Data Management Plan for the AGILE Consortium

Version: V 1.0

This Data Management Plan (DMP) ensures the digital traceability of project data and computational resources produced by AGILE members, enabling an efficient flow of information from acquisition to publication. Additionally, it supports the practical implementation of findable, accessible, interoperable and reusable (FAIR) principles, open science policies in agreement with the AGILE DoA (Description of the Action) to promote research transparency, verifiability, and reproducibility.

The AGILE DMP considers four types of data and resources named as follows throughout the DMP:

- **Images**: microscopy images (3D, 4D) raw and processed, in proprietary and open-source file formats
- **Statistics**: numerical datasets derived from quantitative image analysis, raw and processed, csv
- **Workflows**: image analysis workflows (e.g. Imaris, Fiji, Python, Matlab) and image statistics workflows (e.g. R, Python, Matlab scripts or similar, to process and subset the raw statistics)
- **Models**: deep-learning and machine-learning models used in workflows

Table of contents :

1-General Project Description.....2

2- Roles and Responsibilities.....3

3- Research Outputs.....4

3.1 – Research Data.....4
3.2 – Computational workflows.....5
3.3 – Research materials, equipment and procedures.....5

4 – Data Documentation and Metadata.....6

4.1 – Research data organization and structure.....6
4.2 - Data interpretation, metadata and reproducibility.....7
4.3 – Management of computational processes.....8
4.4 – Management of research procedures and materials.....8

5- Data storage and long-term preservation.....8

5.1 – Data storage during the project's lifetime.....9
5.2 – Long-term storage.....9

6 - Sharing of research outputs.....10

6.1 – Journal publication.....10
6.2 – Data sharing.....11
6.4 – Distribution of research procedures and materials.....13

7- Sensitive data, intellectual property and ethics.....13

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

8- Endorsement of the DMP by AGILE partners.....13

1-General Project Description

Project Name	Advanced Training for Next Generation Scientists in Spatio-Temporal Imaging of Plant Cells (AGILE)
Project ID	Grant agreement ID: 101226536
Project Leader	Dr Frédéric Pontvianne, https://orcid.org/0000-0002-2913-4104
Project description	Transforming plant science through quantitative imaging understanding how plants grow and respond to their environment requires insights from the molecular level to the entire organism. Quantitative microscopy provides this opportunity. Supported by the Marie Skłodowska-Curie Actions (MSCA) programme, the AGILE project offers interdisciplinary doctoral training in imaging and computational analysis focused on plant systems. Researchers investigate the structure and function of plant cell nuclei. They uncover principles that influence growth, development, and adaptation to environmental changes. AGILE prepares scientists to advance plant biotechnology, improve crops, and set new imaging standards. The project fosters a new generation of researchers who can make groundbreaking discoveries and apply quantitative imaging techniques across plant science and related fields. AGILE includes 15 partners each hosting a Doctoral Candidate (DC) running an Individual Research Project (IRP). AGILE is organized in three Scientific WorkPackages (WP): spatial resolution (WP1), Temporal resolution (WP2) and Image analysis and data management (WP3). CORDIS: https://cordis.europa.eu/project/id/101226536
Project Start Date	2026/03/01
Project End Date	2030/02/28
Funding	HORIZON.1.2 - Marie Sk odowska-Curie Actions (MSCA)
Website	https://www.msca-agile.eu/
History Information	
Current Date	2026/07/30
Version #	1
Version # description	created based on the editable DMP template created by Isabel Kemmer (FAIR Image Data Steward, Euro-BioImaging) with input from Aastha Mathur (Coordinator Image Data Services, Euro-BioImaging) and Arina Rybina (Scientific Project Manager, Euro-BioImaging). Editable template available on Zenodo (10.5281/zenodo.11473803) under a CC-BY 4.0 licence

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

2- Roles and Responsibilities

Data owner	All fifteen Principal Investigators (PIs) of the AGILE consortium (https://www.msca-agile.eu/network/).
Data collection	Frederic Pontvianne, IRP01, WP2 Christophe Tatout, IRP02, WP3 Mathilde Grelon, IRP03, WP1 Martina Dvorackova, IRP04, WP1, WP2 Ales Pecinka, IRP05, WP2 Adreas Houben, IRP06, WP1
Processed images	Frédéric Pontvianne, IRP01, WP2 Christophe Tatout, IRP02, WP3 Mathilde Grelon, IRP03, WP1 Martina Dvorackova, IRP04, WP1, WP2 Ales Pecinka, IRP05, WP2 Adreas Houben, IRP06, WP1
Workflows	Célia Baroux, Virginie Uhlmann
Data organization/storage	Christophe Tatout
Long-term preservation	Frédéric Pontvianne
Data stewardship	Jean-Marie Burel
OMERO administrator	Sophie Desset

3- Research Outputs

3.1 – Research Data

Will you re-use existing data?	No
Data	Images and Statistics generated by AGILE partners prior to the start of the AGILE project and similar to data that will be generated during the project. See below for a more detailed description.
Workflows	Workflows and Models (e.g. generated by FRACTAL, IMARIS, Biom3d) generated by AGILE partners prior to the start of the AGILE project and similar to data that will be generated during the project. See below for a more detailed description.

