

# Bioanalytics, Metabolomics and Pharmacokinetics Shared Resource (BMPK)

## Quantitative Targeted Metabolomics using the Biocrates MxP Quant 500 Assay

### Broad Pathway Coverage

- Comprehensive quantification of up to 630 metabolites from 26 biochemical classes
- Broad coverage of metabolic pathways

### Functional Microbiomics

- Includes dozens of metabolites specific for microbiome and its interaction with the host

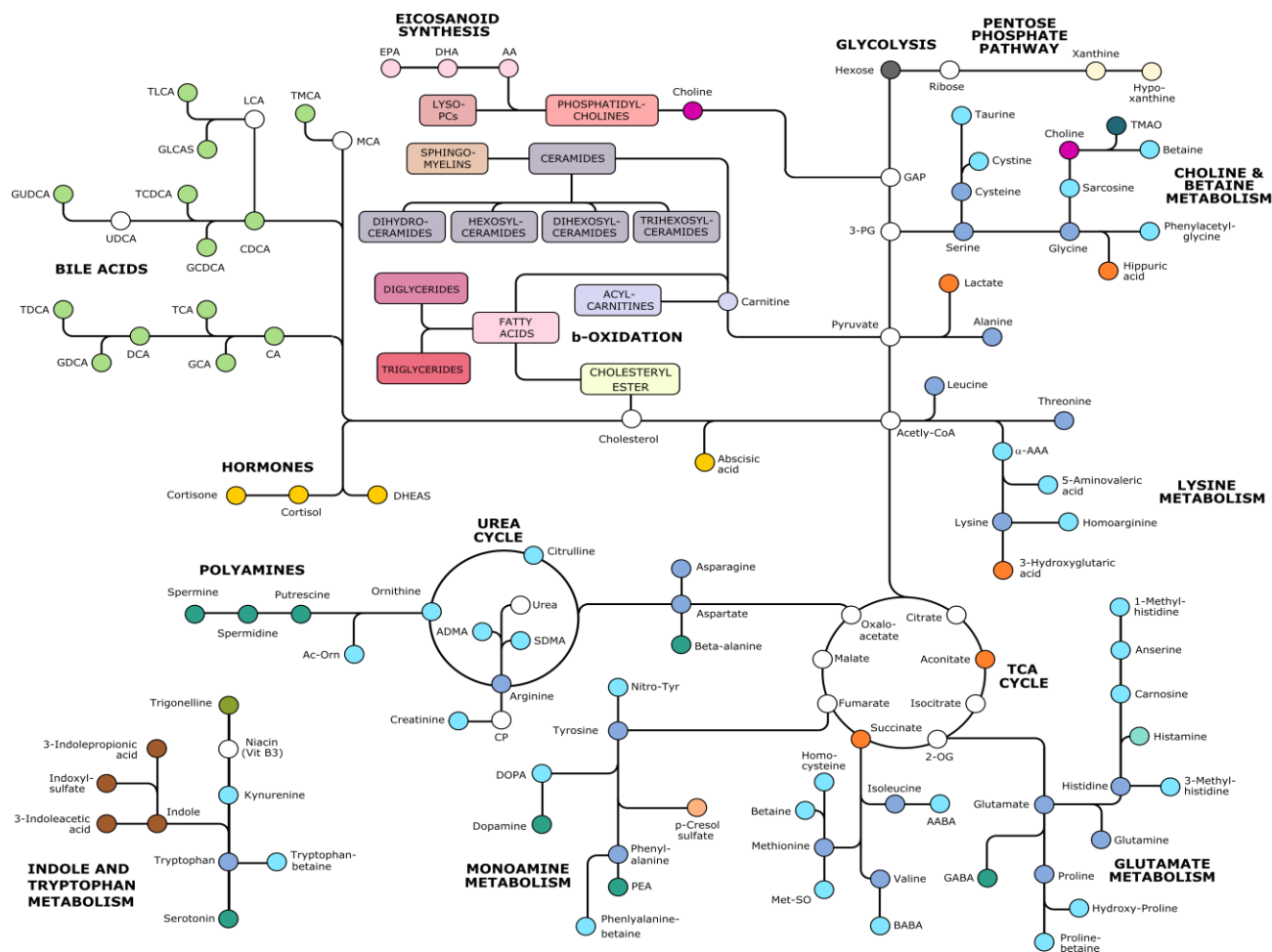
### Wide Sample Applications

- Suitable for analyzing cell culture, biological fluid, tissue, and feces samples from various species
- Requires as little as 10  $\mu$ L of sample

