

Proposals for NORMAN Joint Programme of Activities 2026

Title	Digital Sample Freezing Platform (DSFP)
Type of activity	Research and database development
Leader	Nikiforos Alygizakis (EI/NKUA)
Topic / activities	<p>Background / Justification for the proposed activity:</p> <p>DSFP has evolved from a prototype into a production-ready system with advanced informatic capabilities. It enables archiving, processing, analysis, data mining, and rapid retrieval of information for thousands of contaminants of emerging concern (CECs) contained in HRMS datasets. The platform is fully aligned with NORMAN's strategic objectives (science-to-policy interface), including non-target screening (NTS), risk prioritization schemes and automated extraction of chemical exposure information for early-warning systems.</p> <p>As part of the NORMAN Database System (NDS), DSFP represents a unique, scalable, and continuously expanding repository of HRMS data from environmental samples. It already serves as a key resource for prioritization exercises supporting scientific and regulatory use. Its continued development is crucial for enabling broader community participation, strengthening interoperability, and meeting the growing needs of NTS-driven environmental pollution assessments in Europe and beyond.</p> <p>In 2025, DSFP was enriched with thousands of samples, harmonized metadata, publicly accessible meta-data schemas and APIs enabling advanced data discovery, instant search, and interconnection with other NORMAN modules. The next step is to extend DSFP beyond its current capabilities and align it with the accelerating needs of the non-target screening (NTS) community.</p> <p>Description of the proposed activity and expected outcomes for 2025:</p> <p>The 2026 JPA focuses on expanding DSFP into a fully integrated ecosystem for HRMS data archiving, screening, visualization, interoperability, and early-warning applications. Specific activities for 2026 include:</p> <ol style="list-style-type: none"> 1. Completion of the manuscript describing the new informatics architecture and upscaling strategy of DSFP. 2. Development and debugging of the DSFP Desktop application for suspect screening. This tool will enable laboratories to perform screening locally while connecting to DSFP services through APIs. It will distribute the screening workload across contributors and support screening and indexing of all DSFP collections, ensuring instant-search capabilities and continuous population of EMPODAT-Suspect. 3. Release of the batch import functionality for importing new samples, finalising the development initiated in 2025. 4. Integration of a chromatographic and spectrometric visualization module into the DSFP, based on previous SQUAREF developments (cooperation with INERIS and BRGM), allowing users to inspect chromatograms, spectra, and fragmentation data directly within the platform. 5. Exploration of collaboration opportunities with other major platforms, with priority on enabling export of MS/MS spectra in MassBank compatible format and exploring API-level interoperability with the MassBank consortium. 6. Implementation of an additional layer of access control, authentication, and data-sharing mechanisms so that every user has a private key to monitor downloads and resource usage. This will also help to establish a mechanism for sharing sensitive datasets. 7. Maintaining and supporting current and future users, including fostering connections with PARC and other EU-funded projects involving NORMAN members. 8. Enhancing interoperability and metadata harmonization with national and international initiatives, ensuring alignment with evolving HRMS and FAIR-data standards. <p>Added value / Link with other NORMAN activities and / or other projects</p> <ul style="list-style-type: none"> ▪ Cross-Working Group Activity on Non-target Screening (NTS) ▪ More case studies and support for prioritization exercises of NORMAN WG1 Prioritisation ▪ Added value for the NORMAN Database System ▪ Synergy with WP4 and WP8 of the PARC project ▪ A FAIR data management plan solution for NORMAN laboratories for the EU-funded projects ▪ DSFP as the place for hosting HRMS data of NORMAN collaborative trials
Participants	EI, NKUA, NILU, LCSB, Eawag, UFZ, UBA, INERIS, BRGM and all NTS members of NORMAN.
Proposed in-kind contribution	Working hours for implementation the project.
Contribution needed from NORMAN Association	Total funds required for IT support for the application of the suggested improvements: 15,500 €