

Exposome project for health and occupational research

Protocols for collection, pre-processing and storage of biological samples (WP3, Task 3.1)

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WP (number and title)	WP3- Internal exposure and effect assessment using biomonitoring, omics and minimally invasive biomarker development
Deliverable Number	D3.1
Deliverable Title	Protocol for the collection, pre-processing and storage of biological samples in WP6, WP7
Due date	Month 6
Actual date	
Dissemination Level	PU: Public

Lead beneficiary	6 - KUL
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Collection, pre-processing and storage of exhaled breath

Introduction

Exhaled breath analysis will be performed for both WP6, as part of the asthma/COPD short-term study, and WP7, as part of the working-life exposome study in shift workers. The volatile compounds on breath will be measured and identified by high resolution GC-MS.

A panel of volatile compounds on breath related to mechanisms such as oxidative stress and inflammation makes up the core of the analysis, while discovery analysis will be performed on the collected data to identify new potential compounds which correlate occupational exposures.

Materials needed

Collection:	<ul style="list-style-type: none">-CASPER portable clean air supply<ul style="list-style-type: none">○ CASPER system○ Air filter○ Air supply tubing-Shelf trolley-ReCIVA breath sampler and accessories<ul style="list-style-type: none">○ ReCIVA breath sampler○ Dymo barcode label printer○ Barcode labels (linking participant ID, date and time of sampling to the participant's electronic case report form)○ Barcode scanner○ Laptop with supplied software-Breath biopsy kit (one per patient per sample)<ul style="list-style-type: none">○ Single-use mask assembly○ Single-use sorbent tubes x4-Electronic case report form (eCRF): the software on the supplied laptop has an in-built eCRF which requires several basic questions to be answered
Pre-processing:	Not required
Storage:	-Refrigerator (4-8 °C)



Collection of exhaled breath

Participants are asked to refrain from eating, drinking (except for water), smoking or brushing their teeth for 1 hour prior to sampling.

The participant places the ReCIVA breath sampler mask over their nose and mouth. This is held in place by a head strap. The study subject is then required to breath normally into the mask. The system will calibrate and adjust to match the breathing pattern of the individual, consequently, they will not experience increased resistance whilst breathing into the mask. The breath sampling procedure typically takes 10-15 minutes, this includes the time required to fill-in the basic eCRF. Throughout the procedure, the subject's breathing is continuously monitored by the operator of the system via inbuilt CO₂ and pressure sensors. The procedure can be interrupted or aborted at any time by both the operator and the subject. After sampling has taken place, a barcode on the sorbent tube assembly is scanned using the supplied barcode scanner. This automatically inputs the sorbent tube assembly ID into the participant's eCRF. The supplied barcode label printer is then used to print 3 identical barcodes encoding the patient ID and date and time of sampling. These barcodes are to be used in the shipment of both the exhaled breath and EBA samples. (Retain one label to attach to the packaged EBA device.)

Pre-processing and storage of exhaled breath at site of collection

Pre-processing is not required.

After collection, the sorbent tubes (exhaled breath) are stored in a refrigerator at 4-8°C until shipment to Owlstone Medical for analysis within 2-3 weeks of collection.



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