### Quantitative & Reproducible

- Calibrated and quantitative readouts
- Robust with excellent accuracy and precision

## Metabolite and Pathway Coverage



### Small Molecules

Note: Metabolites as white circles are not quantified

Alkaloids (1)	Biogenic Amines (9)	Hormones and Related (4)
Amine Oxides (1)	Carbohydrates and Related (1)	Indoles and Derivatives (4)
Amino Acids (20)	Carboxylic Acids (7)	Nucleobases and Related (2)
Amino Acid Related (30)	Cresols (1)	Vitamins and Cofactors (1)
Bile Acids (14)	Fatty Acids (12)	

### Lipids

Acylcarnitines (40)	Ceramides (70)
Lysophosphatidylcholines (14)	Cholesterol Esters (22)
Phosphatidylcholines (76)	Diglycerides (44)
Sphingomyelins (15)	Triglycerides (242)

## List of Metabolites: MxP<sup>®</sup> Quant 500 Kit

Alkaloids (1)			
Trigonelline	Trigonelline		

Amine Oxides (1)			
TMAO	Trimethylamine N-oxide		

Amino Acids (20)			
Ala	Alanine	Leu	Leucine
Arg	Arginine	Lys	Lysine
Asn	Asparagine	Met	Methionine
Asp	Aspartate	Phe	Phenylalanine
Cys	Cysteine	Pro	Proline
Glu	Glutamate	Ser	Serine
Gln	Glutamine	Thr	Threonine
Gly	Glycine	Trp	Tryptophan
His	Histidine	Tyr	Tyrosine
Ile	Isoleucine	Val	Valine

Amino Acid Related (30)			
alpha-AAA	alpha-Aminoadipic acid	c4-OH-Pro	cis-4-Hydroxyproline
AABA	alpha-Aminobutyric acid	t4-OH-Pro	trans-4-Hydroxyproline
Ac-Orn	Acetylornithine	Kynurenine	Kynurenine
ADMA	Asymmetric dimethylarginine	Met-SO	Methionine sulfoxide
Anserine	Anserine	1-Met-His	1-Methylhistidine
5-AVA	5-Aminovaleric acid	3-Met-His	3-Methylhistidine
BABA	beta-Aminobutyric acid	Nitro-Tyr	Nitrotyrosine
Betaine	Betaine	Orn	Ornithine
Carnosine	Carnosine	PAG	Phenylacetyl glycine
Cit	Citrulline	PheAlaBetaine	Phenylalanine betaine
Creatinine	Creatinine	ProBetaine	Proline betaine
Cystine	Cystine	Sarcosine	Sarcosine
DOPA	Dihydroxyphenylalanine	SDMA	Symmetric dimethylarginine
HArg	Homoarginine	Taurine	Taurine
HCys	Homocysteine	TrpBetaine	Tryptophan betaine

Bile Acids (14)			
CA	Cholic acid	GLCAS	Glycolithocholic acid sulfate
CDCA	Chenodeoxycholic acid	GUDCA	Glycoursodeoxycholic acid
DCA	Deoxycholic acid	TCA	Taurocholic acid
GCA	Glycocholic acid	TCDCA	Taurochenodeoxycholic acid
GDCA	Glycodeoxycholic acid	TDCA	Taurodeoxycholic acid
GCDCA	Glycochenodeoxycholic acid	TLCA	Taurolithocholic acid
GLCA	Glycolithocholic acid	TMCA	Tauromurocholic acid

Biogenic Amines (9)			
beta-Ala	beta-Alanine	Putrescine	Putrescine
GABA	gamma-Aminobutyric acid	Serotonin	Serotonin
Dopamine	Dopamine	Spermidine	Spermidine
Histamine	Histamine	Spermine	Spermine
PEA	Phenylethylamine		

Carbohydrates and Related (1)			
H1	Hexoses (including glucose)		

Carboxylic Acids (7)			
AconAcid	Aconitic acid	OH-GlutAcid	3-Hydroxyglutaric acid
DiCA(12:0)	Dodecanedioic acid	Lac	Lactic acid
DiCA(14:0)	Tetradecanedioic acid	Suc	Succinic acid
HipAcid	Hippuric acid		

Cresols (1)			
p-Cresol-SO4	p-Cresol sulfate		

Fatty Acids (12)			
AA	Arachidonic acid	FA(18:0)	Stearic acid
DHA	Docosahexaenoid acid	FA(18:1)	Octadecenoic acid
EPA	Eicosapentaenoic acid	FA(18:2)	Octadecadienoic acid
FA(12:0)	Lauric acid	FA(20:1)	Eicosenoic acid
FA(14:0)	Myristic acid	FA(20:2)	Eicosadienoic acid
FA(16:0)	Palmitic acid	FA(20:3)	Eicosatrienoic acid

