# In-situ catalytic bioconversion of pharmaceutically active compounds in wastewater

*A Data Management Plan created using DMPonline.be*

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**Funder:** KU Leuven (KUL)

**Template:** KU Leuven BOF-IOF

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**Data Manager:** n.n. n.n.

**Project Administrator:** n.n. n.n.

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**End date:** 30-09-2025

**Project abstract:**

Pharmaceutically active compounds (PhACs) in natural water bodies are an emerging problem of growing concern since they exhibit high persistence, low biodegradability, promotion of pathogen resistance, and carcinogenic and mutagenic properties. Current (biological) wastewater treatment systems fail to effectively remove these components, leading to the need of their upgrading. AnaCat responds to this imminent problem by investigation the application of novel, waste-derived nanocatalytic carbonaceous materials in anaerobic wastewater treatment systems. By specifically tailoring their properties, they can be efficiently used in the fabrication of low-density biocarriers and electrode materials with the large available surface area to enhance PhAC degradation and colonization of

the microbial communities, hence promoting the performance of anaerobic
wastewater treatment. A consortium of KU Leuven and Tartu University research teams with complementary expertise will realize the enhanced bioconversion system(s) by designing, fabricating and applying biomass-derived (nano)catalytic
carbonaceous structures (n-CCSs). Four reactor configurations will be assessed, in which the n-CCSs will be applied in suspension, as a carrier material and as a biocathode coating. The approach will hence enable to compare the effectiveness in the configurations towards both PhAC degradation and microbial community development, and lead to innovations in anaerobic wastewater treatment. The availability of the different systems (suspended, membrane bioreactor and bioelectrochemical) in is a clear benefit for the AnaCat project since it enables to exploit different anaerobic systems and hence make a comparison between the various approaches, which has not been published before, and represents a strong aspect in elucidating different application possibilities of the designed materials.

**Last modified:** 18-01-2024

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**Research Data Summary**

**List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.**

| Dataset name / ID | Description | New or reuse | Digital or Physical data | Data Type | File format | Data volume | Physical volume |
|---|---|---|---|---|---|---|---|
| | | *Indicate:* ***N****(ew data) or* ***E****(xisting data)* | Indicate: **D**(igital) or **P**(hysical) | Indicate: **A**udiovisual **I**mages **S**ound **N**umerical **T**extual **M**odel **SO**ftware Other (specify) | | Indicate: <1GB <100GB <1TB <5TB >5TB NA | |
| Lab notes | Description of experimental setup and practical execution of the experiments | N | D (if Physical, the notes will be digitalized) | T | .docx | <1 GB | 3-5 notebooks |
| TOC-TN | TOC-TN concentrations | N | D | N (experimental) | .xlsx | <100GB | |
| IC | cation and anion concentrations | N | D | N (experimental) | .xlsx | <100GB | |
| XRD | XRD-profiles | N | D | N (experimental) | .xlsx | <100GB | |
| SEM | microscopy images | N | D | N (experimental | .tif | <100GB | |
| FTIR | FTIR spectra | N | D | N (experimental) | .xlsx | <100GB | |
| Molecular Sequencing | OTU quantification and identification | N | D | N (experimental) | .fastq | <100GB | |
| BET | morphological characterization | N | D | N (experimental) | .tf, .xlsx | <100GB | |

**If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:**

NA

**Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? If so, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.**

- No

**Will you process personal data? If so, please refer to specific datasets or data types when appropriate and provide the KU Leuven or UZ Leuven privacy register number (G or S number).**

- No

**Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.**

- Yes

Before every publication, the potential towards IP creation will be assessed. If there is IP potential, the relevance will be communicated with the relevant tech transfer offices. Therefore, all relevant data will be kept restricted until assessment towards filing a patent. Once these granted, the data can be made public.

**Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material or Data transfer agreements, Research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.**

- No

**Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.**

- No

**Documentation and Metadata**

**Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g. in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, codebook.tsv etc. where this information is recorded).**

The data files will be given a unique name using a standardized coding system, including date of the experiment, name of the researcher, type of analysis and the sample code.
A table of content document will be provided with the explanation of each code and a short description of each related project. A link will be embedded to the data file location.

**Will a metadata standard be used to make it easier to find and reuse the data?**
**If so, please specify which metadata standard will be used.**

**If not, please specify which metadata will be created to make the data easier to find and reuse.**

- No

**Data Storage & Back-up during the Research Project**

**Where will the data be stored?**

- OneDrive (KU Leuven)

**How will the data be backed up?**

- Standard back-up provided by KU Leuven ICTS for my storage solution

**Is there currently sufficient storage & backup capacity during the project?**

**If no or insufficient storage or backup capacities are available, explain how this will be taken care of.**

- Yes

**How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?**

Data will only be stored on OneDrive and the internal KU Leuven drives. Both are only accessable through a 2-factor autentication protocol (password and KU Leuven authenticator).

**What are the expected costs for data storage and backup during the research project? How will these costs be covered?**

OneDrive is free of charge.

**Data Preservation after the end of the Research Project**

**Which data will be retained for 10 years (or longer, in agreement with other retention policies that are applicable) after the end of the project?**

**In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).**

- All data will be preserved for 10 years according to KU Leuven RDM policy

**Where will these data be archived (stored and curated for the long-term)?**

- KU Leuven RDR

**What are the expected costs for data preservation during the expected retention period? How will these costs be covered?**

Every researcher can store 50 GB per year for free.

**Data Sharing and Reuse**

**Will the data (or part of the data) be made available for reuse after/during the project?**
**Please explain per dataset or data type which data will be made available.**

- Yes, as restricted data (upon approval, or institutional access only)

**If access is restricted, please specify who will be able to access the data and under what conditions.**

All researchers involved and the PIs will have access to the data. External researchers will only get access after PI's approval.

**Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)?**

**Please explain per dataset or data type where appropriate.**

- Yes, intellectual property rights

Only data with potential IP protection will be restricted and will not be published before filing a patent.

**Where will the data be made available?**

**If already known, please provide a repository per dataset or data type.**

- KU Leuven RDR (Research Data Repository)

**When will the data be made available?**

- Upon publication of research results

**Which data usage licenses are you going to provide?**

**If none, please explain why.**

- Data Transfer Agreement (restricted data)

**Do you intend to add a persistent identifier (PID) to your dataset(s), e.g. a DOI or accession number? If already available, please provide it here.**

- No

**What are the expected costs for data sharing? How will these costs be covered?**

Every researcher can store 50 GB per year for free.

**Responsibilities**

**Who will manage data documentation and metadata during the research project?**

The researchers involved.

**Who will manage data storage and backup during the research project?**

The researchers involved.

**Who will manage data preservation and sharing?**

Lise Appels and Nick Sweygers

**Who will update and implement this DMP?**

Nick Sweygers