

Supplementary materials

Table S1. Correlation of NT-proBNP and clinical traits

Clinical traits	Spearman's rho	p-value
Hematocrit	-0.455	2.19×10^{-21}
Hemoglobin	-0.446	1.34×10^{-20}
Alanine transferase	-0.409	2.67×10^{-17}
Creatinine	-0.406	5.23×10^{-17}
Red Blood Cell	-0.380	6.24×10^{-15}
Uric Acid	-0.353	5.56×10^{-13}
Alkaline Phosphatase	-0.345	2.11×10^{-12}
HDL Cholesterol	0.329	2.34×10^{-11}
Triglyceride	-0.328	2.46×10^{-11}
Insulin	-0.328	2.56×10^{-11}
Creatine Kinase	-0.332	8.82×10^{-10}
C Peptide	-0.300	1.76×10^{-9}
GGT	-0.410	5.60×10^{-8}
Urea	-0.251	4.48×10^{-7}
Total Protein	-0.234	2.68×10^{-6}
Aspartate aminotransferase	-0.223	7.91×10^{-6}
Albumin	-0.208	3.26×10^{-5}
Average systolic BP	-0.192	1.32×10^{-4}
Glucose	-0.175	4.75×10^{-4}
LDL Cholesterol Calc	-0.157	1.83×10^{-3}
Average pulse rate	-0.153	2.39×10^{-3}
Total Cholesterol	-0.144	4.27×10^{-3}
Average diastolic BP	-0.139	5.68×10^{-3}

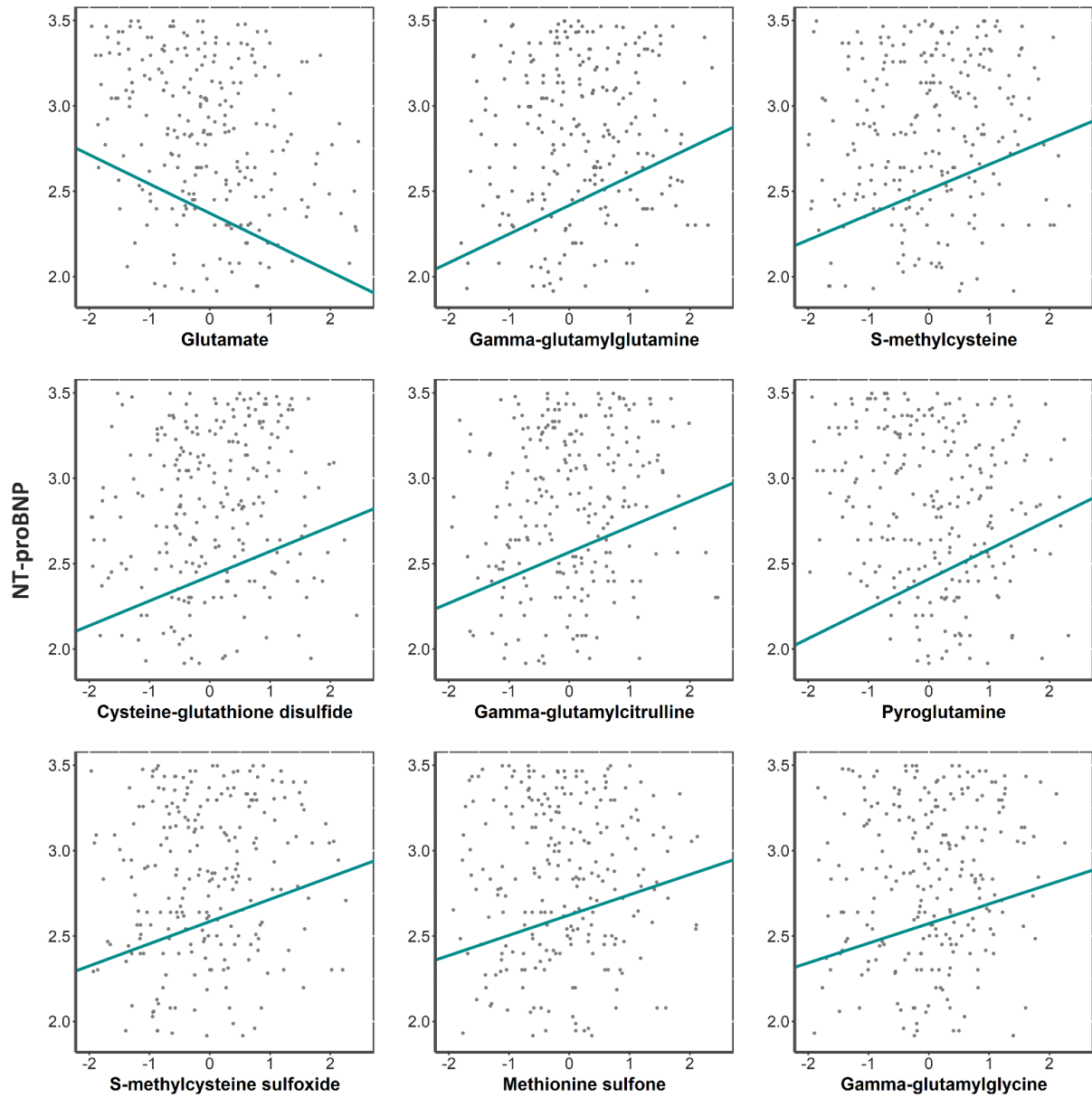


Figure S1. Scatterplot of NT-proBNP vs significant metabolites from linear regression analysis. Green line represents the slope (estimate), which explains the direction and the effect of the metabolites on NT-proBNP (FDR < 0.05).

Table S2. Metabolites that are significantly different between IS and IR groups.

