

Search

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

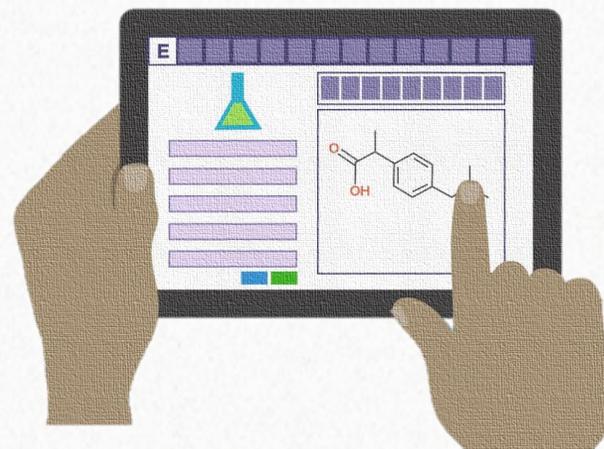
Introduction to Benchling
and best practices

~ 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!



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*

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

Check out our [Benchling Resources wiki](#)

☰ Benchling resources



 Contact us

 FAQ

 Benchling access

 Training for new employees

 Benchling Superusers

 Benchling core concepts

In-house services

→ Order lab materials

→ Submit samples to Analytics

→ Submit samples to Pre-Pilot Plant

→ Submit samples to DNA Foundry

Electronic Lab Notebook

Welcome!

The BRiGHT **Benchling Resources** page will help you navigate Benchling and successfully track and manage your experimental data during your time at BRiGHT.

Here you will find **step-by-step tutorials** and short **training videos** covering topics like:

- How to access Benchling
- How to register data into the system
- How to submit requests for in-house services
- Highlights of new functionalities

Benchling in a nutshell

Benchling is an **online platform** that keeps your experimental data, electronic notebooks, and SOPs **all in one place**, making it easy to organize and link them together, and to share them with other researchers.

Here is an **overview of the main modules** in the system:

> Page contents:

Welcome!

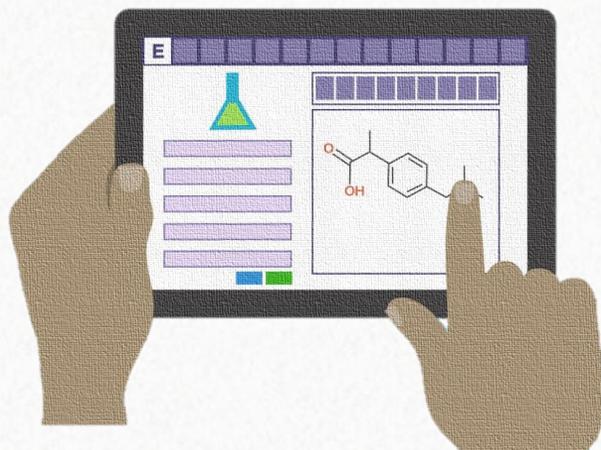
Benchling in a nutshell

Start exploring

More resources



Getting started



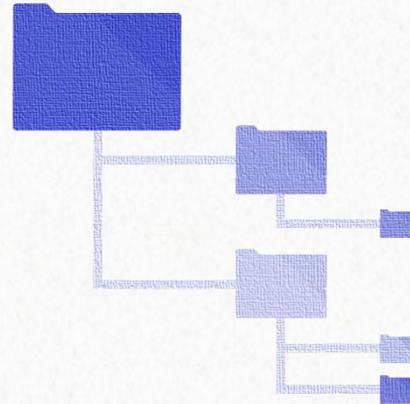
Step 1: Create your project folder

Step 2: Create your experiment ELN & register samples

Step 3: Navigate through your data

Step 1:

Create your project folder



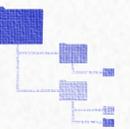
Project folder

Your Project folder will contain:

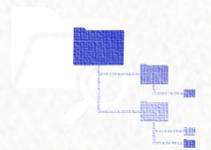
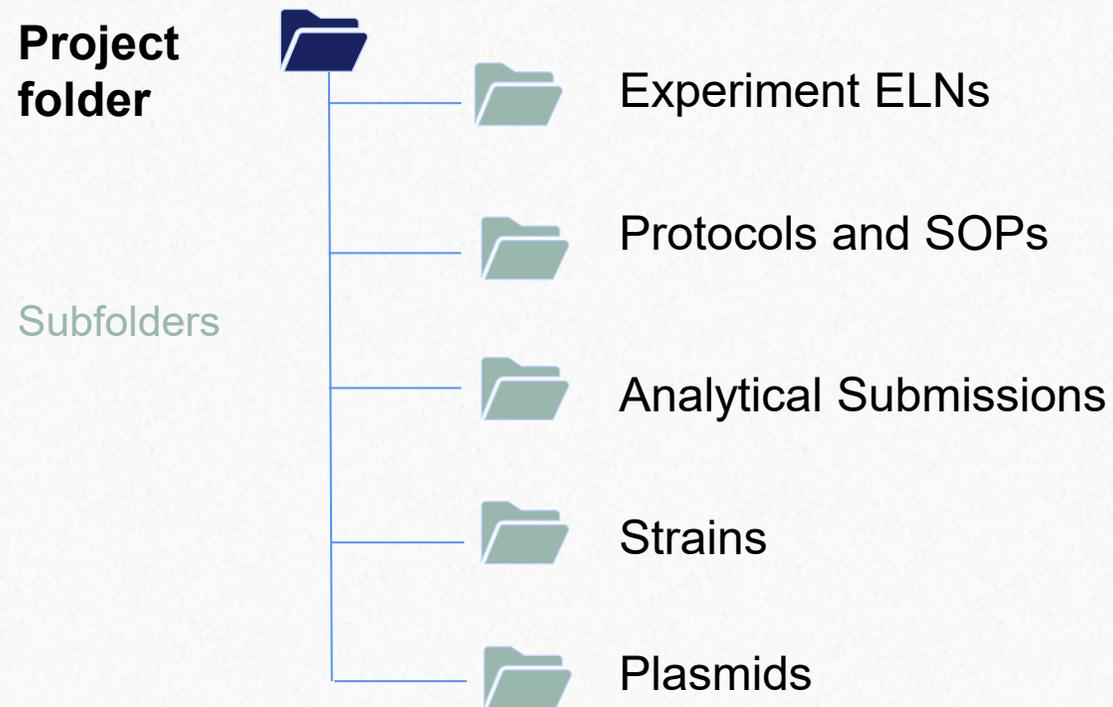
✓ your Electronic Notebook pages (called “**Entries**”)



✓ your registry items (called “**Entities**”) strains, plasmids,...



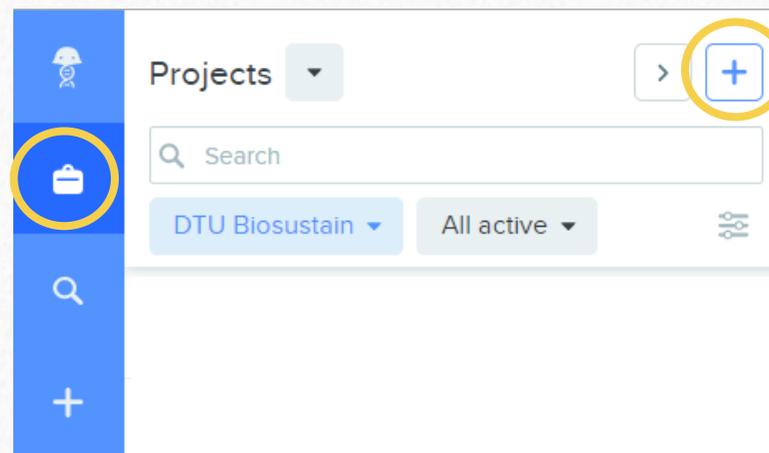
Example of folder structure



Project folder

To create a New Project:

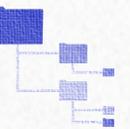
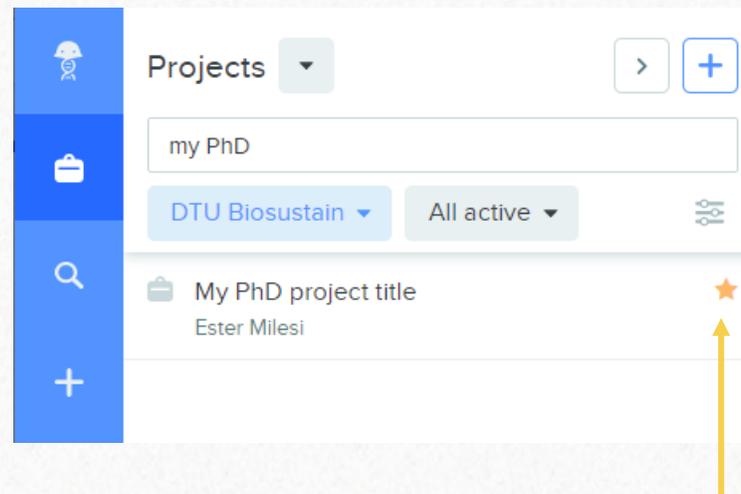
- Click on the “Project” icon
- Click on the “+” icon
- Give the folder a clear name (e.g., your PhD project title)



Project folder

Star ★ your Project:

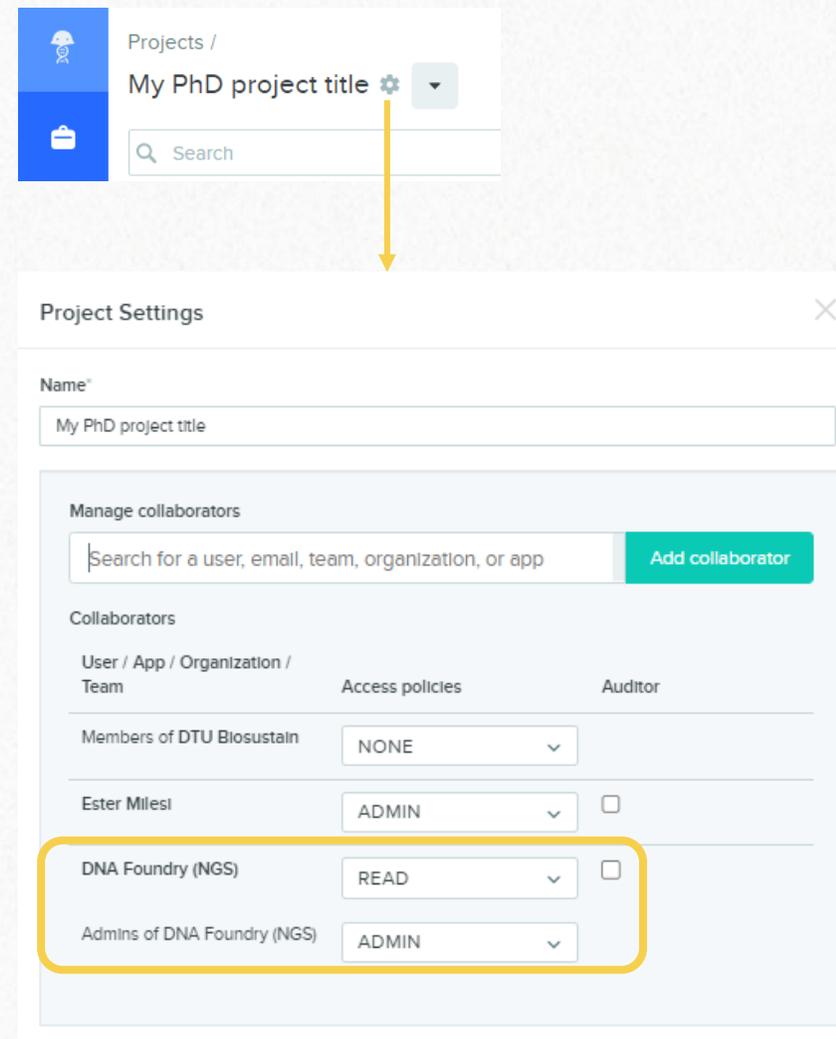
- This way, it will appear on top of every other Project that you have access to



