
cg13829849	9	<i>MAMDC2</i>	-55.37	3.64E-06	-52.92	7.88E-06
cg23021241	1	<i>DMAP1</i>	66.23	1.87E-01	32.99	5.33E-01
cg21919729	8	<i>CTSB</i>	-11.70	2.05E-05	-12.70	9.53E-06
cg11456013	6	--	-14.31	1.13E-05	-14.54	2.32E-05
cg21220721	1	<i>ACOT7</i>	-7.65	8.55E-06	-8.25	2.57E-06
cg01916918	8	<i>CLU</i>	-22.68	3.72E-06	-23.86	4.20E-06
cg18372930	5	--	17.40	2.65E-05	11.39	9.31E-03

cg18543428	13	--	-14.64	1.73E-04	-13.68	7.54E-04
cg26791242	1	<i>LOC339524</i>	-15.02	1.10E-05	-15.85	1.12E-05
cg12198633	3	<i>KLHL24</i>	-30.03	1.00E-05	-29.06	1.45E-05
cg12819873	11	<i>PRG2</i>	-16.15	3.65E-06	-16.46	3.21E-06
cg26396815	4	<i>BANK1</i>	-16.91	5.47E-05	-16.96	1.14E-04
cg17521120	19	<i>SIGLEC8</i>	-13.65	5.73E-05	-15.17	1.31E-05
cg01901579	14	<i>DICER1</i>	-12.01	9.31E-05	-12.78	1.38E-04
cg02970679	17	<i>EPX</i>	-13.75	5.11E-05	-13.91	4.47E-05
cg13562011	9	<i>EXD3</i>	-15.63	4.13E-05	-16.80	1.87E-05
cg25758167	1	<i>AGL</i>	-22.07	8.05E-03	-23.85	7.73E-03
cg25738116	3	<i>PA2G4P4</i>	-13.46	7.82E-06	-12.77	5.32E-05
cg08284993	16	<i>ANKRD11</i>	20.86	2.04E-06	14.74	9.91E-04
cg06391412	3	<i>FOXP1</i>	-14.57	1.87E-05	-17.14	7.09E-06
cg23149249	6	--	-36.76	1.43E-03	-28.63	1.35E-02
cg08818866	2	<i>LTBP1</i>	-27.55	3.65E-05	-29.37	6.85E-05
cg14769121	7	<i>SMURF1</i>	-12.69	1.83E-04	-13.03	3.44E-04
cg25488567	6	<i>CALHM6</i>	-17.32	6.08E-05	-17.32	1.53E-04
cg15344640	5	<i>LMAN2</i>	-24.37	1.07E-04	-26.40	8.81E-05
cg05300717	11	<i>AP5B1</i>	-18.35	2.78E-04	-19.42	1.49E-04
cg08698681	3	<i>TNIK</i>	-16.27	5.33E-05	-17.29	3.62E-05
cg14937228	10	<i>FAM107B</i>	-17.36	1.24E-03	-17.83	1.17E-03

Houseman adjusted for maternal covariates [age at enrollment (continuous), smoking status (never, former, or during pregnancy), education (college / graduate level or not college / graduate level), atopy history (asthma, eczema or hay fever)], child covariates [sex (female or male), race / ethnicity (white, black or others), gestational age (continuous)], and cell type proxies estimated for peripheral blood (percentages of monocytes, CD8T cells, CD4T cells, NK cells, and B cells).

ReFACTor adjusted for maternal covariates[age at enrollment (continuous), smoking status (never, former, or during pregnancy), education (college / graduate level or not college / graduate level), atopy history (asthma, eczema or hay fever)], child covariates [sex (female or male), race / ethnicity (white, black or others), gestational age (continuous)], and the first five components estimated from ReFACTor.

Table S9. Genetic control of DNA methylation of top 30 sites identified from the mid-childhood meta-analysis—results from the ARIES mQTL database (1,000 mother-child pairs), where DNA methylation was measured using peripheral blood collected at mid-childhood. We restricted to SNPs with MAF >5% and within 500Kb away from the methylation site.