Metabolite	Super-pathway	Estimate	SE	p-value	FDR
gamma-glutamylphenylalanine	Gamma-glutamyl Amino Acid	0.789	0.099	1.53×10 ⁻¹⁴	3.67×10 ⁻¹³
gamma-glutamylisoleucine*	Gamma-glutamyl Amino Acid	0.703	0.096	1.33×10 ⁻¹²	2.40×10 ⁻¹¹
gamma-glutamyltyrosine	Gamma-glutamyl Amino Acid	0.749	0.103	1.99×10 ⁻¹²	2.86×10 ⁻¹¹
gamma-glutamylleucine	Gamma-glutamyl Amino Acid	0.666	0.097	2.14×10 ⁻¹¹	2.20×10 ⁻¹⁰
gamma-glutamylcitrulline*	Gamma-glutamyl Amino Acid	-0.666	0.101	1.61×10 ⁻¹⁰	1.29×10 ⁻⁰⁹
gamma-glutamylmethionine	Gamma-glutamyl Amino Acid	0.661	0.109	3.10×10 ⁻⁰⁹	2.24×10 ⁻⁰⁸
gamma-glutamylvaline	Gamma-glutamyl Amino Acid	0.588	0.098	4.50×10 ⁻⁰⁹	2.95×10 ⁻⁰⁸
gamma-glutamylalanine	Gamma-glutamyl Amino Acid	0.630	0.139	7.83×10 ⁻⁰⁶	3.32×10 ⁻⁰⁵
gamma-glutamyltryptophan	Gamma-glutamyl Amino Acid	0.529	0.131	7.29×10 ⁻⁰⁵	2.28×10 ⁻⁰⁴
gamma-glutamylhistidine	Gamma-glutamyl Amino Acid	0.390	0.106	2.63×10 ⁻⁰⁴	7.89×10 ⁻⁰⁴
gamma-glutamylglutamate	Gamma-glutamyl Amino Acid	0.350	0.099	4.41×10 ⁻⁰⁴	1.27×10 ⁻⁰³
gamma-glutamyl-2-aminobutyrate	Gamma-glutamyl Amino Acid	-0.361	0.115	1.75×10 ⁻⁰³	4.19×10 ⁻⁰³
gamma-glutamylglutamine	Gamma-glutamyl Amino Acid	-0.317	0.109	3.67×10 ⁻⁰³	8.02×10 ⁻⁰³
gamma-glutamylglycine	Gamma-glutamyl Amino Acid	-0.309	0.113	6.31×10 ⁻⁰³	1.19×10 ⁻⁰²
glutamate	Glutamate Metabolism	0.883	0.100	4.10×10 ⁻¹⁷	1.48×10 ⁻¹⁵
4-hydroxyglutamate	Glutamate Metabolism	0.716	0.123	1.45×10 ⁻⁰⁸	8.01×10 ⁻⁰⁸
N-acetylglutamate	Glutamate Metabolism	0.521	0.117	1.12×10 ⁻⁰⁵	4.49×10 ⁻⁰⁵
pyroglutamine*	Glutamate Metabolism	-0.293	0.085	6.23×10 ⁻⁰⁴	1.73×10 ⁻⁰³
carboxyethyl-GABA	Glutamate Metabolism	0.355	0.113	1.82×10 ⁻⁰³	4.23×10 ⁻⁰³
beta-citrylglutamate	Glutamate Metabolism	0.351	0.121	3.90×10 ⁻⁰³	8.02×10 ⁻⁰³
cysteine-glutathione disulfide	Glutathione Metabolism	-0.589	0.112	2.46×10 ⁻⁰⁷	1.18×10 ⁻⁰⁶
cysteinylglycine	Glutathione Metabolism	0.523	0.118	1.32×10 ⁻⁰⁵	5.02×10 ⁻⁰⁵
2-aminobutyrate	Glutathione Metabolism	-0.341	0.112	2.55×10 ⁻⁰³	5.73×10 ⁻⁰³
5-oxoproline	Glutathione Metabolism	-0.315	0.111	4.69×10 ⁻⁰³	9.39×10 ⁻⁰³
methionine sulfoxide	Methionine, Cysteine, SAM and Taurine Metabolism	1.005	0.108	8.79×10 ⁻¹⁹	6.33×10 ⁻¹⁷
S-methylcysteine	Methionine, Cysteine, SAM and Taurine Metabolism	-0.764	0.114	6.81×10 ⁻¹¹	6.13×10 ⁻¹⁰
methionine	Methionine, Cysteine, SAM and Taurine Metabolism	0.653	0.112	1.17×10 ⁻⁰⁸	7.04×10 ⁻⁰⁸
cystathionine	Methionine, Cysteine, SAM and Taurine Metabolism	0.700	0.121	1.76×10 ⁻⁰⁸	9.05×10 ⁻⁰⁸
S-methylcysteine sulfoxide	Methionine, Cysteine, SAM and Taurine Metabolism	-0.564	0.112	6.94×10 ⁻⁰⁷	3.12×10 ⁻⁰⁶
cysteine	Methionine, Cysteine, SAM and Taurine Metabolism	0.448	0.110	5.54×10 ⁻⁰⁵	1.81×10 ⁻⁰⁴
S-carboxyethylcysteine	Methionine, Cysteine, SAM and Taurine Metabolism	0.367	0.111	1.02×10 ⁻⁰³	2.72×10 ⁻⁰³
methionine sulfone	Methionine, Cysteine, SAM and Taurine Metabolism	-0.305	0.109	5.35×10 ⁻⁰³	1.04×10 ⁻⁰²
S-adenosylhomocysteine (SAH)	Methionine, Cysteine, SAM and Taurine Metabolism	0.285	0.106	7.79×10 ⁻⁰³	1.44×10 ⁻⁰²