

RSpace integration with identifiers and RRIDs for Samples, Facilities & Instruments

Rob Day

Lead Sales & Product Specialist @ RSpace

FAIR Facilities and Instruments - Workshop 2 - August 20-22, 2024

What is RSpace ?

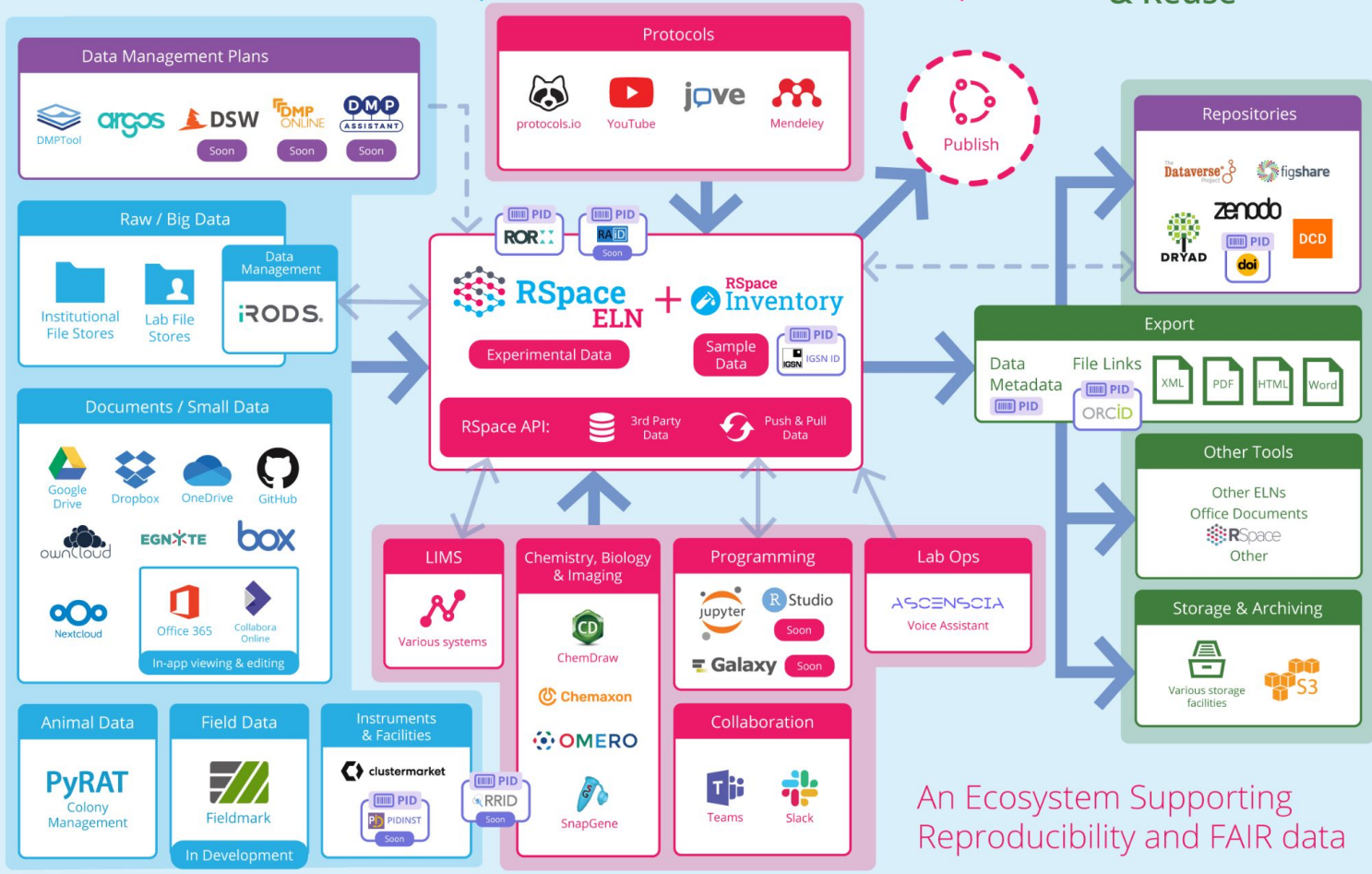
- Research platform for **institutional research data management**
- Lab notebook + flexible inventory management + unlimited integrations
- End-to-end support for FAIR , traceability and searchability
- **Open-source** with modern open APIs and excellent API documentation
- Currently supports:
 - Minting and management of IGSNs associated with inventory items
 - Support for ORCID, ROR, export to repositories with industry standard metadata
 - Exchange of identifiers between RSpace third party systems via API
- Coming soon, additional integrations with RRIDs and other identifiers funded by recent NSF grants

