Proposals for NORMAN Joint Programme of Activities 2023

Title	**Modes of biological action for monitored chemicals**
Type of activity	Review (Literature/database research and data integration)
Leader	UFZ
Topic / activities	***Background / Justification for the proposed activity:*** This JPA aims to provide a list of modes of biological action for about 3000 compounds that are considered in scientific monitoring studies and within NORMAN as potential freshwater contaminants. The study will be based on a study published in 2016 (Busch et al. 2016, doi.org/10.1002/etc.3460) where biological modes of action were researched for about 430 chemicals monitored in European freshwaters. The finding of the mentioned study, that a large number of environmental freshwater contaminants has a neuroactive mode of action (MoA), gained a lot of attention and developments of NAMs to detect such MoAs are under way. Furthermore, grouping of chemicals with similar MoAs is one key approach for mixture risk assessment but requires the respective knowledge. Currently, no database is available combining environmental contaminants and their MoAs. Individual databases, such as e.g. drugbank for pharmaceuticals, or the IRAC database for insecticides are available and provide MoA information, while it is more difficult to find MoA information for industrial chemicals or transformation products. In this study, we will use the existing databases, collect information, perform individual literature research, and build a database for about 3000 potentially most common freshwater chemicals. We aim to provide this knowledge for regulators and as integrative part in NORMAN as a MoA-database that should be published in 2023. ***Description of the proposed activity and expected outcomes for 2023:*** Based on EMPODAT and recent monitoring results (e.g. Finckh et al. 2022, doi.org/10.1016/j.envint.2022.107234) we already extended our list of potentially most common environmentally occurring chemicals. In this JPA we will research the biological MoAs for all of them. Thereby, we will consider information on target and non-target species, on whether or not a compound is a transformation product of another compound and what the usual usage scenarios for all compounds are. With this we will build a basis for potential later connections to information on sources, on AOPs, as well as on measured or predicted effects. The data will be provided as database in a data publication considering the FAIR principles and can be directly integrated into the NORMAN network. Together with to project partners we will i) figure out where exactly and how the data can be integrated into one of the existing databases and ii) realize this integration. ***Added value / Link with other NORMAN activities and / or other projects*** This activity, provided by the NORMAN network as cross WG activity is of high relevance not only for NORMAN but also for PARC. There is huge demand for such MoA information provided for jointly occurring chemicals that are so far considered only in regulatory silos. Next to effect concentrations for such chemicals, which allow a quantitative joint risk assessment, information on MoAs is of high relevance for chemical grouping within joint assessment schemes, e.g. as anticipated also by EFSA (EFSA 2021, doi.org/10.2903/sp.efsa.2021.EN-7029) for human risk assessment as well as for the development of future mixture risk assessment schemes for environmental chemical exposures.
Participants	UFZ *(Wibke Busch, Martin Kraus, Tobias Schulze, Jörg Hackermüller)* UBA *(Peter von der Ohe, Susanne Schmidt)* BFG *(Sebastian Buchinger)* INERIS *(Selim Ait-Aissa, Valeria Dulio)* RECETOX *(Klara Hilscherova)*
Proposed in-kind contribution	The process of research, the establishment of the data integration pipeline, as well as the compound selection process are in-kind contributions. Support is needed for student assistance required to do parts of the research and some analyses of results as preparation for publication.
Contribution needed from NORMAN Association[1]	Total: 15 k€ (for a full-time student assistant)

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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.)