

CONTRACT N°: 101130125

ACRONYM: FLUFET

TITLE: FLOW detection of virUses by graphene Field Effect Transistor microarrays

Instrument: HORIZON-EIC-2023-PATHFINDEROPEN-01

THE DATA MANAGEMENT PLAN 2

Project Starting Date: 1 March 2024

Project End Date: 31 August 2027

Duration: 42 months

PROJECT CO-ORDINATOR: UDC

Coordinator's Organization Name: Universidade da Coruña

REPORTING PERIOD: n.2 from 12 to 24

Reference Work packages:

WP6 Project Coordination & Management

Project Officer: CHRISTIANE WILZECK

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Dissemination Level		
PU	Public	X

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DATA MANAGEMENT PLAN

PROJECT	
Project number:	[101130125]
Project acronym:	[FLUFET]
Project name:	[FLow detection of virUses by graphene Field Effect Transistor microarrays]

DATA MANAGEMENT PLAN	
Date:	[26/02/2026]
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1. Introduction and Update Overview

This document constitutes Version 2.0 of the Data Management Plan (DMP) for the FLUFET project – Deliverable 6.5. It reflects the data generated during the first and second reporting periods and updates the initial DMP (Version 1.0) submitted at project start. This version moves from anticipated data generation to a structured description of datasets produced, including formats, estimated volumes, access conditions, and implementation of the FAIR principles.

The FLUFET project main objectives are the detection of viruses, in particular the ones related to zoonosis in farms, using graphene field effect transistor (g-FET) and their functionalisation to make them more specific. The project will amass various data sets including protocols and measurements concerning graphene's characterization and functionalization, electrochemical readings, information on human receptors, viruses, and relevant proteins for detection purposes, experimental data for simulations and computational models, as well as designs for sensors and microfluidics. Additionally, certain data not initially considered may prove beneficial for achieving specific project milestones, hence it's advised not to disregard any data obtained during the project.

The data generated by FLUFET project collaborators will primarily consist of text, numerical formats, and plots. These data will stem from measurements of the chemical, structural, and electronic attributes of materials and devices. Multimedia files like photos, videos, and visualizations were also produced within the project. Furthermore, data used for modelling and simulating various physical or chemical processes in materials and devices can be generated, alongside data aimed at estimating broader trends, social perceptions, and economic aspects related to virus detection and gFET sensors.

Data analysis software such as Origin or Excel can be employed for storing and analysing the generated data, hence it may be stored in formats compatible with the chosen software. All data produced within the project can be reused if deemed necessary and appropriate.

In this data management plan, we outline strategies to ensure that our data adheres to the FAIR principles: Findable, Accessible, Interoperable, and Reusable. By following these principles, we aim to maximize the value and impact of our research data.

To try to accomplish this, the Project Data Management Officer (PDMO) oversees the integrity, compatibility, storage, preservation, access, maintenance, and quality control of all datasets, as well as updates to the Data Management Plan (DMP). All measures are reviewed and approved in coordination with the Steering Committee.

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2. FAIR Data Implementation

2.1. Making data accessible

To ensure accessibility, whenever possible, we will make our data openly accessible to the public without restrictions, either through data repositories or institutional platforms.

The non-confidential published research data of the FLUFET project will be deposited in a trusted and openly accessible repository such as Zenodo/EU Open Research Repository or the Internal Repository of UDC. In this scenario, a DOI will be assigned to the published data according to the Horizon Europe Funding scheme regulations. Each partner involved in the FLUFET project is tasked with uploading the data to the chosen repository and to link the data DOI to the persistent link of FLUFET project on the Horizon Europe website or the FLUFET own website: <https://flufet.eu/>

Partners will utilize the independent and openly accessible platform Zenodo/EU Open Research Repository, or a comparable open data repository offered by their institution, university, or company, where pertinent metadata will also be provided, along with a DOI and a link to the FLUFET project's persistent URL.

To that end we have created an open community on Zenodo:

<p>FLUFET EIC Pathfinder Community (zenodo.org).</p>	<p>https://zenodo.org/communities/flufet/records?q=&l=list&p=1&s=10</p>
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EU Open Research Repository	https://research-and-innovation.ec.europa.eu
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For the data generated in the computational chemistry and simulation tasks, GitHub will be used. GitHub is a web-based platform used for version control and collaborative software development. It leverages Git, a distributed version control system, to help developers track changes in their code, collaborate with others, and manage various versions of a project. GitHub provides features like repositories, pull requests, issues, and continuous integration, making it easier to work on projects individually or in teams. It supports both public and private repositories and integrates with various development tools, enhancing productivity and facilitating seamless collaboration.

