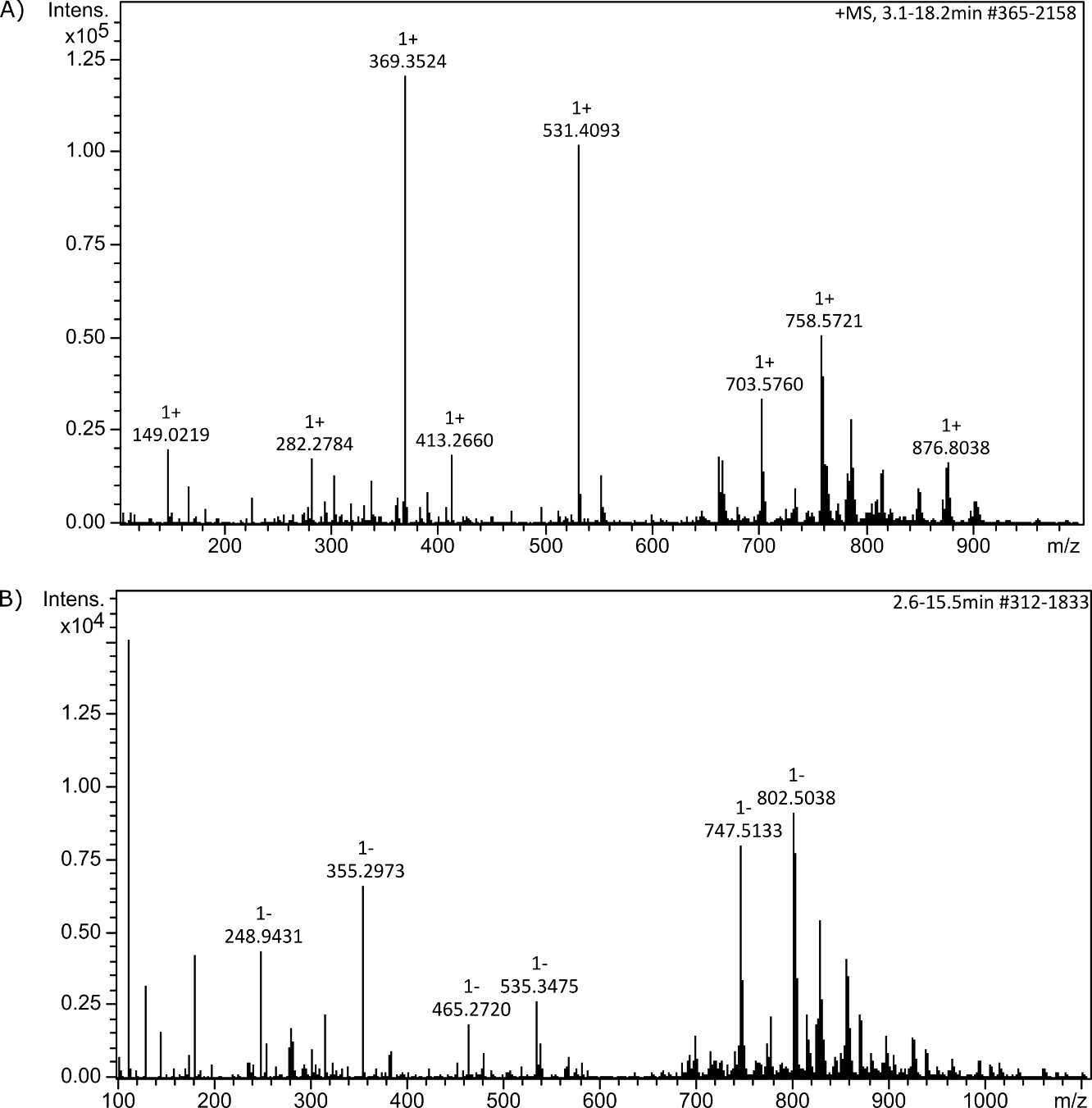


**Figure S1.** Based ion chromatogram of dry blood spot lipids profile in A) positive ion mode, B) negative ion mode. CE – cholesterol ester, Cer – ceramide, CL – cardiolipine, LPC – lysophosphatidylcholine, LPE – lysophosphatidylethanolamine, PC – phosphatidylcholine, PC O- -plasmanylphosphatidylcholines, PC P- - plasmenylphosphatidylcholines, PE – phoshpatidylethanolamine, PE O- - plasmanylphosphatidylethanolamine, PE P- - plasmenylethanolamine, SM – sphingomyeline, TG – triacylglycerol, TG O- - plasmanyltriacylglycerol.



