

Proposals for NORMAN Joint Programme of Activities 2023

Title	Contamination patterns, toxicity fingerprints and toxicity drivers of source-related effluents: Step 3
Type of activity	Pilot Study
Leader	UFZ
Topic / activities	<p>Background / Justification for the proposed activity:</p> <p>This JPA is developed as a continuation and the final stage of the JPAs from years 2022 and 2021 regarding the study on the identification of source-related chemical and toxicological footprints. During the first stage of the study, 120 samples (including blanks) were collected and extracted by NORMAN partners. According to preliminary chemical characterization, a limited number of samples that reflected high contamination were distributed among partners to perform bioassays. Additionally, target screening of the samples were conducted and evaluation of non-target screening data has started. In the second phase, all samples were distributed among partners to get the complete picture of the toxicological profiling of the samples. Partners tested the samples with the bioassays available in their facilities covering 13 modes of actions. The final results will be delivered to UFZ until the end of November 2022. After harmonizing the data, the partners will upload the results to NORMAN Bioassay database.</p> <p>In order to fulfill the objectives of the study and to identify single risk drivers and mixtures from specific sources, we propose in this last stage of this collaborative study to perform high-throughput EDA for endpoints with high and unexplained toxicity. Combining high-throughput fractionation, in-vitro & in-vivo bioassays with non-target screening and multivariate data evaluation, we aim to identify unknown risk drivers and mixtures that are specific to sources.</p> <p>Description of the proposed activity and expected outcomes for 2023:</p> <p>Activity 1: Source prioritization for EDA studies – For endpoints where single chemical toxicity data or prediction models available, mass balance/iceberg modelling will be conducted to identify discrepancies between observed effects and explainable effects based on detected target compounds. For endpoints without such availability, the level of toxicity according to the harmonized results will be taken into account in order to prioritize endpoints and sources for high-throughput EDA studies.</p> <p>Activity 2: High-throughput fractionation – After selecting the priority sources, more samples will be collected and extracted with the same protocol from the previous JPA. The samples will be fractionated directly into 96 well plates using FractioMate, high-throughput fractionation instrument developed by VU Amsterdam. The fractions will be evaporated until dryness and will be distributed to the partners to perform their bioassays directly in the distributed well plates.</p> <p>Activity 3: Risk Driver Identification – The fractions showing effects will be subjected to structure elucidation efforts to identify the risk drivers causing the observed effects.</p> <p>Added value / Link with other NORMAN activities and / or other projects</p> <p>The project will help us bring our efforts on not only to prioritize sources and take further steps for management but also provide valuable information about priority endpoints for specific sources and risk drivers. The fruitful collaborations that were established within the partners contributing mainly in WG2 and 3 will be enhanced to further WGs dealing with non-target screening and prioritization efforts. The results will be interesting for all WGs providing important risk drivers emerging from different activities including indoor environments, leading future common activities. The study will be also used as a common activity within PARC Task 4.3 Project E01 in the activity High-throughput EDA.</p>
Participants	<p>UFZ (Werner Brack, Melis Muz, Beate Escher)</p> <p>Goethe University Frankfurt (Henner Hollert, Sarah Johann) INRAE (Cecil Mieghe)</p> <p>BFG (Sebastian Buchinger) SLU (Lutz Ahrens, Johan Lundqvist)</p> <p>HET Waterlaboratorium (Corine Houtman) INERIS (Selim AitAissa, Valeria Dulio)</p> <p>University of Copenhagen (Jan Christensen) Eawag (Juliane Hollender, Tarek Manasfi, Kasia Arturi)</p> <p>VU Amsterdam (Marja Lamoree, Frederic Been) Örebro Uni (Magnus Engwall)</p> <p>University of the Basque Country (Nestor Etxebarria, Belen Gonzalez-Gaya)</p> <p>Umea University (Christine Gallampois)</p>
Proposed contribution	Almost all the practical work is based on in-kind contributions including chemical analysis, biotesting and sampling campaign.
Contribution needed from NORMAN Association¹	Total: 18 k€ Support is needed for consumables for the fractionation and bioassays, and some student assistance is required for the overall logistics in the project.

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.)