

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](#).

1. General Project Information	
Name Grant Holder & ORCID	Prof. Bram Van de Poel, ORCID: 0000-0001-5638-2472
Contributor name(s) (+ ORCID) & roles	
Project number ¹ & title	Cumella-specific ethylene biosynthesis drives root development during abiotic stress responses
Funder(s) GrantID ²	G023124N
Affiliation(s)	KU Leuven ROR identifier KU Leuven: 05f950310

¹ “Project number” refers to the institutional project number. This question is optional. Applicants can only provide one project number.

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.

Please provide a short project description	<p>The plant hormone ethylene regulates many developmental processes, and is involved in responses towards (a)biotic. Often stress leads to an enhanced ethylene production, which in turn steers developmental plasticity. However, how local ethylene production in one tissue controls the development of other tissues remains practically unstudied. Ethylene is known to inhibit primary root growth and does this through hormonal crosstalk, mainly with auxin. Recently, it was established that the epidermis and the lateral root cap cells are responsive to ethylene and in these cells auxin transport is altered. However, it remains unknown in which root tissue ethylene is being produced. We have preliminary data that shows that the root cap (columella and lateral root cap) is a prime site of local ethylene biosynthesis. In this proposal we want to investigate that tissue-specific ethylene production in the root cap drives local columella development (border cell shedding) and distant root development (inhibition of elongation). Furthermore, we postulate that certain physical environmental stressors, such as soil compaction and waterlogging, activate local ethylene production in the columella to coordinate developmental responses. We will investigate this concept using tissue-specific genetics, reporter lines and spatial omics technology. We aim to show that tissue-specific ethylene production in the root cap drives root developmental plasticity to allow stress resilience.</p>
--	---

2. 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.

Dataset Name	Description	New or Reused	Digital or Physical	ONLY FOR DIGITAL DATA	ONLY FOR DIGITAL DATA	ONLY FOR DIGITAL DATA	ONLY FOR PHYSICAL DATA
				Digital Data Type	Digital Data Format	Digital Data Volume (MB, GB,	Physical Volume

³ Add rows for each dataset you want to describe.

						TB)	
Transgenic plants (Arabidopsis thaliana).	Transgenic plants generated by agrobacterium-mediated transformation (reporter lines and knock-out lines)	New	Physical	N/A	N/A	N/A	Seeds will be stored in 15 mL falcon tubes in a dedicated seed cabinet (dry environment) at 4 C.
Vectors	Plasmid vectors	New	Physical	N/A	N/A	N/A	<50 ml stored at -20 C.
Proteins	Purified recombinant proteins	New	Physical	N/A	N/A	N/A	<50 ml stored in the -80 C freezer.
Transgenic bacteria (E.coli and Agrobacterium tumefaciens)	Transgenic bacteria used in cloning.	New	Physical	N/A	N/A	N/A	2 mL cryotubes stored in the -80 C freezer.
TEXT	Protocols, description of research results, literature studies	New	Digital	Textual	.txt or .docx	> 1GB	N/A
Camera images	Regular camera images of plants and their organs (phenotyping).	New	Digital	images	.tiff and .JPEG	50-100GB	N/A

Microscopy Images	Fluorescent and Confocal microscopy of root tissue.	New	Digital	Images	.tiff and .JPEG	100-200GB	N/A
Microscopy movies	Fluorescent and Confocal microscopy capturing videos of root tissue.	New	Digital	Images	.avi	100-200GB	N/A
Observational numerical data and calculations.	Quantitative observations from experiments.	New	Digital	Numerical	.xlsx	< 1 GB	N/A
Statistical analyses and corresponding scripts	R-scripts and output files from statistical analyses	New	Digital	Numerical	.R	< 1 GB	N/A
RNA and DNA sequencing files	Raw DNA or RNA sequencing reads and processed files	New	Digital	Numerical	.FASTQ and .R and .TXT	200-500 GB	N/A
Mass spectrometry files	Raw and processed mass spectrometry files	New	Digital	Numerical	.mzML and .R and .TXT	10-50 GB	N/A

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 be described under documentation/metadata.

