



CONNECTING RESEARCH,
IDENTIFYING KNOWLEDGE

Making connections with DataCite DOI metadata

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ROR in Repositories Workshop, Open Repositories 2023



[@datacite](https://twitter.com/datacite)



ROR IDs are useful all by themselves...

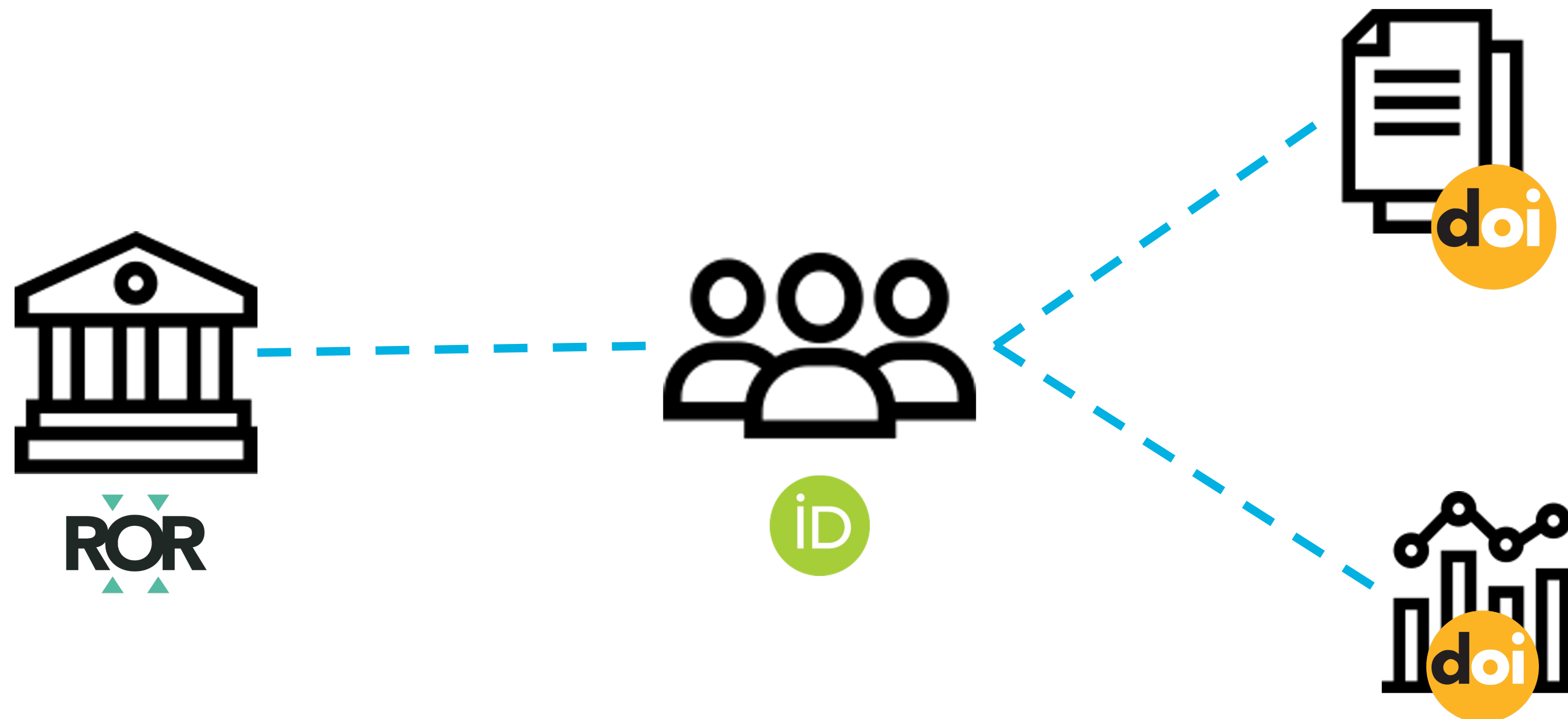
...but they work best when used along with other persistent identifiers, like DOIs and ORCID iDs

When ROR IDs are used with other PIDs, we can answer questions like:

- Which **research outputs** are associated with a particular research **institution** or **funder**?
- How many **research outputs** are associated with a particular research **institution** or **funder**, and how are they being used/reused
- Which **research outputs** are associated with a particular **creator/contributor**?

