

Persistent Identifiers & US Government Policies

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Amanda French, ROR

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Carly Robinson, US DOE, OSTI



*June 26 2023
JCDL Conference, Santa Fe,
New Mexico*

Agenda

Introduction Brian Minihan, ORCID

Review of the White House Initiatives Carly Robinson, DOE Office of Scientific and Technical Information

Technical Discussion

- **Introduction to Crossref** Sara Bowman, Crossref
- **Introduction to ORCID** Brian Minihan, ORCID
- **Introduction to ROR** Amanda French, ROR

Questions, Answers & Interaction

Workshop outcomes

Articulate what a PID is

Familiarity of the new Federal Policies'

- Intention
- Guidelines for use of PIDs

Familiarity with how the different PIDs operate and how this relates to research policies

Articulate how PIDs might benefit librarians (repository managers), developers, funders + policy makers and publishers.

Q&A feedback and interaction



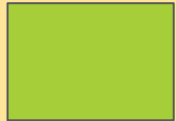
Review of the white house initiatives (Carly)

<https://tinyurl.com/2z6un37x>



Intro to Crossref (Sara)

<https://tinyurl.com/38ypwkrh>



Intro to ORCID (Brian)

<https://tinyurl.com/32whcu7u>



Intro to ROR (Amanda)

<https://tinyurl.com/2xee3yx9>

What is a Persistent Identifier?

Basic definition

Persistent identifiers (PIDs) are long-lasting references to digital objects of various types

US Government Definition

A digital identifier that is globally unique, persistent, machine resolvable and processable, and has an associated metadata schema.

<https://www.whitehouse.gov/wp-content/uploads/2022/08/08-2022-OSTP-Public-Access-Memo.pdf>

What is a Persistent Identifier?

“..because a PID may be connected to a set of metadata describing an object rather than to the object itself. They allow different platforms to exchange information consistently and unambiguously..”

<https://library.cern/submit-and-publish/persistent-identifiers/what-are-pids> CERN Library (European Council for Nuclear Research)

Common Persistent Identifiers

DOIs Digital objects (publications, datasets, etc)

ORCID IDs individuals

ROR IDs organizations

Persistent Identifiers you may not be aware of

RAID (Research Activity ID) projects

IGSN (Int'l Generic Sample Number) physical objects

What are the benefits of a Persistent Identifier?

Link rot or content drift is particularly damaging in the context of academic research. A 404 error is always annoying, but if the goal is findability, accessibility, interoperability and reusable, then a PID is good bet.

What are the benefits of a Persistent Identifier?

The PIDs we will talk about today were specifically created to address the issues of sustainability while pointing to an object uniquely.

They are structures to prevent the loss of research through opacity

Why would you use a Persistent Identifier?

PIDs are “standards”

They should include

- Provenance
- Policies & guarantees
- Metadata
- Machine Readability

Clark, Jonathan (2017): Overview of PID Systems for THOR Webinar. figshare. Journal contribution. <https://doi.org/10.6084/m9.figshare.5016803.v1>

Why would you use a Persistent Identifier?

“Since the construction of a PID follows a predictable format, PIDs are machine readable, that is to say a PID can be used to connect information without human intervention”

Umeå Universitet

<https://www.umu.se/en/library/research-data/specialised-topics/metadata/pid-research-data/>

Why would you use a Persistent Identifier?

Incentives to invest in identifiers: A cost-benefit analysis of persistent identifiers in Australian research systems

Josh Brown, Phill Jones, Alice Meadows, Fiona Murphy

<https://doi.org/10.5281/zenodo.7100578>

How five PIDs (and their metadata!) could save your country millions!

Australia Data Research Commons, et al.

<https://youtu.be/YVvjeWJyzcU>

Increasingly present in national research policies of numerous countries

The recognition that the trust infrastructure included in persistent identifiers assists in compliance and integrity

as well as reducing the associated cost of research administration

means that PIDs are increasingly present in national research policies and strategic planning of numerous countries

Further reading & resources

- NSPM-33 Memo
 - <https://trumpwhitehouse.archives.gov/presidential-actions/presidential-memorandum-united-states-government-supported-research-development-national-security-policy/>
- NSPM-33 Implementation Guidance
 - <https://www.whitehouse.gov/wp-content/uploads/2022/01/010422-NSPM-33-Implementation-Guidance.pdf>
- OSTP Public Access Memo
 - <https://www.whitehouse.gov/wp-content/uploads/2022/01/010422-NSPM-33-Implementation-Guidance.pdf>

Further reading & resources

- RDA PID Interest Group -
<https://www.rd-alliance.org/groups/pid-interest-group.html>
- RDA National PIDs Strategy Group -
<https://www.rd-alliance.org/groups/national-pid-strategies-wg>
- Crossref: Guide on meeting policies using existing open infrastructure
 - <https://www.crossref.org/blog/how-funding-agencies-can-meet-ostp-and-open-science-guidance-using-existing-open-infrastructure/>
- ORCID Guide to supporting research institutions navigating Public Access and Research Security Policies
 - <https://www.crossref.org/blog/how-funding-agencies-can-meet-ostp-and-open-science-guidance-using-existing-open-infrastructure/>
- Lyris: NSPM-33 Guide
 - <https://orcidus.lyris.org/nspm-33-guide/>

US Government PID Policies: NSPM-33 and OSTI Public Access Memo

JCDL Workshop:

Persistent Identifiers & US Federal Agency Policies

June 26, 2023

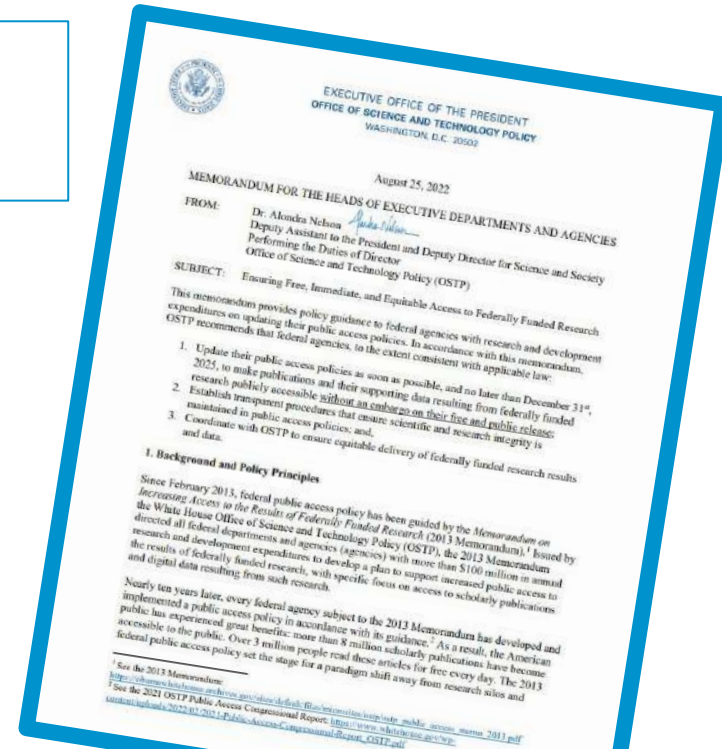
Carly Robinson, PhD

US Department of Energy

Office of Scientific and Technical Information

US Government PID-Related Policies

Supported Research and Development National Security Policy (NSPM-33)



Ensuring Free, Immediate, and Equitable Access to Federally Funded Research

(OSTP Public Access Memo)

PID vs DPI

Digital Persistent Identifier (PID)

- Has been used as the acronym for persistent identifiers (e.g. digital persistent identifiers) by the community/SMEs for over 20 years
- Used by all the PID service organizations
- Used for the NSTC SOS PID Subgroup

Digital Persistent Identifier (DPI)

- Used in NSPM-33
- PID community/SMEs not involved in development of memo language
- NSPM-33 Implementation Guidance updated DPI definition to:
“Digital persistent identifier (DPI or digital PID)...”

NSPM-33 – January 14, 2021

Memo directs action to strengthen protections of United States Government-supported Research and Development (R&D) against foreign government interference and exploitation.

- (v) *Consistent with applicable Federal laws and statutory authorities, within 1 year of the date of this memorandum, funding agencies shall establish policies regarding requirements for individual researchers supported by or working on any Federal research grant to be registered with a service that provides a digital persistent identifier for that individual.*
- (vi) *Agencies shall standardize disclosure processes, definitions, and forms across funding agencies to the extent practicable... Where appropriate and consistent with applicable Federal laws and regulation, agencies should standardize forms for initial disclosures as well as annual updates, integrating digital persistent identifiers wherever appropriate and practicable, and should provide clear instructions to accompany these forms and to minimize any associated administrative burden.*



NSPM-33 Implementation – Disclosure Standardization

Government-wide effort to standardize disclosure forms:

- Biographical Sketch
- Current and Pending Support

PROPOSED INSTRUCTIONS FOR SUBMISSION OF THE BIOGRAPHICAL SKETCH

Instructions for Completion of the Biographical Sketch Template

Identifying Information

***Name:** Enter the name of the senior/key person (Last name, First Name, and Middle Name, including any applicable suffix).

Persistent Identifier (PID) of the Senior/Key Person: Enter the PID of the senior/key person. The PID is a unique, open digital identifier that distinguishes the individual from every other researcher with the same or a similar name.

***Position Title:** Enter the current position title of the senior/key person.

https://www.nsf.gov/bfa/dias/policy/nstc_disclosure.jsp

NSTC Research Security Subcommittee NSPM-33 Implementation Guidance Disclosure Requirements & Standardization

Over the past several months, the National Science and Technology Council (NSTC) Research Security Subcommittee has worked to develop consistent disclosure requirements for use by senior personnel, as well as to develop proposed common disclosure forms for the Biographical Sketch and Current and Pending (Other) Support sections of an application for Federal research and development (R&D) grants or cooperative agreements.

The National Science Foundation (NSF) has agreed to serve as steward for these common forms as well as for posting and maintenance of the table entitled, *NSPM-33 Implementation Guidance Pre- and Post-award Disclosures Relating to the Biographical Sketch and Current and Pending (Other) Support*.

The objective of the *Disclosure Requirements and Standardization* section of NSPM-33 Implementation Guidance is to, "Provide clarity regarding disclosure requirements (e.g., who discloses what, relevant limitations and exclusions), disclosure process (e.g., updates, corrections, certification, and provision of supporting documentation), and expected degree of cross-agency uniformity".

Draft Common Disclosure Forms for the Biographical Sketch and Current and Pending (Other) Support

- Federal Register Notice

NSF, on behalf of the National Science and Technology Council's (NSTC) Research Security Subcommittee, is soliciting public comment on common disclosure forms for the Biographical Sketch and Current and Pending (Other) Support sections of a research application. An excel spreadsheet that summarizes all of the data elements that will be collected in both the Biographical Sketch and Current and Pending (Other) Support, as well as their associated attributes, also is included for public comment.

- "For Comment" Documents

- A common *Biographical Sketch form*, including data elements and associated instructions;
- A common *Current and Pending (Other) Support form*, including data elements and associated instructions; and
- An excel spreadsheet that summarizes all the data elements, as well as their data attributes.

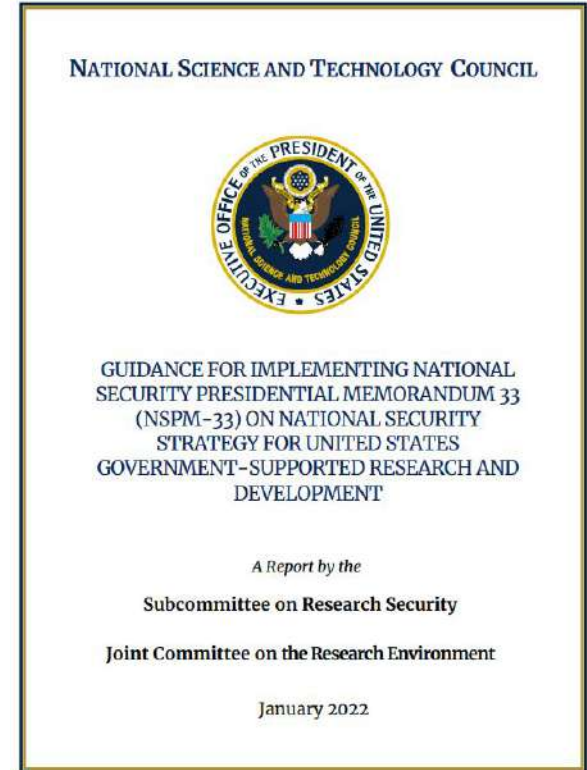
Written comments on these documents should be addressed to: Suzanne H. Plimpton, Reports Clearance Officer, National Science Foundation, 2415 Eisenhower Avenue, Suite E7400, Alexandria, Virginia 22314; telephone (703) 292-7556; or send an email to splimpto@nsf.gov. Individuals who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1-800-877-8339, which is accessible 24 hours a day, 7 days a week, 365 days a year (including Federal holidays). All comments must be received by **October 31, 2022**, to be assured consideration.