<https://www.researchspace.com/>

Preparation

Active Research

Archiving, Storage & Reuse



An Ecosystem Supporting
Reproducibility and FAIR data

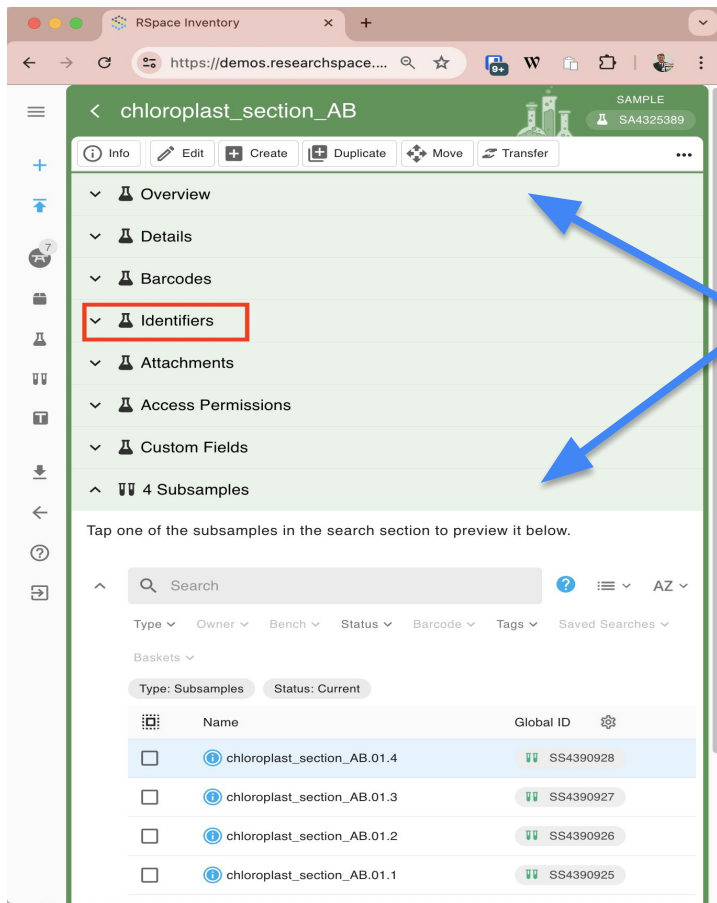
The RSpace Ecosystem - How does RSpace interact with other systems?

- Import / export of data in various formats from and to local user
- DIRECT import / export from and to data sources and repositories
- Creating LINKS to verbose data outside RSpace
- Pulling in metadata summaries from external data to associate with links
- Communicating with third-parties to mint identifiers as needed
- Accessing third-party controlled vocabularies to encourage tagging
- Exchange of data via APIs
- RSpace serves as a conduit to pass certain types of metadata, especially identifiers, from one third-party system to another (e.g Dataverse to DMPtool)

RSpace and IGSNs. First, what are IGSN IDs?

- Persistent identifiers for **material samples**
- Standardized IGSN ID schema (based on DataCite DOIs) useful for **discoverability**
- Citable & shareable public landing pages contain domain-specific metadata for **reproducibility**
- Project goal: enable a single point of access for both sample management & FAIR metadata publishing, by supporting IGSN IDs in RSpace Inventory
- You can learn more about IGSNs in RSpace in the breakout session where Rob Day will show some hands-on examples

RSpace Dedicated Identifier Creation in Sample Management System



The screenshot displays the RSpace Inventory web application interface. The main content area is titled 'chloroplast_section_AB' and shows a list of sub-panels: Overview, Details, Barcodes, Identifiers (highlighted with a red box), Attachments, Access Permissions, Custom Fields, and 4 Subsamples. A blue arrow points from the 'Identifiers' sub-panel to the text on the right. Below the sub-panels, there is a search section with a search bar and filters for Type, Owner, Bench, Status, Barcode, Tags, and Saved Searches. The 'Type' filter is set to 'Subsamples' and the 'Status' filter is set to 'Current'. A table lists the subsamples with their names and Global IDs.

