# Advances in the hunt for cadaveric decomposition VOC profiling

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Human remain detection (HRD) canines are commonly used to locate or trace cadavers, but also to assist in recovering victims of natural disasters. Some artificial scent solutions are available for training purposes, but what dogs are generally educated with are oversimplistic solutions[1]. A better understanding of the volatile organic compound (VOC) profile released by death or injured bodies could possibly help better design of training solutions for forensic purposes.

In previous studies, we developed direct-sampling based approaches for cadaveric VOC analysis from grave soils and decaying bodies by mean of thermal desorption (TD) coupled to comprehensive two-dimensional GC coupled to time-of-flight MS (GC×GC-TOFMS)[2,3,4]. For practical and ethical reasons, they were based on the use of human analogs (Sus domesticus L. carcasses).

For the present study, we investigated the VOC profile of early stage decomposition of human bodies. We analyzed samples collected during different trials organized during different seasons in a body farm located in Texas. Samples included environmental controls, pig carcasses, and human bodies (protected or not from scavenger insects). The additional peak capacity of GC×GC, the spectral deconvolution algorithms applied to unskewed mass spectral data, and the use of a robust data mining strategy allows to the generation of characteristic VOC profiles across the various stages of soft-tissue decomposition. This approach is a step forward in producing specific complex odor profiles that could be used in various types of forensic investigations.

1. Stadler, S. et al. *J Chromatogr A (2012)* 1255, 202–206.
2. Brasseur C. et al. *J Chromatogr A (2012)* 1255, 163–170.
3. Dekeirsschieter, J. et al. *PLoS ONE* (2012) 7, e39005.
4. Stadler, S. et al. *Anal Chem* (2013) 85, 998–1005.