Atopic sensitization				
CpG	CHR	Gene	cis	No. of SNPs
cg04983687	16	<i>ZFPM1</i>	--	--
cg02427831	19	<i>SIGLEC8</i>	--	--
cg26791242	1	<i>LOC339524</i>	--	--
cg11770323	13	<i>NDFIP2</i>	--	--
cg02970679	17	<i>EPX</i>	--	--
cg13628444	9	<i>MED27</i>	--	--
cg21220721	1	<i>ACOT7</i>	--	--
cg09212118	1	<i>GUCA2A</i>	--	--
cg08698681	3	<i>TNIK</i>	--	--
cg10433549	17	--	--	--
cg26396815	4	<i>BANK1</i>	Yes	29
cg07948085	10	--	Yes	1
cg04406620	16	<i>CYB5B</i>	--	--
cg19434937	12	<i>LPCAT3</i>	--	--
cg07819010	11	--	--	--
cg24491618	7	<i>KCNH2</i>	Yes	1
cg00114012	9	<i>SLC2A8</i>	Yes	2
cg11988722	20	--	--	--
cg09596645	3	--	--	--
cg25173129	17	<i>EPX</i>	--	--
cg06391412	3	<i>FOXP1</i>	--	--
cg10704177	1	<i>PATJ</i>	--	--
cg00944309	5	--	--	--
cg04497992	16	<i>NHLRC4</i>	--	--
cg01916918	8	<i>CLU</i>	--	--
cg11456013	6	--	--	--
cg14769121	7	<i>SMURF1</i>	--	--
cg13054523	17	--	--	--
cg20885063	17	<i>ATPAF2</i>	Yes	4
cg06528816	2	<i>TTC7A</i>	--	--
Environmental allergen sensitization				
CpG	CHR	Gene	cis	No. of SNPs
cg02427831	19	<i>SIGLEC8</i>	--	--
cg04983687	16	<i>ZFPM1</i>	--	--
cg11988722	20	--	--	--

cg02475695	16	<i>NHLRC4</i>	--	--
cg19434937	12	<i>LPCAT3</i>	--	--
cg09212118	1	<i>GUCA2A</i>	--	--
cg02970679	17	<i>EPX</i>	--	--
cg26791242	1	<i>LOC339524</i>	--	--
cg21220721	1	<i>ACOT7</i>	--	--
cg13628444	9	<i>MED27</i>	--	--
cg00114012	9	<i>SLC2A8</i>	Yes	2
cg24491618	7	<i>KCNH2</i>	Yes	1
cg04497992	16	<i>NHLRC4</i>	--	--
cg25173129	17	<i>EPX</i>	--	--
cg18666454	7	<i>KCNH2</i>	--	--
cg07970948	7	<i>ZNF862</i>	--	--
cg17988187	2	<i>LOC100189589</i>	--	--
cg10433549	17	--	--	--
cg10704177	1	<i>PATJ</i>	--	--
cg00944309	5	--	--	--
cg09596645	3	--	--	--
cg12614529	4	<i>MND1</i>	--	--
cg26396815	4	<i>BANK1</i>	Yes	29
cg08698681	3	<i>TNIK</i>	--	--
cg10065736	12	<i>FBXW8</i>	--	--
cg16263722	1	<i>MECR</i>	--	--
cg06528816	2	<i>TTC7A</i>	--	--
cg11456013	6	--	--	--
cg18421167	17	<i>EPX</i>	--	--
cg20151107	10	<i>FAM53B</i>	--	--

