DMP title

Project Name dsDNA SLE project - DMP title

Project Identifier TBM-FWO

Grant Title T003419N

Principal Investigator / **Researcher** Xavier Bossuyt

Description Systemic lupus erythematosus (SLE) is a heterogeneous and chronic multisystem autoimmune disease that mainly affects women between puberty and menopause. Typical in these patients is the presence of circulating anti-dsDNA and other anti-nuclear autoantibodies, which serve as serological markers for SLE diagnosis. Anti-dsDNA autoantibodies are the most important biomarkers as their concentration is directly linked to disease activity. The ideal test for anti-dsDNA autoantibody measurement should be able to distinguish high versus low avidity anti-dsDNA antibodies, since low avidity antibodies are also present in healthy individuals and in other (auto)immune diseases. Assays to detect anti-dsDNA antibodies include the Crithidia luciliae assay, the Farr radioimmunoassay (RIA) and solid-phase immunoassays (e.g. ELISA). Farr-RIA has the highest specificity, but is not automated and requires radio-active material for detection of anti-dsDNA autoantibodies and is thus destined to disappear in the clinical laboratories. ELISA is the most commonly used test, but has a low specificity regarding SLE diagnosis as it also detects low avidity anti-dsDNA antibodies. The low specificity of ELISA in SLE diagnosis is not commonly known, resulting in high numbers of SLE misdiagnoses and these patients consequently incorrectly treated with harmful therapies. Additionally, due to the heterogeneity and rarity of SLE, many patients are diagnosed late, causing irreversible organ damage and increased morbidity in the patients. Therefore, this project aims to develop and validate an EvalutionÂ®-based method for reliable, easy and safe measurement of the high avidity anti-dsDNA autoantibodies to guide SLE diagnosis and treatment.

Institution KU Leuven

1. General Information

Name applicant

Professor Xavier Bossuyt

FWO Project Number & Title

T003419N: Development and validation of an assay to quantify anti-dsDNA antibody levels and avidity for more accurate diagnosis and monitoring of SLE

Affiliation

- KU Leuven
- Universiteit Gent

2. Data description

Will you generate/collect new data and/or make use of existing data?

- Generate new data

Describe the origin, type and format of the data (per dataset) and its (estimated) volume, ideally per objective or WP of the project. You might consider using the table in the guidance.

WP1 and WP2

	Raw data	**Analyzed data**	**Processed data**	**Estimated Volume**
Methods, protocols and SOPs	Word documents			1 MB
Evalution system	jpg and excel files	Excel files	Graphs and tables generated by excel (jpg) or Prism (pfzx)	3 GB
ELISA	Excel files	Standard curves in Excel files		50 MB
Critidia assay	jpg files	Excel files		1 GB
Farr-RIA	Excel files	Excel files		50 MB

WP3

Retrospective study: serum samples of SLE patients, disease controls and healthy controls are available at Serotheek of UZ-KU Leuven (-20°C). Clinical data that will be collected at KWS (UZ Leuven) and include personal information (e.g. age, gender) and clinical information (symptoms (e.g. fatigue, rash,...) and SLEDAI score). These will be orderly saved in excel files.

Prospective study: serum samples of newly diagnosed and follow-up SLE patients and disease controls will be collected during the project by clinicians of all participating centers. ICF (word file) will be taken from patients and disease controls. Serum samples of healthy controls will be collected at the Red Cross. Serum samples will be stored in tubes at -20°C in the Laboratory of Clinical and Diagnostic Immunology (KU Leuven). The clinical data include personal information (e.g. age, gender) and clinical information (symptoms (e.g. fatigue, rash,...) and SLEDAI score) and will be provided by the clinician. These will be orderly saved in excel files.

3. Legal & ethical issues

Will you use personal data? If so, shortly describe the kind of personal data you will use. Add the reference to the file in KU Leuven's Privacy & ethical review tool (PRET). Be aware that registering the fact that you process personal data is a legal obligation.

- Yes

The personal data that we will use are reported at the Ethical Committee of UZ Leuven and at the Ethical Committee of all participating centers (**S63277**).

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, add the reference to the formal approval by the relevant ethical review committee(s)

- Yes

At this moment, the project is under review by the Ethics Committee of UZ Leuven and all participating Belgian EC centers.

Does your work possibly result in research data with potential for tech transfer and valorisation? Will IP restrictions be claimed for the data you created? If so, for what data and which restrictions will be asserted?

- Yes

We will share and transfer the obtained results to clinicians and other laboratories on a non-profit basis. There are no restrictions on the freedom to operate for utilization of the project results. Once bought, the IP rights on a commercial product stop and, thus, there is freedom to operate. We will make all KU Leuven components of the assay available at cost price of production. We will negotiate with MyCartis the possibility to provide pre-coupled microparticles that are ready-to-use. We will share and transfer the obtained results (protocols and assay interpretation) to other Laboratories on a non-profit basis. Patient data will not be transfered to other laboratories or industrial partners.

