

Supplementary Table 2A:
Fetal Sheep Cerebral White Matter Lipids Identified by MALDI-Mass
Spectrometry-Positive Ion Mode: Organized by M/Z

m/z	Lipid Assignment	Ion	Source
706.6	PC(30:0)	[M+H] ⁺	67
707.6	PG(31:1), PG(P-32:0), PA(37:6), PA(O-38:6), PE-Cer(34:0)/PA(35:3), PA(O-36:3), PA(P-36:2), PE-Cer(36:3)/PA(34:4)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	LipidMaps and MS/MS
728.6	PC(30:0)/PC(32:3)	[M+Na] ⁺ /[M+H] ⁺	67
730.6	PC (32:2)	[M+H] ⁺	67
731.6	SM(36:1)	[M+H] ⁺	29
732.6	PC(32:1)	[M+H] ⁺	67
733.6	SM(36:0)	[M+H] ⁺	68,69
734.6	PC(32:0)	[M+H] ⁺	67
735.6	PA(36:4)	[M+K] ⁺	70
736.6	PC(28:0)	[M+H] ⁺	70
744.6	PC(32:2), PC(O-34:2), PC(P-34:1)/PC(30:0), PC(O-31:0)	[M+H] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
745.6	SM(37:1)	[M+H] ⁺	Lipid Maps and MS/MS
746.6	PE(36:1)	[M+H] ⁺	29
747.6	PG(34:2), PG(O-35:2), PG(P-35:1), PA(39:0), PA(40:7), PA(O-40:0)/PI(26:1), PA(38:4)/PG(31:0), PG(O-32:0), PA(37:5), PA(O-38:5), PA(P-38:4)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS

750.6	PC(34:6)/PC(32:3), PC(P-33:2)/PC(31:4)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
753.6	SM(36:1)	[M+Na] ⁺	67
754.6	PC(32:1)	[M+Na] ⁺	67
755.6	SM(38:3)/SM(36:0)/SM(35:1)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
756.6	PC(32:0)	[M+Na] ⁺	67
757.6	C13 Isotope of PC(32:0)	[M+Na] ⁺	
758.6	PC(34:2)	[M+H] ⁺	67
759.6	SM(38:1)	[M+H] ⁺	68,69
760.6	PC(34:1)	[M+H] ⁺	29,67
761.6	PG(32:0)	[M+K] ⁺	71
762.6	PC(34:0)	[M+H] ⁺	29,67
763.6	PC-N(CH ₃) ₃ (36:3)	[M+K] ⁺	71
766.6	GlcCer(34:1)	[M+K] ⁺	68,69
768.6	PE(38:4)	[M+H] ⁺	29
769.6	SM(36:1)	[M+K] ⁺	70
770.6	PC(32:1)	[M+K] ⁺	72 and MS/MS
771.6	SM(36:0)	[M+K] ⁺	71
772.6	PC(32:0)	[M+K] ⁺	29
773.6	SM(39:1)	[M+H] ⁺	Lipid Maps and MS/MS
774.6	PC(35:1), PC(36:8), PC(O-36:1), PC(P-36:0)/PC(34:5)	[M+H] ⁺ /[M+Na] ⁺	Lipid Maps and MS/MS
780.6	PC(34:2)/PC(36:5)	[M+Na] ⁺ /[M+H] ⁺	67
782.6	PC(34:1)/PC(36:4)	[M+Na] ⁺ /[M+H] ⁺	67

