

# Dried Blood Spots sampling process for clinical and pharmaceutical approaches

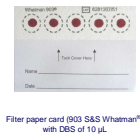
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## Introduction

> Dried blood spot (DBS) sampling process was firstly introduced by Guthrie et al. in 1963 for the neonatal screening of phenylketonuria. This alternative procedure offers many advantages compared to classic venous sampling.

- ✓ Less invasive : blood can be collected from finger prick
- ✓ Small sampling volume (5-10 µL)
- ✓ Analytes stability, storage and shipment improved without using refrigeration
- ✓ More cost effective : sampling can be performed in a non hospital environment
- ✓ On-line extraction without sample pretreatment



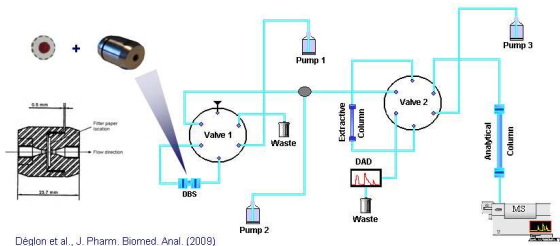
Blood samples of 13 patients under saquinavir

> A comparison between the on-line DBS LC-MS procedure and a validated LC-MS/MS method used routinely in a reference laboratory was performed on 13 patients under saquinavir.

> A good correlation between the two methods was observed suggesting that our procedure is suitable for TDM analyses.

## On-line desorption of DBS

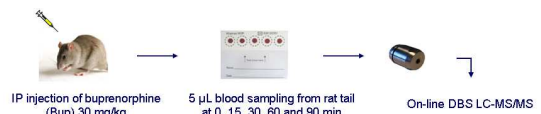
> In order to minimize the extraction step, we have developed in our laboratory an inox cell which can receive a filter paper disk (φ 10 mm) allowing the direct integration of a DBS specimen into conventional LC-MS system.



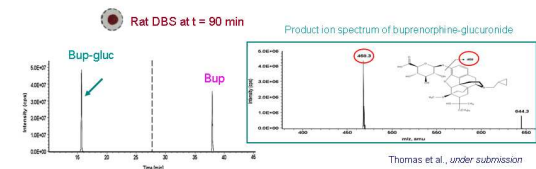
Déglon et al., J. Pharm. Biomed. Anal. (2009)

- ✓ Any sample preparation
- ✓ Flexible system (detectors - LC columns)

## Drug metabolism study

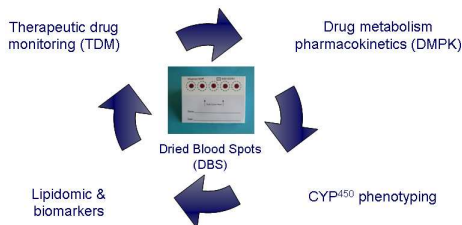


- ✓ The small sampling volume (5 µL) permits to perform the entire study on the same animal

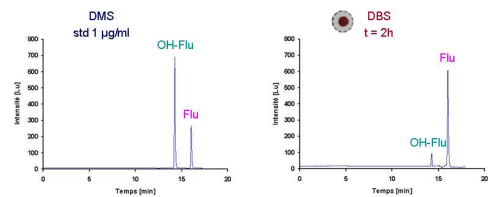


- ✓ Identification of buprenorphine metabolites including norbuprenorphine, buprenorphine and norbuprenorphine-glucuronides based on product ion spectra.

## DBS applications

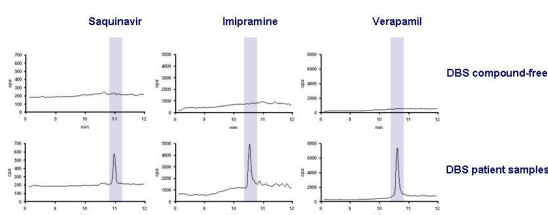


## CYP<sup>450</sup> phenotyping



- ✓ 2C9 phenotyping was determined using the OH-Flu/Flu ratio

## Therapeutic drug monitoring



> Typical selected ion monitoring chromatograms of real patients under saquinavir, imipramine, or verapamil. Analyses were carried out from 10 µL DBS using the on-line DBS LC-MS concept.

## Conclusion

- > Due to its numerous advantages, the DBS sampling process represents an interesting and patient friendly alternative to classic venous sampling in many biomedical applications.
- > The on-line integration of filter paper into conventional LC-MS system allows combining the DBS advantages with a no sample pretreatment procedure.