

Search

Q Search

Type: Location

Folder

Filters

Group by

Save

X Clear

1-50 of 1159 items

Barcode	Name	Location	Modified	Schema
4C002	4C EE&SB fridge transient storage	DTU Buildi...	10/12/2020	4°C Fridge
4C002	4C Fridge 00271	DTU Buildi...	09/08/2018	4°C Fridge
4C009	4C Fridge 01223			4°C Fridge
4C008	4C Fridge 01233			4°C Fridge
4C014	4C Fridge 01871			4°C Fridge
4C015	4C Fridge Aaron	BioInnovati...	15/04/2021	4°C Fridge
4C016	4C Fridge Adam			4°C Fridge
4C005	4C Fridge ANALYTICS			4°C Fridge
4C011	4C Fridge CFB00266			4°C Fridge
4C017	4C Fridge CFB01478	DTU Buildi...	19/11/2018	4°C Fridge
4C01653	4C Fridge CFB01653	DTU Buildi...	19/11/2018	4°C Fridge
4C003	4C Fridge DSP1	DTU Buildi...	09/08/2018	4°C Fridge

Part 1

The Basics of Benchling

An introduction to our **Laboratory Information Management System (LIMS)**

Reach out when struggling with Benchling:

BRIGHT Benchling support
lims_support@bright.dtu.dk

Access Benchling:

bright.benchling.com

(login with DTU credentials. Access granted by HR)

Agenda

Introduction to Benchling
and best practices

~ 30 min

Hands-on

~ 15 min

Agenda

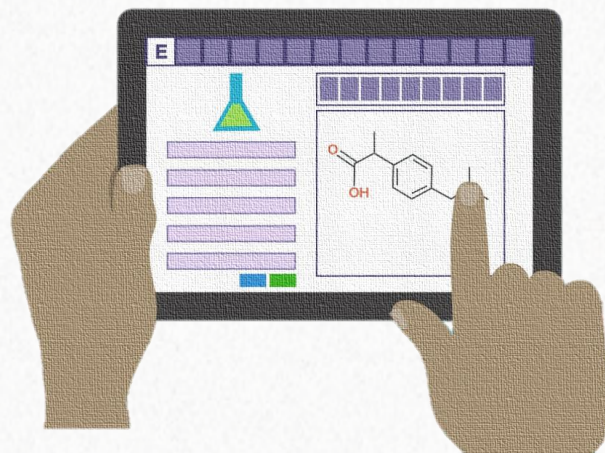
Introduction to Benchling
and best practices

~ 30 min

Hands-on

~ 15 min

What is a LIMS?



What is a LIMS?

L.I.M.S = Laboratory Information Management System

- It **keeps track of laboratory data** associated with samples and experiments
- At BRiGHT, we use **Benchling**, a Cloud-based platform



bright.benchling.com

Main functionalities

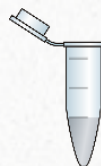
ELN

- Experiment notes
- Registration of samples



Sample storage

- Samples transfer in boxes/plates



Molecular Biology tools

- Import of sequences
- Plasmid design and annotation



Requests

- Sample submission for analysis
- Lab material order requests



Working with Benchling

Benefits

- Facilitates **passing over** of projects
- Fosters **collaboration**
- Promotes data capture in a **defined place** preventing its loss
- Make knowledge **findable**
- Promotes the adoption of **common practices** across research groups

Working with Benchling

Obstacles


- Adapting to a **new way of working**
- **Software limitations** and “pain points”
- **Learning curve**
 - Many functionalities
 - Complex / confusing data model

Good practices

- ✓ Record all necessary information to make your experiment **clear to others** and reproducible
- ✓ Register important data (strains, media, plasmids...)
- ✓ Keep your project folders organized and use **clear names** and **descriptions**


Good practices

- ✓ Reach out if you're struggling when using the platform
- ✓ There might be a **quicker** and **easier** way to do what you are doing!


The DTU logo, consisting of the letters "DTU" above three horizontal wavy lines.

LIMS Support

Get hands-on support for **Benchling** and other **data management** tasks

Send an e-mail 

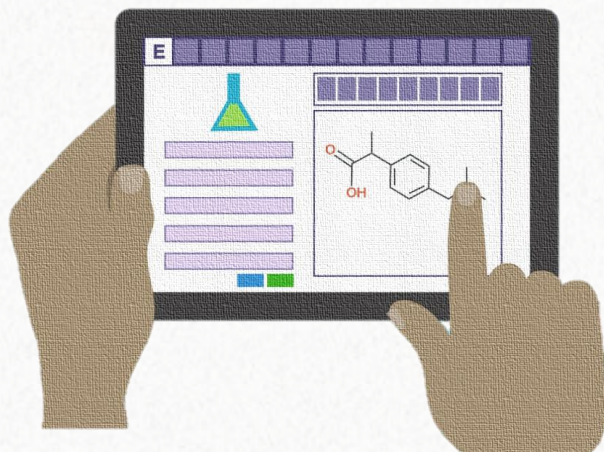
lims_support@bright.dtu.dk

Book a meeting 

[bit.ly/lims-bookings*](https://bit.ly/lims-bookings)

Access from your computer - Please describe the topic you'd like to discuss in the **Notes** field

Getting started



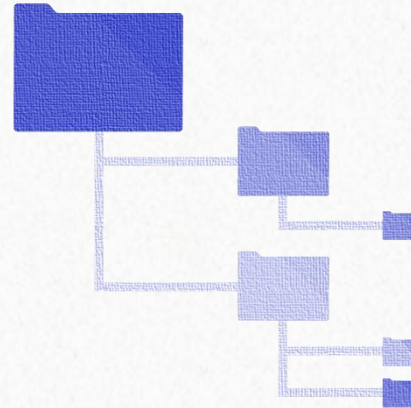
Step 1: Create your project folder

Step 2: Create your experiment ELN & register samples

Step 3: Navigate through your data


Step 1:

Create your project folder



Project folder

Your Project folder will contain:

- ✓ your Electronic Notebook pages (called “**Entries**”) 
- ✓ your registry items (called “**Entities**”) strains, plasmids,...



Example of folder structure

**Project
folder**



Subfolders



Experiment ELNs



Protocols and SOPs



Analytical Submissions



Strains



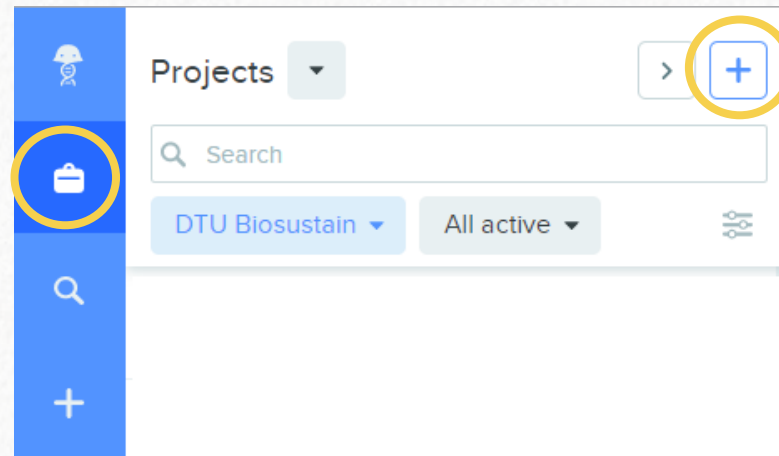
Plasmids



Project folder

To create a New Project:

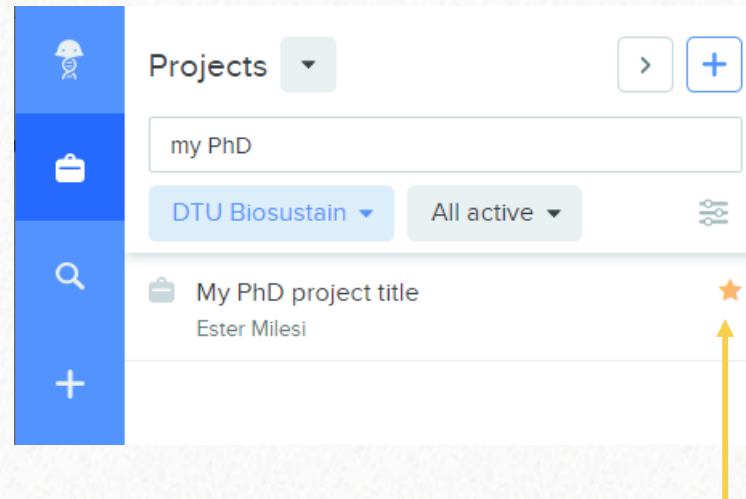
- Click on the “Project” icon
- Click on the “+” icon
- Give the folder a clear name (e.g., your PhD project title)



Project folder

Star ★ your Project:

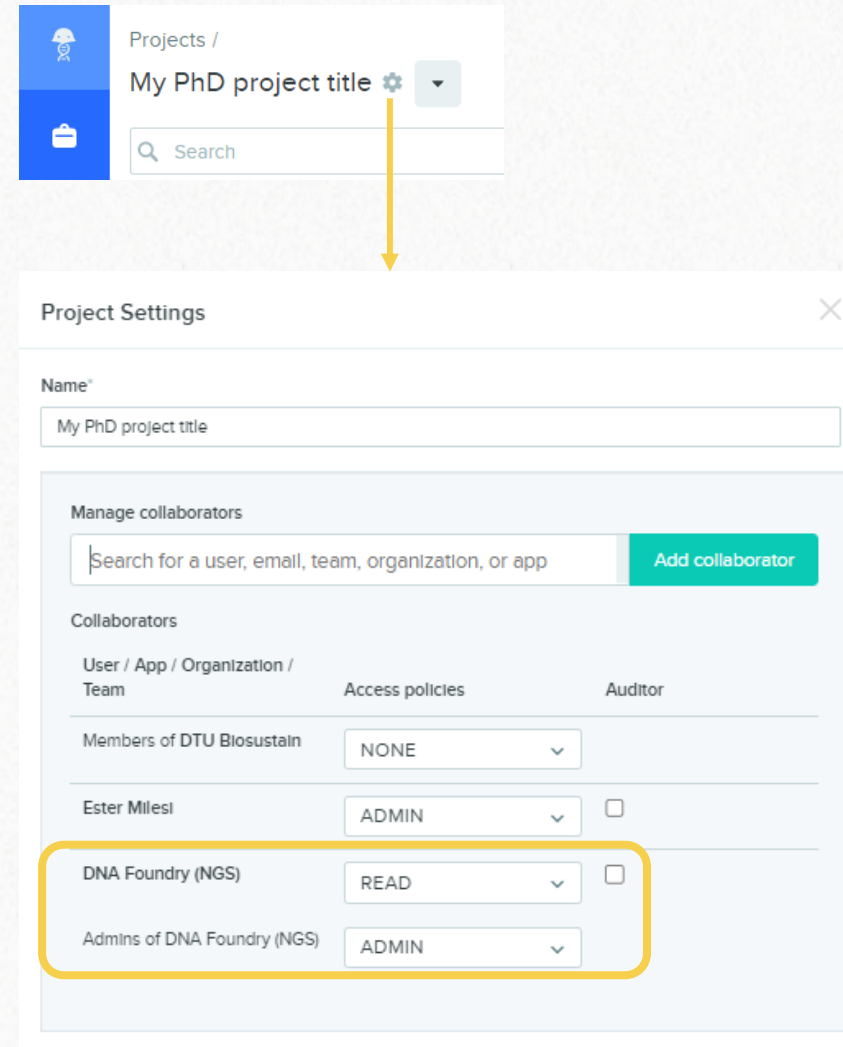
- This way, it will appear on top of every other Project that you have access to



Project folder

Give access to your team

- Almost all Research groups have a **Benchling Team**
- When possible, add **your Team** among the collaborators of the Project
- Keep the access to “***NONE***” for BRiGHT