**Figure S2.** Average mass spectra of dried menstrual blood spot lipid profile. A) Positive ion mode. B) Negative ion mode.



**Figure S3.** Score plot of samples in space “predictive component of OPLS model – orthogonal component of OPLS model”.

**Table S1.** Statistically significant (FDR<0.05) enriched pathways in endometriosis.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Pathway | Database | Size of pathway (metabolites) | Classes of markers, included in pathway | P | FDR |
| MTHFR deficiency | Wikipathways | 21 | Cer-NS; SM; PC; PE-P | <0.001 | <0.001 |
| Glycerophospholipid biosynthesis | Reactome | 94 | PC-P; TG; CL; PC; PE-P | <0.001 | <0.001 |
| Phospholipid metabolism | Reactome | 104 | PC-P; TG; CL; PC; PE-P | <0.001 | <0.001 |
| Metabolism of lipids | Reactome | 626 | TG; CL; PC; PE-P; Cer-NS; PC-P; SM | <0.001 | <0.001 |
| Sphingolipid de novo biosynthesis | Reactome | 35 | Cer-NS; SM; PC; PE-P | <0.001 | <0.001 |
| Glycerophospholipid metabolism | EHMN | 95 | PC-P; TG; CL; PC; PE-P | <0.001 | <0.001 |
| Oligodendrocyte specification and differentiation, leading to myelin components for CNS | Wikipathways | 11 | SM; PC; PE-P | <0.001 | <0.001 |
| Acyl chain remodeling of CL | Reactome | 12 | CL; PC; PE-P | <0.001 | <0.001 |
| Sphingolipid metabolism | Reactome | 65 | Cer-NS; SM; PC; PE-P | <0.001 | <0.001 |
| ceramide signaling pathway | BioCarta | 2 | Cer-NS; SM | <0.001 | <0.001 |
| Immune System | Reactome | 147 | Cer-NS; TG; PC; PE-P | <0.001 | <0.001 |
| Ceramide signalling | Reactome | 5 | Cer-NS; SM | <0.001 | <0.001 |
| Synthesis of PS | Reactome | 6 | PC; PE-P | <0.001 | <0.001 |
| Metabolism | Reactome | 1411 | TG; CL; PC; PE-P; Cer-NS; PC-P; SM | <0.001 | <0.001 |
| Sphingolipid Metabolism | SMPDB | 40 | Cer-NS; SM; PC | <0.001 | <0.001 |
| Gaucher Disease | SMPDB | 40 | Cer-NS; SM; PC | <0.001 | <0.001 |
| Globoid Cell Leukodystrophy | SMPDB | 40 | Cer-NS; SM; PC | <0.001 | <0.001 |
| Metachromatic Leukodystrophy (MLD) | SMPDB | 40 | Cer-NS; SM; PC | <0.001 | <0.001 |
| Fabry disease | SMPDB | 40 | Cer-NS; SM; PC | <0.001 | <0.001 |
| Krabbe disease | SMPDB | 40 | Cer-NS; SM; PC | <0.001 | <0.001 |
| Neurodegeneration with brain iron accumulation (NBIA) subtypes pathway | Wikipathways | 23 | Cer-NS; SM | <0.001 | <0.001 |
| Immunoregulatory interactions between a Lymphoid and a non-Lymphoid cell | Reactome | 20 | Cer-NS; PE-P | <0.001 | <0.001 |
| Formation of the cornified envelope | Reactome | 10 | Cer-NS; TG | <0.001 | <0.001 |
| Keratinization | Reactome | 10 | Cer-NS; TG | <0.001 | <0.001 |
| Glycerophospholipid metabolism - Homo sapiens (human) | KEGG | 55 | CL; PC; PE-P | <0.001 | <0.001 |