Food allergen sensitization				
CpG	CHR	Gene	cis	No. of SNPs
cg13054523	17	--	--	--
cg06906869	13	<i>NEK3</i>	--	--
cg13829849	9	<i>MAMDC2</i>	--	--
cg23021241	1	<i>DMAP1</i>	--	--
cg21919729	8	<i>CTSB</i>	Yes	88
cg11456013	6	--	--	--
cg21220721	1	<i>ACOT7</i>	--	--
cg01916918	8	<i>CLU</i>	--	--
cg18372930	5	--	--	--
cg18543428	13	--	--	--
cg26791242	1	<i>LOC339524</i>	--	--
cg12198633	3	<i>KLHL24</i>	Yes	1

cg12819873	11	<i>PRG2</i>	--	--
cg26396815	4	<i>BANK1</i>	Yes	29
cg17521120	19	<i>SIGLEC8</i>	--	--
cg01901579	14	<i>DICER1</i>	--	--
cg02970679	17	<i>EPX</i>	--	--
cg13562011	9	<i>EXD3</i>	--	--
cg25758167	1	<i>AGL</i>	--	--
cg25738116	3	<i>PA2G4P4</i>	Yes	99
cg08284993	16	<i>ANKRD11</i>	--	--
cg06391412	3	<i>FOXP1</i>	--	--
cg23149249	6	--	--	--
cg08818866	2	<i>LTBP1</i>	--	--
cg14769121	7	<i>SMURF1</i>	--	--
cg25488567	6	<i>CALHM6</i>	--	--
cg15344640	5	<i>LMAN2</i>	--	--
cg05300717	11	<i>AP5B1</i>	--	--
cg08698681	3	<i>TNIK</i>	--	--
cg14937228	10	<i>FAM107B</i>	--	--

Table S10. FDR significant methylation sites from Liang *et al.* (2015) and their corresponding effect estimates and p values in the concurrent meta-analysis.

