

Persistent Identifiers

Repo Builders Workshop

National Centre for Persistent Identifiers, National Library of Technology
National EOOSC CZ Conference 2025, 2–3 December, Ostrava



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the European Union



MINISTRY OF EDUCATION,
YOUTH AND SPORTS

Centre for Repositories and Metadata Management

- National Document Repository
- CCMM – Czech Core Metadata Model for Research Data
- National Catalogue of Repositories
- **National Centre for Persistent Identifiers**



About us

NTK

50°6'14.083"N, 14°23'26.365"E
Národní technická knihovna
National Library of Technology



Hana Heringová
National Centre for
Persistent Identifiers



Hana Šilha Machová
National ORCID Centre



Jakub Šindelář
National DOI Centre

Agenda

- **Persistent identifiers basics**
- **Persistent identifiers in NDI (NRP, NMA, NKR, CCMM)**
- **Recommended PIDs**
 - DOIs for research outputs
 - PIDs for samples and instruments
 - ORCID iD for researchers
 - ROR IDs for research organizations

Methodology for persistent identifiers in NDI in development

(We will be asking for your feedback)



„PIDs are **long-lasting, managed, and registered unique** digital references to an object that can be represented or described online.”

U.S. Department of Energy's Office of Scientific and Technical Information

- **digital**
- **globally unique**
- **persistent**
- **machine actionable**
- have a **metadata** schema
- underpins FAIR principles

What can you associate PIDs with



Digital objects: articles, datasets, software, audiovisual records etc.



Abstract objects: organizations, projects, awards, conferences etc.



Physical objects: persons, samples, instruments etc.

There is a lot of persistent identifiers...

For **objects / outputs**



Handles



For **researchers** and
other contributors



For **research
organizations**



Recommendations for Creating Repositories in the NRP Environment:

„Metadata records in the repository must be tagged with persistent identifiers (PIDs).

It is up to you to choose the appropriate type of PID (e.g. DOI, handle, ...) and determine how and when they are assigned.“

National Metadata Directory (NMA): Harvests metadata records along with the used PIDs

National Catalogue of Repositories (NKR) will request:

Persistent identifier types used in the repository (incl. prefixes)

Supported persistent identifiers for persons

Persistent identifiers in NDI

Czech Core Metadata Model (CCMM):

PID-agnostic but certain PIDs will be recommended by CCMM methodology:

- **DOIs** for datasets / **ORCID** IDs for persons / **ROR** IDs for organizations

ORCID and **ROR IDs** allow matching of identical creators in NMA dashboards. Without their provision, each creator will be considered unique.

The Identifier class contains information about the identifier such as **schema**, **value** and **IRI**, e.g.:

```
<identifier>
  <iri>https://doi.org/10.48700/datst.1m3t2-78951</iri>
  <value>10.48700/datst.1m3t2-78951</value>
  <schema>
    <iri>https://doi.org/</iri>
    <label xml:lang="">DOI</label>
  </schema>
</identifier>
```

Recommended persistent identifiers

For **objects / outputs**



For **researchers** and
other contributors



For **research
organizations**



Recommended PIDs – support services

For **objects / outputs**



National DOI Centre

For **researchers** and
other contributors



National ORCID Centre

For **research
organizations**



National support

Selecting a different PID

There are many materials to help you select:

- FAIR-IMPACT: **Guidelines for creating a user tailored EOSC Compliant PID Policy**
<https://doi.org/10.5281/zenodo.14092489>
- Dutch Digital Heritage Network: **PIDWIJZER - Persistent Identifier Guide** <https://www.pidwijzer.nl/en/>
- FREYA Project: **Guides to Choosing Persistent Identifiers** <https://doi.org/10.5281/zenodo.4192174>
- Technische Informationsbibliothek: **How to choose a PID?**
<https://pid4nfdi-training.readthedocs.io/en/latest/choose.html>
- Finnish Open Science Coordination Working group for linking and citing data: **Choosing and implementing persistent identifiers**: Guide for research organisations. <https://doi.org/10.5281/zenodo.4395767>
- Digital Preservation Coalition, Remco van Veenendaal: **Choosing a Persistent Identifier Type for Your Digital Objects**
<http://doi.org/10.7207/twgn23-02>
- FORCE11: **Desirable characteristics of PIDs**
<https://doi.org/10.54900/c3hdq-0ev76>
- Etc...