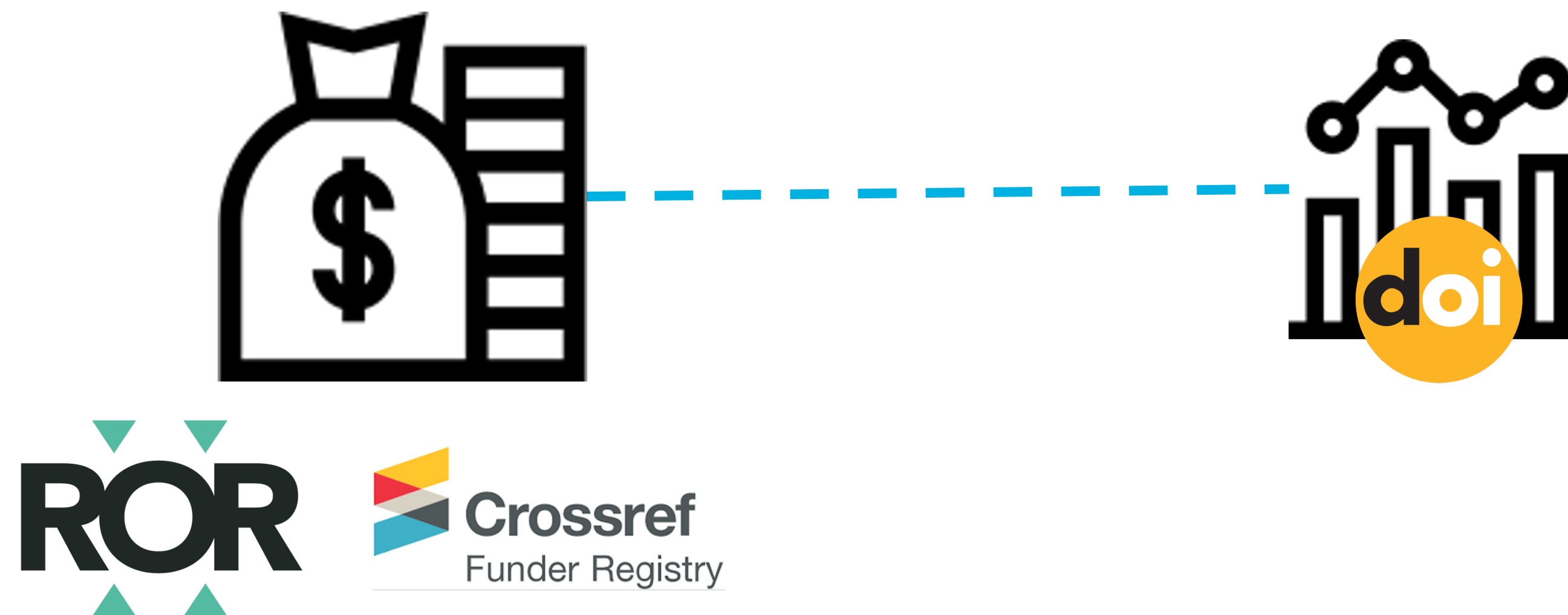
Affiliation

Represents a relationship between a **Creator** or **Contributor** (which can be people or organizations) and their **affiliation** (which is an organization). Affiliation identifiers make it easier to find research outputs associated with a particular institution.



Funding reference

Represents a relationship between a **DOI** and a **funding organization** that financially supported the work that resulted in the research output represented by the DOI.



How do we do this?

Connection metadata + persistent identifiers

```
<creator>
  <creatorName nameType="Personal">Garcia, Sofia</creatorName>
  <givenName>Sofia</givenName>
  <familyName>Garcia</familyName>
  <nameIdentifier schemeURI="https://orcid.org/" nameIdentifierScheme="ORCID">0000-0001-5727-2427</nameIdentifier>
  <affiliation affiliationIdentifier="https://ror.org/03efmqc40" affiliationIdentifierScheme="ROR" SchemeURI="https://ror.org">Arizona State University</affiliation>
</creator>

<relatedIdentifier relatedIdentifierType="DOI"
relationType="IsCitedBy">10.5438/ExampleArticle</relatedIdentifier>

<fundingReference>
  <funderName>European Commission</funderName>
  <funderIdentifier funderIdentifierType="Crossref Funder
ID">https://doi.org/10.13039/501100000780</funderIdentifier>
</fundingReference>
```

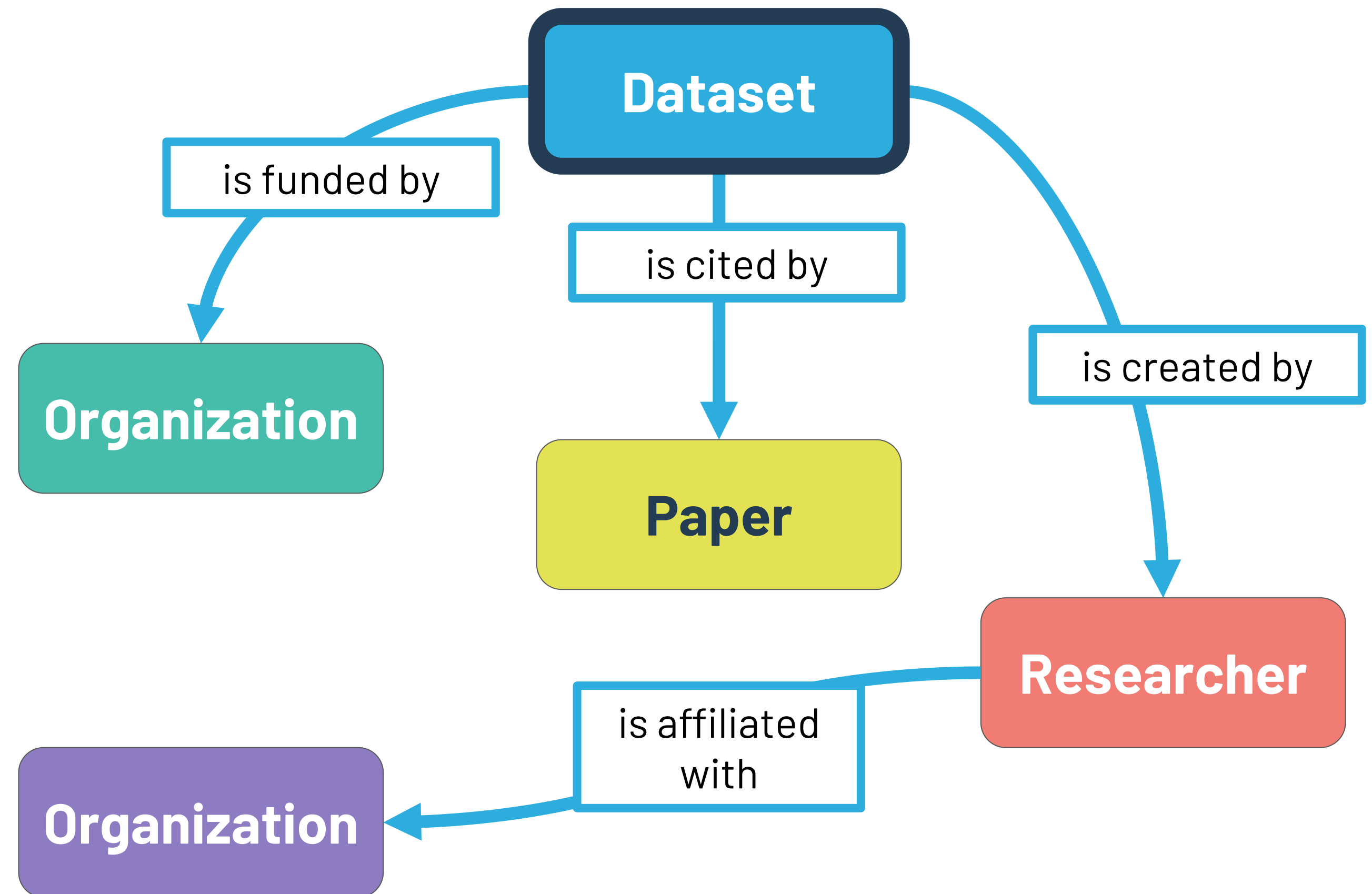


What is connection metadata?

