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Assay Sheet: Oxylipins – Targeted Lipid Quantification Platform

Description:

We offer targeted lipidomics analyses of pro-inflammatory and pro-resolving lipid mediators (Prostaglandins, Leukotrienes, Lipoxins, Resolvins etc.) that are relevant in inflammatory processes.

The UHPLC-MS/MS method contains 54 oxylipins and 5 PUFA precursors covering pro-inflammatory and pro-resolving lipid mediators from all known major pathways, i.e. COX-, LOX-, and CYP450 mediated lipid conversion, as well as non-enzymatic oxidation. The identification and quantification are achieved by retention time and multiple reaction monitoring (MRM), including 9-point calibration with 12 isotopically labelled internal standards.

Matrix	Optimum/Minimum Amount*	Amount needed for handling
Plasma, Serum	50 µL / 50 µL	100 µL
Brain	20 mg / 10 mg	30 mg
Liver	20 mg / 20 mg	60 mg
Lung	20 mg / 10 mg	50 mg
Kidney	20 mg / 10 mg	50 mg
Muscle	20 mg / 10 mg	50 mg
Heart	20 mg / 20 mg	50 mg
Spleen	20 mg / 20 mg	50 mg
iWAT, eWAT	20 mg / 20 mg	50 mg
BAT	5 mg / 5 mg	50 mg
BALF, Cell Supernatant	100 µL / 100 µL	120 µL
Macrophages	0.4 x 10^6 cells	1 x 10^6 cells in 500 µL cold MeOH

* For processing reasons, we need approx. 30 mg to 60 mg of tissue.

Selected References:

Henkel et al., Allergy, 2019 Jun;74(6):1090-1101

Metabolite Overview:

Metabolite Class	Acronym	Number of Metabolites
Dihydroxyeicosatrienoic acid	DHET	4
Dihydroxyeicosatetraenoic acid	DiHETE	1
Dihydroxyoctadecenoic acid	DiHOME	2
Epoxyeicosatrienoic acid	EET	4
Epoxyoctadecenoic acid	EpOME	2
Hydoxydocosahexaenoic acid	HDHA	4
Hydroxyeicosapentaenoic acid	HEPE	4
Hydroxyeicosatetraenoic acid	HETE	6
Hydroxyeicosatrienoic acid	HETrE	1
Hydroxyoctadecadienoic acid	HODE	2
Leukotriene	LTs	3
Lipoxin	LXs	2
Maresin	Mar	1
Oxo-Eicosatetraenoic acid	oxoETE (KETE)	3
Epoxyeicosatetraenoic acid	pETE	2
Prostaglandin	PGs	7
Protectin	Prot	1
Polyunsaturated fatty acid	PUFA	6
Resolvin	Rv	3
Thromboxane	TXs	1

Detailed List of Metabolites:

Abbrev.	Name	Metabolite Class	Formula	ChEBI
(±)18-HEPE	(+/-)-18-hydroxy-5Z,8Z,11Z,14Z,16E-eicosapentaenoic acid	HEPE	$C_{20}H_{30}O_3$	72802
11(12)-EET	(11S,12R)-Epoxy-(5Z,8Z,14Z)-eicosatrienoic acid	EET	$C_{20}H_{32}O_3$	34130
11(S)-HETE	11S-hydroxy-5Z,8Z,12E,14Z-eicosatetraenoic acid	HETE	$C_{20}H_{32}O_3$	138332
11,12-DHET	11,12-dihydroxy-5Z,8Z,14Z-eicosatrienoic acid	DHET	$C_{20}H_{34}O_4$	63969
11b-PGE2	9-oxo-11S,15S-dihydroxy-5Z,13E-prostadienoic acid	Prostaglandin	$C_{20}H_{32}O_5$	140932
11-HDHA	(+/-)-11-hydroxy-4Z,7Z,9E,13Z,16Z,19Z-docosahexaenoic acid	HDHA	$C_{22}H_{32}O_3$	72794
12(S)-HEPE	12S-hydroxy-5Z,8Z,10E,14Z,17Z-eicosapentaenoic acid	HEPE	$C_{20}H_{30}O_3$	88345
12(S)-HETE	12S-hydroxy-5E,8Z,10Z,14Z-eicosatetraenoic acid	HETE	$C_{20}H_{32}O_3$	34146
12,13-DiHOME	12,13-dihydroxy-9-octadecenoic acid	DiHOME	$C_{18}H_{34}O_4$	72665
12,13-EpOME	(+/-)-12(13)-epoxy-9Z-octadecenoic acid	EpOME	$C_{18}H_{32}O_3$	38299
12-oxo-ETE	12-oxo-5Z,8Z,10E,14Z-eicosatetraenoic acid	oxoETE	$C_{20}H_{30}O_3$	34151
13(S)-HODE	13S-hydroxy-9Z,11E-octadecadienoic acid	HODE	$C_{18}H_{32}O_3$	34154
13-HDHA	(+/-)-13-hydroxy-4Z,7Z,10Z,14E,16Z,19Z-docosahexaenoic acid	HDHA	$C_{22}H_{32}O_3$	72608