NSPM-33 – Implementation Guidance – January 2022

Objective: Describe how research agencies will incorporate digital persistent identifiers (DPIs) – also known as Persistent Identifiers (PIDs) – into disclosure processes to bolster research security and integrity while reducing administrative burden.

Guidance: Research agencies should work to implement DPIs into their electronic systems and processes as quickly as is feasible with appropriate protections for personally identifiable information. Until that time, completion of required disclosures using previous systems and processes may still be required. When available, the DPI option will facilitate population of this information into the requisite format.

Note: The DPI section pertains to individuals applying for grants or cooperative agreements. As indicated in point 3 of this section, agencies should consider providing a DPI option for other types of R&D award applicants.



NSPM-33 – Implementation Guidance: PID Definition

“A digital identifier that is globally unique, persistent, machine resolvable and processable, and has an associated metadata schema. Consistent with NSPM-33, digital persistent identifiers for individuals are used to disambiguate and identify an individual person.”

- Globally unique: the identifier is universally/globally recognized and attached to a defined resource. It is not just internal or organizationally recognized.
- Persistent: the identifier needs to be maintained even if the object it is attached to goes away or becomes unavailable.
- Machine resolvable: the identifier is a URL that resolves to a (landing) page that provides information about the object it is identifying.
- Machine processable: the identifier is such that a machine can read it and process information about it.
- Associated metadata schema: the identifier has a metadata schema that is defined and associated with the identifier. The schema would often be defined by the PID provider. The schema is used to provide information about the object the identifier to which it is defined.

NSPM-33 – Implementation Guidance

1. Incorporation of DPIs into grant and cooperative agreement application and disclosure processes

Research agencies should allow submission of required disclosure information via a DPI service, consistent with the Paperwork Reduction Act and the Privacy Act of 1974, as applicable. Basic process steps should include the following:

- Researcher maintains information required under cross-agency disclosure requirements on an individual “profile” or “record” maintained by a DPI service and associated with a DPI.
- During the grant application process, the individual provides their DPI and, via the DPI service, authenticates their DPI and authorizes the research agency to access the required information. This replaces any need for the researcher to manually enter the required disclosure information.
- As part of the grant application process, the researcher certifies to the research agency that the information disclosed through the service is current, complete, and accurate.
- In cases where there remain variations between research agencies’ application processes (i.e., timing of certain disclosure, use of different collection forms), the impact of these differences on the applicant will be minimized. The DPI profile or record will contain the needed disclosure information and can be accessed by the research agency at the appropriate time, once the researcher has provided authorization.
- In cases where a research agency requires an additional disclosure that exceeds the standardized requirements, researchers may also be able to maintain the additional disclosure information on the DPI service, and similarly provide it to the research agency, as an alternative to providing such information separately to the requesting research agency.
- When annual or other updates are required, the researcher may simply ensure that the profile/record information is current, provide an updated authentication if needed for the research agency to access the updated information, and provide an updated certification regarding the completeness and accuracy of the information.

NSPM-33 – Implementation Guidance

2. Requiring DPIs versus providing as an option for disclosures

All research agencies should provide the option of using a DPI service for disclosure, but also may retain the option for a grant or cooperative agreement application to be processed without the use of such a service. The DPI option should provide the lowest administrative burden for researchers, research organizations, and research agencies. Some research agencies currently require use of DPIs under some circumstances, and more may choose to do so.

3. Categories of individuals provided a DPI option for disclosures

Research agencies should provide the DPI option for all individuals seeking or receiving Federal R&D grant and cooperative agreement funding. Research agencies also should consider providing a DPI option for extramural researchers funded through non-grant mechanisms (e.g., contracts), and for intramural researchers.

4. Use of available DPI services

To the greatest extent possible, research agencies should leverage DPI services provided by private entities, including, where possible, services already widely used by researchers. Research agencies should coordinate to establish DPI service requirements and may allow research organizations and/or researchers to utilize any service that meets those requirements. Research agencies should increase consistency and further reduce administrative burden by ensuring that one or more common DPI service is available for use across agencies. If multiple DPI services are used, agencies should develop processes to integrate information from DPI services to assess completeness and consistency. Use of multiple DPI services may increase administrative complexity and cost, potentially impacting data quality.

NSPM-33 – Implementation Guidance

5. Common/core standards that a DPI service should meet to be included as an option for disclosure in Federal grant and cooperative agreement application processes

- Provided by an open, non-proprietary, researcher-driven platform, interoperable with the ISO 27729 certified global standard number service for identifying contributors to creative works including researchers, inventors, and authors.
- Disambiguates one researcher from another, distinguishing individual researchers from others with the same or similar name and allowing Federal research agencies to uniquely identify researchers included in government systems. The DPI service should ensure disambiguation by allowing the researcher to include all associated name variations and additional information that can ensure unique identification.
- Enables a researcher to create a single record that represents their curriculum vitae with relevant information (employment, education, funding, research outputs, etc.) to share with funders, publishers, researchers, and other organizations.
- Prevents unintentional creation of duplicate DPI records for the same researcher. In cases of unintentional duplicate DPIs, the service should allow for the identification and consolidation of records into a single DPI record for the researcher.
- Allows collection of disclosure information in a DPI record, reduces administrative burden by entering information once, and allows researcher information to be transmitted to research agencies and grant recipient organizations, as appropriate and as authorized.
- Provides an ability to exchange and make use of information from multiple systems.
- Supports connection between DPI-associated information about the researcher over time and is inclusive of researcher name changes or different name formats.
- Allows research agencies to read and write validated information associated with the DPI.
- Supports secure integration with standard authentication services – Security Assertion Markup Language (SAML) and Open Authentication (OAuth).
- Provided at no cost to the researcher.
- Allows the researcher to control access to the information, with the privacy level set by the individual researcher, specifically identifying the entities allowed to access the information.

NSPM-33 – Implementation Guidance

6. Ensuring interoperability across multiple options for DPI service

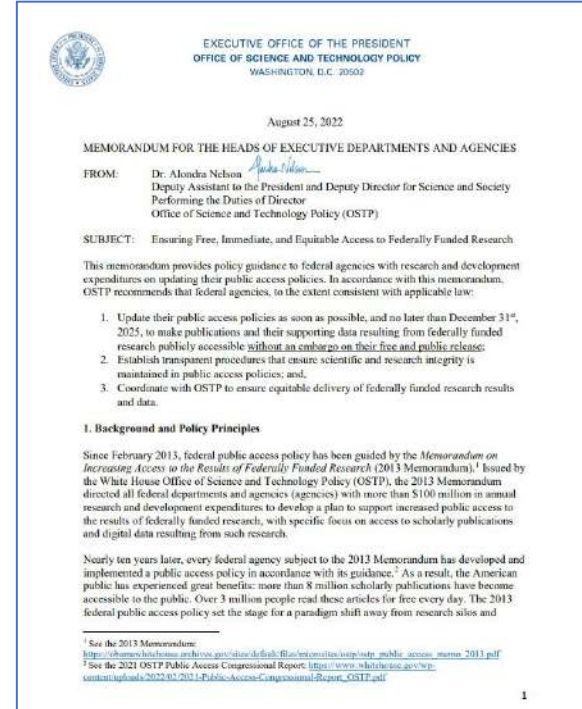
DPIs that meet the common/core standards will allow for interoperability. To ensure that research agencies can support multiple interoperable DPI options, DPI services should be open, non-proprietary, and provide the ability to exchange information. If using multiple DPI services, agencies should develop processes to integrate information access services to ensure complete and accurate reporting of disclosure information provided via DPI services.

7. Potential for public disclosure of information provided to research agencies via a DPI service

Research agencies should not require that individuals provide any public disclosure through the DPI service. Researchers may choose to make information publicly available through their DPI profile or record. Agencies may choose to include DPIs in public records in support of open science activities and/or requirements.

OSTP Public Access Memo – August 25, 2022

- Memo provides policy guidance to federal agencies with research and development expenditures on updating their public access policies.
- Builds off 2013 OSTP Memo – [*Increasing Access to the Results of Federally Funded Scientific Research*](#) (focused on making journal articles and data publicly accessible).
- Required agencies to develop new public access plan and provide to OSTP for review by February 23, 2023.
- Section 4: Ensuring Scientific and Research Integrity in Agency Public Access Policies (PIDs and metadata)
 - The public should be able to identify which federal agencies support given investments in science, the scientists who conduct that research, and the extent to which peer-review was conducted.
 - Do this through use of PIDs and making metadata and research results publicly available.
 - Same PID definition as NSPM-33 Implementation Guidance – *“A digital identifier that is globally unique, persistent, machine resolvable and processable, and has an associated metadata schema.”*



OSTP Public Access Memo PID Language

Federal agencies should, consistent with applicable law:

4a) Collect and make publicly available appropriate metadata associated with scholarly publications and data resulting from federally funded research, to the extent possible at the time of deposit in a public access repository. Such metadata should include at minimum:

- i) all author and co-author names, affiliations, and sources of funding, referencing digital persistent identifiers, as appropriate;*
- ii) the date of publication; and,*
- iii) a unique digital persistent identifier for the research output;*

4b) Instruct federally funded researchers to obtain a digital persistent identifier that meets the common/core standards of a digital persistent identifier service defined in the NSPM-33 Implementation Guidance, include it in published research outputs when available, and provide federal agencies with the metadata associated with all published research outputs they produce, consistent with the law, privacy, and security considerations.

4c) Assign unique digital persistent identifiers to all scientific research and development awards and intramural research protocols that have appropriate metadata linking the funding agency and their awardees through their digital persistent identifiers.

OSTP Public Access Implementation Timeline

2022 OSTP Public Access Memo Section Descriptions

Section 3: Publications & Data Coordination

Section 4: PIDs – Research & Scientific Integrity

Section 5: Interagency Coordination

Aug 25, 2022

Feb 21, 2023

Dec 31, 2024

Dec 31, 2025

Dec 31, 2026

Dec 31, 2027

OSTP Public Access Policy Guidance released

Section 3: DOE Public Access Plan due to OSTP/OMB

Section 3: Last date to publish related DOE policies

Section 3: Last date for related policies to be effective

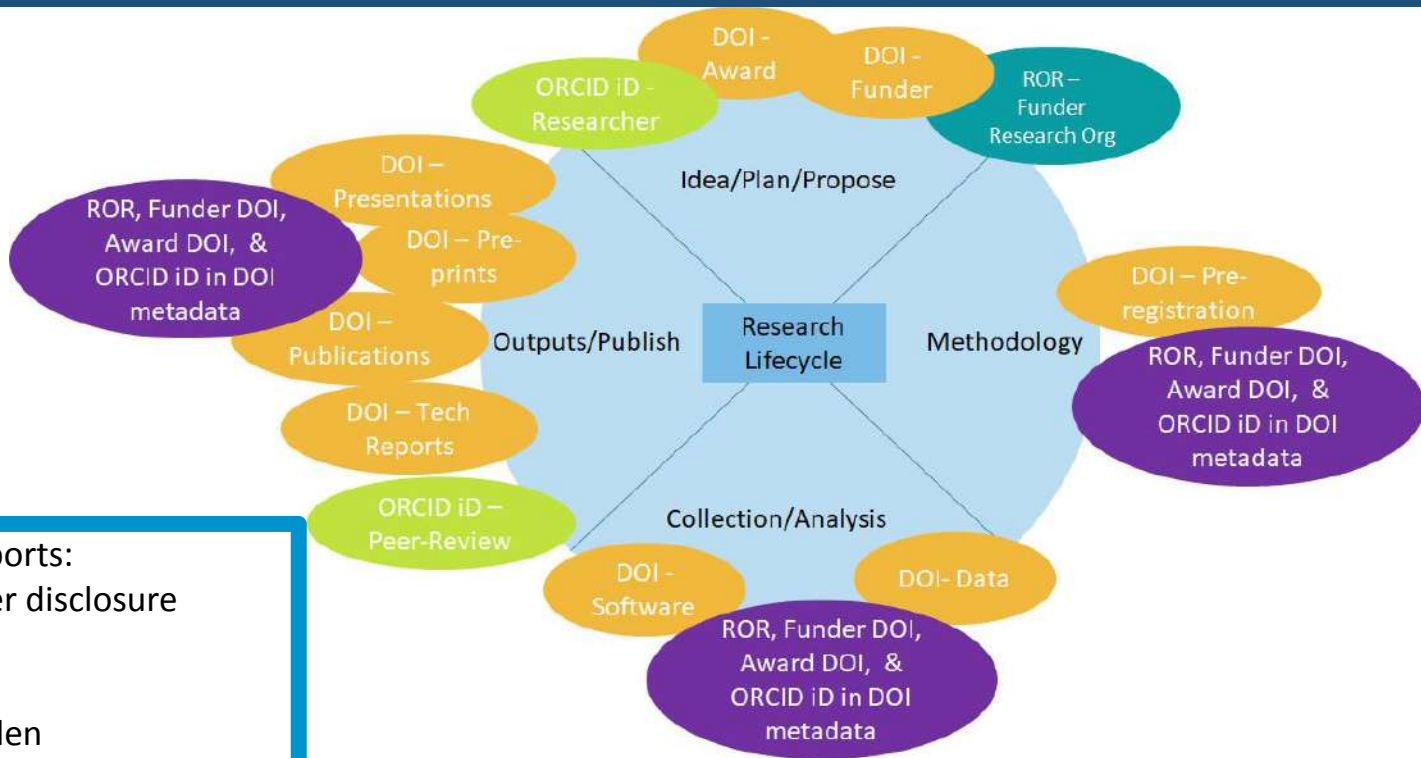
Section 4: Last date to provide optional DOE Public Access Plan update to OSTP/OMB