[RDM Guidance on data](#)

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.	N/A
Will you process personal data 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).	<input checked="" type="checkbox"/> 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.	<input checked="" type="checkbox"/> No

⁴ See Glossary Flemish Standard Data Management Plan

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.	<input checked="" type="checkbox"/> 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 to what data they relate and which restrictions will be asserted.	<input checked="" type="checkbox"/> No

3. Documentation and Metadata

<p>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).</p> <p><i>RDM guidance on documentation and metadata.</i></p>	<p>1) Protocols and descriptions containing info about both materials (product names, vendors, chemical ID's, instrument ID's....) and methods (experimental setting, parameters, set-up's, ...) will be collected in written in standardized and dated lab books that remain property of the lab.</p> <p>2) Data (images, excel, word, R-scripts, statistical output, sequencing data, mass spec data...) will be stored on the lab's drive, which is centrally back-upped by the KU Leuven SET-IT service. Data is automatically cloud-based backed (one-drive).</p> <p>3) Physical samples (vectors, proteins, plasmids, strains, seeds) will be stored for long term in the propriate storage facility:</p> <ul style="list-style-type: none"> - Seeds: a dry seed-cabined at 4 C cold room, equipped with a temperature alarm centrally controlled by the KU Leuven dispatch. - Vectors and plasmids: in screwcaps in the -20C freezer, equipped with a temperature alarm centrally controlled by the KU Leuven dispatch. - Strains: in screwcaps in the -80C freezer, equipped with a temperature alarm centrally controlled by the KU Leuven dispatch. <p>These physical samples will be inventoried digitally (in Excell) and will be updated with new data.</p>
---	---

<p>Will a metadata standard be used to make it easier to find and reuse the data?</p> <p>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.</p> <p><i>REPOSITORIES COULD ASK TO DELIVER METADATA IN A CERTAIN FORMAT, WITH SPECIFIED ONTOLOGIES AND VOCABULARIES, I.E. STANDARD LISTS WITH UNIQUE IDENTIFIERS.</i></p>	<p><input checked="" type="checkbox"/> Yes</p> <p>Metadata from DNA and RNA sequencing experiments and from mass spectrometry experiments is collected and stored in .txt or .csv readable files. The metadata is stored alongside the raw data and the processed/analyzed data. The metadata contains all information on how the data was obtained (machine settings), processed and all the sample identification parameters.</p>
---	---

4. Data Storage & Back-up during the Research Project	
<p>Where will the data be stored?</p> <p><i>Consult the interactive KU Leuven storage guide to find the most suitable storage solution for your data.</i></p>	<p> <input type="checkbox"/> Shared network drive (J-drive) <input type="checkbox"/> Personal network drive (I-drive) <input checked="" type="checkbox"/> OneDrive (KU Leuven) </p> <p>The time-stamped digital data will be stored in a project folder on the shared drive (J:) of KU Leuven. The folder will be open for the members participating in this FWO project and is secured and backed-up by the ICTS service of KU Leuven. Copies can be made and kept on personal devices.</p> <p>Large dataset (e.g. microscopy images/movies, sequencing data, mass-spec data) will be stored on the lab's large-storage drive (K-drive) with automatic back-ups by the ICTS service of KU Leuven.</p>
<p>How will the data be backed up?</p> <p><i>WHAT STORAGE AND BACKUP PROCEDURES WILL BE IN PLACE TO PREVENT DATA LOSS?</i></p>	<p><input checked="" type="checkbox"/> Standard back-up provided by KU Leuven ICTS for my storage solution.</p> <p>The digital data will be stored on the university's central servers with automatic daily back-up procedures.</p>
<p>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.</p>	<p><input checked="" type="checkbox"/> Yes</p> <p>KU Leuven provides sufficient storage and back-up capacity during and after the project. A dedicated folder will be made for the project (1 TB) on which the collaborators will work jointly and store data files.</p> <p>Large dataset are stored on a specific drive (K-drive) with sufficient storage capacity.</p>

<p>How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?</p> <p><i>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.</i></p> <p>Guidance on security for research data</p>	<p>The network drive for the FWO project folder and the large volume storage folder are secured by the ICTS service of KU Leuven with a mirror copy and a two-factor authentication login. Only other lab members, will have access to the shared folder. Unauthorized persons do not have access to this system.</p>
<p>What are the expected costs for data storage and backup during the research project? How will these costs be covered?</p>	<p>OneDrive for business is free for staff and students of KU Leuven (up to 1 TB per user). The large-data storage drive charges 113 euro/TB/year. The data storage costs are covered by other lab incomes.</p>

5. Data Preservation after the end of the Research Project	
<p>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...).</p> <p>Guidance on data preservation</p>	<p><input checked="" type="checkbox"/> All data will be preserved for 10 years according to KU Leuven RDM policy</p>

