

Supplementary Materials

Interactions between Environmental Factors and Glutathione S-Transferase (GST) Genes with Respect to Detectable Blood Aluminum Concentrations in Jamaican Children

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Table S1. Associations between children's genotypes for GST genes and binary detectable blood Al concentrations (BALCs) by children's exposure to environmental factors based on logistic regression models that include interaction between GST genes and the main environmental exposure (N = 366).

Gene	Models	Genotypes Compared	Referent Genotypes	Environmental factor (food consumption)	Category	OR (95%CI)	<i>p</i> Value ^a	Overall interaction <i>p</i> Value ^b
<i>GSTT1</i> ^c	Recessive	DD ^e	I/I or I/D ^f	Porridge	Yes	0.75 (0.45, 1.26)	0.28	0.03
					No	0.08 (0.01, 0.58)	0.01	
<i>GSTT1</i> ^c	Recessive	DD ^e	I/I or I/D ^f	Macaroni	Yes	0.78 (0.47, 1.33)	0.37	0.03
					No	0.14 (0.04, 0.61)	0.01	
<i>GSTT1</i> ^c	Recessive	DD ^e	I/I or I/D ^f	Green banana	Yes	0.89 (0.51, 1.56)	0.68	0.04
					No	0.27 (0.10, 0.74)	0.01	
<i>GSTM1</i> ^d	Recessive	DD ^e	I/I or I/D ^f	Broad beans (fava beans)	Yes	1.18 (0.60, 2.31)	0.63	<0.05
					No	0.41 (0.18, 0.92)	0.03	
<i>GSTP1</i> ^g	Co-dominant	Ile/Val	Ile/Ile	Saltwater fish	Yes	0.64 (0.33, 1.25)	0.19	0.03
					No	1.70 (0.71, 4.07)	0.23	
		Val/Val	Ile/Ile		Yes	0.48 (0.22, 1.04)	0.06	
					No	3.04 (0.93, 9.89)	0.06	
		Ile/Val	Val/Val		Yes	1.33 (0.69, 2.53)	0.39	
					No	0.56 (0.19, 1.64)	0.29	
	Dominant	Val/Val or Ile/Val	Ile/Ile	Saltwater fish	Yes	0.58 (0.31, 1.10)	0.1	0.02
					No	1.96 (0.85, 4.52)	0.12	
	Recessive	Val/Val	Ile/Ile or Ile/Val	Saltwater fish	Yes	0.65 (0.35, 1.20)	0.17	0.05
					No	2.14 (0.76, 6.02)	0.15	
	Co-dominant	Ile/Val	Ile/Ile	White bread	Yes	0.58 (0.29, 1.15)	0.12	0.06
					No	1.77 (0.77, 4.04)	0.18	
					Val/Val	Ile/Ile	Yes	

				No	2.21 (0.70, 7.00)	0.18	
				Yes	1.11 (0.58, 2.11)	0.76	
				No	0.80 (0.27, 2.37)	0.69	
Dominant	Val/Val or Ile/Val	Ile/Ile	White bread	Yes	0.56 (0.29, 1.08)	0.08	0.02
				No	1.86 (0.84, 4.10)	0.12	
Recessive	Val/Val	Ile/Ile or Ile/Val	White bread	Yes	0.76 (0.41, 1.40)	0.38	0.24
				No	1.55 (0.55, 4.39)	0.40	
				Yes	1.43 (0.76, 2.68)	0.27	
				No	0.38 (0.15, 0.99)	0.047	
Co-dominant	Val/Val	Ile/Ile	Whole wheat bread	Yes	1.30 (0.59, 2.87)	0.52	0.07
				No	0.43 (0.15, 1.26)	0.12	
				Yes	1.10 (0.53, 2.29)	0.8	
				No	0.88 (0.38, 2.06)	0.77	
Dominant	Val/Val or Ile/Val	Ile/Ile	Whole wheat bread	Yes	1.39 (0.77, 2.52)	0.28	0.02
				No	0.40 (0.16, 0.98)	<0.05	
Recessive	Val/Val	Ile/Ile or Ile/Val	Whole wheat bread	Yes	1.04 (0.52, 2.08)	0.91	0.72
				No	0.86 (0.38, 1.92)	0.70	

^a *p* values are based on the Wald's test in logistic regression models. ^b Overall interaction *p* values based on the type 3 effect test in logistic regression models. ^c *GSTT1* was missing for 12 children with BAICs above LoD and 6 children with BAICs below LoD. ^d *GSTM1* was missing for 12 children with BAICs above LoD and for 5 children with BAICs below LoD. ^e DD indicates the null alleles for *GSTT1* and *GSTM1*. ^f I/I or I/D indicate the homozygote (I/I) or a heterozygote (I/D) for *GSTT1* and *GSTM1*. ^g *GSTP1* was missing for 11 children with BAICs above LoD and 4 children with BAICs below LoD.

Table S2. Associations between children’s genotypes for *GSTP1* and binary detectable blood AI concentrations (BAICs) by saltwater fish consumption based on logistic regression models that adjusted for parental education level and consumption of string beans (N = 366).

Models	Environmental factor (food consumption)	Category	Gene	Genotypes	OR (95%CI)	<i>p</i> Value ^a	Overall interaction <i>p</i> Value ^b
Co-dominant	Saltwater fish	Yes	<i>GSTP1</i> ^c	Ile/Val vs. Ile/Ile (ref)	0.59 (0.29, 1.21)	0.15	0.02
				Val/Val vs. Ile/Ile (ref)	0.41 (0.18, 0.94)	0.03	
				Ile/Val vs. Val/Val (ref)	1.46 (0.72, 2.95)	0.30	
		No		Ile/Val vs. Ile/Ile (ref)	1.66 (0.67, 4.10)	0.28	
				Val/Val vs. Ile/Ile (ref)	3.12 (0.92, 10.58)	0.07	
				Ile/Val vs. Val/Val (ref)	0.53 (0.17, 1.63)	0.27	
Dominant	Saltwater fish	Yes	<i>GSTP1</i> ^c	Val/Val or Ile/Val vs. Ile/Ile (ref)	0.53 (0.27, 1.04)	0.06	0.02
		No			1.94 (0.82, 4.60)	0.13	
Recessive	Saltwater fish	Yes	<i>GSTP1</i> ^c	Val/Val vs. Ile/Ile or Ile/Val (ref)	0.58 (0.30, 1.13)	0.11	0.04
		No			2.26 (0.77, 6.59)	0.14	

^a *p* values are based on the Wald’s test in logistic regression models. ^b Overall interaction *p* values based on the type 3 effect test in logistic regression models. ^c *GSTP1* was missing for 11 children with BAICs above LoD and 4 children with BAICs below LoD.