Name	Global ID
chloroplast_section_AB.01.4	SS4390928
chloroplast_section_AB.01.3	SS4390927
chloroplast_section_AB.01.2	SS4390926
chloroplast_section_AB.01.1	SS4390925

Sub-panels dedicated to different aspects of sample management including third-party identifiers. The hands-on session will show how to quickly mint FAIR friendly identifiers from your mobile device right at the bench.

SAMPLE SA4325389
chloroplast_section_AB

Info Edit Create Duplicate Move Transfer

- Overview
- Details
- Barcodes
- Identifiers

+ Create a new Identifier

Hide all Identifiers associated with this item.

To update any details, press Edit first.

Identifier	Type	State	Hide
https://doi.org/10.82316/tt6k-1k80	IGSN	Findable	^

PREVIEW REPUBLISH RETRACT

This IGSN ID is Findable. The IGSN ID is a citable URL that redirects to the [RSpace landing page](#). The metadata is publicly available through the landing page, DataCite Commons and the DataCite APIs. [See IGSN Documentation for details](#)

Required Identifier Properties

Creator Name
Rob Day

Creator Type
Personal

Name
chloroplast_section_AB

Publisher
The University Library



RSpace Public Pages

The University Library

chloroplast_section_AB

[10.82316/tt6k-1k80](https://doi.org/10.82316/tt6k-1k80)

Physical Object

General

Name: chloroplast section AB

IGSN ID: <https://doi.org/10.82316/tt6k-1k80>

Resource Type: Material Sample

Creator: Rob Day

Creator Affiliation: University of Information Technology

Creator Affiliation Identifier: <https://ror.org/05kdc4973>

Organisation: The University Library

Publication Year: 2024

Optional Fields

Subjects

Climate change mitigation

Subject Scheme Library of Congress Subject Headings (LCSH)

Scheme URI <https://id.loc.gov/authorities/subjects.html>

Value URI <https://id.loc.gov/authorities/subjects/sh2009009655.html>

Classification Code sh2009009655

Descriptions

Methods

RSpace Inventory good for samples, rooms, equipment, devices or buildings

Type: Containers Status: Current

11 top-level containers found. [Bookmark] [Menu] AZ ▾

	Name	Global ID	
<input type="checkbox"/>	rdprincipal lab and cabinets	IC426000	
<input type="checkbox"/>	-80 Freezer_PSC B0141	IC4063233	
<input type="checkbox"/>	mass spectrometry facility	IC4030464	
<input type="checkbox"/>	microscopy facility	IC3833861	
<input type="checkbox"/>	rdprincipal storage room	IC1933325	
<input type="checkbox"/>	rdprincipal freezer room	IC12	
<input type="checkbox"/>	rdprincipal sequencing room	IC425997	
<input type="checkbox"/>	FFPE storage	IC1015820	
<input type="checkbox"/>	Fume Hood	IC2031622	
<input type="checkbox"/>	chemical shelves	IC1507334	

Search

Type ▾ Owner ▾ Bench ▾ Status ▾ Barcode ▾ Tags ▾ Saved Searches ▾

Baskets ▾

Open Edit Create Duplicate Move ...

1 All locations ▾



Freezer 6 -30c
Visual Container

Global ID IC425998

Description Frostco -30

Tags

Contents 5

Containers /

Tip: Use Command and the - key to zoom the page out to view more of the image. The [Panel Adjuster](#) can also be used to provide more room to fully display the image.

Display domain-specific fields on landing page

- Choose whether to include custom Inventory fields (domain-specific metadata) on the landing page
- Easy public sharing of domain-specific sample information

Inventory Fields



You can include Inventory fields in the item's landing page, to openly share domain-specific metadata outside the IGSN schema.
Before publishing the IGSN ID, please ensure the fields do not contain sensitive information.



Include Inventory fields on landing page

The following fields will be included:

- Description
- Tags
- Custom Fields
- Extra Fields

Map display for geolocation data

Any point, box, and polygon coordinates are displayed visually on an interactive map, both in-Inventory and on the IGSN ID landing page

Geolocations

The image displays two examples of map interfaces for geolocation data. The left interface shows a point on a green map with a blue circle. The right interface shows a box on a world map with a pink rectangle. Both interfaces include a legend and a data table.