Hormones and Related (4)			
AbsAcid	Abscisic Acid	Cortisone	Cortisone
Cortisol	Cortisol	DHEAS	Dehydroepiandrosterone sulfate

Indoles and Derivatives (4)			
Indole	Indole	3-IPA	3-Indolepropionic acid
3-IAA	3-Indoleacetic acid	Ind-SO4	Indoxyl sulfate

Nucleobases and Related (2)			
Hypoxanthine	Hypoxanthine	Xanthine	Xanthine

Vitamins and Cofactors (1)			
Choline	Choline		

Acylcarnitines (40)			
C0	Carnitine	C10:1	Decenoylcarnitine
C2	Acetylcarnitine	C10:2	Decadienoylcarnitine
C3	Propionoylcarnitine	C12	Dodecanoylcarnitine
C3-DC (C4-OH)	Malonylcarnitine (Hydroxybutyrylcarnitine)	C12-DC	Dodecanedioylcarnitine
C3-OH	Hydroxypropionoylcarnitine	C12:1	Dodecenoylcarnitine
C3:1	Propenoylcarnitine	C14	Tetradecanoylcarnitine
C4	Butyrylcarnitine	C14:1	Tetradecenoylcarnitine
C4:1	Butenylcarnitine	C14:1-OH	Hydroxytetradecenoylcarnitine
C5	Valerylcarnitine	C14:2	Tetradecadienoylcarnitine
C5-DC (C6-OH)	Glutarylcarnitine (Hydroxyhexanoylcarnitine)	C14:2-OH	Hydroxytetradecadienoylcarnitine
C5-M-DC	Methylglutarylcarnitine	C16	Hexadecanoylcarnitine
C5-OH (C3-DC-M)	Hydroxyvalerylcarnitine (Methylmalonylcarnitine)	C16-OH	Hydroxyhexadecanoylcarnitine
C5:1	Tiglylcarnitine	C16:1	Hexadecenoylcarnitine
C5:1-DC	Glutaconoylcarnitine	C16:1-OH	Hydroxyhexadecenoylcarnitine
C6 (C4:1-DC)	Hexanoylcarnitine (Fumarylarnitine)	C16:2	Hexadecadienoylcarnitine
C6:1	Hexenoylcarnitine	C16:2-OH	Hydroxyhexadecadienoylcarnitine
C7-DC	Pimeloylcarnitine	C18	Octadecanoylcarnitine
C8	Octanoylcarnitine	C18:1	Octadecenoylcarnitine
C9	Nonaylcarnitine	C18:1-OH	Hydroxyoctadecenoylcarnitine
C10	Decanoylcarnitine	C18:2	Octadecadienylcarnitine

Lysophosphatidylcholines (14)			
lysoPC a C14:0	lysoPC a C18:0	lysoPC a C20:4	lysoPC a C28:0
lysoPC a C16:0	lysoPC a C18:1	lysoPC a C24:0	lysoPC a C28:1
lysoPC a C16:1	lysoPC a C18:2	lysoPC a C26:0	
lysoPC a C17:0	lysoPC a C20:3	lysoPC a C26:1	

Phosphatidylcholines (76)			
PC aa C24:0	PC aa C36:3	PC aa C42:0	PC ae C36:1
PC aa C26:0	PC aa C36:4	PC aa C42:1	PC ae C36:2
PC aa C28:1	PC aa C36:5	PC aa C42:2	PC ae C36:3
PC aa C30:0	PC aa C36:6	PC aa C42:4	PC ae C36:4
PC aa C30:2	PC aa C38:0	PC aa C42:5	PC ae C36:5
PC aa C32:0	PC aa C38:1	PC aa C42:6	PC ae C38:0
PC aa C32:1	PC aa C38:3	PC ae C30:0	PC ae C38:1
PC aa C32:2	PC aa C38:4	PC ae C30:1	PC ae C38:2
PC aa C32:3	PC aa C38:5	PC ae C30:2	PC ae C38:3
PC aa C34:1	PC aa C38:6	PC ae C32:1	PC ae C38:4
PC aa C34:2	PC aa C40:1	PC ae C32:2	PC ae C38:5
PC aa C34:3	PC aa C40:2	PC ae C34:0	PC ae C38:6
PC aa C34:4	PC aa C40:3	PC ae C34:1	PC ae C40:1
PC aa C36:0	PC aa C40:4	PC ae C34:2	PC ae C40:2
PC aa C36:1	PC aa C40:5	PC ae C34:3	PC ae C40:3
PC aa C36:2	PC aa C40:6	PC ae C36:0	PC ae C40:4

