

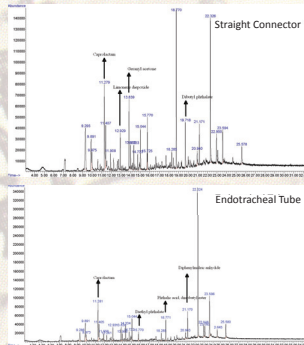
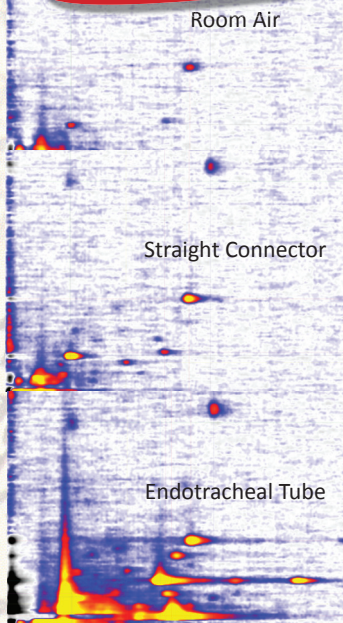
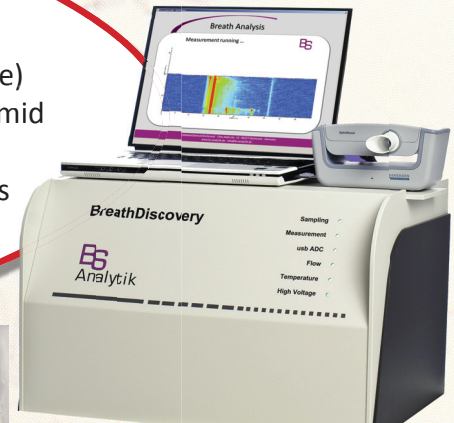
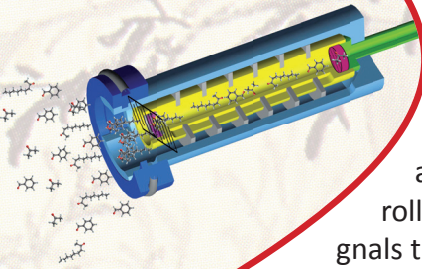
INFLUENCE OF ROOM AIR AND OPERATIONAL BACKGROUND EMISSIONS ON BREATH ANALYSIS USING MCC/IMS

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Ion mobility spectrometry (IMS) – originally used in airports for the detection of explosives or drugs – can be coupled with a multi-capillary column (MCC) and used for metabolic profiling, biomarker investigation and analysis of human breath. This approach is a sensitive (pptv-range) and rapid analytical method to analyse exhaled humid air. Each measurement takes just a few minutes; sample collection just a few seconds. When samples are measured in a laboratory, which has a controlled environment, it is easy to determine signals that are arising from room air or being associated to the MCC/IMS itself, and those from the sample.

Part of a IMS-Chromatogram of human breath



But when breath analysis is carried out in a 'real-life environment' such as a hospital, the room air varies leading to a fluctuating number of peaks. In general, the number of uncontrolled stimuli affecting the measurements increases. For example, in the breath measurement of a patient under anaesthesia, the hospital devices, connections and tubing (like a tracheal tube) could be a source of emission, which were also measured using GC/MS. Also, many volatile organic compounds (VOCs) show significant day-to-day variation in the signal height, which is related to the concentration of the analyte. Our results indicate that systematic and environmental variabilities must be taken into consideration to relate the outcomes to medical questions.

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