# FWO DMP Template - Flemish Standard Data Management Plan

# Version KU Leuven

Project supervisors (from application round 2018 onwards) and fellows (from application round 2020 onwards) will, upon being awarded their project or fellowship, be invited to develop their answers to the data management related questions into a DMP. The FWO expects a **completed DMP no later than 6 months after the official start date** of the project or fellowship. The DMP should not be submitted to FWO but to the research co-ordination office of the host institute; FWO may request the DMP in a random check.

At the end of the project, the **final version of the DMP** has to be added to the final report of the project; this should be submitted to FWO by the supervisor-spokesperson through FWO’s e-portal. This DMP may of course have been updated since its first version. The DMP is an element in the final evaluation of the project by the relevant expert panel. Both the DMP submitted within the first 6 months after the start date and the final DMP may use this template.

The DMP template used by the Research Foundation Flanders (FWO) corresponds with the Flemish Standard Data Management Plan. This Flemish Standard DMP was developed by the Flemish Research Data Network (FRDN) Task Force DMP which comprises representatives of all Flemish funders and research institutions. This is a standardized DMP template based on the previous FWO template that contains the core requirements for data management planning. To increase understanding and facilitate completion of the DMP, a standardized **glossary** of definitions and abbreviations is available via the following [link](https://www.fwo.be/media/1024841/glossary-flemish-standard-data-management-plan.pdf).

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| 1. **General Project Information** | |
| Name Grant Holder & ORCID | **Xiaoyu Tan 0000-0001-7146-1718** |
| Contributor name(s) (+ ORCID) & roles | **Ivo Vankelecom** [**0000-0002-0104-9493**](http://orcid.org/0000-0002-0104-9493) **& promotor**  **Laurens Rutgeerts** [**0000-0002-1809-3722**](http://orcid.org/0000-0002-1809-3722) **& colleague** |
| Project number [[1]](#footnote-1) & title | **(12A8X25N)Ultra-high-performance zeolite-filled membranes for gas and liquid separations** |
| Funder(s) GrantID [[2]](#footnote-2) | **12A8X25N** |
| Affiliation(s) | ✓ KU Leuven  ☐ Universiteit Antwerpen  ☐ Universiteit Gent  ☐ Universiteit Hasselt  ☐ Vrije Universiteit Brussel  ☐ Other:  ROR identifier KU Leuven: 05f950310 |
| Please provide a short project description | An ultra-high performance zeolite-filled mixed matrix membrane (MMM) was published in “Science” by the applicant recently. This novel membrane integrates excellent selectivity/permeability performance, robustness, anti-aging, moisture-resistance, easy-processing and handling properties in one single material, and outperforms all reported membranes by orders of magnitude. This MMM platform exhibits tunable and unprecedented performance for valuable energy-intensive gas separations, such as CO2/CH4, CO2/N2, separations for natural gas/biogas purification and flue-gas treatment, N2/hydrocarbons separation for hydrocarbon recovery, H2/CH4 separations,... Based on these breakthroughs, the applicant aims to (1) further develop a novel thin-film nanocomposite membrane (TFN) which consists of an ultra-permeable, selective zeolite-filled MMM top-layer supported by a flexible polymeric substrate and (2) extend this membrane platform to various critical liquid and gas separations. Ultimately, a roll-to-roll membrane preparation strategy will be developed to scale up the advanced TFN, hence allow industrial applications. |