| Acyl chain remodelling of PE | Reactome | 13 | PC; PE-P | <0.001 | <0.001 |
| Necroptosis - Homo sapiens (human) | KEGG | 10 | Cer-NS; SM | <0.001 | <0.001 |
| ABC transporters in lipid homeostasis | Reactome | 11 | SM; PC | <0.001 | <0.001 |
| p75 NTR receptor-mediated signalling | Reactome | 11 | Cer-NS; SM | <0.001 | <0.001 |
| Acyl chain remodelling of PC | Reactome | 13 | PC-P; PC | <0.001 | <0.001 |
| Death Receptor Signalling | Reactome | 12 | Cer-NS; SM | <0.001 | <0.001 |
| Transport of small molecules | Reactome | 219 | TG; SM; PC; PE-P | <0.001 | 0.001 |
| HDL remodeling | Reactome | 13 | TG; PC | <0.001 | 0.001 |
| Plasma lipoprotein remodeling | Reactome | 16 | TG; PC | <0.001 | 0.002 |
| Sphingolipid signaling pathway - Homo sapiens (human) | KEGG | 15 | Cer-NS; SM | <0.001 | 0.002 |
| ABC-family proteins mediated transport | Reactome | 20 | SM; PC | <0.001 | 0.002 |
| Plasma lipoprotein assembly, remodeling, and clearance | Reactome | 21 | TG; PC | <0.001 | 0.003 |
| Retrograde endocannabinoid signaling - Homo sapiens (human) | KEGG | 19 | PC; PE-P | <0.001 | 0.003 |
| Insulin resistance - Homo sapiens (human) | KEGG | 20 | Cer-NS; TG | <0.001 | 0.003 |
| Phospholipid Biosynthesis | SMPDB | 27 | PC; PE-P | <0.001 | 0.003 |
| Synthesis of PC | Reactome | 28 | PC; PE-P | <0.001 | 0.003 |
| Developmental Biology | Reactome | 30 | Cer-NS; TG | <0.001 | 0.004 |
| Synthesis of PA | Reactome | 27 | CL; PC | <0.001 | 0.004 |
| Sphingolipid metabolism - Homo sapiens (human) | KEGG | 25 | Cer-NS; SM | <0.001 | 0.004 |
| Membrane Trafficking | Reactome | 31 | TG; PC | <0.001 | 0.005 |
| sphingomyelin metabolism/ceramide salvage | HumanCyc | 55 | Cer-NS; PC | 0.001 | 0.007 |
| Adaptive Immune System | Reactome | 51 | Cer-NS; PE-P | 0.001 | 0.007 |
| Glycosphingolipid metabolism | Reactome | 38 | Cer-NS; SM | 0.001 | 0.007 |
| TNF receptor signaling pathway | PID | 1 | Cer-NS | 0.002 | 0.008 |
| fas signaling pathway (cd95) | BioCarta | 1 | Cer-NS | 0.002 | 0.008 |
| Pathogenic Escherichia coli infection | Wikipathways | 1 | PE-P | 0.002 | 0.008 |
| Host-pathogen interaction of human coronaviruses - autophagy | Wikipathways | 1 | PE-P | 0.002 | 0.008 |
| FOXA2 pathway | Wikipathways | 1 | TG | 0.002 | 0.008 |
| Glycerophospholipid Biosynthetic Pathway | Wikipathways | 49 | PC-P; CL | 0.002 | 0.008 |
| One-carbon metabolism and related pathways | Wikipathways | 42 | PC; PE-P | 0.002 | 0.009 |
| Vesicle-mediated transport | Reactome | 66 | TG; PC | 0.003 | 0.01 |
| Visual phototransduction | Reactome | 68 | TG; PE-P | 0.003 | 0.01 |
| Sensory Perception | Reactome | 69 | TG; PE-P | 0.003 | 0.01 |
| Glycosphingolipid metabolism | EHMN | 52 | Cer-NS; SM | 0.003 | 0.01 |