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

Will you generate new data?	Yes 1) Images: Raw and Processed Raw: Generated by WP1 (spatial resolution datasets; 7 IRP projects) and WP2 (temporal resolution datasets; 5 IRP projects), consisting in 3D and 4D images from different microscopy imaging modalities including CSLM, Spinning Disk Confocal, STED, SIM, Airyscan, PALM, LSFM, MinFlux, SFB-SEM as described in the AGILE DoA. Formats: TIF and Proprietary format files Processed: 3D and 4D raw images processed for one or several of the following: deconvolution, denoising, field correction, channel shift, image registration, segmentation, masking or a combination thereof. Formats: Imaris, OME-TIFF, OME-Zarr
	2) Statistics Datasets derived from image analysis and corresponding to files (csv, JSON...) reporting on image descriptors (e.g. signal intensity variables, signal distribution analysis, object size and shape, inter-object distance measurements, time, velocity and displacement etc…) Raw: Data as exported from image analysis software and workflows (Imaris, Fiji,

Data Size
3 TB (Estimate for stage 2 data, see section 4.1)

Data type	**File format**
Images	.czi, .lif, .nd2, OME-Zarr
Statistics	plain-text tabular (csv or equivalent)

Data Processing	
Will you (re)use existing software to generate, process and analyse data?	Yes

Software	Fiji	IMARIS	FRACTAL	BIOM3D	OMERO
Purpose	image analysis	image analysis	image analysis	image analysis	image analysis
Link to the complete description	https://imagej.net/software/fiji/downloads	https://imaris.oxinst.com/products/image-analysis-software/	https://github.com/fractal-analytics-platform	https://github.com/GuillaumeMougeot/biom3d	https://www.openmicroscopy.org/omero/downloads/

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

3.2 – Computational workflows

Will you generate image acquisition or analysis workflows?	○ No ○ Yes, but only for certain steps ◉ Yes, for everything
Short description	Two types of computational workflows Workflows for image analysis
Full description	Workflow for Image analysis: Will combine one or several of these actions: deconvolution, denoising, registration, field correction, channel shift, segmentation, masking, channel duplication, signal transformation (e.g. distance), 3D rendering, projection, statistics export, snapshot, using software described in 3.1. Workflow Type 2) Image Statistics processing

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

3.3 – Research materials, equipment and procedures

Will you generate new materials, reagents or equipment?	◉ No
	○ Yes, please describe
Will you generate new experimental procedures?	○ No
	◉ Yes, please describe

4 – Data Documentation and Metadata

4.1 – Research data organization and structure

How do you organize your data during data generation and further analysis?

☒ file-system based

Stage 1: data not shared; acquisition of image data, image processing and generation of image statistics (raw + processed) stored by each AGILE partner.

Data are acquired, processed and documented by each AGILE member (Doctoral Candidates (DC) and associated Team members) according to templates provided by the Data Management Committee (templates for images, statistics datasets, workflows and models) and available at www.msca-agile.eu. Data are stored on partner's server facilities.

Stage 2: data shared between AGILE partners on the AGILE_OMERO@UCA server; image, workflow and statistics selection from stage.
3 categories:
Images & Statistics: Selection of datasets to upload on AGILE_OMERO@UCA, based on image quality criteria as listed in the "Stage 2 Data Selection - Guidelines" documents provided by the DMC and available at www.msca-agile.eu. Metadata will be enriched with REMBI criteria
Workflows: Selection of validated, robust workflows for upload on AGILE_OMERO@UCA and/or https://workflowhub.eu/
Models: Selection of validated models for upload on https://bioimage.io/#/models

Stage 3: data shared with the public community on public repositories; stage 2 data and metadata consolidation for publication.