Abbrev.	Name	Metabolite Class	Formula	ChEBI
14,15-DHET	14,15-dihydroxy-5Z,8Z,11Z-eicosatrienoic acid	DHET	C20H34O4	63966
14,15-DiHETE	(+/-)-14,15-dihydroxy-5Z,8Z,11Z,17Z-eicosatetraenoic acid	DHETE	C20H32O4	88459
14(15)-EET	14,15-epoxy-5Z,8Z,11Z-eicosatrienoic acid	EET	C20H32O3	34157
14(15)-EpETE	(+/-)-14(15)-epoxy-5Z,8Z,11Z,17Z-eicosatetraenoic acid	pETE	C20H30O3	137269
15(S)-HEPE	15S-hydroxy-5Z,8Z,11Z,13E,17Z-eicosapentaenoic acid	HEPE	C20H30O3	88347
15(S)-HETE	15S-hydroxy-5Z,8Z,11Z,13E-eicosatetraenoic acid	HETE	C20H32O3	15558
15(S)-HETrE	15S-hydroxy-8Z,11Z,13E-eicosatrienoic acid	HETrE	C20H34O3	17897
15(S)-HpETE	15S-hydroperoxy-5Z,8Z,11Z,13E-eicosatetraenoic acid	pETE	C20H32O4	15628
15-oxo-ETE	15-oxo-5Z,8Z,11Z,13E-eicosatetraenoic acid	oxoETE	C20H30O3	15559
17-HDHA	(+/-)-17-hydroxy-4Z,7Z,10Z,13Z,15E,19Z-docosahexaenoic acid	HDHA	C22H32O3	72637
20-HETE	20-hydroxy-5Z,8Z,11Z,14Z-eicosatetraenoic acid	HETE	C20H32O3	34306
4-HDHA	(+/-)-4-hydroxy-5E,7Z,10Z,13Z,16Z,19Z-docosahexaenoic acid	HDHA	C22H32O3	72624
5(6)-EET	5,6-epoxy-8Z,11Z,14Z-eicosatrienoic acid	EEt	C20H32O3	34450

Abbrev.	Name	Metabolite Class	Formula	ChEBI
5(S)-HEPE	5S-hydroxy-6E,8Z,11Z,14Z,17Z-eicosapentaenoic acid	HEPE	$C_{20}H_{30}O_3$	140934
5(S)-HETE	5S-hydroxy-6E,8Z,11Z,14Z-eicosatetraenoic acid	HETE	$C_{20}H_{32}O_3$	28209
5,6-DHET	5,6-dihydroxy-8Z,11Z,14Z-eicosatrienoic acid	DHET	$C_{20}H_{34}O_4$	63974
5-oxo-ETE	5-oxo-6E,8Z,11Z,14Z-eicosatetraenoic acid	oxoETE	$C_{20}H_{30}O_3$	52449
6-keto-PGF1alpha	6-oxo-9S,11R,15S-trihydroxy-13E-prostenoic acid	Prostaglandin	$C_{20}H_{34}O_6$	28158
6R-LXA4	5S,6R,15S-trihydroxy-7E,9E,11Z,13E-eicosatetraenoic acid	Lipoxin	$C_{20}H_{32}O_5$	6498
6S-LXA4	5S,6S,15S-trihydroxy-7E,9E,11Z,13E-eicosatetraenoic acid	Lipoxin	$C_{20}H_{32}O_5$	63990
7(R) Maresin 1	7R,14S-dihydroxy-4Z,8E,10E,12Z,16Z,19Z-docosahexaenoic acid	Maresin	$C_{22}H_{32}O_4$	138249
8(9) EET	8,9-epoxy-5Z,11Z,14Z-eicosatrienoic acid	EET	$C_{20}H_{32}O_3$	34490
8,9-DHET	8,9-dihydroxy-5Z,11Z,14Z-eicosatrienoic acid	DHET	$C_{20}H_{34}O_4$	63970
8iso-PGE2	9-oxo-11R,15S-dihydroxy-5Z,13E-prostadienoic acid-cyclo[8S,12R]	Prostaglandin	$C_{20}H_{32}O_5$	131888
8-iso-PGF2alpha	(9S,11R,15S)-15-F2-IsoP[8S,12R]	Prostaglandin	$C_{20}H_{34}O_5$	34505
9(S)-HODE	9S-hydroxy-10E,12Z-octadecadienoic acid	HODE	$C_{18}H_{32}O_3$	34496
9,10-DiHOME	9,10-dihydroxy-12Z-octadecenoic acid	DiHOME	$C_{18}H_{34}O_4$	72663

