Dental Tissue Regeneration via Bioengineered Immune Modulatory Scaffolds (DREIMS)

A Data Management Plan created using DMPonline.be

Creators: n.n. n.n., Mostafa Ezeldeen

Affiliation: KU Leuven (KUL)

Funder: Bijzonder Onderzoeksfonds

Template: KU Leuven BOF-IOF

Principal Investigator: Mostafa Ezeldeen, n.n. n.n.

Data Manager: Mostafa Ezeldeen

Project Administrator: Mostafa Ezeldeen, n.n. n.n.

Grant number / URL: IDN/23/008/https://research.kuleuven.be/portal/en/project/3M230281

ID: 206084

Start date: 01-10-2023

End date: 30-09-2027

Project abstract:

Oral health plays an essential role in our daily lives and wellbeing. Yet, poor oral conditions are highly prevalent, affecting almost half the world's population, with high socio-economic burden. Treatment of conditions affecting the dental root remains highly challenging. Moreover, dental root replacement with titanium implants may work for adult patients, yet in children such technique cannot be applied as an osseointegrated implant will not follow dentoalveolar growth. Therefore, replacing a lost permanent tooth in children is extremely challenging. In order to offer a viable solution for pediatric tooth loss, tissue engineering strategies utilizing combinations of scaffolds, growth factors, and stem cells, are currently in development. However, clinical success remains limited to small defects, and suffers from limited reproducibility. This project aims a novel tissue engineering approach for dental root tissue replacement based on multi-material scaffolds with immunomodulatory properties.

Last modified: 31-03-2024

Dental Tissue Regeneration via Bioengineered Immune Modulatory Scaffolds (DREIMS)

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.

Dataset name / ID	Description	New or reuse	Digital or Physical data	Data Type	File format	Data volume	Physical volume
		*Indicate: **N**(ew data) or **E**(xisting data)*	Indicate: **D**(igital) or **P**(hysical)	Indicate: **A**udiovisual **I**mages **S**ound **N**umerical **T**extual **M**odel **SO**ftware Other (specify)		Indicate: <1GB <100GB <1TB <5TB >5TB NA	
WP1: CaP Ink development	Development of novel calcium phosphate inks and in silico modelling driven design for mechanically robust dental root shaped scaffolds	N	D & P	Images from nano-CT scans Modelling data from Finite element analysis Numerical data from mechanical testing and characterization	TIFF images mesh files for modelling (.stl) Numerical data spreadsheets in CSV or XLSX	<5TB	at least 3 samples per-condition
WP2: Multi-layered hybrid scaffolds	Biofabrication of multi-layered hybrid scaffolds mimicking periodontal ligament interface	N	D & P	Images from nano-CT scans Modelling data from Finite element analysis Numerical data from mechanical testing and characterisation	TIFF images mesh files for modelling (.stl) Numerical data spreadsheets in CSV or XLSX	<5TB	at least 3 samples per-condition
WP3: Antimicrobial immunomodulatory scaffolds	COAM as a novel strategy for antimicrobial, immunomodulatory scaffolds and unlocking the interplay between biomaterial immune-cell and dental stem cells	N	D & P	Numerical data from characterisation of: chemokine and cytokine immobilisation, in vitro screening Proteomics and Sequencing data	spreadsheets in CSV or XLSX FASTA and FASTQ	<5TB	at least 3 samples per-condition
WP4: In vivo proof of concept	Proof of concept for biomaterial based immunomodulated	N	D & P	Hitsological samples and microscopy data Multiplexed immunohistochemistry	Microscopy images: Bio-formats Multiplexed data: Bio-formats	<5TB	Sections on glass slides will be stored

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)? If so, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.

- Yes, animal data (Provide ECD reference number below)

ECD still to be applied for as animal experiments planned in the last year of the project (status in progress)

Will you process personal data? 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).

- No

NA

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 or 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.

- Yes

There might be possible patent applications, difficult to determine at the moment.
Chlorite Oxidized Oxyamylose (COAM) is a molecule patented by the Rega institute, KU Leuven as an antiviral we plan also to patent it's use in immunomodulated dental tissue eingineering

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).

All data will be saved on the KU Leuven Large storage drive and organised per Workpackage and experiment date.
We will explore the use of Mango en Electronic lab notebooks

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.

- No

All data will be saved on the KU Leuven Large storage drive and organised per Workpackage and experiment date.

Data Storage & Back-up during the Research Project

Where will the data be stored?

- Large Volume Storage
- OneDrive (KU Leuven)
- ManGO

How will the data be backed up?

- Standard back-up provided by KU Leuven ICTS for my storage solution

Is there currently sufficient storage & backup capacity during the project?

If no or insufficient storage or backup capacities are available, explain how this will be taken care of.

- Yes

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

The data will be stored on the Large Volume Storage of the OMFS-IMPATH research group and access will be only granted to authorised persons.
The data OneDrive will be be only shared within the research consortium

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

The OMFS-IMPATH research group as the co-ordinator of the consortium will cover the costs for the data managment

Data Preservation after the end of the Research Project

Which data will be retained for 10 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 will be preserved for 10 years according to KU Leuven RDM policy

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

- Large Volume Storage (longterm for large volumes)

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

The OMFS-IMPATH research group as the co-ordinator of the consortium will cover the costs for the data managment

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.

- No (closed access)

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

The members of the project consortium

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, intellectual property rights
- No

Where will the data be made available?

If already known, please provide a repository per dataset or data type.

- Other (specify below)

Not applicable

When will the data be made available?

- Upon publication of research results

Which data usage licenses are you going to provide?

If none, please explain why.

- CC-BY 4.0 (data)

Do you intend to add a persistent identifier (PID) to your dataset(s), e.g. a DOI or accession number? If already available, please provide it here.

- No

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

The OMFS-IMPATH research group as the co-ordinator of the consortium will cover the costs for the data managment

Responsibilities

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

The OMFS-IMPATH research group as a co-ordinator, also the PhD students employed in the project

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

The OMFS-IMPATH research group as a co-ordinator, also the PhD students employed in the project

Who will manage data preservation and sharing?

The OMFS-IMPATH research group as a co-ordinator

Who will update and implement this DMP?

The OMFS-IMPATH research group as a co-ordinator. Prof. Reinhilde Jacobs and Dr. Mostafa EzEldeen