Left Interface (Point):

- Map: Green background with a blue circle representing a point.
- Legend: Point, Box, Polygon.
- Data Table:

Latitude	Longitude
54°	42.23232°

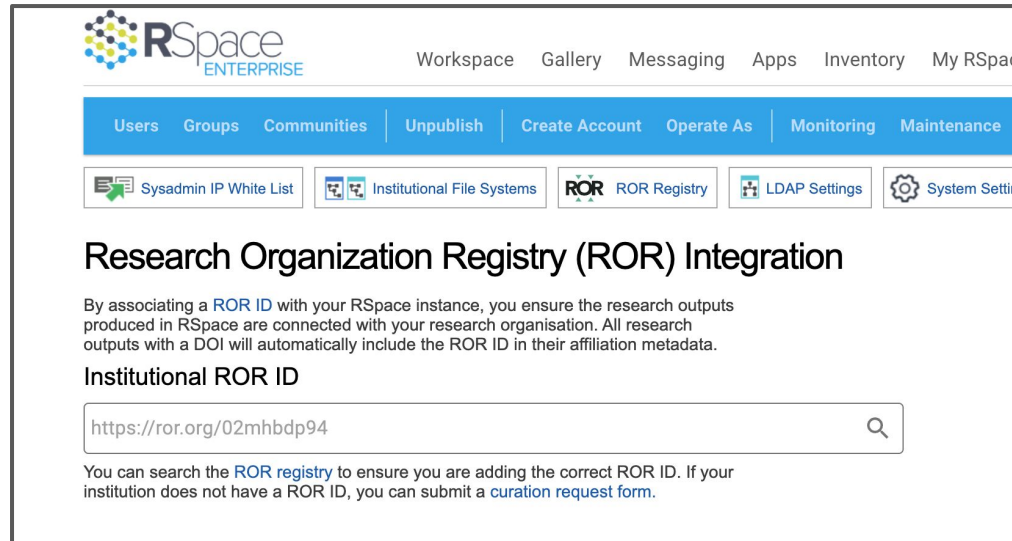
Right Interface (Box):

- Map: World map with a pink rectangle representing a box.
- Legend: Point, Box, Polygon.
- Data Table:

Northbound Latitude	Westbound Longitude
23°	53°
Southbound Latitude	Eastbound Longitude
12°	33°

RSpace ROR ID Integration

If RSpace has been configured with an ROR ID, any published IGSN IDs will automatically include the ROR ID as the Creator Affiliation metadata property.



The screenshot displays the RSpace Enterprise user interface. At the top left is the RSpace logo. The navigation bar includes links for Workspace, Gallery, Messaging, Apps, Inventory, and My RSpace. Below this is a blue menu bar with options: Users, Groups, Communities, Unpublish, Create Account, Operate As, Monitoring, and Maintenance. A secondary menu bar contains icons and labels for Sysadmin IP White List, Institutional File Systems, ROR ROR Registry, LDAP Settings, and System Settings. The main content area features the heading "Research Organization Registry (ROR) Integration". Below the heading is a paragraph explaining that associating a ROR ID with the RSpace instance connects research outputs to the organization's affiliation metadata. A section titled "Institutional ROR ID" contains a search input field with the text "https://ror.org/02mhbdp94" and a search icon. At the bottom, a note states that users can search the ROR registry for the correct ID or submit a curation request form if their institution lacks one.

Research Organization Registry (ROR) Integration

By associating a [ROR ID](#) with your RSpace instance, you ensure the research outputs produced in RSpace are connected with your research organisation. All research outputs with a DOI will automatically include the ROR ID in their affiliation metadata.

Institutional ROR ID

You can search the [ROR registry](#) to ensure you are adding the correct ROR ID. If your institution does not have a ROR ID, you can submit a [curation request form](#).

RSpace ORCID ID Integration with automatic inclusion in exports sent to repositories

The image shows a composite of three browser windows illustrating the integration of ORCID ID into RSpace exports.