**...but if you end up not using the recommended PIDs,
no support guaranteed (technical, methodological,
financial & administrative)**

Digital Object Identifier



- Identifies different types of research entities (not only digital objects)
- Location of an entity/its metadata can change, but a DOI should always resolve to it
- Based on the Handle System®
- Registered via a few Registration Agencies, assigned through the agencies „members“:



DOIs in publishing workflows



DOIs in repositories

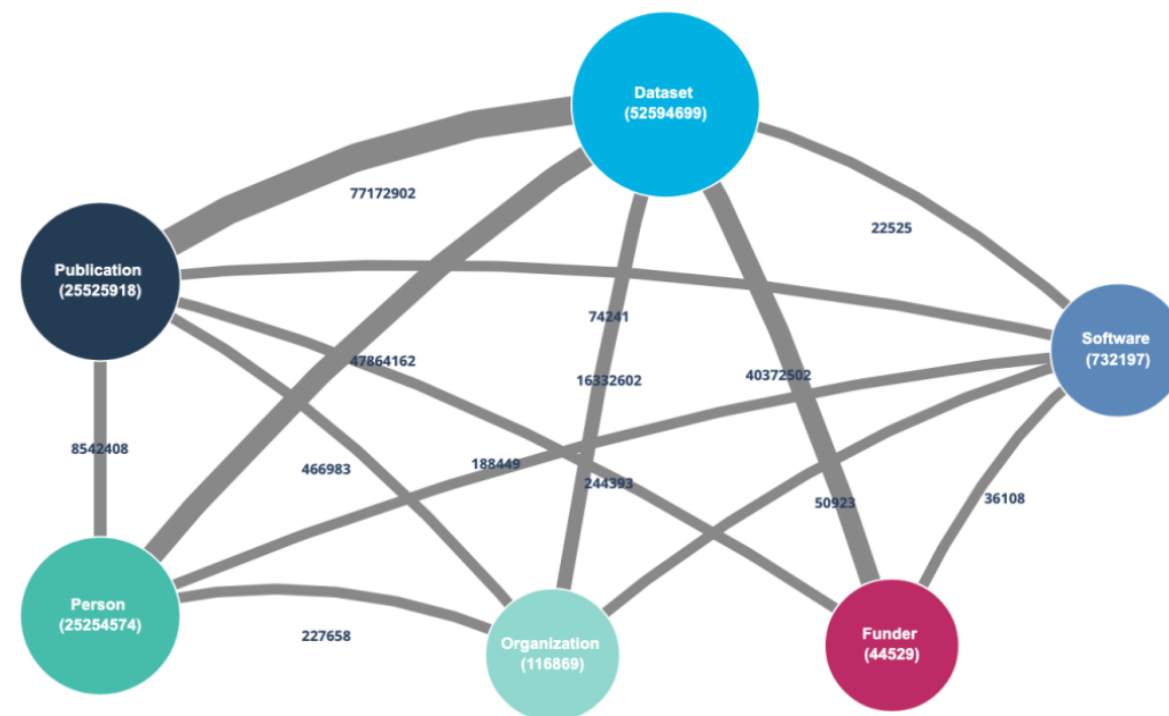
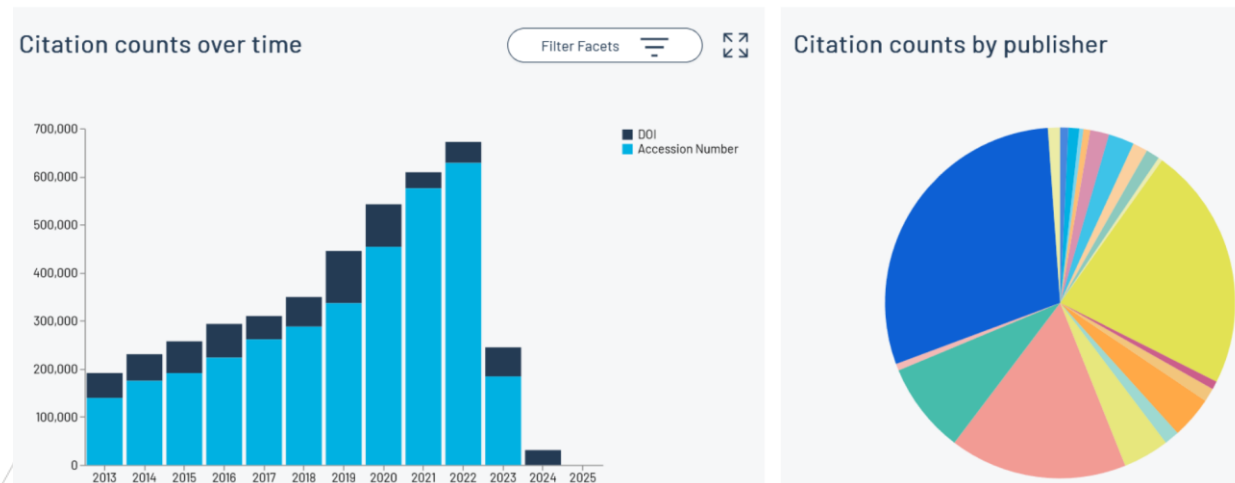
(National DOI Centre)



