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# ENLIGHT Open Science Toolkit

ENLIGHT RISE - RESEARCH AND INNOVATION AGENDA WITH AND FOR SOCIETY:  
LEVERAGING DIGITAL INNOVATION FOR A GREENER AND HEALTHIER EUROPE

*This Open Science, Open Access, and Research Data Management (RDM) Starter Kit brings together basic arguments and information on how to get started, generic information and information on OA and RDM – where to get started, where are places to get information for example on GDPR, DMPs, data repositories, required policies, licenses etc. The first version of this toolkit was part of the deliverable D7.3 of ENLIGHT RISE\*. Beyond the project, it is now maintained by the Open Science experts of the partners in ENLIGHT.*

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## Executive Summary

This toolkit aims to provide essential information for researchers, students, staff, and other people affiliated with ENLIGHT partner universities on Open Science (OS), with a focus on Open Access (OA) and Research Data Management (RDM). We offer information on OS terms and concepts and a guide on what services and online tools are available locally. ENLIGHT partners built this toolkit based on network materials, considering the needs of ENLIGHT universities. This is complemented by pointers to information and services available through European research community initiatives. The toolkit is not an exhaustive resource; further inquiries can be made to your local [Open Science experts](#).

## I Introduction

For the benefit of scientists and society at large, Open Science is a set of concepts and practices that aim to make scientific knowledge from all domains available to everyone. To ensure that scientific information is accessible to all, inclusive, egalitarian, and sustainable knowledge creation must also be ensured.

According to the [UNESCO Recommendation on Open Science](#), Open Science: “increases scientific collaborations and sharing of information for the benefits of science and society; makes multilingual scientific knowledge openly available, accessible and reusable for everyone; and opens the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community.”

Furthermore, [Open Science is also a priority for the European Commission](#) since it enhances research quality, effectiveness, and responsiveness. Open Science is a strategic objective for the European Commission and the usual manner of operation under its research and innovation financing programs. In addition, many private and third-party funders are also increasingly requiring various aspects of Open Science in their funding streams.

Within ENLIGHT, the Open Science experts of all partners have joined forces in the Open Science Network. To encourage Open Science principles and practices within partner universities, the Open Science Network has come up with a toolkit that is mainly targeting researchers with fundamental questions about Open Access, Open Science, and Research Data Management.

The academic community is strengthened by openness and transparency, and the

dissemination of research findings to the public and within the research community is sped-up and improved.

## II Open Science Basics

### What is Open Science?

From the perspective of its ambition, Open Science is a global movement that aims to make scientific research and education openly available, accessible, transparent, and usable by everyone. In practical terms, Open Science is an umbrella term for a range of practices that range from (open) educational materials to opening up the entire research process and creating new opportunities for interaction, collaboration, and engagement between academia and society.

More information:

[Open Science – \(University of Groningen\)](#)

[Open Science – \(Georg-August-Universität Göttingen\)](#)

[Open Research Practices - \(University of Galway\)](#)

[Open Science - \(Ghent University\)](#)

[Open Science - \(University of Bordeaux\)](#)

### What is Open Access (OA)?

Open Access (OA) is a mechanism by which research outputs are made freely accessible for everyone, free of charge to the user, and reusable with only limited copyright restrictions. Open Access makes peer-reviewed scholarly research and literature freely available online to anyone interested in reading and reusing it. There are two primary areas of open access to scientific knowledge in research and innovation:

- scholarly works that have undergone peer review, e.g., journal articles for scholarly periodicals or monographs,
- data used in research includes data that supports publications as well as other data (e.g., curated but unpublished datasets or raw data).

A substantial share of current scholarship is still behind paywalls; therefore, only those who can afford access can contribute to moving knowledge of a subject forward.

Scholarly journals can be costly in terms of subscription costs, but also in terms of Open Access publication fees. This makes scholarly research expensive for institutions and individual researchers. Several research funders allow the use of project funds to cover costs related to Open Access publishing. Moreover, some institutions have negotiated agreements with publishers to control and monitor the costs. Some institutions offer additional financial

support through Open Access publication funds. Note, however, that many Open Access journals do not charge publication fees (so-called “diamond Open Access” journals) and that some institutions invest in infrastructure to support diamond open access.

More information:

[Open Access - \(University of Tartu\)](#)

[Open access in practice – \(Uppsala University\)](#)

[Open Access Publishing \(University of Galway\)](#)

[Open Access - \(University of Groningen\)](#)

[Publishing & Open Access - \(University of Göttingen\)](#)

[Scholarly publishing and Open Access - \(Ghent University\)](#)

### What is the research data life cycle?

The research data lifecycle is a crucial concept within Research Data Management (RDM). It describes the research data's stages before, during, and after a research project. Various data management activities occur within each stage of the data lifecycle. It represents a structured framework that encompasses the entire lifespan of research data and highlights the important steps in managing and utilizing data effectively. The specific stages may vary slightly depending on the field or context, but the general research data life cycle (**cf. Figure 1<sup>1</sup>**) typically includes planning, collecting, storing & protecting, processing, archiving, publishing, and discovering/re-using/citing scientific articles.

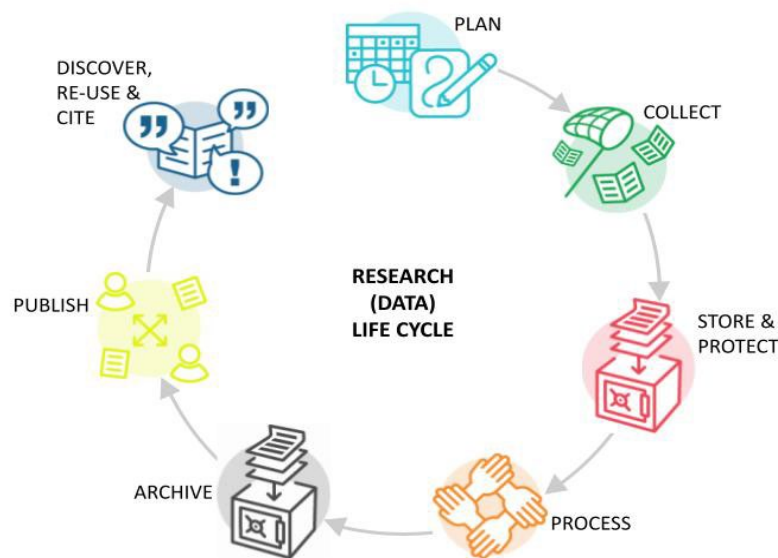


Figure 1. Research (Data) Life Cycle, courtesy of the [University of Groningen DCC](#)

