

ODM Configuration Guide

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ODM Configuration Guide

Welcome to the Omics Data Manager (ODM) configuration guide.

ODM is deployed with the default template, set of vocabularies, and required groups and can be used straight away. But in order to become more efficient and better satisfy your needs, it can be configured.

In this guide, we will take a look at customizable settings and see what and how you can change to make your day-to-day data management more convenient and smooth.

Content

The following topics are to be discussed:

- **Getting Started:** How to set users, user permissions and groups
- **Minimal metadata model:** Why template is important, how it can be changed
- **Ontologies:** What is the role of dictionaries and ontologies in the system, and how they can be seen and updated
- **Facets:** How to configure the faceted search
- **Q&A Session**

Content

- **Getting started:** How to set users, user permissions and groups
- Minimal metadata model
- Ontologies
- Facets
- Q&A Session

Users, Permissions and Groups

Creating Users

There are a few ways to create users in ODM:

- Creating a user manually
- Creating users by running a script
- Automated user creation upon login (SSO is required)
- Users synchronisation via SCIM APIs

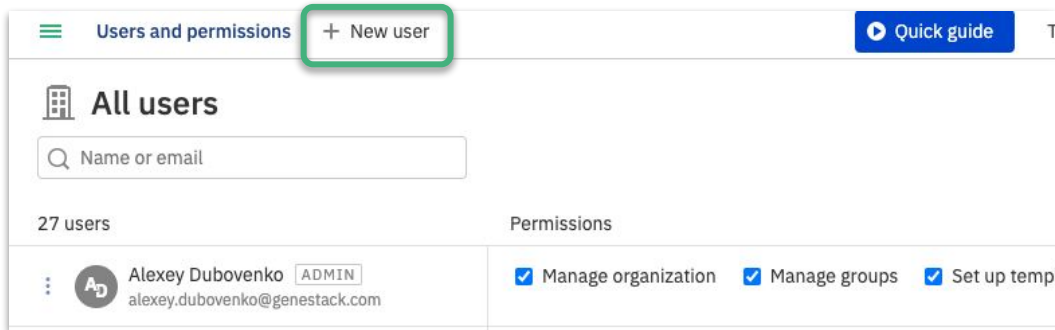
Once a user is created it cannot be deleted from the system, but can be deactivated.

Prerequisites: To create or deactivate a user, one should have “**Manage Organisation**” permission.

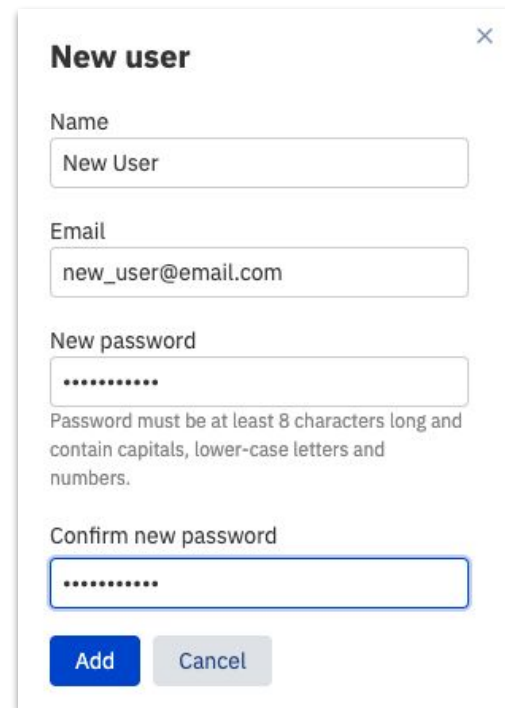
Creating Users Manually

The users will be created one by one. Fast and easy way to create a **small number of users**, but could be potentially error-prone.

- Go to “Users and permissions” page
- Click on “+ New user” button
- Enter name, email and temporary password.
- Send the details to the user and instruct them to change the temporary password.



The screenshot shows the 'Users and permissions' management interface. At the top, there is a navigation bar with a hamburger menu icon, the text 'Users and permissions', a '+ New user' button (highlighted with a green box), and a 'Quick guide' button. Below the navigation bar, the main section is titled 'All users' and contains a search bar labeled 'Name or email'. Under the search bar, it indicates '27 users'. Below this, there is a table of users. The first user listed is 'Alexey Dubovenko' with the role 'ADMIN' and email 'alexey.dubovenko@genestack.com'. To the right of the user list, there are three permission checkboxes: 'Manage organization' (checked), 'Manage groups' (checked), and 'Set up temp' (checked).



The 'New user' modal form is displayed. It includes a close button (X) in the top right corner. The form fields are: 'Name' (with 'New User' entered), 'Email' (with 'new_user@email.com' entered), and 'New password' (with masked characters '.....'). Below the password field, a note states: 'Password must be at least 8 characters long and contain capitals, lower-case letters and numbers.' There is a 'Confirm new password' field (also with masked characters). At the bottom, there are 'Add' and 'Cancel' buttons.

Creating Users via Script

Users can be created by running a script. The process is similar to manual creation, but has a few advantages which make it more suitable for creating a **large number of users**:

1. The prepared file with the list of usernames and emails is used rather than manual typing (less error-prone).
2. Temporary passwords are auto generated.
3. Multiple users can be created in one go.

Prerequisites: To create a user, one should have “**Manage Organisation**” permission, genestack python client configured, and the list of users prepared.