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| 1. **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 [[3]](#footnote-3).   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  | | | | *Only for digital data* | *Only for digital data* | *Only for digital data* | *Only for physical data* | | Dataset Name | Description | New or Reused | Digital or Physical | Digital Data Type | Digital Data Format | Digital Data Volume (MB, GB, TB) | Physical Volume | | Lab book  notes | Observations and description of the practical execution of  experiments | Generate new data  Reuse existing data | Digital  Physical | Audiovisual  Images  Sound  Numerical  Textual  Model  Software  Other: | / | < 1 GB  < 100 GB  < 1 TB  < 5 TB  > 5 TB  NA | +/- 3 books | | Experimental | Description of the experimental procedures used to execute the  experiments (including membrane synthesis parameters,  description of the used materials,...) | Generate new data | Digital | Audiovisual  Images  Numerical  Textual | .xlsx  .docx  .jpg  .mp4 | < 1 TB | / | | Microscopy  images | SEM, TEM, AFM and other microscopy images | Generate new data | Digital | Audiovisual  Images | .tif | < 5 TB | / | | HTGS  Results | Results of high-throughput gas separation experiments | Generate new data | Digital | Numerical  Textual | .xlsx  .csv | < 5 TB | / | | TGA and  DSC data | Output of thermogravimetric analysis and differential scanning  calorimetry experiments | Generate new data | Digital | Numerical | .xlsx | < 100 GB | / | | IR spectra | Results of Fourier-transform and Raman infrared spectroscopy  experiments | Generate new data | Digital | Numerical | .xlsx | < 100 GB | / | | UV-vis | Results of UV-vis spectroscopy | Generate new data | Digital | Numerical | .xlsx | < 100 GB | / | | XRD | Results of X-ray diffraction analysis | Generate new data | Digital | Numerical | .xlsx | < 100 GB | / | | PALS | Results of Positron annihilation lifetime spectroscopy | Generate new data | Digital | Numerical | .xlsx | < 100 GB | / | | Viscometry | Results of viscosity measurements | Generate new data | Digital | Numerical | .xlsx | < 100 GB | / | | TEA | Results of the techno-economic analysis | Generate new data | Digital | Numerical | .xlsx  .docx | < 100 GB | / | | Literature | Scientific papers, reviews,... | Reuse existing data | Digital | Textual | .pdf | < 100 GB | / | | |
| *Guidance:*  *The data description forms the basis of your entire DMP, so make sure it is detailed and complete. It includes digital and physical data and encompasses the whole spectrum ranging from raw data to processed and analysed data including analysis scripts and code. Physical data are all materials that need proper management because they are valuable, difficult to replace and/or ethical issues are associated.* *Materials that are not considered data in an RDM context include your own manuscripts, theses and presentations; documentation is an integral part of your datasets and should described under documentation/metadata.*  [*RDM Guidance on data*](https://www.kuleuven.be/rdm/en/guidance/data-standards) | |
| 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. | N.A. |
| 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. | Yes, human subject data; provide SMEC or EC approval number:  Yes, animal data; provide ECD reference number:  Yes, dual use; provide approval number:  No  Additional information: |
| Will you process personaldata*[[4]](#footnote-4)*? 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). | Yes (provide PRET G-number or EC S-number below)  No  Additional information: |
| 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  No  New membrane synthesis conditions or membrane chemistries/compositions could prove valuable to patent for the desired application. Herein, the protocols for preparing these materials will be patented before sharing the data. |
| Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements, research collaboration agreements)?  If so, please explain to what data they relate and what restrictions are in place. | Yes  No  If yes, please explain: |
| 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 to what data they relate and which restrictions will be asserted. | Yes  No  If yes, please explain: |

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| 1. **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).  [*RDM guidance on documentation and metadata*](https://www.kuleuven.be/rdm/en/guidance/documentation-metadata)*.* | **Data is linked to experimental sections (word files), which describe how the data is generated and processed. These files are linked to the corresponding data files via an index file (excel file).** |
| 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.  *Repositories could ask to deliver metadata in a certain format, with specified ontologies and vocabularies, i.e. standard lists with unique identifiers.* | Yes  No  If yes, please specify (where appropriate per dataset or data type) which metadata standard will be used:  If no, please specify (where appropriate per dataset or data type) which metadata will be created:  An excel file will be provided, which links each data file to the purpose, the experiment which generated it and the place where it is stored. |

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| 1. **Data Storage & Back-up during the Research Project** | |
| Where will the data be stored?  *Consult the*[*interactive KU Leuven storage guide*](https://icts.kuleuven.be/storagewijzer/en)*to find the most suitable storage solution for your data.* | Shared network drive (J-drive)  Personal network drive (I-drive)  Teams  Sharepoint online  Sharepoint on-premis  Large Volume Storage  ManGO  Digital vault  Other: OneDrive (KU Leuven)  All project data will always be saved in (Shared) OneDrive folders.  These folders will be backed-up every 3 months on the Archive drive K |
| How will the data be backed up?  *What storage and backup procedures will be in place to prevent data loss?* | Standard back-up provided by KU Leuven ICTS for my storage solution  Personal back-ups I make (specify)  Other (specify)  The back-ups are organized internally in the research group for all data. |
| Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely. If no or insufficient storage or backup capacities are available, then explain how this will be taken care of. | Yes  No  If no, please specify: |
| How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?  *clearly describe the measures (in terms of physical security, network security, and security of computer systems and files) that will be taken to ensure that stored and transferred data are safe.*  [*Guidance on security for research data*](https://icts.kuleuven.be/storagewijzer/en) | The lab notes and work laptop are stored in a locked cupboard in the researcher's office. The office is located in a badge-restricted area of the  building, and is locked if no one is inside.  The laptop is secured with a password and access to double authentication is required to access the KUL One Drive system from other  devices.  No very sensitive data will be generated, therefore no extra security (encryption of the computer) is foreseen at this stage. |
| What are the expected costs for data storage and backup during the research project? How will these costs be covered? | The internal storage costs are estimated to be 50 euro per TB for backup on the internal severs. OneDrive is provided by KU Leuven for free. |