<sup>1</sup> Image Source: University of Groningen, *Research (Data) Life Cycle*  
<https://www.rug.nl/digital-competence-centre/research-data/?lang=en>

More information:

[The research data lifecycle: What is it? - \(Ghent University\)](#)

### **What is FAIR data?**

The FAIR Data Principles (Wilkinson et al., 2016) were developed to provide guidance in the process of making data **F** - findable (others can discover the data), **A** - accessible (data can be made available to others), **I** - interoperable (data can be integrated with other data), and **R** - reusable (others can understand and reuse data). The goal of applying the FAIR Data Principles is to enable and enhance the reuse of data (and other digital objects) for both humans and machines. Research data can be managed without a view to data sharing, in which case they are neither open nor FAIR (Higman, Bangert & Jones, 2019). Nevertheless, there are increasing expectations from research funders and other stakeholders to share research data.

### **What is Research Data Management (RDM)?**

Research Data Management is a broad term encompassing all practices and actions to ensure that research data are secure, sustainable, easy to find, understandable, and (re)usable. RDM includes activities such as planning, collecting and organizing, documenting, storing and backing up, preserving, and sharing research data. It is about taking proper care of data, not only during a research project but also in the longer term.

More information:

[Research Data Management \(RDM\) – \(Ghent University\)](#)

[Research Data Management – \(University of Galway\)](#)

[Research Data Management – \(University of Groningen\)](#)

[Research Data – \(Uppsala University\)](#)

### **What is open (research or scholarly) infrastructure?**

Open (research or scholarly) infrastructure refers to sets of services, protocols, standards, and software along the research life cycle, typically collectively built and managed to deliver new or improved collective benefits without restrictions and for a healthy global interrelated infrastructure system. Initiatives in support of open infrastructures address, e.g., [good practice principles](#) and advocate for and organize collective funding (e.g., [Invest in Open Infrastructure](#), and [SCOSS](#)).

**Does my university have an Open Access, RDM, or Open Science policy or regulations?**

- The University of the Basque Country has an [institutional policy and legal framework](#).
- The University of Bern has an [institutional policy](#) (will be updated in 2025).

- **The University of Bordeaux** has an [Open Science roadmap](#).
- **The University of Galway** [Open Access to Research Outputs Policy](#) and [Research Data Management Policy](#).
- **Ghent University** introduced a new [policy for scholarly publishing](#) as of January 1, 2023.
- **The University of Groningen** has an [Open Access policy](#), and a [RDM policy](#) (as of February 2025).
- **The University of Göttingen** supports Open Science through its policies and support measures for its practical implementation. In April 2014 (update published in 2024), a joint [research data policy](#), and in November 2016 (update published in 2025), a joint [policy on Open Access to publications](#) was adopted by the University of Göttingen and the University Medical Center Göttingen.
- **The University of Tartu, the University of Comenius, and the University of Uppsala** do not yet have an OA, RDM, or OS policy.

### III Open Access (OA) publishing

OA is based on the idea that publicly funded research should be free to read and download so that the results are freely reusable while retaining your copyright as an author. OA publishing transforms the traditional scholarly publishing model, making research accessible to all and fostering a more equitable, collaborative, and impactful global research community. In this section, you will find answers to some common questions.

#### What do the more common types of Open Access publishing models mean?

##### Immediate OA

Immediate Open Access means that the article or the book becomes immediately openly available online.

##### Embargoed OA

Embargoed Open Access means that the article, book, or other research output can only be made openly available with some specified delay (embargo period).

##### Green OA

Green Open Access typically involves depositing an accepted version of your publication manuscript in an (institutional) repository.

##### Gold OA

Gold Open Access means the primary publication is immediately openly available (e.g., journal article or book). This approach often operates on the basis of paying an Article

Processing Charge (also known as “article publication charges”, “author processing charge” or APCs) to the publisher. Most of these publishers or journals do not ask authors to transfer their copyright and apply a Creative Commons license to their content.

### **Hybrid OA**

The author publishes in a traditional subscription journal that offers Open Access publication for individual articles on payment of an Article Processing Charge (APC). Institutional read & publish agreements, or transformative agreements, can facilitate hybrid OA.

### **Bronze OA**

Bronze OA articles are free-to-read on the publisher's website, without an explicit open license specifying possible reuse. There is no guarantee that these articles will stay openly available over time.

### **Diamond OA**

The author publishes in a fully Open Access journal or platform that does not charge publication fees (APCs). Diamond OA relies on alternative funding models (e.g., support from institutions and scholarly societies).

### **Publishing - predatory**

When you submit your article to a journal, ensure you are not dealing with a publisher that uses predatory practices. Predatory practices can be used by all sorts of journals, ranging from bad communication practices such as spamming to flagrant fraudulent practices such as fake editors, fake or absent peer review, false claims of indexing, and excessive self-citation. You can often recognize predatory publishers through aggressive marketing strategies and spam emails. Yet predatory journals may look legitimate at first sight. If you're concerned about the trustworthiness of a journal, consult with colleagues in your field.

[ThinkCheckSubmit](#) is a recommended tool for identifying a trusted journal or publisher for your research.

More information:

[Predatory publishers - \(University of Groningen\)](#)

[Open Access Publishing - Frequently asked questions \(University of Göttingen\)](#)

[Assess the quality of a journal - Ghent University](#)

### **How can I find a good quality journal to publish my article?**

Researchers can choose from thousands of scholarly journals to disseminate their research results. One of the most straightforward approaches to narrowing down where to submit your work is to start with journals that you read and cite yourself. Your library may have agreements with publishers—sometimes called “read and publish” or “transformative agreements”—that can reduce the cost of article processing charges



(APCs) for publishing open access in hybrid or fully open access journals.