CpG	CHR	Gene	Atopic sensitization		Environ. sensitization		Food sensitization	
			Estimate	P value	Estimate	P value	Estimate	P value
cg00002426	3	<i>SLMAP</i>	-15.63	3.10E-04	-17.09	7.86E-05	-10.24	9.86E-02
cg00079056	9	<i>SUGTIP1;SPINK4</i>	-15.55	3.54E-03	-19.66	3.27E-04	-8.44	1.94E-01
cg01614759	10	<i>C10orf25;ZNF22</i>	-23.21	3.94E-07	-32.81	2.42E-11	-16.09	8.13E-06
cg01770400	1	<i>SERPINC1</i>	-18.16	3.88E-04	-20.22	9.29E-05	-27.37	1.14E-04
cg01998785	16	<i>LPCAT2</i>	-11.72	1.21E-06	-13.95	1.95E-08	-11.38	6.35E-05
cg02643667	21	<i>TFF1</i>	-1.31	8.48E-01	-3.00	6.68E-01	-19.63	1.28E-01
cg03580247	17	<i>SLC4A1</i>	-1.37	4.70E-01	-2.46	2.24E-01	-2.75	1.99E-01
cg03693099	9	<i>CEL</i>	-13.57	1.03E-06	-18.94	7.30E-11	-10.62	2.06E-03
cg04111761	3	<i>CCR3</i>	-8.18	4.16E-04	-10.20	1.69E-05	-7.49	8.06E-03
cg04523589	3	<i>CAMP</i>	-7.87	4.41E-03	-10.84	1.48E-04	-10.89	2.06E-03
cg05154390	1	<i>MRPS15</i>	-2.21	5.74E-01	-2.65	5.07E-01	2.33	7.60E-01
cg05869585	16	<i>TMEM186;PMM2</i>	-3.90	3.80E-01	-3.64	4.16E-01	-1.10	8.63E-01
cg06690548	4	<i>SLC7A11</i>	-17.72	2.53E-04	-21.19	2.01E-05	-14.87	3.63E-02
cg06736444	16	<i>LOC100128788;SRRM2</i>	-11.49	6.38E-06	-14.67	4.20E-08	-6.52	2.96E-02
cg07374928	11	<i>FAM118B</i>	-3.01	3.39E-02	-0.84	5.45E-01	-1.91	2.26E-01
cg07689731	1	--	-0.04	9.77E-01	-0.68	5.86E-01	-0.25	8.76E-01
cg08377000	4	<i>TIGD2</i>	-3.22	1.08E-01	-4.43	2.76E-02	-5.14	4.78E-02
cg08404225	3	<i>IL5RA</i>	-12.10	1.13E-06	-14.02	3.42E-08	-9.70	2.62E-04
cg09447105	12	<i>PDE6H</i>	-10.57	3.10E-04	-14.42	2.05E-06	-8.31	1.71E-02
cg09676390	21	<i>ADARB1; SSR4P1</i>	-4.72	7.66E-03	-5.31	2.98E-03	-5.63	1.09E-02
cg09793866	8	<i>STAR</i>	-6.03	1.04E-02	-9.35	1.12E-04	-1.82	5.15E-01
cg09914444	1	<i>DMBX1</i>	-4.51	1.34E-02	-4.90	8.04E-03	-1.91	4.00E-01
cg10414946	11	<i>MS4A2</i>	-20.20	2.65E-06	-23.01	1.26E-07	-17.08	7.05E-04
cg10805676	16	<i>TMEM8A;MRPL28</i>	-6.84	1.58E-02	-12.22	3.54E-05	-7.77	3.20E-02
cg11136251	15	<i>ZWILCH;RPL4</i>	-16.23	6.54E-02	-17.05	5.80E-02	6.96	6.38E-01
cg11398517	20	<i>GTSF1L</i>	-5.51	3.11E-02	-10.18	1.32E-04	-4.44	1.73E-01
cg12818699	6	<i>RIPOR2</i>	-17.23	2.83E-06	-20.22	7.32E-08	-15.87	2.02E-04
cg12866859	17	<i>HEXIM1</i>	-5.85	5.70E-02	-7.69	1.48E-02	-3.81	3.23E-01
cg13221796	13	<i>RB1</i>	-11.10	4.64E-06	-13.74	3.79E-08	-8.42	3.59E-03
cg15357945	11	<i>PRG2</i>	-7.68	1.71E-03	-11.75	4.47E-06	-4.28	1.59E-01
cg15996947	14	<i>ATP5S</i>	-22.49	4.17E-03	-21.63	5.77E-03	-41.34	4.46E-03
cg15998761	2	<i>MFSD6</i>	-16.76	5.79E-07	-20.90	1.58E-09	-12.27	6.96E-04
cg16050349	3	<i>PIK3CB</i>	-13.87	3.60E-03	-14.05	4.39E-03	-30.80	1.71E-04
cg16386158	2	<i>IL1RL1</i>	-7.25	3.02E-02	-11.94	6.29E-04	-7.94	3.77E-02
cg16396488	12	<i>PLA2G1B</i>	-8.48	7.38E-05	-10.37	2.47E-06	-5.41	3.08E-02
cg17582777	1	<i>EFNA3</i>	-21.31	3.65E-06	-25.61	5.35E-08	-18.93	3.18E-04
cg17749520	17	<i>ITGA2B</i>	-20.47	2.49E-05	-22.40	5.60E-06	-24.69	2.92E-05
cg17784922	7	<i>KEL</i>	-16.38	2.10E-03	-20.03	2.02E-04	-23.01	8.42E-04

