Welcome to this survey.

The purpose of this study is to gain a better understanding of what is needed to achieve reproducibility of experiments in science. The results of this study will help us in developing tools that support reproducibility. In turn, this will (hopefully) benefit the scientific community.

This survey should take around 10 minutes to complete. This survey is completely anonymous. We provide this survey in the context of DFG CRC/TRR ReceptorLight.

If you have any questions regarding this survey, please contact Sheeba Samuel (sheeba.samuel@uni-jena.de) or Prof. Dr. Birgitta König-Ries (birgitta.koenig-ries@uni-jena.de).

Section A: Privacy Policy/Datenschutzerklärung

Dear scholar,

From 25th May 2018, the new General Data Protection Regulation (GDPR) (in German: Datenschutz-Grundverordnung, DSGVO) has come into effect. For compliance reasons, we are obliged to get your consent on the privacy policy before collecting any kind of personal information.

The following information applies as a supplement to the general privacy policy of the Friedrich Schiller University Jena. We request you to please kindly read both policies carefully and to agree.

Please note, as the Friedrich Schiller University Jena is headquartered in Germany, only the German version of this privacy policy is legally binding.

Liebe Wissenschaftlerinnen und Wissenschaftler,

Am 25. Mai 2018 trat die Datenschutz-Grundverordnung (DSGVO, https://dsgvo-gesetz.de/) in Kraft. Um Ihre personenbezogenen Daten erheben und verarbeiten zu können, benötigen wir daher aus rechtlichen Gründen zunächst Ihre Zustimmung zur Datenverarbeitung.

Die folgende Erklärung dient als Ergänzung zur Datenschutzerklärung der Friedrich-Schiller-Universität Jena. Wir möchten Sie bitten, beide Dokumente gründlich durchzulesen und mit Ihrer Einwilligung zu bestätigen, dass Sie der Datenverarbeitung zustimmen.

Privacy Policy (English) Datenschutzerklärung (Deutsch) Definition We use common language instead of more formal terms throughout this policy. To help ensure your understanding of some particular key terms, here is a table of translations:

When we say…

…we mean

"Friedrich Schiller University Jena"/"we"/"us"/"our" The Friedrich Schiller University Jena that conducts this survey. "this survey" The forms on this website that collect your answers. "personal information" Information you provide us or information we collect from you that could be used to personally identify you. We consider at least the following to be "personal information":

IP address, operating system, browser

"third party" Individuals, entities, websites, services, products, and applications that are not controlled, managed, or operated by the Friederich Schiller University Jena Collection and Use of Information How do we collect personal information?

In this survey, we only collect data about your research contexts such as primary research fields and your research practice. All questions are not mandatory. You can omit questions you can not answer or you do not want to answer.

While browsing, some general information is stored in the server log files. We collect (1) the browser type and version used, (2) the operating system used by the accessing system (3) the date and time of access to the Internet site (4) and the Internet protocol address (IP address).

All this information is needed to deliver correct website content and to optimize web content continuously. In the case of cyber-attacks, log files provide necessary information for criminal prosecution.

How do we use that information?

We use your answers to gain better understanding of what is needed to achieve reproducibility of experiments in science and to understand the research practices followed in different science domain.

The results of this study will help us in developing tools, methods and workflows that support reproducibility. In turn, this will benefit the scientific community.

Sharing We support the idea of generating only FAIR data. Thus, we intend to publish all answers as open data in a data

Section B:

Research Context

In this section, we would like to know about your research background.

B1. What is your current position?

Student ☐

PhD Student ☐

Research Associate ☐

PostDoc ☐

Junior Research Group Leader/ Junior Professor ☐

Technical Assistant ☐

Lecturer ☐

Data Manager ☐

Professor ☐

Other ▼

Other

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B2. **What is your primary area of study?**

Molecular Biology ☐

Cell Biology ☐

Microbiology ☐

Neuroscience ☐

Biology(other) ☐

Chemistry ☐

Plant Sciences ☐

Health Sciences ☐

Environmental Sciences ☐

Physics ☐

Computer Science ☐

Other ▼

Other
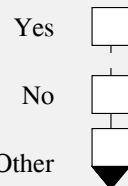
Section C:

Reproducibility

Reproducibility is the ability of getting the same (or close-by) results when repeating an experiment under different conditions of measurement (e.g. experimental setup, experimenter).

Reproducibility crisis refers to the growing belief that the results of many scientific studies are difficult or impossible to reproduce on subsequent investigation, either by independent researchers or by the original researchers themselves.