In addition to avoiding so-called “predatory journals” (see above), there are several tools and directories that can help you to find the right venue for your work:

- [Directory of Open Access Journals](#) (DOAJ): general directory of Open Access journals that must meet rigorous criteria before they can be indexed
- [Journal Checker tool](#) (Plan S): a tool where you can check whether a journal complies with your funder and institutional mandates
- [OA.finder](#) (Open Access Network): a tool where you can enter your publication type, role, and organization to generate a list of potential journals/publishers; primarily focused on publishers in Switzerland, Germany, and Austria
- [Committee on Publication Ethics](#) (COPE): directory of more than 15,000 publishers and other organizations that are dedicated to upholding integrity in research publishing

More information:

[Finding Open Access journals - \(Bern University\)](#)

[Assessing the quality of journals – \(Ghent University\)](#)

[Journals - Publishing your research - \(University of Galway\)](#)

### **What are Article Processing Charges (APC)?**

Article processing charges (APCs) and book processing charges (BPCs) are author-facing fees that are (sometimes) charged to publish open access. These fees may be covered by the author, the author's institution, or by the research funder. APCs are usually charged for publication in gold and hybrid journals, while diamond journals do not charge a fee for Open Access publication. APCs and BPCs vary enormously from journal to journal and publisher to publisher. We advise that you consult the journal's/publisher's webpages for information on APCs and BPCs prior to submission. The Directory of Open Access Journals ([DOAJ](#)) also provides information on APCs and possible waivers.

### **Where can I find an Open Access Repository?**

In addition to your institutional repository, you can use various tools to find Open Access Repositories: the Registry of Open Access Repositories ([ROAR](#)), with the aim to promote the development of Open Access by providing timely information about the growth and status of repositories throughout the world. Open access to research maximises research access and thereby also research impact, making research more productive and effective. The Confederation of Open Access Repositories ([COAR](#)) is an international association that brings together individual repositories and repository networks in order to build capacity, align

policies and practices, and act as a global voice for the repository community.

You can also check your local institution if there is an Open Access publication repository:

[University of Bern](#) (DSpace)

[University of Bordeaux institutional repository](#) (DSpace)

[University of Galway Research Repository](#) (DSpace)

[Biblio - Ghent University](#)

[University of Göttingen's GRO.publications](#)

[The University of Tartu ADA](#) (DSpace),

[Uppsala University institutional repository](#)

[List of ENLIGHT data repositories is below.](#)

### **What do I need to keep in mind when sharing through researcher networks/platforms?**

When sharing publications with others, typically via a commercial sharing or scholarly collaboration network websites (e.g., ResearchGate, Academia), you need to check publishers' policies about which versions of content can be publicly posted online and when the content can be posted (some publishers request embargos). Ultimately, it means sharing in a way that does not undermine the sustainability of the high-quality publications on which research and learning depend.

### **Am I allowed to make my published article openly available?**

In order to find out if you are allowed to share your published article or other works via a repository, website, or other means with others, you should consult the publisher's OA policy. [Open Policy Finder](#) (formerly Sherpa/Romeo) is an online resource that aggregates and analyses publisher OA policies from around the world and provides summaries of publisher copyright and open access archiving policies on a journal-by-journal basis.

### **What is a preprint?**

There is still another legal way of making your article openly accessible and, at the same time, publishing it in a high-quality journal – this is archiving it in a preprint archive. A preprint is an article manuscript that may have been submitted to a journal but has not yet undergone revisions after peer review; the notion of preprint is also applied to conference papers and reports.

More information on Open Access publishing:

[How to publish Open Access – \(Ghent University\)](#)

[Step-by-step guide to Open Access publishing – \(University of Groningen\)](#)

[Open Access to publications - \(University of Tartu\)](#)

[Open Access Publishing - \(University of Galway\)](#)

[Open Access Publishing - \(University of Bordeaux\)](#)

[Open Science and Open Access - \(Uppsala University\)](#)

### **Where to find Open Access journals or books? What are DOAJ and DOAB?**

Open Access journals and books provide direct open access upon publication. To find a peer-reviewed Open Access journal, you can consult the Directory of Open Access Journals ([DOAJ](#)) and browse OA journals by subject. Some Open Access journals require authors to pay a fee, article processing charges (APC).

- [DOAJ](#) is a community-curated database of Open Access journals that use an appropriate quality control system and open licenses.
- Directory of Open Access Books ([DOAB](#)) is a discovery service that indexes and provides access to peer-reviewed Open Access books.

### **What are open journal publishing platforms?**

Open journal platforms like Open Journal Systems (OJS) or Janeway enable research institutions to provide peer-reviewed diamond open access services. These platforms cover most aspects related to the publication of academic journals, starting from the creation of the journal's web page up to different activities in publishing a journal – submission of articles by authors, expert evaluation, publishing, archiving, metadata and full text search. Open journal publishing platforms help manage the journal's work, monitor the activities of the authors, editors, and reviewers, inform the readers, and help organize the paperwork.

Open Journal publishing platforms within the ENLIGHT network:

- Bern Open Publishing (BOP) for [journals](#) and [books](#)
- [The University of Bordeaux platform](#) for journals proposes an open-access digital publishing service for researchers.
- [OJS-de.net](#) is a German-language information platform that provides information on founding and operating an Open Access journal using the free open source software OJS (Open Journal Systems).
- [Openjournals UGent](#) offers services for Open Access journals and conference.
- A [journal service](#) based on OJS is under development for the University of Göttingen.
- The University of Tartu Library offers the opportunity to publish open-access journals on the [Open Journal System publishing](#) platform. OJS (Open Journal System) is a system for publishing online journals used for publishing and managing the University of Tartu Open Access journals. The OJS platform includes peer-reviewed journals published by the University of Tartu (incl. the UT Press), containing full texts of articles in Estonian, English, and Russian.
- The Publications Service of the UPV/EHU has an [OJS platform](#) to manage the journals it publishes.

- Uppsala University [OJS platform](#) for journal proceedings.

### **What kind of publishing agreements do ENLIGHT Network institutions have?**

- [Publishing deals and agreements](#) for the staff of the University of the Basque Country
- [Publishing deals and agreements](#) for the staff of the University of Bern
- [Publishing deals and agreements](#) for the staff of the University of Galway
- [Publishing deals and agreements](#) for the staff of the University of Groningen
- [Publishing deals and agreements](#) for the staff of the University of Göttingen
- [Publishing deals and agreements](#) for the staff of the University of Tartu
- [Publishing deals and agreements](#) for the staff of the University of Uppsala
- [Supported Open Access initiatives](#) Ghent University
- The University of Comenius currently does not have any publishing agreements.

