

Genomic determinants of hypertension with a focus on metabolomics and the gut microbiome

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Supplementary Table: Metabolites associated with blood pressure and hypertension

Metabolite	Super Pathway	Sub pathway	HMDB ID	Of microbial origin	Metabolite Trend	BP trait	Ref
1-arachidonoylglycerophosphoethanolamine	Lipid	Lysolipid	HMDB0011517	No	↑ ↑	SBP DBP	26
1-myristoylglycerophosphocholine	Lipid	Lysolipid	HMDB0010379	Yes	↑ ↑	SBP DBP	26
1-palmitoleoylglycerophosphocholine	Lipid	Lysolipid	HMDB0010383	Yes	↑ ↑	SBP DBP	26
1-palmitoylglycerol (1-monopalmitin)	Lipid	Lysolipid	HMDB0011564	No	↑ ↑	SBP DBP	26
1-stearoylglycerol (1-monostearin)	Lipid	Lysolipid	HMDB0011131	No	↑ ↑	SBP DBP	26
1,7-dimethylurate	Lipid	Phospholipid Metabolism	HMDB0011103	No	↑ ↑ ↑	SBP DBP HTN	26,60
10-HDoHE	Lipid	Phospholipid Metabolism	HMDB0060037	No	↑	HTN	79
10-heptadecenoate (17:1n7)	Lipid	Phospholipid Metabolism	HMDB0060038	No	↑ ↑	SBP DBP	26
10-nonadecenoate (19:1n9)	Lipid	Long Chain Fatty Acid	HMDB13622	No	↑ ↑	SBP DBP	26
10-undecenoate (11:1n1)	Lipid	Medium Chain Fatty Acid	HMDB0029585	No	↑ ↑	SBP DBP	26
2 hydroxyvaleric acid	Lipid	Phospholipid Metabolism	HMDB0001863	No		SBP DBP	80

2-Aminoethanethiol	Amino Acid	Methionine, Cysteine, SAM and Taurine Metabolism	HMDB0002991	No	↑	HTN	81
2-Aminophenol	Lipid	Fatty Acid, Amino	HMDB0061116	No	↑	HTN	81
2-hydroxybutyrate (AHB)	Lipid	Fatty Acid, Dicarboxylate	HMDB0000008	Yes	↑ ↑	SBP DBP	26,80
2-hydroxyhippurate (salicylurate)	Xenobiotics	Benzoate Metabolism	HMDB00840	Yes	↑	SBP DBP HTN	60
2-hydroxyisobutyrate	Xenobiotics	Drug	HMDB0000729	Yes	↑	HTN	60
2-Methoxyestrone	Xenobiotics	Drug	HMDB0000010	No	↑	HTN	81
2-tetradecenoyl carnitine	Lipid	Lysolipid	HMDB0013329	No	↑ ↑	SBP DBP	26
3-(4-hydroxyphenyl)lactate	Amino Acid	Phenylalanine and Tyrosine Metabolism	HMDB00755	Yes	↑ ↑	SBP DBP	26
3-hydroxybutyrate (BHBA)	Xenobiotics	Drug	HMDB0000357	Yes	↑ ↑ ↑	SBP DBP HTN	26,82
3-Hydroxyhippuric acid	Xenobiotics	Drug	HMDB0006116	Yes	↑	HTN	79
3-indoxyl sulfate	Amino Acid	Tryptophan Metabolism	HMDB0000682	Yes	↓ ↓	SBP DBP	26
3-methyl-2-oxobutyrate	Amino Acid		HMDB0000019	Yes	↑ ↑	SBP DBP	26
3-methyl-2-oxovalerate	Amino Acid		HMDB0000491	Yes	↑ ↑	SBP DBP	26
3-Oxododecanoic acid	Lipid	Fatty acid	HMDB0010727	No	↑	HTN	79

