vaccines

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Article

Alterations in the Human Plasma Lipidome in Response to Tularemia Vaccination

Supplementary Table S1. *Subject Demographics.*

Category	Sub-Category	DVC-LVS (N=10)
Gender	Female	5 (50%)
	Male	5 (50%)
Race	Black / African American	3 (30%)
	White	7 (70%)
Ethnicity	Non-Hispanic or Non-Latino	10 (100%)
Age	Mean (S.D.)	27.3 (6.3)
	Median	26
	Range	22.7, 44.1

Supplementary Table S2. ***Table of Lipidomics Standards.*** The following synthetic standards were used to optimize instrumental parameters and also for quantification of patient plasma samples.

OXY Standards		
Lipid Abbrev.	Lipid Species	Conc. (pg/ml)
OEA	Oleoylethanolamide	14.2
AEA	Arachidonoylethanolamine	28.4
PGE2 EA	Prostaglandin E2 Ethanolamide	11.4
PGF2a EA	Prostaglandin F2a Ethanolamide	14.2
	12(13)-EpOME/13-HODE	
12(13) EpOME	12(13)epoxy-9-octadecenoic acid	1.1
13 HODE	13-hydroxy-9,11-octadecadienoic acid	1.4
9,10 DIHOME	9,10-dihydroxy-12-octadecenoic acid	1.1
TBX2	Thromboxane B2	11.4
12 HETE	12-hydroxy-5,8,10,14-eicosatetraenoic acid	1.1
	9-HETE/11(12)-EET	
9 HETE	9-hydroxy-5,7,11,14-eicosatetraenoic acid	1.1
11(12) EET	11(12)-epoxy-5,8,14-eicosatrienoic acid	1.1
20 HETE	20-hydroxy-5,8,11,14-eicosatetraenoic acid	1.1
5 HETE	5-hydroxy-6,8,11,14-eicosatetraenoic acid	1.1
8(9) EET	8(9)-epoxy-5,11,14-eicosatrienoic acid	1.1
	14(15)-epoxy-5,8,11-eicosatrienoic acid	1.1
	Summed DHET Species	
14,15 DHET	14,15-dihydroxy-5,8,11-eicosatrienoic acid	1.1
11,12 DHET	11,12-dihydroxy-5,8,14-eicosatrienoic acid	1.1
8,9 DHET	8,9-dihydroxy-5,11,14-eicosatrienoic acid	1.1
5,6 DHET	5,6-dihydroxy-8,11,14-eicosatrienoic acid	1.1

Shotgun Lipidomics Standards		
Lipid	Lipid Class	[Conc; ug/ul]

di20:0 PC	Phosphatidylcholine	60.0
di14:0 PE	Phosphatidylethanolamine	1.0
17:0 SM	Spingomyelin	4.0
di20:0 DG	Diacylglyerol	4.0
17:0 FFA	Free Fatty Acid	1.0
Tri17:1 TG	Triacylglycerol	10.0
di14:0 PS	Phosphatidylserine	0.1
17:0 LPC	Lysophosphatidylcholine	2.5
14:0 LPE	Lysophosphatidylethanolamine	0.1

Supplementary Table S3. ***Table of instrumental parameters.*** A list of optimized instrumental parameters used to conduct targeted lipidomics studies at EMO and SLU laboratories, respectively.

EMO Instrumental Parameters			
Curtain Gas (CUR)	25.00	Collision Gas (CAD)	Low
ESI Voltage (IS)	-3500	Gas Source 1 (GS1)	55.00
ESI Temp (TEM)	650°C	Gas Source 2 (GS2)	50.00
Declustering Potential (DP)	-90.00	Collision Energy (CE)	-40.00
Entrance Potential (EP)	-10.00	Collision Energy Spread (CES)	0.00
Q1 and Q3 Resolution	Unit	Step Size	0.2Da

SLU Instrumental Parameters			
Curtain Gas (CUR)	20.00	Sheath Gas	12 arb. units
ESI Voltage (IS)	3500	Ion Sweep Gas	1 arb. Units
Capillary Temp.	270°C	Auxillary Gas	2 arb. units
Collision Pressure (Argon)	1 atm	Capillary Offset	35

Supplementary Table S4. *Table of serum cytokines serum samples.* A list of the cytokines measured and represented in Figure 6.

