

Open Science 101 - Getting Started

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The background is a dark blue field filled with glowing, curved lines in shades of purple and white. Scattered throughout are strings of binary code (0s and 1s) and various mathematical symbols like pi (π), infinity (∞), and hash symbols (#).

UNESCO & Open Science

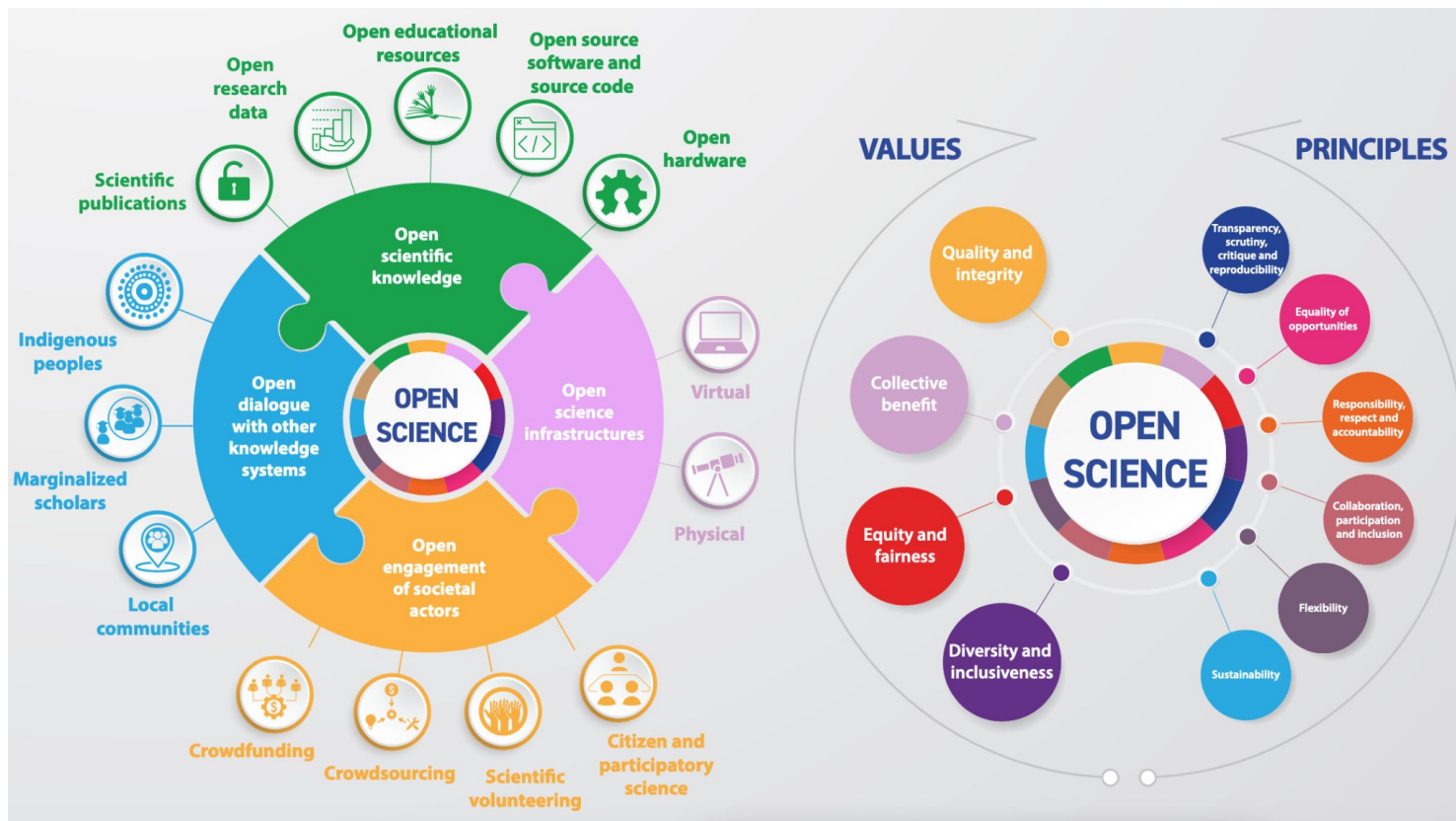
UNESCO Open Science Definition



An **inclusive** construct that combines various movements and practices aiming to make multilingual scientific knowledge **openly** available, accessible and reusable for everyone, to increase scientific **collaborations** and **sharing** of information for the benefits of science and **society**, and to open the processes of scientific knowledge creation, evaluation and communication to societal actors **beyond the traditional** scientific community.