| multi-drug resistance factors | BioCarta | 2 | PC | 0.003 | 0.01 |
| ras signaling pathway | BioCarta | 2 | PC | 0.003 | 0.01 |
| PI and PC transport between ER and Golgi membranes | Reactome | 2 | PC | 0.003 | 0.01 |
| TRAIL signaling pathway | PID | 2 | Cer-NS | 0.003 | 0.01 |
| inactivation of gsk3 by akt causes accumulation of b-catenin in alveolar macrophages | BioCarta | 2 | Cer-NS | 0.003 | 0.01 |
| FAS (CD95) signaling pathway | PID | 2 | Cer-NS | 0.003 | 0.01 |
| TNF-alpha signaling pathway | Wikipathways | 3 | Cer-NS | 0.003 | 0.01 |
| Autophagy | Wikipathways | 2 | PE-P | 0.003 | 0.01 |
| phosphatidylserine biosynthesis I | HumanCyc | 4 | PC | 0.005 | 0.02 |
| p75(NTR)-mediated signaling | PID | 3 | Cer-NS | 0.005 | 0.02 |
| Ceramide signaling pathway | PID | 3 | Cer-NS | 0.005 | 0.02 |
| Pathogenic Escherichia coli infection - Homo sapiens (human) | KEGG | 3 | PE-P | 0.005 | 0.02 |
| Autophagy - other - Homo sapiens (human) | KEGG | 3 | PE-P | 0.005 | 0.02 |
| Lipid particle organization | Reactome | 3 | TG | 0.005 | 0.02 |
| glutathione redox reactions I | HumanCyc | 100 | Cer-NS; PC | 0.005 | 0.02 |
| Signal Transduction | Reactome | 290 | Cer-NS; SM; PC | 0.005 | 0.02 |
| Innate Immune System | Reactome | 119 | TG; PC | 0.005 | 0.02 |
| regulation of bad phosphorylation | BioCarta | 4 | Cer-NS | 0.006 | 0.02 |
| Biosynthesis of A2E, implicated in retinal degradation | Reactome | 7 | PE-P | 0.006 | 0.02 |
| Retinoid cycle disease events | Reactome | 7 | PE-P | 0.006 | 0.02 |
| Diseases associated with visual transduction | Reactome | 7 | PE-P | 0.006 | 0.02 |
| Diseases of the neuronal system | Reactome | 7 | PE-P | 0.006 | 0.02 |
| Chylomicron assembly | Reactome | 4 | TG | 0.006 | 0.02 |
| VLDL assembly | Reactome | 4 | TG | 0.006 | 0.02 |
| LDL remodeling | Reactome | 4 | TG | 0.006 | 0.02 |
| Chylomicron clearance | Reactome | 4 | TG | 0.006 | 0.02 |
| VLDL clearance | Reactome | 4 | TG | 0.006 | 0.02 |
| HDL clearance | Reactome | 4 | TG | 0.006 | 0.02 |
| Assembly of active LPL and LIPC lipase complexes | Reactome | 6 | TG | 0.006 | 0.02 |
| Synthesis of CL | Reactome | 4 | CL | 0.006 | 0.02 |
| Neurotrophin signaling pathway - Homo sapiens (human) | KEGG | 5 | Cer-NS | 0.008 | 0.02 |
| Nanoparticle triggered regulated necrosis | Wikipathways | 8 | Cer-NS | 0.008 | 0.02 |
| Kaposi sarcoma-associated herpesvirus infection - Homo sapiens (human) | KEGG | 5 | PE-P | 0.008 | 0.02 |
| Scavenging by Class F Receptors | Reactome | 9 | TG | 0.008 | 0.02 |
| Composition of Lipid Particles | Wikipathways | 10 | TG | 0.008 | 0.02 |
| Pyroptosis | Reactome | 5 | CL | 0.008 | 0.02 |
| Leishmaniasis - Homo sapiens (human) | KEGG | 6 | Cer-NS | 0.01 | 0.02 |