Metadata that represents relationships—connections—between entities

Examples:

- A paper cites a dataset
- A person authors a paper
- **A person is affiliated with an institution**
- **An institution funds a research output**



Connection metadata in the DataCite Schema

DataCite Metadata Schema property	Used for connections to...	Typical identifiers
relatedIdentifier	related research outputs - citations, versions...	DOIs  URLs, handles...
nameIdentifier <i>for Creators and Contributors</i>	authors and contributors	ORCID iDs (for people)  ROR IDs (for organizations) 
affiliationIdentifier <i>for Creators and Contributors</i>	affiliated organizations	ROR IDs 
funderIdentifier <i>for FundingReferences</i>	funding organizations	Crossref Funder IDs  ROR IDs 

Hands on: Search for DOIs with ROR IDs in DataCite Commons

Searching DOI metadata

When DOI metadata contains ROR IDs, it's easy to search for items associated with a particular organization, even if those items live in repositories that aren't under the control of that organization!

DataCite offers several ways to search DOI metadata. In this exercise, we'll cover 2:

- DataCite Commons
- DataCite GraphQL API

Searching DataCite Commons

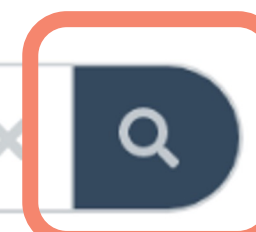
DataCite Commons provides a web interface to DOI metadata and allows easily searching DOIs by organization, author and other facets

Visit <https://commons.datacite.org> to get started!

Searching DataCite Commons

2. Type an organization name in the search box, then click the magnifying glass

university of wisconsin madison



Pages ▾

Support

➔ Sign In

Works

People

Organizations

Repositories

24,750 Orgar

1. Click the "Organizations" tab

Country

<input type="checkbox"/> United States of America	5,120
<input type="checkbox"/> China	2,282
<input type="checkbox"/> Russian Federation	1,541
<input type="checkbox"/> India	1,331
<input type="checkbox"/> Japan	1,296
<input type="checkbox"/> United Kingdom of Great Britain and Northern Ireland	802
<input type="checkbox"/> Korea (Republic of)	699
<input type="checkbox"/> Germany	595
<input type="checkbox"/> Canada	528
<input type="checkbox"/> France	462

University of Wisconsin–Madison
UW–Madison, UW

Links

3. Click the name of the organization
(info shown here is derived from ROR)

Other Identifiers

GRID [grid.14003.36](#)
Crossref Funder ID [10.13039/100007015](#)
Crossref Funder ID [10.13039/100008959](#)
Crossref Funder ID [10.13039/100005996](#)
Crossref Funder ID [10.13039/100007870](#)
Crossref Funder ID [10.13039/100008301](#)
ISNI [0000000121673675](#)
Wikidata [Q838330](#)
Wikidata [Q33122195](#)
Wikidata [Q7662222](#)

Searching DataCite Commons

Type to search... Pages ▾ Support

Works People Organizations Repositories

University of Wisconsin–Madison <https://ror.org/01y2jtd41>

69,247 Works	2,506 Citations	48,775 Views	12,159 Downloads
------------------------	---------------------------	------------------------	----------------------------

Founded 1848

Links

- Homepage
- Wikipedia
- Twitter

Other Identifiers

- GRID grid.14003.36
- Crossref Funder ID 10.13039/100007015
- Crossref Funder ID 10.13039/100008959
- Crossref Funder ID 10.13039/100005996
- Crossref Funder ID 10.13039/100007870
- Crossref Funder ID 10.13039/100008301
- ISNI 0000000121673675
- Wikidata Q838330
- Wikidata Q33122195
- Wikidata Q7662222

Organization details page shows all works with DataCite DOIs that contain this ROR ID (in any field)

Share

- Email
- Twitter
- Facebook

Hands on: Postman setup

Setup

We'll run DataCite API requests using Postman, a web-based tool. We have pre-configured the requests in a Postman collection. To access it:

- 1. Create a free Postman account (or login, if you already have an account)**

<https://identity.getpostman.com/signup>

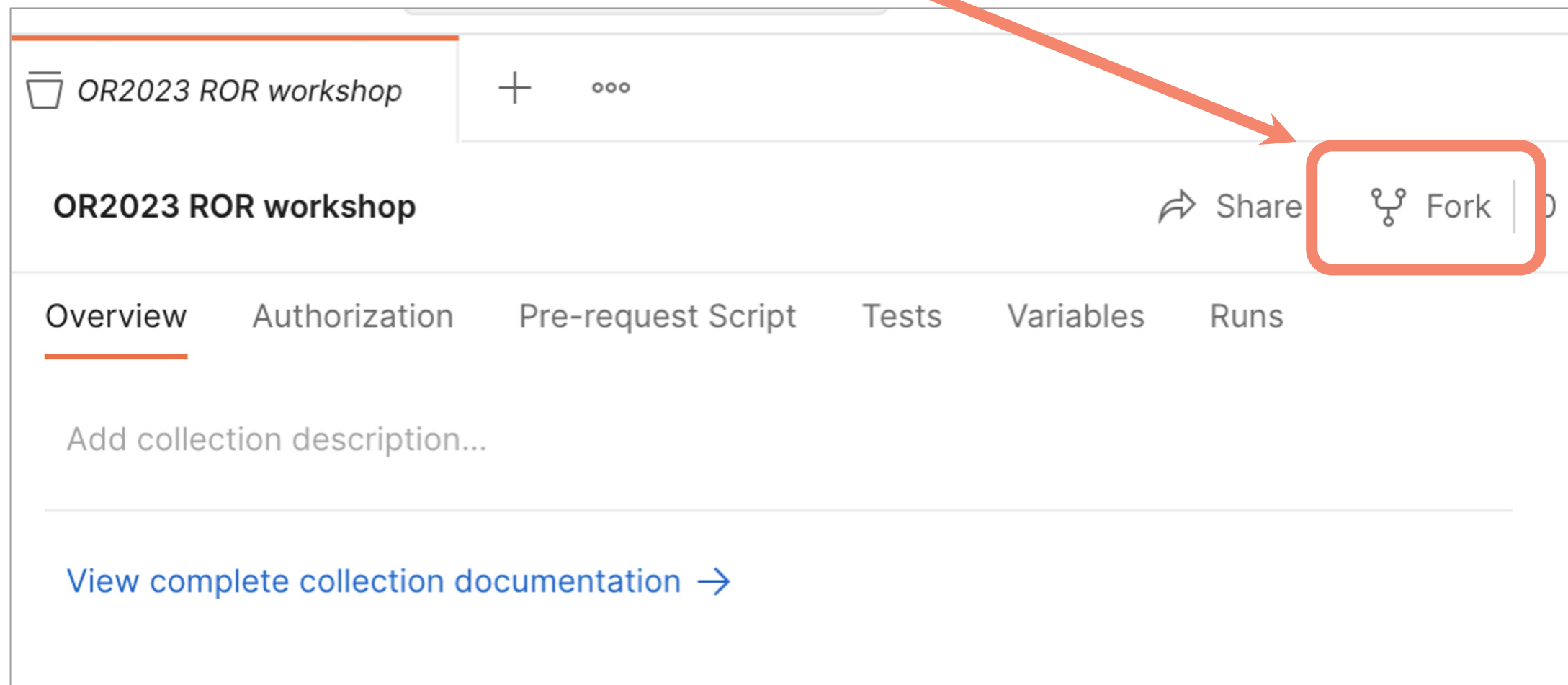
- 2. Visit the OR2023 collection at**

<https://tinyurl.com/or2023-ror>

Setup

Fork the collection to copy it into your account (required in order to run the requests)

Click "Fork"



OR2023 ROR workshop

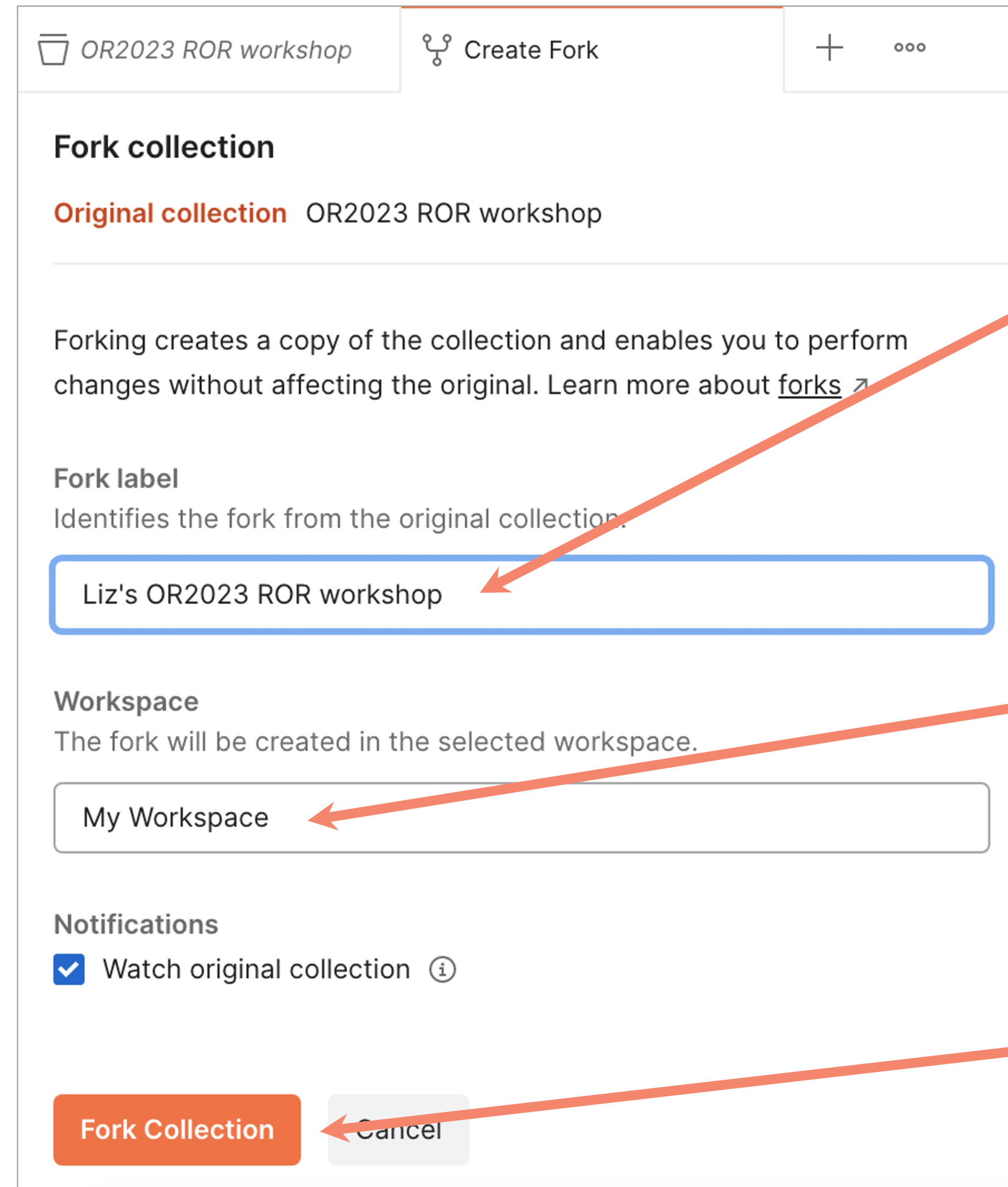
OR2023 ROR workshop

Share Fork

Overview Authorization Pre-request Script Tests Variables Runs

Add collection description...

[View complete collection documentation →](#)



OR2023 ROR workshop Create Fork

Fork collection

Original collection OR2023 ROR workshop

Forking creates a copy of the collection and enables you to perform changes without affecting the original. [Learn more about forks ↗](#)

Fork label
Identifies the fork from the original collection.

Liz's OR2023 ROR workshop

Workspace
The fork will be created in the selected workspace.