UNESCO Open Science Recommendations & Toolkit



The background is a dark blue field filled with glowing, curved lines in shades of purple and white. Scattered throughout are binary digits (0s and 1s) and small, pixelated patterns, creating a sense of digital motion and data flow.


Guidelines, Policies, Recommendations

National Guidelines for Open Science



National guidelines for promoting open science in Sweden

15 januari 2024

 [Open Science \(In English\)](#)







On behalf of the Swedish government, the National Library of Sweden (Kungliga biblioteket, KB) has developed national guidelines for open science. The guidelines are intended to provide support and guidance to actors in Sweden who have an important role to play in the transition to open science.



- **Open Access to Scholarly Publications:** Research publications freely available without any subscription or payment barriers
- **Open Access to Research Data:** Availability/accessibility of research data for reproducibility, to further scientific inquiry
- **Open Research Methods:** Transparency of research methodologies to facilitate replication and validation of research findings
- **Open Educational Resources:** Freely accessible educational materials to enhance learning and teaching practices
- **Public Engagement in Science:** Public, community, citizen science to increase public understanding and trust in science
- **Infrastructures Supporting Open Science:** Develop/support infrastructures for open science ecosystem, including repositories and data management systems

Open Science Policy Comparisons (July 2023)



						
OA Required	✓	✓	✓	✓	✓	✓
Preprint Required	✓	X	X	X	X	✓
Data Sharing	✓	✓	✓	✓	✓	✓
Code Sharing	✓	✓	✓	✓	✓	✓
Materials/Resource Sharing	✓	X	X	X	X	X
Protocol Sharing	✓	X	X	X	X	X

Open Science Indicators and Monitoring



[ABOUT](#) [PRINCIPLES](#) [TECHNICAL SPECIFICATIONS](#) [NEWS](#) [MONITORS](#) [CONTACT](#)



Open science monitoring initiative (OSMI)

OSMI brings together institutions and individuals involved in monitoring open science. OSMI aims to encourage the adoption of open science monitoring principles and to promote their practical implementation.

After being debated during the workshop at Unesco and subsequently reviewed online by more than 20 experts, the principles are now being submitted to Unesco for approval.

[MORE INFORMATION](#) →

Explore the first Open Science Indicators dataset—and share your thoughts

December 12, 2022 / [PLOS](#) / [Open Code](#) [Open Data](#) [Open Science](#) [Open Science Indicators](#) [Preprints](#)



Written by Lauren Cadwallader, Lindsay Morton, and Iain Hrynaszkiewicz

Open Science is on the rise. We can infer as much from the proliferation of Open Access publishing options; the steady upward trend in bioRxiv postings; the periodic rollout of new national, institutional, or funder policies.

Examples: UNESCO Open Science Monitoring Initiative, PLoS Open Science Indicators

Key Principles



Promote collaboration, replication, sharing and open access

Open science and reproducibility accelerate progress

Public (community) access to research is fundamental to accelerating progress

Sharing outputs (data/software) are important towards building trust

FAIR & Persistent Identifiers (PIDs)



FAIR Guiding Principles (GO FAIR)

Meant to **improve the Findability, Accessibility, Interoperability, and Reuse** of digital assets.

Emphasise **machine-actionability** (i.e., the capacity of computational systems to find, access, interoperate, and reuse data with none or minimal human intervention) to assist with the computational nature of research.

A national persistent identifier research strategy

Delivering sector-wide cost savings through improved automation and technical integration.



