



Crossref

DOIs and metadata completeness

Lucy Ofiesh



Mission & vision

Mission

Crossref is a not-for-profit membership organization that exists to make scholarly communications better. We make research objects easy to find, cite, link, assess, and reuse.

Vision

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.



Scale of Crossref

25,000 organisational members from **167** countries

- **51%** of members are based in Asia
- **40%** of members are universities or scholar-led
- **6%** of members are based in GEM-eligible countries

140 Sponsoring orgs; **42** Ambassadors

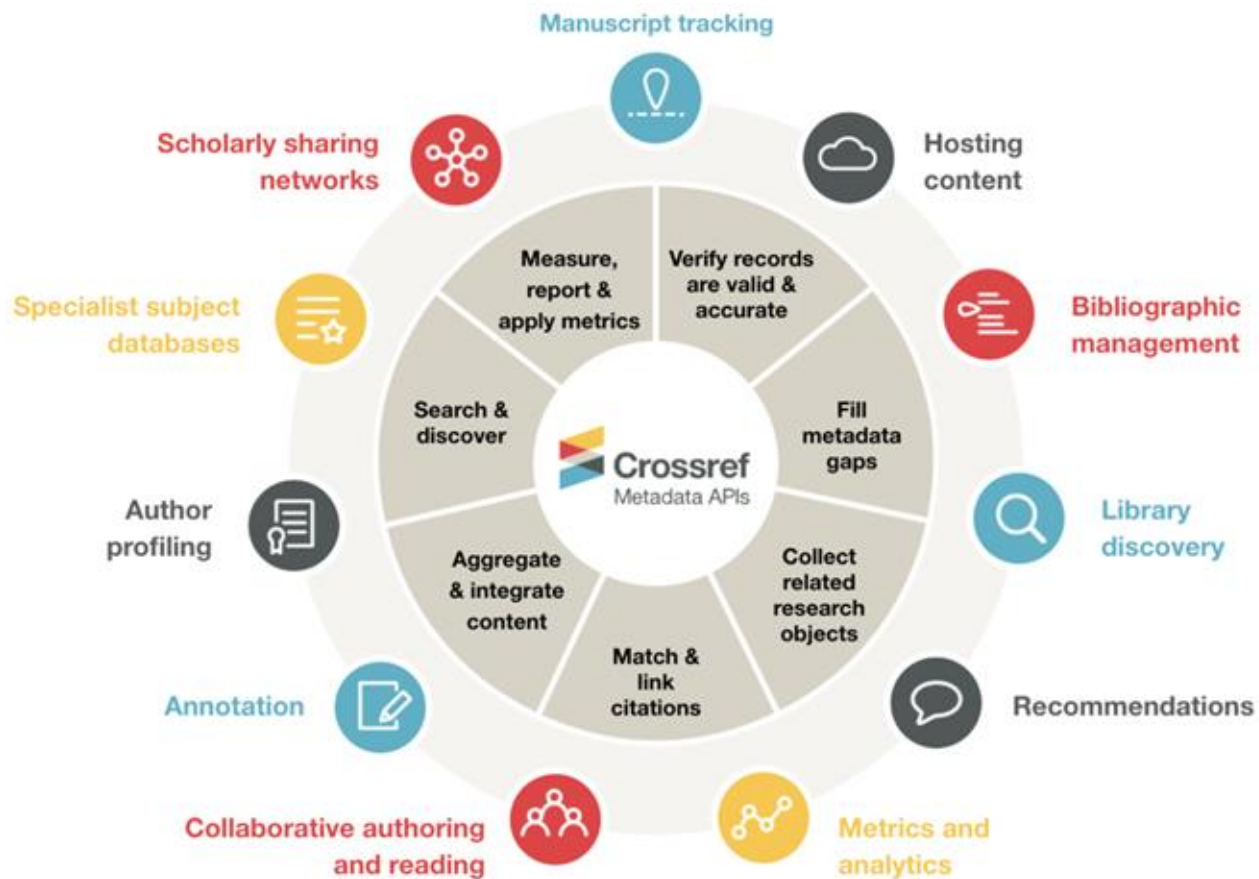
183 million open metadata records with DOIs that are resolved

1.4 billion times per month (**93%** of all DOI usage)

2.1 billion queries of our metadata every month by **hundreds of thousands of** systems ingesting and reusing this open metadata



Importance of metadata quality



Research Nexus



WHAT WE'RE AIMING FOR

- Bringing together the disparate pieces of the scholarly record
- Better view of relationships (beyond PIDs)
- Exposing internal stuff publicly
- Enabling multi-party assertions
- Evidence. Provenance. Persistence.
- **60% of this is possible, the rest is aspirational**

Metadata best practices: complete DOI records

<https://www.crossref.org/members/prep>

Search by member - Participation Reports ? Crossref

How good is your metadata?

Find a Crossref Member

Search by member

- Welcome
- University of Szeged
- eLife Sciences Publications, Ltd

Make sure your work can be found.

[LEARN MORE](#)

Search by member - Participation Reports ? Crossref

Office of Academic Resources,
Chulalongkorn University

Richer metadata makes research usable.
Make sure your work can be found.

91,182
Total registered records

[DOWNLOAD GAP REPORT](#)

Select date: All time | Journal: Search by title

Books: 895 | Dissertations: 76,780 | **Journal Articles: 10,700** | Reports: 2,805

References	2%	Abstracts	94%	ORCID iDs	0%
Affiliations	0%	ROR IDs	0%	Funder Registry IDs	0%
Funding award numbers	0%	Crossmark enabled	0%	Text-mining URLs	4%
License URLs	0%	Similarity Check URLs	4%		

■ Crossref Grant Linking System



GLS IN ACTION

(Funding<>Research outputs connecting!)

eLife Home Magazine Community About Search

Research Article
Neuroscience

CRISPR-Cas9 knockdown of ESR1 in preoptic GABA-kisspeptin neurons suppresses the preovulatory surge and estrous cycles in female mice

Jenny Clarkson, Siew Hoong Yip, Robert Port, ...
Centre for Neuroendocrinology, New Zealand; Department of Physiology, New Zealand; Department of Physiology, United Kingdom

Dec 21, 2023 · <https://doi.org/10.7554/eLife.90954>

This eLife journal article...