PC ae C40:5	PC ae C42:1	PC ae C42:4	PC ae C44:4
PC ae C40:6	PC ae C42:2	PC ae C42:5	PC ae C44:5
PC ae C42:0	PC ae C42:3	PC ae C44:3	PC ae C44:6

### Sphingomyelins (15)

SM (OH) C14:1	SM C18:0	SM (OH) C22:2	SM (OH) C24:1
SM C16:0	SM C18:1	SM C22:3	SM C26:0
SM C16:1	SM C20:2	SM C24:0	SM C26:1
SM (OH) C16:1	SM (OH) C22:1	SM C24:1	

### Ceramides (28)

Cer(d16:1/18:0)	Cer(d18:1/18:0(OH))	Cer(d18:1/24:0)	Cer(d18:2/18:0)
Cer(d16:1/20:0)	Cer(d18:1/18:0)	Cer(d18:1/24:1)	Cer(d18:2/18:1)
Cer(d16:1/22:0)	Cer(d18:1/18:1)	Cer(d18:1/25:0)	Cer(d18:2/20:0)
Cer(d16:1/23:0)	Cer(d18:1/20:0(OH))	Cer(d18:1/26:0)	Cer(d18:2/22:0)
Cer(d16:1/24:0)	Cer(d18:1/20:0)	Cer(d18:1/26:1)	Cer(d18:2/23:0)
Cer(d18:1/14:0)	Cer(d18:1/22:0)	Cer(d18:2/14:0)	Cer(d18:2/24:0)
Cer(d18:1/16:0)	Cer(d18:1/23:0)	Cer(d18:2/16:0)	Cer(d18:2/24:1)

### Dihydroceramides (8)

Cer(d18:0/18:0(OH))	Cer(d18:0/20:0)	Cer(d18:0/24:0)	Cer(d18:0/26:1(OH))
Cer(d18:0/18:0)	Cer(d18:0/22:0)	Cer(d18:0/24:1)	Cer(d18:0/26:1)

### Hexosylceramides (19)

HexCer(d16:1/22:0)	HexCer(d18:1/18:1)	HexCer(d18:1/24:1)	HexCer(d18:2/20:0)
HexCer(d16:1/24:0)	HexCer(d18:1/20:0)	HexCer(d18:1/26:0)	HexCer(d18:2/22:0)
HexCer(d18:1/14:0)	HexCer(d18:1/22:0)	HexCer(d18:1/26:1)	HexCer(d18:2/23:0)
HexCer(d18:1/16:0)	HexCer(d18:1/23:0)	HexCer(d18:2/16:0)	HexCer(d18:2/24:0)
HexCer(d18:1/18:0)	HexCer(d18:1/24:0)	HexCer(d18:2/18:0)	

### Dihexosylceramides (9)

Hex2Cer(d18:1/14:0)	Hex2Cer(d18:1/20:0)	Hex2Cer(d18:1/24:1)	
Hex2Cer(d18:1/16:0)	Hex2Cer(d18:1/22:0)	Hex2Cer(d18:1/26:0)	
Hex2Cer(d18:1/18:0)	Hex2Cer(d18:1/24:0)	Hex2Cer(d18:1/26:1)	

### Trihexosylceramides (6)

Hex3Cer(d18:1/16:0)	Hex3Cer(d18:1/24:1)	Hex3Cer(d18:1_20:0)	
Hex3Cer(d18:1/18:0)	Hex3Cer(d18:1/26:1)	Hex3Cer(d18:1_22:0)	

### Cholesteryl Esters (22)

CE(14:0)	CE(17:0)	CE(20:0)	CE(22:1)
CE(14:1)	CE(17:1)	CE(20:1)	CE(22:2)
CE(15:0)	CE(18:0)	CE(20:3)	CE(22:5)
CE(15:1)	CE(18:1)	CE(20:4)	CE(22:6)
CE(16:0)	CE(18:2)	CE(20:5)	
CE(16:1)	CE(18:3)	CE(22:0)	

