THE NEW GENERATION OF BIOMINERALISED MYCELIUM ARCHITECTURE

A Data Management Plan created using DMPonline.be

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Project abstract:
Architects and designers are beginning to explore the use of mycelium biocomposites, which have demonstrated potential for sustainable design approaches. These materials are bound together by a fungal hyphae network but they are typically limited in their applicability due to a low compressive strength. Other research has demonstrated that microbial-induced calcite precipitations can add mechanical strength to materials, but there exists no materials that combine fungal hyphae networks and calcite precipitations. Therefore, the goal of this project is develop a new class of biocomposite materials in which an aggregate matrix is bound together by fungal biomass and calcite precipitation. The development of these new materials will be based on a broad study of the fungi's ability to grow, produce calcite precipitation and bind aggregates together through these processes. Moreover, this project will focus on discovering the material properties that are obtained from this novel and sustainable class of biocomposite. The resulting materials and the identification of their properties will lead to new circular material usage in future architecture.

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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 phy sic

Dataset Name	Description	New or reused	Digital or Physical	Digital Data Type	Digital Data format	Digital data volume (MB/GB/TB)	al data Physical volume
		Please choose from the following options: • Generate new data • Reuse existing data	*Please choose from the following options:* • Digital • Physical	*Please choose from the following options:* • Observational • Experimental • Compiled/ aggregated data • Simulation data • Software • Other • NA	*Please choose from the following options:* • .por, .xml, .tab, .csv,.pdf, .txt, .rtf, .dwg, .gml, … • NA	*Please choose from the following options:* • <100MB • <1GB • <100GB • <1TB • <5TB • <10TB • <50TB • >50	

							TB • NA
literature study of mineralised mycelium biocomposite	manuscripts of state-of-the-art myceliu m biocomposite and biotechnology of biomineralisation in sustainable building	New	Digital	Compile data (academic journals)	.doc		< 1 GB
data of Fungal growth & precipitation experiment	Measuring fungal conditions such as growth and precipitation rates of direffer ent strains	New	Digital	Experimental	.exe		<100 MB
visual documentation of Fungal growth & precipitation experiment	collecting pictures during experiment of fungal growth & precipitation	New	Digital	Observational	.jpeg		<100 GB
data of mineralised mycelium biocomposite experiment	measuring biochemical activities during the production of mineralised	New	Digital	Experiment	.exe		< 100 MB

protocol of mineralised myceliu m biocomposite production	myceliu m biocom posite manuscripts of the bioproc ess and biofabri cation of minerali sed myceliu m biocom posite	New	Digital	Others	.doc	< 1 GB
visual documentation of the production of mineralised myceliu m biocomposite	colectin g pictures and video clips during experim ent of biofabri cation of minerali sed myceliu m biocom posite	New	Digital	Observational	.jpeg .mp4	< 1 TB
data of testing the mechanical properties of mineralised myceliu m biocomposite	measuri ng the compre ssive strengt h of the sample s of minerali sed myceliu m biocom posite	New	Digital	Experiment	.exe	< 100 MB
visual documentation of the mechanical streght of mineralised myceli	collecti ng pictures and video clips during testing the sample s of minerali	New	Digital	Observational	.jpeg .mp4	< 1 TB

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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)? 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).

1. data from analysing equitment (i.e Atomic absorbtion spectroscopy for calcium concentration measurement) will be kept into .exe file. A readme file will be constructed for each group of experiments to describe the materials and method of experiment.

2. for the model fit data, all relevant model parameter will be visible in the Matlab file used for model fit (which can be opened as a txt.-file)

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

3. DATA STORAGE & BACK-UP DURING THE RESEARCH PROJECT

Where will the data be stored?

During the project, I will be the responsible person for the preservation of data and after the research project comes to an end, a new responsible person can be assigned. The results of the study and other data will be stored on the office pc of myself and KU Leuven/BioTeC+ team, and in shared folder or cloud services (e.g. OneDrive, Google drive).

How will the data be backed up?

As a back-up, data will also be saved on my KU leuven clouds and on my personal external hard drive.

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 data will be stored in 1) my pc, 2) my KU leuven clouds, 3) BioTeC+ research group shared folder, and 4) my external hard drive

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

my pc need pascode to enter. KU leuven clouds need authenticator to log in with pascode.

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

NA

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...).

Experimental data.

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

data will be stored on the office pc of myself and KU Leuven/BioTeC+ team shared clouds for long-term

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

NA

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.

- Yes, in a restricted access repository (after approval, institutional access only, …)

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

data will be available to all researchers upon request. However, request will be handled individually case-by-case

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.

Data will be available on request after agreement with the project supervisor Prof. Jan Van Impe.

When will the data be made available?

Data will be available on request after the results have been published.

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

No licenses will be provided in the project as the data can only be shared under request and supervisor agreement.

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

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

there is no expected costs related to data sharing

6. RESPONSIBILITIES

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

triaamalia.ningsih@kuleuven.be

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

triaamalia.ningsih@kuleuven.be

Who will manage data preservation and sharing?

jan.vanimpe@kuleuven.be

Who will update and implement this DMP?

triaamalia.ningsih@kuleuven.be