Section 4: Last date to publish related DOE policies

Section 4: Last date for related policies to be effective

Section 5: Ongoing interagency coordination

PID Implementation



USG PID implementation supports:

- Research integrity & proper disclosure
- Disambiguation
- Giving proper credit
- Easing administration burden
- Help with reporting
- Enabling broader discovery and making connections
- Understanding impact

Using PIDs for Research Integrity & Proper Disclosure

An official website of the United States government. [Learn how you track.](#)

NIH National Library of Medicine
National Center for Biotechnology Information [Log in](#)

SciENcv: Science Experts Network Curriculum Vitae

A researcher profile system for all individuals who apply for, receive or are associated with research investments from federal agencies. SciENcv is available in My NCBI.

About SciENcv

Background Information
Help Documentation

Developer Tools

Data Documentation
Data Schemas

Log in

eRA Commons National Science Foundation

More Options

DOE Office of Science “requires the use of the format approved by the National Science Foundation (NSF), which may be generated by the Science Experts Network Curriculum Vitae (SciENcv), a cooperative venture maintained at [https://www.ncbi.nlm.nih.gov/sciencv/...](https://www.ncbi.nlm.nih.gov/sciencv/)”

Log in

eRA Commons

Google Account

ORCID

Login.gov

Microsoft

NIH Account

NCBI Account

NIH National Library of Medicine
National Center for Biotechnology Information

Create a New Document

Document name:
Enter a name to help you to identify this document

Format:

- NIH Biosketch
- NIH Fellowship Biosketch
- NSF Biographical Sketch
- NSF Current and Pending (Other) Support
- IES Biosketch

Select a format for this document

Choose data source:

- Start with a blank document
- Existing Document:
- External source:

You must link to an eRA Commons Documentation on host

Sharing:

- Private
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You can change the shared settings at any time.

[Create](#) [Cancel](#)

Using PIDs for Reporting and Easing Burden

United States Department of Energy Energy Link System (E-Link) DOE STI Management System

Submission of USDOE Scientific and Technical Information
(Stop-by-step version of Announcement Notice 241.3)

(For use by Financial Assistance Recipients and Non-Major Site/Facility Management Contractors to submit Final Technical Reports, Accepted Manuscripts of Journal Articles, Conference Papers, and other STI products under an award; reference other Submission Options for Software and Datasets)

*** DOE Award/Contract Number ?**
DE-

Other Identifying Numbers ?

Award DOIs ?
(Click on a row below to Edit or Delete Award DOIs)

DOI	Funder
No data available in table	

Showing 0 to 0 of 0 entries
[Add Award DOI](#) [Clear](#)

*** Recipient/Contractor (Organization) ?**

*** STI Product Type ?**

*** Is there a DOI assigned to this Manuscript?**
 Yes No

This accepted manuscript will be made publicly available OSTI products after an administrative interval of 12 months. A digital object identifier (DOI) is a unique persistent identifier and provides long-term access; DOIs remain stable address or URL for the content changes.

What is an accepted manuscript?
An accepted manuscript is the version of the article that has been accepted for publication by a publisher and includes changes made during the production process. It is also known as the final peer-reviewed accepted manuscript content as the published article in the journal and may or may not be in the publisher's form or format. Find more information and access the published article.

*** Digital Object Identifier (DOI) ?**

Your DOI may auto-populate some of the required metadata, including title, author, and publication date.

* Is there a DOI assigned to this Manuscript?

Yes No

This accepted manuscript will be made publicly available OSTI products after an administrative interval of 12 months. A digital object identifier (DOI) is a unique persistent identifier and provides long-term access; DOIs remain stable address or URL for the content changes.

What is an accepted manuscript?

An accepted manuscript is the version of the article that has been accepted for publication by a publisher and includes changes made during the production process. It is also known as the final peer-reviewed accepted manuscript content as the published article in the journal and may or may not be in the publisher's form or format. Find more information and access the published article.

* Digital Object Identifier (DOI) ?

Your DOI may auto-populate some of the required metadata, including title, author, and publication date.

1. Product Description

2. Product Type Info

3. Authors

4. Content

5. Related Documents

6. Contact Info

7. Upload/Link

8. Certifications

9. Summary

Product Type Info

* STI Product Title ?

Novel Target Fabrication Using 3D Printing Developed at University of Michigan

Conference Information

* Journal Name

Journal of Physics: Conference Series

Volume

Issue

Serial Identifier

ISSN 1742-6588

Page Range

Article No. 012008

Publication/Issue Date ?

Date

Publication/Issue

Year Journal Issue

[Clear Date](#)

* Required

[Start Over](#)

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Using PIDs to Broaden Discovery and Make Connections

Data Record

Omics-Lethal Human Virus, Influenza A Experiment ICL102

Full Record | References (1) | Cited by (1) | Other Related Research

DATASET: [View Dataset](#)

<https://doi.org/10.25584/LHVICL102/1661912>

Abstract

The purpose of this experiment was to evaluate the human host cell response to wild-type influenza A/Anhui/1/2013 (H7N9; 'AH1-WT') virus and NS1-L103F/11999 and partially ferret-adapted ('AH1-691') mutant virus infection. Sample data was obtained from primary experimental study design data, leveraging unique capabilities. Proteomic, metabolomic, lipidomic, and/or transcriptomics dataset download a direct relationship to a primary sample data submission corresponding to a specific Influenza A host infection.

Authors: Anderson, Lindsey; Eisele, Arnie J.; Waters, Katrina M.

Publication Date: 2021-01-18

Research Org.: Pacific Northwest National Lab. (PNNL), Richland, WA (US); Environmental Molecular Sciences Lab. (EMSL)

Sponsoring Org.: National Institute of Allergy and Infectious Diseases (NIAID), HHS (US)

Contributing Org.: Environmental Molecular Sciences Laboratory (ORNL)

OSTI Identifier: 1661912

Report Number(s): ICL102; PRJNA284341 (NCBI BioProject), GSE151111 (GEO Series, mRNA transcriptome), MSV00007916 (Metabolite, LC-MS proteomics), MSV00007915 (Metabolite, LC-MS lipidome), MSV00007916 (MassIVE, Omics metabolite)

DOE Contract Number: AC05-76RL01830

Data DOI

Researchers/Authors ORCID iDs

Research Organization ROR iDs

Sponsoring/Funding Organization ROR ID

Contract/Award/Grant DOI

Full Record | References (1) | Cited by (1) | Other Related Research

All References

Works referenced in this record:

Journal (1)

Hypergraph analysis of biological networks to identify genes critical to pathogenic viral response

JOURNAL, MAY 2021

Feng, Song; Heath, Emily; Jefferson, Brett

BMC Bioinformatics, Vol. 22, Issue 1

<https://doi.org/10.1186/s12859-021-04197-2>

Reference Publication DOI

Full Record | References (1) | Cited by (1) | Other Related Research

All Cited By

Works referencing / citing this record:

Dataset (1)

PNNL DataHub Project Omics-LHV Profiling of Host Response to Influenza Infection Post-Processed Data Package DOIs

DATASET, JANUARY 2021

Anderson, Lindsey; McDermott, Jason; Waters, Katrina

Pacific Northwest National Laboratory 2; PNNL

<https://doi.org/10.25584/LHVFLU/1773426>

Cited By Data DOI

SOFTWARE - [Statistical Analysis](#)

pmartR: Quality Control and Statistics for Mass Spectrometry-Based Biological Data

SCIENTIFIC DISCOVERY

BIOLOGY

COMPUTATIONAL RESEARCH

SOFTWARE DATA/ANALYSIS

STATISTICS

MASS SPECTROMETRY

OMICs

Reference Software DOI

pmartR Software Overview

Using PIDs to Broaden Discovery and Make Connections

<https://doi.org/10.46936/10.25585/60008401>

Award Record

Award DOI Service OSTI.GOV
U.S. Department of Energy
Office of Scientific and Technical Information

Submit/Edit Dev Tools & Resources About FAQs Contact Sign In
Create an Account

SIP-Omics: Development of a semi-automated stable isotope probing pipeline for targeted metagenomics & metatranscriptomics

AWARD	Lead Investigator:	Pett-Ridge, Jennifer
Site Award URL: https://genome.jgi.doe.gov/portal/SIP0micrptomic/s/SIP0micrptomics/info.html		1 DOE OBER, NSF
Award DOI: https://doi.org/10.46936/10.25585/60008401	Awarding Organization:	Joint Genome Institute (JGI)
	Award Type:	Award
	Site Award Number:	2749
	Award Start Date:	2016-01-06

Investigator ORCID ID

Awarding Organization ROR ID

Publication DOI

Award DOI

Research | Open Access | Published: 25 November 2022

HT-SIP: a semi-automated stable isotope probing pipeline identifies cross-kingdom interactions in the hyphosphere of arbuscular mycorrhizal fungi

Erin E. Nuccio Steven J. Blazewicz, Marissa Laifer, Ashley N. Campbell, Anne Kakouridis, Jeffrey A. Kimbrel, Jessica Wollard, Daria Vychenska, Robert Riley, Andy Tomatsu, Rachel Hestrin, Rex R. Malstrom, Mary Firestone & Jennifer Pett-Ridge

Microbiome 10 Article number: 199 (2022) | [Cite this article](#)
3152 Accesses | 1 Citations | 105 Altmetric | [Metrics](#)

Acknowledgements

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Funding

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<https://doi.org/10.1186/s40168-022-01391-z>

Using PIDs to Understand Impact

Impact of Persistent Identifiers

The persistent identification of digital entities (e.g., research outputs, people, funders, awards, etc.) can increase discoverability of research, alleviating data validation issues, and reducing researcher burden.

By increasing discoverability of research-related objects, user communities can track their research over time and develop programmatic methods for finding, reproducing, and reusing research. PIDs are an essential component to developing mechanisms for human-machine interoperability, which helps promote improved citation and reference tracking.

PIDs are not just for journal articles and datasets. DOE OSTI collects DOIs for many different research product types (e.g. conference papers, conference proceedings, journal articles, etc.). And OSTI's [DOI Services](#) provide DOI assignment and registration for technical reports, conference posters and presentations, data, and software.

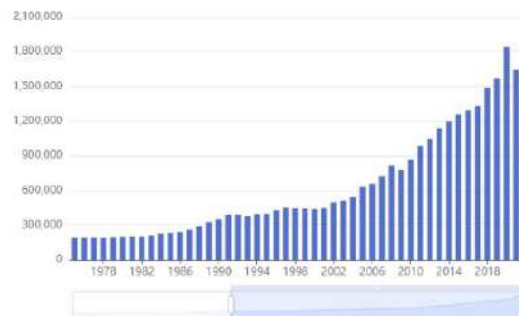
Since 2007, more than 400k DOIs have been registered by OSTI on behalf of the DOE community for texts, data, and software. More than 1.6M of the records in OSTI.GOV can be referenced with a DOI.

Total DOI Registration by Type

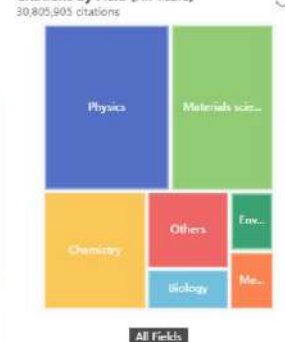


To date, more than 200k records in OSTI.GOV have been submitted or curated with related identifiers that identify specific types of relationships with other research products.