Started 01 Jul 2019

Expected outcome:
Advice

- People ([ORCID iDs](#))
- Outputs ([Crossref](#) and [DataCite](#) DOIs)
- Grants ([Crossref grant DOIs](#))
- Organisations ([ROR identifiers](#))
- Projects ([RAiDs](#))

Identifiers assist with the exchange of metadata

Example of PIDs in Use - DOI Citation Formatter



DOI Citation Formatter

Paste your DOI:

10.7554/eLife.79771

For example 10.1145/2783446.2783605

Select Formatting Style:

apa

Begin typing (e.g. Chicago or IEEE.) or use the drop down menu.

Select Language and Country:

en-US

Begin typing (e.g. en-GB for English, Great Britain) or use the drop down menu.

Format

Vides, E. G., Adhikari, A., Chiang, C. Y., Lis, P., Purlyte, E., Limouse, C., Shumate, J. L., Spinola-Lasso, E., Dhekne, H. S., Alessi, D. R., & Pfeffer, S. R. (2022). A feed-forward pathway drives LRRK2 kinase membrane recruitment and activation. In eLife (Vol. 11). eLife Sciences Publications, Ltd. <https://doi.org/10.7554/elife.79771>

<https://citation.crosscite.org/>

The background is a dark blue field filled with glowing, curved lines in shades of purple and white. Scattered throughout are strings of binary code (0s and 1s) and some faint, illegible text, creating a sense of digital data and connectivity.

ORCiD & Digital Presence

ORCiD & Digital Presence



https://orcid.org/0000-0003-1374-6015

AuthorCarpentry | R Programming | Professional | Personal | GoToMeet.Me | Geographic access blo... | Adobe Document Clo...

ORCID
Connecting Research and Researchers

6,865,856 ORCID IDs and counting. See more...

Hugh P. Shanahan

ORCID ID
https://orcid.org/0000-0003-1374-6015

Print view

Also known as
Hugh Shanahan

Websites
Lab page

Keywords
Computational Biology, Bioinformatics, FAIR Data

Other IDs
Scopus Author ID: 7004258684

Biography

Hugh Shanahan has a background in Computational Biology, focussing on transcriptomics and metagenomics combined with a deep background in Computational and Theoretical Physics. He completed his PhD in 1994 in Lattice QCD and completed postdocs in Glasgow, Cambridge and Tsukuba before moving into Bioinformatics in 1999. In 2005 he joined the department of Computer Science at Royal Holloway, University of London where he is now Reader.

Since 2015 he been a co-chair of the CODATA-RDA schools in Research Data Science that has delivered training in Data Science methods for researchers to students from approximately 40 countries. He is a member of the FAIR4FAIR consortium which is focussed on the development of an overall knowledge infrastructure on academic quality data management, procedures, standards, metrics and related matters, based on the FAIR principles.

Employment (2)

Royal Holloway University of London: Egham, Surrey 2014-01-01 to 2017-12-31 Senior Lecturer (Computer Science) Employment Source: Hugh P. Shanahan ★ Preferred source
Royal Holloway University of London: Egham, Surrey 2005-01-01 to 2013-12-31 Lecturer (Computer Science) Employment Source: Hugh P. Shanahan ★ Preferred source

Education and qualifications (3)

University of Edinburgh: Edinburgh, Edinburgh 1991-10-01 to 1994-09-01 Ph.D. (Physics) Education Source: Hugh P. Shanahan ★ Preferred source
University College Cork: Cork, Cork 1990-10-01 to 1991-06-01 MSc (Experimental Physics) Education Source: Hugh P. Shanahan ★ Preferred source

ORCID - Unique, PID for researchers/authors which you can link to your publications, data, software, and more.