783.6	PG(37:5), PG(O-38:5), PG(P-38:4), PI(30:0), PA(42:3)/PG(35:2), PG(O-36:2), PG(P-36:1), PA(40:0), PA(41:7), PA(O-41:0), PA(P-42:6), LPIM1(18:1), PE- Cer(40:1)(2OH)/PG(34:3), PG(P-3:2), PA(39:1), PA(O-40:1), PA(P-40:0), PE-Cer(40:0), PE-Cer(39:2)(2OH)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
784.6	PC(34:0)/PC(36:3)	[M+Na] ⁺ /[M+H] ⁺	67
785.6	SM(40:2)	[M+H] ⁺	73
786.6	PC(36:2)	[M+H] ⁺	67
787.6	SM(40:1)	[M+H] ⁺	73
788.7	PC(36:1)	[M+H] ⁺	29 67
789.7	PG(36:6)	[M+Na] ⁺	67
790.6	PC(P-38:6)/PC(36:0)	[M+H] ⁺ /[M+H] ⁺	74
791.5	PG(37:1), PG(O-38:1), PG(P-38:0), PI(31:3), PA(43:6)/PG(36:5), PI(29:0), PA(41:3), PA(P- 42:2)/PG(35:6), PG(P-36:5), PI(28:1), PI(P-29:0), PA(40:4)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
796.6	PC(34:2)	[M+K] ⁺	71
798.6	PC(34:1)	[M+K] ⁺	75
799.6	SM(41:2)	[M+H] ⁺	73
800.6	PC(34:0)	[M+K] ⁺	71
801.6	SM(41:1)	[M+H] ⁺	73
802.6	PE(40:1), PS(37:2), PS(38:9), PS(O-38:2), PS(P- 38:1)/PE(39:5), PE(O-40:5), PE(P-40:4), PS(36:6), PE(38:6)(14OH), PI-Cer(34:1)/PE(38:6), PS(34:0), PS(O- 35:0), PE(P-38:6)(14OH)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
804.6	PC(36:4)/PC(38:7)	[M+Na] ⁺ /[M+H] ⁺	67

806.6	PC(36:3)/PC(38:6)	[M+Na] ⁺ /[M+H] ⁺	67
807.6	SM(40:2)	[M+Na] ⁺	Lipid Maps and MS/MS
808.6	GlcCer(40:1)	[M+K] ⁺	68,69 and MS/MS
809.6	SM(40:1)/ SM(39:2)	[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
810.6	PC(38:4)/PC(36:1)	[M+H] ⁺ /[M+Na] ⁺	67 and MS/MS
811.6	SM(42:3)/SM(40:0)/SM(39:1)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
812.6	PC(36:0)	[M+Na] ⁺	71
824.6	PC(36:2)	[M+K] ⁺	71
825.6	PG(40:5), PI(33:0), PI(O-34:0)/PG(38:2), PI(32:4), PA(43:0), PA(44:7)/PG(37:3), PG(O-38;3), PG(P-38:2), PA(42:1), SM(40:1)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
826.6	PC(36:1)	[M+K] ⁺	71
827.6	PG(40:4), PI(34:6)/PG(38:1), PG(39:8), PG(O-39:1), PG(P-39:0), PI(32:3), PI(P-33:2), PA(44:6)/PG(37:2), PG(38:9), PG(O-38:2), PG(P-38:1), PI(31:4), PA(42:0)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
828.6	PC(36:0)	[M+K] ⁺	71
830.6	GalCer(42:3)	[M+Na] ⁺	68,75
832.6	PC(38:4)/GlcCer(42:2)	[M+Na] ⁺ /[M+Na] ⁺	70 69
834.7	PC(40:6)	[M+H] ⁺	70
835.7	SM(42:2)	[M+Na] ⁺	67
836.7	PC(40:5)	[M+H] ⁺	70
838.7	PC(40:4)	[M+H] ⁺	70
844.6	ST(36:2)	[M+K] ⁺	71 and MS/MS

846.6	ST(36:1)	[M+K] ⁺	⁷¹ and MS/MS
848.6	PC(38:4)/GlcCer(42:2)	[M+K] ⁺ / [M+K] ⁺	⁷⁰ ⁷⁵
851.6	SM(42:2)	[M+K] ⁺	⁷⁰
863.7	SM(44:2)	[M+Na] ⁺	Lipid Maps and MS/MS
1440.2	CL(68:4)/GalCer(36:1)	[M+K] ⁺ /[M+Na] ⁺	Lipid Maps
1441.5	CL(68:3)	[M+K] ⁺	Lipid Maps
1465.2	Unknown	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1466.2	CL(72:0)/CL(70:5)	[M+H] ⁺ /[M+K] ⁺	Lipid Maps
1467.2	Unknown	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1468.2	PC(32:0)	[2M+H] ⁺	⁷⁰
1469.2	PIM4(30:0)	[M+K] ⁺	Lipid Maps
1470.6	PA(36:4)	[2M+K] ⁺	⁷⁰
1491.2	Unknown	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1492.2	CL(74:1)/PIM4(33:2)/CL(72:6)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1493.2	PIM4(32:2)	[M+K] ⁺	Lipid Maps
1494.2	CL(74:0), PIM4(35:4)/PIM4(33:1)/CL(72:5)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1495.2	PIM4(32:1)	[M+K] ⁺	Lipid Maps
1496.2	PIM4(35:3)/CL(73:10), PIM4(33:0)/CL(72:4)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1497.2	Unknown	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1507.6	CL(76:7)/CL(74:4), PIM4(34:1)/PIM4(33:2)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS

1516.2	CL(76:3), PIM4(36:0)/CL(74:0), PIM4(35:4)/CL(74:8)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1517.2	Unknown	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1518.2	GM1(34:1)	[M+H] ⁺	76
1519.2	PIM4(34:3)	[M+K] ⁺	Lipid Maps
1520.2	CL(76:1)/CL(76:12), PIM4(35:2)/CL(74:6)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1521.2	Unknown	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1522.2	CL(76:0)/CL(76:11), PIM4(35:1)/CL(74:5), PIM4(34:2)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1523.2	PC(34:0)	[2M+H] ⁺	70
1524.3	GD1a(36:1) [M1-Neu5Ac-CO2+Na] ⁺	[M+Na] ⁺	77
1540.2	CL(78:5)/CL(76:2)/CL(76:10), PIM4(35:0)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1541.2	Unknown	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1542.2	CL(78:4)/CL(76:1)/CL(76:9)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1543.2	Unknown	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1544.2	CL(76:0)/CL(78:14)/CL(76:8)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1545.2	LPIM6(16:0)	[M+H] ⁺	Lipid Maps
1546.2	GM1(36:1)	[M+H] ⁺	78
1547.2	GM1(36:1)	[M + 2H + e] ⁺⁺	78
1548.2	CL(78:1)/CL(78:12), PIM4(37:2)/CL(76:6), PIM4(36:3)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1549.2	Unknown	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1550.2	CL(78:0)/PIM4(37:1)/CL(76:5), PIM4(36:2)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1566.2	PIM4(37:1)	[M+K] ⁺	Lipid Maps

1567.2	LPIM6(16:0)	[M+Na] ⁺	Lipid Maps
1568.2	GD1a(36:1) [M1-Neu5Ac+Na] ⁺	[M+Na] ⁺	77
1569.2	LPIM6(18:2)	[M+H] ⁺	Lipid Maps
1570.2	CL(80:4)/CL(78:1)/CL(78:9)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1571.2	LPIM6(18:1)	[M+H] ⁺	Lipid Maps
1572.2	CL(78:0)/CL(78:8)	[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1573.6	LPIM6(18:0)	[M+H] ⁺	LipidMaps
1574.5	GalCer(38:1)	[M+H] ⁺	Lipid Maps
1594.3	Unknown	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1596.0	GD1a(36:1) [M2-Neu5Ac+Na] ⁺	[M+Na] ⁺	77

Lipids identified in fetal sheep brain white matter. Lipids extracted from fresh frozen tissue were analyzed with an Ultraflexextreme MALDI-time-of-flight (TOF)/TOF (Bruker Daltonics, Bremen, Germany) mass spectrometer in the positive ion mode with DHB as matrix. MALDI data were processed using ClinProTools v3.0. Lipid assignment were made using LIPIDMAPS and based on previous publications (Right column). Abbreviations: GalCer= Galactosylceramide; GlcCer= Glucosylceramide; PE-Cer= Ceramide Phosphatidylethanolamine; PI-Cer= Ceramide Phosphatidylinositol; GM1,GM2,GD1a= Gangliosides; CL= Cardiolipins ; PA= Phosphatidic Acid; PC= Phosphatidylcholine; PE= Phosphatidylethanolamine; PG= Phosphatidylglycerol; PIM/LPIM= Phosphatidylinositol mannoside; SM= Sphingomyelin; ST= Sulfatide.

Supplementary Table 2B:
Fetal Sheep Cerebral White Matter Lipids Identified by MALDI-Mass
Spectrometry-Positive Ion Mode: Organized by Lipid Subtype

m/z	Sphingolipids	Ion	Source
	Ceramides		
766.6	GlcCer(34:1)	[M+K] ⁺	68,69
808.6	GlcCer(40:1)	[M+K] ⁺	68,69 and MS/MS
830.6	GalCer(42:3)	[M+Na] ⁺	68,75
1574.5	GalCer(38:1)	[M+H] ⁺	Lipid Maps
	Gangliosides		
1524.3	GD1a(36:1) [M1-Neu5Ac-CO ₂ +Na] ⁺	[M+Na] ⁺	77
1546.2	GM1(36:1)	[M+H] ⁺	78
1547.2	GM1(36:1)	[M + 2H + e] ⁺⁺	78
1568.2	GD1a(36:1) [M1-Neu5Ac+Na] ⁺	[M+Na] ⁺	77
1596.0	GD1a(36:1) [M2-Neu5Ac+Na] ⁺	[M+Na] ⁺	77
	Sphingomyelin		
731.6	SM(36:1)	[M+H] ⁺	29
733.6	SM(36:0)	[M+H] ⁺	68,69
745.6	SM(37:1)	[M+H] ⁺	Lipid Maps
753.6	SM(36:1)	[M+Na] ⁺	67
755.6	SM(38:3)/SM(36:0)/SM(35:1)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
759.6	SM(38:1)	[M+H] ⁺	68,69
769.6	SM(36:1)	[M+K] ⁺	70
771.6	SM(36:0)	[M+K] ⁺	71