### **What are the different journals' data availability policies?**

Current journal data availability policies range from mere encouragements to share data (and related research materials) that underpin publications to hard mandates. The specific requirements regarding data availability can usually be found on a journal's website (e.g., in the editorial policies or instructions for authors).

[Journal and publisher policies on data — \(Ghent University\)](#)

## **IV Copyright**

Making scholarly publications accessible in open access can be challenging due to copyright restrictions. Because traditional publishers tend to demand a transfer of copyright, they become the rights holders of the publications, thus permission needs to be granted by them to open the publications in open access, unless there are legal mechanisms that allow researchers a so-called “secondary publishing right”. This means the law enables researchers to disseminate their publication in open access under certain conditions without needing to ask for permission.

Open Access publishers typically don't ask for a transfer of copyright. They ask for a non-exclusive license to publish the papers, attaching an open license, typically a Creative Commons license, to indicate the conditions for re-use.

Below is a list of measures researchers can use to deal with copyright.

**Belgium:** [The basics of Belgian law](#) describe the fundamental aspects of Belgian copyright. Belgium introduced a secondary publishing right to support [Open Access in Belgian legislation](#) (Ghent University) in 2018. This law gives authors the right to make the Author

Accepted Manuscript (AAM) of peer reviewed scholarly journal articles available in Open Access with a maximum embargo period of 12 months for Social Science & Humanities (SSH) and 6 months for other disciplines if the publication is a result of research funded for at least 50% by public funds and if there is a connection with Belgium. The source of the first publication must be mentioned.

Ghent University uses this law to mandate Open Access for scholarly journal articles in its [policy on scholarly publishing](#).

**Germany:** Since the beginning of 2014, the [right of secondary publication](#) (in German) has been in force in Germany (§ 38 (4) of the Copyright Act (UrhG)). Under certain conditions, authors can make the manuscripts of their scientific articles published in journals freely accessible via the Internet one year after their first publication. The right can be exercised by the authors themselves. However, you can also commission an institution, e.g., a library, to put the manuscript online for free access. According to the current understanding, the regulation applies to articles published since the law came into force, regardless of which rights were transferred to the publisher with the publication contract.

**Ireland:** The Secondary Rights, Copyright, Open Access, Institutional Policies, and Rights Retention" ([SCOIR](#)) project is drafting secondary rights legislation for Ireland and creating an Open Access and Rights Retention policy framework for institutions and funders. The project is funded by the [National Open Research Forum](#).

**The Netherlands:** [The Copyright Act](#) of the Netherlands. Article 25fa of the Dutch Copyright Act (Aw, Auteurswet), also known as the [Taverne amendment](#), grants the author of any short scientific work that is fully or partly financed by Dutch public funds the right to make this work freely available to the public, following 'a reasonable term' after its publication. The Copyright Act is a so-called mandatory law and takes precedence over contract law. Therefore, Article 25fa Aw supersedes any agreement made between the author and the publisher. Based on this, the UG decided to introduce the [Open Access procedural regulations for short academic works by UG staff members](#), whereby publications by UG authors are automatically made available through the institutional repository (Pure) six months after their first publication in a journal or edited book.

**Estonia:** [The Copyright Act](#) allows free access to materials for scientific and educational reasons, including for text and data mining.

## Licensing

When you submit an article to a traditional journal, you may have to transfer your copyright by signing a 'copyright transfer agreement.' When you publish in Open Access journals, you retain the copyright and give a non-exclusive license to the publisher. In most cases, Open Access publications are published under public copyright licenses (such as Creative

Commons licenses). This means that you retain the copyright and indicate (by way of license) what others may do with the article.

### **What license do I need to publish my work?**

[Creative Commons](#) is an open license for copyrighted works. These licenses allow certain, globally recognized, standardised re-use of copyrighted material. It is a so-called upfront license. You don't have to ask for permission to access, share, or use a protected work; the permission is granted automatically, and conditions are clearly indicated. If you want to give people the right to share, use, and even build upon your work, consider publishing it under a Creative Commons license.

You can also try to use the license choosing tool, [Choose a License \(creativecommons.org\)](https://creativecommons.org/licenses/)

More information:

[Creative Commons: open license for copyrighted works – \(Ghent University\)](#)

[Frequently asked questions about copyright - \(University of Groningen\)](#)

### **Can I keep the copyright to my publication if I publish Open Access?**

When you submit an article to a traditional journal, you may have to transfer your copyright by signing a 'copyright transfer agreement'. When you publish in Open Access journals, you retain the copyright. Open Access articles are published under public copyright licenses (such as Creative Commons licenses). This means that you retain the copyright and indicate (by way of license) what others may do with the article.

### **Can I benefit from the Rights Retention Strategy?**

[cOAlition S](#) has developed a Rights Retention Strategy to give researchers supported by a cOAlition S organisation the freedom to submit manuscripts for publication to their journal of choice, including subscription journals. Using this strategy, you retain copyright on the AAM of your publication by applying a cc licence and depositing the publication in a repository.

Read more: [Rights Retention Strategy | Plan S \(Coalition-s.org\)](#)

## **V Research Data Management**

Research Data Management is a broad term encompassing all practices and actions to ensure that research data are secure, sustainable, easy to find, understand, and (re)use.

RDM includes planning, collecting, organizing, documenting, storing and backing up, preserving, and sharing research data.

It is about taking proper care of data, not only during a research project, but also in the longer term.

[What is RDM? - Ghent University](#)

## Making data FAIR

### Why is FAIR data important?

If your research data is FAIR, it can be reused by fellow researchers from other institutions and disciplines. The benefits are, for instance:

- Better science - others can reproduce your findings, leading to more reliable research;
- Credit for your work - increased visibility and citations for your published articles and datasets;
- More impact - gain maximum potential from your dataset;
- Alignment with international standards and requirements of your institution and funder;
- Opportunities for new partnerships with fellow researchers and the broader community;

More information:

[FAIR data – \(Ghent University\)](#)

[FAIR data & Open Science – \(University of Groningen\)](#)

### How do you make your own data **FAIR**?

The practical steps required to make data FAIR differ depending on the scientific domain.

