

# PHOSPHATIDYLETHANOL MEASURED ON A BUCCAL SWAB

**PEth**  
PHOSPHATIDYLÉTHANOL

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In contact with cell membranes, ethanol produces an abnormal lipid, phosphatidylethanol (PEth). PEth is a direct and specific biomarker of alcohol use. PEth assay is sensitive and concentration values are proportional to the quantities of alcohol consumed in the past weeks. Usually, PEth is measured from blood, precisely from erythrocytes membranes.

## Objectives of the preliminary study

- ▶ To propose a non-invasive sampling of the bucco-gingival fold,
- ▶ To research / quantify the presence of PEth in the buccal swab,
- ▶ To compare buccal and blood PEth measurements.

## Material and method

The samples were taken from 34 patients consulting for alcohol misuse: AUDIT scores and units of alcohol consumed (AU) are recorded.

Buccal samples and capillary blood are collected with volumetric devices (VAMS Mitra 10  $\mu$ L and 30  $\mu$ L) and dried. They are sent by post to the laboratory.

Measurements of blood and buccal samples are performed using liquid chromatography with tandem mass spectrometry detection (LC-MS/MS).

For the 34 patients, the measurement concerns PEth 16:0/18:1.

For 14 of these patients, we also measured: PEth16:0/20:4 and ethyl glucuronide (EtG).

## Results

1. All PEth 16:0/18:1 measurement performed on capillary blood and oral swabs show a good correlation with declared consumption. The average concentration ratio of oral PEth/blood capillary PEth is 23%. The variations are from 6% to 98%.
2. The comparison of measurements of PEth 16:0/18:1, PEth16:0/20:4, EtGs, blood and oral, shows the excellent sensitivity of PEth 16:0/18:1, and the lower performance for PEth16:0/20:4 and EtG.
3. In the situation of withdrawal and abstinence observed (1 case) the decrease in blood PEth is 30% per week, oral PEth is no longer detectable in the third week.
4. The preservation of dried oral and blood samples is excellent.

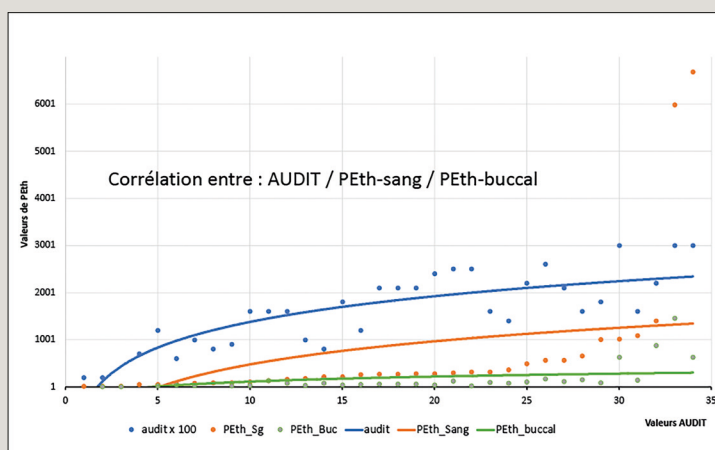
## Discussion and conclusion

As PEth is formed on the membranes of all cells, it is logical to look for it in the membranes of cells present in the buccal sulcus.

Our results show reliable detection of PEth in the buccal swab as soon as the blood PEth level reaches a value greater than  $\geq 200$   $\mu$ g/L, a level suggestive of excessive consumption.

Measuring PEth16:0/18:1 on a swab of the bucco-gingival fold has two advantages: non-invasive and easy to perform.

Buccal sampling has a place in alcohol prevention and risk reduction tools. For example, in situations where it is necessary to differentiate between isolated alcohol consumption and repeated alcohol consumption (measurement of exhaled alcohol and buccal PEth on the side of a road).



**Key words :** phosphatidylethanol, PEth16:0/18:1, biomarkers, alcohol, mouth swab, blood, DBS.

**Declaration of interest :** Dr Journe declares that he is the owner and the General Manager of the company "La Santé se Mesure" which promotes PEth.

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