<p>Where will these data be archived (stored and curated for the long-term)?</p> <p><i>Dedicated data repositories 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.</i></p>	<p><input checked="" type="checkbox"/> KU Leuven RDR</p> <p><input type="checkbox"/> Large Volume Storage (longterm for large volumes)</p> <p><input type="checkbox"/> Shared network drive (J-drive)</p> <p><input type="checkbox"/> Other (specify):</p> <p>1) The digital data will be stored on the lab's archive drive (K-drive) managed by the university's central servers (with automatic backup procedures) for at least 10 years, conform the KU Leuven RDM policy.</p> <p>2) The physical data will be stored in freezers and seed cabinets in the host lab for up to 10 years after the project.</p> <p>3) The accompanying metadata will be stored on the lab's digital drives (with automatic backup procedures).</p>
<p>What are the expected costs for data preservation during the expected retention period? How will these costs be covered?</p>	<p>The archive and large-data storage drive (K-drive) charges 113 euro/TB/year. The data storage costs are covered by other lab incomes. Costs involved with the maintenance of the freezers and seed cabinet will be paid other project incomes, as these facilities will be used by other active users.</p>

6. Data Sharing and Reuse

<p>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.</p> <p><i>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:</i></p> <p>https://wiki.surfnet.nl/display/STANDARDS/INFO-EU-REPO/#INFOEU-REPO-ACCESSRIGHTS</p>	<p><input type="checkbox"/> Yes, as open data</p> <p><input checked="" type="checkbox"/> Yes, as embargoed data (temporary restriction)</p> <p><input type="checkbox"/> Yes, as restricted data (upon approval, or institutional access only)</p> <p><input type="checkbox"/> No (closed access)</p> <p><input type="checkbox"/> Other, please specify:</p>
<p>If access is restricted, please specify who will be able to access the data and under what conditions.</p>	<p>The data will be embargoed while the researcher will be working on the project outputs and then opened (open access) once the publications are out.</p>
<p>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.</p>	<p><input checked="" type="checkbox"/> No</p> <p>If yes, please specify:</p>
<p>Where will the data be made available? If already known, please provide a repository per dataset or data type.</p>	<p><input checked="" type="checkbox"/> KU Leuven RDR</p> <p>All digital data will be stored and be available for lab members using a shared network drive and large volume storage provided by the KU Leuven. In addition, the relevant data will be made available to external people upon request by mail or published in papers and repository websites.</p>
<p>When will the data be made available?</p>	<p><input checked="" type="checkbox"/> Upon publication of research results</p>

<p>Which data usage licenses are you going to provide? If none, please explain why.</p> <p><i>A DATA USAGE LICENSE INDICATES WHETHER THE DATA CAN BE REUSED OR NOT AND UNDER WHAT CONDITIONS. IF NO LICENSE IS GRANTED, THE DATA ARE IN A GREY ZONE AND CANNOT BE LEGALLY REUSED. DO NOTE THAT YOU MAY ONLY RELEASE DATA UNDER A LICENSE CHOSEN BY YOURSELF IF IT DOES NOT ALREADY FALL UNDER ANOTHER LICENSE THAT MIGHT PROHIBIT THAT.</i></p> <p><i>Check the RDR guidance on licences for data and software sources code or consult the License selector tool to help you choose.</i></p>	<p><input checked="" type="checkbox"/> CC-BY 4.0 (data)</p> <p><input checked="" type="checkbox"/> Data Transfer Agreement (restricted data)</p> <p><input type="checkbox"/> MIT licence (code)</p> <p><input type="checkbox"/> GNU GPL-3.0 (code)</p> <p><input type="checkbox"/> Other (specify)</p>
<p>Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, please provide it here.</p> <p><i>INDICATE WHETHER YOU INTEND TO ADD A PERSISTENT AND UNIQUE IDENTIFIER IN ORDER TO IDENTIFY AND RETRIEVE THE DATA.</i></p>	<p><input checked="" type="checkbox"/> Yes, a PID will be added upon deposit in a data repository</p> <p><input type="checkbox"/> My dataset already has a PID</p> <p><input type="checkbox"/> No</p>
<p>What are the expected costs for data sharing? How will these costs be covered?</p>	<p>There are no costs, as we will use free online depositories.</p>

7. Responsibilities	
Who will manage data documentation and metadata during the research project?	The PI (prof. Van de Poel) is responsible for the lab's data storage policy. He is also in contact with SET-IT to manage and update the storage drives.
Who will manage data storage and backup during the research project?	The ICTS service of KU Leuven is responsible for the back-up of the network drives at KU Leuven.
Who will manage data preservation and sharing?	While the project is ongoing, the PI (Prof. Van de Poel) will take care of the preservation after the completion of the doctoral dissertation. The researcher will manage the sharing of the data.
Who will update and implement this DMP?	Prof. Van de Poel.

