Phosphatidylethanol

A MARKER FOR PROLONGED ALCOHOL CONSUMPTION

Concentration PEth [µmol/L] in blood	Comments
< 0.1	None or low intake
0.1 - 0.3	Moderate intake
> 0.3	Large intake

PEth 16:0/18:1 D5 Internal Standard

Phosphatidylethanol (PEth) in the blood is a biomarker for alcohol consumption and is an unnatural phospholipid that can only be formed in presence of alcohol, which theoretically provides 100% diagnostic specificity for alcohol.

The half-life of PEth in blood is 4-5 days, meaning the molecule can be detected up to 3 weeks after the alcohol have been cleared out of the blood
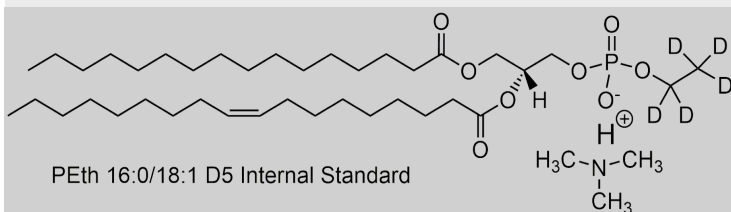
DESCRIPTION OF THE BIOMARKER

Phosphatidylethanol (PEth) is a generic term for a large group of phospholipids formed from the membrane molecule phosphatidylcholine in the presence of ethanol. PEth-16:0/18:1 is the most abundant form of the PEth-homologues. It is used in quantitative LC-MS/MS analysis of blood from patients to estimate the level of alcohol consumption.

PEth formation after drinking alcohol are dose dependent. The marker is very useful to separate total sobriety to alcohol consumption. PEth is increased in the blood in relation to alcohol intake.

PEth is the only biomarker which is correlated to alcohol consumption over time. Still no false positives have been reported in humans. Nor are there endogenous or other drugs that interfere with the analytical method. In a clinical perspective, PEth is therefore, a 100% alcohol specific marker (1).

CE LABELED ANALYZING METHOD

redhot diagnostics has developed a method that is robust, easy-to-use with high specificity and sensitivity. To facilitate for the user the calibrator is ready to use in blood, with the concentration 0, 0.05, 0.1, 0.4, 0.8, 1.6 µM.

KIT CONTENT
Art.no. 50-2001, 200 determinations including column
Art.no. 50-2002, 200 determinations

Calibrator PEth 16:0/18:1,	6 x 0.3 mL
Int. std. D_5- PEth 16:0/18:1,	4.5 nmol
QC sample medium	0.5 mL
Extraction solution	45 mL
Tuning solution	1 mL

COLUMN
redhot column validated for the PEth kit.
Art. no.   52-1000

DETECTION LEVEL
(lowest calibrator level)
The least detecable level is 0.05 µM

MEASURING RANGE
The calibrator range is 0.05 to 1.6 µM

ASSAY PERFORMANCE
Reproducibility of QC samples in blood

Sample	PEth µM	Intra assay CV % (n=5)	Inter assay CV % (n=5)
QC low	0.25	< 7.3	4.3
QC mid	0.5	< 12	11
QC high	1.0	< 4.8	5.6

PEth calibration curve

The PEth method gives the ability to objectively characterize an individual's relationship to alcohol. The PEth test is the only test that can quantify alcohol consumption both for early intervention and research [5,6].

INTENDED USE
This product should be used for LC-MS/MS application for the qualitative and quantitative analyse of PEth

PRINCIPLES OF THE METHOD
Phosphatidylethanol is extracted from blood by addition of totally 150 µL of extraction solvent containing an internal standard (D_5-PEth) to 20 µL of blood. After thorough mixing, the sample is centrifuged and an aliquot of the supernatant is injected in the LC-MS system. Components are separated on a reversed phase column using a binary gradient.
The effluent from column is monitored with electrospray ionization mass spectrometry using multiple reactions monitoring to follow the respective characteristic transitions for PEth and the internal standard. The ratios of the peak areas for PEth to the internal standard are used to quantify the concentration of PEth in the sample.
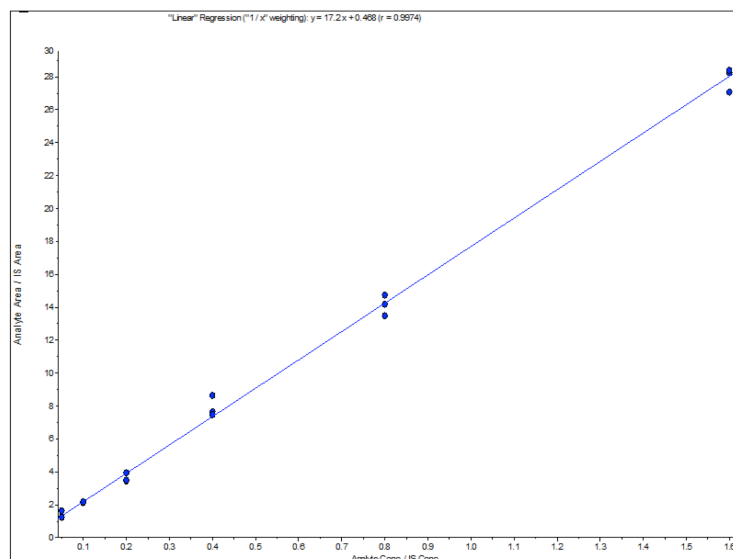
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