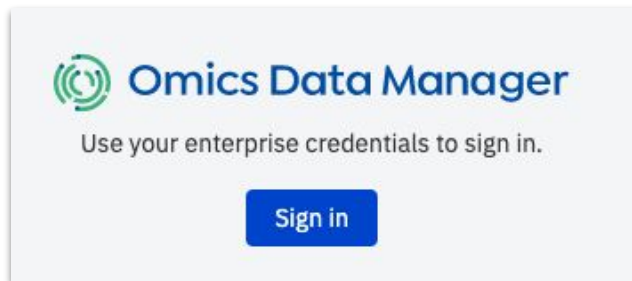
More detailed instructions on usage the users creation script and the link to the repository with the script can be found on GitHub.

Creating Users with SSO

With the Single Sign On (SSO) configured new users are **automatically** created upon the first login into the system. The users will have immediate access to studies shared with everyone in the organisation.

The users still need to be added to appropriate groups for being able to:

- See the confidential studies shared with the specified groups only,
- Contribute to data (import new data and/or curate existing data).



Access Management via SCIM APIs

ODM has RESTful APIs for user and group management based on SCIM provisioning. It can be used for integration with identity provider and establishing **automated access management** based on regular synchronisation.

This approach is recommended for customers with an identity provider supporting SCIM 2.0 specification as the most reliable and efficient. It reduces the number of entry points for access management to just one system.

Groups	
GET	/Groups Retrieve a list of available groups
POST	/Groups Add a new user group
GET	/Groups/{id} Retrieve a group by id
PATCH	/Groups/{id} Update a group
DELETE	/Groups/{id} Delete a group

Users	
GET	/Users Retrieve a list of all active users
POST	/Users Add a new user
GET	/Users/{id} Retrieve a user by id
PATCH	/Users/{id} Update a user
DELETE	/Users/{id} Deactivate a user

User Management via SCIM APIs

- Originally developed for integration via Azure Active Directory
- Developed based on SCIM 2.0 specification
- May be used with any identity provider supporting SCIM
- More information in Swagger in the "Manage Organization" section
- Instruction for integration with Active Directory is located in the admin guide.

Prerequisites: Call endpoints on behalf of a user with the “**Manage Organisation**” and the “**Manage Groups**” permission;

Note: For integration with access provides rather than Azure Active directory.

Active Directory Integration

The SCIM endpoints for automated user and group management have been created in ODM so that Active Directory can now be the only entry point for user management

The admin manages users in Active Directory:

- creates users and groups,
- adds users to the groups or removes users from the groups,
- deactivates users;

The changes propagate to ODM periodically. The schedule is configured in Active Directory.

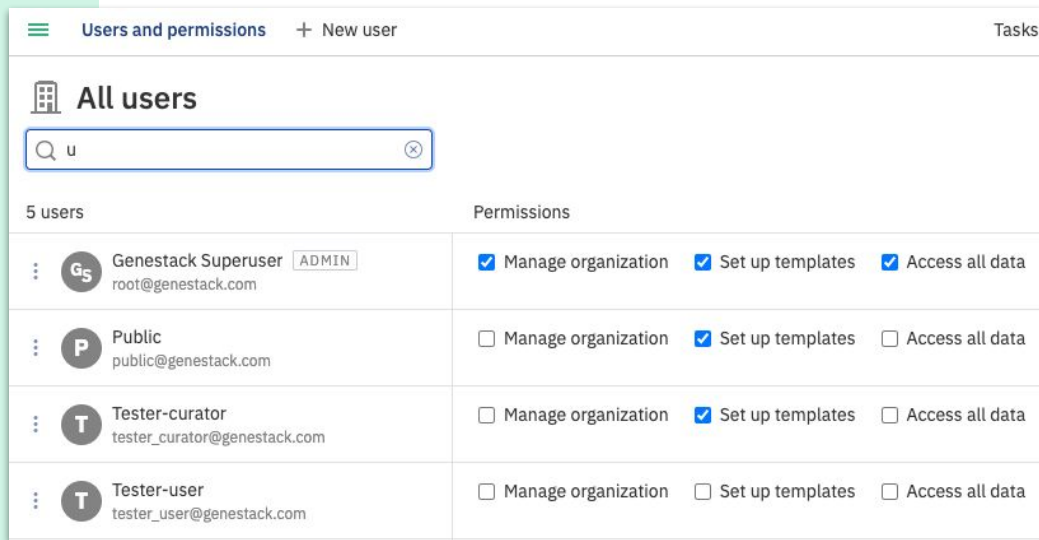
The admin has one entry point for managing users and their access in ODM.

Preparations before the First Sync





- Create a technical user for user sync between Active Directory and ODM. The user must have the “Manage Groups” permission so that the user has access to all groups in ODM via API and in the web interface and “Manage Organisation” so that the user can create new users in ODM.
- Check the list of groups and users in ODM and add the same users to the same groups in AD.
- Check the group names for their uniqueness: remove or rename the duplicates.
- Create the “Curator” group in Active Directory and add users who should be able to load and edit studies to this group. (There is no need to create the "All users" group in Active Directory since this is a technical group in ODM, all users are added to this group automatically.)
- Configure the User Provisioning in Active Directory for ODM application » admin guide.

Technical Users

On a fresh installment of ODM a few users are created for technical purposes like integration, autotests etc. Those users should not be deactivated, have their permissions revoked or removed from groups. The password for these users can be changed for security reasons.



The screenshot shows the 'Users and permissions' management interface. At the top, there's a header with a menu icon, the text 'Users and permissions', a '+ New user' button, and a 'Tasks' link. Below the header, there's a section titled 'All users' with a search bar containing the letter 'u'. A table below lists 5 users. The first user is 'Genestack Superuser' (root@genestack.com) with 'ADMIN' status and full permissions. The other three users are 'Public', 'Tester-curator', and 'Tester-user', all with email addresses ending in @genestack.com. Their permissions are listed in a table with checkboxes for 'Manage organization', 'Set up templates', and 'Access all data'.

