

Supplementary Materials: Genetic Variation in Choline-Metabolizing Enzymes Alters Choline Metabolism in Young Women Consuming Choline Intakes Meeting Current Recommendations

Ariel B. Ganz, Vanessa V. Cohen, Camille C. Swersky, Julie Stover, Gerardo A. Vitiello, Jessica Lovesky, Jasmine C. Chuang, Kelsey Shields, Vladislav G. Fomin, Yusnier S. Lopez Sanjay Mohan, Anita Ganti, Bradley Carrier, Olga V. Malysheva and Marie A. Caudill

Table S1. Effect of SNP genotype and interaction (*p*-values) on plasma choline metabolite partitioning and flux.

SNP and Metabolic Outcome	Gene	G × RS	G × Cho	Three-Way
CHKA rs10791957				
Betaine-d ₉ /PC-d ₉	0.6	-	-	-
PC-d ₃₊₆ /PC-d ₉	0.09	-	-	-
Choline → Betaine	0.8	-	-	-
Choline → CDP-PC	0.3	-	-	-
Betaine → DMG	0.5	-	-	-
Betaine → Methionine	0.6	-	-	-
Methionine → PEMT-PC	0.0005	-	-	-
CHDH rs9001				
Betaine-d ₉ /PC-d ₉	0.2	-	0.07	-
PC-d ₃₊₆ /PC-d ₉	0.1	-	-	-
Choline → Betaine	0.6	-	-	-
Choline → CDP-PC	0.7	0.04	-	-
Betaine → DMG	0.2	-	-	-
Betaine → Methionine	0.9	-	-	-
Methionine → PEMT-PC	0.9	-	-	-
CHDH rs12676				
Betaine-d ₉ /PC-d ₉	0.2	-	-	-
PC-d ₃₊₆ /PC-d ₉	0.055	-	-	-
Choline → Betaine	0.3	-	-	-
Choline → CDP-PC	0.2	0.08	0.9	0.05
Betaine → DMG	0.03	0.09	-	-
Betaine → Methionine	0.2	-	0.1	-
Methionine → PEMT-PC	0.2	0.02	0.8	0.05
BHMT rs3733890				
Betaine-d ₉ /PC-d ₉	0.066	-	-	-
PC-d ₃₊₆ /PC-d ₉	0.3	-	-	-
Choline → Betaine	0.03	-	-	-
Choline → CDP-PC	0.03	-	-	-
Betaine → DMG	0.1	-	-	-
Betaine → Methionine	0.95	-	-	-
Methionine → PEMT-PC	0.15	-	-	-

Table S1. Cont.

SNP and Metabolic Outcome	Gene	G × RS	G × Cho	Three-Way
PEMT rs4646343				
Betaine-d ₉ /PC-d ₉	0.6	-	-	-
PC-d ₃₊₆ /PC-d ₉	0.05	-	-	-
Choline → Betaine	0.9	-	-	-
Choline → CDP-PC	0.9	-	-	-
Betaine → DMG	0.6	-	-	-
Betaine → Methionine	0.97	0.08	-	-
Methionine → PEMT-PC	0.6	0.4	0.2	0.04
PEMT rs7946				
Betaine-d ₉ /PC-d ₉	0.1	-	-	-
PC-d ₃₊₆ /PC-d ₉	0.1	0.098	-	-
Choline → Betaine	0.96	-	-	-
Choline → CDP-PC	0.5	-	-	-
Betaine → DMG	0.3	-	-	-
Betaine → Methionine	0.3	-	-	-
Methionine → PEMT-PC	0.07	-	-	-
FMO3 rs2266782				
Betaine-d ₉ /PC-d ₉	0.1	-	-	-
PC-d ₃₊₆ /PC-d ₉	0.6	-	-	-
Choline → Betaine	0.9	-	-	-
Choline → CDP-PC	0.9	-	-	-
Betaine → DMG	0.7	-	-	-
Betaine → Methionine	0.03	-	-	-
Methionine → PEMT-PC	0.05	-	-	-
SLC44A1 rs7873937				
Betaine-d ₉ /PC-d ₉	0.5	-	-	-
PC-d ₃₊₆ /PC-d ₉	0.8	0.96	0.8	0.08
Choline → Betaine	0.3	-	-	-
Choline → CDP-PC	0.7	-	-	-
Betaine → DMG	0.3	0.4	0.10	0.04
Betaine → Methionine	0.6	-	0.06	-
Methionine → PEMT-PC	0.3	0.2	0.5	0.05
SLC44A1 rs3199966				
Betaine-d ₉ /PC-d ₉	0.9	-	-	-
PC-d ₃₊₆ /PC-d ₉	0.4	-	-	-
Choline → Betaine	0.2	-	-	-
Choline → CDP-PC	0.2	-	-	-
Betaine → DMG	0.8	0.5	0.5	0.106
Betaine → Methionine	0.5	-	0.08	-
Methionine → PEMT-PC	0.7	-	-	-