
Molecular and physiological analysis of discolorations in witloof chicory

A Data Management Plan created using DMPOnline.be

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Project abstract:

Belgian endive or witloof chicory is a world-famous heritage crop, and Belgium is internationally renowned for its superior chicory quality. However, chicory heads can suffer from discolorations such as reddening or browning of both the leaves and the pith, which leads to severe quality losses as these chicons do not meet the strict quality standards at Flemish auctions. Quality losses are estimated to be 10%, but can escalate for certain cultivars. This problem is persistent and past studies, focusing mainly on forcing and storage conditions, were unable to pinpoint the causes of these physiological disorders. In this research project, we will use contemporary approaches to identify the underlying processes that govern the development of color disorders during forcing and storage, taking into account the genetic differences between cultivars. To this purpose, we will first perform microscopic and physiological assays to study disease progression. Then we will use advanced transcriptomics and metabolomics, in combination with biochemical assays, to elucidate the actual causes of discolorations. Finally, we will validate the function of newly discovered target genes using a reverse genetics approach. Thus, this project will lead to new fundamental insights about the processes that govern chicory discolorations. This will allow us to provide chicory growers and seed companies with the knowledge they need to improve the quality of their product.

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Application DMP

Questionnaire

Describe the datatypes (surveys, sequences, manuscripts, objects ...) the research will collect and/or generate and /or (re)use. (use up to 700 characters)

Question not answered.

Specify in which way the following provisions are in place in order to preserve the data during and at least 5 years after the end of the research? Motivate your answer. (use up to 700 characters)

Question not answered.

What's the reason why you wish to deviate from the principle of preservation of data and of the minimum preservation term of 5 years? (max. 700 characters)

Question not answered.

Are there issues concerning research data indicated in the ethics questionnaire of this application form? Which specific security measures do those data require? (use up to 700 characters)

Question not answered.

Which other issues related to the data management are relevant to mention? (use up to 700 characters)

Question not answered.

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DPIA

DPIA

Have you performed a DPIA for the personal data processing activities for this project?

- Not applicable

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GDPR

GDPR

Have you registered personal data processing activities for this project?

- No

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FWO DMP (Flemish Standard DMP)

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.

				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
		<i>Please choose from the following options:</i> <ul style="list-style-type: none"> • Generate new data • Reuse existing data 	<i>Please choose from the following options:</i> <ul style="list-style-type: none"> • Digital • Physical 	<i>Please choose from the following options:</i> <ul style="list-style-type: none"> • Observational • Experimental • Compiled/aggregated data • Simulation data • Software • Other • NA 	<i>Please choose from the following options:</i> <ul style="list-style-type: none"> • .por, .xml, .tab, .cvs, .pdf, .txt, .rtf, .dwg, .gml, ... • NA 	<i>Please choose from the following options:</i> <ul style="list-style-type: none"> • <100MB • <1GB • <100GB • <1TB • <5TB • <10TB • <50TB • >50TB • NA 	
Microscopy images	Microscopy discolorations	Generate new data	Digital	Experimental	.tif, .jpg	<100GB	
Discoloration quantification	Quantification images	Generate new data	Digital	Experimental	.jpg	<100GB	
	Quantification data	Generate new data	Digital	Experimental	.xlsx	<1GB	
	Quantification analysis	Generate new data	Digital	Experimental	.rmd, .html	<100MB	
Calcium deficiency	Samples	Generate new data	Physical				+/- 300 15mL falcons, +/- 400 paper bags
	AAS analysis	Generate new data	Digital	Experimental	.xlsx	<100MB	
Water metabolism	Water content data	Generate new data	Digital	Experimental	.xlsx	<100MB	
	Water content analysis	Generate new data	Digital	Experimental	.R	<100MB	
	Osmometer data	Generate new data	Digital	Experimental	.xlsx	<100MB	
	Osmometer analysis	Generate new data	Digital	Experimental	.R	<100MB	
RNAseq	Samples (ground tissue and RNA)	Generate new data	Physical				2 boxes in -80
	Sequencing data raw	Generate new data	Digital	Experimental	.fastq.gz	<1TB	
	Sequencing data processed	Generate new data	Digital	Experimental	.bam	<1TB	
	Data analysis	Generate new data	Digital	Experimental	.rmd, .html, .docx, .png, .txt, .xlsx	<1GB	