Stall, S., Specht, A., Amato, J. G., Corrêa, P. L. P., Curivil, F. A. L., David, R., Erdmann, C., et al. (2023). **Digital Presence Checklist**. Zenodo. <https://doi.org/10.5281/zenodo.7841734>

How to link your ORCiD w/ Crossref (for publications)



How to add works to your ORCID iD using CrossRef


YouTube · Ebling Library · 30 Mar 2017



<https://www.youtube.com/watch?v=sfWP1tqHknI>

How to link your ORCiD w/ DataCite (for data, software, etc)



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[Home](#) [Guides](#) [API Reference](#)

Integrations from Registered Service Providers

Code Examples in GitHub

MORE DATACITE SERVICES

[DataCite Service Status](#)

[DataCite Public Data File](#)

[DataCite Citation Formatter](#)

✓ [DataCite Profiles](#)

[DataCite and ORCID](#)

[ORCID Auto-Update Troubleshooting Guide](#)

[DataCite Statistics](#)

[Data Citation Corpus](#)

USAGE AND CITATIONS

> [Views and Downloads](#)

> [Citations and References](#)


[Displaying Usage and Citations in your Repository](#)

DataCite and ORCID

DataCite provides Persistent Identifiers (DOIs) for all research outputs. ORCID provides Persistent Identifiers (ORCID iDs) for all researchers. The two organisations work closely together to identify research and connect it to the researchers that created it.

DataCite's integration with ORCID's API means it is quick and easy for researchers to link any works which have a DataCite DOI to their ORCID profile.

Here we describe the two ways in which your works with a DataCite DOI can be linked to your ORCID profile.



What is a claim?

In DataCite, when a work (a DOI) is sent to an ORCID record via either of the methods outlined below, this is known as a "claim" and simply means a request has been sent to ORCID to connect a specific DOI to an ORCID profile. Failed claims will also be listed in the settings of your [Profiles](#) account.

1. ORCID Search & Link Wizard

The [ORCID Search & Link wizard](#) allows you to manually add your works to your ORCID record from DataCite Commons.

<https://support.datacite.org/docs/datacite-and-orcid>

The background is a dark blue field filled with glowing, out-of-focus elements. It features numerous white and orange binary digits (0s and 1s) scattered throughout. Overlaid on this are several bright, curved lines in shades of white and light blue, which sweep across the frame in a dynamic, swirling pattern, suggesting a sense of motion and digital connectivity.

Accessibility of Publications

Preprints



[HOME](#) | [SUBMIT](#) | [FAQ](#) | [BLOG](#) | [ALERTS / RSS](#) | [ABOUT](#) | [CHANNELS](#)

bioRxiv

THE PREPRINT SERVER FOR BIOLOGY

[Advanced Search](#)

COVID-19 SARS-CoV-2 preprints from medRxiv and bioRxiv

Subject Areas

All Articles

Animal Behavior and Cognition

Biochemistry

Bioengineering

Bioinformatics

Biophysics

Ecology

Epidemiology*

Evolutionary Biology

Genetics

Genomics

Paleontology

Pathology

Pharmacology and Toxicology

Physiology

Plant Biology

- Scholarly manuscripts made available before peer review (e.g., [bioRxiv](#), medRxiv, arXiv, OSF, Zenodo, also see [ASAPbio](#))
- Help w/ rapid dissemination, visibility, and feedback
- Open, versioned, and establish priority of discoveries
- Option of open peer review (e.g., [PREreview](#))


Additional Paths Towards Open



- Deposit final peer reviewed manuscript in institutional repository, Europe PMC/PMC, [Shareyourpaper.org](https://shareyourpaper.org)
- [Choose a license](#), Creative Commons Attribution 4.0 Generic License ([CC BY 4.0](#)) or an equivalent license and include the license in the paper/metadata/acknowledgement
- [Author Rights: Using the SPARC Author Addendum](#)
- Institutional support for open access publication charges (APCs)

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Type [?](#)

☐ Research articles (32 896)

☐ Review articles (17 334)

☐ Preprints (1 200)

☐ Books & documents (10)

1-25 of 51 765 results

Sort by: ☒ Relevance ☐ Times cited ☐ Date [1](#) [2](#) [3](#) [Next](#) ...