- Left Window (User Settings | ResearchSpace):** Shows the user's profile information for 'rdprincipal'. The ORCID ID is listed as <http://orcid.org/0000-0002-6671-8301>. A red arrow points from this ORCID ID to the export manifest.
- Middle Window (Account - Demo Dataverse):** Shows the user's account settings in Dataverse, including a list of dataverses, datasets, and files. The user is listed as 'rdprincipal' with roles of Admin and Contributor.
- Right Window (manifest.txt - rdprincipal):** Shows the export manifest for a file named 'manifest.txt'. The manifest includes the following information:

```
Database version:1.101.2
Exported by:Rob Principal
OrcidId:0000-0002-6671-8301
RSpace application version:1.101.2
Source URL:https://demos.researchspace.com
archiveId:0b0c0b5c-25c5-439e-9c42-921b7588bce2
archiveSource:ResearchSpace
exportDate:2024-08-19
scope:SELECTION
```

RSpace facilitates creation, use and exchange of identifiers between third party systems:

The image shows two overlapping screenshots. The left screenshot is from the RSpace interface, displaying the 'Funding Outcome' and 'Research Outputs' sections. The 'Funding Outcome' section includes a 'Funding status' dropdown menu (currently showing '- Please select one -'), a 'Grant number/url' input field, and a 'Save funding information' button. The 'Research Outputs' section includes a text area for linking research outputs, a 'Dataset:' field with the URL <https://demo.dataverse.org//dataset.xhtml?persistentId=doi:10.70122/FK2/Z2LLDO>, an 'Add a research output' button, and a 'Save changes' button. The right screenshot is a browser view of a Dataverse dataset page for 'rdprincipal' (ResearchSpace) with the title 'Algal DNA study'. The page shows a 'Draft' status, a description by Rob Day (2024), and a 'Cite Dataset' button. A red arrow points from the 'Add a research output' button in RSpace to the 'Cite Dataset' button in the Dataverse page.

RSpace IGSN / PID integration, summary publication available on Zenodo

- Recommendations for developing & reviewing PIDs workflows and research tool interoperability with use cases list, integration diagrams, collaboration advice.
- <https://zenodo.org/record/8284206>
- Full use case Guiding principles for implementing persistent identification and metadata features on research tools to boost interoperability of research data and support sample management workflows

Vaida Plankytė, Rory, Macneil, Xiaoli Chen

Interoperability guideline

Guiding principles for implementing persistent identification and metadata features on research tools to boost interoperability of research data and support sample management workflows

Part of "Enhancing interoperability through the use of PIDs in research platforms" project
<https://eoscfuture-grants.eu/meet-the-grantees/data-and-metadata-interoperability-through-incorporation-pids-research>

Vaida Plankytė
Product Design and User Research Lead
Research Space
vaida@researchspace.com

Rory Macneil
Founder and CEO
Research Space
rmacneil@researchspace.com

Xiaoli Chen
FAIR Workflows Project Lead
DataCite
xiaoli.chen@datacite.org
<https://orcid.org/0000-0003-0207-2705>

31.07.2023

Version 1



The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 101017735.



Supported by the Research Data Alliance through the RDA Open Call as part of the EOSC Future project.

Coming soon: RSpace & RRIDs

Supporting Facilities, Instruments, and other Research Resources. Enhancing traceability, illuminating relationships.

RRID Portal for Tools & Facilities

Tools

Select Another Resource Report Type

[Home](#) / [Resource Reports](#) / [Tools](#)

SciCrunch Registry is a curated repository of scientific resources, with a focus on biomedical resources, including tools, databases, and cor ...[more]

SEARCH Type in a keyword to search

Search

Save search

Reset search

Filter by records added date
See new records

Snippet view Table view

Can't find your tool? Help us by registering it into the system - it's easy. Register it with the SciCrunch Registry. An RRID will be generated in 1-2 business day.