etc.

Advantages of using DOI

- **Maturity and widespread adoption**
- **Exact metadata schema**
- **Open metadata**
- **Additional services**
 - Usage tracking
 - Ability to identify duplicates
 - Access via API, citation managers
 - Visualization, analysis
 - Etc.



DOI basics

1 object – 1 DOI (In some cases, more DOIs are desirable / necessary - versioning, translations etc.)

1 repository - 1 prefix (more prefixes in special cases)

Suffixes should not contain meaning – might become problematic

DOI should be displayed
in full URL format

<https://doi.org/10.48813/yt6w-6h15>

Prefix - Identifies
repository

Suffix - Identifies
object

DOI versioning

Non-significant changes
(typo corrections etc.)



same DOI
with updated metadata

Significant changes



new DOI
use Related Identifier
(Is Version Of / Has Version;
Is previous version of / Is new version of)

- Each version of dataset should have its own DOI
- All the versions should have one „canonical DOI“.
- Canonical DOI and the versions' DOIs should be connected via metadata (RelatedIdentifier).

Versions

Version V2

Apr 1, 2025

10.5281/zenodo.15130643

Version V1

Oct 18, 2024

10.5281/zenodo.13950727

[View all 2 versions](#)

Cite all versions? You can cite all versions by using the DOI [10.5281/zenodo.13950726](#). This DOI represents all versions, and will always resolve to the latest one. [Read more.](#)

- **Via web interface** – only suitable for low numbers of DOI
- **Via API** (<https://support.datacite.org/docs/api>)
- **Via platforms with integrated DOI registration** (Dspace, InvenioRDM, Open Journal Systems etc.)

Testing environment for DataCite freely available per request

(contact us at doi@techlib.cz)

<https://support.datacite.org/docs/testing-guide>

- Check that the object does not already have a DOI.
- Assigning a DOI means committing to (long-term) **maintenance** and updating of its metadata record.
- The DOI should be assigned by the institution **responsible** for the object. It is not possible to resell or provide DOIs to a third party.
- The DOI record must comply with the **metadata schema** of the registration agency.