However, the FAIR Data principles, created as universal guidelines, aim to enhance the reusability of data. Creating a data management plan can assist in learning, considering, and deciding methods to make your data FAIR. This includes determining how to document your data, selecting relevant metadata, choosing file formats, establishing data access protocols, licensing the data, and adding persistent identifiers. To better understand these concepts, refer to the FAIR principles section. You can check your data FAIRness through various self-assessment tools (for example, [FAIR Data Self](#)



## Assessment Tool | ARDC)

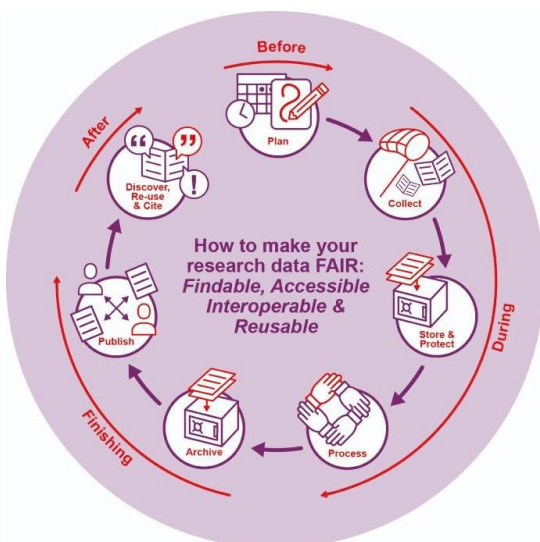


Figure 2 [FAIR data & Open Science](#) – (University of Groningen)

More information:

[FAIR data guide - \(University of Groningen\)](#)

[How to make your data FAIR? – \(Ghent University\)](#)

### Does FAIR always mean Open?

FAIR does not necessarily mean that your data is openly available to everyone, nor the other way around. There can be legitimate reasons to restrict access to your data, for instance, when this would affect participants' privacy, intellectual property rights, or commercial interests. Funders and institutions increasingly ask researchers to make their research data available to the research community and society. Although data can often be shared openly, sometimes access needs to be restricted. In these cases, data will only be shared if interested parties meet certain criteria. The leading principle is making your data 'as open as possible and as closed as necessary.' Placing data under restricted access is a way of making personal and sensitive data FAIR.

## Levels of Sharing

### How to share and cite data?

When **reusing existing data**, you must check and comply with the conditions of access and use. You may not be allowed to do whatever you want with the data, e.g., because of confidentiality or protection by intellectual property rights. Some data will be available as open research data, meaning they can be freely accessed and used. Some data will fall under the category of restricted data: in this case, specific access and/or use conditions are in place.



Terms and conditions of access and use depend on the nature of the data. At best, these terms are made explicit in advance by means of a specified access category and a license or user agreement. If not, you will have to find out yourself whether and how you can access and use the data and obtain any permissions needed. Terms and conditions of access and use depend on the nature of the data.

When **making research data publicly available**, it is important to let potential users know in advance what they are allowed to do with the data. Licensing is an effective way to communicate such permissions. A trusted data repository will normally apply a license to any dataset it holds, which you typically select (from a list of options) when depositing data. A good practice is to apply a standard and open license for open research data, as it ensures legal interoperability and the broadest possible reuse.

More information:

[Sharing data — \(Ghent University\)](#)

## Data Management Plan (DMP)

### What is a Data Management Plan (DMP)?

A Data Management Plan specifies how research data will be handled during and after a research project. It identifies key actions and strategies to ensure that research data are high-quality, secure, sustainable, and – to the extent possible – accessible and reusable. More and more research funders require a short data management statement or plan as part of the grant proposal process and a full-blown DMP after funding approval.

To get started with writing a DMP, consult the following guides and checklists. There is also guidance available on reviewing a DMP based on funder requirements. Typically, your local RDM support services will be available to provide feedback before you submit your DMP to a funder.

More information:

[Data management plan – \(University of Bordeaux\)](#)

[Writing your DMP – \(University of Galway\)](#)

[Preparing a Data Management Plan \(DMP\) — \(Ghent University\)](#)

[Data Management Planning – \(University of Groningen\)](#)

[Data Management Plan GRO.plan – \(University of Göttingen\)](#)

[Data Management Plan \(DMP\) – \(University of Tartu\)](#)

[Data Management Plans – \(Uppsala University\)](#)

### **Which online tools for Data Management Plans are available in the ENLIGHT Network?**

The University of Bordeaux uses [DMP OPIDoR](#), the French DMP tool.

The University of Comenius uses the DMPonline tool.

The University of Ghent uses [DMPonline.be](#), the Belgian DMP tool.

The University of Groningen uses [RDMP online support tool](#).

The University of Göttingen uses [GRO.plan](#).

The University of Tartu uses [DMPonline](#) tool.

### **What is a research data repository?**

A data repository is an online platform used to deposit completed datasets with the purpose of publishing, sharing, and/or preserving them. A data repository is a database infrastructure that compiles, manages, and gives access to data and associated metadata and documentation.

More information:

[How to preserve and share data in data repositories? - \(Ghent University\)](#)

### **How to choose a data repository?**

There are hundreds of data repositories or archives to choose from. Keep in mind, however, that not all repositories are equivalent. Some repositories focus more on disseminating and making your data visible than on ensuring its preservation in the long term.

Here are some basic tips to take into consideration:

Check the list of repositories recommended by your journal/publisher. Many journals and publishers with data-sharing policies recommend, and for some data types even require, the use of specific repositories.

Check best practices within your community by reaching out to peers, by reading data availability statements in publications, or by identifying research data management initiatives (e.g., Research Data Alliance (RDA)) in your scientific domain.

Check data portals that combine data from different data repositories (e.g., the EOSC Portal).

- Look for information about a specific repository or identify one suitable for your research data via the [Re3data](#) and [FAIRsharing](#) registries.
- Select a general-purpose repository, such as Zenodo or Open Science Framework, if no established repository exists for your research domain.

### **What is Re3Data?**

Data repositories are registered in [re3data](#). Re3data is a global registry of research data repositories that covers research data repositories from different academic disciplines. It includes repositories that enable permanent storage of and access to data sets to researchers,

funding bodies, publishers, and scholarly institutions.