C1. **Do you think there is a reproducibility crisis in your field of research?**

Yes ☐

No ☐

Other ▼

Other

☐

C2. **In your experience, what are the factors leading to poor reproducibility?**

Lack of sufficient metadata regarding the experiment (e.g. culturing conditions, environmental conditions, software version) ☐

Lack of data that is publicly available for use (e.g. code, methods, results) ☐

Lack of complete information in the Methods/Standard Operating Procedures/Protocols ☐

Poor experimental design ☐

Lack of resources like equipments/devices in your workplace ☐

Lack of the information related to the settings used in original experiment (eg. Experiment Setup, Instrument Settings) ☐

Difficulty in understanding laboratory notebook records ☐

Pressure to publish ☐

Lack of knowledge or training on reproducible research practices ☐

Lack of time to follow reproducible research practices ☐

Data privacy (e.g. Data sharing with third parties) ☐

Other

Section D:

Measures to ensure reproducibility

In this section, we would like to know about the measures taken in your field of research to ensure reproducibility.

D1. **How easy would it be for you to find all the experimental data related to your own project in order to reproduce the results at a later point in time (e.g. 6 months after the original experiment)?**

	Very Easy	Easy	Neither Easy nor difficult	Difficult	Very difficult
Input Data	☐	☐	☐	☐	☐
Metadata about the methods	☐	☐	☐	☐	☐
Metadata about the steps	☐	☐	☐	☐	☐
Metadata about the experimental setup	☐	☐	☐	☐	☐
Results	☐	☐	☐	☐	☐

D2. **How easy would it be for a newcomer in your workplace to find all the experimental data related to your project/experiment without any/limited instructions from you?**

	Very Easy	Easy	Neither Easy nor difficult	Difficult	Very difficult
Input Data	☐	☐	☐	☐	☐
Metadata about the methods	☐	☐	☐	☐	☐
Metadata about the steps	☐	☐	☐	☐	☐
Metadata about the experimental setup	☐	☐	☐	☐	☐
Results	☐	☐	☐	☐	☐

D3. Have you ever been unable to reproduce published results of others?

Yes ☐

No ☐

Never tried to reproduce others published results ☐

D4. Has anybody contacted you that they have a problem in reproducing your published results?

Yes ☐

No ☐

D5. Do you repeat your experiments to verify the results?

Yes ☐

No ☐

Sometimes ☐
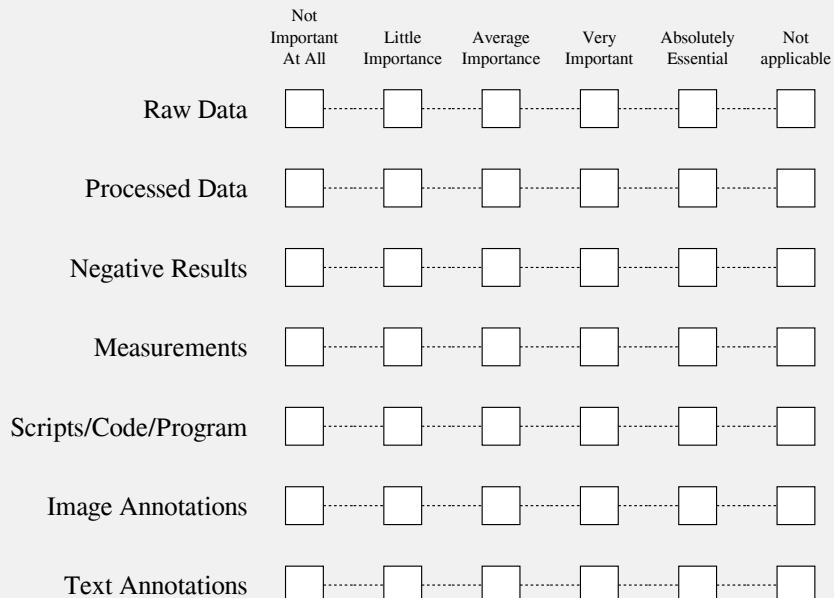
Section E:

In order to reproduce published experiment results...

In this section, we would like to know the factors that are important for you to understand a scientific experiment in your field of research to enable reproducibility.

In order to reproduce published experiment results, what is your opinion on sharing metadata...?

E1. What is your opinion on sharing experimental data?

	Not Important At All	Little Importance	Average Importance	Very Important	Absolutely Essential	Not applicable
Raw Data	☐	☐	☐	☐	☐	☐
Processed Data	☐	☐	☐	☐	☐	☐
Negative Results	☐	☐	☐	☐	☐	☐
Measurements	☐	☐	☐	☐	☐	☐
Scripts/Code/Program	☐	☐	☐	☐	☐	☐
Image Annotations	☐	☐	☐	☐	☐	☐
Text Annotations	☐	☐	☐	☐	☐	☐

E2. **What is your opinion on sharing metadata regarding experimental requirements?**

	Not Important At All	Little Importance	Average Importance	Very Important	Absolutely Essential	Not applicable
Experiment Materials	☐	☐	☐	☐	☐	☐
Instruments/Devices Used	☐	☐	☐	☐	☐	☐