773.6	SM(39:1)	[M+H] ⁺	Lipid Maps and MS/MS
785.6	SM(40:2)	[M+H] ⁺	73
787.6	SM(40:1)	[M+H] ⁺	73
799.6	SM(41:2)	[M+H] ⁺	73
801.6	SM(41:1)	[M+H] ⁺	73
807.6	SM(40:2)	[M+Na] ⁺	Lipid Maps and MS/MS
809.6	SM(40:1)/ SM(39:2)	[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
811.6	SM(42:3)/SM(40:0)/SM(39:1)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
835.7	SM(42:2)	[M+Na] ⁺	67
851.6	SM(42:2)	[M+K] ⁺	70
863.7	SM(44:2)	[M+Na] ⁺	Lipid Maps and MS/MS
	Sulfatides		
844.6	ST(36:2)	[M+K] ⁺	⁷¹ and MS/MS
846.6	ST(36:1)	[M+K] ⁺	⁷¹ and MS/MS
	Phospholipids		
	Cardiolipins		
1441.5	CL(68:3)	[M+K] ⁺	Lipid Maps
1466.2	CL(72:0)/CL(70:5)	[M+H] ⁺ /[M+K] ⁺	Lipid Maps
1542.2	CL(78:4)/CL(76:1)/CL(76:9)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1544.2	CL(76:0)/CL(78:14)/CL(76:8)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps

1570.2	CL(80:4)/CL(78:1)/CL(78:9)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1572.2	CL(78:0)/CL(78:8)	[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
	Phosphatidic Acid		
735.6	PA(36:4)	[M+K] ⁺	70
1470.6	PA(36:4)	[2M+K] ⁺	70
	Phosphatidylcholine		
706.6	PC(30:0)	[M+H] ⁺	67
728.6	PC(30:0)/PC(32:3)	[M+Na] ⁺ /[M+H] ⁺	67
730.6	PC(32:2)	[M+H] ⁺	67
732.6	PC(32:1)	[M+H] ⁺	67
734.6	PC(32:0)	[M+H] ⁺	67
736.6	PC(28:0)	[M+H] ⁺	70
744.6	PC(32:2), PC(O-34:2), PC(P-34:1)/PC(30:0), PC(O-31:0)	[M+H] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
750.6	PC(34:6)/PC(32:3), PC(P-33:2)/PC(31:4)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
754.6	PC(32:1)	[M+Na] ⁺	67
756.6	PC(32:0)	[M+Na] ⁺	67
757.6	C13 Isotope of PC(32:0)	[M+Na] ⁺	
758.6	PC(34:2)	[M+H] ⁺	67
760.6	PC(34:1)	[M+H] ⁺	29,67
762.6	PC(34:0)	[M+H] ⁺	29,67
763.6	PC-N(CH ₃) ₃ (36:3)	[M+K] ⁺	71
770.6	PC(32:1)	[M+K] ⁺	⁷² and MS/MS
772.6	PC(32:0)	[M+K] ⁺	29

