

## Supplementary Materials: Do Variants in *GST*s Modify the Association between Traffic Air Pollution and Asthma in Adolescence?

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**Table S1.** Genotype frequencies for *GSTT1*, *GSTP1* and *GSTM1* genes among 12 and 18 years participants and non-participants.

Genetic Polymorphism	At 12 Years		<i>p</i>	At 18 Years
	Participants	Non-Participants		Participants (%)
<i>GSTT1</i> ( <i>n</i> = 428)				
Non-null	249 (83.6%)	104 (80.0%)	0.40	353 (82.5%)
Null	49 (16.4%)	26 (20.0%)	0.40	75 (17.5%)
<i>GSTP1</i> ( <i>n</i> = 429)				
<i>Ile/Ile</i>	127 (42.6%)	57 (43.5%)	0.90	184 (42.9%)
<i>Ile/Val</i>	127 (42.6%)	58 (44.2%)	0.76	185 (43.1%)
<i>Val/Val</i>	44 (14.8%)	16 (12.2%)	0.45	60 (14.0%)
<i>GSTM1</i> ( <i>n</i> = 424)				
Non-null	131 (44.0%)	45 (35.7%)	0.11	176 (41.5%)
Null	167 (56.0%)	81 (64.3%)	0.11	248 (58.5%)

“*p*” Value for test for differences between the two populations—z-test. Note that blood samples were collected from participants at 18 years for gene testing; therefore non-participants not exist to compare.

**Table S2.** Associations of traffic-related air pollution (TRAP) exposure (cumulative lengths of major roads in 150 m buffer of each participant’s residence during the first year of life) and asthma, wheeze and hay fever at 12 and 18 years.

Outcome	12 Years			18 Years		
	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>
Asthma	1.02	0.86, 1.22	0.79	1.02	0.86, 1.21	0.80
Wheeze	1.03	0.87, 1.21	0.74	1.02	0.87, 1.21	0.77
Hay fever	0.89	0.75, 1.05	0.10	1.02	0.88, 1.18	0.80

ORs are for 100 m increase in cumulative lengths of major roads in 150.m buffer at home address during the first year of life. Adjusted for parent asthma and smoking.

**Table S3.** Associations between TRAP exposure (living ≤150 m from a freeway or highway of each participant’s residence during the first year of life-categorical variable) and asthma, wheeze and hay fever at 12 and 18 years.

Outcome	12 Years			18 Years		
	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>
asthma	0.78	0.36, 1.70	0.53	1.24	0.65, 2.36	0.52
wheeze	0.83	0.41, 1.69	0.61	1.09	0.58, 2.05	0.80
hay fever	0.59	0.30, 1.17	0.13	0.79	0.45, 1.37	0.39

Adjusted for parent asthma and smoking.

**Table S4.** Association between TRAP exposure (cumulative lengths of major roads in 150 m buffer of each participant's residence during the first year of life) during the first year of life and current symptoms of asthma, wheeze and hay fever stratified by *GSTT1*, *GSTP1* and *GSTM1* polymorphisms.