cg17890764	3	<i>ITIH4</i>	-5.89	1.60E-01	-5.42	1.99E-01	-13.65	1.37E-01
cg18254848	19	<i>CLC</i>	-13.40	2.16E-04	-15.19	3.24E-05	-15.20	5.85E-03
cg18783781	1	<i>SLC25A33</i>	-15.13	1.70E-07	-18.36	6.34E-10	-10.19	1.15E-03
cg19881895	11	<i>SLC43A3</i>	-10.97	1.08E-01	-14.09	4.05E-02	-13.43	2.80E-01
cg20503329	9	<i>COL15A1</i>	-27.84	2.23E-06	-31.64	1.09E-07	-35.83	2.06E-04
cg20967028	12	<i>ART4</i>	10.31	1.07E-01	9.40	1.41E-01	14.05	4.40E-01
cg21627181	6	<i>SLC17A4</i>	-18.69	4.57E-08	-22.41	1.57E-10	-16.20	3.74E-05
cg21631409	11	<i>ALDH3B2</i>	-6.33	1.81E-01	-6.45	1.80E-01	-20.00	5.23E-02
cg21682902	12	<i>HAL</i>	-6.84	1.36E-02	-9.22	1.06E-03	-5.10	1.34E-01
cg23064554	1	<i>CTRC</i>	-16.23	4.09E-02	-16.92	3.30E-02	-24.29	3.74E-02
cg23759710	2	<i>OXER1</i>	-10.53	3.38E-02	-10.95	2.86E-02	-11.62	2.40E-01
cg24459209	11	<i>PRG3</i>	-19.13	5.06E-06	-23.24	5.68E-08	-14.46	1.23E-03
cg25494227	12	<i>TMEM52B</i>	-11.53	1.85E-04	-13.22	2.70E-05	-7.30	5.17E-02
cg25636075	3	<i>TMEM41A</i>	-14.90	5.77E-04	-19.34	1.18E-05	-15.83	2.40E-03
cg26136776	19	<i>KLF1</i>	-13.81	4.25E-05	-14.73	1.27E-05	-7.27	7.19E-02
cg26251865	19	<i>IRGC</i>	-4.08	3.02E-02	-5.48	4.39E-03	-1.24	5.88E-01
cg26457013	19	<i>TMEM86B</i>	-10.02	9.75E-04	-16.24	3.92E-07	-2.42	5.25E-01
cg26787239	5	<i>IL4</i>	-17.55	1.14E-06	-22.30	1.82E-09	-15.60	1.65E-04
cg27653134	12	<i>A2ML1</i>	-22.56	5.27E-06	-25.95	1.58E-07	-21.50	3.88E-04

Figure S1. Q-Q plots of meta-analysis results of the association between mid-childhood peripheral blood DNA methylation with mid-childhood allergic phenotypes.