Citations of OSTI Records in Scientific / Scholarly Publications



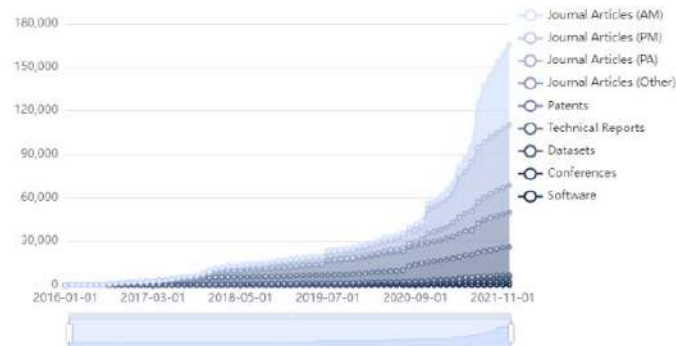
Citations by Field (All Years)



Interact with the bar chart by hovering on or clicking on a year. To see the total number of citations for a given year, hover over the year. Clicking on a specific year will refresh the treemap of citations by field, showing the top seven (7) fields by citation volume for that year.

Interact with the treemap by hovering over a topic to see the number of citations by field; clicking on a field will drill into subfields, hovering over a subfield will display the

R&D Results with Related Identifiers by Type



Thank you!

Intermission

10 mins

Next up: Technical Discussion

Crossref

Open infrastructure
and identifiers to
support policy



@CrossrefOrg



Agenda

- About us
- How open infrastructure supports federal policies
- Retrieving metadata from open APIs
- Summary



Our mission

Crossref makes research outputs easy to find, cite, link, assess, and reuse.

We're a not-for-profit membership organization that exists to make scholarly communications better.

About Crossref

- A small team of 45, with staff based in Europe, the US, Indonesia, Nigeria and Kenya
- 17,000+ member and affiliated organisations across 146 countries
- Not just a DOI registration agency - we offer a wide range of services to ensure that scholarly research metadata is registered, linked and distributed
- We provide metadata and services to make research outputs easy to find, cite, link, assess and reuse
- We have a metadata store of >142 million scholarly content items
- **We preserve the metadata we receive and make it available via our open APIs and Search with ~600 million queries each month**

Universities, research institutes and publishers are our largest group of members

Funders can join and register grants

Everyone benefits from quality metadata and good quality research

- Archives & repositories
- Research councils
- Data centres
- Professional networks
- Patent offices
- Indexing services
- Publishing vendors
- Peer review systems
- Reference manager systems
- Lab & diagnostics suppliers
- Info management systems
- Educational tools
- Literature discovery services
- Registration Agencies

Members → Crossref

A decorative graphic on the left side of the slide consists of several colored arrows (yellow, black, red, grey, blue) pointing horizontally to the right, originating from the left edge and pointing towards the text on the right.

Basic metadata: titles; author names; ISSN/ISBNs, abstracts, references

Funding information: Funder identifiers, award numbers

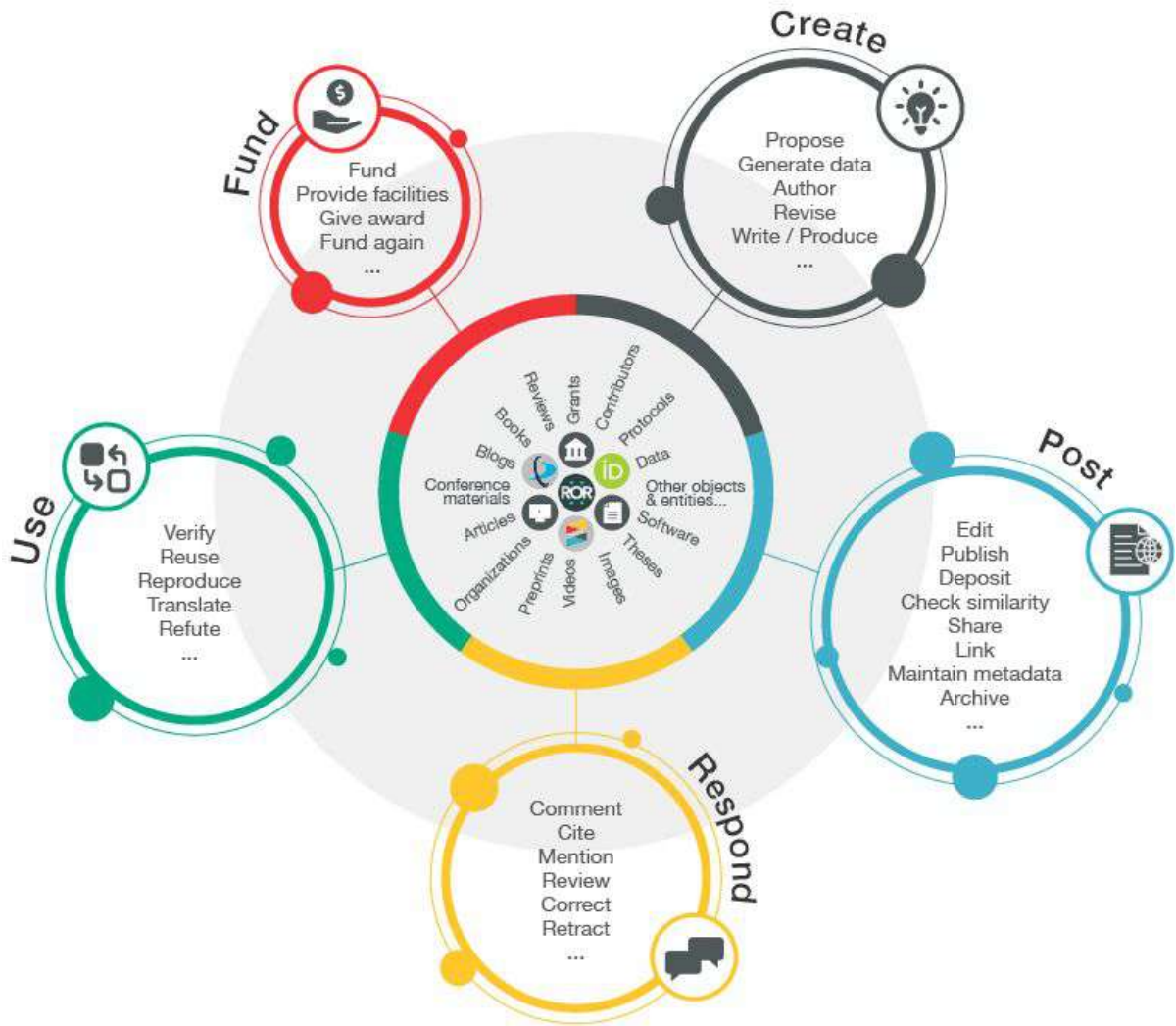
License information: License URLs

Full-text URLs: e.g. for text-mining and Similarity Check

Crossmark: updates, retractions, corrections
ORCID iDs

Recently: Peer Review reports, relations, links to related data, Grant identifiers, ROR identifiers

Research Nexus vision



POSI and why it matters to us and our community

Principles of Open Scholarly Infrastructure

A set of concrete commitments that an organization can make to build trust about its accountability, funding, and protection of community interests

Open infrastructure already exists to support funder goals; it just needs more adoption

Ensuring free, immediate, and equitable access to metadata that captures the scholarly record is an essential part of meeting the aims of the memo but also supporting Open Science globally.

Open infrastructure already exists, but it's unevenly implemented

Some US federal agencies registering grant DOIs

Increased collaboration and effort are key to making this all work

Award DOI Service OSTI.GOV
U.S. Department of Energy
Office of Scientific and Technical Information

Submit/Edit View Tools & Resources About FAQs Contact

Single-particle cryo-EM structural analysis of Q-dependent transcription antitermination

Abstract
The transcription antitermination factor Q, produced by bacteriophage lambda, is a textbook example of a regulator of gene expression that functions at the level of transcription termination. Q promotes function by binding to RNA polymerase-DNA/RNA transcription elongation complexes (TECs) and rendering TECs unable to recognize and respond to transcription termination signals. Q proteins from different bacteriophage complexes have different protein families (the Qantidote family, the Q21 family, and the Q22 family), with no detectable sequence similarity to each other and no detectable sequence similarity to other transcriptional proteins. Questions from different protein families are thought to be analogous (both identical functions but unrelated structures) rather than homologous (both identical functions and related structures). Questions have been the subject of extensive biochemical and genetic analysis opening the debate. However, an understanding of the structural and mechanistic basis of transcription antitermination by Q proteins has remained elusive in the absence of three-dimensional structural information for Q-dependent antitermination complexes. We present a paleotomographic single-particle reconstruction cryo-EM structure of Qantidote, Q21, and Q22-dependent transcription antitermination complexes. The availability of these dimensional structures of Q-dependent transcription antitermination complexes will define the molecular interactions between Q proteins and RNA polymerase and between Qantidote and nucleic acids, and will define the mechanism of Q-dependent transcription antitermination. The availability of these dimensional structures of Q-dependent transcription antitermination complexes from all three protein families of bacteriophage lambda proteins will enable exploration of the remarkable ability of these structurally unrelated protein families to perform analogous biochemical functions. Programmatic Access is Required (2 year, 4 days on T-Drive Archive, preferably starting in the second- or third-quarter of 2019, 31 days on Titan files, preferably starting in the first- or fourth-quarter of 2019).

Lead investigator: [Bright, Richard](#)

Investigator: [Wang, Chengzhen](#), [Zhou, Hanyu](#), [Baskins, Lisa](#), [Matsubara, Yuki](#), [Yu, Shuo](#)

Europe PMC About Tools Developers Help Explore the beta version Europe PMC plus

Search worldwide, life-sciences literature

E.g. "breast cancer" OR "DNA damage"

Tools overview ORCID article clearing journal list **Grant finder** External links service RSS feeds SciLife annotations

Annotations submission Service

Can a system intervention employing team-based case review help improve quality and safety of paediatric hospital care in Kenya?

[Prof MC English, University Of Oxford](#)
[View author profile](#) ORCID: [0000-0001-7627-9802](#)

Abstract
In Kenya 5% of children admitted to hospital die, a figure many times higher than developed countries. Severe illness and co-morbidity underlie many deaths, and require a coordinated response from health worker teams to deliver multiple interventions safely across admission periods of several days. This can expose many team and system weaknesses that need to be addressed to improve outcomes. We will build on prior work in Kenya to: 1. Comprehensively describe quality and safety concerns, avoidable mortality, their relationship with case severity and case complexity and the changing epidemiology of care in multiple Kenyan county hospitals 2. Co-design the tools and procedures that enable multi-site, team-based case review (TCR) to diagnose and tackle important quality and safety concerns locally and at scale 3. Test if intervention can reduce the frequency of modifiable factors that undermine quality and safety of hospital care and reduce preventably avoidable mortality 4. Undertake empirical work to refine a theory of change supporting a detailed process evaluation and critical exploration of mechanisms of intervention effect spanning individual providers, teams, organisations and institutions. This work will be a major contribution to the field of quality and safety in Africa and help develop scalable improvement interventions.