3-Hydroxyisovalerylcarnitine / Octanoylcarnitine	Amino Acid / lipid	Medium Chain Fatty Acid	HMDB0061189 / HMDB0000791	No	↑	HTN	83
3-Hydroxy-tetradecanoylcarnitine	Lipid	Fatty acid	HMDB61640	No	↓	HTN	83
3,4,5-trimethoxycinnamic acid			HMDB0002511	Yes	↓	HTN and pre-HTN	27
4-androsten-3beta,17beta-diol disulfate 1	Lipid	Steroid	HMDB0240429	No	↑ ↑	SBP DBP	26
4-Hydroxybenzaldehyde	Amino Acid	Guanidino and Acetamido Metabolism	HMDB0011718	Yes	↑	HTN	79
4-hydroxyhippurate	Xenobiotics	Benzoate Metabolism	HMDB0013678	Yes	↑	HTN	60
4,8 Dimethylnonanoyl carnitine	Xenobiotics	Benzoate Metabolism	HMDB06202	No	↑	HTN	79
5-dodecenoate (12:1n7)	Xenobiotics	Xanthine Metabolism	HMDB0000529	No	↑ ↑	SBP DBP	26
5alpha-androstan-3beta,17beta-diol disulfate	Lipid	Steroid	HMDB00493	No	↑	HTN	60
Acetate	Xenobiotics	Xanthine Metabolism	HMDB0000042	Yes	↓	Average BP (SBP DBP)	84
acetylcarnitine	Lipid	Fatty Acid Metabolism(Acyl Carnitine)	HMDB00201	No	↑ ↑	SBP DBP	26
acetylphosphate	Lipid	Fatty Acid Metabolism(Acyl Carnitine)	HMDB0001494	No	↑ ↑	SBP DBP	26
Adenine	Nucleotide	Purine Metabolism, Adenine containing	HMDB00034	No	↑	HTN	85

Alanine	Amino Acid	Alanine and Aspartate Metabolism	HMDB00161	No	↑ ↑	SBP DBP	26,59
alpha-hydroxyisovalerate	Amino Acid	Leucine, Isoleucine and Valine Metabolism	HMDB00407	Yes	↑ ↑	SBP DBP	26
alpha-ketoglutarate	Energy Cofactors	TCA Cycle	HMDB00208	No	↑ ↑	SBP DBP	26
Alpha-tocopherol	and Vitamins	Tocopherol Metabolism	HMDB01893	No	↑	HTN	81
androsterone sulfate	Lipid	Steroid	HMDB02759	No	↑	HTN	60
Arabinose	Amino Acid	Tryptophan Metabolism	HMDB000064 6	No		SBP DBP	80
Arachidonic acid	Lipid	Polyunsaturated Fatty Acid (n3 and n6)	HMDB01043	No		SBP DBP	80
Aspartic acid	Amino Acid	Alanine and Aspartate Metabolism	HMDB00191	No	↑	HTN	81
bilirubin	Xenobiotics	Food Component/Plant	HMDB00054	No	↑ ↑	SBP DBP	26
Butyrylcarnitine / Octanoylcarnitine	Lipid	Fatty Acid Metabolism (also BCAA Metabolism)	HMDB02013 / HMDB000079 1	No	↑	HTN	83
caffeine	Xenobiotics	Xanthine Metabolism	HMDB01847	No	↑ ↑	SBP DBP	
Capric acid	Lipid	Medium Chain Fatty Acid	HMDB00511	No	↑ ↑ ↓	SBP DBP HTN	26,85
Caprylic acid	Lipid	Medium Chain Fatty Acid	HMDB00482	No		SBP DBP	80
cholesterol	Lipid	Sterol	HMDB00067	Yes	↑ ↑	SBP DBP	26
citrate	Energy	TCA Cycle	HMDB00094	No	↑ ↑	SBP DBP	26
Citrulline	Amino Acid	Urea cycle; Arginine and Proline Metabolism	HMDB000090 4	No	↓	HTN	85
cortisol	Lipid	Steroid	HMDB00063	No	↑ ↑	SBP DBP	26

cortisone	Lipid	Steroid	HMDB02802	No	↑ ↑	SBP DBP	26
cysteine	Amino Acid	Methionine, Cysteine, SAM and Taurine Metabolism	HMDB00574	No	↑ ↑	SBP DBP	26
Decadienoylcarnitine / Decanoylcarnitine	Nucleotide	Pyrimidine Metabolism, Cytidine containing	HMDB00089	No	↑	HTN	83
Decanoylcarnitine	Lipid	Fatty Acid Metabolism(Acyl Carnitine)	HMDB000065 1 HMDB000709 8 / HMDB000715	No	↑ ↑ ↓	SBP DBP HTN	26,83
DG 16:0/18:0	Lipid	Fatty acid	8 / HMDB000715 8 HMDB000709	No	↑ ↑	SBP MAP	86
DG 16:0/20:3	Lipid	Fatty acid	8 / HMDB000744 8 HMDB000709	No	↑	SBP	86
DG 16:0/22:5	Lipid	Fatty acid	8 / HMDB005636 3 HMDB000709	No	↑ ↑ ↑	SBP DBP MAP	86
DG 16:0/22:6	Lipid	Fatty acid	8 / HMDB005638 6 HMDB000712	No	↑ ↑	SBP MAP	86
DG 16:1/18:1	Lipid	Fatty acid	4 / HMDB000699 5 HMDB000715	No	↑ ↑	DBP MAP	86
DG 18:0/18:1	Lipid	Fatty acid	8 /	No	↑	DBP	86