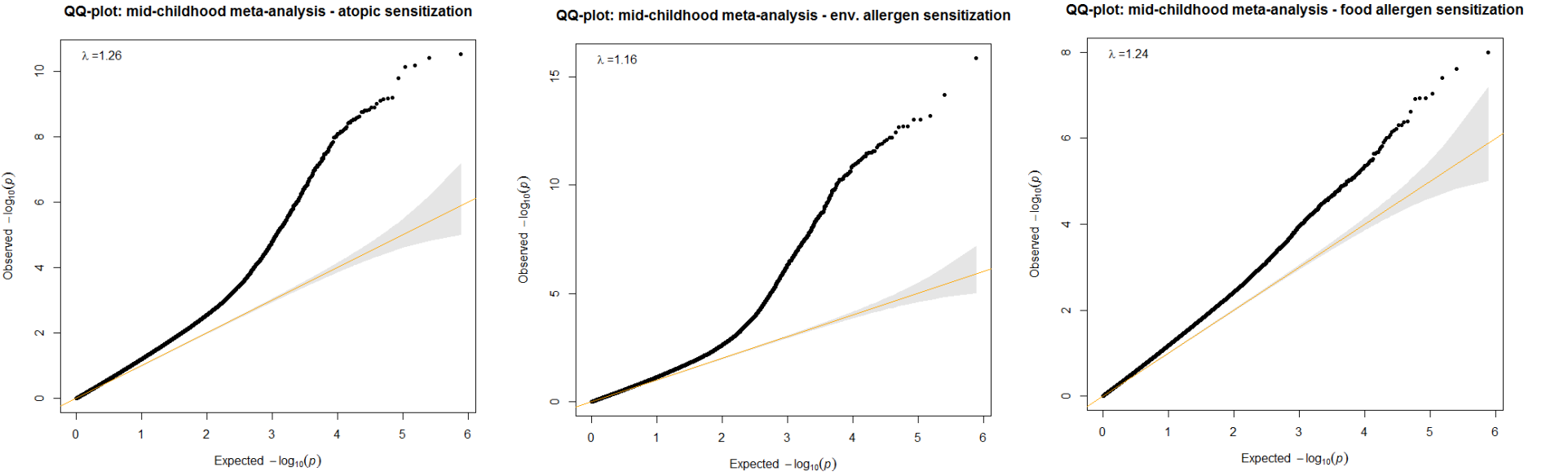


Figure S1 continued. Q-Q plots of meta-analysis results of the association between cord blood DNA methylation with mid-childhood allergic phenotypes.

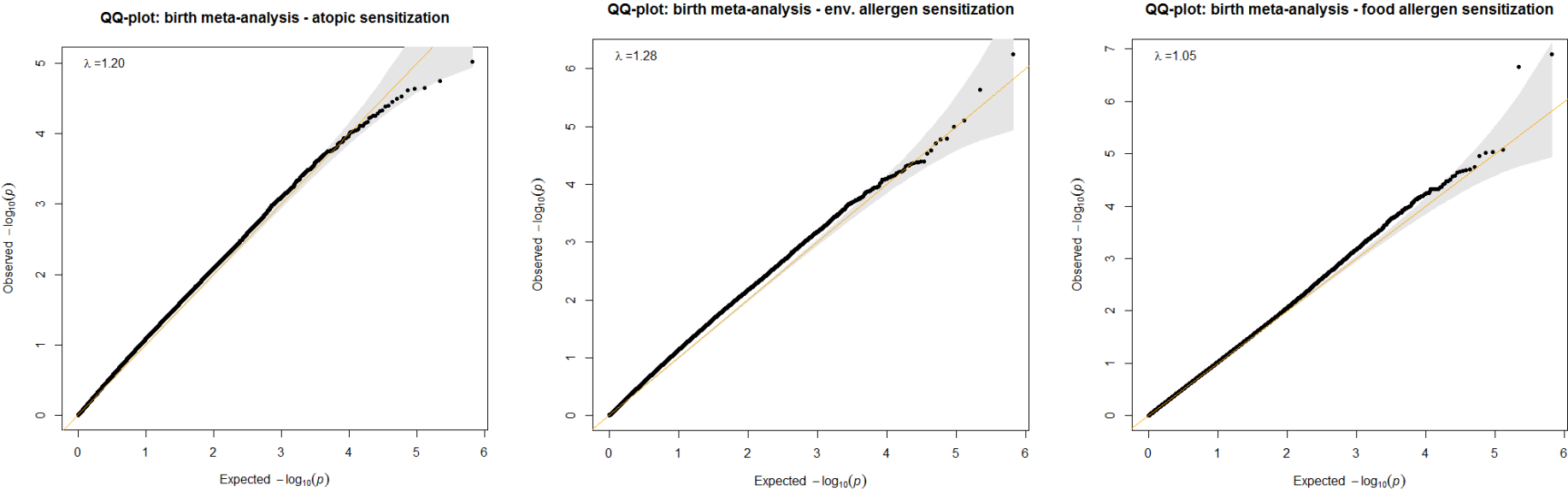


Figure S2. Trajectory plots of methylation changes by environmental allergen sensitization status. Methylation sites were selected as they showed nominal significance in the cord blood analysis, and epigenome-wide significance in the mid-childhood analysis. Top 4 plots: top 4 methylation sites sorted by cord blood p-values based on the criteria described above; bottom 4 plots: methylation sites previously shown to be associated with asthma.