Lay abstract
Many more children die in Kenyan hospitals than in richer countries, often from treatable illnesses. Preventing deaths in very sick children requires health-workers to act effectively as a team to initiate correct care rapidly and sustain good care over time. When teams do not or cannot act effectively mistakes can be made and children may not receive what they need. A key to preventing avoidable deaths in Kenyan hospitals is to reflect on

Funded by Wellcome Trust

£ 2,553,243

Duration 01 Apr 2018 - 01 Apr 2023

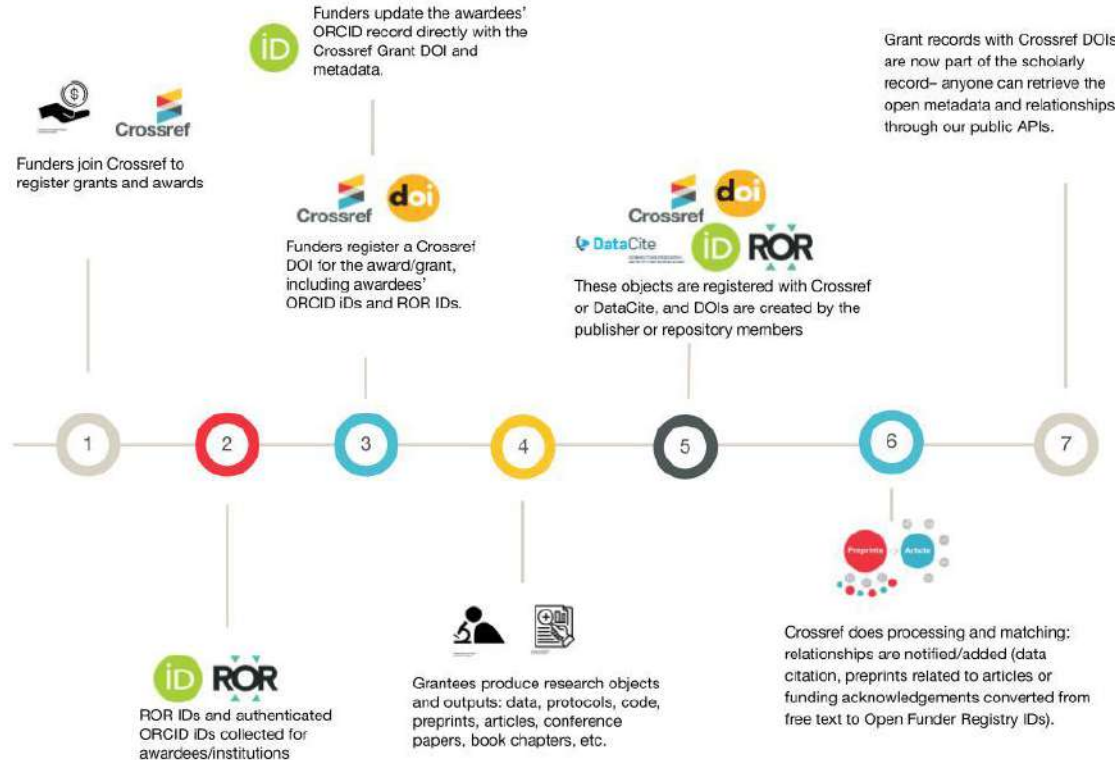
Grant number 203522

Funding stream Population and Public Health

Grant type Senior Research Fellowship Clinical Research

Publications No publications available

How do funders + publishers work w/this infrastructure



Using the metadata from Crossref/DataCite/ORCID/ROR

- Funding agencies can monitor compliance with their policies
- Publishers can identify the funder and meet their requirements
- Funding agencies can assess and report on the reach and return of their funding programs
- The provenance and integrity of the scholarly record is preserved and discoverable, benefitting all stakeholders.

▼ Funding (1) Sort

Can methods from computational psychology generate digital phenotypes that can be used to improve efficacy in clinical trials?

2020 to 2024 | Grant
Irish Research Council (Dublin, IE) [Show less detail](#)

Organization identifiers
FUNDRF: <https://dx.doi.org/10.13039/501100002681>
Irish Research Council: IE

Funding subtype
ICON Plc

Added
2021-04-25

Last modified
2021-04-25

NIH Blueprint for Neuroscience Research Metadata Search: Rachael Lammy

Sort by: RELEVANCE PUBLICATION YEAR [Download as CSV](#) Page 1 of 364 results

Extracting Individual Neural Fingerprint Encoded in Functional Connectivity by Silencing Indirect Effects
Journal Article published Aug 2020 in IEEE Transactions on Biomedical Engineering volume 67 issue 8 on pages 2253 to 2265
Research funded by National Natural Science Foundation of China (61673267619761366157129561876108) | Science and Technology Commission of Shanghai Municipality (19441907900) | National Project of Translational Medicine Fund of Shanghai Jiao Tong University (202018ZDA30) | Human Connectome (1U54M-091657)
Authors: Wen Jin, Hong Zhu, Pin Shu, Shantao Tong, Junfeng Sun
<https://doi.org/10.1109/tbme.2019.2968353> [Actions](#) [Add to ORCID](#)

Model-free Data-Driven viscoelasticity in the frequency domain
Journal Article published Jan 2023 in Computer Methods in Applied Mechanics and Engineering volume 403 on page 115657
Research funded by NIH Blueprint for Neuroscience Research (1RF1MH117080) | Deutsche Forschungsgemeinschaft (211504059 - SFB 1060390665813 - GZ 2047/1441211072 - SPP 2256)
Authors: Hossein Salahshoor, Michael Ortiz
<https://doi.org/10.1016/j.cma.2022.115657> [Actions](#) [Add to ORCID](#)

The nuts and bolts of the platelet release reaction
Journal Article published 17 Feb 2017 in Platelets volume 28 issue 2 on pages 129 to 137
Research funded by American Heart Association (15PRE2550020180RNT27620001) | NIH Blueprint for Neuroscience Research (1L58662) | American Heart Association (16GRNT27620001)
Authors: Smita Joshi, Sidney W. Whiteheart
<https://doi.org/10.1080/09637104.2016.1248768> [Actions](#) [Add to ORCID](#)

An amino-terminal fragment of apolipoprotein E4 leads to behavioral deficits, increased PHF-1 immunoreactivity, and mortality in zebrafish

Using the metadata from Crossref

Interfaces for people

- <https://search.crossref.org/>

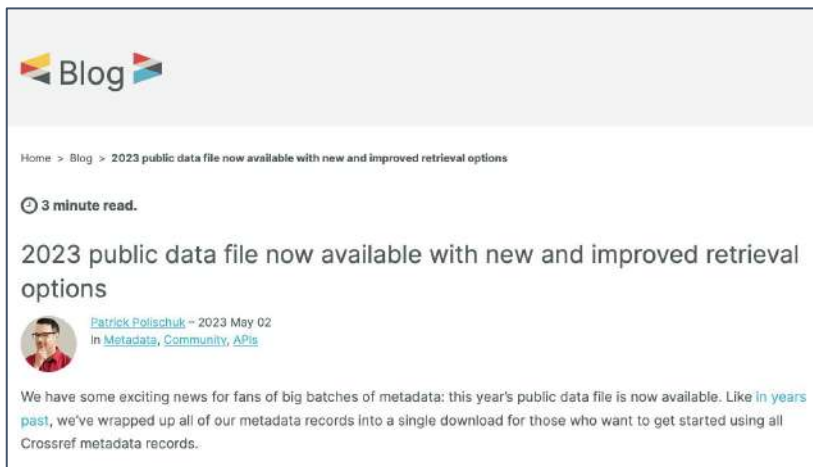
APIs for machines

- REST API <https://api.crossref.org>
- XML API
- OpenURL



Crossref REST API and data file

- <https://api.crossref.org>
- Public, open, free!
- Public (anonymous), Polite (self-identification), Plus (paid) options



The screenshot shows a blog post header with the Crossref logo and the title "2023 public data file now available with new and improved retrieval options". It includes a sub-header "Home > Blog > 2023 public data file now available with new and improved retrieval options", a "3 minute read" indicator, and a byline for Patrick Polischuk dated 2023 May 02. The main text begins with "We have some exciting news for fans of big batches of metadata: this year's public data file is now available. Like in years past, we've wrapped up all of our metadata records into a single download for those who want to get started using all Crossref metadata records."

<https://crossref.org/blog/2023-public-data-file-now-available-with-new-and-improved-retrieval-options/>



In Summary

- Metadata and services make research outputs easy to find, cite, link, assess, and reuse.
- Crossref DOIs are citation identifiers: [grants](#), [preprints](#), [articles](#), [chapters](#), [proceedings](#), [standards](#), [reports](#), [protocols](#), [dissertations](#), [reviews](#), [comments](#).
- Open data and APIs to retrieve metadata from >145 million records.
- “We envision a rich and reusable open network of relationships connecting research organizations, people, things, and actions; a scholarly record that the global community can build on forever, for the benefit of society.”

In Summary

- Open infrastructure to support funder goals already exists, it just needs more adoption
- Collaboration is key to making this work
- Open APIs and Open Metadata are foundational to making more connections between research objects



Thank-you

Email sbowman@crossref.org/ rlammey@crossref.org



@CrossrefOrg



Introduction to ORCID: PIDs & US Gov't Policies Workshop

ACM/IEEE Joint Conference on Digital Libraries
Santa Fe, New Mexico
26 June 2023



Brian Minihan, ORCID Engagement

<https://orcid.org/0000-0001-8412-717X>

Technical Discussion

- ORCID: the organization that supports Persistent Identifiers for people
- The ORCID Record, the ORCID Registry of researchers
- Only ORCID record holders, and explicitly trusted individuals and organizations can add, edit or delete information. period.
- Technical walkthrough of the Member API
- Ways in which technical aspects relate to policies

ORCID provides three main services



1. The ORCID iD: a unique, persistent identifier free of charge to researchers



2. An ORCID record/profile connected to the ORCID iD, that can include employment, education, funding, peer review, research output and other metadata



3. A set of Application Programming Interfaces (APIs), as well as the services and support of communities of practice that enable interoperability between an ORCID record and member organizations

ORCID is a non-profit organization

- ORCID is a 501 c 3 non-profit registered in the United States
- It has a governance structure, with an elected Board
- an associated metadata schema that was developed by CASRAI
- ORCID works closely with other PID organizations (Datacite, Crossref, ROR)
- In 2022 ORCID, in agreement with initial lenders, started a global participation program to extend membership growth beyond middle-high income countries, using ORCID's start-up loans from 2012



ORCID works best when used at pain points in the research cycle

a manuscript is submitted using an authenticated ORCID iD by the author.

publishers send manuscript metadata (including funding info) to Crossref

Crossref and Datacite create DOIs

DOIs are added to ORCID records

Universities read author's works data and add affiliations using RORs



Information on ORCID records

Researchers can add:

- Affiliations
- Professional activities
- Funding information
- Publications
- Other outputs
- Website URLs

The screenshot displays an ORCID iD profile for Sofia Maria Hernandez Garcia. The profile includes a header with the ORCID logo and the URL <https://orcid.org/0000-0001-5727-2427>. Below the header, there are sections for Emails (s.garcia@orcid.org), Websites & social links (Faculty profile webpage), Other IDs (Profile system identifier: A-123456, ResearcherID: L-8716-2018, eScientist: 0000-0001-5727-2427), and Countries (United States). The main profile area shows the published name Sofia Maria Hernandez Garcia and a biography stating it is used for testing. The Activities section is expanded, showing a list of activities: Employment (2), Education and qualifications (4), Invited positions and distinctions (3), Membership and service (2), Funding (1), Research resources (2), Works (7), and Peer review (2). Each activity entry has a 'Sort' button.

ORCID member organisations add validated information

When an ORCID member updates an ORCID record, the source of that update is captured for re-use:

- Research organisations add affiliations
- Publishers add outputs and reviews
- Funders add funding items



These provide **'trust markers'** that can be used to help in decision making.



University of Oxford: Oxford, Oxfordshire, GB

(Said Business School)
Employment

Source: ORCID Integration at the University of Oxford



▼ Review activity for **British journal of Cancer** (1)

Journal, British journal of Cancer
ISSN: [1532-1827](#)

Review date: 2020-11-16

Type: Review

Role: Reviewer

Source: Nature Publishing Group

The ORCID Member API

OAuth 2.0, RESTful

- all access to ORCID requires an access token
- and subsequently use that access token to obtain a token for API permissions
 - GET /read-limited
 - POST /activities/update
 - PUT /activities/update
- Using json or xml templates to add, update info in ORCID

3-legged OAuth authorization URL

https://sandbox.orcid.org/oauth/authorize?client_id=APP-674MCQQR985VZZQ2&response_type=code&scope=/read-limited%20/activities/update%20/person/update&redirect_uri=https://developers.google.com/oauthplayground

- host → <https://sandbox.orcid.org/oauth/authorize> = *endpoint*
- client_id → APP-674MCQQR985VZZQ2
- response_type → code
- scope → /read-limited & /activities/update & /person/update
- redirect_uri → <https://developers.google.com/oauthplayground> (the client application's landing page)

ORCID @ State University

[Home](#)

[About ORCID](#)

[Contact ORCID](#)

Get an ORCID iD!

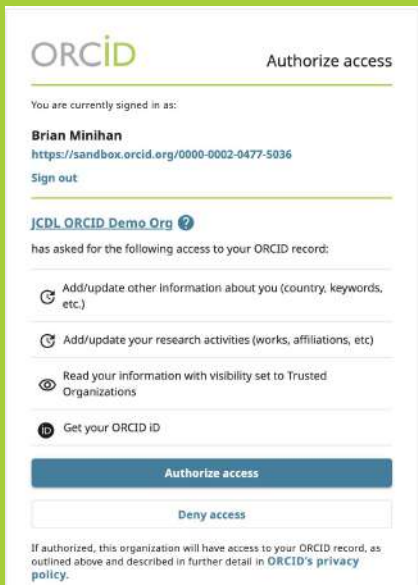
Click the button below to create an ORCID iD and connect it to State University's faculty profile system.