Diglycerides (44)			
DG(14:0_14:0)	DG(16:0_20:3)	DG(18:1_18:2)	DG(18:2_18:3)
DG(14:0_18:1)	DG(16:0_20:4)	DG(18:1_18:3)	DG(18:2_18:4)
DG(14:0_18:2)	DG(16:1_18:0)	DG(18:1_18:4)	DG(18:2_20:0)
DG(14:0_20:0)	DG(16:1_18:1)	DG(18:1_20:0)	DG(18:2_20:4)
DG(14:1_18:1)	DG(16:1_18:2)	DG(18:1_20:1)	DG(18:3_18:3)
DG(14:1_20:2)	DG(16:1_20:0)	DG(18:1_20:2)	DG(18:3_20:2)
DG(16:0_16:0)	DG(17:0_17:1)	DG(18:1_20:3)	DG(21:0_22:6)
DG(16:0_16:1)	DG(17:0_18:1)	DG(18:1_20:4)	DG(22:1_22:2)
DG(16:0_18:1)	DG(18:0_20:0)	DG(18:1_22:5)	DG-O(14:0_18:2)
DG(16:0_18:2)	DG(18:0_20:4)	DG(18:1_22:6)	DG-O(16:0_18:1)
DG(16:0_20:0)	DG(18:1_18:1)	DG(18:2_18:2)	DG-O(16:0_20:4)

Triglycerides (242)			
TG(14:0_32:2)	TG(16:0_36:3)	TG(16:1_38:5)	TG(18:0_36:1)
TG(14:0_34:0)	TG(16:0_36:4)	TG(17:0_32:1)	TG(18:0_36:2)
TG(14:0_34:1)	TG(16:0_36:5)	TG(17:0_34:1)	TG(18:0_36:3)
TG(14:0_34:2)	TG(16:0_36:6)	TG(17:0_34:2)	TG(18:0_36:4)
TG(14:0_34:3)	TG(16:0_37:3)	TG(17:0_34:3)	TG(18:0_36:5)
TG(14:0_35:1)	TG(16:0_38:1)	TG(17:0_36:3)	TG(18:0_38:6)
TG(14:0_35:2)	TG(16:0_38:2)	TG(17:0_36:4)	TG(18:0_38:7)
TG(14:0_36:1)	TG(16:0_38:3)	TG(17:1_32:1)	TG(18:1_26:0)
TG(14:0_36:2)	TG(16:0_38:4)	TG(17:1_34:1)	TG(18:1_28:1)
TG(14:0_36:3)	TG(16:0_38:5)	TG(17:1_34:2)	TG(18:1_30:0)
TG(14:0_36:4)	TG(16:0_38:6)	TG(17:1_34:3)	TG(18:1_30:1)
TG(14:0_38:4)	TG(16:0_38:7)	TG(17:1_36:3)	TG(18:1_30:2)
TG(14:0_38:5)	TG(16:0_40:6)	TG(17:1_36:4)	TG(18:1_31:0)
TG(14:0_39:3)	TG(16:0_40:7)	TG(17:1_36:5)	TG(18:1_32:0)
TG(16:0_28:1)	TG(16:0_40:8)	TG(17:1_38:5)	TG(18:1_32:1)
TG(16:0_28:2)	TG(16:1_28:0)	TG(17:1_38:6)	TG(18:1_32:2)
TG(16:0_30:2)	TG(16:1_30:1)	TG(17:1_38:7)	TG(18:1_32:3)
TG(16:0_32:0)	TG(16:1_32:0)	TG(17:2_34:2)	TG(18:1_33:0)
TG(16:0_32:1)	TG(16:1_32:1)	TG(17:2_34:3)	TG(18:1_33:1)
TG(16:0_32:2)	TG(16:1_32:2)	TG(17:2_36:2)	TG(18:1_33:2)
TG(16:0_32:3)	TG(16:1_33:1)	TG(17:2_36:3)	TG(18:1_33:3)
TG(16:0_33:1)	TG(16:1_34:0)	TG(17:2_36:4)	TG(18:1_34:1)
TG(16:0_33:2)	TG(16:1_34:1)	TG(17:2_38:5)	TG(18:1_34:2)
TG(16:0_34:0)	TG(16:1_34:2)	TG(17:2_38:6)	TG(18:1_34:3)
TG(16:0_34:1)	TG(16:1_34:3)	TG(17:2_38:7)	TG(18:1_34:4)
TG(16:0_34:2)	TG(16:1_36:1)	TG(18:0_30:0)	TG(18:1_35:2)
TG(16:0_34:3)	TG(16:1_36:2)	TG(18:0_30:1)	TG(18:1_35:3)
TG(16:0_34:4)	TG(16:1_36:3)	TG(18:0_32:0)	TG(18:1_36:0)
TG(16:0_35:1)	TG(16:1_36:4)	TG(18:0_32:1)	TG(18:1_36:1)
TG(16:0_35:2)	TG(16:1_36:5)	TG(18:0_32:2)	TG(18:1_36:2)
TG(16:0_35:3)	TG(16:1_38:3)	TG(18:0_34:2)	TG(18:1_36:3)
TG(16:0_36:2)	TG(16:1_38:4)	TG(18:0_34:3)	TG(18:1_36:4)