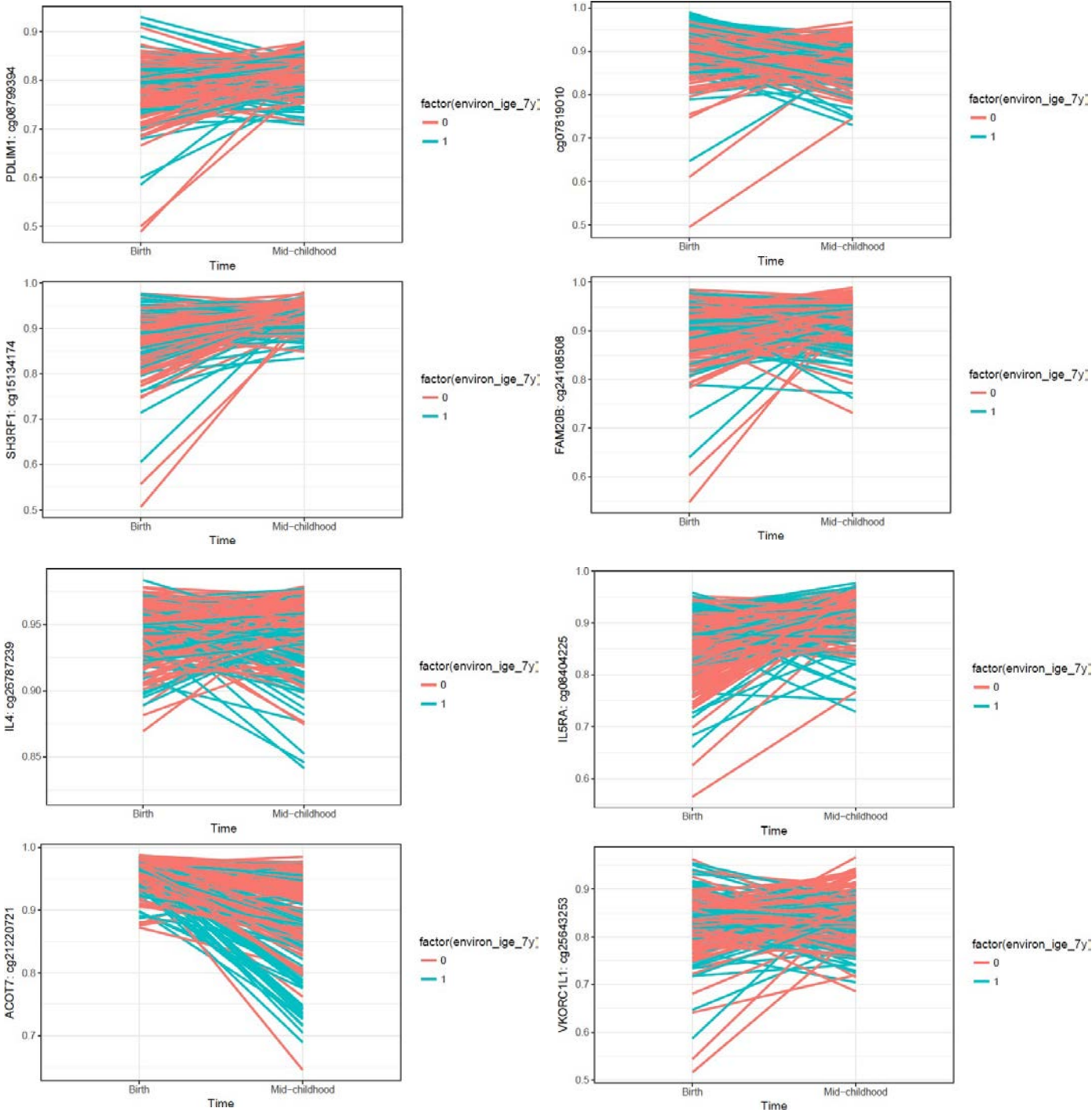


Figure S2 continued. Trajectory plots of methylation changes by food allergen sensitization status. Methylation sites were selected as they showed nominal significance in the cord blood analysis, and epigenome-wide significance in the mid-childhood analysis.