 [Create a new ORCID iD](#)

Already have an ORCID iD? [Connect your existing ORCID iD](#)



3-legged OAuth authorization URL produces this



ORCID Authorize access

You are currently signed in as:

Brian Minihan
<https://sandbox.orcid.org/0000-0002-0477-5036>

Sign out

JKDL ORCID Demo Org

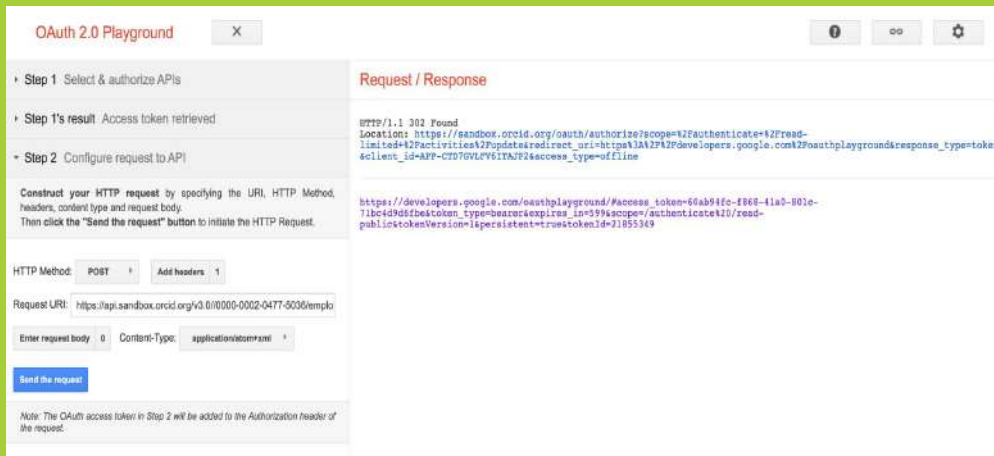
has asked for the following access to your ORCID record:

- Add/update other information about you (country, keywords, etc.)
- Add/update your research activities (works, affiliations, etc.)
- Read your information with visibility set to Trusted Organizations
- Get your ORCID ID

Authorize access

Deny access

If authorized, this organization will have access to your ORCID record, as outlined above and described in further detail in [ORCID's privacy policy](#).



OAuth 2.0 Playground

Step 1 Select & authorize APIs

Step 1's result Access token retrieved

Step 2 Configure request to API

Construct your HTTP request by specifying the URI, HTTP Method, headers, content type and request body. Then click the "Send the request" button to initiate the HTTP Request.

HTTP Method: POST Add headers: 1

Request URI: <https://api.sandbox.orcid.org/v3.0/0000-0002-0477-5036/templ>

Enter request body: 0 Content-Type: application/json

Send the request

Note: The OAuth access token in Step 2 will be added to the Authorization header of the request.

Request / Response

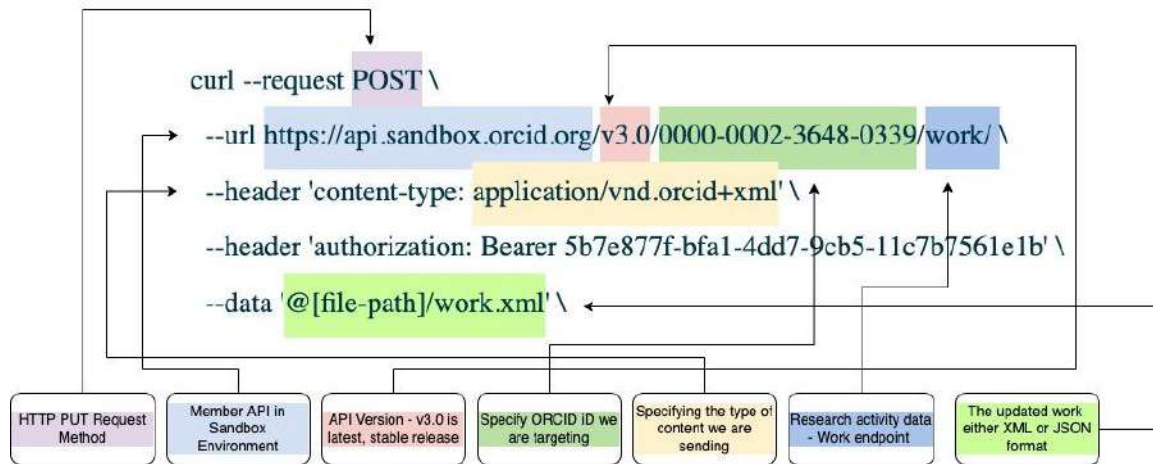
```
HTTP/1.1 200 Found
Location: https://sandbox.orcid.org/oauth/authorize?scope=42authenticate+42read-limited+42activities+2pdpdats+redirect_uri=https%3A%2F%2Fdevelopers.google.com%2Foauthplayground&response_type=token&client_id=APP-CTD7GVLCV61TA7F2&access_type=offline

https://developers.google.com/oauthplayground/#access_token=66ab9ffc-f868-41a0-801e-71bc49ad5f6e&token_type=bearer&expires_in=3599&scope=authenticate+read-publictokensVersion=1&persistent=true&tokenId=21855349
```

POST: Adding items

Items (works, employment, funding, peer review etc) can be added to an ORCID record using the ORCID member API.

- First [obtain permission from the researcher using OAuth](#) and [format the item metadata](#) using the ORCID message schema.
- Make an API request using HTTP POST, specifying the [relevant endpoint](#).
- The API will return a 201 message to indicate that the item posted correctly, along with the item's **put code**.



Posted content looks like this

University of California Davis: Davis, CA, US

2018-07-09 to present | ASSOCIATE DEAN (COLLEGE OF ENGINEERING)
Employment

[Show more detail](#)

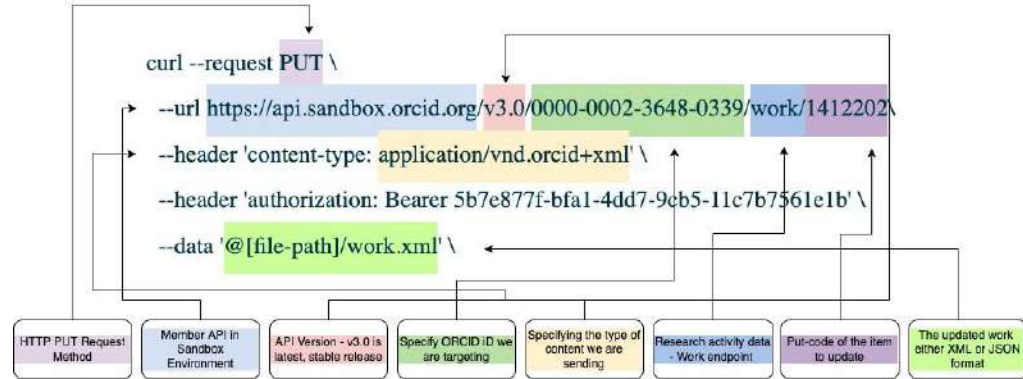
Source: University of California, Davis



PUT: updating items

ORCID members can update information they've previously added to an ORCID record. Only one item can be updated at a time, and it can only be updated using the client credentials that created it in the first place.

- Make sure you [store the put code and access token](#) when creating items.
- [Format the updated item in ORCID message schema](#) with the changed information and include the stored **put code**.
- The API will return a 200 OK message to indicate that the item updated correctly.



Use of identifiers (organizations) and PUT codes ensure that data added to ORCID is from a traceable source

```
<?xml version="1.0" encoding="UTF-8" />
<funding:funding
  xmlns:common="http://www.orcid.org/ns/common" xmlns:funding="http://www.orcid.org/ns/funding"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.orcid.org/ns/funding /funding-2.0.xsd">
  <funding:type>grant</funding:type>
  <funding:organization-defined-type>Principal Investigator</funding:organization-defined-type>
  <funding:title>
    <common:title>Moe Szycslak Annual Grant of Isotopic Studies in Cartoons</common:title>
    <common:translated-title language-code="en">Translated title</common:translated-title>
  </funding:title>
  <funding:short-description>Building on Dept. Chair Homer Simpson's work in epistemology this will result in more papers raising Springfield State's
funding:short-description>
  <funding:amount currency-code="HKD">17000</funding:amount>
  <funding:url>https://alt-url.org/</funding:url>
  <common:start-date>
    <common:year>1997</common:year>
    <common:month>02</common:month>
    <common:day>14</common:day>
  </common:start-date>
  <common:end-date>
    <common:year>2020</common:year>
    <common:month>02</common:month>
    <common:day>02</common:day>
  </common:end-date>
  <common:external-ids>
    <common:external-id>
      <common:external-id-type>grant_number</common:external-id-type>
      <common:external-id-value>1234</common:external-id-value>
      <common:external-id-url>http://tempuri.org/12345</common:external-id-url>
      <common:external-id-relationship>self</common:external-id-relationship>
    </common:external-id>
  </common:external-ids>
  <funding:organization>
    <common:name>Wellcome Trust</common:name>
    <common:address>
      <common:city>London</common:city>
      <common:country>GB</common:country>
    </common:address>
    <common:disambiguated-organization>
      <common:disambiguated-organization-identifier>http://dx.doi.org/10.13039/100004440</common:disambiguated-organization-identifier>
      <common:disambiguation-source>FUNDRF</common:disambiguation-source>
    </common:disambiguated-organization>
  </funding:organization>
</funding:funding>
```



National Strategies are asking for help in ensuring Compliance and Integrity

Traceability of sources of information: organizations, works, grants, supporting data

Balance between access and security, machines (API) and human researchers (permission)

And interoperability between systems

Is also how ORCID works to reduce administrative burden for individual researchers





b.minihan@orcid.org

Many thanks!



ROR and U.S. Federal Agency Policies

JCDL 2023 workshop

June 26, 2023

Dr. Amanda French



What is ROR?

What is ROR?

The Research Organization Registry (ROR) is a global, community-led registry of open persistent identifiers for research organizations.

(ROR is pronounced "roar" like a lion's roar. 🦁)

← ROR search home page

 <https://ror.org/01e41cf67>

Los Alamos National Laboratory

ORGANIZATION TYPE

Facility

OTHER NAMES

LANL, Laboratorio Nacional de Los Álamos, Laboratoire national de los alamos

WEBSITE

<http://lanl.gov/>

RELATIONSHIPS

Parent Organization(s)

[United States Department of Energy](#)

Child Organization(s)

[Center for Integrated Nanotechnologies](#)

[National High Magnetic Field Laboratory](#)

Related Organization(s)

[National Microbiome Data Collaborative](#)

LOCATION

Los Alamos (GeoNames ID [5476825](#))

United States

OTHER IDENTIFIERS

GRID [grid.148313.c](#)

ISNI [0000 0004 0428 3079](#)

Crossref Funder ID [100008902](#)

Wikidata [Q379848](#)

Is there an issue with the data on this record? [Submit a curation request](#)

What is a "registry"?



Search Registry...

ABOUT REGISTRY COMMUNITY BLOG DOCUMENTATION

103,872 Organizations

Are we missing an organization you're looking for? [Submit a request to add it](#)

Record status

- Active
- Inactive
- Withdrawn

Apply Clear

<https://ror.org/019wvm592>

Australian National University

ORGANIZATION TYPE

Education

OTHER NAMES

ANU

WEBSITE

<http://www.anu.edu.au/>

RELATIONSHIPS (6)

View details

LOCATION

Canberra (GeoNames ID 2172517)

Australia

OTHER IDENTIFIERS

GRID [grid.1001.0](#)

ISNI [0000 0001 2100 7477](#)

Crossref Funder ID [501100000995](#)

Wikidata [Q127990](#)

<https://ror.org/02bfwt286>

Monash University

ORGANIZATION TYPE

Education

LOCATION

Melbourne (GeoNames ID 2158177)

Australia

ROR is a **registry**, meaning that it is fundamentally a list. There are currently over 100,000 research organizations listed in the registry.

<https://ror.org/search>

What is a "persistent identifier"?

 <https://ror.org/05fs6jp91>

University of New Mexico

ROR is not just a list of names, however: it is a list of alphanumeric **identifiers** that can help systems disambiguate research organizations. These identifiers will **persist** over time, unlike an ordinary URL, which may cease to resolve to a working web page.