- Metadata completeness:
 - Use **recommended** and **optional** properties on top of the mandatory ones
 - Use **Related Identifier** to indicate relationships with other objects
 - Use PIDs (ORCID) for **persons**
 - Use PIDs (ROR) for **organizations** (Creator, Contributor, affiliation, funder)
- Landing pages:
 - DOI should resolve to a **web page**, not to the actual object
 - Landing page should contain information on the object – licence, how to access it, share it, cite it etc.
 - The object itself does not have to be publicly available/exist, but its metadata (landing page) must be.
 - Tombstone pages (should be prevented)

DataCite documentation: <https://support.datacite.org>



IGSN (International Generic Sample Number)

- For samples/collections identification and management
- On DataCite infrastructure (IGSN type repositories)

<https://support.datacite.org/docs/igsn-id-registration-guide>



PIDINST

- Metadata schema - PIDs can be registered with DataCite, ePIC, B2INST
- White Paper guide (DOI and ePIC cookbooks)

<https://docs.pidinst.org/en/latest/white-paper/index.html>

KA 5.3 NRP working group

- Re-usable automatic (meta)data collection and PID assignment in pilot cases
- Database of instruments and samples

Currently 15 member institutions: 4 universities, Czech Academy of Sciences – library, Institute of Archaeology, Institute of Biotechnology, CESNET, NTK, etc.

Service:

Member institutions can register DOIs for various types of objects (including IGSNs for samples) through the DataCite registration agency

How does it work?

NTK provides member institutions with a DataCite account.

Institutions manage their own "prefixes"/repositories and control the allocation of DOIs themselves.

NTK covers all costs / member fees until the end of 2028.

How to gain access to DataCite services

- ✓ Check if your organization is a member of the National DOI Centre (if not, contact us at doi@techlib.cz)
- ✓ Get a repository account via an institutional account:

Type

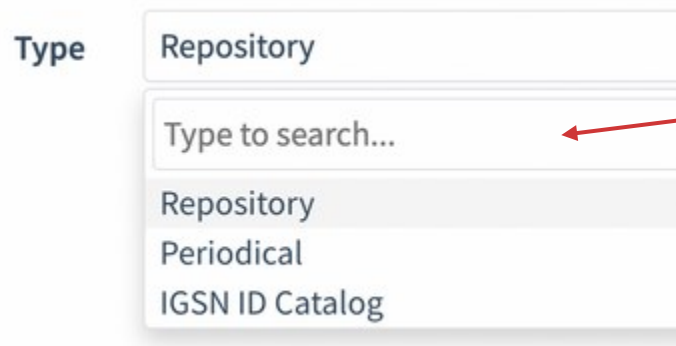
Repository

Type to search...

Repository

Periodical

IGSN ID Catalog



Mandatory Fields:

- Repository ID
- Type
- Repository Name
- System Email
- Service Contact
- Domains (for „landing pages“)

Other fields: re3data Record, Repository Alternate Name, Description, URL, Language, Software, Repository type (Repository Discipline), Certificate

- ✓ Test your workflow from start to finish
- ✓ Start minting DOIs


- **Open Researcher and Contributor ID**
- A standard for the unique and persistent identification of all individuals involved in research and publication processes in science
- Managed by non-profit organization ORCID (not connected to any commercial resource such as Researcher ID or Scopus ID)
- Supported by the European Commission – required in e.g. Horizon Europe, by scholarly publishers (Elsevier, Springer Nature, The Royal Society, Wiley, IEEE aj.)
- Conditionally mandatory for reporting research results into RIV, IS VaVal