Figure 6 Cytokines and Abbreviations					
EOTAXIN	basic fibroblast growth factor (FGF-BASIC)	granulocyte colony-stimulating factor (G CSF)	granulocyte-macrophage colony stimulating factor (GM CSF)	interferon gamma (IFN-γ)	tumor necrosis factor alpha (TNF-a)
interleukin 10 (IL-10)	interleukin 10 (IL-10)	interleukin 13 (IL-13)	interleukin 17 (IL-17)	interleukin 1 receptor agonist (IL-1RA)	vascular endothelial growth factor (VEGF)
interleukin 2 (IL-2)	interleukin 4 (IL-4)	interleukin 5 (IL-5)	interleukin 8 (IL-8)	interleukin 9 (IL-9)	interleukin 10 (IP-10)

monocyte chemoattractant protein-1/monocyte chemotactic and activating factor (MCP-1/MCAF)	macrophage inflammatory protein 1b (MIP 1B)	platelet derived growth factor BB (PDGF BB)	RANTES

Supplementary Table S5. ***Table of positively identified targeted lipids in serum samples.*** A list of all of the identified targeted lipids are shown in this table with corresponding mass to charge (m/z) value and lipid scan type/experiment.

Tularemia Lipid ID	Lipid Species	Scan	m/z
TULIPID001	OEA	MRM	326.0
TULIPID002	AEA	MRM	348.0
TULIPID003	PGE2 Ethanolamide	MRM	378.0
TULIPID004	PGF2a Ethanolamide	MRM	380.0
TULIPID005	12(13)-EpOME; 13-HODE	MRM	169.0
TULIPID006	9,10 DIHOME	MRM	173.0
TULIPID007	Summed DHET Species	MRM	NA
TULIPID008	TXB2	MRM	147.0
TULIPID009	12-HETE	MRM	87.0
TULIPID010	9-HETE; 11(12)-EET	MRM	167.0
TULIPID011	20-HETE	MRM	289.0
TULIPID012	5-HETE	MRM	301.0
TULIPID013	8(9)-EET	MRM	70.0
TULIPID014	14(15)-EET	MRM	220.0
TULIPID015	14:0 LPC	NL50	502.5
TULIPID016	15:0 LPC	NL50	516.4
TULIPID017	16:1 LPC	NL50	528.4
TULIPID018	16:0 LPC	NL50	530.4
TULIPID019	17:0 LPC	NL50	544.4
TULIPID020	18:2 LPC	NL50	554.4
TULIPID021	18:1 LPC	NL50	556.4
TULIPID022	18:0 LPC	NL50	558.4
TULIPID023	20:4 LPC	NL50	578.4
TULIPID024	20:3 LPC	NL50	580.4
TULIPID025	22:6 LPC	NL50	602.4
TULIPID026	22:5 LPC	NL50	604.3
TULIPID027	30:2 PC	NL50	736.7
TULIPID028	30:1 PC	NL50	738.7
TULIPID029	30:0 PC	NL50	740.6
TULIPID030	32:1e PC	NL50	752.7
TULIPID031	32:0e PC	NL50	754.9
TULIPID032	32:1 PC	NL50	766.7
TULIPID033	32:0 PC	NL50	768.6
TULIPID034	34:1p PC	NL50	778.7
TULIPID035	34:0p PC	NL50	780.6
TULIPID036	34:3 PC	NL50	790.7
TULIPID037	34:2 PC	NL50	792.7
TULIPID038	34:1 PC	NL50	794.7
TULIPID039	34:0 PC	NL50	796.7
TULIPID040	36:3p PC	NL50	802.7
TULIPID041	36:4 PC	NL50	816.6
TULIPID042	36:3 PC	NL50	818.7
TULIPID043	36:2 PC	NL50	820.7
TULIPID044	36:1 PC	NL50	822.7