5 users		Permissions
 Genestack Superuser root@genestack.com	ADMIN	<input checked="" type="checkbox"/> Manage organization <input checked="" type="checkbox"/> Set up templates <input checked="" type="checkbox"/> Access all data
 Public public@genestack.com		<input type="checkbox"/> Manage organization <input checked="" type="checkbox"/> Set up templates <input type="checkbox"/> Access all data
 Tester-curator tester_curator@genestack.com		<input type="checkbox"/> Manage organization <input checked="" type="checkbox"/> Set up templates <input type="checkbox"/> Access all data
 Tester-user tester_user@genestack.com		<input type="checkbox"/> Manage organization <input type="checkbox"/> Set up templates <input type="checkbox"/> Access all data

Technical users:

- root@genestack.com
- public@genestack.com
- tester_curator@genestack.com
- tester_user@genestack.com

Granting Permissions

Granting Permissions

Once the user is created the appropriate permissions can be assigned on the “**Users and permissions**” page by ticking the corresponding box. To grant and revoke permissions user should have the “**Manage organization**” permission.

root@genestack.com is created with the organization management permission.

The screenshot displays the 'Users and permissions' management interface. At the top, there's a header with a menu icon, the title 'Users and permissions', a '+ New user' button, a 'Quick guide' button, and user information 'Tasks Maria Borodaenko'. Below the header, the section 'All users' includes a search bar with 'maria' entered. A table lists three users, each with a set of permissions. Maria Borodaenko is an administrator with full permissions. Maria Lazarenko is deactivated and has no permissions. Maria Researcher has permissions for setting up templates and configuring facets. A tooltip for the 'Manage organization' checkbox for Maria Lazarenko lists the following actions:

- Create and deactivate users
- Change user passwords
- Manage user permissions

Users		Permissions
	Maria Borodaenko ADMIN You maria.borodaenko@genestack.com	<input checked="" type="checkbox"/> Manage organization <input checked="" type="checkbox"/> Manage groups <input checked="" type="checkbox"/> Set up templates <input checked="" type="checkbox"/> Access all data <input checked="" type="checkbox"/> Configure facets
	Maria Lazarenko DEACTIVATED maria.lazarenko@genestack.com	<input type="checkbox"/> Manage organization <input type="checkbox"/> Manage groups <input type="checkbox"/> Set up templates <input type="checkbox"/> Access all data <input type="checkbox"/> Configure facets
	Maria Researcher maria.borodaenko+r@genestack.com	<input type="checkbox"/> Manage organization <input type="checkbox"/> Manage groups <input checked="" type="checkbox"/> Set up templates <input type="checkbox"/> Access all data <input checked="" type="checkbox"/> Configure facets

Granting Permissions

There are five permissions available in the system. The description of the permission is displayed when you hover over the mouse.

1. **“Manage organization”** – creating and deactivating users, changing their passwords, and granting permissions.
2. **“Manage groups”** – access and manage all existing groups, even if you are neither an admin nor a member of the group. Recommended for integration purposes.
3. **“Set up templates”** – creating new and altering existing templates.
4. **“Access all data”** – access to all studies in the system. Recommended for integration purposes.
5. **“Configure facets”** – setting desired list and order of facets in the Study Browser for all users on the instance.


Groups Management

Group Role

Groups are used in ODM for easier collaboration and for data sharing. They can represent departments, project teams or any other preferred structure.

The list of all groups you are a member of can be browse on the “Groups” page. A user with “**Manage groups**” permission can browse and manage all groups available in the system.

The screenshot displays the 'Groups' management interface. On the left, a sidebar lists several groups: 'Another Test Group', 'Curator', 'Data Team' (highlighted in blue), 'Infectious Diseases', 'Maria test group', 'Precision Immunology', and 'Test'. The main content area is titled 'Data Team' with a group icon and '2 members'. Below the title is a search bar labeled 'Name or email'. A 'New members' button is located to the right of the search bar. A table below shows the group's members, with columns for 'User' and 'Role'. The first member listed is Kevin Dialdestoro, with the email kevin@genestack.com, holding the role of 'Group admin'. A 'Quick guide' button is visible in the top right corner of the interface.

User	Role
 Kevin Dialdestoro kevin@genestack.com	Group admin

Creating a Group

A new group can be created in ODM:

- Creating a group manually in ODM
- Creating groups using SCIM API (automated access management)

Prerequisites: There are no prerequisites, any user can create a group and invite other users into it. Users can see only those groups they are members of.

Default groups created upon installation, they should not be removed:

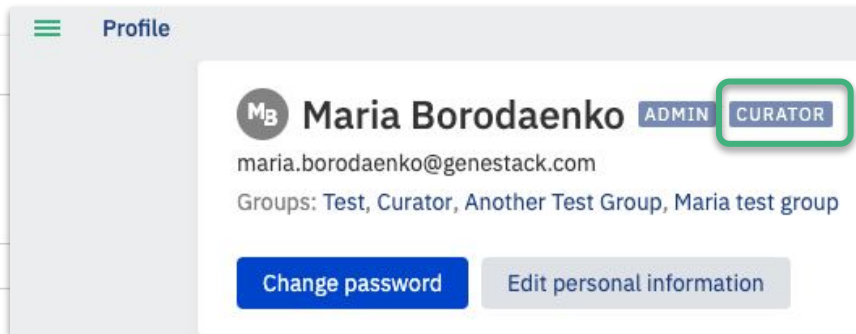
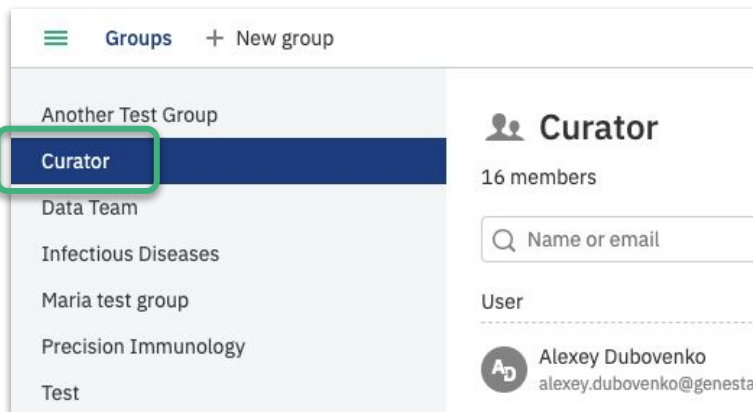
- **Curator** (special group granting edit permissions)
- **All users** (all users are automatically added to this group)