Projects / My PhD project title

Search

Project Settings

Name*
My PhD project title

Manage collaborators

Search for a user, email, team, organization, or app Add collaborator

Collaborators

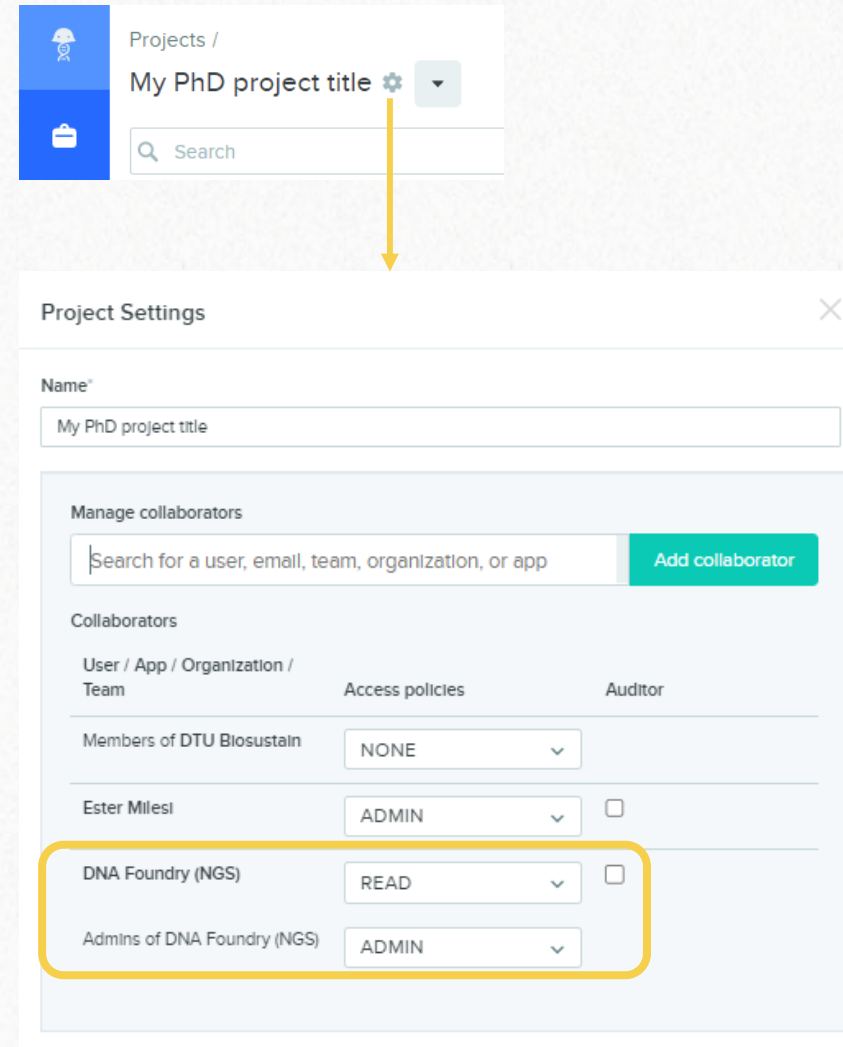
User / App / Organization / Team	Access policies	Auditor
Members of DTU Biosustain	NONE	<input type="checkbox"/>
Ester Milest	ADMIN	<input type="checkbox"/>
DNA Foundry (NGS)	READ	<input type="checkbox"/>
Admins of DNA Foundry (NGS)	ADMIN	<input type="checkbox"/>



Project folder

Benefits

- ✓ You don't have to add each member one-by-one
- ✓ When new researchers join the Team, **they get automatically access to all shared Project folders**



Projects / My PhD project title

Search

Project Settings

Name*
My PhD project title

Manage collaborators

Search for a user, email, team, organization, or app Add collaborator

Collaborators

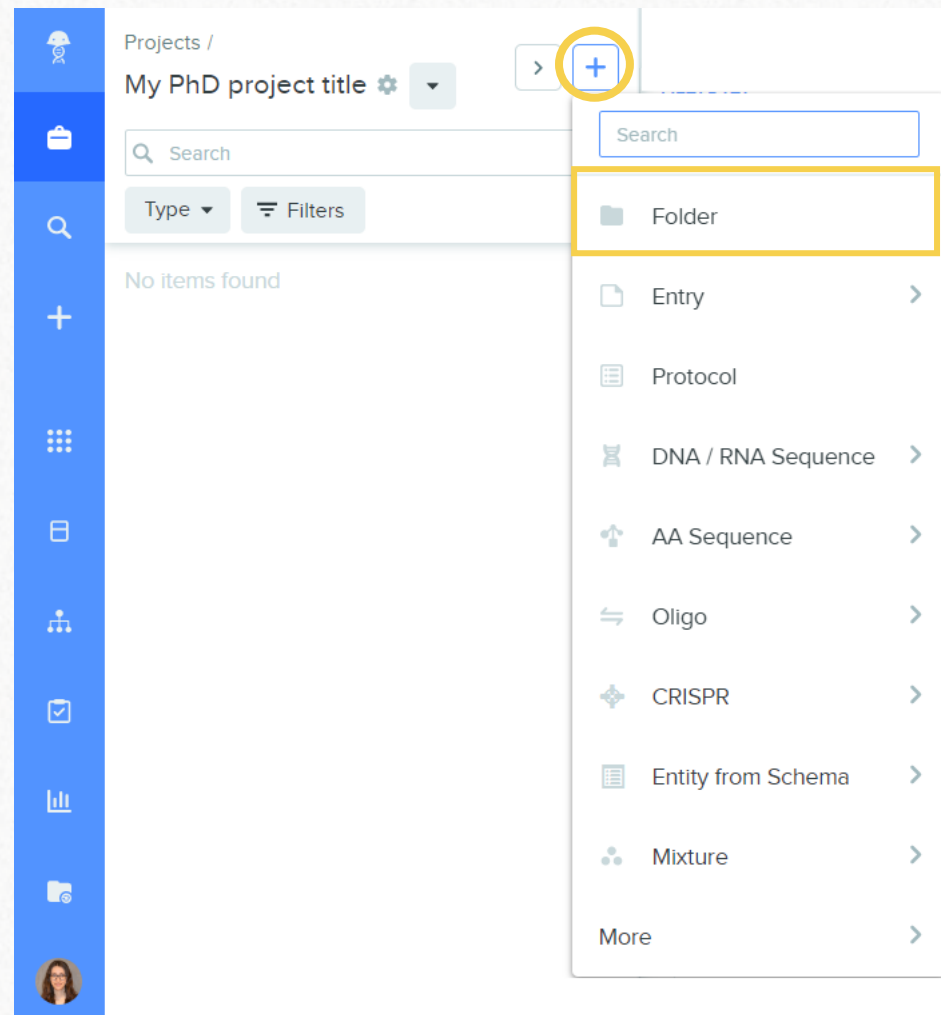
User / App / Organization / Team	Access policies	Auditor
Members of DTU Biosustain	NONE	
Ester Milest	ADMIN	<input type="checkbox"/>
DNA Foundry (NGS)	READ	<input type="checkbox"/>
Admins of DNA Foundry (NGS)	ADMIN	



Creating subfolders

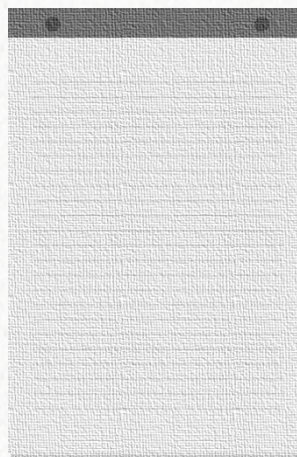
To create a subfolder:

- Enter your newly created Project
- Click on the “+” icon
- Select “Folder”



Step 2:

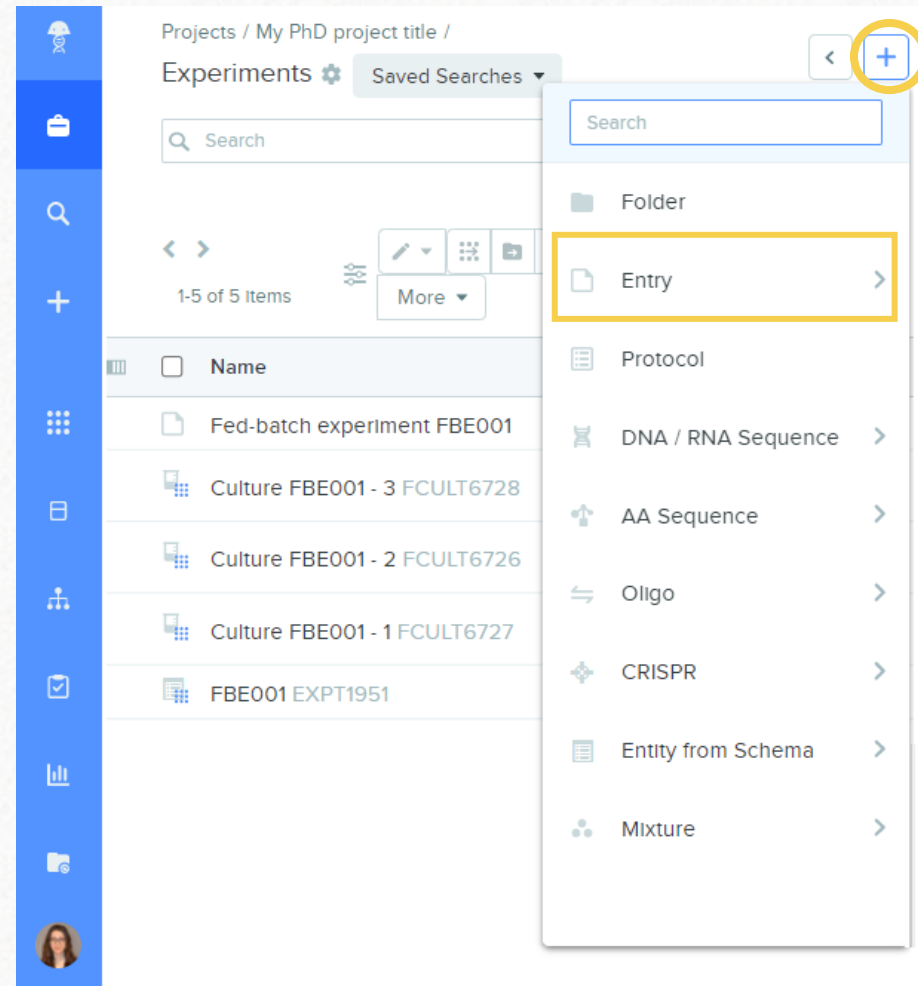
Create your experiment ELN & create samples



Electronic notebook

To create a new Entry:

- Go to the relevant folder (e.g., “Experiments”)
- Click on the “+” icon
- Select “Entry”



Electronic notebook

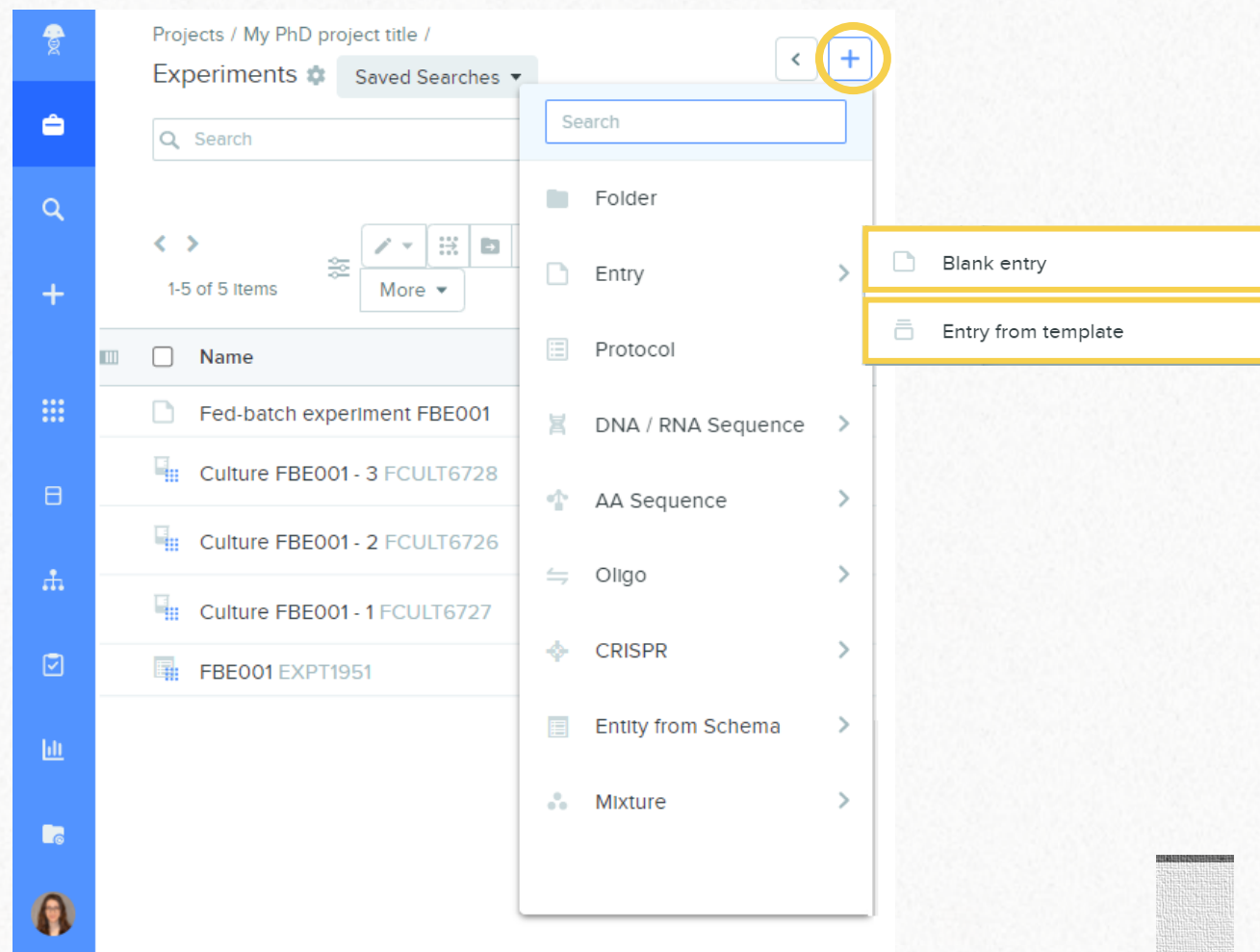
Option 1:

Blank entry

Option 2:

New Entry from Template

--- you can create your own!