Metabolomics	Samples (ground tissue -80)	Generate new data	Physical				1 box in -80 (same as RNAseq)
	Processed data	Generate new data	Digital	Experimental	.csv	<100MB	
	Data analysis	Generate new data	Digital	Experimental	.R, .docx	<100MB	
PPO activity	Samples	Generate new data	Physical				1 box in -80
	Activity data	Generate new data	Digital	Experimental	.xlsx	<100MB	
	Data analysis	Generate new data	Digital	Experimental	.rmd, .html	<100MB	
Reverse genetics	Transgenic lines	Generate new data	Physical				up to 20 plants, seeds?
	Vector DNA	Generate new data	Physical				1 box in -20
	Sequencing datasets	Generate new data	Digital	Experimental	.fastq	<1TB	
	Analysis sequencing data	Generate new data	Digital	Experimental	.xlsx, .docx	<100MB	
	Quantification images	Generate new data	Digital	Experimental	.jpg	<100GB	
Protocols	Experimental procedures	Generate new data	Digital	Experimental	.docx	<100MB	
Lab books	log with notes experimental work	Generate new data	Physical				4 booklets

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:

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? Describe these issues in the comment section. Please refer to specific datasets or data types when appropriate.

- No

Will you process personal data? If so, briefly describe the kind of personal data you will use in the comment section. Please refer to specific datasets or data types when appropriate.

- 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.

- No

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 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

2. 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).

Experimental work will be documented in protocols and lab books. README.txt files will be provided for raw datafiles, elaborating on the origin of the dataset and describing the variables. Physical data (plant tissue/extracts) will be stored and labeled appropriately.

Will a metadata standard be used to make it easier to find and reuse the data? If so, please specify (where appropriate per dataset or data type) which metadata standard will be used. If not, please specify (where appropriate per dataset or data type) which metadata will be created to make the data easier to find and reuse.

- No

README.txt files will be provided for raw data files.

Data analysis folders will be provided with an additional text document containing a list of each file in the folder with a short description of its contents.

3. Data storage & back-up during the research project

Where will the data be stored?

OneDrive and KU Leuven's central servers

How will the data be backed up?

Data are continuously backed up in OneDrive and are additionally saved on the university's central servers, which are backed up daily.

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

The lab has sufficient storage and back-up capacity on the central servers of SET-IT.

Physical data (crushed plant material, RNA...) will be stored on silica at room temperature for dry samples and in the -80 °C freezer for other samples. The lab has sufficient space in the -80 °C freezer. The -80 °C freezer is equipped with an automated temperature alarm, provided by the KU Leuven central dispatch team. A backup contact list is provided in case the -80 °C goes into alarm.

The lab maintains a chicory seed bank in collaboration with Bioversity. Seeds from this project will be added to the seed bank, which is stored dry on silica and in liquid nitrogen.

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

The KU Leuven drives are password protected through the central KU Leuven login. KU Leuven obliges users to update passwords regularly. The network drive of the shared folder is secured by the ICTS service of KU Leuven with a mirror copy. Only specific lab members will have access to the shared folder. Unauthorized persons do not have access to this system.

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

We don't expect extra costs for data storage. But in case the lab does not have enough storage space, the PI has budget to buy more.

4. 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...).

All data obtained during this FWO project will be retained for the expected 5 year period.

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

On the university's central service, in the -80°C freezer and in boxes on silica.

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

We don't expect extra costs. In case there will be, the PI had budget for this.

5. Data sharing and reuse

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

- Other, please specify:

We aim to publish all data and make it available for requests afterwards. The original datafiles will be deposited in the supplemental material of the papers. Until publication the data will be protected.

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

All lab members will have access to the data. The published data will be available upon request for non-lab members.

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 in the comment section per dataset or data type where appropriate.

- No

Where will the data be made available? If already known, please provide a repository per dataset or data type.

Upon request by email.

When will the data be made available?

Upon publication of the research results.

Which data usage licenses are you going to provide? If none, please explain why.

Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, you have the option to provide it in the comment section.

- No

Datasets will be made available through the supplemental material section of the papers.

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

Data sharing is organized by the KU Leuven and is free of cost for the lab.

6. Responsibilities

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

Isabel De Jaegere

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

Isabel De Jaegere

Who will manage data preservation and sharing?

Prof. Bram Van de Poel

Who will update and implement this DMP?

Prof. Bram Van de Poel