			HMDB000699				
			5				
			HMDB000715				
DG 18:0/20:4	Lipid	Fatty acid	8 / HMDB011598	No	↑ ↑	SBP MAP	86
			7				
			HMDB009331				
DG(14:0/22:5)	Lipid	Fatty acid	9 / HMDB005636	No	↑	HTN	79
			3				
			HMDB000706				
DG(15:0/18:3)	Lipid	Fatty acid	7 / HMDB000727	No	↑	HTN	79
			4				
			HMDB000706				
DG(15:0/18:4)	Lipid	Fatty acid	7 / HMDB000733	No	↑	HTN	79
			0				
dihomo-linolenate (20:3n3 or n6)	Lipid	Polyunsaturated Fatty Acid (n3 and n6)	HMDB006186	No	↑ ↑	SBP DBP	26
			4				
Dihydroabiatic acid	Lipid	Polyunsaturated Fatty Acid (n3 and n6)		No		SBP DBP	80
Dihydroxyacetone	Nucleotide	Pyrimidine Metabolism, Orotate containing	HMDB000188	No	↑	HTN	81
			2				
dimethylarginine (SDMA + ADMA)	Amino Acid	Urea cycle; Arginine and Proline Metabolism	HMDB01539	No	↓ ↓	SBP DBP	26
dimethylglycine	Amino Acid	Glycine, Serine and Threonine Metabolism	HMDB00092	Yes	↑	HTN	60
docosapentaenoate (n3 DPA; 22:5n3)	Lipid	Polyunsaturated Fatty Acid (n3 and n6)	HMDB01976	No	↑ ↑	SBP DBP	26

dodecanedioate	Lipid	Fatty Acid, Dicarboxylate	HMDB00623	No	↑ ↑	SBP DBP	26
Dodecanol	Lipid	Fatty Acid, Dicarboxylate	HMDB001162 6	No		SBP DBP	80
eicosenoate (20:1n9 or 11)	Lipid	Long Chain Fatty Acid	HMDB02231	No	↑ ↑	SBP DBP	26
erythritol	Xenobiotics	Food Component/Plant	HMDB02994	No	↑ ↑	SBP DBP	26
erythronate	Carbohydrate		HMDB000061 3	No	↑ ↑	SBP DBP	26
Formate	Lipid		HMDB000014 2	Yes	↓	SBP DBP	59
Fumaric acid	Energy	TCA Cycle	HMDB00134	No	↑	SBP DBP HTN	80,85
Galactose	Carbohydrate	Fructose, Mannose and Galactose Metabolism	HMDB00565	No	↑	HTN	81
gamma-glutamylglutamine	Peptide	Gamma-glutamyl Amino Acid	HMDB11738	No	↓ ↓	SBP DBP	26
Glucose	Carbohydrate	Glycolysis, Gluconeogenesis, and Pyruvate Metabolism	HMDB00122	Yes	↑ ↑	SBP DBP	26
Glucose-1-phosphate	Carbohydrate	Glycolysis, Gluconeogenesis, and Pyruvate Metabolism	HMDB000158 6	Yes	↓	HTN	81
Glutaryl carnitine	Amino Acid	Lysine Metabolism	HMDB13130	No	↓	HTN	83
Glutaryl carnitine / Octanoyl carnitine	Amino Acid	Lysine Metabolism	HMDB13130 / HMDB000079 1	No	↑	HTN	83
Gly-Pro	Amino Acid	Dipeptide	HMDB000072 1	No	↑	HTN	81
Gly/Ala	Amino Acid	Dipeptide	HMDB000012 3 /	No	↓	HTN	83