| IL2 signaling events mediated by PI3K | PID | 7 | Cer-NS | 0.01 | 0.02 |
| metabolism of anandamide an endogenous cannabinoid | BioCarta | 6 | PE-P | 0.01 | 0.02 |
| Autophagy - animal - Homo sapiens (human) | KEGG | 6 | PE-P | 0.01 | 0.02 |
| Platelet sensitization by LDL | Reactome | 6 | TG | 0.01 | 0.02 |
| Chylomicron remodeling | Reactome | 7 | TG | 0.01 | 0.02 |
| Regulation of TLR by endogenous ligand | Reactome | 13 | TG | 0.01 | 0.02 |
| Phosphatidylcholine catabolism | Wikipathways | 9 | SM | 0.01 | 0.02 |
| phospho-PLA2 pathway | Reactome | 7 | PC | 0.01 | 0.03 |
| Adipocytokine signaling pathway - Homo sapiens (human) | KEGG | 7 | Cer-NS | 0.01 | 0.03 |
| Degradation pathway of sphingolipids, including diseases | Wikipathways | 13 | Cer-NS | 0.01 | 0.03 |
| Triacylglyceride synthesis | Wikipathways | 10 | TG | 0.01 | 0.03 |
| phospholipids as signalling intermediaries | BioCarta | 7 | SM | 0.01 | 0.03 |
| phosphatidylcholine biosynthesis pathway | BioCarta | 8 | PC | 0.01 | 0.03 |
| Fc-epsilon receptor I signaling in mast cells | PID | 8 | PC | 0.01 | 0.03 |
| COPI-independent Golgi-to-ER retrograde traffic | Reactome | 9 | PC | 0.01 | 0.03 |
| Heme signaling | Reactome | 10 | TG | 0.01 | 0.03 |
| Scavenging by Class H Receptors | Reactome | 11 | TG | 0.01 | 0.03 |
| Acetylcholine Synthesis | Wikipathways | 11 | PC | 0.01 | 0.03 |
| AGE-RAGE signaling pathway in diabetic complications - Homo sapiens (human) | KEGG | 9 | Cer-NS | 0.01 | 0.03 |
| LDL clearance | Reactome | 9 | TG | 0.01 | 0.03 |
| Plasma lipoprotein clearance | Reactome | 9 | TG | 0.01 | 0.03 |
| Scavenging by Class B Receptors | Reactome | 16 | TG | 0.01 | 0.03 |
| Golgi-to-ER retrograde transport | Reactome | 11 | PC | 0.02 | 0.03 |
| Macroautophagy | Reactome | 12 | PE-P | 0.02 | 0.03 |
| Cargo recognition for clathrin-mediated endocytosis | Reactome | 10 | TG | 0.02 | 0.03 |
| HIF1A and PPARG regulation of glycolysis | Wikipathways | 10 | TG | 0.02 | 0.03 |
| Acyl chain remodeling of DAG and TAG | Reactome | 10 | TG | 0.02 | 0.03 |
| Cholesterol metabolism - Homo sapiens (human) | KEGG | 10 | TG | 0.02 | 0.03 |
| Ca-dependent events | Reactome | 11 | PC | 0.02 | 0.03 |
| Choline metabolism in cancer - Homo sapiens (human) | KEGG | 11 | PC | 0.02 | 0.03 |
| phosphatidylcholine biosynthesis | HumanCyc | 12 | PC | 0.02 | 0.03 |
| Autophagy | Reactome | 13 | PE-P | 0.02 | 0.03 |
| Plasma lipoprotein assembly | Reactome | 11 | TG | 0.02 | 0.03 |
| Cell surface interactions at the vascular wall | Reactome | 13 | TG | 0.02 | 0.03 |
| Statin inhibition of cholesterol production | Wikipathways | 17 | TG | 0.02 | 0.03 |
| Intra-Golgi and retrograde Golgi-to-ER traffic | Reactome | 13 | PC | 0.02 | 0.04 |