Curator Group

Curator group is a special group granting the **edit permissions** to its members.

Members of the Curator group are considered as **curators**. They can import new studies and edit any study shared with them.

If a user is not a member the Curator they are considered as **researchers** and are able just to browse available studies and retrieve data, but not contribute to it.



Creating a Group Manually

- Go to “Groups” page
- Click on ”+ New group” button
- Enter the group’s name.

You automatically become a member of the group and its admin. You are able now to add new members and assign roles to them.

The screenshot displays the Genestack interface for managing groups. At the top, the 'Groups' page is visible with a list of existing groups: 'Another Test Group', 'Curator', 'Data Team', 'Infectious Diseases', 'Maria test group', 'New group' (highlighted), and 'Precision Immunology'. A green box highlights the '+ New group' button in the top right corner. An arrow points from this button to the 'New group' modal, which is open in the foreground. The modal contains a 'Name' input field with the text 'New group' and two buttons: 'Create' and 'Cancel'. Another arrow points from the 'Create' button to the 'New group' page. This page shows the details of the newly created group, including the name 'New group', the number of members (1), and a search bar for adding members. Below this, a table lists the group's members, with Maria Borodaenko as the sole member and the role of 'Group admin'.

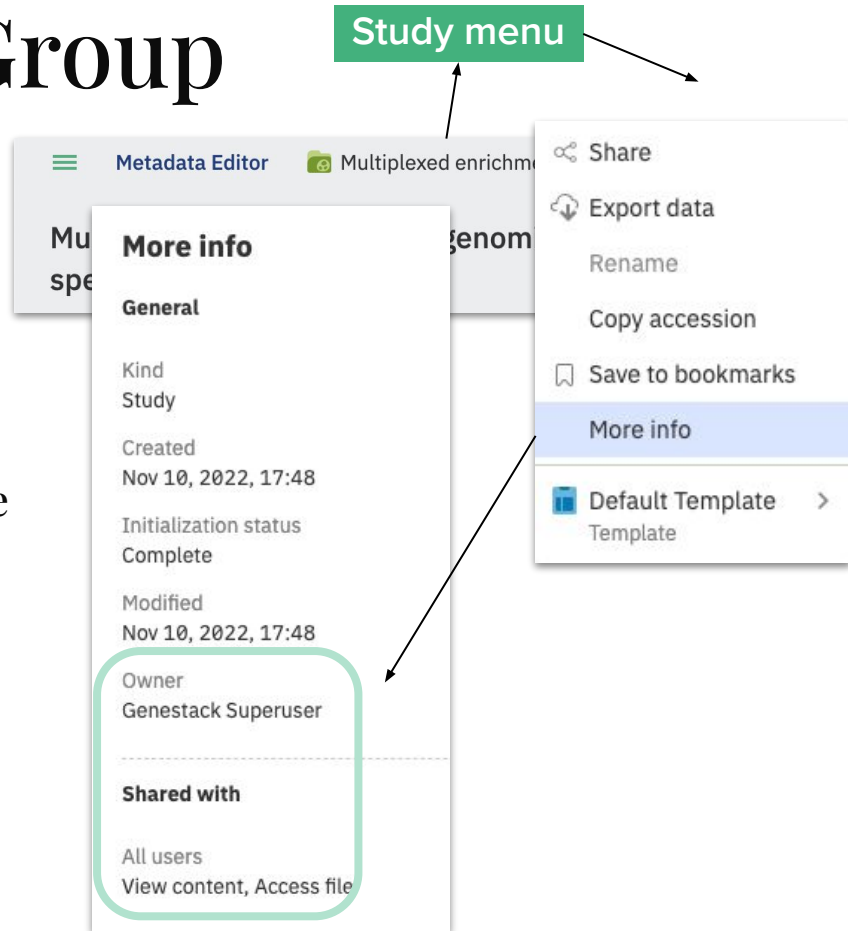
User	Role
Maria Borodaenko maria.borodaenko@genestack.com	Group admin

Sharing Data with a Group

To share a study you should be the **study owner** - the user who imported it to ODM. Share option is available in the Study menu. Owners can share studies only with a group they are members of.

If you are not an owner you can browse the owner and the groups it shared with in “More info” and ask the owner to share it.

If the owner became unavailable, a new owner can be assigned using a script.



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Minimum Metadata Model

Minimum Metadata Model

Minimum Metadata Model is a **list of attributes** with their **properties** for each data entity. It is described in a template. The **template** acts as a filter through which you are looking at your data, it helps in both data exploring and data curation.

ODM is installed with a **Default template**, you can modify it based on your needs to improve curation and search capabilities. The properties should be agreed among all users, so that the same attribute names and terms are used for data capturing. This is crucial for search.