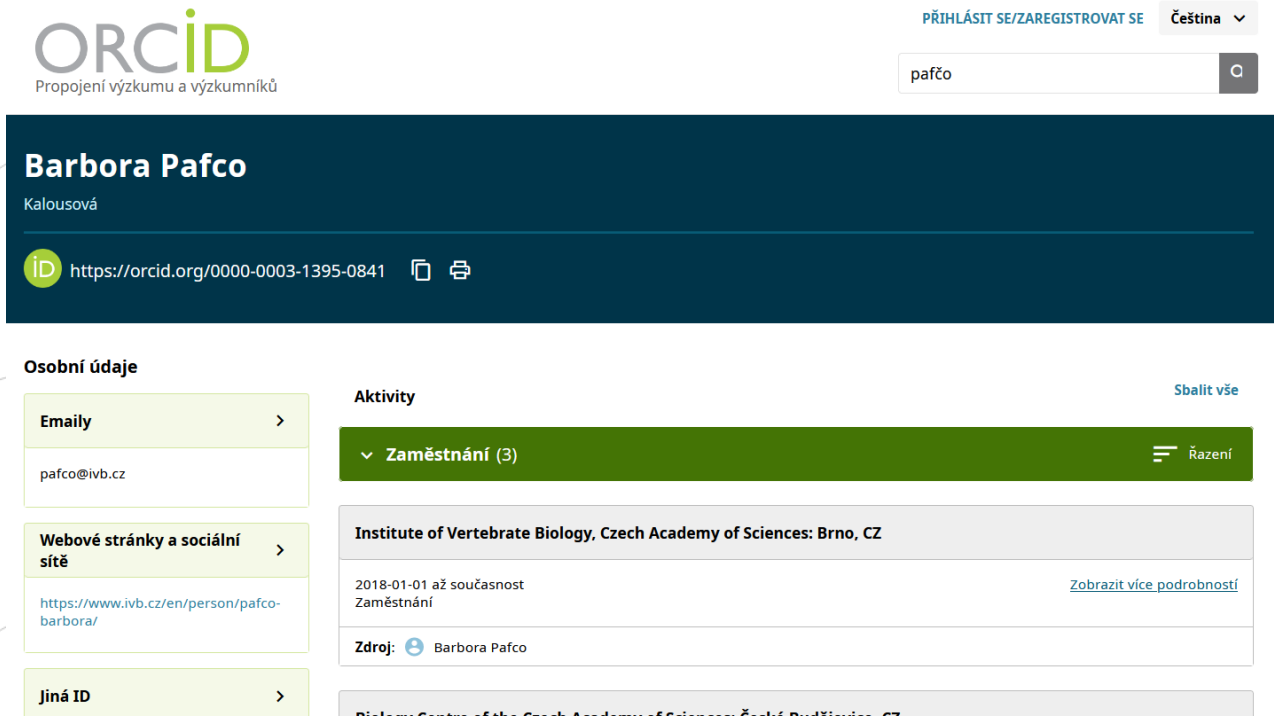
<https://orcid.org/0000-0001-8683-6156>

ORCID services

ORCID iD: unique, persistent identifier provided to researchers for **free**

 <https://orcid.org/0000-0003-1395-0841>

ORCID record connected to ORCID iD – “researcher’s CV”





The screenshot shows the ORCID profile of Barbora Pafco. At the top, there's a navigation bar with the ORCID logo and the tagline "Propojení výzkumu a výzkumníků". To the right, there are links for "PŘIHLÁSIT SE/ZAREGISTROVAT SE" and a language dropdown set to "Čeština". Below this is a search bar containing the text "pafčo". The main header of the profile displays the name "Barbora Pafco" and the surname "Kalousová". Below the name is the ORCID iD icon and the URL "https://orcid.org/0000-0003-1395-0841", followed by icons for a document and a share button. The profile is divided into two main sections: "Osobní údaje" (Personal data) on the left and "Aktivity" (Activities) on the right. The "Osobní údaje" section includes "Email" (pafco@ivb.cz), "Webové stránky a sociální sítě" (a link to the IVB website), and "Jiná ID". The "Aktivity" section is titled "Zaměstnání (3)" (Employment (3)) and shows a list of jobs. The first job is at the "Institute of Vertebrate Biology, Czech Academy of Sciences: Brno, CZ", with the dates "2018-01-01 až současnost" (2018-01-01 to present) and a link to "Zobrazit více podrobností" (Show more details). The source is listed as "Zdroj: Barbora Pafco".

+ **API** allowing automated updates between ORCID record and other systems (CRIS / OBD, DataCite, Crossref apod.)