TG(18:1_36:5)	TG(18:2_38:4)	TG(20:1_34:1)	TG(20:4_35:3)
TG(18:1_36:6)	TG(18:2_38:5)	TG(20:1_34:2)	TG(20:4_36:2)
TG(18:1_38:5)	TG(18:2_38:6)	TG(20:1_34:3)	TG(20:4_36:3)
TG(18:1_38:6)	TG(18:3_30:0)	TG(20:2_32:0)	TG(20:4_36:4)
TG(18:1_38:7)	TG(18:3_32:0)	TG(20:2_32:1)	TG(20:4_36:5)
TG(18:2_28:0)	TG(18:3_32:1)	TG(20:2_34:1)	TG(20:5_34:0)
TG(18:2_30:0)	TG(18:3_33:2)	TG(20:2_34:2)	TG(20:5_34:1)
TG(18:2_30:1)	TG(18:3_34:0)	TG(20:2_34:3)	TG(20:5_34:2)
TG(18:2_31:0)	TG(18:3_34:1)	TG(20:2_34:4)	TG(20:5_36:2)
TG(18:2_32:0)	TG(18:3_34:2)	TG(20:2_36:5)	TG(20:5_36:3)
TG(18:2_32:1)	TG(18:3_34:3)	TG(20:3_32:0)	TG(22:0_32:4)
TG(18:2_32:2)	TG(18:3_35:2)	TG(20:3_32:1)	TG(22:1_32:5)
TG(18:2_33:0)	TG(18:3_36:1)	TG(20:3_32:2)	TG(22:2_32:4)
TG(18:2_33:1)	TG(18:3_36:2)	TG(20:3_34:0)	TG(22:3_30:2)
TG(18:2_33:2)	TG(18:3_36:3)	TG(20:3_34:1)	TG(22:4_32:0)
TG(18:2_34:0)	TG(18:3_36:4)	TG(20:3_34:2)	TG(22:4_32:2)
TG(18:2_34:1)	TG(18:3_38:5)	TG(20:3_34:3)	TG(22:4_34:2)
TG(18:2_34:2)	TG(18:3_38:6)	TG(20:3_36:3)	TG(22:5_32:0)
TG(18:2_34:3)	TG(20:0_32:3)	TG(20:3_36:4)	TG(22:5_32:1)
TG(18:2_34:4)	TG(20:0_32:4)	TG(20:3_36:5)	TG(22:5_34:1)
TG(18:2_35:1)	TG(20:0_34:1)	TG(20:4_30:0)	TG(22:5_34:2)
TG(18:2_35:2)	TG(20:1_24:3)	TG(20:4_32:0)	TG(22:5_34:3)
TG(18:2_35:3)	TG(20:1_26:1)	TG(20:4_32:1)	TG(22:6_32:0)
TG(18:2_36:0)	TG(20:1_30:1)	TG(20:4_32:2)	TG(22:6_32:1)
TG(18:2_36:1)	TG(20:1_31:0)	TG(20:4_33:2)	TG(22:6_34:1)
TG(18:2_36:2)	TG(20:1_32:1)	TG(20:4_34:0)	TG(22:6_34:2)
TG(18:2_36:3)	TG(20:1_32:2)	TG(20:4_34:1)	TG(22:6_34:3)
TG(18:2_36:4)	TG(20:1_32:3)	TG(20:4_34:2)	
TG(18:2_36:5)	TG(20:1_34:0)	TG(20:4_34:3)	