Cerebrospinal fluid α -synuclein adds the risk of cognitive decline and is associated with tau pathology among non-demented older adults.
[Liu W, Li W, Liu Z, Li Y, Wang X, Guo M, Wang S, Wang S, Li Y, Jia J](#)
[Alzheimers Res Ther](#), 16(1):103, 10 May 2024
lower α -synuclein group (α -synuclein-L, n = 245) and a higher α -synuclein group (α -synuclein-H, n = 86... disorders α -synuclein-L. Lower level of α -synuclein α -synuclein-H Higher level of α -synuclein GSEA Gene
Cited by: 0 articles | PMID: 38725083 | PMCID: PMC11084056
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- Academic search/databases like [Europe PMC](#) are able to index openly accessible research and therefore curate and improve the discoverability, accessibility of it
- Search your profile/papers to see what level of openness you are and what publications are linked to data, software, etc.
(See link your ORCID/publications feature)

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Data and Code Accessibility

Open Access, Data/Software Availability



849 SciLifeLab Publications in 2023 ([Dimensions](#))

- 47% w/ “Data Availability” (20% w/ available “upon request”)
 - Other Challenges: No Links/Citations, References to Uncitable Supplements...

Avoid parachuting into data/software and do more to guide them to accessing, understanding, and reusing it

Preserve the data/software via a repository (e.g., [SciLifeLab’s Figshare](#), [Zenodo](#)) and cite



Data Available Upon Request



Data Availability Statement

Research data used in this article are available from the corresponding author on request.

Availability Statement Templates



The [type of data] data used for [brief context, description] in the study are available at [repository, source name] via [DOI, persistent identifier link] with [license, access conditions] [in-text citation in References]

[Version number] of the [software name] used for [brief context, description of what the software was used for] is preserved at [DOI, persistent identifier link], available via [license type, access conditions] and developed openly at [software development platform link]. [in-text citation in References]

Data & Software Shared



Data availability

All primary data associated with each figure has been deposited in a repository; most can be found at <https://doi.org/10.5061/dryad.3tx95x6j7>. Quantitation data of the blots in Figure 3–figure supplement 4 (for the bar graphs in Figures 3C and 3D) can be found at doi (10.5281/zenodo.7057419). Analysis presented in Figure 8–figure supplement 1 can be found at <https://doi.org/10.5281/zenodo.7108943>. All code is available at https://github.com/PfefferLab/Vides_et_al_2022 (copy archived at <https://swh:1:rev:2b50525ee1d48790466d35222956f16615ae96e8>).

The following data sets were generated

<https://elifesciences.org/articles/79771>

Vides EG, Pfeffer SR (2022) **Dryad Digital Repository** Data from: A feed-forward pathway drives LRRK2 kinase membrane recruitment and activation.

<https://doi.org/10.5061/dryad.3tx95x6j7>

Limouse C, Vides EG, Adhikari A, Pfeffer SR (2022) **Zenodo** PfefferLab/Vides_et_al_2022: v1.0.

<https://doi.org/10.5281/zenodo.7108943>

Lis P, Alessi DR (2022) **Zenodo** Figure 3–Figure Supplement 4 of the paper 'A Feed-forward Pathway Drives LRRK2 kinase Membrane Recruitment and Activation'.

<https://doi.org/10.5281/zenodo.7057419>


- Include a bracketed description with your data/software citation ([Data set], [Computer software]) to assist indexing.

Impact of Sharing



“We also find an association between articles that include statements that link to data in a repository and up to 25.36% (\pm 1.07%) higher citation impact on average, using a citation prediction model.”

<https://doi.org/10.1371/journal.pone.0230416>

The background is a dark blue field filled with glowing, out-of-focus elements. It features numerous binary digits (0s and 1s) in white and orange, along with thin, curved lines of light in white and orange that sweep across the frame, creating a sense of dynamic movement and digital connectivity.

Preserving and Citing Software

Release Code (GitHub), Preserve, and Cite w/ Zenodo



Referencing and citing content

You can use third-party tools to cite and reference content on GitHub.