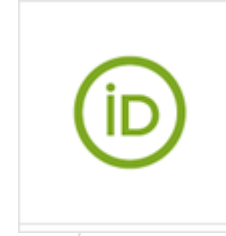
Authenticated vs. unauthenticated ORCID iDs




 <https://orcid.org/0000-0002-2771-9344>

 [0000-0002-2771-9344](https://orcid.org/0000-0002-2771-9344)

- Verified through a secure sign-in using the ORCID API – ensures connection between an ID and a specific person
- User can allow systems to access and update his/her ORCID record at the same time.



 <https://orcid.org/0000-0002-2771-9344> (unauthenticated)

 [0000-0002-2771-9344](https://orcid.org/0000-0002-2771-9344) (unauthenticated)

- No verification.
- Must be displayed with the special unauthenticated icon and the suffix "(unauthenticated)".

Sign in with ORCID

MSSx

Manuscript Submission System X


[Help & support](#)

Welcome to Manuscript Submission System X

Turpis enim leo vitae integer sed risus nisl etiam at. Gravida tellus pharetra sed at cras. Mattis ante est consequat nec ut pellentesque. Integer natoque amet et in. Orci mi sit parturient risus eu. Elementum et ante lorem leo sodales mauris non at.

Nisl dui vel id blandit posuere diam tortor nunc quisque. Risus fames adipiscing vulputate facilisis nulla sit sed nibh nulla. In non quis massa metus praesent viverra auctor. Dolor laoreet ut nisl hendrerit ut auctor. Felis cursus porttitor ligula consectetur facilisis et malesuada adipiscing viverra. In mi mus tortor nulla placerat pellentesque tempus aliquam.

Get started and submit your manuscript in minutes

 Sign in with ORCID

[Tracking system home](#) | [Privacy policy](#) | [Cookie policy](#) | [Manage cookies](#)



