

Experimental Man

Envirogenetic interaction of Mercury: Sample Interactions, Individual (David Ewing Duncan)

<u>Chemical</u>	<u>DED Level</u>	<u>Gene</u>	<u>SNP/Marker</u>	<u>Risk Var</u>	<u>DED Var</u>	<u>Disease(s)</u>	<u>Notes</u>
Mercury(total)	4ppm-14ppm*						
MeHg		GSTP1-105	rs1695	G	AA	Asthma, drug response, > risk of some cancers	Reduced glutithione, > retention of MeHg
MeHg		GSTP1-114	rs1138272	T	CC	> risk of some cancers	
MeHg		GCLM-588	rs41303970	T	N/A	< GSH Production	>Blood PI, urine Hg levels
MeHg		GCLC-129	rs17883901	T	N/A	< GSH Production	
Elemental		BDNF	rs 6265	T	CC	> neural impairment	

*4 ppm: Background level; 14ppm after two meals of fish

References

1: Engstrom, K.S. et al. Genetic Variation in Glutathione-related Genes and Body Burden of Methylmercury. Environmental Health <http://www.ehponline.org/members/2008/10804/10804.pdf>

2: Custodio, H.M. et al. Polymorphisms in glutathione-related genes affect methylmercury retention. Archives of environmental health

3: Gene-Environment Interactions: Fundamentals of Ecogenetics. By Lucio G. Costa, David L. Eaton. ISBN 0471758035 . Wiley Int

4: Custodio, H.M. et al. Genetic influences on the retention of inorganic mercury. Archives of Environmental & Occupational Health

5: Echeverria, D. et al. Chronic low-level mercury exposure, BDNF polymorphism, and associations with cognitive and motor functi

6: Heyer, N.J. et al. Chronic low-level mercury exposure, BDNF polymorphism, and associations with self-reported symptoms and r

7: OMIM: <http://www.ncbi.nlm.nih.gov/entrez/dispomim.cgi?id=113505>

Low (3.6-5.8ppm)

Medium (5.9-7.5ppm)

High (7.6-16 ppm)

GSTP1-105	Merc Level	No. Subjects				
AA	3.1	45	4.1	41	7	44
GA	2.7	43	3.6	47	5.6	46
GG	3.7	9	5.2	9	4.4	7
GSTP-114						
TT	2.9	80	4	77	6.5	75
CT & CC	3.1	16	3.9	21	4.7	22
Combined						
No risk marker	3	44	4.1	40	7	44
One risk marke	2.7	33	3.6	33	6.1	28
Two risk marke	3.2	19	4.2	24	4.6	25