When you import data the attributes are matched on the template ones. The rest of attributes are loaded as **non-template**. They are indexed and searchable, but not validated.

Metadata Templates

In the template the following properties can be defined:

- The list of attributes for each entity,
- If the attributes are required,
- Expected data type (string, decimal, date, etc),
- If the attributes are read-only (recommended for IDs, links, etc),
- Ontologies for metadata validation
- Description for the attribute (will be shown during curation as a hint).

Template Editor Baseline Biospyder Template					
Study	Sample				
Sample					
Library					
Preparation					
Expression					
	Name	Required	Metainfo type	Read-only	Dictionary
	Accession	Yes ▼	Text ▼	Yes ▼	▼
	SAMPLE_ID	Yes ▼	Text ▼	Yes ▼	▼
	Sample Name	Yes ▼	Text ▼	No ▼	▼
	Organism	Yes ▼	Text ▼	No ▼	NCBI Taxonomy / GSF047496 ▼
	Tissue	No ▼	Text ▼	No ▼	Uberon Anatomical Entities / ▼

Metadata Validation

Values entered in the attributes are validated against the template applied to the study.

Any inconsistencies are immediately shown to ease data standardisation.

Validation summary ×

Select value to replace

Organism

No value 80
Not filled

Sex

F 72
Should be a preferred label from dictionary "Sex"

M 8
Should be a preferred label from dictionary "Sex"

Cell Type

No value 80
Not filled

Multiplexed enrichment and genomic profiling of peripheral blood cells reveal sub-specific immune signature

[Study](#)[Samples 80](#)[Libraries 80](#)[EXP](#) [Expression](#) Filters

Invalid metadata



	A	D	E	F	G	H	I	J
	genestack:...	Organism	Sex	Disease	Age	Age Unit	Tissue	Cell Type
1	GSF052047		F		24			
2	GSF052048		F		24			

Creating New Template

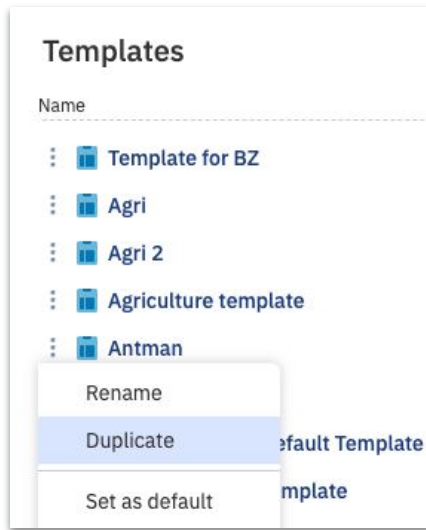
Creating a template **manually**:

- Go to the “**Template Editor**” page
- Choose the most relevant template
- Create a copy by clicking “**Duplicate**”
- Optional: rename the template
- Edit the template as needed.

Creating a template **programmatically**:

A template can be exported as a .json file, altered and imported back to ODM via a script. The instruction and the script are available on the [GitHub](#).

Prerequisites: “**Set up templates**” permission.



Changing Existing Templates

Existing templates can be altered at any time either directly in the ODM or by running a script. The changes made to a template are immediately applied to all studies using the template.

Note: The template is just a filter, it will never change you data. Hence, if an attributes name is changed in a template, the values will still be under the old attribute which will become “Not from template”. A new blank template attribute will be displayed.

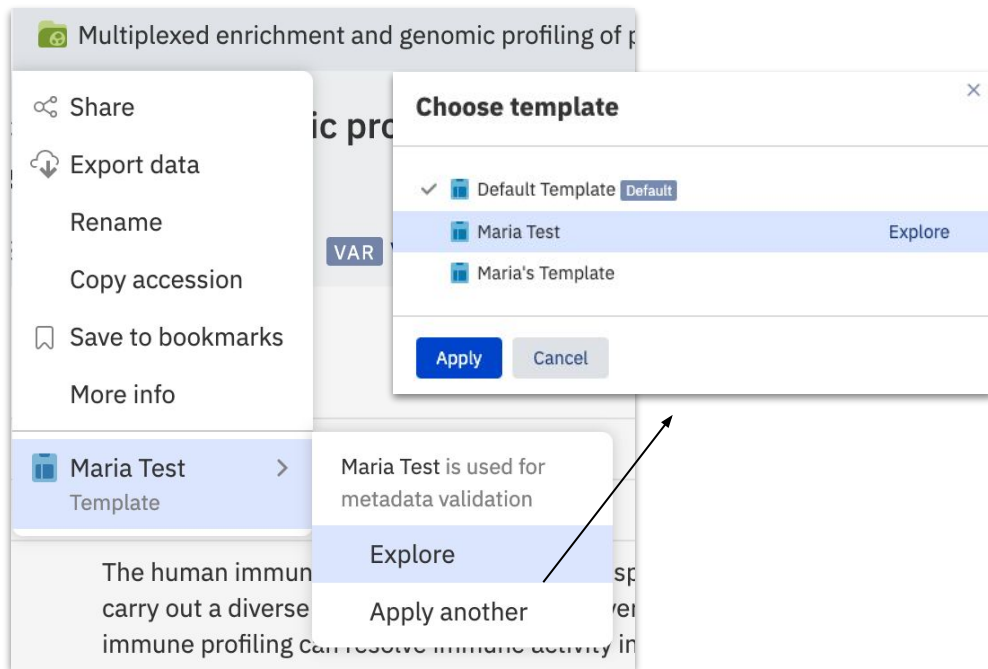
To “move” the values to the up-to-date attribute the Curation script can be used.

Assigning a Template

There could be many templates on the instance to have sets of attributes specific to different study types. A template can be assigned upon study import or changed by a curator later.