ORCID for researchers

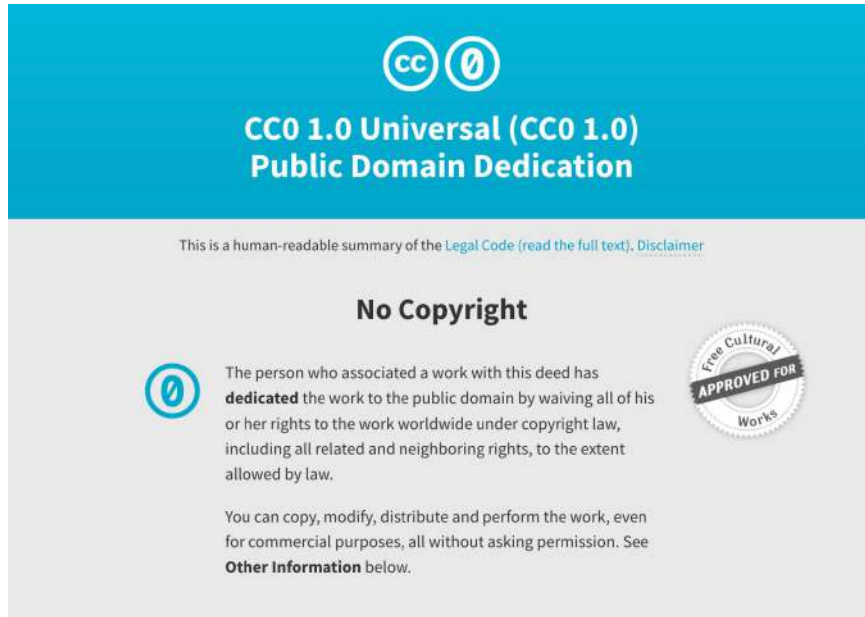


DOI for research outputs



ROR for research organizations

What does "open" mean?



The image shows a screenshot of the Creative Commons CC0 1.0 Universal Public Domain Dedication page. At the top, there are the CC and 0 icons, followed by the text "CC0 1.0 Universal (CC0 1.0) Public Domain Dedication". Below this, a line of text reads "This is a human-readable summary of the [Legal Code](#) (read the full text). [Disclaimer](#)". The main heading is "No Copyright". To the left of the text is a circular icon with a 0 inside. The text explains that the person who associated a work with this deed has dedicated the work to the public domain by waiving all of his or her rights to the work worldwide under copyright law, including all related and neighboring rights, to the extent allowed by law. Below this, it states that you can copy, modify, distribute and perform the work, even for commercial purposes, all without asking permission. See **Other Information** below. To the right of the text is a circular seal that says "Free Cultural Works APPROVED FOR Works".

Every identifier in the ROR registry is part of an **open** record released into the public domain under a CC-0 Public Domain dedication. The ROR API and the ROR dataset of 100,000+ organizations with IDs and metadata are entirely free to use with no cost or restrictions.

What is a "research organization"?

- ROR defines “research organization” as any high-level organization that conducts, produces, manages, or touches research.
- ROR identifies organizations that have a formal relationship – an "affiliation" – with researchers, including but not limited to **employers, educators, funders, publishers, and scholarly societies.**
- ROR currently lists well over 100,000 research organizations from around the world.

What is a "research organization"?

Common organization types that are **in scope** for ROR

- Universities and colleges
- Companies that are involved in research
- Private foundations
- Government agencies
- Hospitals and healthcare centers
- Laboratories
- Nonprofits
- Research institutes and facilities
- Scholarly societies

Common research entities that are **out of scope** for ROR

- Departments and wholly dependent subdivisions within organizations
- Companies that are not involved in research
- Single-person consultancies
- Pre-collegiate schools
- Journals
- Projects (see RAiD!)

What does "global" mean?

```
▼ countries:  
  ▼ 0:  
    id: "us"  
    title: "United States"  
    count: 30882  
  ▼ 1:  
    id: "gb"  
    title: "United Kingdom"  
    count: 7365  
  ▼ 2:  
    id: "de"  
    title: "Germany"  
    count: 5098  
  ▼ 3:  
    id: "cn"  
    title: "China"  
    count: 4810  
  ▼ 4:  
    id: "fr"  
    title: "France"  
    count: 3945  
  ▼ 5:  
    id: "jp"  
    title: "Japan"  
    count: 3920
```

- ROR contains records for 229 countries
- All ROR records are multilingual and support non-Latin character sets

```
▼ labels:  
  ▼ 0:  
    label: "המכללה האקדמית להנדסה אורט בראודה"  
    iso639: "he"  
  ▼ country:  
    country_name: "Israel"  
    country_code: "IL"
```

What does "community-led" mean?

- ROR was developed over three years of workshops from 2016-2019 and working groups in which 17 organizations outlined requirements for an open organization identifier.
- ROR is operated as a collaborative initiative by **California Digital Library, Crossref, and DataCite** as part of each organization's ongoing operational budget. **ROR does not depend on grants or on fees** for its sustainability, and it cannot be transferred to a commercial entity.
- All major changes to ROR's schema, technology, and governance are submitted for [community comment and review](#).

What does "community-led" mean?

- ROR is a **curated** registry, meaning that anyone can [request a change](#) to a ROR record or the addition of a new ROR record and all such requests then go through [a review process](#).
- ROR is not a membership organization and charges no fees, so it is not necessary to “join” ROR in order to add a record or request changes to a record.
- Simple change requests are approved or denied by the ROR Metadata Curation Lead. More difficult requests are sent to the international volunteer [ROR Curation Advisory Board](#).

What does "community-led" mean?

- ROR is a collaborative, open infrastructure initiative and service.
- ROR itself is not an independent organization or legal entity.
- ROR is committed to following the [Principles of Open Scholarly Infrastructure](#) (POSI).
- ROR cannot be governed by, purchased by, controlled by or sold to a commercial entity.
- The ROR governing organizations agree to not transfer control of any aspect of ROR or the ROR system to a commercial entity.

What tools does ROR offer?

- The ROR REST API - <https://api.ror.org/organizations>
- The ROR browser search interface - <https://ror.org/search>
- The ROR dataset - <https://doi.org/10.5281/zenodo.6347574>
- The ROR OpenRefine Reconciler - <https://ror.readme.io/docs/openrefine-reconciler>
- ROR scripts for searching and matching - <https://github.com/ror-community/ror-utilities>

See all ROR technical documentation at <https://ror.readme.io>



Why ROR?

ROR makes information about research organizations cleaner and easier to exchange among information systems so that research outputs can be reliably associated with organizations.

What problems does ROR solve?

- Many different variants of organization names in user-entered, free text data make internal reporting difficult and produce inconsistent search results
- Research institutions have a hard time tracking the output of their researchers
- Funders have a hard time tracking research outputs they have funded

Affiliation 

Virginia Tech



Published in:

Enter journal title

Published date:

All dates

Within the last

Select date range 


Custom range

From:

Select month 

Select year 

To:

Select month 

Select year 

Access type:

All content

 Open Access content only

 Only content I have full access to

SEARCH

ROR Typeahead Demos

This example queries the ROR API as the user types and generates suggestions based on the query results. The URL for this query is:

```
https://api.ror.org/organizations?query=
```

This example uses [Twitter typeahead.js](#) and [jQuery](#), however, it can be created using a variety of typeahead plugins, including those for specific JS frameworks.

Basic institution name typeahead

Institution name

Begin typing to activate a suggestion list. Please choose an institution from the list, if available. If your institution is not listed, continue typing to enter its name manually.

Data returned from ROR API

Including department-level information

Use ROR to capture the the "top level" organization (ex: University of Wisconsin-Madison). If you also need to capture department,

Visit <https://ror-community.github.io/ror-typeahead-demos> to try this demo yourself

Virginia Tech <https://ror.org/02smfhw86>

1,986
Works

650
Citations [?](#)

18,319
Views [?](#)

4,715
Downloads [?](#)

Founded 1872

Links

- [Homepage](#)
- [Wikipedia](#)
- [Twitter](#)

Other Identifiers

- GRID [grid.438526.e](#)
- Crossref Funder ID [10.13039/100007263](#)
- Crossref Funder ID [10.13039/100006601](#)
- Crossref Funder ID [10.13039/100009522](#)
- Crossref Funder ID [10.13039/100009778](#)
- ISNI [0000000106944940](#)
- Wikidata [Q65379](#)

Geolocation

37° 13' 30.0" N, 80° 25' 30.0" E

- [United States](#)
- [Education](#)
- [DataCite Consortium Organization](#)

<https://ror.org/02smfhw86>

1,986 Works

Share

- [Email](#)
- [Twitter](#)
- [Facebook](#)

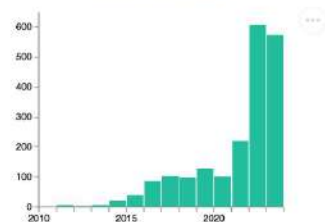
Filter Works

Type to search...

Authors [?](#)

- Perez, Miguel A. 101
- Lakdawala, Seema 26
- Bianchi, Eric 23

Publication Year



Work Type



License



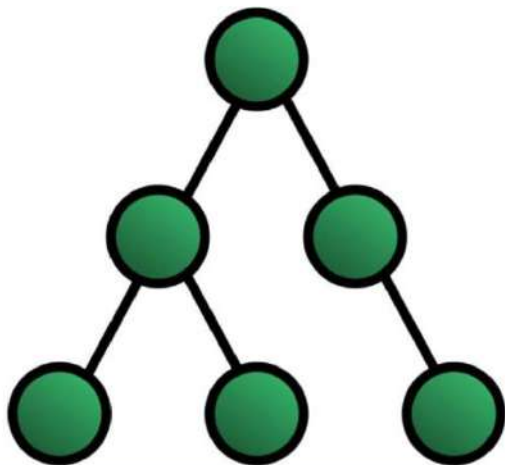


Amanda French (She/Her) · You

ROR Technical Community Manager

6d · 🌐

Did you know that you can use **ROR - Research Organization Registry** to create organizational "family trees"? In this new explainer we talk about hierarchy and relationships in ROR -- the metadata, the policies, the real-live uses out there in the wild. [#openscience](#) [#pids](#) [#scholarlypublishing](#)



Parents, Children, and Other Relationships in ROR Records

ror.org



David C. Pace, PhD, MBA · 2nd

Deputy Director, DIII-D National Fusion Facility

4d · 🌐

+ Follow ...

This is an informative post from **ROR - Research Organization Registry**. Something as simple as being able to identify the research products from a research program can be challenging, but what about the agencies that support that program? Universities, national labs, and other groups all put effort into communicating the value of our research efforts. ROR and other persistent identifiers are improving our ability to associate research outputs with the "family tree" of the producing organization. We are going to see this approach advance rapidly as metadata such as ROR identifiers become integrated into research publications, conference presentations, and other research products.

ROR Core Team, "Parents, Children, and Other Relationships in ROR Records," ROR Blog, February 27, 2023:

<https://ror.org/blog/2023-02-27-parents-children-and-other-relationships-in-ror/>

[Amanda French LinkedIn post](#) | [David C. Pace LinkedIn post](#)

- United States Department of Energy
 - Advanced Research Projects Agency-Energy
 - Ames Laboratory
 - Argonne National Laboratory
 - Center for Light Energy Activated Redox Processes
 - Brookhaven National Laboratory
 - RIKEN BNL Research Center
 - Consortium for the Advanced Simulation of Light Water Reactors
 - Fermilab
 - Fuel Cell Technologies Office
 - Geothermal Technologies Office
 - Great Lakes Bioenergy Research Center
 - Idaho National Laboratory
 - International Partnership for the Hydrogen and Fuel Cell in the Economy
 - Joint BioEnergy Institute
 - Joint Genome Institute
 - Lawrence Berkeley National Laboratory
 - Joint Center for Artificial Photosynthesis
 - Lawrence Livermore National Laboratory
 - Los Alamos National Laboratory
 - Center for Integrated Nanotechnologies
 - National High Magnetic Field Laboratory
 - National Energy Technology Laboratory
 - National Nuclear Security Administration
 - National Renewable Energy Laboratory
 - Nevada National Security Site
 - Oak Ridge National Laboratory
 - Joint Institute for Computational Sciences
 - Atmospheric Radiation Measurement User Facility
 - Office of Economic Impact and Diversity
 - Office of Electricity Delivery and Energy Reliability
 - Office of Energy Efficiency and Renewable Energy
 - Vehicle Technologies Office
 - Office of Environmental Management
 - Office of Environmental Protection, Sustainability Support and Corporate Safety Analysis
 - Office of Fossil Energy
 - Office of Health and Safety
 - Office of Inspector General

- Office of Inspector General
- Office of Intelligence and Counterintelligence
- Office of International Affairs
- Office of Legacy Management
- Office of Management
- Office of Nuclear Energy
- Office of Nuclear Safety
- Office of Science
 - Office of Advanced Scientific Computing Research
 - Office of Basic Energy Sciences
 - Office of Biological and Environmental Research
 - Office of Fusion Energy Sciences
 - DIII-D National Fusion Facility ←
 - Office of High Energy Physics
 - Office of Nuclear Physics
 - Office of Scientific and Technical Information
 - Office of Workforce Development for Teachers and Scientists
- Office of Space and Defense Power Systems
- Office of Under Secretary of Energy for Science
- Office of the General Counsel
- Pacific Northwest National Laboratory
 - Joint Global Change Research Institute
- Princeton Plasma Physics Laboratory
- SLAC National Accelerator Laboratory
 - Kavli Institute for Particle Astrophysics and Cosmology
 - Linac Coherent Light Source
 - Stanford Synchrotron Radiation Lightsource
- Sandia National Laboratories
 - Center for Integrated Nanotechnologies
 - Sandia National Laboratories California
- Savannah River National Laboratory
- Savannah River Operations Office
- Solar Energy Technologies Office
- United States Energy Information Administration
- Vera C. Rubin Observatory
- KBase
- Kansas City National Security Campus
- Atmospheric Radiation Measurement User Facility

Visual representation of ROR relationships for the US Department of Energy - <https://ror.org/01bj3aw27>



Amanda French

Were you the primary advocate of implementing ROR at your organization?