Do existing 3rd party agreements restrict dissemination or exploitation of the data you (re)use? If so, to what data do they relate and what restrictions are in place?

- No

4. Documentation & metadata

What documentation will be provided to enable reuse of the data collected/generated in this project?

WP1&2: A read-me file in each map will be provide. For each DNA molecule, a separate map will be made. Protocols per experiment will be foreseen (word). We will start with optimizing coupling conditions of synthetic and native DNA molecules (coupling buffer, concentration, duration, number of steps,... will be mentioned in each separate experiment in word file). Optimal conditions will be determined by signal intensities (jpg files), standard deviation and CV's (excel files) and will be summarized in a word file. dsDNA concentration of serum samples will be determined by making a standard curve with the international dsDNA standard.

WP3: Undersigned informed consents will be stored in a map. Patient data will be pseudonimized for the main researcher (Maaike) and anonimized for other researchers and clinicians. Patient number will be linked to serum sample.

Will a metadata standard be used? If so, describe in detail which standard will be used. If no, state in detail which metadata will be created to make the data easy/easier to find and reuse.

- No

Since there is no formally acknowledged metadata standard specific to our discipline.

5. Data storage & back up during the FWO project

Where will the data be stored?

The generated data of this project will be stored on the server of UZ Leuven. During the research, serum samples will be collected (after having obtained informed consent), coded and stored at the Serotheek of UZ-KU Leuven, unless participating centers want to store the samples recruited at their center themselves. Storage of samples will be all according to the new GDPR guidelines. This serum bank will be used for the study and will also be available for future serological studies under the condition that approval has been granted by the ethics committee.

All the collected clinical data will be stored on the server of UZ Leuven in the folder of 'LaboratoriumGeneeskunde', which is only accessible for the staff of our group.

How is back up of the data provided?

The data will be stored on the UZ Leuven university hospital servers with automatic daily back-up procedures.

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 storage capacity of the server of UZ Leuven provides sufficient storage volume for our generated data.

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

We expect no costs for data storage and back up during the project

Data security: how will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

The data will be stored at the hospital's secure environment for private data. The files in which the patient data will be stored, is only accesible by the personnel of the lab. The patient data is pneumonized for the main researcher (Maaike Cockx), but

anonymized for the colleagues of the lab. The key will be stored in a separate file (separate from the experimental data).

6. Data preservation after the FWO project

Which data will be retained for the expected 5 year period after the end of the project? In case only a selection of the data can/will be preserved, clearly state the reasons for this (legal or contractual restrictions, physical preservation issues, ...).

All data (patient data, serum samples, methodologies,...) will be retained for the expected 5 year period, preferably for 25 years. If too much space is needed to store all the data, the raw data generated by the Evalution device will not be maintained after 10 years.

Where will the data be archived (= stored for the longer term)?

The data will be stored on the university's central servers (with automatic back-up procedures) for at least 10 years, conform the KU Leuven RDM policy.

What are the expected costs for data preservation during the retention period of 5 years? How will the costs be covered?

Everything will be stored on UZ Leuven server and is free of costs at this moment.

7. Data sharing and reuse

Are there any factors restricting or preventing the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)?

- Yes. Specify:

During the research, serum samples will be collected (after having obtained informed consent), coded and stored at the (Serotheek of UZ-KU Leuven). This serum bank will be used for the study and will also be available for future serological studies under the condition that approval has been granted by the ethics committee. Secundary use of collected serum samples by other laboratories is possible after our agreement.

Which data will be made available after the end of the project?

The methodologies and if successful, the data published in scientific publications. Serum samples will be available for secondary use in other relevant studies. All personal data regarding the patients will not be available.

Where/how will the data be made available for reuse?

- Upon request by mail

When will the data be made available?

- Upon publication of the research results

Who will be able to access the data and under what conditions?

Access will be granted upon written request by the creators of the dataset. Commercial reuse is not allowed.

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

We will share and transfer the obtained results to clinicians and other laboratories on a non-profit basis.

8. Responsibilities

Who will be responsible for data documentation & metadata?

Professor Xavier Bossuyt and Maaike Cockx

Who will be responsible for data storage & back up during the project?

Professor Xavier Bossuyt and Maaike Cockx

Who will be responsible for ensuring data preservation and reuse ?

Professor Xavier Bossuyt

Who bears the end responsibility for updating & implementing this DMP?

Professor Xavier Bossuyt bears the end responsibility of updating & implementing this DMP.