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| **5. Data Preservation after the end of the Research Project** | |
| Which data will be retained for at least five 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...).  [*Guidance on data preservation*](https://icts.kuleuven.be/storagewijzer/en) | ​​ All data will be preserved for 10 years according to KU Leuven RDM policy  All data will be preserved for 25 years according to CTC recommendations for clinical trials with medicinal products for human use and for clinical experiments on humans  Certain data cannot be kept for 10 years (explain) |
| Where will these data be archived (stored and curated for the long-term)?  [*Dedicated data repositories*](https://www.kuleuven.be/rdm/en/policy)*are often the best place to preserve your data. Data not suitable for preservation in a repository can be stored using a KU Leuven storage solution, consult the*[*interactive KU Leuven storage guide*](https://www.kuleuven.be/rdm/en/guidance/data-sharing)*.* | KU Leuven RDR  Large Volume Storage (longterm for large volumes)  Shared network drive (J-drive)  Other (specifiy): |
| What are the expected costs for data preservation during the expected retention period? How will these costs be covered? | **The costs for long term data storage are 50 euro per TB per year.** |

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| **6. 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.  *Note that ‘available’ does not necessarily mean that the data set becomes openly available, conditions for access and use may apply. Availability in this question thus entails both open & restricted access. For more information:* [*https://wiki.surfnet.nl/display/standards/info-eu-repo/#infoeurepo-AccessRights*](https://wiki.surfnet.nl/display/standards/info-eu-repo/#infoeurepo-AccessRights) | Yes, as open data  Yes, as embargoed data (temporary restriction)  Yes, as restricted data (upon approval, or institutional access only)  No (closed access)  Other, please specify: |
| If access is restricted, please specify who will be able to access the data and under what conditions. | All researchers and PI will have access at all time to the data. Externals can get access to the data upon approval of the PI. |
| 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, privacy aspects  Yes, intellectual property rights  Yes, ethical aspects  Yes, aspects of dual use  Yes, other  No  If yes, please specify: |
| Where will the data be made available?  If already known, please provide a repository per dataset or data type. | KU Leuven RDR  Other data repository (specify)  Other (specify) |
| When will the data be made available? | Upon publication of research results  Specific date (specify)  Other (specify) |
| Which data usage licenses are you going to provide? If none, please explain why.  *A data usage license indicates whether the data can be reused or not and under what conditions. If no licence is granted, the data are in a grey zone and cannot be legally reused. Do note that you may only release data under a licence chosen by yourself if it does not already fall under another licence that might prohibit that.*  *Check the*[*RDR guidance on licences*](https://www.kuleuven.be/rdm/en/rdr/licenses)*for data and software sources code or consult the*[*License selector tool*](https://ufal.github.io/public-license-selector/)*to help you choose.* | CC-BY 4.0 (data)  Data Transfer Agreement (restricted data)  MIT licence (code)  GNU GPL-3.0 (code)  Other (specify) |
| Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, please provide it here.  *Indicate whether you intend to add a persistent and unique identifier in order to identify and retrieve the data.* | Yes, a PID will be added upon deposit in a data repository  My dataset already has a PID  No |
| What are the expected costs for data sharing? How will these costs be covered? | **KU Leuven RDR free for 50 GB, this should cover the total amount of data generated during this project.** |

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| **7. Responsibilities** | |
| Who will manage data documentation and metadata during the research project? | **Xiaoyu Tan** |
| Who will manage data storage and backup during the research project? | **Laurens Rutgeerts** |
| Who will manage data preservation and sharing? | **Laurens Rutgeerts**  **Annelies Vanvlasselaer** |
| Who will update and implement this DMP? | **Xiaoyu Tan** |

1. “Project number” refers to the institutional project number. This question is optional. Applicants can only provide one project number. [↑](#footnote-ref-1)
2. Funder(s) GrantID refers to the number of the DMP at the funder(s), here one can specify multiple GrantIDs if multiple funding sources were used. [↑](#footnote-ref-2)
3. Add rows for each dataset you want to describe. [↑](#footnote-ref-3)
4. See Glossary Flemish Standard Data Management Plan [↑](#footnote-ref-4)