Genes	Outcome	<i>GSTT1</i> Non-Null				<i>GSTT1</i> Null				Interaction <i>p</i>	<i>n</i>
		OR	95%CI	<i>p</i>	<i>n</i>	OR	95%CI	<i>p</i>	<i>n</i>		
<i>GSTT1</i>	Asthma 12 years	1.03	0.82, 1.29	0.81	241	2.15	1.15, 4.00	0.02	40	0.04	281
<i>GSTT1</i>	Asthma 18 years	1.06	0.88, 1.28	0.52	323	0.78	0.43, 1.43	0.43	68	0.32	391
<i>GSTT1</i>	Wheeze 12 years	1.02	0.82, 1.26	0.88	240	2.31	1.17, 4.57	0.02	47	0.02	287
<i>GSTT1</i>	Wheeze 18 years	1.09	0.92, 1.30	0.33	332	0.66	0.34, 1.25	0.20	70	0.15	402
<i>GSTT1</i>	Hay fever 12 years	1.00	0.77, 1.17	0.63	234	0.77	0.42, 1.41	0.40	48	0.51	282
<i>GSTT1</i>	Hay fever 18 years	1.00	0.87, 1.19	0.83	328	0.95	0.63, 1.41	0.79	70	0.71	398
Genes	Outcome	<i>Ile/Ile</i>				<i>Ile/Val+Val/Val</i>				Interaction <i>p</i>	<i>n</i>
		OR	95%CI	<i>p</i>	<i>n</i>	OR	95%CI	<i>p</i>	<i>n</i>		
<i>GSTP1</i>	Asthma 12 years	1.28	0.95, 1.72	0.11	120	1.01	0.76, 1.35	0.93	161	0.26	281
<i>GSTP1</i>	Asthma 18 years	1.00	0.76, 1.32	1.00	164	1.04	0.84, 1.29	0.74	228	0.84	392
<i>GSTP1</i>	Wheeze 12 years	1.30	0.97, 1.74	0.07	168	1.00	0.76, 1.31	0.99	119	0.19	287
<i>GSTP1</i>	Wheeze 18 years	0.98	0.74, 1.28	0.86	171	1.06	0.86, 1.30	0.61	232	0.64	403
<i>GSTP1</i>	Hay fever 12 years	1.05	0.79, 1.41	0.72	121	0.83	0.63, 1.08	0.17	161	0.24	282
<i>GSTP1</i>	Hay fever 18 years	1.16	0.91, 1.47	0.22	169	0.95	0.79, 1.14	0.55	230	0.19	399
Genes	Outcome	<i>GSTM1</i> Non-Null				<i>GSTM1</i> Null				Interaction <i>p</i>	<i>n</i>
		OR	95%CI	<i>p</i>	<i>n</i>	OR	95%CI	<i>p</i>	<i>n</i>		
<i>GSTM1</i>	Asthma 12 years	1.34	0.98, 1.83	0.06	123	0.96	0.72, 1.30	0.81	158	0.04	281
<i>GSTM1</i>	Asthma 18 years	1.18	0.90, 1.55	0.22	164	0.92	0.73, 1.16	0.48	227	0.32	391
<i>GSTM1</i>	Wheeze 12 years	1.42	1.05, 1.92	0.02	128	0.93	0.71, 1.21	0.58	159	0.02	287
<i>GSTM1</i>	Wheeze 18 years	1.06	0.80, 1.39	0.69	168	1.02	0.82, 1.25	0.88	234	0.85	402
<i>GSTM1</i>	Hay fever 12 years	0.91	0.68, 1.22	0.53	124	0.92	0.70, 1.20	0.52	158	0.51	282
<i>GSTM1</i>	Hay fever 18 years	1.10	0.87, 1.38	0.44	165	0.94	0.77, 1.14	0.52	233	0.71	398

ORs are for 100 m increase in cumulative lengths of major roads in 150 m buffer at home address during the first year of life. Adjusted for parent asthma and smoking.

**Table S5.** Interactions of *GSTs* for the associations between TRAP exposure (living  $\leq 150$  m from a freeway or highway of each participant's residence during the first year of life) and current symptoms of asthma, wheeze and hay fever.

Genes	Outcome	Interaction <i>p</i>	<i>n</i>
<i>GSTT1</i>	Asthma 12 years	0.15	281
<i>GSTT1</i>	Asthma 18 years	0.67	391
<i>GSTT1</i>	Wheeze 12 years	0.08	287
<i>GSTT1</i>	Wheeze 18 years	0.45	402
<i>GSTT1</i>	Hay fever 12 years	0.42	282
<i>GSTT1</i>	Hay fever 18 years	0.75	398
<i>GSTP1</i>	Asthma 12 years	0.20	281
<i>GSTP1</i>	Asthma 18 years	0.52	392
<i>GSTP1</i>	Wheeze 12 years	0.24	287
<i>GSTP1</i>	Wheeze 18 years	0.60	403
<i>GSTP1</i>	Hay fever 12 years	0.33	282
<i>GSTP1</i>	Hay fever 18 years	0.16	399
<i>GSTM1</i>	Asthma 12 years	0.80	281
<i>GSTM1</i>	Asthma 18 years	0.90	391
<i>GSTM1</i>	Wheeze 12 years	0.94	287
<i>GSTM1</i>	Wheeze 18 years	0.97	402
<i>GSTM1</i>	Hay fever 12 years	0.59	282
<i>GSTM1</i>	Hay fever 18 years	0.88	398

**Table S6.** Associations of TRAP exposure (cumulative lengths of major roads in 150 m buffer of each participant's residence during the first year of life) and asthma, wheeze and hay fever at 12 and 18 years (restricted to participants who lived in the same address from birth to 12 years of age).

Outcome	12 Years			18 Years		
	OR	95% CI	<i>p</i>	OR	95% CI	<i>p</i>
Asthma	1.16	0.89, 1.50	0.27	1.09	0.80, 1.50	0.58
Wheeze	1.06	0.82, 1.37	0.66	1.17	0.87, 1.56	0.30
Hay fever	0.82	0.62, 1.09	0.17	1.13	0.86, 1.49	0.39

ORs are for 100 m increase in cumulative lengths of major roads in 150 m buffer at home address during the first year of life. Adjusted for parent asthma and smoking.