Data and workflows selected at stage 2 and their metadata will be indexed and listed using a routine extracting information from the OMERO server (responsible: JM Burel @UD partner) and will be formatted /prepared for uploading on public repositories (See 5)

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

How will changes in the data organization be documented?
- new versions of this DMP, templates and guidelines available at msca-agile.eu - info letter and email to all AGILE members

4.2 - Data interpretation, metadata and reproducibility

Explain which types of metadata will be associated with the data and which standards they follow:	Most of the thorough documentation will happen at stage 2 upon sharing selected data the AGILE_OMERO@UCA server (Images, Statistics, Workflows) Images will be annotated following published recommendations: Sarkans, U., Chiu, W., Collinson, L. et al. REMBI: Recommended Metadata for Biological Images—enabling reuse of microscopy data in biology. Nat Methods 18, 1418–1422 (2021) Statistics associated with Image analysis will be associated with README files providing explanation on the dataset identity and origin (workflow used to produce them), and explanation on the variables Workflows will be annotated either by the macro structure of the proprietary software (eg Imaris, Fiji) or annotated in the script's interface notebook (eg
Where is the metadata stored and how will the data and metadata be linked? How will the link between data and metadata be preserved as the data organization changes?	Metadata Stage 1: stored locally by each AGILE partner Metadata Stage 2: stored on the AGILE_OMERO@UCA server Metadata Stage 3: stored on the selected image public repository, Zenodo, Git repository or combination thereof
How are (biological) entities (e.g. strains, materials, equipment, methods ...) referenced using controlled vocabularies/ontologies?	Images Metadata Stage 2 will use controlled ontologies following the REMBI recommendation. EDAM-BIOIMAGING - an extension to the EDAM ontology (edamontology.org) for bioimage analysis, bioimage informatics, and bioimaging - https://bioportal.bioontology.org/ontologies/EDAM-BIOIMAGING FBbi - Biological Imaging Methods Ontology - https://www.ebi.ac.uk/ols/ontologies/FBbi Guidelines and examples will be provided by the DMC.
Describe the system used for file versioning:	file versioning by file name extension (_V1) script/software/workflow versioning using Git repository

4.3 – Management of computational processes

Will a computational workflow management system be used?	No ☒ no Explain how you manage and document your computational workflows instead. How will software configuration parameters and manual data processing interventions be documented? Computational workflows will be made available at

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

	https://workflowhub.eu/ and/or Github repositories of the DC and PI authors A list of available workflows and their authors will be made available on the AGILE website/Resources and updated monthly to every three months

4.4 – Management of research procedures and materials

Will an experimental workflow management system be used?	No • no Explain how you document your
Which metadata do you store for research material? How is the research material managed?	Research material used in the projects (for instance reporter lines, mutant lines, antibodies, labeling kits, genotyping primer sequences, FISH probe sequences…), plant growth and sample preparation procedures will be documented according to each DC host lab local guidelines and be detailed upon publication following the journal recommendation and standards.

5- Data storage and long-term preservation

5.1 – Data storage during the project's lifetime

Initial data storage location	stage 1 data: local at each AGILE partner local server
Data storage lifecycle	Describe where the data will be stored during the project's lifetime and how it will be moved. - stage 2 data: following curation and selection (see section 2), images will be stored at AGILE_OMERO@UCA server at Mesocentre Clermont Auvergne - stage 3 data: for publication, data will be uploaded on public repositories for images
Data access pattern	Who is going to access the data during the project's lifetime and for which purpose? Explain the requirements this puts on your data storage (bandwidth, permissions…) and if they are met. At stage 2, images, statistics and workflows deposited on AGILE_OMERO@UCA will be accessible by the OMERO administrators (C. Tatout/S. Desset) and with personalised access to each DC and associated PI.
Data back-up strategy	Describe which data is backed-up and detail the back-up process. datasets stored at the AGILE_OMERO@UCA server are saved as triplicate locally

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

5.2 – Long-term storage

Data selection	How will you select data for preservation? Explain which data must be retained or destroyed for contractual, legal or regulatory purposes. Data generated at stage 1 will be selected at stage 2 for storing on the AGILE_OMERO@UCA server during the AGILE project and then at stage 3 on public repositories for long term storage. Selection of images follows image quality criteria described in the document "Guidelines for Data selection _Stage 2" on the msca-agile.eu website essentially capturing published criteria for reproducible image analysis: https://www.embl.org/news/science/global-guidelines-to-improve-the-quality-of-microscopy-images-in-scientific-publications/ Schmied, C., Nelson, M.S., Avilov, S. et al. (2024) Community-developed checklists for publishing images and image analyses. Nat Methods 21. doi: 10.1038/s41592-023-01987-9
Minimal retention period	Stage 2 data will be preserved at AGILE_OMERO@UCA for 4 years following the duration of the AGILE project (March 2026 to January 2030)
Place of long-term storage	Stage 3 data will be stored on public repositories (long term): Bioimage Archive@BioStudies, workflowhub.eu, bioimage.io, Zenodo, Git repositories
Data preservation strategy	Briefly describe the procedures your long-term storage facility has in place for preservation and back-up, if known. Stage 2 data preservation strategy: datasets stored at the AGILE_OMERO@UCA server are saved as triplicate locally @UCA and mirrored @UD Stage 3 data preservation strategy: relying on public repositories such as Bioimage