The screenshot displays the BRiGHT electronic notebook interface. On the left is a blue sidebar with various icons. The main area shows a project titled 'My PhD project title' with a list of experiments. A '+ ' button in the top right corner is circled in yellow, and a dropdown menu is open, listing various entry types. The 'Entry' option is highlighted, and a secondary menu is shown to its right, also with a yellow border, containing 'Blank entry' and 'Entry from template' options.

Projects / My PhD project title / Experiments Saved Searches

Search

1-5 of 5 Items

More

Name

- Fed-batch experiment FBE001
- Culture FBE001 - 3 FCULT6728
- Culture FBE001 - 2 FCULT6726
- Culture FBE001 - 1 FCULT6727
- FBE001 EXPT1951

Search

- Folder
- Entry
- Protocol
- DNA / RNA Sequence
- AA Sequence
- Oligo
- CRISPR
- Entity from Schema
- Mixture

Blank entry

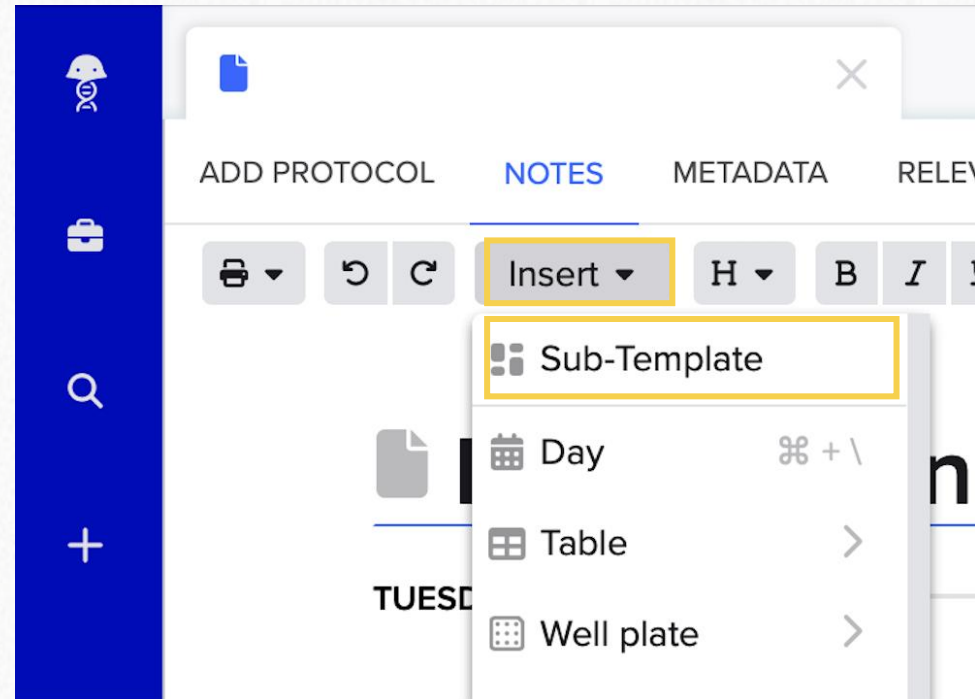
Entry from template

Electronic notebook

Option 3:

Blank entry + Sub-Template

--- you can create your own!

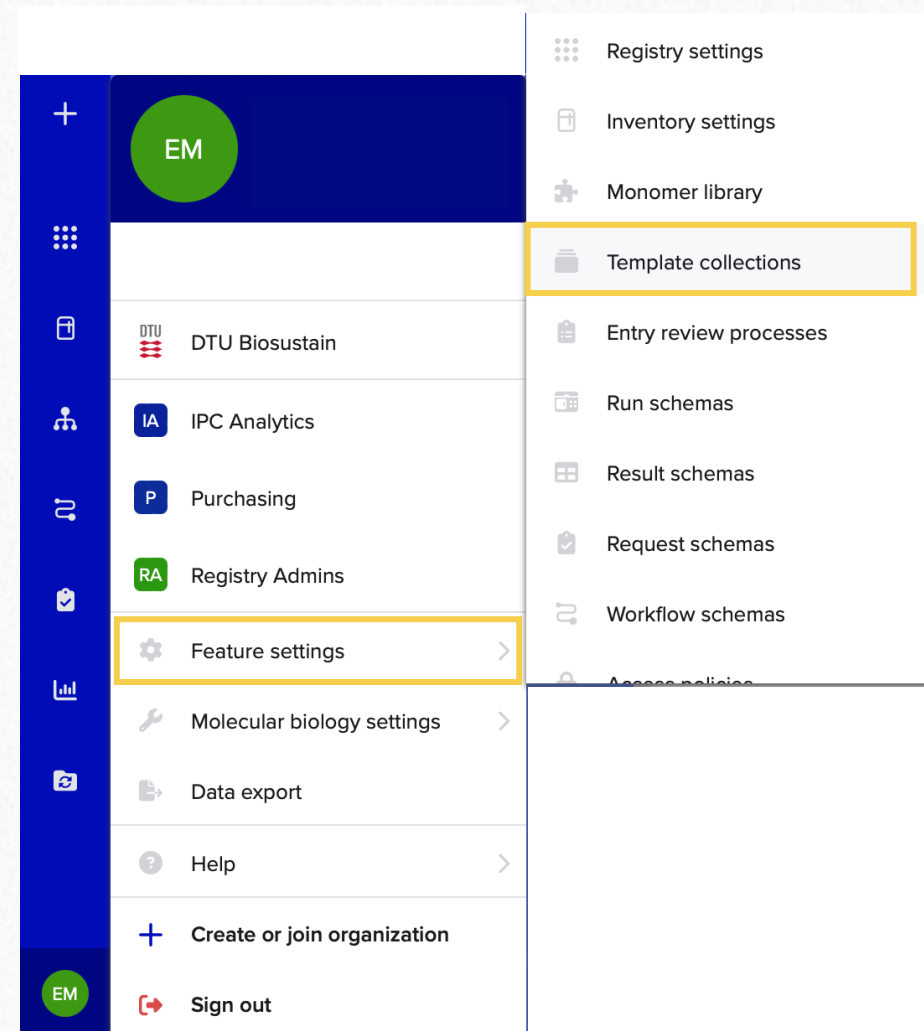


Electronic notebook

To create a Template or a Sub-template:

- Go to your profile
- Go to Feature settings
- Go to Template collections

Create your own!

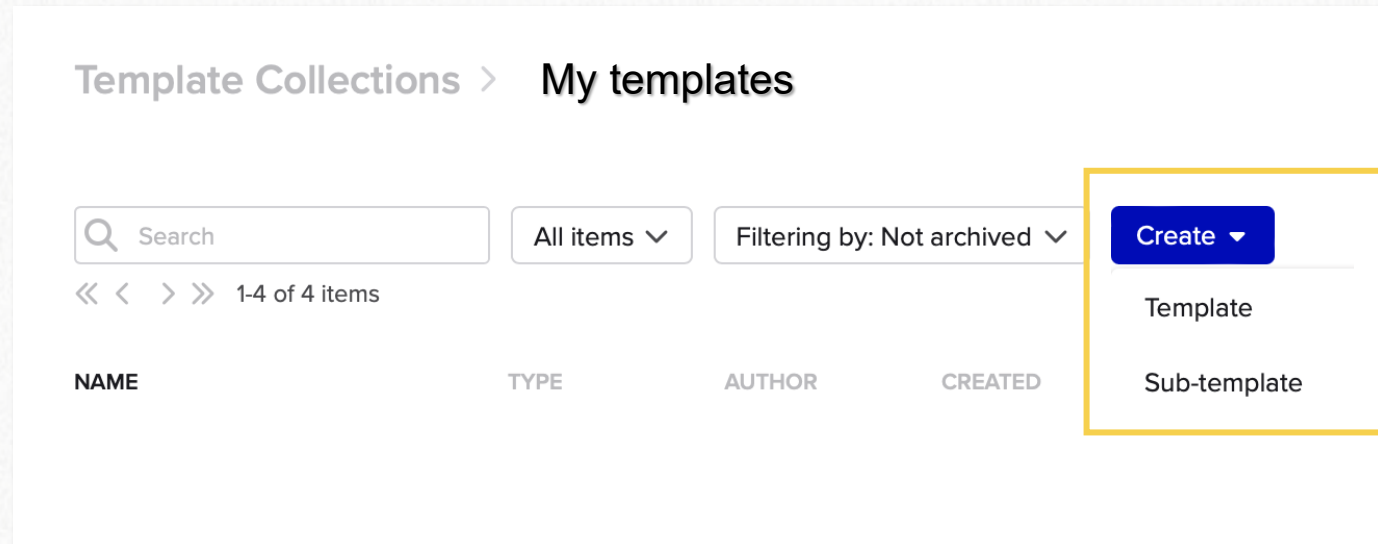


Electronic notebook

To create a Template or a Sub-template:

- Go to your profile
- Go to Feature settings
- Go to Template collections

Create your own!

A screenshot of the 'My templates' page in the BRIGHT application. The page has a header with 'Template Collections' and 'My templates'. Below the header is a search bar with a magnifying glass icon and the text 'Search'. To the right of the search bar are two dropdown menus: 'All items' and 'Filtering by: Not archived'. Below these is a pagination bar showing '1-4 of 4 items' with navigation arrows. A table with four columns: 'NAME', 'TYPE', 'AUTHOR', and 'CREATED' is visible. On the right side of the page, there is a yellow-bordered box containing a blue 'Create' button with a dropdown arrow. The dropdown menu is open, showing two options: 'Template' and 'Sub-template'.