My Workspace

Notifications

Watch original collection ⓘ

Fork Collection Cancel

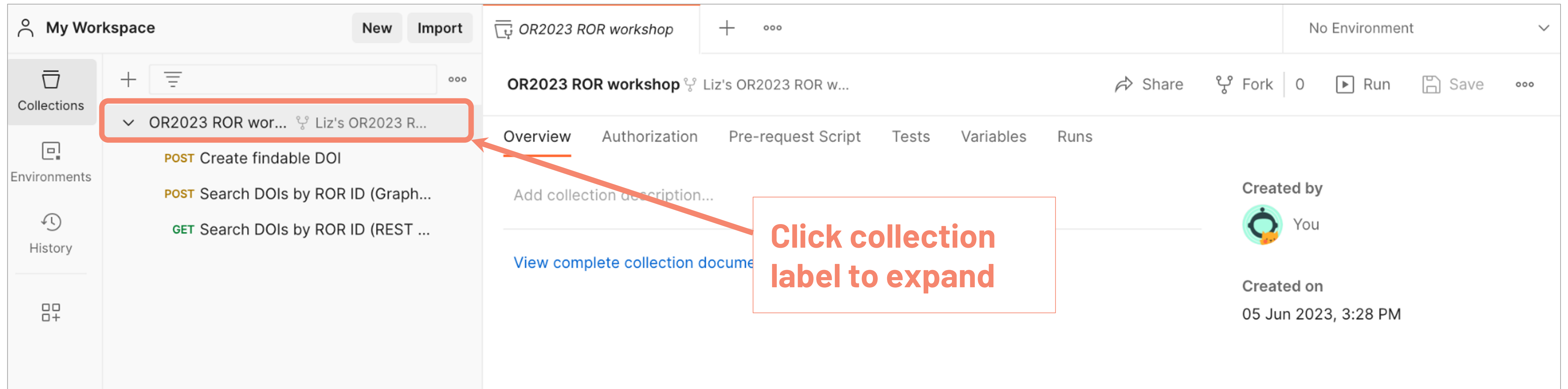
Give your fork a name different from the original

Leave workspace set to "My Workspace"

Click "Fork collection"

Setup

You can now access your copy of the collection.

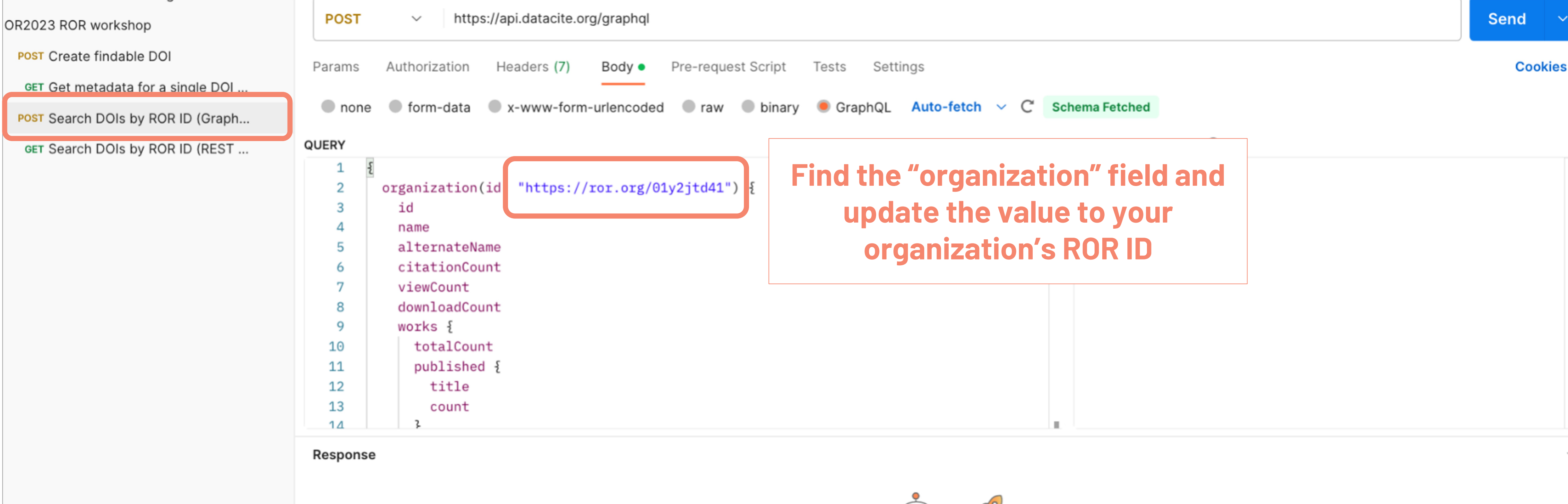


The screenshot shows the DataCite workspace interface. On the left, there is a sidebar with 'My Workspace' and 'Collections'. The 'Collections' section is expanded to show a collection named 'OR2023 ROR workshop' by 'Liz's OR2023 R...'. This collection label is highlighted with a red box. An arrow points from a callout box to this label. The callout box contains the text 'Click collection label to expand'. The main area shows the collection details, including a 'POST Create findable DOI' endpoint, a 'POST Search DOIs by ROR ID (Graph...)' endpoint, and a 'GET Search DOIs by ROR ID (REST ...)' endpoint. The 'Overview' tab is selected, and the 'Created by' section shows 'You' and the creation date '05 Jun 2023, 3:28 PM'.

Hands on: Search for DOIs with ROR IDs in DataCite GraphQL API

Searching DataCite GraphQL API

The data shown in Commons can also be retrieved from the DataCite GraphQL API. This API is free and open to anyone to use.



