

Proposals for NORMAN Joint Programme of Activities 2024

Title	WG-2 Bioassays
Type of activity	Workshop, Joint publication, and Research project
Leader	University Frankfurt (Lead: Henner Hollert, Sarah Johann & Francisco Sylvester) with UBA (Jan Koschorreck) and Fraunhofer-IME (Sebastian Eilebrecht, Bernd Göckener).
Topic / activities	<p>Two day Workshop of WG2. At the World Cafe on WG2, it was agreed that a two-day workshop on the future direction and activities of WG2 should be held in spring/summer of 2024. A broad range of topics will be discussed at the planned WS, including contributions of WG2 to the bioactivity database, links of bioassays in JPAs of WG3 EDA, innovative behavioural assays, eDNA-and (e)RNA based methods, including transcriptomics, adverse outcome pathways, as well as the further implementation of effect-based methods in European chemical regulations..</p> <p>Joint Publication. As a follow-up to the successful workshop of Working Group 2 "<i>Innovative Approaches for Environmental Monitoring of Chemical Pollution and Biodiversity – Linking Biodiversity Loss and Chemical Pollution</i>" in December 2023, a joint manuscript is planned to be submitted as a NORMAN position paper. This manuscript should involve all workshop presenters as well as interested workshop participants. The overall objective of this manuscript is to (i) discuss the linkage between chemical pollution and biodiversity changes and the implication of the new role of chemical pollution within the conceptual framework of planetary boundaries, the EU strategies on biodiversity and chemicals for sustainable chemical markets, the EU one health concept, and, more specifically (ii) to bring together existing expertise and methods on chemical pollution and biodiversity, promote cooperation, combination of existing databases on both fields and joint studies.</p> <p>Research project on temporal trends for transcriptomics in effects assessment. This research project was designed as a direct follow-up to the NORMAN Workshop on Chemical Pollution / Biodiversity Loss: Since 2005, suspended particulate matter (SPM) samples are systematically collected from major German rivers, including Rhine, Elbe and Danube for the German Environmental Specimen Bank (https://umweltprobenbank.de/en/), Zizka et al 2022, ESEU, https://doi.org/10.1186/s12302-022-00618-y and Fliedner et al. 2022, STOTEN, http://dx.doi.org/10.1016/j.scitotenv.2022.158430. The samples have been analysed for a range of inorganic and organic pollutants with target, cumulative and Non-Target Screening methods. In addition, DNA metabarcoding data from the SPM samples are available for fish and macrozoobenthos communities. Additionally, fish from the Environmental Specimen Bank have also been analyzed using transcriptomics.</p> <p>The aim of this JPA is a joint investigation of suspended particulate matter from the environmental specimen bank using effect-based methods. On the one hand, selected effect-based methods of the NORMAN/Solutions biotest battery will be carried out on the extracted suspended matter samples and, on the other hand, extensive transcriptome and behavioural studies of early life stages of <i>Danio rerio</i> will be carried out in order to compare both the already existing chemical exposure data of the SPM and the transcriptome data of the investigated fish from the environmental specimen bank with a comprehensive profiling of effect-based methods.</p> <p>In the planned project, extracts from the archived SPM samples will be used to expose the early life stages of <i>Danio rerio</i> and to analyse gene expression using transcriptomics methods (eg Bluhm et al. 2014, DOI10.1371/journal.pone.0106523 and Reinwald et al. 2022, DOI10.1016/j.chemosphere.2021.132746) and to apply EBM of the NORMAN/SOLUTIONS EBM battery (Brack et al.2019, ESEU, https://doi.org/10.1186/s12302-019-0192-2).</p> <p>Added value / Link with other NORMAN activities and / or other projects</p> <p>This JPA would for the first time couple extensive profiling of time series from environmental specimen banks with a broad battery of transcriptome studies and EBM and would allow comparison with available eDNA based biodiversity data, chemical expression data from SPM and transcriptome data from fish, thus making an important contribution to the temporal understanding of the link between chemical pollution and biodiversity loss and contributing to the establishment of effect-based early warning systems. It would thus provide a powerful link from NORMAN to the biodiversity community, PARC, e.g. task 8.2. early warning) and the Green Deal.</p>

Participants	<p>Workshop: Workshop of WG2 with participation from members of several other WGs (eg, WG1, WG3). Participants e.g. from GU (Henner Hollert, Francisco Sylvester, Sarah Johann, Sabrina Schiwy), UBA (Jan Koschorreck, INERIS (Valeria Dulio), ETH/EAWAG, BfG, RWTH, KWR, CNRS, UFZ, FhG IME, ORU, ACS Stockholm, NIVA, Recetox</p> <p>Publication: A co-author team of approx. 20-25+ scientists under the lead of GU and UBA. The authors will mainly consist of speakers and participants of the NORMAN workshop on chemical pollution / biodiversity loss in December 2023</p> <p>Research Project: GU, UBA, Fh-IME, BfG, UFZ, SGN, SLU, Örebro and others</p>
Proposed in-kind contribution	<p>Workshop: Meeting place, experienced team capable of organizing the workshop and time availability for it. The open WG-2 workshop will be held at the Goethe University in Frankfurt. The organization will be carried out in kind by the Goethe University Frankfurt. Only 3k€ are requested for catering and drinks.</p> <p>Joint Publication: The publication will be written under the lead and with strong in-kind contribution of an experience team at the GU and UBA with contributions from the workshop presenters and other interested participants.</p> <p>Research Project: In the research project, the samples from the environmental specimen bank are provided by UBA as in-kind contribution, the processing and extraction of the suspended matter is carried out in-kind at the Goethe University. The labor for the exposure of the zebrafish larvae, the extraction of the RNA and the transcriptome analysis of the samples is carried out as an in-kind contribution of the Goethe University, the F-IME supports the analysis by means of a bioinformatic pipeline in-kind. In addition to the GU, the F-IME, Örebro, the BfG and the UFZ, other interested parties are also supporting the implementation of EBMs as an in-kind contribution. 10 k€ will be requested for consumables and sequencing.</p>
Contribution needed from NORMAN Association¹	<p>WG2 Workshop: 3 k€ to be used for workshop venue, catering, and invitation of speakers.</p> <p>Publication: - €</p> <p>Research Project: 10 k€ (tbc) will be requested for consumables and sequencing costs.</p>

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.)