

Use of human dried-blood spots as a minimally invasive method to assess exposure to organic pollutants

L'Homme B., Focant J-F

Organic and Biological Analytical Chemistry group, University of Liège, Allée du 6 août B6c, 4000 Liège

The concept of sampling newborn infants for a few microliters of blood to screen for inherited disorders has been introduced by Guthrie at the University of Buffalo in 1963¹. Human dried-blood spots (DBS) are generally simply obtained by pricking the heel or finger to sample a few microliters (20-100 μ l) of capillary blood on filter paper².

DBS testing is now considered for exposure to environmental toxicants due to the availability of sensitive and specific methodologies. Dua *et al.* and Burse *et al.* already reported preliminary data on the potential use of 100 μ L DBS for the measurement of some persistent organic pollutants (POP)^{3 4}.

The use of GC \times GC hyphenated to high-resolution (HR) time-of-flight (TOF) mass spectrometer (MS) with negative chemical ionization (NCI) allows us to quantify PCB-153 and DDE in 20 μ L DBS. These molecules are representative of PCB and organochlorine pesticides contamination. This small quantity of blood accounts for 1 or 2 drops of blood for a minimally invasive and comfortable analysis suitable for newborns as well as adults.

¹ Guthrie, R., Susi, A., 1963. Pediatrics 32, 338-343.

² Turner, R.C., Holman, R.R., 1978. Lancet 2, 712.

³ Dua, V., Pant, C.S., Sharma, V.P., Pathak, G.K., 1996. Bull. Environ. Contam. Toxicol. 56, 50-57.

⁴ Dua, V.K., Pant, C.S., Sharma, V.P., Pathak, G.K., 1996. Bull. Environ. Contam. Toxicol. 56, 50-57.

Burse, V.W., DeGuzman, M.R., Korver, M.P., Najam, A.R., Williams, C.C., Hannon, W.H., Therrell, B.L., 1997. Biochem. Mol. Med. 61, 236-239.