Sign in with ORCID

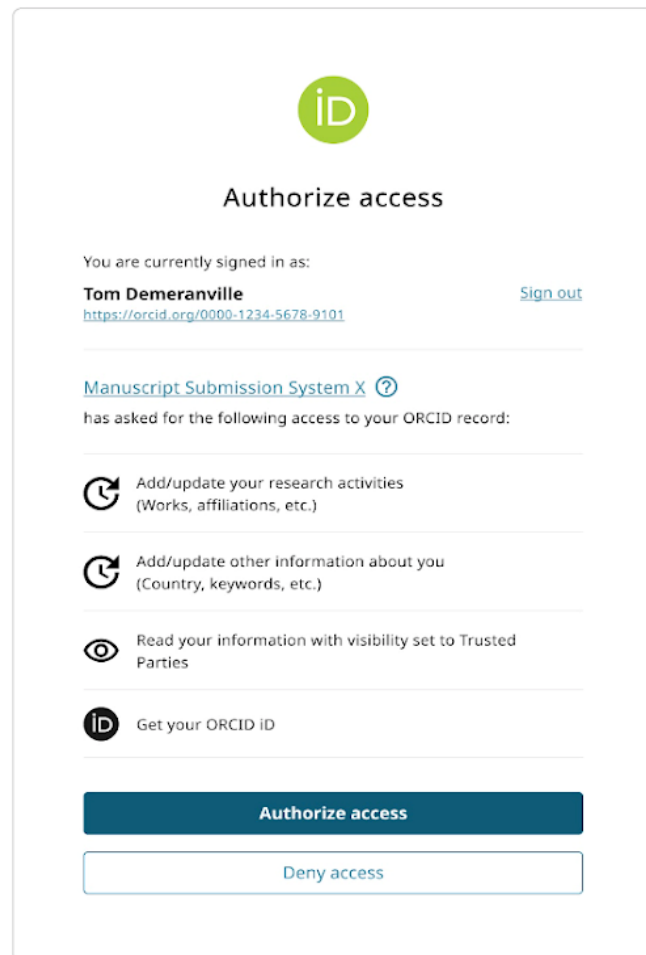
Email

tom@email.com

Password

Sign in with ORCID

Authorization process







The screenshot shows the ORCID 'Authorize access' page. At the top is the ORCID logo and the title 'Authorize access'. Below this, it states 'You are currently signed in as:' followed by the name 'Tom Demeranville' and a link to the user's ORCID profile. A 'Sign out' link is also present. The page then lists the permissions being requested by 'Manuscript Submission System X'. These include: 'Add/update your research activities (Works, affiliations, etc.)', 'Add/update other information about you (Country, keywords, etc.)', 'Read your information with visibility set to Trusted Parties', and 'Get your ORCID iD'. At the bottom, there are two buttons: 'Authorize access' and 'Deny access'.

Authorize access

You are currently signed in as:
Tom Demeranville
<https://orcid.org/0000-1234-5678-9101> [Sign out](#)

[Manuscript Submission System X](#) [?](#)
has asked for the following access to your ORCID record:

-  Add/update your research activities
(Works, affiliations, etc.)
-  Add/update other information about you
(Country, keywords, etc.)
-  Read your information with visibility set to Trusted Parties
-  Get your ORCID iD

Authorize access

[Deny access](#)



User logs in to their ORCID account to ensure the app connects to the correct ORCID iD.

← Who is asking for access permissions?

← What permissions are being requested?

Collecting ORCID iDs

1. **Via direct interaction with a researcher:**
an **authenticated iD** (and, optionally, permission to update the user's ORCID record) obtained from a user through an OAuth interaction
2. **Via mediated deposit:**
an **unauthenticated iD** associated with an item or user by an individual other than the iD owner (validation should be in place)
3. **Via external 3rd party import/deposit:**
an iD (authenticated or unauthenticated) is extracted from metadata obtained via import or deposit from an external source



Always prioritize authenticated IDs

- Allow **sign-in with ORCID iD and authenticate** author's/contributor's ORCID iD
- Allow administrators to **collect authenticated iDs and permission** where metadata includes non-authenticated iDs
- Collect **authenticated ORCID iDs from contributors**
- **Include (authenticated) ORCID iDs** in any metadata passed downstream
- Make sure **ORCID iDs are displayed** on research outputs and wherever possible
- Make sure research **outputs are added to authors' ORCID records**
- Allow administrators to **associate ORCID iDs with authors/contributors**

Public vs. member API

- **Sign** into your system with ORCID
- **Collect user's validated ORCID iDs**
- Retrieve **public data** from a user's ORCID record
- Search **public ORCID registry data**
- **Access trusted data**
- **Write data** to ORCID records
- **Sync** ORCID records and your own system

PUBLIC API

MEMBER API

Access to member API is paid and available to members of ORCID or various ORCID consortia (incl. **National ORCID Centre)**

ORCID Documentation: <https://info.orcid.org/documentation/>

- Integration Guide - How to integrate ORCID in your repository
- API provided by ORCID - types and features
- How does the ORCID API work? ORCID API Tech Tutorial on GitHub
- <https://info.orcid.org/repository-systems/>

ORCID suport: National ORCID Centre

Currently 28 member institutions: 20 universities + Library of the Czech Academy of Sciences, Czech Science Foundation, CESNET etc

Service:

Member institutions can:

- work with authenticated ORCID iDs of researchers in their systems
- enter information about affiliation, publication activity, etc. into the ORCID profiles of their researchers, or download information from ORCID profiles

How does it work?

Until 2028, NTK covers all ORCID fees for member institutions, but member institutions themselves bear the costs of integrating ORCID into their systems and of internal communication about ORCID to employees.