774.6	PC(35:1), PC(36:8), PC(O-36:1), PC(P-36:0)/PC(34:5)	[M+H] ⁺ /[M+Na] ⁺	Lipid Maps and MS/MS
780.6	PC(34:2)/PC(36:5)	[M+Na] ⁺ /[M+H] ⁺	67
782.6	PC(34:1)/PC(36:4)	[M+Na] ⁺ /[M+H] ⁺	67
784.6	PC(34:0)/PC(36:3)	[M+Na] ⁺ /[M+H] ⁺	67
786.6	PC(36:2)	[M+H] ⁺	67
788.7	PC(36:1)	[M+H] ⁺	29,67
790.6	PC(P-38:6)/PC(36:0)	[M+H] ⁺ /[M+H] ⁺	74
796.6	PC(34:2)	[M+K] ⁺	71
798.6	PC(34:1)	[M+K] ⁺	75
800.6	PC(34:0)	[M+K] ⁺	71
804.6	PC(36:4)/PC(38:7)	[M+Na] ⁺ /[M+H] ⁺	67
806.6	PC(36:3)/PC(38:6)	[M+Na] ⁺ /[M+H] ⁺	67
810.6	PC(38:4)/PC(36:1)	[M+H] ⁺ /[M+Na] ⁺	67 and MS/MS
812.6	PC(36:0)	[M+Na] ⁺	71
824.6	PC(36:2)	[M+K] ⁺	71
826.6	PC(36:1)	[M+K] ⁺	71
828.6	PC(36:0)	[M+K] ⁺	71
834.7	PC(40:6)	[M+H] ⁺	70
836.7	PC(40:5)	[M+H] ⁺	70
838.7	PC(40:4)	[M+H] ⁺	70
1468.2	PC(32:0)	[2M+H] ⁺	70
1523.2	PC(34:0)	[2M+H] ⁺	70
	Phosphatidylethanolamine		
746.6	PE(36:1)	[M+H] ⁺	29
768.6	PE(38:4)	[M+H] ⁺	29

	Phosphatidylglycerol		
761.6	PG(32:0)	[M+K]+	71
789.7	PG(36:6)	[M+Na]+	67
	Phosphatidylinisitol mannoside		
1469.2	PIM4(30:0)	[M+K]+	Lipid Maps
1493.2	PIM4(32:2)	[M+K]+	Lipid Maps
1495.2	PIM4(32:1)	[M+K]+	Lipid Maps
1519.2	PIM4(34:3)	[M+K]+	Lipid Maps
1545.2	LPIM6(16:0)	[M+H]+	Lipid Maps
1566.2	PIM4(37:1)	[M+K]+	Lipid Maps
1567.2	LPIM6(16:0)	[M+Na]+	Lipid Maps
1569.2	LPIM6(18:2)	[M+H]+	Lipid Maps
1571.2	LPIM6(18:1)	[M+H]+	Lipid Maps
1573.6	LPIM6(18:0)	[M+H]+	Lipid Maps
	Phospholipids (Head Group Unidentified)		
747.6	PG(34:2), PG(O-35:2), PG(P-35:1), PA(39:0), PA(40:7), PA(O-40:0)/PI(26:1), PA(38:4)/PG(31:0), PG(O-32:0), PA(37:5), PA(O-38:5), PA(P-38:4)	[M+H]+/[M+Na]+/[M+K]+	Lipid Maps and MS/MS
791.5	PG(37:1), PG(O-38:1), PG(P-38:0), PI(31:3), PA(43:6)/PG(36:5), PI(29:0), PA(41:3), PA(P-42:2)/PG(35:6), PG(P-36:5), PI(28:1), PI(P-29:0), PA(40:4)	[M+H]+/[M+Na]+/[M+K]+	Lipid Maps and MS/MS

827.6	PG(40:4), PI(34:6)/PG(38:1), PG(39:8), PG(O-39:1), PG(P-39:0), PI(32:3), PI(P-33:2), PA(44:6)/PG(37:2), PG(38:9), PG(O-38:2), PG(P-38:1), PI(31:4), PA(42:0)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1492.2	CL(74:1)/PIM4(33:2)/CL(72:6)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1494.2	CL(74:0), PIM4(35:4)/PIM4(33:1)/CL(72:5)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1496.2	PIM4(35:3)/CL(73:10), PIM4(33:0)/CL(72:4)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1507.6	CL(76:7)/CL(74:4), PIM4(34:1)/PIM4(33:2)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1516.2	CL(76:3), PIM4(36:0)/CL(74:0), PIM4(35:4)/CL(74:8)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1518.2	CL(76:2)/PIM4(35:3)/CL(74:7)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1520.2	CL(76:1)/CL(76:12), PIM4(35:2)/CL(74:6)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1522.2	CL(76:0)/CL(76:11), PIM4(35:1)/CL(74:5), PIM4(34:2)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
1540.2	CL(78:5)/CL(76:2)/CL(76:10), PIM4(35:0)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS

1548.2	CL(78:1)/CL(78:12), PIM4(37:2)/CL(76:6), PIM4(36:3)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
1550.2	CL(78:0)/PIM4(37:1)/CL(76:5), PIM4(36:2)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
	Ambiguous		
707.6	PG(31:1), PG(P-32:0), PA(37:6), PA(O-38:6), PE- Cer(34:0)/PA(35:3), PA(O-36:3), PA(P-36:2), PE- Cer(36:3)/PA(34:4)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
783.6	PG(37:5), PG(O-38:5), PG(P-38:4), PI(30:0), PA(42:3)/PG(35:2), PG(O-36:2), PG(P-36:1), PA(40:0), PA(41:7), PA(O-41:0), PA(P-42:6), LPIM1(18:1), PE-Cer(40:1)(2OH)/PG(34:3), PG(P- 3:2), PA(39:1), PA(O-40:1), PA(P-40:0), PE- Cer(40:0), PE-Cer(39:2)(2OH)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS
802.6	PE(40:1), PS(37:2), PS(38:9), PS(O-38:2), PS(P- 38:1)/ PE(39:5), PE(O-40:5), PE(P-40:4), PS(36:6), PE(38:6)(14OH), PI-Cer(34:1)/PE(38:6), PS(34:0), PS(O-35:0), PE(P-38:6)(14OH)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps and MS/MS

825.6	PG(40:5), PI(33:0), PI(O-34:0)/PG(38:2), PI(32:4), PA(43:0), PA(44:7)/PG(37:3), PG(O-38:3), PG(P-38:2), PA(42:1), SM(40:1)	[M+H] ⁺ /[M+Na] ⁺ /[M+K] ⁺	Lipid Maps
832.6	PC(38:4)/GlcCer(42:2)	[M+Na] ⁺ /[M+Na] ⁺	69,70
848.6	PC(38:4)/GlcCer(42:2)	[M+K] ⁺ / [M+K] ⁺	70,75
1440.2	CL(68:4)/GalCer(36:1)	[M+K] ⁺ /[M+Na] ⁺	Lipid Maps

Lipids identified in fetal sheep brain white matter. Lipids extracted from fresh frozen tissue were analyzed with an Ultraflex extreme MALDI-time-of-flight (TOF)/TOF (Bruker Daltonics, Bremen, Germany) mass spectrometer in the positive ion mode with DHB as matrix. MALDI data were processed using ClinProTools v3.0. Lipid assignment were made using LIPIDMAPS and based on previous publications (right column).

Abbreviations: GalCer= Galactosylceramide; GlcCer= Glucosylceramide; PE-Cer= Ceramide Phosphatidylethanolamine; PI-Cer= Ceramide Phosphatidylinositol; GM1,GM2,GD1a= Gangliosides; CL= Cardiolipins ; PA= Phosphatidic Acid; PC= Phosphatidylcholine; PE= Phosphatidylethanolamine; PG= Phosphatidylglycerol; PIM/LPIM= Phosphatidylinositol mannoside; SM= Sphingomyelin; ST= Sulfatide.

Supplementary Table 3: Functions of Lipids Expressed in Fetal Sheep Cerebral White Matter
Positive Ionization Mode MALDI-MS

Lipid Class	Functions
Cardiolipin (CL)	• Mitochondria-specific phospholipid • Maintains functionality and membrane integrity³⁹.
Phosphatidic Acid (PA)	• Structural component of cell membranes. • Helps mediate signaling through cell growth, proliferation, and reproduction pathways²⁸.
Phosphatidylcholine (PC)	• Majority of lipid mass in eukaryotic cell membranes. • Important for cell signaling. • Disruption of PC homeostasis leads to apoptosis²⁹
Phosphatidylethanolamine (PE)	• Inner leaflet of plasma membrane³⁰.
Phosphatidylglycerol (PG)	• Cell membrane homeostasis³¹.
Phosphatidylinositol monomannosides (PIM/LPIM)	• Unknown function in mammals • Normally found in the plasma membranes of mycobacteria³².
Galactosylceramide (GalCer)	• Most prevalent glycolipid in myelin³⁴.
Glucosylceramide (GlcCer)	• Precursor lipid for lactosylceramides³⁵.
Sphingomyelin (SM)	• Maintenance and function of the nervous system. • Helps compartmentalize signaling events • Neuronal differentiation, synapse formation, synaptic transmission, and glial-nerve interactions³⁷.
Sulfatides (ST)	• Assists in stabilizing plasma membranes⁷⁹ • Myelin structural lipid • Functional role in myelination

Ganglioside (GD1a/GM1/GM2)	• Regulates cell-to-cell interactions • Usually located on the outer part of the plasma membrane • Regulates functions of physically associated proteins³⁶.
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