...includes (scroll down)...

Funding

Marsden Fund (16-UOO-201)
• Allan E Herbison

Health Research Council of New Zealand (17-285)
• Allan E Herbison

Wellcome Trust
<https://doi.org/10.35802/212242>
• Allan E Herbison

The funders had no role in study design, data collection and interpretation, or the decision to submit the work for publication. For the purpose of Open Access, the authors have applied a CC BY public copyright license to any Author Accepted Manuscript version arising from this submission.

...this Crossref grant ID from Wellcome Trust



GLS IN ACTION

(See and use the open metadata)

```
https://api.crossref.org/works/10.7554/eLife.90959.3

{
  "funder": [
    {
      "DOI": "10.13039/501100009193",
      "name": "Marsden Fund",
      "doi-asserted-by": "publisher",
      "award": [
        "16-U00-201"
      ]
    },
    {
      "DOI": "10.13039/501100001505",
      "name": "Health Research Council of New Zealand",
      "doi-asserted-by": "publisher",
      "award": [
        "17-285"
      ]
    },
    {
      "DOI": "10.13039/100010269",
      "name": "Wellcome Trust",
      "doi-asserted-by": "publisher",
      "award": [
        "10.35802/212242"
      ]
    }
  ]
}
```

This is the same eLife article's metadata record

This is the Open Funder Registry id for three funders

Each funder has an internal award id but this is a persistent one created by the funder



GLS IN ACTION

(See and use the open metadata)

```
→ ↻ 🏠 🔒 https://api.crossref.org/works/10.7554/eLife.90959.3
{
  "is-version-of": [
    {
      "id-type": "doi",
      "id": "10.7554/eLife.90959.1",
      "asserted-by": "subject"
    },
    {
      "id-type": "doi",
      "id": "10.7554/eLife.90959.2",
      "asserted-by": "subject"
    }
  ],
  "is-financed-by": [
    {
      "id-type": "doi",
      "id": "10.35802/212242",
      "asserted-by": "subject"
    }
  ],
  "has-review": [
    {
      "id-type": "doi",
      "id": "10.7554/eLife.90959.3.sa0",
      "asserted-by": "object"
    }
  ]
}
```

Further, in the same eLife article's metadata record

This relationship metadata. eLife is linking versions and reviews

And they are linking this article with actual grant through **is-financed-by** relationship.



Funders perspectives

<https://doi.org/10.64000/n9n69-y5b75>

🕒 13 minute read.

Connecting the dots: FWFs transition to linked grant metadata to support a thriving culture of openness



Rocío Gaudioso Pedraza, Katharina Rieck – 2025 July 23
In [Grant Linking System](#), [Research Funders](#), [Metadata](#), [Identifiers](#), [Community](#)

[Click here for the version in German](#)

As a new Community Engagement Manager at Crossref, dedicated to working with the funders community, I frequently hear requests for examples and case studies of adopting Crossref. This has spurred me to start a series of blog posts presenting funders' perspectives – to demonstrate how it's done.

<https://doi.org/10.64000/9g/p-5p69l>

🕒 13 minute read.

In the first case study of a series, I speak with Katharina Rieck (FWF), Austria's national funding agency for basic research, transparency and openness, and the role that the Grant Linking System plays in their processes.

Integrating grant metadata for seamless research interconnectivity at FCCN|FCT



Rocío Gaudioso Pedraza, Cátia Laranjeira – 2025 October 15
In [Grant Linking System](#), [Research Funders](#), [Metadata](#), [Identifiers](#), [Community](#)

[Click here for the version in Portuguese](#)

Welcome back to our series of case studies of research funders using the Grant Linking System. In this interview, I talk with Cátia Laranjeira, PTCRS Program Manager at FCCN|FCT, Portugal's main public funding agency, about the agency's approach to metadata, persistent identifiers, Open Science and Open infrastructure. With a holistic approach to the management, production and access to information on science, FCCN|FCT's decision to implement the Grant Linking System within their processes was not simply a technical upgrade, but a coordinated effort to continue building a strong culture of openness. With the mantra "register once, reuse always", FCCN|FCT efforts to embrace open funding metadata was only logical.

<https://doi.org/10.64000/c1dh8-qn968>

🕒 8 minute read.

Wellcome and Europe PMC: supporting Open Research through open metadata



Rocío Gaudioso Pedraza, Hannah Hope, Melissa Harrison – 2025 December 15
In [Community](#), [Grant Linking System](#), [Research Funders](#), [Research Nexus](#)

In my latest conversations with research funders, I talked with Hannah Hope, Open Research Lead at Wellcome, and Melissa Harrison, Team Leader of Literature Services at Europe PMC. Wellcome and Europe PMC are working together to realise the potential of funding metadata and the Crossref Grant Linking System for, among other things, programmatic grantee reporting. In this blog, we explore how this partnership works and how the [Crossref Grant Linking System](#) is supporting Wellcome in realising their Open Science vision.

What motivated you to join Crossref?

One of the main motivations for joining Crossref was the opportunity to be able to disaggregate research outputs between funders. Funders' identifiers, funders might change them over time, and there are also similarities between permanent identifiers, in this case, Crossref Grant IDs, are an opportunity to avoid duplicating identifiers throughout the research ecosystem.