## Trusted data repositories

A trusted data repository is the ideal storage location for your data and an interesting option to make your research data increase your scientific impact. Determining a suitable data repository depends on several factors, such as whether a discipline-specific repository already exists. What requirements on the data, the metadata, and the repository exist on the publisher's side if the research data accompany a publication? Which legal restrictions need to be accounted for, e.g., copyright, data protection, embargo periods required in the project's context?

Trusted data repositories meet the following characteristics:

- Provide broad, unbiased, and ideally open access to the repository's content, respecting legal and ethical limitations.
- Assign persistent identifiers to the content for referencing and citing.
- Manage metadata to enable discovery, reuse, and citation, and provide information about provenance and licensing. Metadata is machine-actionable and standardized.
- Ensure the preservation of the repository's content, also in the long term.
- Offer expert curation, guidance, and/or quality assurance services for the accuracy and integrity of datasets and metadata.
- Provide explicit information about policies.
- Run services, mechanisms, and/or provisions to secure the integrity and authenticity of the repository's content and prevent unauthorized access and release.

### What are some universal data repositories?

[Zenodo](#) is a repository for all research outputs from across all research domains and any file format, which promotes Open Access but also allows restricted or embargoed access. Zenodo is a service operated by CERN and was developed in the context of the European Commission-funded project [OpenAIREplus](#).

### ENLIGHT partners' data repositories

**The University of the Basque Country**- no institutional data repository.

**The University of Bordeaux** - no institutional data repository.

**Comenius University Bratislava** – data repository [DSpace](#)

**The University of Galway** - [Zenodo community](#)

**Ghent University** - there is no institutional data repository. There is a [data registry](#), incorporated in the [publications' repository](#).

**Ghent University** - [Ghent University Zenodo Community](#).

**The University of Groningen** – please consult our [Archiving & Publishing pages](#).

**The University of Göttingen**– data repository [GRO.data](#)

**The University of Tartu** – Data repository [DataDOI](#)

**The University of Uppsala** – no institutional data repository, but recommends the repository of [The Swedish National Data Service](#)

## VI European Open Science Initiatives

### Open Science in Horizon Europe

Open Science has been an integral part of the EU's research policy since 2015 and, based on this, of funding measures in the EU Framework Programmes for Research and Innovation. The EU Commission distinguishes between mandatory and recommended Open Science practices. In particular, scientific publications from EU-funded projects will be made openly accessible directly via suitable repositories (Open Access). In projects funded under Horizon Europe, responsible management of research data in line with the FAIR principles is mandatory, notably through the generalised use of data management plans (DMP), including regular updates, and ensuring open access to research data under the principle "as open as possible, as closed as necessary".

More information:

[Open Science in Horizon Europe – \(University of Göttingen\)](#)

[What are the open science requirements in Horizon Europe projects? – \(Ghent University\)](#)

### Open Research Europe (ORE)

In 2021, the EU Commission officially launched Open Research Europe ([ORE](#)), the Open Access publishing platform for scientific articles presenting research results funded by the EU framework programmes for research and innovation, Horizon 2020, and Horizon Europe (2021-2027). Publishing in Open Research Europe is an optional service. Because the EU Commission covers all costs upfront, there is no author fee or administrative burden. In January 2025, a group of 10 research funders signed a [statement of intent](#) to fund ORE for the public good collectively.

More information:

[Open Research Europe: what is it – \(Ghent University\)](#)

## Open Science in Horizon Europe – (University of Göttingen)

### European Open Science Cloud (EOSC)

The [EOSC](#) creates a virtual environment in which researchers, in particular, can use data across disciplines and national borders. The services of the EOSC are based on the "FAIR Principles". The EOSC is complemented by national initiatives. The [EOSC EU Node](#) is a platform designed to support multi-disciplinary and international research by promoting the use of FAIR data and related services across Europe and beyond. It provides researchers with user-friendly tools and essential support to plan, conduct, disseminate, and evaluate their research workflows and outcomes—both individually and collaboratively—within the broader EOSC ecosystem. The creation of the [EOSC Federation](#) of nodes—linking data repositories and services—is a key step toward advancing Open Science in Europe, with the current build-up phase marking the initial stage in developing a fully operational federation.

More information:

[Briefing Paper on EOSC: Federating Research Infrastructures in Europe for Fair Access to Data \(University of Göttingen\)](#)

## VII General OS tools and services

### Researcher Identifiers

#### What is a Researcher Identifier?

[ORCID](#) and [ResearcherID](#) (now the Web of Science ResearcherID) are two ways to uniquely identify a scientist. They are connected and improve each other.

ORCID (Open Researcher and Contributor ID) is the researcher's unique and persistent identifier, which distinguishes them from every other researcher and supports linking between the researcher and all of their professional activities, such as their research institution, grants, research projects, publications, and research results. ORCID guarantees the researcher's credentials as the owner of their results. ORCID is linked only to the person, so moving from one institution to another does not change it.

#### Why should I use a Researcher Identifier?

- Avoid name confusion and increase visibility
- To link your unique identifier with your publications and research activities
- International standard

- More and more journals and funders request or even require a researcher's ID if you submit your manuscript or grant application
- Save time
- Open and transparent
- Privacy well protected
- Researchers own and control their own Researcher Identifier information
- Not limited to a single institution
- You can take your Researcher Identifier with you throughout your academic career, even when you move from one university or research institute to another.

More information:

[ORCID](#) - (University of Bordeaux)

[Persistent identifiers](#) - (University of Galway)

[ORCID: what is it?](#) – (Ghent University)

[ORCID](#) – (University of Groningen)

[Scientific signature and researcher profiles](#) – (UPV/EHU)

## Open Science communities

[International Network of Open Science & Scholarship Communities](#) - INOSC is an international network of local Open Science & Open Scholarship communities (OSC). OSCs are hubs where academics learn from their peers how to make their workflows more open. Over 1000 academics have joined OSCs, ready to put Open Science to practice!

- [Open Science Community Estonia](#)
- [Open Science Community Galway](#)
- [Open Science Community the Netherlands](#)
- [Open Science Community Sweden](#)
- [Network of \(German-speaking\) Open Science Initiatives \(NOSI\)](#)
- [GhentCORR, Ghent University Community for Open and Reproducible Research](#)

## Training opportunities within the ENLIGHT Network

- [Open Research Workshops and Events](#). In-person and hybrid workshops and events related to research practices and digital tools to help researchers make their work as open as possible. (University of Galway).