There is a scripts for facilitating template management available on the GitHub. It helps:

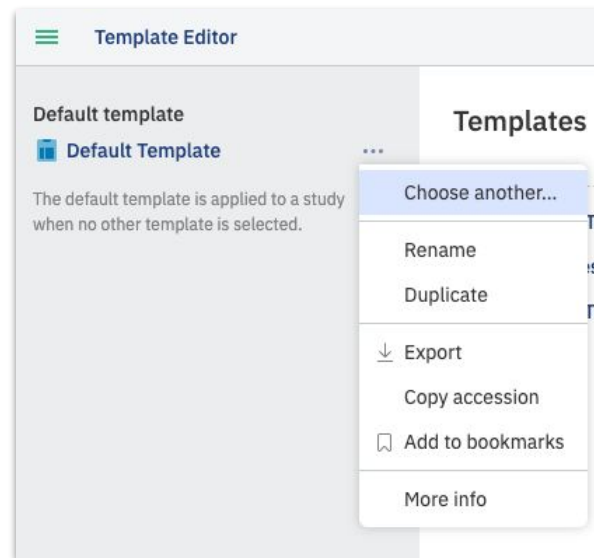
- Getting all studies using the specified template
- Changing the template for a bunch of studies



Default Template

If no template is specified during the data import, the template which is set to be the default one is used. Thus, it is recommended to set the most common template as the Default Template for the instance.

The current Default template can be found and changed on the “**Template Editor**” page.



Prerequisites: Changing the Default template will require the “**Set up templates**” permission.

Content

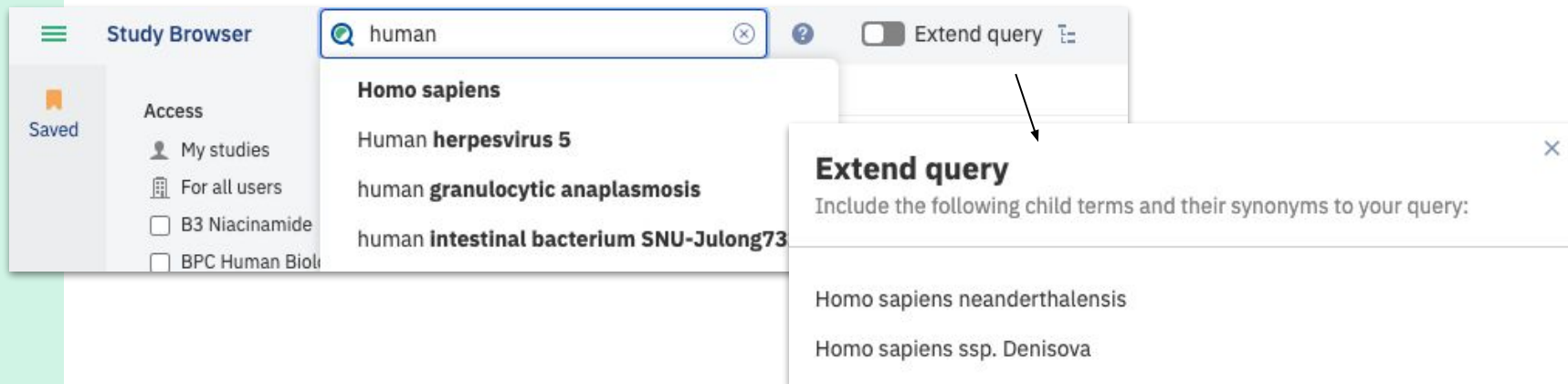
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Ontology Management

Ontology Management

Dictionaries and ontologies provide metadata validation, used for generating suggestions during metadata curation and search, and can be used for extending queries by enriching it with the child terms.

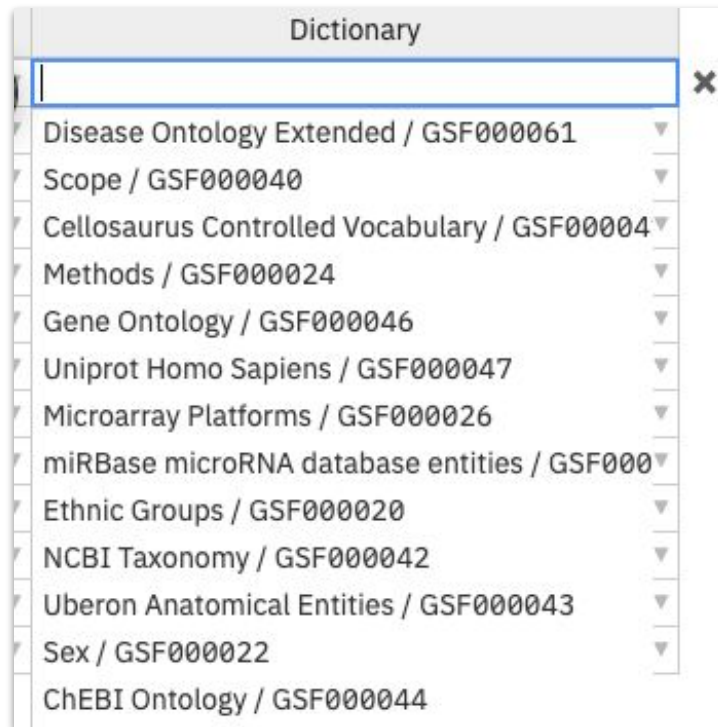
Defining a set of ontologies used among the team and "speaking" using the same terms is crucial for data harmonisation and ultimate search capabilities.



Browsing Available Ontologies

ODM is deployed with a default set of Ontologies: some of them are publicly available like NCBI Taxonomy or Uberon Anatomical Entities, others are created by Genestack team to facilitate your work.