The screenshot shows a GraphQL API client interface. The URL is `https://api.datacite.org/graphql` and the method is `POST`. The `Body` tab is selected, showing a GraphQL query. The query is:

```
1 {
2   organization(id: "https://ror.org/01y2jtd41") {
3     id
4     name
5     alternateName
6     citationCount
7     viewCount
8     downloadCount
9     works {
10      totalCount
11      published {
12        title
13        count
14      }
15    }
16  }
17 }
```

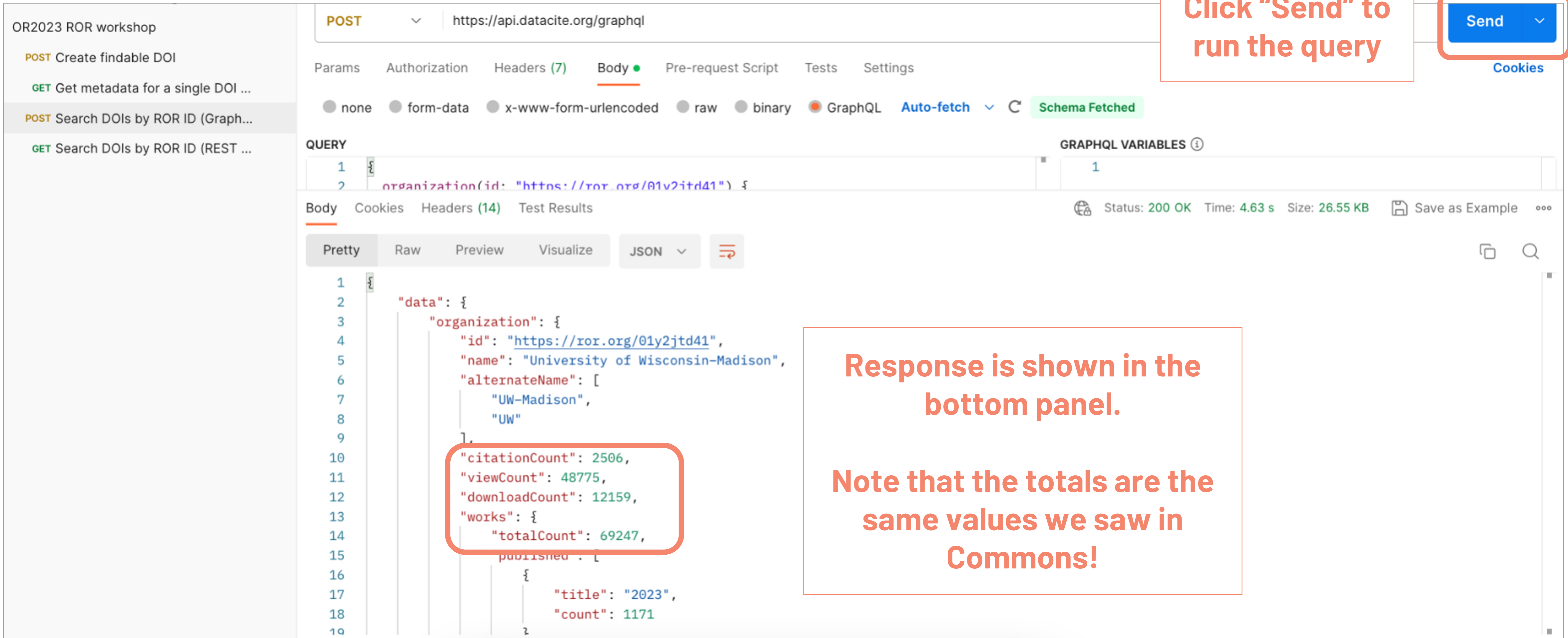
The value `"https://ror.org/01y2jtd41"` in the query is highlighted with a red box. A red callout box points to this value with the text: **Find the "organization" field and update the value to your organization's ROR ID**. The interface also shows a list of API endpoints on the left, with `POST Search DOIs by ROR ID (Graph...` highlighted in a red box. The `Response` section is currently empty.

Searching DataCite GraphQL API

Click "Send" to run the query

Send

Cookies



The screenshot shows a GraphQL client interface with the following components:

- URL:** `https://api.datacite.org/graphql`
- Method:** `POST`
- Body:**

```
1 {
2   organization(id: "https://ror.org/01y2jtd41") {
```
- GraphQL Variables:** `1`
- Status:** `200 OK`, Time: 4.63 s, Size: 26.55 KB
- Response (Pretty):**

```
1 {
2   "data": {
3     "organization": {
4       "id": "https://ror.org/01y2jtd41",
5       "name": "University of Wisconsin-Madison",
6       "alternateName": [
7         "UW-Madison",
8         "UW"
9       ],
10      "citationCount": 2506,
11      "viewCount": 48775,
12      "downloadCount": 12159,
13      "works": {
14        "totalCount": 69247,
```

Response is shown in the bottom panel.

Note that the totals are the same values we saw in Commons!

Hands on: Create a DOI with ROR IDs in metadata

DataCite REST API



- For this workshop, we're using the [DataCite Test Environment](#), with API credentials pre-configured. We're not creating real DOIs!
- To create real DOIs, a DataCite membership and a production account are needed.
- Any organization can request a test account to learn more about creating DataCite DOIs. Contact support@datacite.org
- Commons does not have a publicly-available test environment, so we can't search for our test DOIs there.

Example metadata: Affiliation

Sub-element of Creator or Contributor

Value The name of the institution

Optional attributes

- affiliationIdentifier (ROR, ISNI, etc)
- affiliationIdentifierScheme, schemeUri (required if affiliationIdentifier is used)

```
<creator>
  <creatorName nameType="Personal">Miller,
  Elizabeth</creatorName>
  <givenName>Elizabeth</givenName>
  <familyName>Miller</familyName>
  <nameIdentifier schemeURI="https://orcid.org/"
  nameIdentifierScheme="ORCID">0000-0001-5000-
  0007</nameIdentifier>
  <affiliation
  affiliationIdentifier="https://ror.org/04wxnsj81"
  affiliationIdentifierScheme="ROR">
    DataCite
  </affiliation>
</creator>
```

Schema docs for affiliation: <https://support.datacite.org/docs/datacite-metadata-schema-v44-mandatory-properties#25-affiliation>

Example metadata: Funding

reference

Required

elements/attributes

- funderName

Optional elements/attributes

- funderIdentifier (ROR, Crossref Funder ID, etc)
- funderIdentifierType [cl], schemeUri (if funderIdentifier is used)
- awardNumber, awardUri, awardTitle

```
<fundingReferences>
  <fundingReference>
    <funderName>European Commission</funderName>
    <funderIdentifier funderIdentifierType="Crossref
Funder ID">
      https://doi.org/10.13039/501100000780
    </funderIdentifier>
    <awardNumber
awardURI="https://cordis.europa.eu/project/rcn/100180
en.html">
      282625
    </awardNumber>
    <awardTitle>MOTivational strength of ecosystem
services and alternative ways to express the value of
BIOdiversity</awardTitle>
  </fundingReference>
</fundingReferences>
```

Schema docs for fundingReference <https://support.datacite.org/docs/datacite-metadata-schema-v44-recommended-and-optional-properties#19-fundingreference>

Create a new DOI: Metadata

OR2023 ROR workshop

- POST Create findable DOI**
- POST Search DOIs by ROR ID (Graph...
- GET Search DOIs by ROR ID (REST ...)