			HMDB000016 1					
Glycerol	Lipid	Glycerolipid Metabolism	HMDB00131	Yes	↑ ↑ ↑	HTN SBP DBP	26,60,7 9,85	
Glycine	Amino Acid	Glycine, Serine and Threonine Metabolism	HMDB00123	No	↓ ↑	HTN	81,83,8 5	
Glycolic acid	Lipid	Secondary Bile Acid Metabolism	HMDB000011 5	No		SBP DBP	80	
Hexadecanedioate	Lipid	Fatty Acid, Dicarboxylate	HMDB00672	No	↑ ↑ ↑	SBP DBP HTN	26,79	
hexanoylcarnitine	Lipid	Fatty Acid Metabolism(Acyl Carnitine)	HMDB00705	No	↑ ↑	SBP DBP	26	
Hippurate	Xenobiotic s	Benzoate Metabolism	HMDB00714	Yes	↑ ↑	SBP DBP	75	
HWESASXX	Amino Acid	Urea cycle; Arginine and Proline Metabolism		No	↑ ↑	SBP DBP	26	
Iminodiacetic acid	Amino Acid	Histidine Metabolism	HMDB001175 3	No		SBP DBP	80	
L-Acetylcarnitine	Amino Acid	Tryptophan Metabolism	HMDB000020 1	No	↑	HTN	79	
l-asparagine	Amino Acid	Tryptophan Metabolism	HMDB000016 8	No	↓	HTN	85	
l-cystine	Amino Acid	Tryptophan Metabolism	HMDB000019 2	No	↓	HTN	85	
l-glutamine	Amino Acid	Tryptophan Metabolism	HMDB000064 1	No	↓	HTN	85	
l-isoleucine	Amino Acid	Tryptophan Metabolism	HMDB000017 2	No	↓	HTN	85	
l-lysine	Amino Acid	Tryptophan Metabolism	HMDB000018 2	Yes	↓	HTN	85	

l-methionine	Amino Acid	Tryptophan Metabolism	HMDB0000696	No	↓	HTN	85
l-threonine	Amino Acid	Tryptophan Metabolism	HMDB0000167	No	↓	HTN	85
l-tryptophan	Amino Acid	Tryptophan Metabolism	HMDB0000929	No	↓	HTN	85
l-tyrosine	Amino Acid	Tryptophan Metabolism	HMDB0000158	No	↓	HTN	85
l-valine	Amino Acid	Tryptophan Metabolism	HMDB0000883	No	↓	HTN	85
lactate	Carbohydrate	Glycolysis, Gluconeogenesis, and Pyruvate Metabolism	HMDB00190	Yes	↑ ↑	SBP DBP	26
laurate (12:0)	Lipid	Medium Chain Fatty Acid	HMDB0034840	No	↑ ↑	SBP DBP	26
Lauroylcarnitine	Lipid	Medium Chain Fatty Acid	HMDB0002250	No	↓ ↓	HTN	79,83
levulinate (4-oxovalerate)	Lipid	Eicosanoid	HMDB0040433	Yes	↑ ↑	SBP DBP	26
linoleate (18:2n6)	Lipid	Polyunsaturated Fatty Acid (n3 and n6)	HMDB00673	No	↑ ↑	SBP DBP	26
linolenate [alpha or gamma; (18:3n3 or 6)]	Lipid	Polyunsaturated Fatty Acid (n3 and n6)	HMDB03073	No	↑ ↑	SBP DBP	26
LysoPC	Amino Acid	Lysine Metabolism	HMDB0010382	No	↓	HTN and pre-HTN	27
LysoPC(16:1)	Amino Acid	Lysine Metabolism	HMDB0010383	Yes	↑	HTN	79
LysoPE	Amino Acid	Lysine Metabolism	HMDB0011506	No	↓	HTN and pre-HTN	27
Lyxose	Amino Acid	Lysine Metabolism	HMDB0003402	No	↑	HTN	81

