

Proposals for NORMAN Joint Programme of Activities 2022

Title	NORMAN Collaborative trial: Passive air sampling and wide-scope suspect/non-target screening for organic substances in indoor and outdoor air
Type of activity	Collaborative trial (Experimental, Non-target analysis, Interlaboratory study, Passive sampling, Indoor, Outdoor)
Leader	WG6 Indoor environments: Jonathan Martin (SU), Pernilla Bohlin-Nizzetto (NILU), Katrin Vorkamp (AU), Cross-WG Passive sampling: Ian Allan (NIVA), Cécile Miege (INRAE)
Topic / activities	<p>Background / Justification for the proposed activity:</p> <p>With progress in recent years on the performance of high-resolution mass spectrometric analysis, and on associated workflows for wide-scope suspect and non-target screening (NTS), powerful approaches now allow screening of a wide range of chemicals to identify and prioritize emerging substances in environmental samples. Nevertheless, until now it has been a challenge to apply NTS for air sample analysis, in part because the commonly used air sampling adsorbents cause major interferences and often require destructive or very selective clean-up processes that narrow the screening to only very persistent substances. However, very recent developments of new air sampling adsorbents may allow us to face the challenge and enable us to finally apply NTS to air samples as well, both from indoor and outdoor environments. Yet, very few laboratories have applied NTS on air samples to date.</p> <p>The experiences from previous collaborative trials (CTs) involving NTS of indoor dust samples (both GC-MS and LC-MS) under WG6, as well as other CTs on NTS under NORMAN, have shown that the overlap and agreements between NTS laboratories still is poor. The main factor causing variability between laboratories seems to be differences in data processing and to a lesser extent the acquisition methods. In order to approach standardized and harmonized procedures and to extend the applicability of NTS techniques from research to monitoring initiatives, comparability between laboratories must be further improved. Here, a combination of testing the new passive air sampling adsorbent in a few locations and NTS analyses of a broad group of participating laboratories will help the community to take important steps forward.</p> <p>Description of the proposed activity and expected outcomes for 2022-23:</p> <p>With this JPA, WG6 and cross-WG on passive sampling jointly propose to organise a CT on passive air sampling and wide-scope suspect/non-target screening using GC-HR-MS and LC-HR-MS(MS) for organic substances in indoor and outdoor air to be conducted in 2022 and 2023.</p> <p>In 2022, we propose to:</p> <ol style="list-style-type: none"> invite participants (end of March); arrange one preparatory workshop to discuss and plan the sampling strategies (number of samples), sample preparation, data acquisition, data processing and data interpretation. We aim to organize the meeting back-to-back with an existing meeting in Europe that many of the participants are expected to attend (e.g. SETAC Europe conference in Copenhagen in May 2022); Conduct the air sampling by preparing sampling adsorbents and deploy samplers (Autumn 2022). It is suggested to use one type of adsorbent, deploy it in two locations (indoor and outdoor), and test two exposure times (2 weeks and 4 weeks). The use of indoor environments will allow comparison to results from the CT on indoor dust from homes and public environments in Europe (WG6). For each location there will also be one field blank. In total, six samples (as extracts) are expected for each participant (to be decided in the preparatory workshop). <p>In 2023, we propose to:</p> <ol style="list-style-type: none"> extract the samplers and distribute the extracts to participating laboratories (end of March 2023); collect data (August/September); perform data evaluation (Autumn); initiate preparation of scientific publication. <p>Added value / Link with other NORMAN activities and / or other projects</p> <p>This project will increase the interactions between WG6 and the two cross-working group activities on passive sampling and NTS. This project will increase our understanding about using passive air sampling for NTS and expand the Suspect exchange list with airborne substances.</p> <p>A subtask of this activity will be to see how the use of the same data processing scheme (open science tool set) affects the variability of the data (identified as a major source of variability in earlier CTs). Some of the labs will be asked to follow this scheme while others will use their own data processing schemes.</p> <p>This project aims at build upon what has previously done by other CTs within the Norman Network (i.e. Schymanski scale) but expanding into a new and important matrix (i.e. air). We will be able to produce a comprehensive guideline for the application of data-independent acquisition mode in non-target analysis of air samples. The results of this project will put the network at forefront of the research in this field.</p> <p>This project will further link different participants in sharing their data processing approaches as well as helping in so needed harmonization in our methods.</p>
Participants	Expected: 10-15 participating laboratories
Proposed in-kind contribution	Time and costs for each participating institute to analyse of the provided sample extracts (n=6). The coordinators will lead the data evaluation with time covered with in kind contribution



Contribution needed from NORMAN Association¹	Workshop organization, preparation of adsorbents, air sampling, extraction and distribution and samples – ca. 9 000 EUR .
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¹ Please, provide here a transparent justification of the requested resources and of the in-kind contribution, thereby distinguishing between the costs associated with “person-months” for the organisation, the “travelling costs” for invited speakers and the costs for the logistics (e.g. meals, room rental etc.)