- [Training and events](#): Contains training and upcoming events, training materials, and knowledge clips on RDM and scholarly publishing. (Ghent University).
- [Training events](#) related to research data management, Open Access, and other topics (University of Göttingen)
- [Open Science Göttingen Meet-ups - \(University of Göttingen\)](#)  
Initiated in Autumn 2016, the Open Science Göttingen Meet-up brings together enthusiastic researchers and librarians who aim to promote Open Science principles in the scientific community in Göttingen. On these pages, you will find information about past and forthcoming meet-ups, working groups, and useful tools for implementing Open Science.
- [Workshops at Groningen University – \(University of Groningen\)](#) Various online webinars on different topics of OS.
- [Research Data Management self-learning training course - \(University of Tartu\).](#)  
Quick and basic knowledge about RDM in English.

## More resources from the ENLIGHT Network

- [Tools for Open Science - \(University of Göttingen\)](#)

This list highlights tools and services that enable Open Science practices. Please note that this list is a living document.

- [Open Science pages – \(Ghent University\)](#) Overview of Open Science at Ghent University.

## VIII External resources

Here is a list of some additional external resources. This list is not exhaustive.

### Training resources

- [Open Science: the very idea](#)

This Open Access book provides a broad context for understanding current scientific problems and the different movements aiming to improve the societal impact of science and research.

- [The Open Science Training Handbook](#)

The new handbook focuses not on spreading the ideas of Open Science but on showing how to spread these ideas most effectively. Bringing together methods, techniques, and practices, the handbook aims to support educators of Open Science. The result is intended as a helpful guide on forward knowledge of Open Science principles to our networks, institutions, colleagues, and students.



- [How to be FAIR with your data: A teaching and training handbook for higher education institutions](#)

This handbook was written and edited by a group of about 40 collaborators in a series of six book sprints that took place between 1 and 10 June 2021. It aims to support higher education institutions with the practical implementation of content relating to the FAIR principles in their curricula while also aiding teaching by providing practical material, such as competence profiles, learning outcomes, lesson plans, and supporting information. It incorporates community feedback received during the public consultation, which ran from 27 July to 12 September 2021.

- [Courses on Open Science - \(FOSTER\)](#)

The FOSTER portal is an e-learning platform that brings together the best training resources addressed to those who need to know more about Open Science or need to develop strategies and skills for implementing Open Science practices in their daily workflows. Here you will find a growing collection of training materials.

## FAIR data

- [FAIR principles](#)

In 2016, the 'FAIR Guiding Principles for scientific data management and stewardship' were published in Scientific Data. The authors intended to provide guidelines to improve the Findability, Accessibility, Interoperability, and Reuse of digital assets.

- [F-UJI Automated FAIR Data Assessment Tool](#)

FAIRsFAIR has developed F-UJI, a service based on REST, and is piloting a programmatic assessment of the FAIRness of research datasets in five trustworthy data repositories.

- [FAIR-Aware: Assess Your Knowledge of FAIR – \(FAIRsFAIR\)](#)

FAIR-Aware is an online tool that helps researchers and data managers assess how much they know about the requirements for making datasets findable, accessible, interoperable, and reusable (FAIR) before uploading them into a data repository.

- [How to make your scientific data accessible, discoverable, and useful](#). Specialists offer seven tips for effectively sharing your data.

## DMP

- [Data Stewardship Wizard](#).

Researchers are truly guided through composing a DMP, which can be exported using a selected template and format, including machine-actionable.

- [Argos DMP](#)

Joint effort of OpenAIRE and EUDAT to deliver an open platform for Data Management Planning that addresses FAIR and Open best practices and assumes no barriers to its use and adoption.

- [DMP checklist](#)



Checklist for a Data Management Plan. v.4.0. Edinburgh: Digital Curation Centre.

- [DMPonline](#)

DMPonline helps to create, review, and share data management plans that meet institutional and funder requirements. It is provided by the Digital Curation Centre (DCC).

## EOSC

- [EOSC-Pillar Legal Compliance Guidelines for Researchers: a Checklist \(interactive digital version\)](#)

This document provides a guideline in the form of checklists to help researchers comply with the legal requirements of publishing, sharing, and integrating research data. In particular, the challenges raised by intellectual property rights, data protection laws, and regulations on non-personal data are addressed. The guideline aims to promote the implementation of FAIR principles beyond their original scope and lay down the conditions for the effective realisation of Open Data and Open Science policies.

- [EOSC-Pillar RDM Training and support catalogue](#)

The EOSC-Pillar RDM Training and support catalogue is a collection of online searchable resources for Data Stewardship and Research Data Management support. It includes training materials, but it also includes day-to-day, operational, and readily available resources that can be used by data stewards to support researchers. However, these resources might be useful for other target groups as well.

## Open Access

- [OA Journals Toolkit](#). The Toolkit answers a need for an online resource to support new and established Open Access journals in navigating the rapidly changing landscape of Open Access publishing. Intended for anyone involved in journal publishing and with a strong focus on helping under-resourced journals globally, the Toolkit enables empowered and informed decision-making. It will contribute to the advancement of scholarly publishing standards and best practices.
- [EU ready to back immediate open access without author fees](#)

## Copyright

- Kreutzer, T., & Lahmann, H. (2019). Rechtsfragen bei Open Science. Hamburg University Press. Hamburg University Press. (in German)  
<https://doi.org/10.15460/HUP.195>

## Licensing

- [Open Licencing - \(Foster Open Science/OpenPlato\)](#)

This course helps you to find the best open license for your research outputs.

- [Choose an open source license](#)

Licenses for code.

## Glossary

- [Glossary - Open Science Training Handbook \(gitbook.io\)](https://gitbook.io)

Like any other emerging field, Open Science uses quite a lot of sometimes difficult terminology. Some of it you may not be familiar with. Don't lose heart! The "Glossary" will explain most of the less familiar terms and concepts.

## Local ENLIGHT institutions' contacts

If the previous toolkit did not cover your questions about different aspects of Open Science, we recommend contacting your local university's Open Science experts.