GitHub - Coluzza/FluFet	https://github.com/Coluzza/FluFet
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All non-confidential generated data published by FLUFET partners will be openly available under Creative Commons licences CC0, CC-BY or CC-BY-SA, in line with the “Open Definition” for content and data established by “The Open Knowledge Foundation”.

In instance where the data is deemed highly promising by one or more partners of FLUFET and requires intellectual property protection, while a patent is being filed, an embargo period of 6 months can be applied. However, no embargo will be applied for non-confidential data.

The data is expected to be accessible via a free and standardized access protocol. As all non-confidential published data will be publicly accessible through the mentioned repositories, there is no requirement for a data access committee to review or approve data access requests.

Metadata will also be openly available under Creative Commons licenses as described earlier, in accordance with the GA, and will remain accessible and discoverable as long as the repositories housing the data remain accessible. In addition to metadata, we will provide detailed documentation, including data dictionaries, user guides, and README files, to aid users in understanding and utilizing the data effectively.

In cases where accessing specific data extensions requires particular software, details regarding the required software tools will be provided alongside the data.

2.2. Making data interoperable

To promote interoperability, data and metadata vocabularies, standards, formats and methodologies will follow the general practices within the scientific community. We will use common data formats and standards within our field to ensure compatibility with existing tools and workflows. This consistency with other data generated outside of the FLUFET project is expected to make the data interoperable and flexible for exchange across disciplines.

In case it becomes unavoidable or inefficient to avoid the use of uncommon or only project specific ontologies and vocabularies, mappings and references to the more commonly used ontologies will be provided. Such uncommon ontologies will be published together with the data to allow their reuse, refinement and possible extension.

If deemed relevant, the published data could also include qualified references to other data generated within FLUFET project or already published data from previous research. Where applicable, we will adopt linked data principles to connect our datasets with related resources, enabling seamless integration and analysis across diverse datasets.

2.3. Increase data re-use

To enhance the reusability of our data, we will provide clear terms of use through appropriate licensing, such as Creative Commons licenses, enabling others to understand how they can legally reuse and redistribute the data. Additionally, we will implement version control mechanisms to monitor changes and updates to our datasets over time, ensuring transparency and reproducibility.

Guidelines and documentation for data validation analysis will be included alongside the published data to further enhance its reusability. These materials may consist of readme files detailing methodology, codebooks, data cleaning procedures, analyses conducted, variable definitions, units of measurement, and other pertinent information. Whenever possible, data files will include header information specifying the type and units of the contained data.

Once published, the generated data will be freely accessible under Creative Commons licensing agreements, as previously described, in compliance with standard reuse licenses outlined in the General Agreement (GA). Proper attribution and citation of our data will be encouraged through citation metadata and guidelines, enabling accurate acknowledgment and referencing of our work.

Prior to publication, internal reviewers within the FLUFET consortium and external reviewers outside of the consortium will scrutinize the data for consistency and quality assurance.

3. Intellectual Property and Access Conditions

Certain datasets and design files remain restricted due to potential intellectual property protection and exploitation strategies. Non-confidential datasets non related to the IP or supporting peer-reviewed publications are/will be made openly accessible in compliance with Horizon Europe requirements, following the guidelines in this DMP.

4. Generated Data

The FLUFET project aims at the detection of viruses, particularly those related to zoonosis in farms, using graphene field effect transistor (g-FET) microarrays and their functionalization to enhance specificity and sensitivity. To achieve these objectives, the consortium has generated experimental, computational, and design-related datasets as detailed below.

4.1. Graphene Characterization and Functionalization Data

Datasets include Raman spectroscopy outputs, SEM images, electrical transport measurements, surface functionalization protocols, and device stability assessments.

Formats: .csv, .xlsx, origin, .txt, .jpg, .tiff, .pdf

Estimated cumulative volume: ~10 GB

Access: Primarily internal; processed datasets supporting publications will be openly shared.

4.2. Electrochemical and Biosensing Measurements

Time-series measurements, calibration curves, sensitivity analyses, and limit-of-detection assessments have been generated from virus detection experiments.