TULIPID045	38:4p PC	NL50	828.6
TULIPID046	38:6 PC	NL50	840.6
TULIPID047	38:5 PC	NL50	842.6
TULIPID048	38:4 PC	NL50	844.7
TULIPID049	38:3 PC	NL50	846.7
TULIPID050	38:2 PC	NL50	848.8
TULIPID051	38:1 PC	NL50	850.7
TULIPID052	38:0 PC	NL50	852.6
TULIPID053	40:0e PC	NL50	866.8
TULIPID054	40:6 PC	NL50	868.7
TULIPID055	40:5 PC	NL50	870.7
TULIPID056	40:0 PC	NL50	880.8
TULIPID057	34:2 PI	PREC241	833.4
TULIPID058	34:1 PI	PREC241	835.5
TULIPID059	36:4 PI	PREC241	857.7
TULIPID060	36:2 PI	PREC241	861.6
TULIPID061	36:1 PI	PREC241	862.8
TULIPID062	38:5 PI	PREC241	883.6
TULIPID063	38:4 PI	PREC241	885.7
TULIPID064	38:3 PI	PREC241	887.0
TULIPID065	38:2 PI	PREC241	888.0
TULIPID066	16:0 Cer	NL256	536.6
TULIPID067	18:1 Cer	NL256	562.0
TULIPID068	18:0 Cer	NL256	564.6
TULIPID069	20:1 Cer	NL256	590.0
TULIPID070	20:0 Cer	NL256	592.6
TULIPID071	22:1 Cer	NL256	618.6
TULIPID072	22:0 Cer	NL256	620.7
TULIPID073	23:0 Cer	NL256	634.7
TULIPID074	24:2 Cer	NL256	644.8
TULIPID075	24:1 Cer	NL256	646.6
TULIPID076	24:0 Cer	NL256	648.7
TULIPID077	14:0 CE	NL368	619.7
TULIPID078	16:1 CE	NL368	645.7
TULIPID079	16:0 CE	NL368	647.7
TULIPID080	18:3 CE	NL368	669.7
TULIPID081	18:2 CE	NL368	671.7
TULIPID082	18:1 CE	NL368	673.7
TULIPID083	18:0 CE	NL368	675.8
TULIPID084	20:5 CE	NL368	693.7
TULIPID085	20:4 CE	NL368	695.7
TULIPID086	22:6 CE	NL368	719.7
TULIPID087	22:5 CE	NL368	721.7
TULIPID088	22:4 CE	NL368	723.7
TULIPID089	22:3 CE	NL368	725.0
TULIPID090	22:2 CE	NL368	727.8
TULIPID091	e32:0 PE	FMOC	898.7
TULIPID092	32:2 PE	FMOC	908.6
TULIPID093	32:1 PE	FMOC	910.7
TULIPID094	32:0 PE	FMOC	912.8
TULIPID095	p34:2 PE	FMOC	920.8
TULIPID096	p34:1 PE	FMOC	922.7
TULIPID097	e34:1 PE	FMOC	924.8
TULIPID098	34:3 PE	FMOC	934.9
TULIPID099	34:2 PE	FMOC	936.8
TULIPID100	34:1 PE	FMOC	938.8
TULIPID101	p36:4 PE	FMOC	944.8
TULIPID102	e36:4 PE	FMOC	946.8

TULIPID103	e36:3 PE	FMOC	948.8
TULIPID104	e36:2 PE	FMOC	950.8
TULIPID105	36:5 PE	FMOC	958.7
TULIPID106	36:4 PE	FMOC	960.7
TULIPID107	36:3 PE	FMOC	962.8
TULIPID108	36:2 PE	FMOC	964.8
TULIPID109	36:1 PE	FMOC	966.8
TULIPID110	36:0 PE	FMOC	968.8
TULIPID111	p38:5 PE	FMOC	970.8
TULIPID112	p38:4 PE	FMOC	972.8
TULIPID113	e38:4 PE	FMOC	974.8
TULIPID114	38:6 PE	FMOC	984.7
TULIPID115	38:5 PE	FMOC	986.8
TULIPID116	38:4 PE	FMOC	988.8
TULIPID117	38:3 PE	FMOC	990.8
TULIPID118	p40:7 PE	FMOC	994.8
TULIPID119	p40:6 PE	FMOC	996.8
TULIPID120	p40:5 PE	FMOC	998.8
TULIPID121	40:7 PE	FMOC	1010.9
TULIPID122	40:6 PE	FMOC	1012.8
TULIPID123	40:5 PE	FMOC	1014.7
TULIPID124	40:4 PE	FMOC	1016.8
TULIPID125	40:1 PE	FMOC	1022.8
TULIPID126	16:1 SM	NL50	735.6
TULIPID127	16:0 SM	NL50	737.6
TULIPID128	18:1 SM	NL50	763.6
TULIPID129	18:0 SM	NL50	765.6