Abbrev.	Name	Metabolite Class	Formula	ChEBI
9,10-EpOME	9,10-epoxy-12Z-octadecenoic acid	EpOME	$C_{18}H_{32}O_3$	34494
9-HETE	9-hydroxy-5E,7Z,11Z,14Z-eicosatetraenoic acid	HETE	$C_{20}H_{32}O_3$	72786
AA (Arachidonic acid)	5Z,8Z,11Z,14Z-eicosatetraenoic acid	PUFA	$C_{20}H_{32}O_2$	15843
ALA (alpha-linolenic acid)	9Z,12Z,15Z-octadecatrienoic acid	PUFA	$C_{18}H_{30}O_2$	27432
DGLA (Dihomo-gamma-Linolenic acid)	8Z,11Z,14Z-eicosatrienoic acid	PUFA	$C_{20}H_{34}O_2$	53486
DHA (Docosahexaenoic acid)	4Z,7Z,10Z,13Z,16Z,19Z-docosahexaenoic acid	PUFA	$C_{22}H_{32}O_2$	28125
EPA (Eicosapentaenoic acid)	5Z,8Z,11Z,14Z,17Z-eicosapentaenoic acid	PUFA	$C_{20}H_{30}O_2$	28364
LA (Linoleic acid)	9Z,12Z-octadecadienoic acid	Leukotriene	$C_{18}H_{32}O_2$	17351
LTB4	5S,12R-dihydroxy-6Z,8E,10E,14Z-eicosatetraenoic acid	Leukotriene	$C_{20}H_{32}O_4$	15647
LTD4	5S-hydroxy-6R-(S-cysteinylglycinyl)-7E,9E,11E,14Z-eicosatetraenoic acid	Leukotriene	$C_{25}H_{40}N_2O_6S$	28666

Abbrev.	Name	Metabolite Class	Formula	ChEBI
LTE4	5S-hydroxy-6R-(S-cysteinyl),7E,9E,11Z,14Z-eicosatetraenoic acid	Leukotriene	C23H37NO5S	15650
PGD2	9S,15S-dihydroxy-11-oxo-5Z,13E-prostadienoic acid	Prostaglandin	C20H32O5	15555
PGE2	9-oxo-11R,15S-dihydroxy-5Z,13E-prostadienoic acid	Prostaglandin	C20H32O5	15551
PGF2alpha	9S,11R,15S-trihydroxy-5Z,13E-prostadienoic acid	Prostaglandin	C20H34O5	15553
Protectin DX (10(S),17(S)-DiHDHA)	10S,17S-dihydroxy-4Z,7Z,11E,13Z,15E,19Z-docosahexaenoic acid	Protectine	C22H32O4	138653
Resolvin D1	7S,8R,17S-trihydroxy-4Z,9E,11E,13Z,15E,19Z-docosahexaenoic acid	Resolvine	C22H32O5	81564
Resolvin D2	7S,16R,17S-trihydroxy-4Z,8E,10Z,12E,14E,19Z-docosahexaenoic acid	Resolvine	C22H32O5	81565
Resolvin E1	5S,12R,18R-trihydroxy-6Z,8E,10E,14Z,16E-eicosapentaenoic acid	Resolvine	C20H30O5	81559
TXB2	9S,11,15S-trihydroxy-thromboxa-5Z,13E-dien-1-oic acid	Thromboxane	C20H34O6	28728