Click the to add this resource to a Collection

Options

Log in for Collection Options

Facets

Resource Type >

Keywords >

Related Resources >

Related Condition >

Funding Agency >

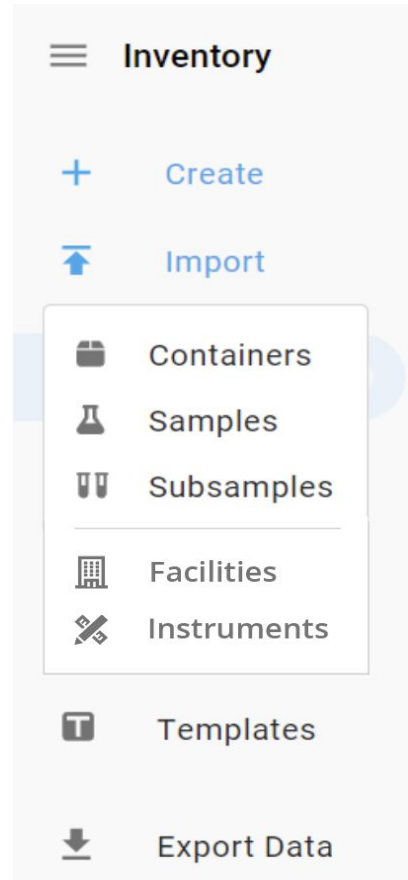
3 Results - 20 per page

Show More Columns | Download 3 Results


Resource Name	Proper Citation	Abbreviations	Resource Type	Description	Keywords	Resource Relationships
<input type="checkbox"/> Vilnius University; Vilnius; Lithuania Resource Report Resource Website	Vilnius University; Vilnius; Lithuania (RRID:SCR_011764)	Vilnius University	institution, university	Vilnius University is the oldest and largest Lithuanian higher education institution. Since its establishment in the 16th century, Vilnius University, as integral part of European science and ...[more]		is parent organization of: Crystallography Open Database (COD)
<input type="checkbox"/> Crystallography Open Database (COD) Resource Report Resource Website	Crystallography Open Database (COD) (RRID:SCR_005874)	COD	service resource, data repository, storage service resource, data or information resource, database	Database of crystal structures of organic, inorganic, metal-organic compounds and minerals, excluding biopolymers. It currently contains ~291204 entries (July 2014) in most of organic...	inorganic, metal-organic, organic, molecule, structure, small molecule, compound, mineral, crystal structure, crystallography, polymorphism, crystal, organic compound	is recommended by: NIDDK Information Network (dINET) is recommended by: NIDDK - National Institute of Diabetes and Digestive and Kidney Diseases

RSpace will directly Import & Reference RRIDs















- RRID <-> RSpace API Integration
- Similar to already implemented IGSN support
- Import -> Facilities / Instruments
- Item can be referenced inside of RSpace, linked to ELN/Inventory items, without losing reference to RRID and its associated metadata
- RRID will “travel together” with item to repositories
- Improvements to how RSpace pulls in and displays RRIDs referenced within linked external resources eg., Omero.


























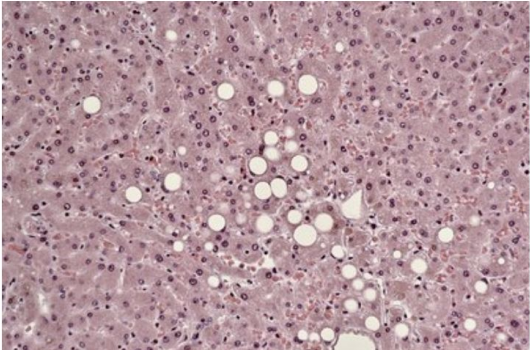
Pulling in Metadata including identifiers from an image in Omero and associating the metadata with a summary link in RSpace:

Description and Image New List of Materials 

File Insert Format Table View Science Tools Online Tools

   **B** *I*         Paragraph  Arial  14px 

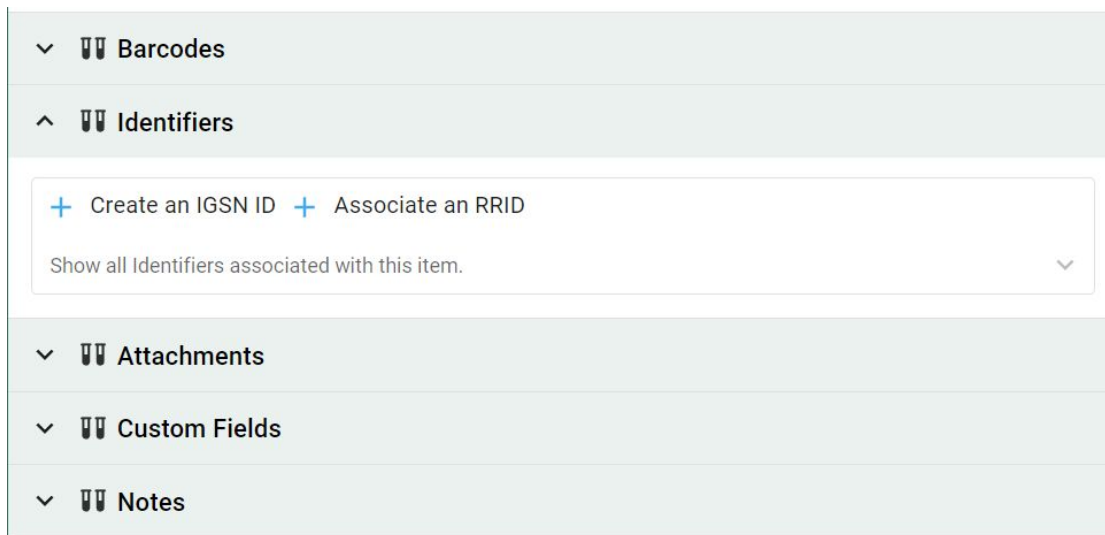
                      

Path	Description	Notes
NASHmed.png  see in omero	<ul style="list-style-type: none">Description = Cell line HH01 is a Spontaneously immortalized cell line with a species of origin Homo sapiens (Human) RRID URL: https://web.expasy.org/cellosaurus/CVCL_4Z97Z-sections = 1Timepoints = 1Number of Channels = 4Pixels Type = uint8Dimensions(XY) = 1440 x 960Pixel Size (XYZ) = n/a X x n/a Y x n/a ZChannels = [name = Red colour = -16776961 photo interpretation = Monochrome] [name = Green colour = 16711935 photo interpretation = Monochrome] [name = Blue colour = 65535 photo interpretation = Monochrome] [name = Alpha colour = 0 photo interpretation = Monochrome]Tag = "URL=https://www.cellosaurus.org/CVCL_4Z97"Tag = "RRID=CVCL_4Z97"Tag = "PubMed=7514562"Tag = "DOI=10.1002/hep.1840190612"Comment = "Derived from sampling site: Liver. Cell type=Hepatocyte."Tag = "tissue=liver"	

/project/Rob's
images/112/dataset/Hepatocytes/1418/image/NASHmed.png/15294

Using IGSN IDs together with RRIDs for samples

- RRID: description of exact **type** of item used
- IGSN ID: how was this **individual sample** processed in this lab?
 - IGSN ID metadata references RRID for a complete record



▼ 📄 Barcodes

▲ 📄 Identifiers

+ Create an IGSN ID + Associate an RRID

Show all Identifiers associated with this item. ▼

▼ 📄 Attachments

▼ 📄 Custom Fields

▼ 📄 Notes

Plans for Facility RRID metadata import into RSpace Inventory

Inventory

Search

Type Owner Bench Status Barcode Tags Saved Searches

Baskets

Type: Samples Status: Current

7084 samples found.

- My Bench 91
- Containers
- Facilities**
- Instruments
- Templates
- Export Data
- RSpace ELN
- Settings
- Need Help?
- Sign Out

LOGGED IN AS

Crystallography Open Database (COD)

SAMPLE SA4325383

Info Edit Create Duplicate Move Transfer Add to Basket Export Print Barcode

Custom Fields RRID: SCR_005874

Resource Report

https://dknet.org/data/record/nlx_144509-1/RRID:SCR_005874/resolver?q=&i=rrid:scr_005874

Resource Website

<http://www.crystallography.net/>

Proper Citation

Crystallography Open Database (COD) (RRID:SCR_005874)

Abbreviations

COD

Resource Type

service resource, data repository, storage service resource, data or information resource, database

Resource Relationships

is recommended by::NIDDK Information Network (dkNET)::SCR_001606, is recommended by::NIDDK - National Institute of Diabetes and Digestive and Kidney Diseases::SCR_012895, is listed by::re3data.org::SCR_006782, has parent organization::Vilnius University; Vilnius; Lithuania::SCR_011764

Related Condition

None

Export Options

Exporting selected: Subsamples.

Export Mode



Full



Key Resources Table



All data, excluding custom and template fields.

File Type



ZIP Bundle



Single CSV

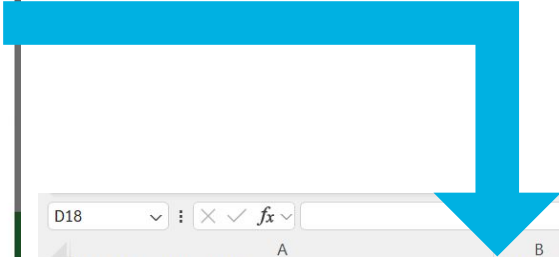


A single .CSV file combining all exported items.