## EXPANDED LIPIDOMICS Using the Biocrates MxP® Quant 500 XL Assay

Monoacylglycerols			
MG 16:1	MG 18:3	MG 20:4	MG 22:2
MG 18:1	MG 20:1	MG 20:5	MG 22:4
MG 18:2	MG 20:3	MG 22:1	MG 22:6
Lysophosphatidic acids			
LPA 14:0	LPA 15:0	LPA 18:1	LPA 22:3
LPA 14:1	LPA 16:0	LPA 18:2	LPA 22:4
Lysophosphatidylethanolamines			
LPE 16:0	LPE 14:1	LPE 20:2	LPE P-18:2
LPE 18:0	LPE 15:0	LPE 20:3	LPE P-20:0
LPE 18:1	LPE 16:1	LPE 20:5	LPE P-20:1
LPE 18:2	LPE 17:0	LPE 22:0	LPE P-20:4
LPE 20:4	LPE 17:1	LPE 22:1	LPE P-20:5
LPE 22:4	LPE 18:3	LPE 24:0	LPE P-22:0
LPE 22:5	LPE 19:0	LPE P-14:0	LPE P-22:1
LPE 22:6	LPE 19:1	LPE P-15:0	LPE P-22:4
LPE P-18:0	LPE 19:2	LPE P-16:0	LPE P-22:5
LPE 12:0	LPE 20:0	LPE P-17:0	LPE P-22:6
LPE 14:0	LPE 20:1	LPE P-18:1	
Lysophosphatidylglycerols			
LPG 14:0	LPG 16:1	LPG 18:0	LPG 20:1
LPG 14:1	LPG 17:0	LPG 18:1	
LPG 16:0	LPG 17:1	LPG 18:2	
Lysophosphatidylinositols			
LPI 14:0	LPI 16:1	LPI 18:1	LPI 20:1
LPI 14:1	LPI 17:0	LPI 18:2	LPI 20:4
LPI 15:0	LPI 17:1	LPI 18:3	LPI 22:0
LPI 16:0	LPI 18:0	LPI 19:0	LPI 22:1
Lysophosphatidylserines			
LPS 16:0	LPS 18:1	LPS 20:0	LPS 20:5
LPS 16:1	LPS 18:2	LPS 20:1	LPS 22:0
LPS 18:0	LPS 18:3	LPS 20:4	LPS 22:6
Phosphatidic acids			
PA 14:0_14:1	PA 18:1_20:2	PA 16:1_18:1	PA 18:1_22:3
PA 17:0_18:3	PA 18:2_22:0	PA 18:0_18:2	PA 20:0_20:4
PA 18:1_20:0	PA 16:0_18:3	PA 18:1_22:1	PA 16:2_18:1
PA 18:2_20:1	PA 17:2_18:1	PA 18:2_22:4	PA 18:1_18:2
PA 16:0_18:1	PA 18:1_20:3	PA 16:1_18:2	PA 18:2_18:2
PA 17:1_18:1	PA 18:2_22:1	PA 18:0_18:3	PA 17:0_18:1
PA 18:1_20:1	PA 16:0_19:2	PA 18:1_22:2	PA 18:1_18:3
PA 18:2_20:2	PA 18:0_18:1	PA 18:3_18:3	PA 18:2_18:3
PA 16:0_18:2	PA 18:1_22:0	PA 16:1_22:0	PA 17:0_18:2
PA 17:1_18:2	PA 18:2_22:3	PA 18:1_18:1	PA 18:1_18:4
			PA 18:2_20:0
Phosphatidylethanolamines			
PE 20:0	PE 28:0	PE P-18:0/16:0	PE P-18:0/14:0
PE 34:0	PE 28:1	PE P-18:0/16:1	PE P-18:0/17:1
PE 34:1	PE 30:0	PE P-16:0/18:2	PE P-18:0/18:0
PE 34:2	PE 30:1	PE P-18:0/18:1	PE P-18:0/18:2
PE 34:3	PE 31:0	PE P-18:0/18:3	PE P-18:0/20:2
PE 36:0	PE 32:0	PE P-16:0/20:4	PE P-18:0/20:4
PE 36:1	PE 32:1	PE P-18:0/20:1	PE P-18:0/22:3
PE 36:2	PE 32:2	PE P-18:0/20:3	PE P-18:0/22:6
PE 36:3	PE 33:0	PE P-16:0/22:4	PE P-18:1/18:1
PE 36:4	PE 33:1	PE P-18:0/20:5	PE P-18:1/18:2
PE 36:5	PE 33:2	PE P-18:0/22:1	PE P-18:1/20:4