| Visual signal transduction: Rods | PID | 13 | PC | 0.02 | 0.04 |
| Role of phospholipids in phagocytosis | Reactome | 13 | PC | 0.02 | 0.04 |
| Alpha Linolenic Acid and Linoleic Acid Metabolism | SMPDB | 18 | PC | 0.02 | 0.04 |
| Sphingolipid pathway | Wikipathways | 14 | Cer-NS | 0.02 | 0.04 |
| Lipid Metabolism Pathway | Wikipathways | 14 | TG | 0.02 | 0.04 |
| Toll-like Receptor Cascades | Reactome | 31 | TG | 0.02 | 0.04 |
| Surfactant metabolism | Reactome | 13 | PC | 0.02 | 0.04 |
| Synthesis of PG | Reactome | 13 | PC | 0.02 | 0.04 |
| Visual signal transduction: Cones | PID | 14 | PC | 0.02 | 0.04 |
| Serine Metabolism | Wikipathways | 27 | Cer-NS | 0.02 | 0.04 |
| Fat digestion and absorption - Homo sapiens (human) | KEGG | 13 | TG | 0.02 | 0.04 |
| 16p11.2 proximal deletion syndrome | Wikipathways | 40 | Cer-NS | 0.02 | 0.04 |
| Glycosylphosphatidylinositol(GPI)-anchor biosynthesis | EHMN | 14 | PE-P | 0.02 | 0.04 |
| Ion transport by P-type ATPases | Reactome | 17 | PE-P | 0.02 | 0.04 |
| Lipid and atherosclerosis - Homo sapiens (human) | KEGG | 14 | TG | 0.02 | 0.04 |
| Regulation of lipolysis in adipocytes - Homo sapiens (human) | KEGG | 14 | TG | 0.02 | 0.04 |
| Regulated Necrosis | Reactome | 16 | CL | 0.02 | 0.04 |
| Fcgamma receptor (FCGR) dependent phagocytosis | Reactome | 16 | PC | 0.02 | 0.04 |
| ceramide *de novo* biosynthesis | HumanCyc | 20 | Cer-NS | 0.03 | 0.04 |
| Glycosylphosphatidylinositol (GPI)-anchor biosynthesis - Homo sapiens (human) | KEGG | 16 | PE-P | 0.03 | 0.04 |
| Kennedy pathway from sphingolipids | Wikipathways | 18 | PE-P | 0.03 | 0.04 |
| Synthesis of glycosylphosphatidylinositol (GPI) | Reactome | 19 | PE-P | 0.03 | 0.04 |
| Clathrin-mediated endocytosis | Reactome | 17 | TG | 0.03 | 0.04 |
| Triglyceride biosynthesis | Reactome | 18 | TG | 0.03 | 0.04 |
| PLC beta mediated events | Reactome | 17 | PC | 0.03 | 0.04 |
| G-protein mediated events | Reactome | 17 | PC | 0.03 | 0.04 |
| Digestion of dietary lipid | Reactome | 17 | TG | 0.03 | 0.04 |
| Triglyceride catabolism | Reactome | 19 | TG | 0.03 | 0.04 |
| Ion channel transport | Reactome | 22 | PE-P | 0.03 | 0.04 |
| Thyroid hormones production and their peripheral downstream signaling effects | Wikipathways | 25 | TG | 0.03 | 0.04 |
| Programmed Cell Death | Reactome | 21 | CL | 0.03 | 0.04 |
| Post-translational modification: synthesis of GPI-anchored proteins | Reactome | 22 | PE-P | 0.03 | 0.047 |
| Metabolism of Spingolipids in ER and Golgi apparatus | Wikipathways | 21 | Cer-NS | 0.03 | 0.049 |
| Synthesis of PE | Reactome | 21 | PE-P | 0.03 | 0.049 |
| Scavenging by Class A Receptors | Reactome | 32 | TG | 0.03 | 0.049 |