**Invitation to:**

**NORMAN Collaborative Trial 2022-2023**

**Passive air sampling and wide-scope suspect/non-target screening for organic substances in indoor and outdoor air**

**Background**

This Collaborative Trial is organised by the NORMAN Association ([www.norman-network.net](http://www.norman-network.net)) as part of its Joint Programme of Activities for the year 2022-2023. The activity is an initiative between NORMAN’sWorking Group 6, on Emerging Substances in the Indoor Environment, and the Cross Working Group Activity on Passive sampling. This is a strategic activity to broaden the objectives of NORMAN and WG6 to include **emerging contaminants in outdoor air**.

The Collaborative Trial is a joint initiative by NILU - Norwegian Institute for Air Research, Norway; Stockholm University, Sweden; Aarhus University, Denmark; Environmental Institute, Slovak Republic and University of Athens, Greece. These institutes will be responsible for the scientific and technical preparation of the exercise, the collection, evaluation and dissemination of the results, in close cooperation with NIVA - Norwegian Institute for Water Research, Norway; and INREA, France.

**Objectives**

The main objective of the exercise is to draft a recommendation by the NORMAN Association on the use of **passive air samplers** **(PAS)** and **wide-scope suspect/non-target screening for** **the identification of organic contaminants in indoor and outdoor air**.

This recommendation will be based on the outcomes of the Collaborative Trial as well as discussions at a planned workshop in 2023.

The Collaborative Trial will include **two PAS adsorbents for suspect/non-target screening.** It will assess:

* **Interference and background contamination of the adsorbents;**
* **the number of substances present in an indoor and outdoor air sample;**
* **the identity of substances in indoor and outdoor air;**
* **the semi-quantitative amounts of the identified substances.**

The Collaborative Trial should provide information on airborne substances and their mass spectra based on methodologies selected by participating laboratories. The results will be included in the NORMAN database. It will be the first collaborative trial using passive air samples and suspect/non-target screening, therefore the results should be aimed for a common publication in an impactful prestigious refereed journal.

**Set up**

The Collaborative Trial will be carried out with two types of PAS;

1. polydimethylsiloxane (PDMS) disk, developed at Stockholm University;
2. ABN adsorbent, used for siloxanes and volatile fluorinated substances by NILU.

The two PAS types will be deployed for about 50 days (7-8 weeks) in one indoor location and one nearby outdoor location in central Europe. For each adsorbent there will also be one field blank sample.

After exposure, the PAS adsorbents (including field blanks) will be distributed to the participating laboratories. Each participant will:

1. **extract** the PAS adsorbents using recommended extraction techniques (to be decided in the preparatory workshop – e.g. ethyl acetate/hexane for GC-MS analysis and methanol/ethyl acetate for LC-MS analysis),
2. analyse the extracts using liquid chromatography-high resolution-mass spectrometry (**LC-HR-MS**) and/or gas chromatography-mass spectrometry (**GC-MS**) methodologies available in their laboratory.

Based on the results from the previous NORMAN Collaborative Trials on non-target screening of indoor dust and the list of prioritized substances established by NORMAN WG6, a suspect list of detected substances in European indoor dust will be provided to the participants so that the suspect screening analyses are based on the same knowledge.

A **preparatory workshop/meeting** will be organized virtually before shipment of samples (end of 2022). The purpose of this preparatory meeting will be to present and discuss extraction techniques and workflows.

An **evaluation workshop** will be organised in the end of 2023[[1]](#footnote-2) to provide in-depth discussions of the results with the participating laboratories and drafting of recommendations for further improvement actions.

**Samples**

Participants will receive in **total 6 PAS** **to extract and analyse**:

**Two** exposed PDMS-PAS.

**One** field blank PDMS-PAS.

**Two** exposed ABN-PAS.

**One** field blank ABN-PAS.

The participants will also receive the following retention index solutions for determination of retention indices, distributed together with the PAS:

* For LC-MS (provided by Environmental Institute, Slovak Republic; University of Athens, Greece; and Stockholm University, Sweden)
* For GC-MS (provided by NILU, Norway)

The mixture should be injected into the analytical system under the same conditions used for analysis of the PAS. The compounds should be identified and their retention times recorded. Other retention time prediction methods can be used in parallel.

The distribution of the PAS adsorbents and retention index solutionswill be organised by Stockholm University and NILU.

An Excel reporting template, based on the template used in the previous NORMAN non-target Collaborative Trial for indoor dust, will be provided to all participants.

**Timing**

The PAS adsorbents with accompanying retention index solutions will be distributed to the participating laboratories in the beginning of **2023.**

**Reporting of results**

Results from each participant should be registered in an Excel reporting template distributed to all participants. The template with the results should be returned electronically by **June 30th, 2023**.

**Time schedule**

**1 August 2022**: Deadline for registration to the Collaborative Trial

**December 2022** (date and venue to be confirmed): Preparatory workshop/ meeting

**13 January 2023**: Distribution of PAS adsorbents and retention index solutions to participants

**30 June 2023**: Deadline for submission of the results by the participants

**1 December 2023**: Distribution of draft report to the participants

**2023** (date and venue to be confirmed): Discussion of the results in a workshop

**Participation and registration**

If you wish to participate, please **register on:**

**[forms.office.com](https://forms.office.com/Pages/ResponsePage.aspx?id=DQSIkWdsW0yxEjajBLZtrQAAAAAAAAAAAAZ__uPO1yFUQTFQR0tHTVBUR1BLQ0VaSjhJRENBTExLOS4u)**

before **August 1st, 2022**.

**Participants**

Any laboratory equipped with LC-HR-MS and/or GC-MS instruments for analysis of unknown organic pollutants (i.e. performing non-target screening) is invited to participate in this Collaborative Trial. Participation of external laboratories, i.e. non-NORMAN members, is very much welcome.

Participation includes invitation to the preparatory and follow-up workshops.

A preliminary list of potentially interested laboratories:

Aarhus University, Denmark

ACES, Stockholm University, Sweden

BRGM, France

Eawag, Switzerland

Environmental Institute, Slovak Republic

IAREN, Water Institute of Northern Region, Portugal

INERIS, National Institute for Environmental Technology and Hazards, France

IRSTEA, Nat. Research Inst. of Science & Tech. for Environment and Agriculture, France

ISSeP, Institut Scientifique de Service Public, Belgium

IVL, Swedish Environmental Research Institute, Sweden

IUPA, Research Institute for Pesticides and water - University Jaume I, Spain

LPTC, Groupe de Physico-Chimie de l'environnement, Université Bordeaux 1, France

NIVA, Norwegian Institute for Water Research, Norway

NILU, Norwegian Institute for Air Research, Norway

OMEGAM Laboratoria, The Netherlands

Ontario Ministry of the Environment, Applied Chromatography Sect., Canada

RECETOX, Czech Republic

Technical University of Munich, Germany

TGM, T. G. Masaryk Water Research Institute, Czech Republic

UFZ, Germany

Umeå University, Sweden

University of Antwerp, Belgium

University of Birmingham, United Kingdom

UoA, National and Kapodistrian University of Athens, Greece

VEOLIA Environment, France

Vrije University, Netherlands

1. The date and venue of the workshop will be confirmed during the course of the exercise. [↑](#footnote-ref-2)