6 - Sharing of research outputs

6.1 – Journal publication

Are you integrating the data into a journal publication?	Yes
	• yes
Which data will be included in the publication and which not? Describe your selection process:	Stage 2 selected data (or subset thereof) will be published (Stage 3) following recommendations for reproducible sample preparation, imaging and image analysis

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

	References: Gaudreault N, Gibbs H (2023) Reporting reproducible imaging protocols. STAR Protocols, 4, Cell Press doi: 10.1016/j.xpro.2022.102040 Schmied, C., Nelson, M.S., Avilov, S. et al. (2024) Community-developed checklists for publishing images and image analyses. Nat Methods 21. doi: 10.1038/s41592-023-01987-9 Collinson, L. et al. REMBI: Recommended Metadata for Biological Images—enabling reuse of microscopy data in biology. Nat Methods 18, 1418–1422 (2021) Moore, J., Basurto-Lozada, D., Besson, S. et al. OME-Zarr: a cloud-optimized bioimaging file format with international community support. Histochem Cell Biol 160, 223–251 (2023). https://doi.org/10.1007/s00418-023-02209-1 Kemmer I, Keppler A, Serrano-Solano B, Rybina A, Özdemir B, Bischof J, El Ghadraoui A, Eriksson JE, Mathur A. Building a FAIR image data ecosystem for microscopy communities. Histochem Cell Biol. 2023 Sep;160(3):199-209. doi: 10.1007/s00418-023-02203-7 Yamauchi and Uhlmann (2026) Bridging annotated microscopy imaging data and analysis method development for scientific discovery, Patterns, 7(6) doi: 10.1016/j.patter.2026.101542. Gustafsson, O.J.R., Wilkinson, S.R., Bacall, F. et al. WorkflowHub: a registry for computational workflows. Sci Data 12, 837 (2025). https://doi.org/10.1038/s41597-025-04786-3

Will a pre-print be available?	Yes

Describe the journal and its requirements for data publication:

Journal	
Publishing license	Open-access
Specific requirements	

6.2 – Data sharing

Which datasets will be shared?	☐ All data produced
	☒ Data used in publication
	☐ Certain datasets

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

	☐ Only the metadata
	☐ None
When will your data be shared?	☐ As soon as it is generated
	☒ Together with paper publication
	☐ Upon project completion
	☐ After an embargo
	☐ Other

Where will the data be shared?	☒ Domain-specific, open repository
	☒ Domain-specific, restricted-access repository
	☐ Institutional repository
	☒ General purpose repository
	☐ Upon request/publication only
	☐ Other

Under which **licence** will the data be shared?	◯ Fully open (CC0)
	◉ Attribution (e.g. CC BY)
	◯ Non-derivative (e.g. CC BY-ND)
	◯ Non-commercial (e.g. CC BY-NC)
	◯ Other

6.3 – Distribution of computational workflows

Are the computational workflows and software made available?	Yes
	☐ no Describe why not
Specify the licence:	CC-BY
Describe which documentation will be made available with the software:	Workflows will be documented either according to the proprietary software structure (eg Imaris) or according to good developer practices and recommendation of the community Yamauchi and Uhlmann (2026) Bridging annotated microscopy imaging data and analysis method development for scientific discovery. Patterns, Cell

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

	Press https://doi.org/10.1016/j.patter.2026.101542 https://workflows.community/groups/fair/resources/ Validated workflows will be uploaded to relevant platforms (workflowhub.eu, Git repositories, Zenodo, see 5.1) at publication time

6.4 – Distribution of research procedures and materials

Will you share developed experimental protocols?	Yes ☐ no Describe why not:
Will you share physical research outputs?	Yes ☐ no Describe why not:

7- Sensitive data, intellectual property and ethics

Will you store or process sensitive or personal data?	◯ Yes ⦿ No
Are there any issues that will restrict access to the data or impact data sharing?	◯ Yes, please describe ⦿ No
Are there any other ethical considerations?	◯ Yes, please explain ⦿ No

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

8- Endorsement of the DMP by AGILE partners

Name	Place, Date	Signature

Funded by the European Union

AGILE

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement N°101226536.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.