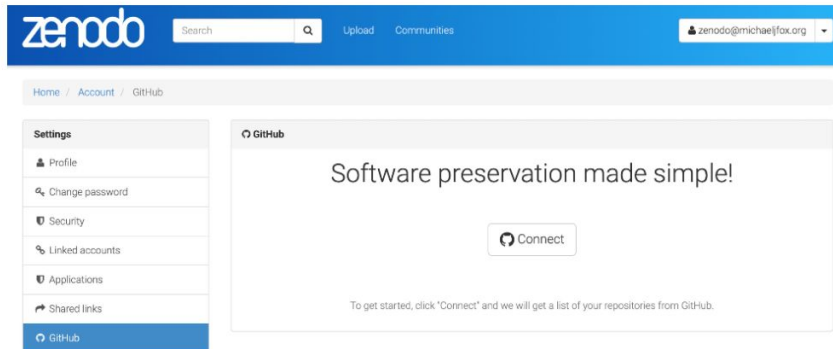
Issuing a persistent identifier for your repository with Zenodo

To make your repositories easier to reference in academic literature, you can create persistent identifiers, also known as Digital Object Identifiers (DOIs). You can use the data archiving tool [Zenodo](#) to archive a repository on GitHub.com and issue a DOI for the archive.

Tips:

- Zenodo can only access public repositories, so make sure the repository you want to archive is [public](#).
- If you want to archive a repository that belongs to an organization, the organization owner may need to [approve access](#) for the Zenodo application.
- Make sure to include a [license](#) in your repository so readers know how they can reuse your work.

- 1 Navigate to the [login page](#) for Zenodo.
- 2 Click **Log in with GitHub**.
- 3 Review the information about access permissions, then click **Authorize zenodo**.



Software Journals (e.g., JOSS)



The Journal of
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Software Citation Files (.CFF, GitHub)



GitHub Docs

Version: Free, Pro, & Team ▾

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About CITATION files

You can add a CITATION file to your repository to help users correctly cite your software.

About CITATION files

You can add a `CITATION.cff` file to the root of a repository to let others know how you would like them to cite your work. The citation file format is plain text with human- and machine-readable citation information.

Example `CITATION.cff` file:

```
cff-version: 1.2.0
message: "If you use this software, please cite it as below."
authors:
- family-names: "Lisa"
  given-names: "Mona"
  orcid: "https://orcid.org/0000-0000-0000-0000"
- family-names: "Bot"
  given-names: "Hew"
  orcid: "https://orcid.org/0000-0000-0000-0000"
title: "My Research Software"
version: 2.0.4
```

The background is a dark blue field filled with glowing, curved lines in shades of purple and white. Scattered throughout are strings of binary code (0s and 1s) and some orange-colored data-like patterns, creating a sense of digital motion and complexity.

Resources and Protocols

Resource Identification



Research Resource Identifiers (RRIDs)
Resources (e.g., cell lines, transgenic models, plasmids/clones, antibodies, and other reagents) identification, discovery, and reuse.

Example Identifier: Antibody:
[RRID:AB_9075](#) *Materials & Methods >*
Recommended Citation: (Millipore Cat# AB1542, RRID:AB_90755)

[Find RRIDs at SciCrunch](#) (registry for tracking/credit) and
[Add a Resource](#)

The screenshot shows the RRID Portal interface. At the top, there's a search bar and a navigation menu with 'Home / Resource Reports / Antibodies / Resource Summary Report'. The main heading is 'Resource Summary Report' with buttons for 'New Search' and 'Previous Search Results'. Below this, the 'Antibody Name' section displays the full name: 'Sheep Anti-Tyrosine Hydroxylase (TH, Tyrosine Monooxygenase) Polyclonal antibody, Unconjugated'. It also shows the RRID:AB_90755 and a download icon. A notice at the top right states: '*NOTICE: Multiple vendors found, please select your record: Millipore - AB1542'. At the bottom, the 'Antibody Information' section provides the URL (http://antibodyregistry.org/AB_90755), proper citation (Millipore Cat# AB1542, RRID:AB_90755), target antigen (Tyrosine Hydroxylase), and host organism (Sheep). Links for 'PDF REPORT' and 'HOW TO CITE' are also present.