Partner	Contact person and information	OS/OA English website
University of the Basque Country		<a href="https://www.ehu.eus/es/web/biblioteka/ikerkuntzarako-baliabidea_k">https://www.ehu.eus/es/web/biblioteka/ikerkuntzarako-baliabidea_k</a> (Research Support Service)  <a href="https://www.ehu.eus/es/web/biblioteka/publicar-en-acceso-abierto">https://www.ehu.eus/es/web/biblioteka/publicar-en-acceso-abierto</a> (Publishing in Open Access)
University of Bordeaux		<a href="https://www.u-bordeaux.fr/recherche/ambition-scientifique/science-ouverte">https://www.u-bordeaux.fr/recherche/ambition-scientifique/science-ouverte</a> (institutional site) <a href="https://open.u-bordeaux.fr">https://open.u-bordeaux.fr</a> (Open Access journals platform) <a href="https://oskar-bordeaux.fr/">https://oskar-bordeaux.fr/</a> (open archives platform) <a href="https://bibliotheques.u-bordeaux.fr/Soutien-a-la-recherche">https://bibliotheques.u-bordeaux.fr/Soutien-a-la-recherche</a> (library Open Science services) <a href="https://bibliotheques.u-bordeaux.fr/Soutien-a-la-recherche/Science-ouverte-l-engagement-de-l-universite2">https://bibliotheques.u-bordeaux.fr/Soutien-a-la-recherche/Science-ouverte-l-engagement-de-l-universite2</a> (Open Science roadmap)
Comenius University Bratislava	<a href="mailto:kniznica@vili.uniba.sk">kniznica@vili.uniba.sk</a>	<a href="https://midas.uniba.sk/">https://midas.uniba.sk/</a>

University of Galway	<a href="#">Dr. Jen Smith</a> , Open Research Librarian	<a href="https://library.universityofgalway.ie/research/">https://library.universityofgalway.ie/research/</a> (Open and Digital Research Team) <a href="https://libguides.library.universityofgalway.ie/openpractice">https://libguides.library.universityofgalway.ie/openpractice</a> (Open Research Practices) <a href="https://libguides.library.universityofgalway.ie/oer">https://libguides.library.universityofgalway.ie/oer</a> (Open Educational Resources) <a href="https://libguides.library.universityofgalway.ie/openaccesspublishing">https://libguides.library.universityofgalway.ie/openaccesspublishing</a> (Open Access Publishing) <a href="https://library.universityofgalway.ie/research/resources/nationaldealsforapcs/">https://library.universityofgalway.ie/research/resources/nationaldealsforapcs/</a> (National Deals for APCs)
Ghent University (UGent)	<a href="mailto:openscience@ugent.be">openscience@ugent.be</a>	RDM: <a href="https://www.ugent.be/en/research/datamanagement">https://www.ugent.be/en/research/datamanagement</a> Scholarly publishing: <a href="https://www.ugent.be/en/research/openscience/scholarlypublishing/policy-ugent.htm">https://www.ugent.be/en/research/openscience/scholarlypublishing/policy-ugent.htm</a> <a href="https://researchtips.ugent.be/en/tags/open%20science/">https://researchtips.ugent.be/en/tags/open%20science/</a> (other resources only intranet)
University of Groningen	For open science: <a href="mailto:a.ranitovic@rug.nl">a.ranitovic@rug.nl</a>  For open access: <a href="mailto:g.trentacosti@rug.nl">g.trentacosti@rug.nl</a>  For FAIR data: <a href="mailto:l.j.f.g.ter.schure@rug.nl">l.j.f.g.ter.schure@rug.nl</a>  For Public Engagement: <a href="mailto:pe@rug.nl">pe@rug.nl</a>  For Open Education: <a href="mailto:m.b.blikmans@rug.nl">m.b.blikmans@rug.nl</a>	<a href="https://www.rug.nl/research/openscience/">https://www.rug.nl/research/openscience/</a>
University of Göttingen	For open access: <a href="mailto:oa@sub.uni-goettingen.de">oa@sub.uni-goettingen.de</a>  For research data	<a href="https://www.uni-goettingen.de/en/487290.html">https://www.uni-goettingen.de/en/487290.html</a> <a href="https://www.sub.uni-goettingen.de/en/publishing-open-access/op">https://www.sub.uni-goettingen.de/en/publishing-open-access/op</a>

	management and e-science: <a href="mailto:info@ereseach.uni-goettingen.de">info@ereseach.uni-goettingen.de</a>	<a href="https://www.sub.uni-goettingen.de/en/publishing-open-access/publication-funds/">en-science-open-access/ https://www.sub.uni-goettingen.de/en/publishing-open-access/publication-funds/</a> (OA publication funds)  <a href="https://www.sub.uni-goettingen.de/en/ereseach-alliance/">https://www.sub.uni-goettingen.de/en/ereseach-alliance/</a> (research data management)
University of Tartu (Tartu Ülikool)	University of Tartu Library: Tiiu Tarkpea, <a href="mailto:tiiu.tarkpea@ut.ee">tiiu.tarkpea@ut.ee</a>  Grant Office	<a href="https://utlib.ut.ee/en/open-science">https://utlib.ut.ee/en/open-science</a>
Uppsala University	For open science: <a href="mailto:ask.library@ub.uu.se">ask.library@ub.uu.se</a>  For data management <a href="mailto:dataoffice@uu.se">dataoffice@uu.se</a>	<a href="https://www.uu.se/en/library/publish/open-science">https://www.uu.se/en/library/publish/open-science</a>
Enlight Open Science Ambassadors		<a href="#">ENLIGHT</a>

## References

Engelhardt, C. et al. (2022). *How to be FAIR with your data: A teaching and training handbook for higher education institutions*. Göttingen University Press.

<https://doi.org/10.17875/gup2022-1915>

*The EU's open science policy*. (2019). European Commission.

[https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science\\_en#the-eus-open-science-policy](https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science_en#the-eus-open-science-policy)

Higman, R., Bangert, D. and Jones, S., (2019). Three camps, one destination: the intersections of research data management, FAIR and Open. *Insights: the UKSG journal*, 32(1). <https://doi.org/10.1629/uksg.468>

*UNESCO Recommendation on Open Science*. (2021). The United Nations Educational, Scientific and Cultural Organization.

<https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=en>

Wilkinson, M., Dumontier, M., Aalbersberg, I. et al. (2016). The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data* 3, 160018.

<https://doi.org/10.1038/sdata.2016.18>

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