Template Collections > My templates

Search All items Filtering by: Not archived

<< < > >> 1-4 of 4 items

NAME	TYPE	AUTHOR	CREATED
------	------	--------	---------

Create

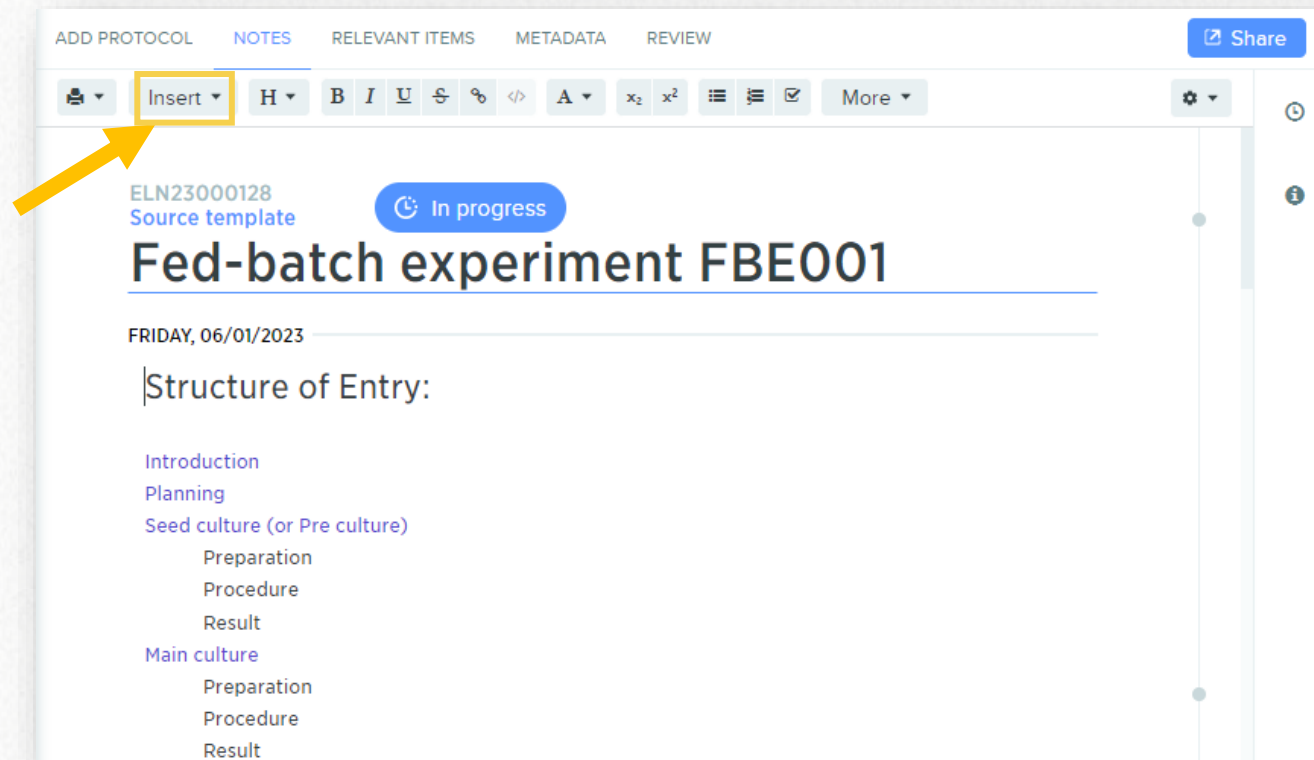
- Template
- Sub-template

Electronic notebook

In your Entry you can:

- Take **notes**
- Add **attachments/files**
- Create **tables**

Click on **Insert** to see the whole list of options

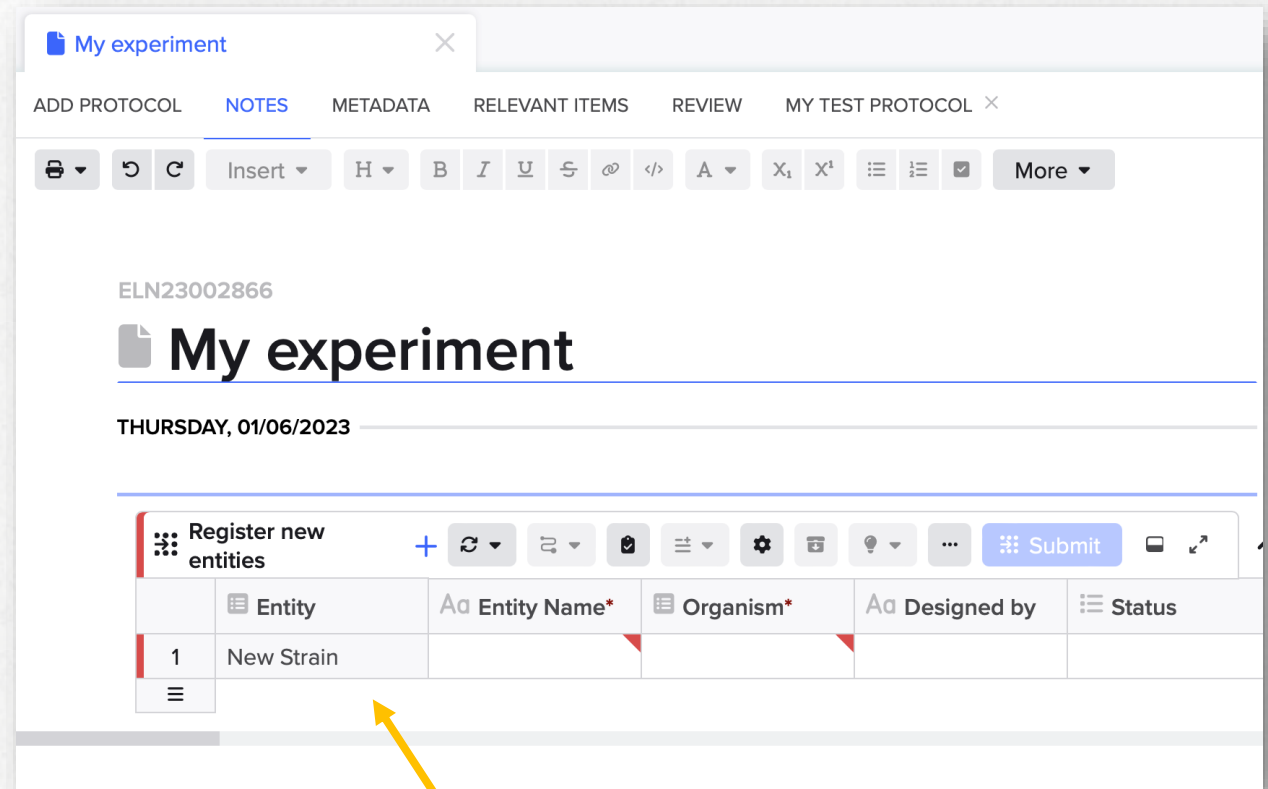


Electronic notebook

In your Entry you can:

- Register strains, media, etc. using **Registration tables**
- Assign **storage location** to registered entities

= more of this in the *Hands-on*



Register new entities					
	Entity	Aa Entity Name*	Organism*	Aa Designed by	Status
1	New Strain				

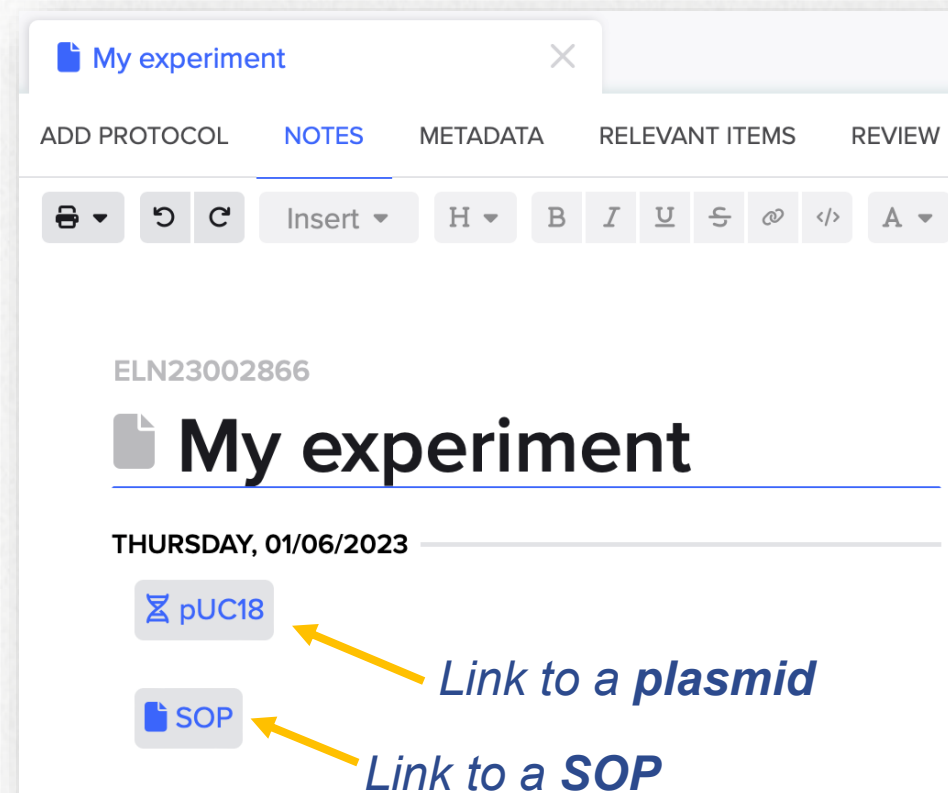
A Registration table for strains

Electronic notebook

In your Entry you can:

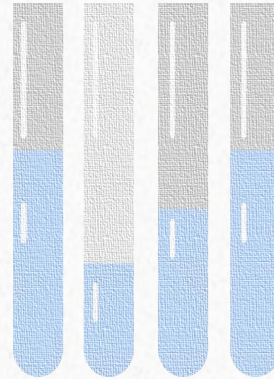
- Tag your plasmids, sequences, etc. (everything that you create)
- Tag another ELN or SOP

To tag an object, type @...



Step 3:

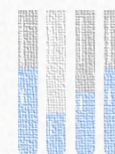
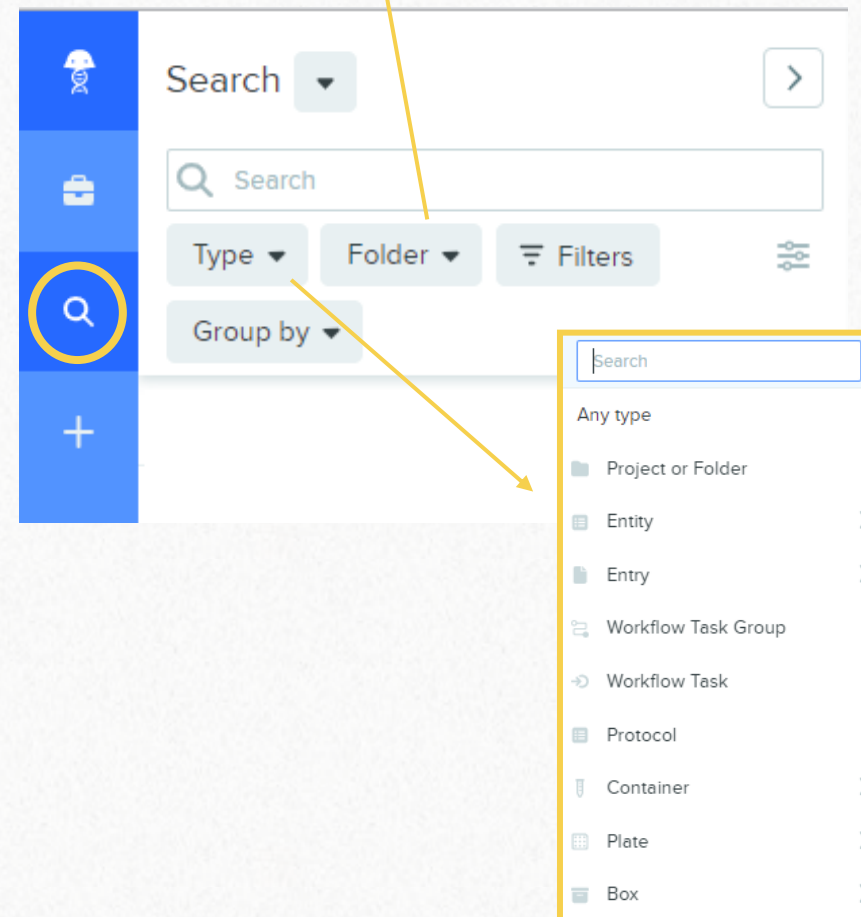
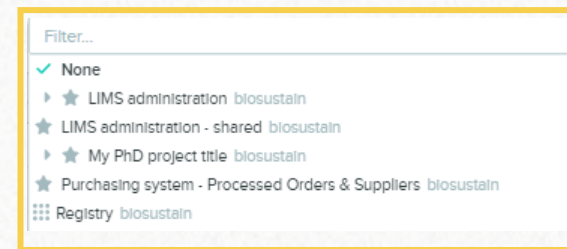
Navigate through your data



Global search

It allows to search through all your data and filter by:

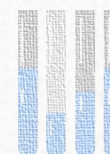
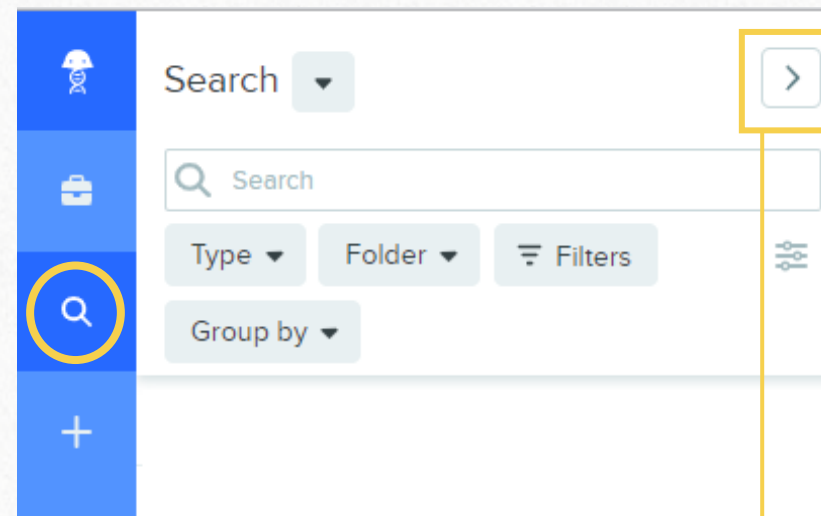
- Data type (samples, boxes...)
- Folder
- Metadata field



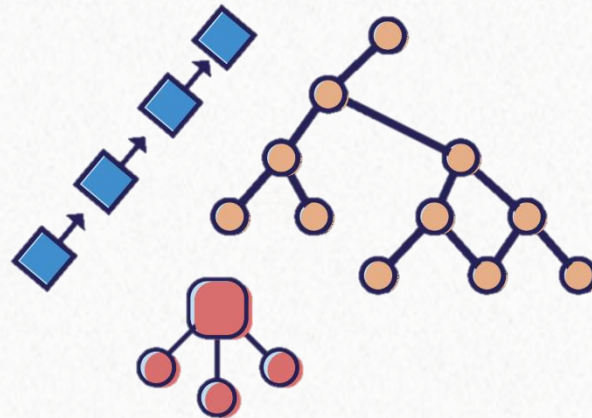
Global search

Expand view to do bulk actions on your data:

- Bulk **edit** of metadata fields
- Bulk **registration** of imported sequences
- Bulk **transfer** to a different folder
- Bulk **archive**



Benchling entities: what you need to know



Registering entities: what to consider

1. Entities can store different information

Entity types that can store:

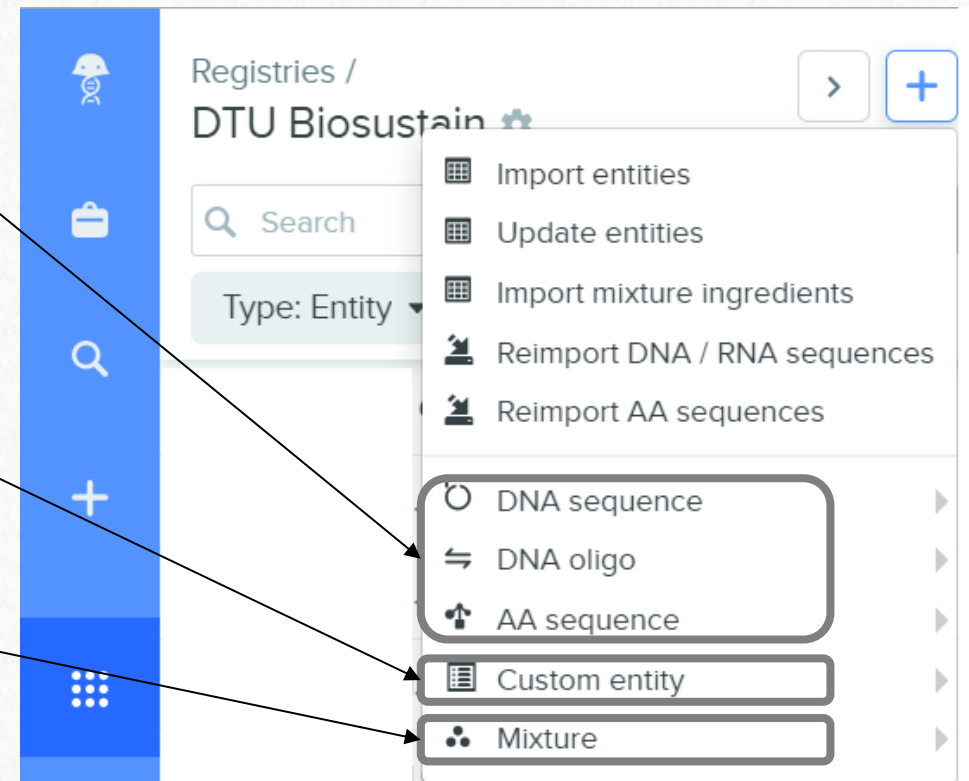
- metadata
- a sequence

Entity type that can store:

- metadata

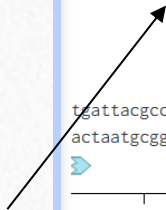
Entity type that can store:

- metadata
- media ingredients and recipe




Sequence

- ☐ DNA sequence
- ☒ DNA oligo
- ☐ AA sequence



Entity types that can store:

- metadata

 Custom entity

METADATA

STRAIN BATCH

RELEVANT ITEMS

DESCRIPTION

RESULTS

Share

Estermtest_01

DTU Biosustain Registry

Authors

Ester Milesi

Project location

Experiments

Registry ID

STRAIN25640

DTU Biosustain

Registered in

Strains registration 21/03/2024 Esterm

Created

21/03/2024 13:44

Aliases

+

This entity has no aliases.

Schema

Strain

Edit

Cannot change schema of registered entities

FIELD	VALUE
Organism	Escherichia coli
Designed by	
Status	
Host strain	
Parent strain	Strainesterm02
Clonal or population?	



Entity types that can store:

- metadata
- media ingredients and recipe



Component list
(with amount)

Recipe

Metadata

METADATA
RELEVANT ITEMS
DESCRIPTION
MEDIUM WITH RECIPE
MEDIUM PREP
RESULTS

My medium
DTU Biosustain Registry

Authors
Project location
Inventory

Registry ID
MEDIUM1420
DTU Biosustain
Created

Aliases
+
This entity has no aliases.

Medium with Recipe Ingredients
Edit
Ingredients Specified: per L

COMPONENT +	CATALOG #	TARGET AMOUNT	UNITS	NOTES
D-glucose			g/L	
Synthetic Complete			Units/L	

Medium with Recipe Instructions

H
B
I
U
S
A
X
X

Enter text here or type / to insert

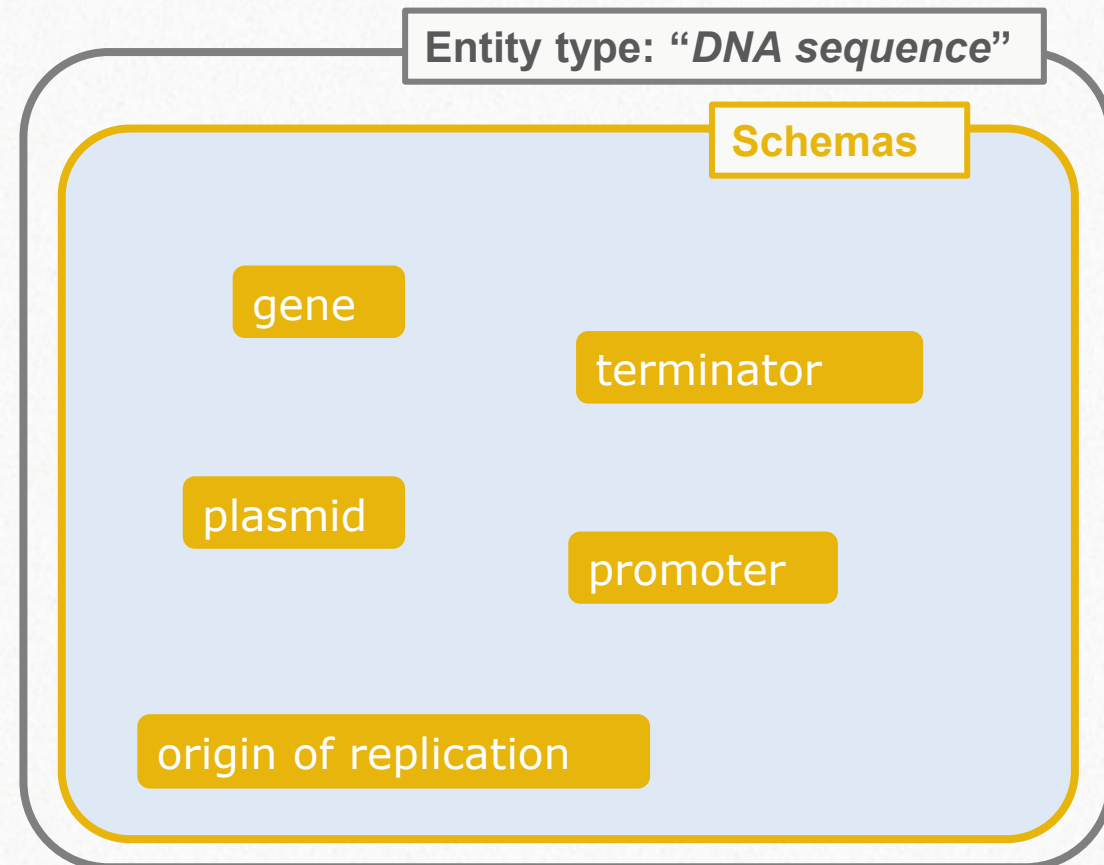


Registering entities: what to consider

2. Entities are assigned a “schema”

→ The “**type**” only tells you which information the entity stores

The various sample types are described by “**schemas**”

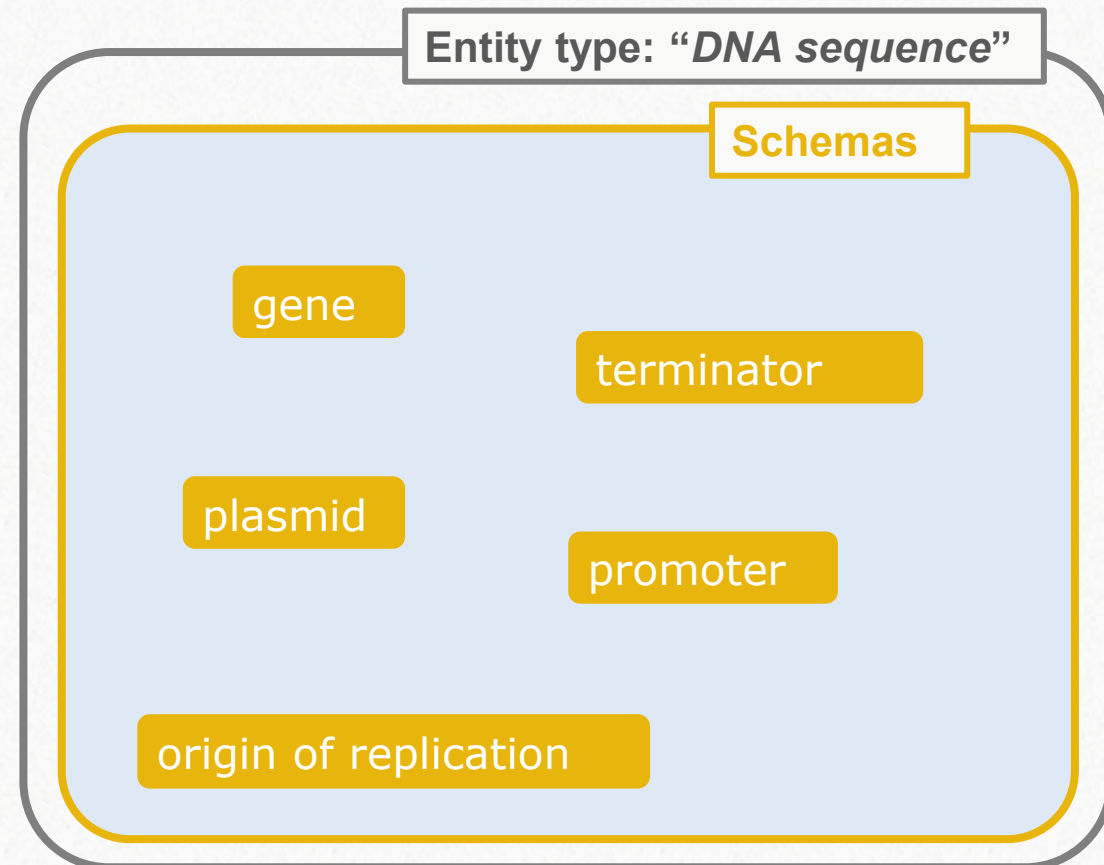


Registering entities: what to consider

2. Entities are assigned a “schema”

A schema specifies:

- sample type
- required information to fill-in
- **links** to other schemas

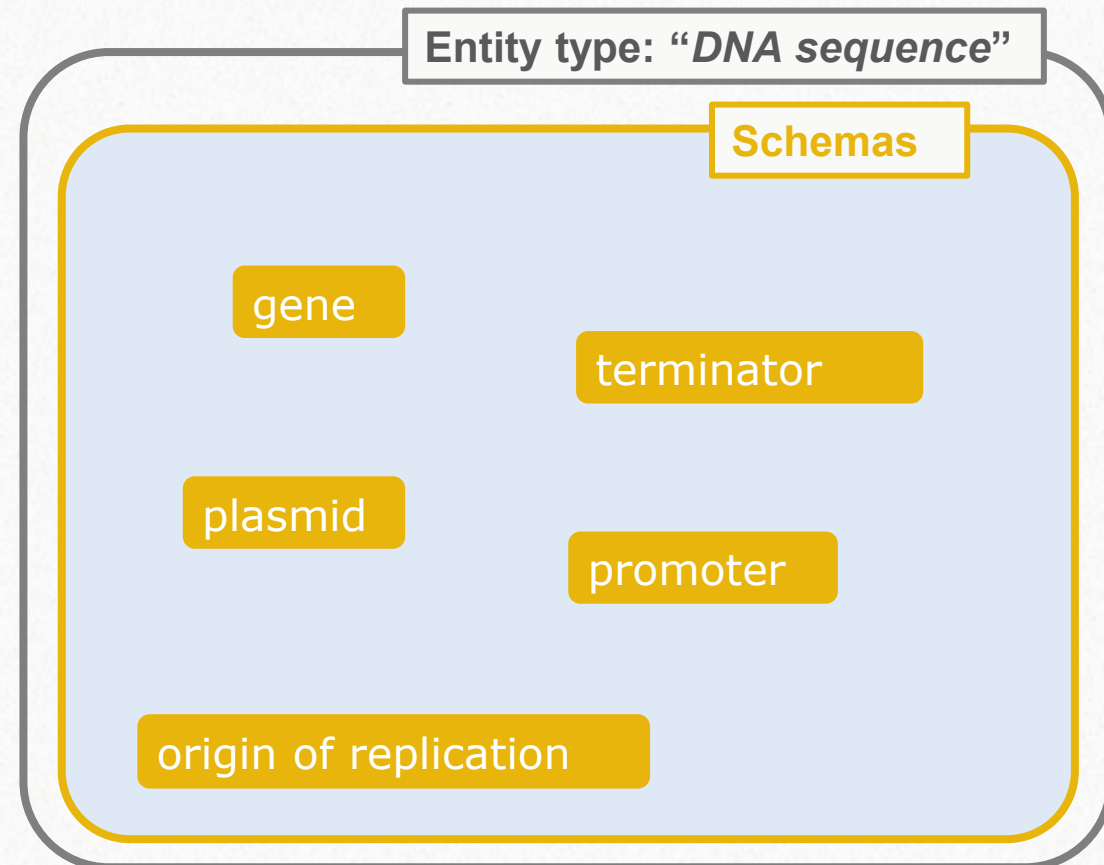


Registering entities: what to consider

2. Entities are assigned a “schema”

A schema specifies:

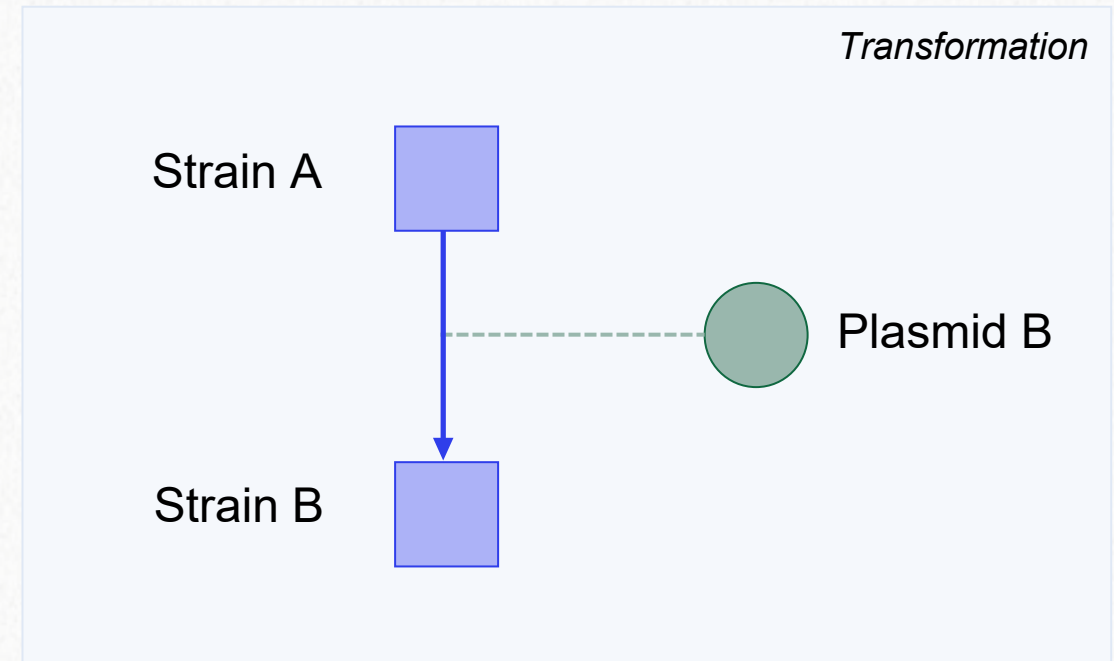
- sample type
- required information to fill-in
- links to other schemas



Registering entities: what to consider

2. Entities are assigned a “schema”

For example, the schema “**Strain**” can link to another strain (parent) and to a plasmid



Links  allow to track the sample “history”

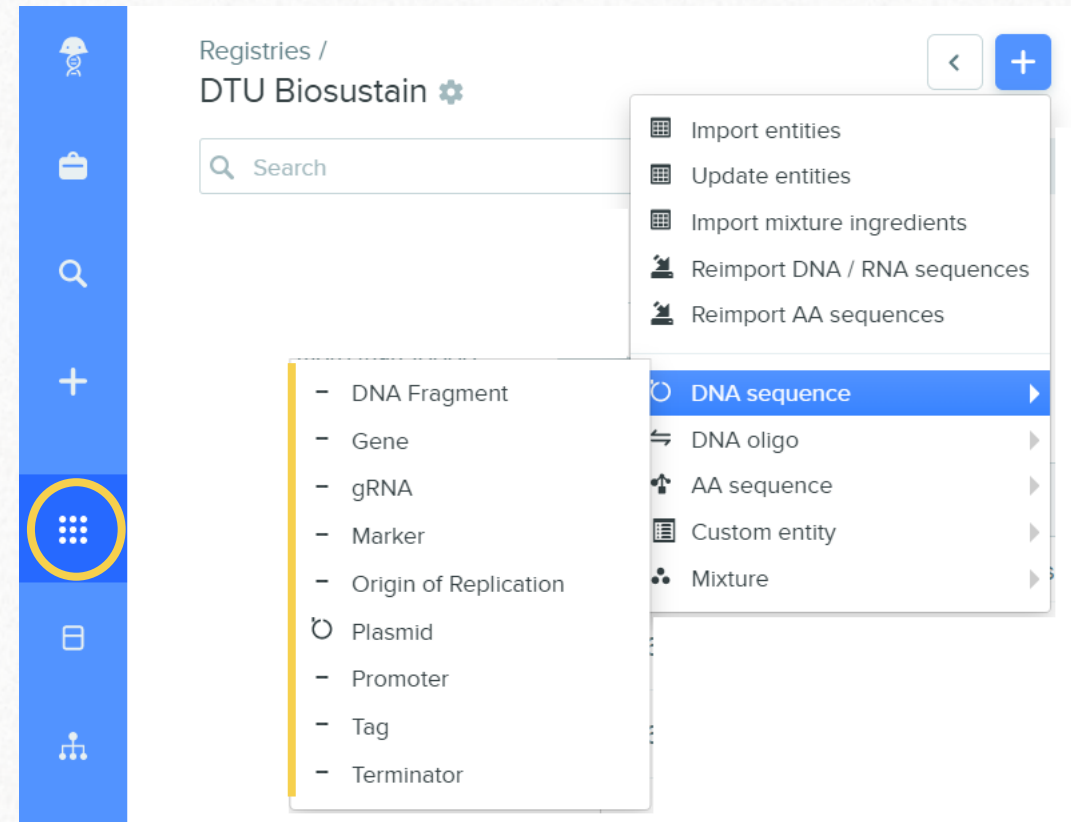


Registering entities: what to consider

3. You can create entities 1-by-1 or in bulk

To create entities 1-by-1:

- Go to Registry > Click on the “+” icon
- Select the **entity type**
e.g., “DNA sequence”
- Select the **schema**
e.g., “Plasmid”



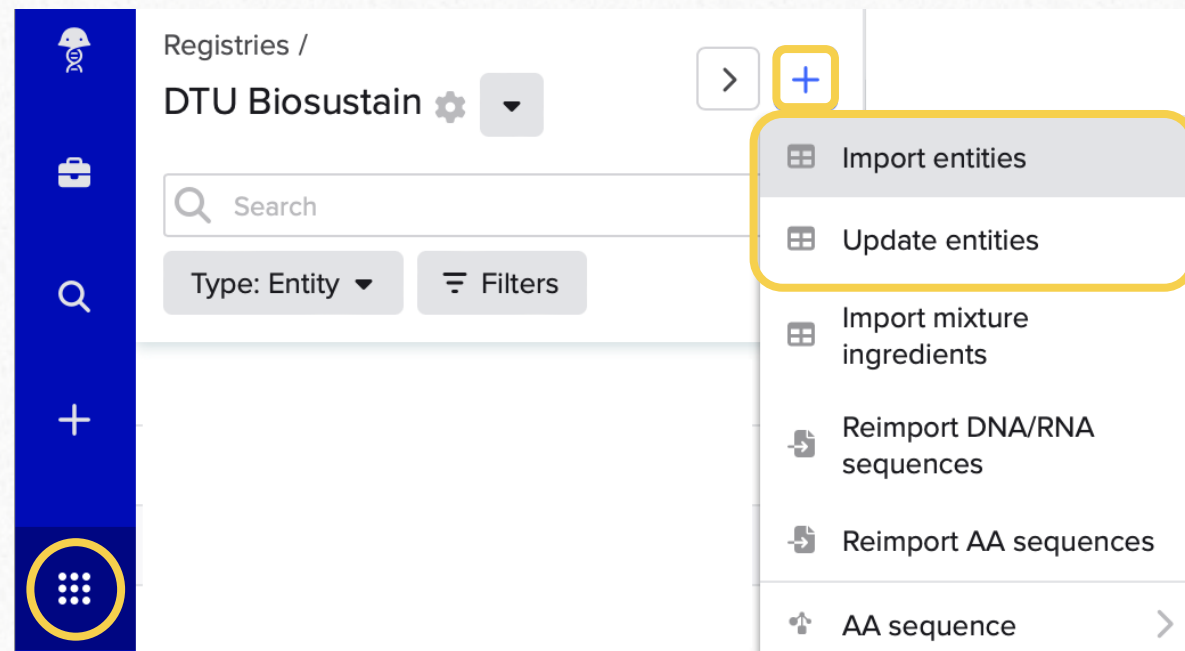
Registering entities: what to consider

3. You can create entities 1-by-1 or in bulk

To create entities in bulk:

- Upload a **spreadsheet**
Select *import* or *update* *entities*

(make sure that the values in the cells are the one that Benchling expects)