E3. **What is your opinion on sharing metadata regarding settings?**

	Not Important At All	Little Importance	Average Importance	Very Important	Absolutely Essential	Not applicable
Instrument Settings	☐	☐	☐	☐	☐	☐
Experiment Environment Conditions	☐	☐	☐	☐	☐	☐
Publications used	☐	☐	☐	☐	☐	☐

E4. **What is your opinion on knowing the names and contacts of people/organizations who are involved directly (eg. Experimenter, Supervisor) or indirectly (eg. Manufacturer, Distributor) in your experiment and their roles?**

	Not Important At All	Little Importance	Average Importance	Very Important	Absolutely Essential	Not applicable
Names of people who are directly involved	☐	☐	☐	☐	☐	☐
Contacts of people who are directly involved	☐	☐	☐	☐	☐	☐
Roles of people who are directly involved	☐	☐	☐	☐	☐	☐
Names of people who are indirectly involved	☐	☐	☐	☐	☐	☐
Contacts of people who are indirectly involved	☐	☐	☐	☐	☐	☐
Roles of people who are indirectly involved	☐	☐	☐	☐	☐	☐

E5. **What is your opinion on sharing metadata regarding time, duration, and the location of experiments?**

	Not Important At All	Little Importance	Average Importance	Very Important	Absolutely Essential	Not applicable
Date	☐	☐	☐	☐	☐	☐
Time	☐	☐	☐	☐	☐	☐
Duration	☐	☐	☐	☐	☐	☐
Location	☐	☐	☐	☐	☐	☐

E6. What is your opinion on sharing metadata regarding software used?

	Not Important At All	Little Importance	Average Importance	Very Important	Absolutely Essential	Not applicable
Software Parameters	☐	☐	☐	☐	☐	☐
Software Version	☐	☐	☐	☐	☐	☐
Software License	☐	☐	☐	☐	☐	☐
Scripts/Code/Program	☐	☐	☐	☐	☐	☐

E7. What is your opinion on sharing metadata regarding all the steps and plans?

	Not Important At All	Little Importance	Average Importance	Very Important	Absolutely Essential	Not applicable
Laboratory Protocols	☐	☐	☐	☐	☐	☐
Methods	☐	☐	☐	☐	☐	☐
Activities/Steps	☐	☐	☐	☐	☐	☐
Order of Activities/Steps	☐	☐	☐	☐	☐	☐
Validation Methods	☐	☐	☐	☐	☐	☐
Quality Control Methods	☐	☐	☐	☐	☐	☐

E8. What is your opinion on sharing the intermediate and final results of each trial of your experiments?

	Not Important At All	Little Importance	Average Importance	Very Important	Absolutely Essential	Not applicable
Final Results	☐	☐	☐	☐	☐	☐
Intermediate Results	☐	☐	☐	☐	☐	☐

E9. Please let us know what else should be shared when publishing experimental results.

Section F:

Experiment Workflow/Research Practices

In this section, we would like to know about your experiment workflow and your research practices.

F1. **What kind of data do you work primarily with?**

Images ☐

Multimedia files (Video, Audio) ☐

Measurements ☐

Graphs ☐

Tabular ☐

Other ▼

Other

> [ ]

F2. **Where do you store your experimental data files?**

Personal Devices (eg. Computer) ☐

Local Server provided at your workplace ☐

Removable Storage Device (eg. USB, Harddisk, CD Drive) ☐

Version Controlled Repositories (eg. Github, GitLab, Figshare, Zenodo etc.) ☐

Data Management Platforms ☐

Other ▼

Other

> [ ]

F3. **Where do you save your experimental metadata like descriptions of experiment, methods, samples used?**

	Primary Source	Secondary Source	Other
Hand written Lab Notebooks	☐	☐	☐

	Primary Source	Secondary Source	Other
Electronic Notebooks	☐	☐	☐
Data Management Platforms	☐	☐	☐
Other	☐	☐	☐

F4. **Do you write scripts or program to perform data analysis at any stage in your experimental workflow?**

Yes ☐

No ☐

Sometimes ☐

F5. **Have you heard about the FAIR (Findable, Accessible, Interoperable, Reusable) principles?**

Yes ☐

No ☐

Heard, but I don't know what exactly FAIR means ☐

F6. **Does your research follow the FAIR (Findable, Accessible, Interoperable, Reusable) principles?**

	Always	Often	Sometimes	Rarely	Never
Findable	☐	☐	☐	☐	☐
Accessible	☐	☐	☐	☐	☐
Interoperable	☐	☐	☐	☐	☐
Reusable	☐	☐	☐	☐	☐

F7. **Please feel free to provide comments regarding what you think is important to enable understandability and reproducibility of scientific experiments in your field of research.**