List of all available dictionaries can be found in the dropdown on the Template Editor page.



Adding New Ontologies

Dictionaries can be loaded via a python script. The script allows loading dictionaries hosted at FTP or HTTP web addresses or contained in a local folder. A description to the dictionary can be added upon import. Loaded dictionaries will be indexed and become available for all users.

Existing dictionaries can be updated by exporting them, applying changes and importing to ODM.

```
[
  {
    "name": "NCI Thesaurus",
    "url": "http://purl.obolibrary.org/obo/ncit.owl",
    "description": "NCI Thesaurus (NCIt) is a reference terminology
that includes broad coverage of the cancer domain, including cancer
related diseases, findings and abnormalities. The NCIt OBO Edition aims
to increase integration of the NCIt with OBO Library ontologies"
  }
]
```

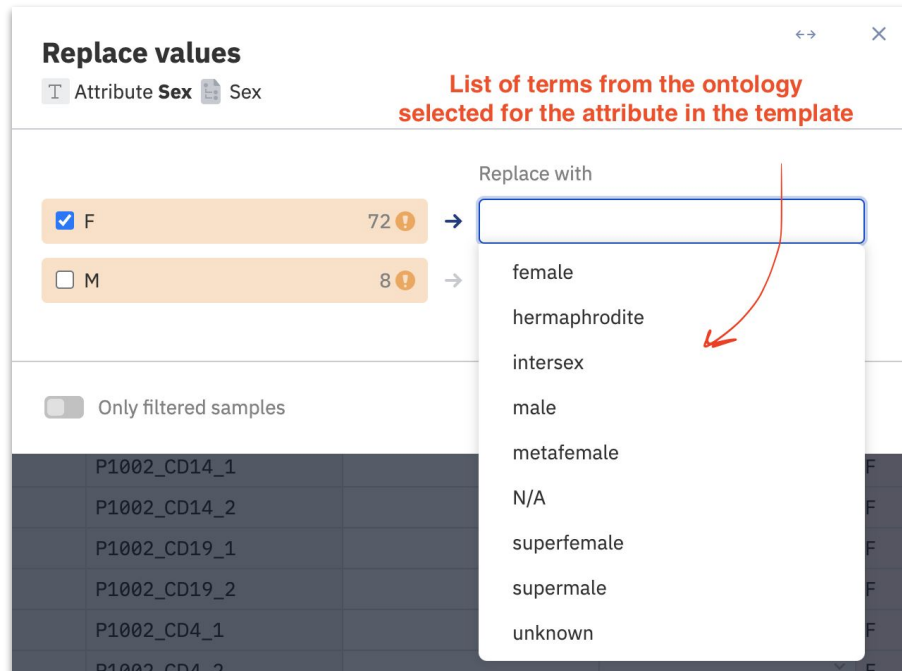
Supported formats:
CSV, JSON, OWL,
OBO or TTL.

Validating against Ontologies

Once an ontology is defined for an attribute in the template, all values entered for the attribute in all studies using the template are validated against the ontology.

If the term used is not a preferred label from the ontology, the metadata is considered as invalid, the user is notified.

The list of terms from a dictionary can be found in suggestions for an attribute using this dictionary.



Bulk Replace window in the Metadata Editor

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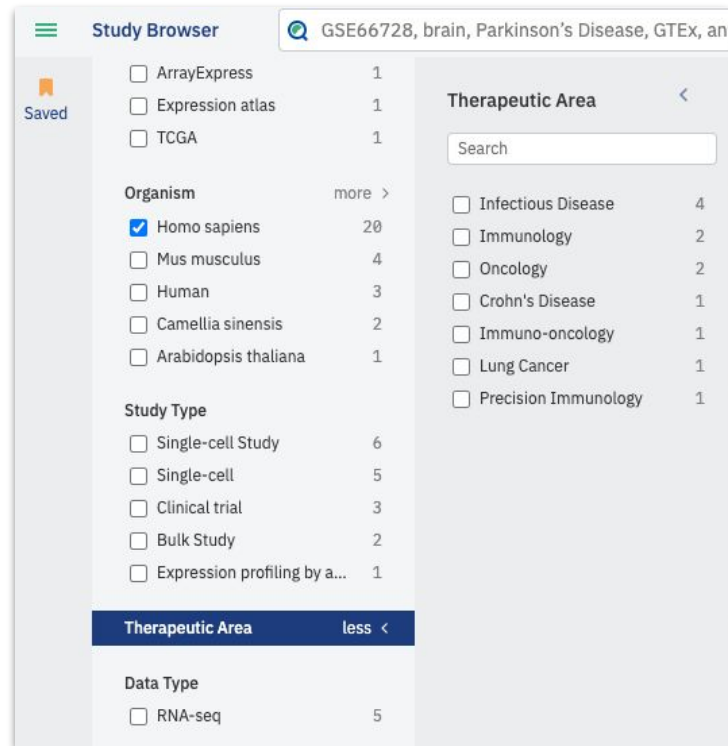
Facets Configuration

Facets Configuration

Facets are a powerful instrument for searching relevant data in the Study Browser.

The content of facets is filled in based on the studies imported available in ODM and the quality of data curation. Helpful and effective facets will be shown in case the attribute names and terms for values are synchronised across the studies.

The list and the order of facets can be changed based on the attributes you work with frequently.