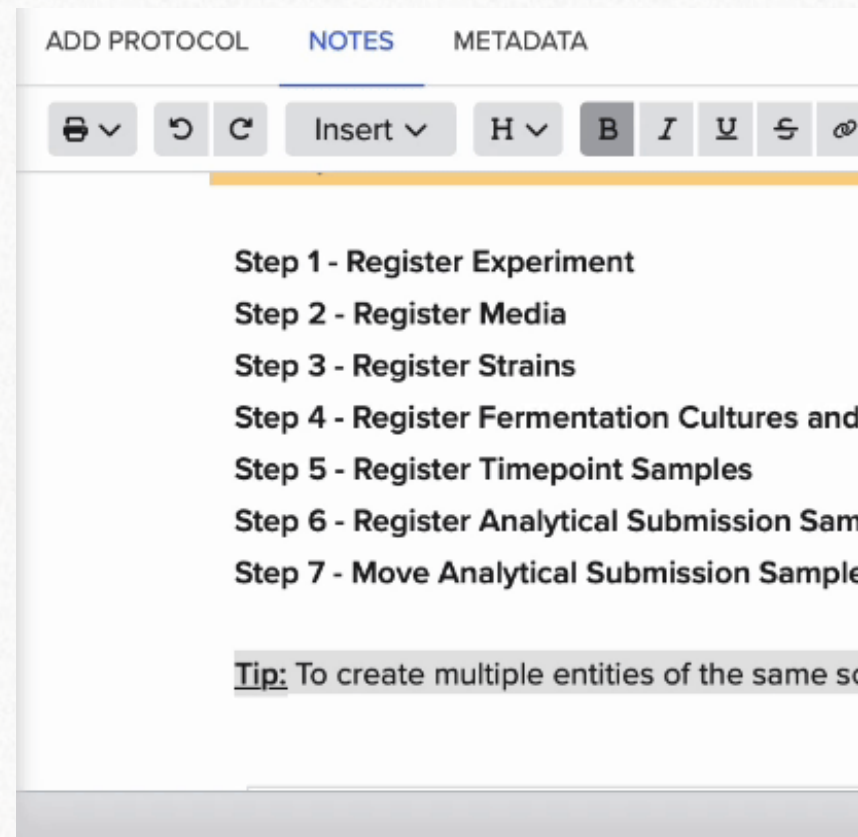
Registering entities: what to consider

3. You can create entities 1-by-1 or in bulk

To create entities in bulk:

- Use a registration table directly in the **Electronic Notebook**

Click “**Insert**” > ”Registration table” > Select Schema



The screenshot shows the 'NOTES' tab in the Electronic Notebook interface. At the top, there are tabs for 'ADD PROTOCOL', 'NOTES', and 'METADATA'. Below these is a toolbar with icons for undo, redo, insert, bold, italic, underline, and link. The main content area displays a list of steps for registering entities:

- Step 1 - Register Experiment
- Step 2 - Register Media
- Step 3 - Register Strains
- Step 4 - Register Fermentation Cultures and
- Step 5 - Register Timepoint Samples
- Step 6 - Register Analytical Submission Sam
- Step 7 - Move Analytical Submission Sample

Below the list, there is a tip: Tip: To create multiple entities of the same sc



Registering entities: what to consider

4. Some entities have “batches” schemas

Batches = physical samples

- When storing your sample long-term, create **batches** in **Benchling**
- This helps your team to track **where samples are stored**

Plasmid

Strain

Plasmid batch

Strain batch

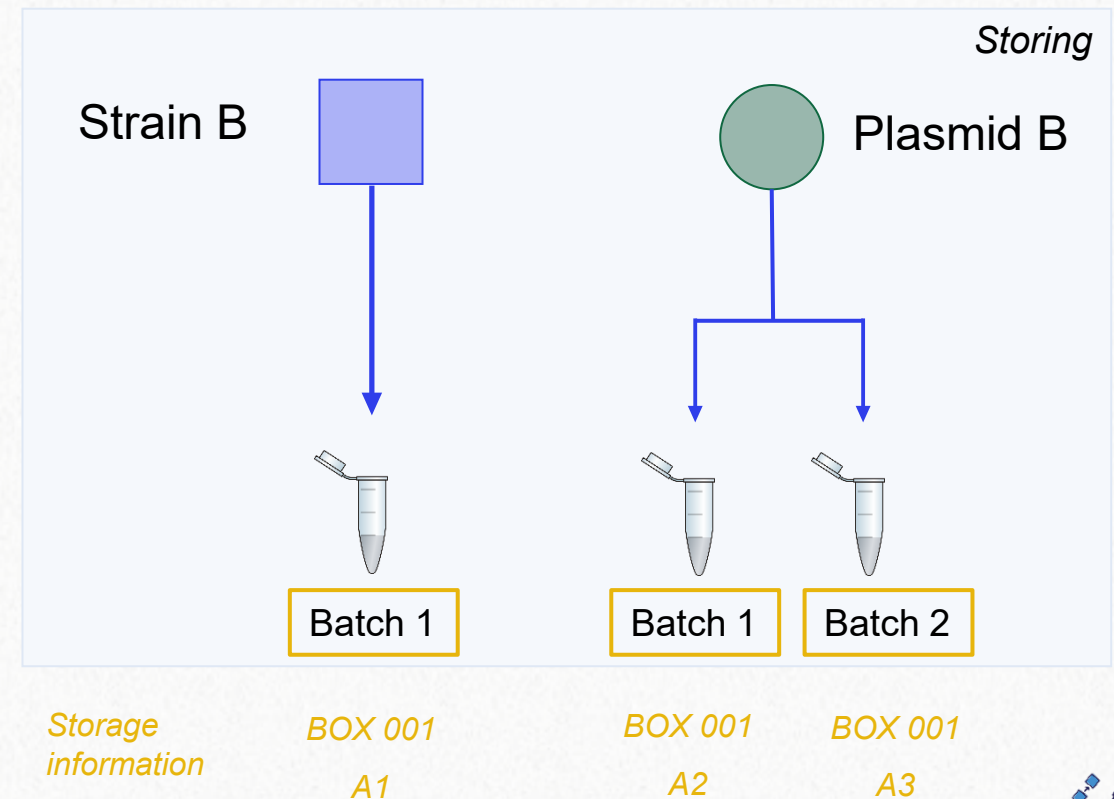


Registering entities: what to consider

4. Some entities have “batches” schemas

Batches = physical samples

- When storing your sample long-term, create **batches** in **Benchling**
- This helps your team to track **where samples are stored**

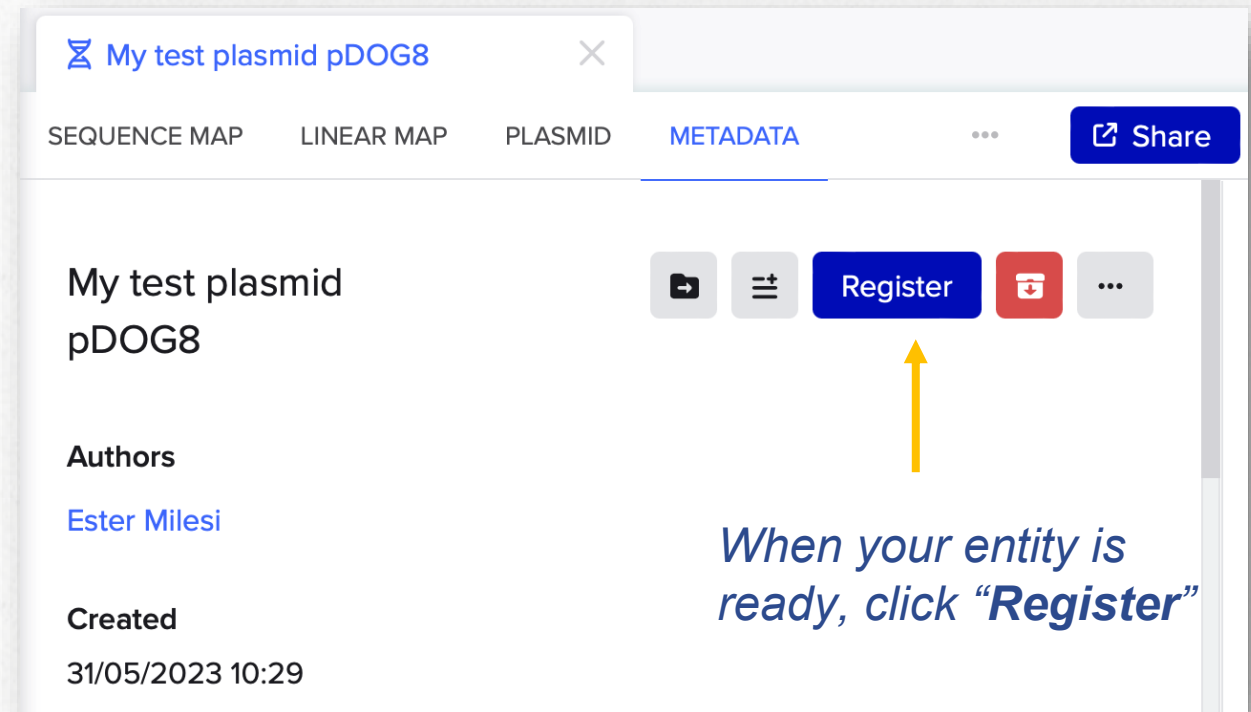


Registering entities: what to consider

5. Entities can exist outside of the Registry

Sometime, entities are not automatically registered

- In order to register an entity, you need to **select the Schema** (entity type)
- Registering the entity will add a **unique identifier** to your sample



My test plasmid pDOG8

SEQUENCE MAP LINEAR MAP PLASMID METADATA

Share

My test plasmid pDOG8

Authors
Ester Milesi

Created
31/05/2023 10:29

Register

*When your entity is ready, click “**Register**”*

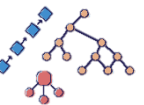


Good practices

(If you haven't done this consistently during your project)

At the end of your project:

- ✓ **Re-organize** your registered samples and entries and **give access** to your team
- ✓ Register **important strains/other samples** and their **location**, and print the label for the Box before moving it in the freezer



Storage: track your samples



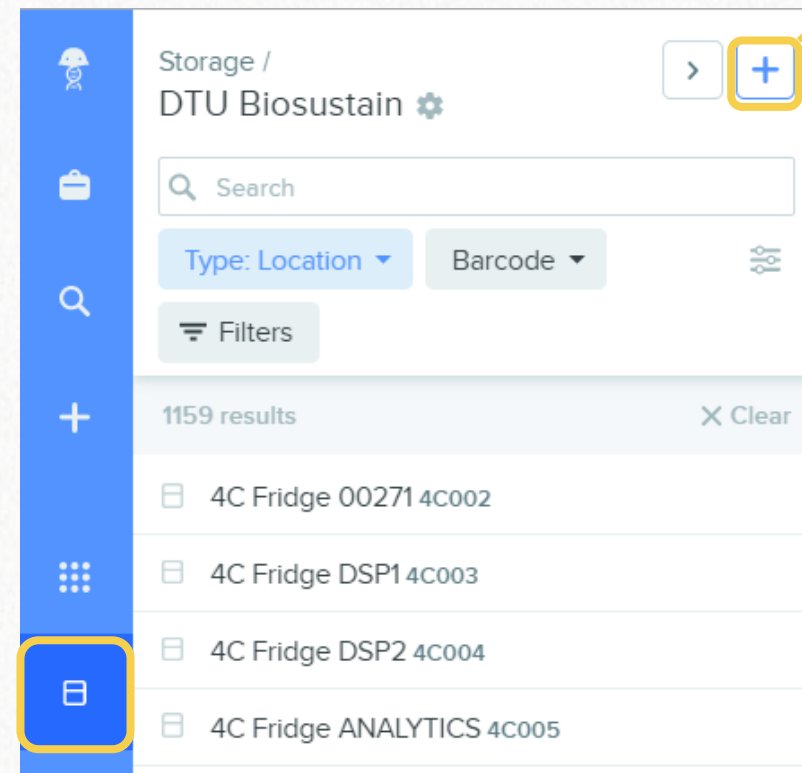
The Inventory

Benchling allows you to track the location of your samples

Room > Fridge > Box > Vial

If your fridge/location is not registered, let RDM support know

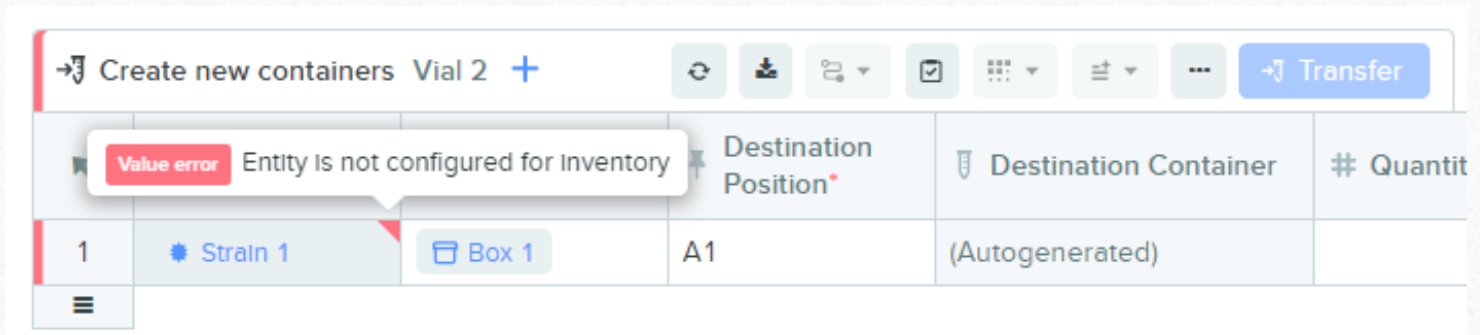
Create new box/plate/vial



The Inventory

Storable samples include:

- Batches
(e.g., “Strain batch”)
- Fermentation cultures
- Submission samples
(e.g., for analysis)



		Destination Position*	Destination Container	# Quantit
1	Strain 1	A1	(Autogenerated)	

Error showed in an Inventory table **in the Notebook** when trying to move a “Strain” in a Vial instead of a “Strain batch”



The Inventory

Benchling allows you to track the volume or concentration in of each vial

- Example of a **Box** in Benchling

Update quantity

Current quantity

Not specified

New quantity*

20

New units*

uL

Training box esterm

METADATA RESULTS

Training box esterm

Barcode 81BOX984

Location DTU Building 220 / Training Location

Move

	1	2	3	4	5	6	7	8	9
A	1	2	3	4	5	6	7	8	9
B	10	11	12	13	14	15	16	17	18
C	19	20	21	22	23	24	25	26	27
D	28	29	30	31	32	33	34	35	36
E	37	38	39	40	41	42	43	44	45
F	46	47	48	49	50	51	52	53	54
G	55	56	57	58	59	60	61	62	63
H	64	65	66	67	68	69	70	71	72
I	73	74	75	76	77	78	79	80	81

Fill containers

Actions

	Position	Container	Quantity
	1 A1	Training vial e	20 uL
<input checked="" type="checkbox"/>	2 A2	Training vial fc	40 uL

← Back

Position 2 (A2)

Barcode VIAL25349 Quantity 40 uL

No contents in Position 2 (A2).



Lastly: Archiving

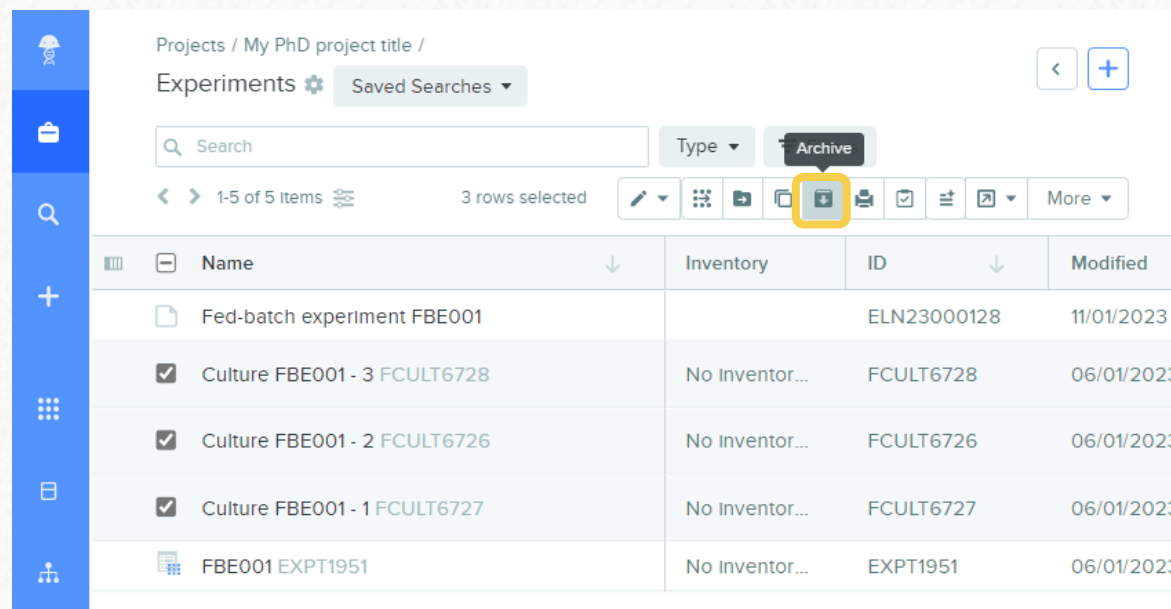


Archiving entities

Nothing can be deleted but only archived

- You can archive
 - ✓ Project folders
 - ✓ ELN entries
 - ✓ Entities

If you created them **by mistake** or if they are not relevant




The screenshot shows the BRIGHT interface for managing experiments. The breadcrumb path is 'Projects / My PhD project title / Experiments'. There is a search bar and a 'Saved Searches' dropdown. A toolbar contains various icons, with the 'Archive' icon (a document with a downward arrow) highlighted by a yellow box. Below the toolbar, a table lists experiments with columns for Name, Inventory, ID, and Modified. Three rows are selected, indicated by checkboxes in the first column.

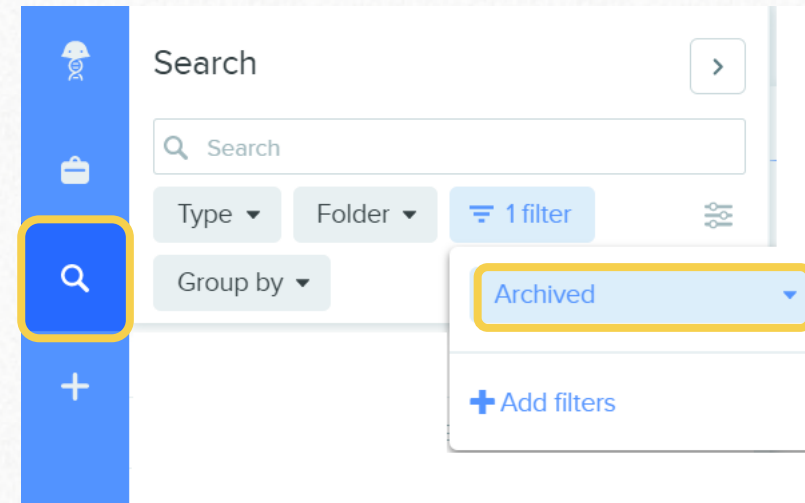
	Name	Inventory	ID	Modified
<input type="checkbox"/>	Fed-batch experiment FBE001		ELN23000128	11/01/2023
<input checked="" type="checkbox"/>	Culture FBE001 - 3 FCULT6728	No Inventor...	FCULT6728	06/01/2023
<input checked="" type="checkbox"/>	Culture FBE001 - 2 FCULT6726	No Inventor...	FCULT6726	06/01/2023
<input checked="" type="checkbox"/>	Culture FBE001 - 1 FCULT6727	No Inventor...	FCULT6727	06/01/2023
<input type="checkbox"/>	FBE001 EXPT1951	No Inventor...	EXPT1951	06/01/2023



Archiving entities

It is still possible to go through archived items and unarchive them 

- In the search tab, filter by “Archive” status



Questions?



Agenda

Introduction to Benchling
and best practices

~ 30 min

Hands-on

~ 15 min

Agenda

Introduction to Benchling
and best practices

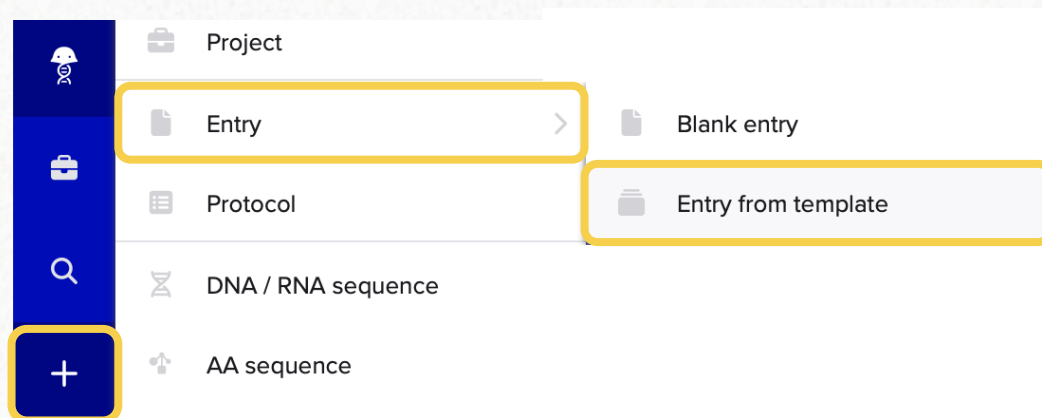
~ 30 min

Hands-on

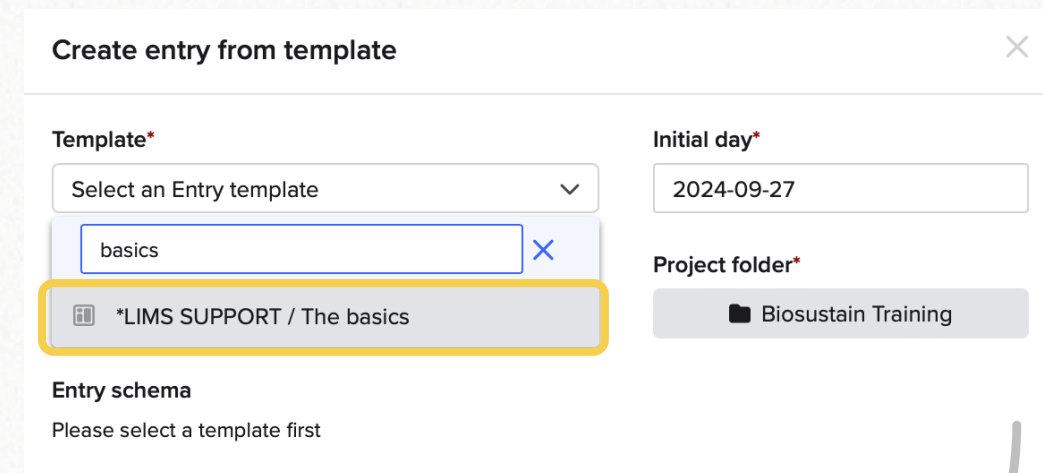
~ 15 min

Explore the Notebook functionalities

1 CREATE ENTRY FROM TEMPLATE

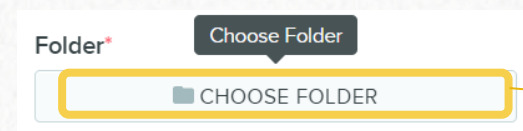


2 CHOSE "THE BASICS" TEMPLATE

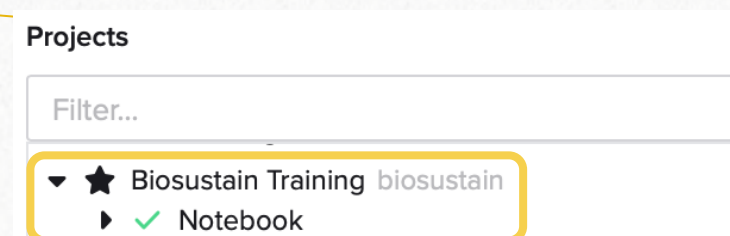


The 'Create entry from template' dialog box is shown. It has a 'Template*' dropdown menu with 'Select an Entry template' and a search input showing 'basics'. Below the dropdown, the option '*LIMS SUPPORT / The basics' is highlighted with a yellow box. To the right, there are fields for 'Initial day*' (2024-09-27) and 'Project folder*' (Biosustain Training). At the bottom, it says 'Entry schema' and 'Please select a template first'.

3 SAVE IT IN THE BIOSUSTAIN TRAINING FOLDER



The 'Folder*' dropdown menu is shown with a 'Choose Folder' button. The option 'CHOOSE FOLDER' is highlighted with a yellow box.



The 'Projects' list is shown with a 'Filter...' input. Below the input, the project 'Biosustain Training' is listed with a star icon and the text 'biosustain'. Under it, 'Notebook' is listed with a green checkmark icon. This section is highlighted with a yellow box.



Questions?