POST `https://api.test.datacite.org/DOIs`

Params Authorization Headers (9) **Body** Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary GraphQL **JSON**

```
7     "creators": [  
8         {  
9             "nameIdentifiers": [  
10                {  
11                    "nameIdentifier": "0000-0001-6622-4910",  
12                    "nameIdentifierScheme": "ORCID",  
13                    "schemeUri": "https://orcid.org"  
14                }  
15            ],  
16            "nameType": "Personal",  
17            "name": "Krznarich, Liz",  
18            "givenName": "Liz",  
19            "familyName": "Krznarich",  
20            "affiliation": [  
21                {  
22                    "affiliationIdentifier": "https://ror.org/04wxnsj81",  
23                    "affiliationIdentifierScheme": "ROR",  
24                    "name": "DataCite",  
25                    "schemeUri": "https://ror.org/"  
26                }  
27            ]  
28        }  
29     ],
```

Find the "creators" section and update the fields with your own ORCID ID, name and ROR ID

Create a new DOI: Metadata

OR2023 ROR workshop

- POST Create findable DOI**
- POST Search DOIs by ROR ID (Graph...
- GET Search DOIs by ROR ID (REST ...)

POST `https://api.test.datacite.org/DOIs`

Params Authorization Headers (9) **Body** Pre-request Script Tests Settings

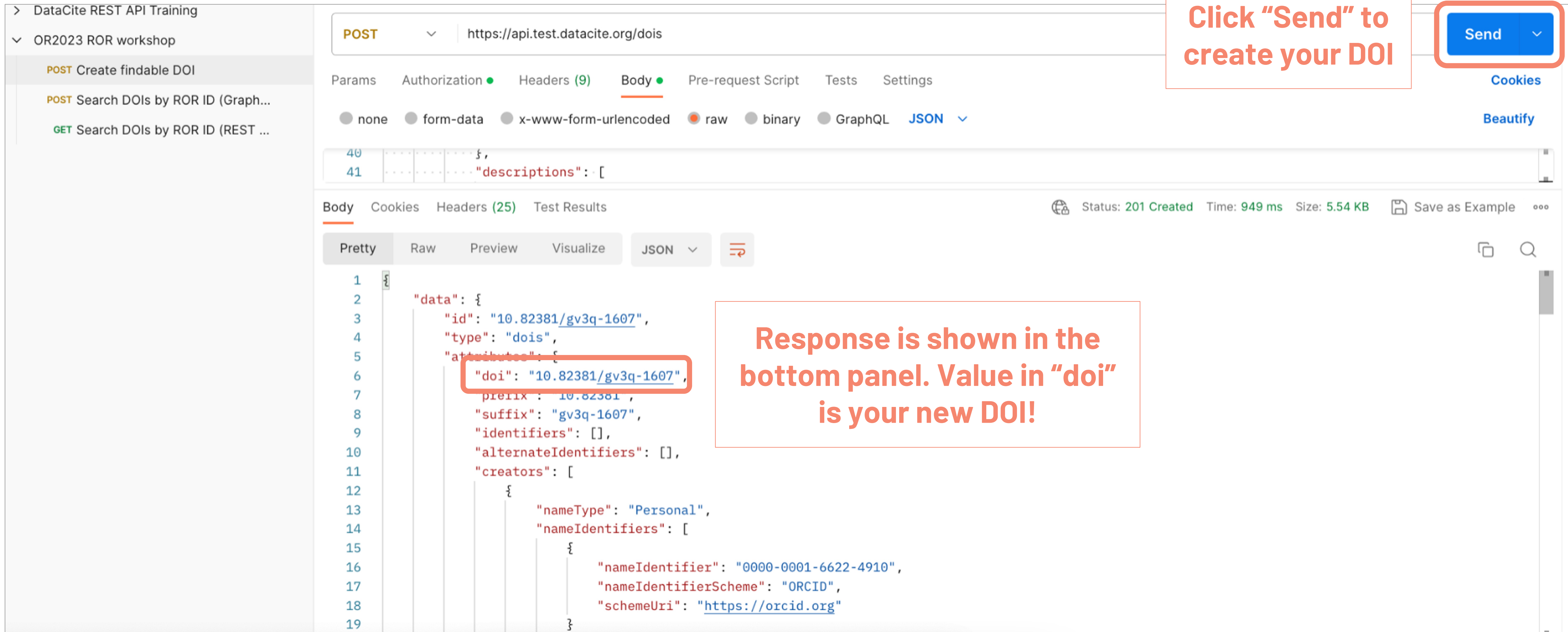
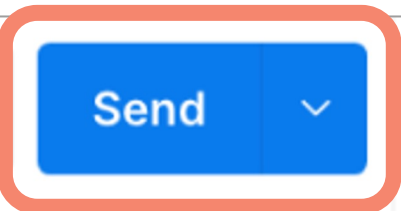
none form-data x-www-form-urlencoded **raw** binary GraphQL JSON

```
40     },
41     "descriptions": [
42       {
43         "description": "Slides for the DataCite portion of the ROR in Repositories Workshop hel",
44         "descriptionType": "Abstract",
45         "lang": "en"
46       }
47     ],
48     "fundingReferences": [
49       {
50         "funderName": "DataCite",
51         "funderIdentifierType": "ROR",
52         "funderIdentifier": "https://ror.org/04wxnsj81",
53         "awardTitle": "Example Award Title",
54         "awardNumber": "1234",
55         "awardUri": "https://datacite.org/"
56       }
57     ],
58     "language": "en",
59     "url": "https://docs.google.com/presentation/d/1Bz8uEj9ATyFaQhA3kkc0tRT5GS2t6EG2fnJcwHQTR9s",
60     "schemaVersion": "http://datacite.org/schema/kernel-4"
61   }
62 }
63 }
```

