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	**Mrinal Gaurav Srivastava 0000-0001-9058-3462**
Contributor name(s) (+ ORCID) & roles	**Annabel Braem 0000-0002-4890-0177, Promotor** **Sylvie Castagne 0000-0003-3648-0432, Co-promotor**
Project number [1] & title	**3E210926 - Multifunctional smart-releasing mesoporous materials for dental implant applications**
Funder(s) GrantID [2]	**1SHFK24N**
Affiliation(s)	☒ KU Leuven ☐ Universiteit Antwerpen ☐ Universiteit Gent ☐ Universiteit Hasselt ☐ Vrije Universiteit Brussel ☐ Other: 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	With the global increase in dental implant procedures, the number of implant-associated infections caused by bacterial biofilm formation is also on the rise. Unless proper action is taken, these infections can induce peri-implantitis, which can eventually lead to implant failure, burdening both patients and healthcare systems. Although research is progressing in this field, there is no current gold-standard treatment for it. Therefore, this project aims at a dual approach to develop smart multifunctional surfaces for dental abutments, i.e. the transmucosal part of a dental implant, that will enable a good overall peri-implant health. First, femtosecond laser patterning (FLP) will be used to generate a hierarchical micro/nanostructured topography that will promote the attachment of soft-tissues onto the abutment, thereby establishing a mechanically stable soft-tissue sealing which can effectively protect the underlying tissues from invading pathogens. Next, micro-pockets created on the surface will be loaded with a mesoporous silica drug carrier material fine-tuned for the controlled release of prebiotic sugar molecules. These prebiotics can selectively stimulate the growth of commensal bacteria at the expense of pathogens in order to install a more healthy oral microbiome. For a more durable and timely therapeutic effect, the micro-pockets will be capped with a pH-responsive coating, confining the prebiotic release to the onset of bacterial biofilm formation.

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].

				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
		☐ 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	
Femtosecond laser	Programming files	New	Digital	Experimental	.rcp	<1 GB	
Microscopy images	SEM	New	Digital	Images	.tif	<100 GB	
Topography	AFM 3-D optical profiler	New	Digital	Images	.nid .plux	<10 GB	
Swelling studies	QCM-D	New	Digital	Textual	.txt	<1 GB	
Drug release	UV-Vis	New	Digital	Textual	.xls	<1 GB	
Chemical characterization	XPS ToF-SIMS FT-IR	New	Digital	Textual	.vms .ita .txt	<100 GB	
Physicochemical characterization	BET, BJH	New	Digital	Textual	.xls	<1 GB	

[3] Add rows for each dataset you want to describe.

Protein studies	Zeta potential, Streaming current	New	Digital	Textual	.xls	<1 GB	
Solid surface energy	Contact angle	New	Physical	Textual	.xls	<1 GB	
q-PCR	Bacterial species quantification	New	Digital	Textual	.pcrd	<1 GB	
XRD	Phase identification	New	Digital	Textual	.txt	<1 GB	
Tensiometer	Surface tension	New	Digital	Textual	.txt	<1 GB	
Powder surface energy	Zeta potential and DLS	New	Digital	Textual	.xls	<1 GB	
Fatigue testing	Fatigue properties	New	Digital	Textual	,xls	<10 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

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.	Not applicable.
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: *In vitro* studies will address human gingival fibroblast cell growth on titanium with the following EC approval number: S54254(ML8189)

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).	☐ 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 If yes, please comment: Valorization of this project depends on the ability to develop femtosecond laser program files of complex Ti geometries. This will be discussed with the (co)promotors and included in this DMP.
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:

3. Documentation and Metadata

[4] See Glossary Flemish Standard Data Management Plan

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*.	The raw data files used for reporting at conferences, annual meetings and publications will be categorized in KU Leuven J: drive for easy access. Each folder will have a README.txt file containing instructions to use navigate through the files in a convenient manner.
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: All the different datasets will be stored and categorized according to Dublin core which is a set of fifteen important metadata items for describing resources which are either physical or digital.

4. Data Storage & Back-up during the Research Project

Where will the data be stored? *Consult the interactive KU Leuven storage guide to find the most suitable storage solution for your data.*	☒ Shared network drive (J-drive) ☒ Personal network drive (I-drive) ☒ OneDrive (KU Leuven) ☐ Sharepoint online ☐ Sharepoint on-premis ☐ Large Volume Storage ☐ Digital Vault ☐ Other:
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) In addition to the KU Leuven provided data storage, the data will be backed up in my personal external hard drive and lab computers.
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*	KU Leuven personnel has strict authorizations in place so no external/unauthorized user can access the data. Each KU Leuven-associated PC requires username and password, which must be changed every year.

What are the expected costs for data storage and backup during the research project? How will these costs be covered?	Since there is need for extra storage at the moment, no extra costs are anticipated.

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*	☒ 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 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.*	☐ 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?	

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*	☐ 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: All data can be made available upon request of an individual (e.g. a researcher who intends to reproduce an experiment).
If access is restricted, please specify who will be able to access the data and under what conditions.	The full dataset will be transferred to my supervisors and will be stored on the university's central servers. The data can be reused with the approval from my PhD supervisor and me. The valuable data will be written into research papers. The paper-related information could be shared upon request by mail.
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 for data and software sources code or consult the License selector tool to help you choose.*	☐ CC-BY 4.0 (data) ☐ Data Transfer Agreement (restricted data) ☐ MIT licence (code) ☐ GNU GPL-3.0 (code) ☒ Other (specify) **CC BY-NC Licence**
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?	The data sharing through university server is free. Freeware such as WeTransfer can also be used to transfer and share the files.

7. Responsibilities	
Who will manage data documentation and metadata during the research project?	**Day-to-day data management: Mrinal Gaurav Srivastava** **Overall data management, in the long term and after completion of the project: Annabel Braem**
Who will manage data storage and backup during the research project?	**Day-to-day data management: Mrinal Gaurav Srivastava** **Overall data management, in the long term and after completion of the project: Annabel Braem** **Mrinal Gaurav Srivastava is in charge of data back-up on the university server (shared drive)**
Who will manage data preservation and sharing?	**Day-to-day data management: Mrinal Gaurav Srivastava** **Overall data management, in the long term and after completion of the project: Annabel Braem**
Who will update and implement this DMP?	**Mrinal Gaurav Srivastava (with support from Annabel Braem)**