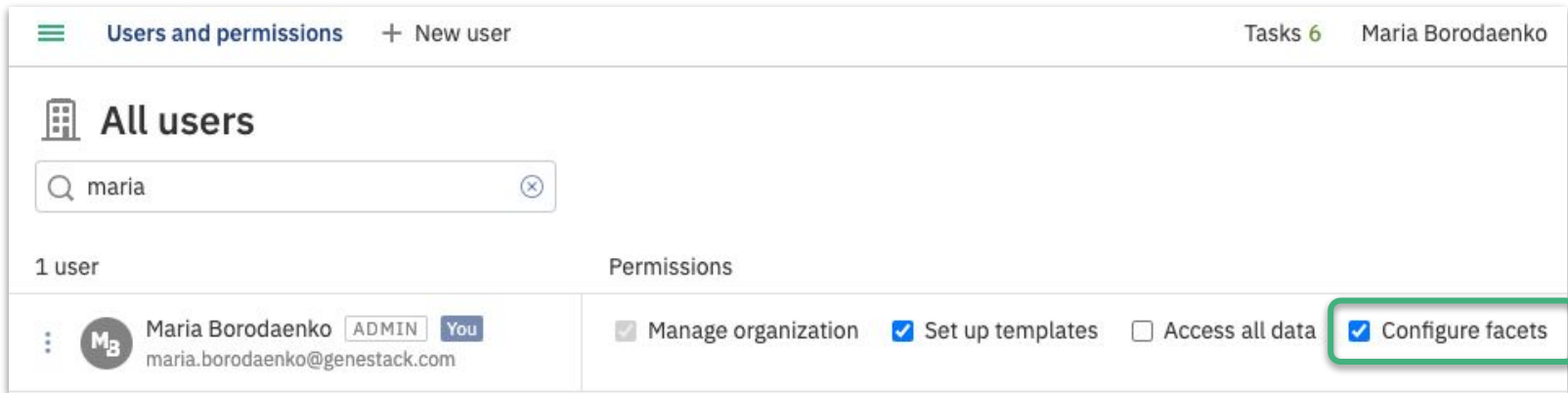


Facets Configuration

The changes made to the facets' configuration will affect all users.

The changes made to the order of facets and/or attribute removal will be seen immediately, meanwhile, newly added attributes are displayed only if there are values available for these attributes among the data loaded into the system.

Prerequisites: “Configure facets” permission.

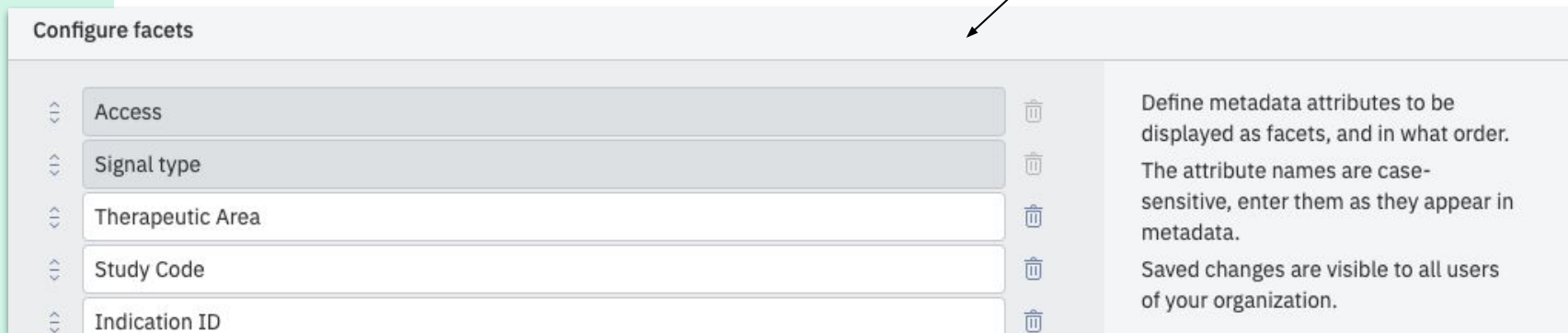
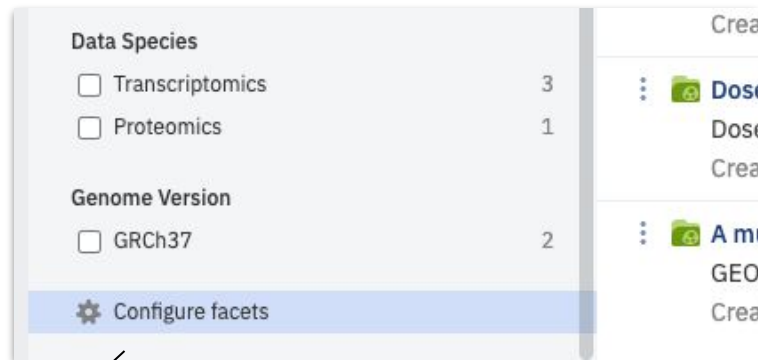


The screenshot displays the 'Users and permissions' management interface. At the top, there's a header with a menu icon, the title 'Users and permissions', a '+ New user' button, and user information 'Tasks 6' and 'Maria Borodaenko'. Below the header, the main section is titled 'All users' with a search bar containing 'maria'. It indicates '1 user' is found. The user's details are shown in a card: Maria Borodaenko, ADMIN role, and email maria.borodaenko@genestack.com. To the right, the 'Permissions' section lists four permissions: 'Manage organization' (checked), 'Set up templates' (checked), 'Access all data' (unchecked), and 'Configure facets' (checked). The 'Configure facets' permission is highlighted with a green rectangular box.

Facets Configuration

To change the facets configuration:

- Scroll to the bottom of the facets and open the configuration window.
- Add desired attributes (either from the template or non-template attributes)
- Delete unneeded attributes.
- Adjust the order and save changes.



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Q&A





Thank You!

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Unlocking the Power of Life-Sciences Data