Formats: .csv, .xlsx, origin, .dat

Estimated cumulative volume: ~50 GB

Access: Partially restricted pending intellectual property assessment.

4.3. Computational Modelling and Simulation Data

Simulation datasets describe electronic transport mechanisms, molecular interactions, and device optimisation processes.

Formats: .py, .ipynb, .csv, .mat, .json, .txt

Estimated cumulative volume: ~15 GB

Access: Version-controlled; selective open release planned.

4.4. Sensor and microfluidic design Data

Technical drawings and CAD files for sensor architectures and microfluidic systems.

Formats: .dwg, .dxf, .step, .stl, .pdf

Estimated cumulative volume: ~8 GB

Access: Confidential due to innovation and IP considerations.

4.5. Multimedia and Documentation

Photographs, laboratory recordings, and visualisation materials documenting fabrication and testing procedures.

Formats: .jpg, .png, .mp4

Estimated cumulative volume: ~12 GB

Access: Internal documentation; selected materials may support dissemination.

5. Data Volume Overview

By the end of Month 24, the cumulative volume of generated data is approximately 95 GB. All datasets are securely stored on institutional servers and backed up according to internal IT policies

6. Other research outputs

As of the end of the second reporting period, no research outputs beyond the datasets described in this Data Management Plan have been generated within the FLUFET project. All current project results are fully reflected in the experimental, computational, and design-related data outlined in the previous sections.

If other research outputs are generated within FLUFET project, partners will evaluate sharing these results in accordance with the FAIR principles outlined above. Such research outputs outside of the scope of generated or re-used data could be either digital outputs (e.g., protocols, models, sensorics concepts) or physical (e.g., new materials, measurement devices) output type.

In cases where the aforementioned principles may not directly apply to these research outputs, supplementary procedures for their data management will be devised and presented, ensuring consistency with the FAIR principles.

7. Allocation of resources

FLUFET uses standard tools and a free of charge research data repository. The costs of data management activities are limited to project management costs and will be covered by allocated resources in the project budget.

Long-term preservation of the public data is ensured through Zenodo, EU Open Research Repository or GitHub. Other resources needed to support reuse of data after the project ends will be solved on a case-by-case basis.

The overall responsibility for data management lies with the project coordinator, the UDC team, supported by members of each partner, with experience in Horizon Europe projects.

8. Data security and Long-Term Preservation

All data generated, reused, and other research outputs produced within the FLUFET project are stored on secure institutional servers of the respective consortium partners. Access to these servers is restricted to authorized project members to ensure data confidentiality and integrity. Regular backup procedures are implemented in accordance with each institution's internal IT policies to prevent data loss and ensure business continuity.

For collaborative work and controlled data exchange among partners, SharePoint/OneDrive services hosted on UDC (the coordinator)'s secure servers are used. These platforms provide data transfer, version control, and structured access management, facilitating secure storage, recovery, archiving, and internal sharing of project data.

Public, non-confidential datasets are deposited in certified and trusted repositories (e.g., Zenodo/ EU Open Research Repository or equivalent institutional repositories), where they benefit from established long-term preservation and curation policies. These repositories ensure persistent identifiers (DOIs), metadata preservation, and long-term accessibility in line with Horizon Europe requirements.

Also, Standardized data formats suitable for long-term archiving will be used:

Naming scheme: for example, 20260228_FLUFET_PARTNER_WP_DatasetX_v01.xls.

Where WP is Work Package, the datasets metadata will be described in tabular form. The naming establishes which partner produces the dataset for which WP. Folder structure: up to three subfolders.

Folder structure: up to three subfolders.

Where available, partners also archive relevant datasets in their institutional repositories to further ensure redundancy and long-term preservation. The project coordinator oversees compliance with data management and security procedures, supported by designated data management contacts within each partner institution.

No data security incidents have been recorded during the reporting period. The consortium continues to monitor data protection measures and update procedures where necessary to ensure full compliance with institutional, national, and EU regulations.

9. Ethics

No ethical or legal impediments affecting data sharing have arisen. Data protection regulations and institutional policies are respected. The project team will continuously review and address any ethical or legal issues that might impact data sharing and will outline procedures to address ethical and legal issues relating to steering committee. If there is a question about research ethics, the Coordinator will contact the UDC Research and Teaching Ethics Committee (CEID). The CEID ensures the protection of the rights of individuals participating in scientific and research projects conducted by employees and students.