Tom Morrell

I would say yes, but we had lots of other librarians who were also very excited and interested in this. Because it's going to be helpful not only for discoverability by making our metadata better, but it'll also be really helpful for reporting. One of the types of reports that we have to do often is compliance reports for funders, and we track who's collaborating with who. At the moment those are challenging to put together, because you need to know everybody's affiliation, and trying to match up what a given affiliation is when you have random strings that are coming in from publications is really challenging. So we have librarians who are very excited about the possibility of actually having identifiers for these affiliations. That makes a lot of the reporting stuff a lot easier.

ROR and other organizational identifiers

ROR is different from other organizational identifiers such as **GRID**, **ISNI**, **Wikidata**, **Funder IDs**, and **Ringgold** in a few key ways:

- ROR is completely open (CC0 data, open API) and noncommercial
- ROR is focused on identifying scholarly affiliations
- ROR is designed to be supported in core scholarly infrastructure (e.g., Crossref, DataCite, ORCID)
- ROR is developed as a community initiative
- ROR has a transparent curation process
- ROR's modern REST API and JSON data makes it easy to implement

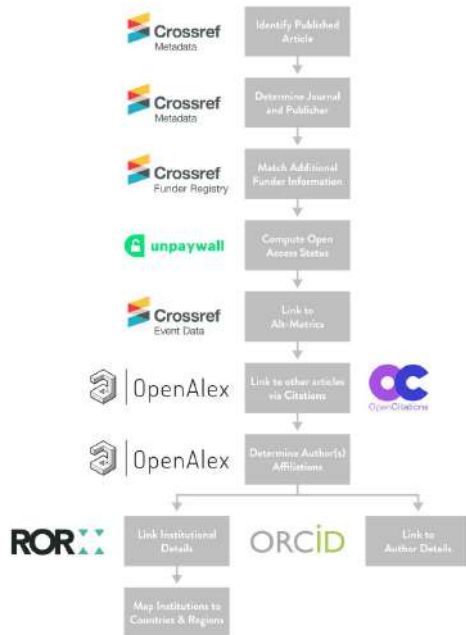


ROR and Public Access Monitoring

"Federal agencies should report to OSTP, when requested, on the status of their public access plans and policy implementation, including the number of all scholarly publications funded by the federal agencies and any other relevant statistics collected by the agency."

Figure 1. COKI dataset analysis pipeline.

The table of publications is created by joining records from the research publication datasets on Digital Object Identifiers (DOIs); unique digital identifiers given to the majority of publications. Figure 2 illustrates how each dataset contributes to the publications table during the joining process, using the example of a single publication. Unique publications are discovered with Crossref Metadata, from which the publication's DOI, Journal, Publisher, Funder identifiers and citation counts are derived. The publication's Open Access status is computed using Unpaywall. The authors of the paper and their institutional affiliations are derived from OpenAlex. ROR is used to enrich the institutional affiliation records with institution details and map institutions to countries and regions. The COKI Open Access Dataset uses the ROR assignment of country codes to institutions.



COKI Open Access Dashboard - <https://open.coki.ac>

COUNTRY	OPEN %	BREAKDOWN PUBLISHER OPEN OTHER PLATFORM OPEN CLOSED	TOTAL PUBLICATIONS	OPEN PUBLICATIONS
SÃO TOMÉ AND PRÍNCIPE	94%	[Bar chart showing high open access]	1,602	1,501
INDONESIA	89%	[Bar chart showing high open access]	972,703	863,931
NICARAGUA	83%	[Bar chart showing high open access]	5,115	4,267
EQUATORIAL GUINEA	82%	[Bar chart showing high open access]	130	107
PERU	80%	[Bar chart showing high open access]	84,485	67,680
THE GAMBIA	79%	[Bar chart showing high open access]	3,303	2,622

Publications

Search for DOI or Source ID

Dimension Institution	Institution ID	Number of corresponding	Total count
Technical University of Munich	https://orcid.org/0366pp42	14,239	33,123
Ludwig-Maximilians-Universität in Munich	https://orcid.org/05501w55	12,600	31,673
Charité - Universitätsmedizin Berlin	https://orcid.org/001w7p25	8,203	23,944
Heidelberg University	https://orcid.org/0383ky00	7,493	21,827
TU Dresden	https://orcid.org/042arjy30	8,712	20,604
RWTH Aachen University	https://orcid.org/04afq034	9,244	19,967
University of Erlangen-Nuremberg	https://orcid.org/0077qz57	8,531	18,983
Karlsruhe Institute of Technology	https://orcid.org/0403w470	8,187	17,944
University of Tübingen	https://orcid.org/0345wz48	6,284	16,905
University of Freiburg	https://orcid.org/0445og223	7,239	16,738

last update: 22.06.2023

Open Access Monitor (OAM)

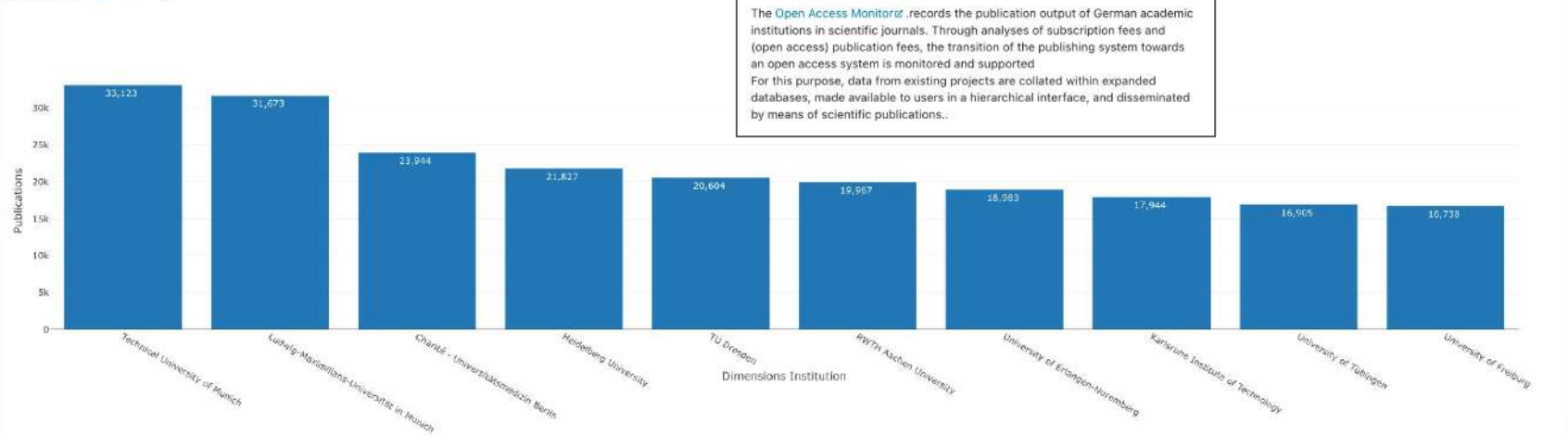
A project to establish and operate a national Open Access Monitor & funded by the Federal Ministry of Education and Research.



Overview

The Open Access Monitor records the publication output of German academic institutions in scientific journals. Through analyses of subscription fees and (open access) publication fees, the transition of the publishing system towards an open access system is monitored and supported. For this purpose, data from existing projects are collated within expanded databases, made available to users in a hierarchical interface, and disseminated by means of scientific publications.

Chart selection





ROR and Research Integrity

"Federal agencies should take steps to ensure that public access policies support scientific and research integrity by transparently communicating to the public critical information, including that which is related to the authorship, funding, ***affiliations***, and development status of federally funded research. The public should be able to identify which federal agencies support given investments in science, the scientists who conduct that research, and the extent to which peer-review was conducted."

```
https://api.crossref.org/works?filter=ror-id:https://ror.org/052gg0110
JSON Raw Data Headers
Save Copy Collapse All Expand All Filter JSON
status: "ok"
message-type: "work-list"
message-version: "1.0.0"
message:
  facets: {}
  total-results: 2478
  items:
    0:
      indexed: {...}
      publisher: "Muscular Dystrophy Association"
      award: "578222"
      DOI: "10.55762/pc.gr.81520"
      type: "grant"
      created: {...}
      source: "Crossref"
      prefix: "10.55762"
      member: "33899"
      project:
        0:
          project-title:
            0:
              title: "Androgen Receptor isofor... to therapeutic targets"
              language: "en"
          project-description: [...]
          investigator:
            0:
              given: "Daniel"
              family: "Blakey"
              affiliation:
                0:
                  id: "https://ror.org/052gg0110"
                  id-type: "ROR"
                  asserted-by: "publisher"
                  name: "University of Oxford"
            1:
              given: "MATTHEW"
              family: "WOOD"
              affiliation: [...]
```

Finding works whose authors are affiliated with the University of Oxford in the Crossref API

<https://api.crossref.org/works?filter=ror-id:https://ror.org/052gg0110>



ROR and International Collaboration

Institution > North Carolina State University ✕

Institution > Chinese Academy of Sciences ✕

Limit your search

Subject keyword >

Geographical Location >

Journal >

Institution ▾

Chinese Academy of Sciences 12 ✕

North Carolina State University 12 ✕

China Three Gorges University 2

Nanjing Agricultural University 2

Zhejiang University 2

Alabama State University 1

Arizona State University 1

Beijing Forestry University 1

more »

< Previous | 1 - 10 of 12 | Next >

1. Data for: Predation risk and the evolution of a vertebrate stress response: parallel evolution of stress reactivity and sexual dimorphism >

2. Data from: Effects of plant functional group loss on soil biota and net ecosystem exchange: a plant removal experiment in the Mongolian grassland >

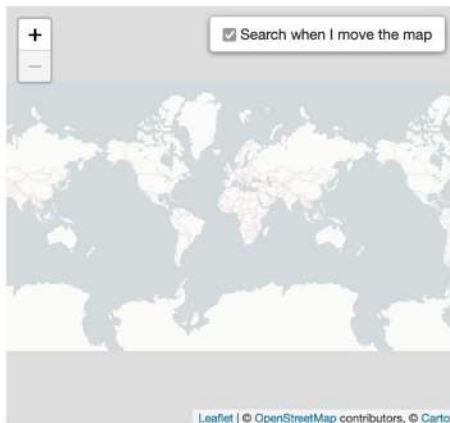
 3. Data from: Genetic structure and post-glacial expansion of *Cornus florida* L. (Cornaceae): integrative evidence from phylogeography, population demographic history, and species distribution modeling >

4. Data from: Livestock grazing regulates ecosystem multifunctionality in semi-arid grassland >

5. Data from: Natural selection and repeated patterns of molecular evolution following allopatric divergence >

6. Data from: Reconciling multiple impacts of nitrogen enrichment on soil carbon: plant, microbial, and geochemical controls >

7. Data from: Soil acidification exerts a greater control on soil respiration than soil nitrogen availability in grasslands subjected to long-term nitrogen enrichment >



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      "name": "North Carolina State University"
    }
  },
  {
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    "givenName": "Yan - Xia",
    "familyName": "Sun",
    "affiliation": {
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      "sameAs": "https://ror.org/04tj63d06",
      "name": "North Carolina State University"
    }
  },
  {
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    }
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    "familyName": "Thomas",
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      "sameAs": "https://ror.org/00h8xnr33",
      "name": "Science Learning Resources (United States)"
    }
  }
],

```



Thank you!

Amanda French
amanda@ror.org

Intermission

15 mins

Next up: Q&A Discussion