RRID Portal

ABOUT

Resource Summary Report

Home / Resource Reports / Antibodies / Resource Summary Report

Antibody Name *NOTICE: Multiple vendors found, please select your record: Millipore - AB1542

Sheep Anti-Tyrosine Hydroxylase (TH, Tyrosine Monooxygenase)

Polyclonal antibody, Unconjugated

RRID:AB_90755

PDF REPORT HOW TO CITE

Antibody Information

URL: http://antibodyregistry.org/AB_90755

Proper Citation: (Millipore Cat# AB1542, RRID:AB_90755)

Target Antigen: Tyrosine Hydroxylase

Host Organism: Sheep

Sharing Protocols



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Bring structure to your research

A secure platform for developing and sharing reproducible methods.

Q SEARCH →

computational workflows

clinical trials

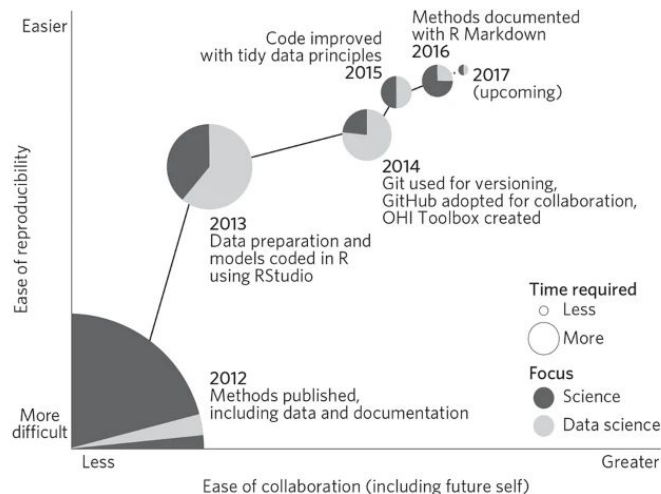
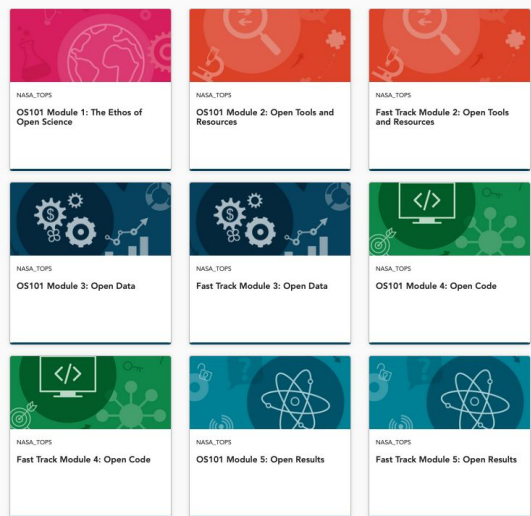
operational procedures

- Repository for step-by-step detailed protocols that are indexed (i.e. searchable on the web)
- A platform to organize, exchange, and keep method details up to date
- Allows for versioning tracks who is viewing, exporting, bookmarking these protocols
- Can use this platform to register protocols and cite in methods section of your paper
- Introduction to protocols.io ([video](#))

The background is a dark blue field filled with glowing, out-of-focus elements. It features numerous binary digits (0s and 1s) in white and orange, some of which are arranged in horizontal lines. Sweeping across the scene are several bright, curved lines in shades of white and light blue, creating a sense of dynamic movement and depth, reminiscent of a data stream or a futuristic interface.

Additional Sources

TOPS Open Science 101, Turing Way, Our Path to Better Science (OpenScapes)



- <https://openscience101.org/>
- <https://the-turing-way.netlify.app/index.html>
- <https://www.nature.com/articles/s41559-017-0160>
- <https://openscapes.org/>

Thank you!



Vetenskapsrådet



datacentre@scilifelab.se (or me directly
christopher.erdmann@scilifelab.uu.se)

[Visit us: scilifelab.se/data](https://scilifelab.se/data)



Scilifelab-data-centre

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