malate	Energy	TCA Cycle	HMDB00156	No	↑ ↑	SBP DBP	26
Malonic acid	Lipid	Fatty Acid Synthesis	HMDB00691	No	↑	HTN	81
Malonylcarnitine / Decanoylcarnitine	Lipid	Fatty Acid Synthesis	HMDB000209 5 / HMDB000065 1	No	↑	HTN	83
mannose	Carbohydrate	Fructose, Mannose and Galactose Metabolism	HMDB00169	No	↑ ↑	SBP DBP	26
margarate (17:0)	Lipid	Long Chain Fatty Acid	HMDB000225 9	No	↑ ↑	SBP DBP	26
Melezitose	Lipid	Long Chain Fatty Acid	HMDB001173 0	No	↑	HTN	81
Methyl-beta-D- galactopyranoside			HMDB002996 5	No	↑	HTN	81
Methylmalonic acid	Lipid	Fatty acid	HMDB000020 2	No	↑	HTN	81
MHC 22:0	Lipid	Glycerolipid Metabolism		No	↑	DBP	86
MHC 24:0	Lipid	Glycerolipid Metabolism		No	↑ ↑	DBP MAP	86
MHC 24:1	Lipid	Glycerolipid Metabolism		No	↑ ↑	DBP MAP	86
myo-inositol	Lipid	Inositol Metabolism	HMDB00211	No	↑ ↑	SBP DBP	26
Myristic acid	Lipid	Long Chain Fatty Acid	HMDB00806	No	↑ ↑ ↑	SBP DBP HTN	26,79
myristoleate (14:1n5)	Lipid	Long Chain Fatty Acid	HMDB02000	No	↑ ↑	SBP DBP	26
N-Acetylarlyamine	Xenobiotics	Food Component/Plant	HMDB000125 0	No	↑	HTN	79
N-methyl-2-pyridone-5- carboxamide	Xenobiotics	Food Component/Plant	HMDB000419 3	No	↓ ↓	SBP DBP	75
Nicotinoyl glycine			HMDB000326 9	No	↑	HTN	81
nonadecanoate (19:0)	Lipid	Long Chain Fatty Acid	HMDB00772	No	↑ ↑	SBP DBP	26

Noradrenaline			HMDB0000216	No	↑	HTN	81
octadecanedioate	Lipid	Fatty Acid, Dicarboxylate	HMDB00782	No	↑ ↑	SBP DBP	26
Octadecanol	Lipid	Fatty Acid, Dicarboxylate	HMDB0002350	No	↑	HTN	81
Octanoylcarnitine	Lipid	Fatty Acid Metabolism(Acyl Carnitine)	HMDB0000791	No	↓	HTN	83
octanoylcarnitine	Lipid	Fatty Acid Metabolism(Acyl Carnitine)	HMDB0000791	No	↑ ↑	SBP DBP	26
oleate (18:1n9)	Lipid	Fatty Acid Metabolism(Acyl Carnitine)	HMDB0000207	No	↑ ↑ ↑	SBP DBP HTN	26,79
oleoylcarnitine	Lipid	Fatty acid	HMDB0005065	No	↑ ↑	SBP DBP	26
Ornithine	Amino Acid	Urea cycle; Arginine and Proline Metabolism	HMDB03374	No	↑ ↓	HTN	83,85
Ornithine/Citruline	Amino Acid	Urea cycle; Arginine and Proline Metabolism	HMDB03374 / HMDB0000904	No	↑	HTN	83
Oxalic acid	Cofactors and Vitamins	Ascorbate and Aldarate Metabolism	HMDB02329	No	↑	HTN	81,85
p-cresol sulfate			HMDB0011635	Yes	↓ ↓	SBP DBP	26
palmitate (16:0)	Lipid	Long Chain Fatty Acid	HMDB00220	No	↑ ↑ ↑	SBP DBP HTN	26,79
Palmitic amide	Lipid	Fatty acid	HMDB0012273	No	↑	HTN	79
palmitoleate (16:1n7)	Lipid	Long Chain Fatty Acid	HMDB0003229	No	↑ ↑ ↑	SBP DBP HTN	26,79

palmitoylcarnitine	Lipid	Fatty Acid Metabolism(Acyl Carnitine)	HMDB00222	No	↑ ↑	SBP DBP	26
paraxanthine	xenobiotics	Drug	HMDB0001860	No	↑ ↑	SBP DBP	26
PC 34:4	Lipid	Phospholipid Metabolism	HMDB0008007	No	↑ ↑	DBP MAP	86
PC(14:018:1)	Lipid	Phospholipid Metabolism	HMDB0007886 / HMDB0008124	No	↑	HTN	79
PC(16:1/22:3)	Lipid	Phospholipid Metabolism	HMDB0007998 / HMDB0013457	No	↑	HTN	79
PC(18:0/20:4)	Lipid	Phospholipid Metabolism	HMDB0008034 / HMDB0008428	No	↑	HTN	79
pentadecanoate (15:0)	Amino Acid	Phenylalanine and Tyrosine Metabolism	HMDB0059870	No	↑ ↑	SBP DBP	26
phenylacetylglutamine	Amino Acid	Phenylalanine and Tyrosine Metabolism	HMDB06344	Yes	↓ ↓	SBP DBP	26
Phenylalanine	Amino Acid	Phenylalanine and Tyrosine Metabolism	HMDB00159	No	↑	HTN	81
Phenylalanine / Tyrosine	Amino Acid	Phenylalanine and Tyrosine Metabolism	HMDB00159 / HMDB0000158	No	↓	HTN	83
phenyllactate	Peptide	Dipeptide	HMDB0000779	Yes	↑ ↑	SBP DBP	26