CANCEL

EXPORT

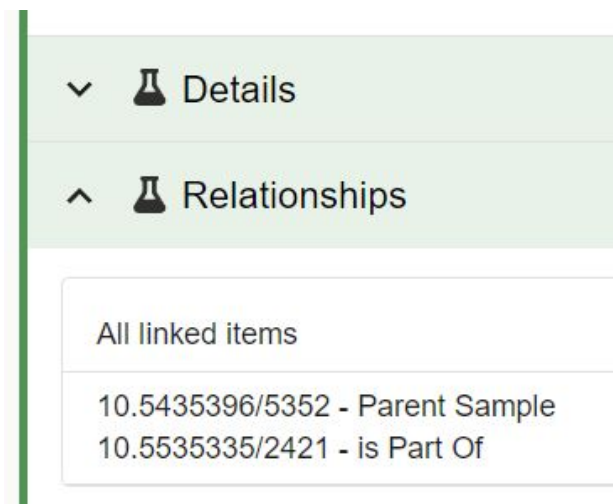
RSpace exports of selected inventory items include all metadata include associated RRIDs and other identifiers.



	A	B	C	D
1	REAGENT or RESOURCE	TYPE	SOURCE	IDENTIFIER
2	Magic Anti-Malaria HRP-II Monoclonal antibody[HRP]	Antibody	Creative Diagnostics	Cat# DMABRM008T, RRID:AB_2528349
3	Mouse anti-Malaria LDH (pan) monoclonal antibody	Antibody	Creative Diagnostics	Cat# DMABT-S15211, RRID:AB_2531355
4	Mouse Anti-Plasmodium falciparum (Malaria) Monoclonal Antibody, HRP Conjugated, Clone BDI400	Antibody	Meridian Life Science	Cat# C03400P, RRID:AB_817152
5	Mouse Anti-Plasmodium falciparum (Malaria) Antibody, HRP Conjugated	Antibody	Acris Antibodies	Cat# BM3272HRP, RRID:AB_1621238
6	Anti-Plasmodium vivax (Malaria) Polyclonal Antibody, Unconjugated	Antibody	MyBioSource	Cat# MBS535006, RRID:AB_10578141
7	Plasmodium falciparum (Malaria)	Antibody	MyBioSource	Cat# MBS531391, RRID:AB_10577873
8	Mouse Anti-Plasmodium falciparum (Malaria) merozoite surface protein 1 (MSP1) Monoclonal Antibody, Unconjugated, Clone B938P	Antibody	Meridian Life Science	Cat# C86944M, RRID:AB_817154
9	Mouse Anti-Plasmodium falciparum (Malaria) merozoite surface protein 1 (MSP1) Monoclonal Antibody, Unconjugated, Clone B937P	Antibody	Meridian Life Science	Cat# C86943M, RRID:AB_817153
10				

Sample, Measurement, Instrument relationships

- Tracking of which instruments recorded which measurements: relatedIdentifier DataCite property?
- How should modular components of an instrument be recorded, when tracking the configuration is essential for reproducibility?
- What is the PID for a measurement?



The screenshot shows a sidebar with two main sections: 'Details' and 'Relationships'. The 'Relationships' section is expanded, showing a list of 'All linked items'.

All linked items	
10.5435396/5352	- Parent Sample
10.5535335/2421	- is Part Of

Ongoing Funded Projects

in collaboration with California Digital Library

FAIR Samples: exploring research and sample data management best practices in place-based research

Award Nr. [2433320](#)



EAGER

Advancing Research Data Management through Enhanced Vertical Interoperability

Award Nr. [2433321](#)



Conference

FAIR Samples: exploring research and sample data management best practices in place-based research

Award Nr. [2433320](#)



EAGER

- FieldMark Integration (offline field sample metadata collection)
- Data Manager/Curator role in RSpace
- Relationship modelling between entities (parent/child/etc)
- Flexibility in sample concept (singleton, batch, subsampling)
- Enhanced DMP Tool integration
- ORCID, ROR, IGSN ID enhancements (sending to repositories)
- PIDINST
- Automatic PID graph generation from RSpace
- End-to-end sample workflow guidelines for research tools

We're here to learn from you!

- We're beginning specification work for these various projects, and would be grateful for your input. Real-life use cases are invaluable!
 - We have the NSF funding, expertise and proven platform for building a powerful, FAIR, data management hub, now we want you to tell us what you need.
 - What other tools/PIDs would be useful for us to integrate with?
 - What RRID, facility, and instrument workflows should we support in RSpace Inventory?
 - What are the points of friction in adopting and using research tools & PIDs at your institution?
 - Learn more in our hands-on session in the afternoon breakout session
 - Want an extended demo? Let's keep in touch! rob@researchspace.com