ROR IDs can also be used in "fundingReferences" section

Create a new DOI: Send request

Click "Send" to create your DOI



The screenshot shows a REST client interface with the following components:

- Request:** Method: POST, URL: `https://api.test.datacite.org/does`. The body is set to raw JSON.
- Response:** Status: 201 Created, Time: 949 ms, Size: 5.54 KB.
- JSON Response (Pretty view):**

```
1  {
2    "data": {
3      "id": "10.82381/gv3q-1607",
4      "type": "dois",
5      "attributes": {
6        "doi": "10.82381/gv3q-1607",
7        "prefix": "10.82381",
8        "suffix": "gv3q-1607",
9        "identifiers": [],
10       "alternateIdentifiers": [],
11       "creators": [
12         {
13           "nameType": "Personal",
14           "nameIdentifiers": [
15             {
16               "nameIdentifier": "0000-0001-6622-4910",
17               "nameIdentifierScheme": "ORCID",
18               "schemeUri": "https://orcid.org"
19             }
20           ]
21         }
22       ]
23     }
24   }
25 }
```

Response is shown in the bottom panel. Value in "doi" is your new DOI!

Resolve your test DOI

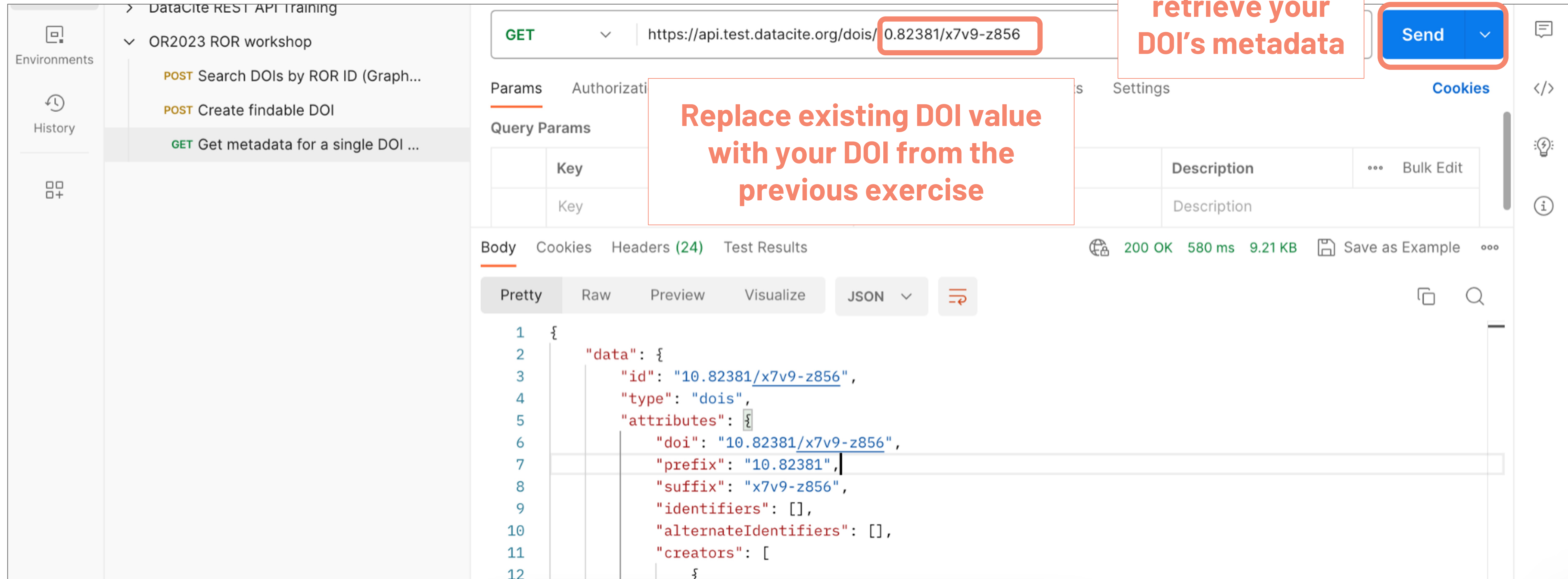


DOIs created in the test system are not resolvable via doi.org!

<https://handle.stage.datacite.org/YOUR-DOI-ID>

Example: <https://handle.stage.datacite.org/10.82381/gv3q-1607>

Retrieve metadata for your DOI



The screenshot shows a REST client interface with the following elements:

- URL:** `https://api.test.datacite.org/doi/10.82381/x7v9-z856` (The DOI value is highlighted with a red box).
- Method:** GET
- Buttons:** A blue "Send" button is highlighted with a red box. Other buttons include "Params", "Authorization", "Settings", and "Cookies".
- Response Body:** A JSON object is displayed in "Pretty" format:

```
1 {
2   "data": {
3     "id": "10.82381/x7v9-z856",
4     "type": "dois",
5     "attributes": {
6       "doi": "10.82381/x7v9-z856",
7       "prefix": "10.82381",
8       "suffix": "x7v9-z856",
9       "identifiers": [],
10      "alternateIdentifiers": [],
11      "creators": [
12        ]
13    }
14  }
15 }
```
- Annotations:** Two red boxes with text provide instructions: "Click 'Send' to retrieve your DOI's metadata" and "Replace existing DOI value with your DOI from the previous exercise".

Resources

- [Metadata docs](#)
- [REST API docs](#)
- [GraphQL API docs](#)
- [DataCite Commons docs](#)
- [Best practice guide: Making connections to to organizations](#)



CONNECTING RESEARCH,
IDENTIFYING KNOWLEDGE



info@datacite.org



pidforum.org



datacite.org
blog.datacite.org



support.datacite.org
support@datacite.org



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[DataCite](https://www.youtube.com/DataCite)



[@datacite](https://www.linkedin.com/company/datacite)