PE 38:0	PE 34:4	PE P-18:0/22:2	PE P-18:1/20:5
PE 38:1	PE 35:1	PE P-18:0/22:4	PE P-18:1/22:6
PE 38:2	PE 35:2	PE P-18:0/22:5	PE P-20:0/14:0
PE 38:3	PE 35:3	PE P-16:0/14:0	PE P-20:0/16:0
PE 38:4	PE 36:6	PE P-16:0/15:0	PE P-20:0/16:1
PE 38:5	PE 40:1	PE P-16:0/16:0	PE P-20:0/17:1
PE 38:6	PE 40:8	PE P-16:0/16:1	PE P-20:0/18:1
PE 38:7	PE 42:7	PE P-16:0/18:1	PE P-20:0/18:2
PE 40:3	PE 42:8	PE P-16:0/18:3	PE P-20:0/20:0
PE 40:4	PE 44:11	PE P-16:0/20:3	PE P-20:0/20:4
PE 40:5	PE 44:12	PE P-16:0/20:5	PE P-20:0/20:5
PE 40:6	PE 44:6	PE P-16:0/22:5	PE P-18:0/19:1
PE 40:7	PE 44:7	PE P-16:0/22:6	
Phosphatidylglycerols			
PG 16:0_16:0	PG 16:0_22:2	PG 18:1_18:3	PG 18:2_20:0
PG 16:0_18:1	PG 16:1_16:1	PG 18:1_20:0	PG 18:2_20:2
PG 16:1_18:2	PG 16:1_18:0	PG 18:1_20:1	PG 18:2_20:4
PG 18:0_18:1	PG 16:1_18:1	PG 18:1_20:2	PG 18:2_20:5
PG 18:0_18:2	PG 16:1_20:4	PG 18:1_20:3	PG 18:2_22:0
PG 16:0_20:4	PG 16:1_22:1	PG 18:1_20:4	PG 18:2_22:1
PG 18:2_20:3	PG 16:2_18:1	PG 18:1_20:5	PG 18:2_22:3
PG 14:0_16:0	PG 16:2_18:2	PG 18:1_22:0	PG 18:2_22:4
PG 15:0_18:1	PG 16:3_18:1	PG 18:1_22:1	PG 20:3_20:4
PG 16:0_16:1	PG 17:0_18:1	PG 18:1_22:2	PG 20:4_20:4
PG 16:0_18:2	PG 17:0_18:2	PG 18:1_22:3	PG 20:4_22:1
PG 16:0_18:3	PG 17:1_18:1	PG 18:1_22:4	PG 20:4_22:3
PG 16:0_19:1	PG 18:0_18:3	PG 18:1_22:5	PG 20:4_22:4
PG 16:0_20:3	PG 18:0_22:1	PG 18:2_18:2	PG 22:4_22:6
PG 16:0_20:5	PG 18:1_18:1	PG 18:2_18:3	PG 22:5_22:6
PG 16:0_22:1	PG 18:1_18:2	PG 18:2_18:4	PG 22:6_22:6
Phosphatidylinositols			
PI 14:0_18:1	PI 16:0_20:4	PI 18:0_20:3	PI 18:1_22:1
PI 14:0_18:2	PI 16:0_22:1	PI 18:0_20:4	PI 18:1_22:2
PI 15:0_16:0	PI 16:1_18:0	PI 18:0_22:0	PI 18:1_22:3
PI 15:1_16:0	PI 16:1_18:1	PI 18:1_18:1	PI 18:1_22:4
PI 16:0_16:0	PI 16:1_18:2	PI 18:1_18:2	PI 18:1_22:5
PI 16:0_17:0	PI 17:0_18:1	PI 18:1_18:3	PI 18:1_22:6
PI 16:0_17:1	PI 17:1_18:1	PI 18:1_20:0	PI 18:2_18:3
PI 16:0_17:2	PI 17:1_18:2	PI 18:1_20:1	PI 18:2_20:0
PI 16:0_18:1	PI 18:0_18:0	PI 18:1_20:2	PI 18:2_20:1
PI 16:0_18:2	PI 18:0_18:1	PI 18:1_20:3	PI 18:2_20:4
PI 16:0_18:3	PI 18:0_18:2	PI 18:1_20:4	PI 18:2_20:5
PI 16:0_20:0	PI 18:0_18:3	PI 18:1_20:5	PI 18:2_22:0
PI 16:0_20:3	PI 18:0_20:0	PI 18:1_22:0	PI 18:2_22:1
			PI 18:2_22:6
Phosphatidylserines			
PS 30:0	PS 36:2	PS 38:5	PS 40:5
PS 32:0	PS 36:3	PS 38:6	PS 40:6
PS 34:1	PS 36:4	PS 38:7	PS 40:7
PS 34:2	PS 36:5	PS 40:4	PS 40:8
PS 36:1	PS 38:4		
Sphinganine and sphingosine phosphates			
SPBP d14:0	SPBP d16:0	SPBP d17:0	SPBP d18:0
SPBP d14:1	SPBP d16:1	SPBP d17:1	SPBP d18:1
Sphinganines and sphingosines			
SPB d14:0	SPB d16:0	SPB d17:0	SPB d18:0
SPB d14:1	SPB d16:1	SPB d17:1	SPB d18:1

## METABOLOMICS

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