How to gain access to ORCID services

- ✓ Check if your organization is part of the National ORCID Centre (if not, contact us at orcid@techlib.cz)
- ✓ Request access to a „sand box“ to test your workflow
- ✓ Test your integration against ORCID's integration checklist
- ✓ Request production API credentials
- ✓ Start exchanging data with ORCID registry
- ✓ Communicate with your researchers/users about what it means and the value it brings

ROR ID for research organizations



<https://ror.org/05pq4yn02>

Czech Academy of Sciences, Biology Centre

ORGANIZATION TYPES

Facility, Funder

OTHER NAMES

Acronyms

BC AV ČR

BC CAS (en)

Labels

Biologické centrum AV ČR (cs)

Biologické centrum AV ČR, v. v. i. (cs)

Biologické centrum AV ČR, veřejná výzkumná instituce (cs)

Aliases

Biology Centre CAS (en)

Biology Centre of the Czech Academy of Sciences (en)

Czech Acad Sci, Biol Ctr (en)

RELATIONSHIPS

Parent Organizations

Czech Academy of Sciences

Child Organizations

Czech National Infrastructure for Biological Data

National Research Infrastructure for Biological and Medical Imaging

Predecessor Organizations

Institute of Entomology

Institute of Hydrobiology, Biology Centre, Academy of Sciences of the Czech Republic

Institute of Parasitology

Institute of Plant Molecular Biology

Institute of Soil Biology

LOCATIONS

České Budějovice (GeoNames ID [3077916](#)), Czechia

WEBSITE

<https://www.bc.cas.cz>

OTHER IDENTIFIERS

GRID [grid.418338.5](#)

ISNI [0000 0001 2255 8513](#)

Crossref Funder ID [501100017273](#)

Wikidata [Q8310408](#)

Research Organization Registry

- Identifier for all types of research organizations, including research funding organizations
- Created specifically for affiliations and funding acknowledgments.
- Initiative by the California Digital Library, Crossref, and DataCite.
- NTK strives to update ROR IDs for Czech research institutions, including mapping ROR and IČO.
- Part of the IS VaVal from 2025.

ROR ID for research organizations

ROR is **completely open** (CC0 data, open API)

ROR IDs **crosswalk** to other open, globally used identifiers - currently ISNI, Crossref Funder Registry, and Wikidata.

NTK prepared a crosswalk between ROR IDs and IČO (01/2026 on Github).

How to get new ROR / modify existing ROR: ask NTK – ror@techlib.cz

How to access ROR data:

- Data dump available in JSON, CSV format <https://doi.org/10.5281/zenodo.6347574>
- API - <https://ror.readme.io/docs/rest-api>

ROR documentation: <https://ror.readme.io/>

National centres - funding

Without the consortia / financial support from the NTK, the services would cost each institution:

Premium ORCID services: around CZK 200,000 per year

DataCite services: at least CZK 60,000 per year

- Until 2028, the NTK will cover all fees for member institutions from the CARDS project
- Efforts are being made to secure follow-up funding
- In any case, member institutions would continue to benefit from significantly more favorable conditions for consortium members

The more institutions use the services, the better conditions for everyone

Persistent identifiers (PIDs) are tools that are used to uniquely identify people, organisations, and other objects (e.g., books, articles, datasets) in a scholarly communication system. This website provides information about persistent identifiers and the types of support for them at the national level.

Favourite links

**National ORCID
Centre**

National DOI Centre

**Czech National
Agency for ISBN
and ISMN**

**National ISSN
Centre**

News from blog

PIDfest 2026 — SAVE THE DATE

November 12, 2025

Invitation to the second edition of the PIDfest international conference dedicated to persistent identifiers. PIDfest is a three-day international summit...

[Continue reading...](#)

ORCID's New Featured Works Section

November 4, 2025

ORCID has introduced a new Featured Works section that allows researchers to select up to five of their most important...

[Continue reading...](#)

DataCite: 100 million registered DOIs

October 31, 2025

In October 2025, a milestone was reached in DataCite infrastructure: the registration of 100 millionth DOI. Since its founding nearly...

[Continue reading...](#)

ORCID notice of Directors election 2026

October 23, 2025

ORCID has announced the candidates for Board of Directors for the year of 2026. Voting will be open from November...

[Continue reading...](#)

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identifikatory@techlib.cz
orcid@techlib.cz
doi@techlib.cz
ror@techlib.cz



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