Phosphatidylserine (PS)	Energy	Oxidative Phosphorylation	HMDB001429 1	No	↓	HTN and pre-HTN	27
Phytol	Lipid	phospholipid	HMDB000201 9	No		SBP DBP	80
PI 34:1	Lipid	phospholipid	HMDB000978 3	No	↑	MAP	86
PI 36:2	Lipid	phospholipid	HMDB000983 7	No	↑ ↑	SBP MAP	86
PI 40:6	Lipid	phospholipid	HMDB000988 4	No	↑	DBP	86
Proline-betaine	Amino Acid	Urea cycle; Arginine and Proline Metabolism	HMDB000482 7	Yes	↓↑ ↓ ↓	HTN SBP DBP	60,75
Propionate	Lipid	Fatty acid	HMDB000023 7	Yes	↓	Average BP (SBP DBP)	84
Pyrazine 2,5 dihydroxy NIST	Nucleotide	Pyrimidine Metabolism, Uracil containing		No		SBP DBP	80
pyroglutamylglycine	Peptide	Dipeptide	HMDB006189 0	No	↑	HTN	60
Pyrophosphate	Peptide	Dipeptide	HMDB000025 0	No	↑	HTN	85
S-carboxymethyl-l-cysteine	Carbohydrate	Pentose Metabolism	HMDB002941 5	No	↓	HTN and pre-HTN	27
S-carboxymethyl-l-cysteine	Carbohydrate	Pentose Metabolism	HMDB002941 5	No	↑	HTN	81
salicylate	Amino Acid	Methionine, Cysteine, SAM and Taurine Metabolism	HMDB003201 8	No	↑	HTN	60
Shikimic acid	Amino Acid	Methionine, Cysteine, SAM and Taurine Metabolism	HMDB000307 0	No	↑	HTN	81
stearate (18:0)	Lipid	Long Chain Fatty Acid	HMDB00827	No	↑ ↑	SBP DBP	26

stearidonate (18:4n3)	Lipid	Polyunsaturated Fatty Acid (n3 and n6)	HMDB06547	No	↑ ↑	SBP DBP	26
stearoylcarnitine	Lipid	Fatty Acid Metabolism(Acyl Carnitine)	HMDB00848	No	↑ ↑	SBP DBP	26
Succinyl- /methylmalonylcarnitine	Xenobiotics	Chemical	HMDB000102 2 / HMDB001313 3	No	↓	HTN	83
Talose	Xenobiotics	Chemical	HMDB000139 1	No	↑	HTN	81
Tetradecadienoylcarnitine	Lipid	Secondary Bile Acid Metabolism		No	↓	HTN	83
tetradecanedioate	Lipid	Fatty Acid, Dicarboxylate	HMDB00872	No	↑ ↑	SBP DBP	26
Tetradecenoylcarnitine	Lipid	Fatty Acid, Dicarboxylate	HMDB000201 4	No	↓ ↑	HTN	79,83
Tetradecenoylcarnitine / Palmitoylcarnitine	Lipid	Fatty Acid, Dicarboxylate	HMDB000201 4 / HMDB000022 2	No	↓	HTN	83
theobromine	Xenobiotics	Xanthine Metabolism	HMDB02825	No	↑ ↑	SBP DBP	26
theophylline	Xenobiotics	Xanthine Metabolism	HMDB01889	No	↑ ↑	SBP DBP	26
Threonine	Amino Acid	Glycine, Serine and Threonine Metabolism	HMDB00167	No	↑	HTN	60,81
Thymol	Nucleotide	Pyrimidine Metabolism, Thymine containing	HMDB00262	No	↑	HTN	81
Total short-chain fatty acids	Lipid	Fatty acid		Yes	↓	Average BP (SBP DBP)	84
trans-Hexadec-2-enoyl carnitine	Amino Acid	Urea cycle; Arginine and Proline Metabolism	HMDB000631 7	No	↑	HTN	79

Trihydroxypyrazine NIST	Cofactors and Vitamins	Nicotinate and Nicotinamide Metabolism		No		SBP DBP	80
Tyrosine	Amino Acid	Phenylalanine and Tyrosine Metabolism	HMDB00158	No	↑	HTN	81
Uric acid	Amino Acid	Urea cycle; Arginine and Proline Metabolism	HMDB00294	No	↑ ↑ ↑	SBP DBP HTN	26,85