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

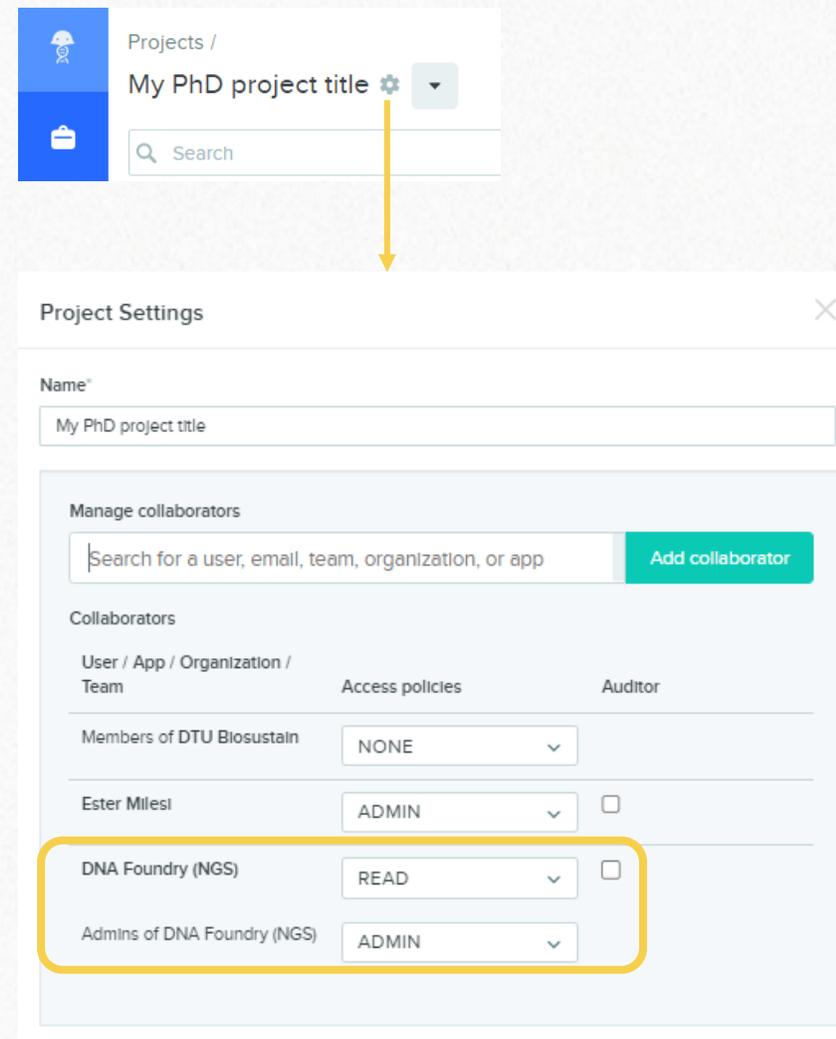
User / App / Organization / Team	Access policies	Auditor
Members of DTU Biosustain	NONE	<input type="checkbox"/>
Ester Milest	ADMIN	<input type="checkbox"/>
DNA Foundry (NGS)	READ	<input type="checkbox"/>
Admins of DNA Foundry (NGS)	ADMIN	<input type="checkbox"/>



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*

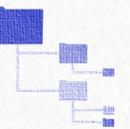
My PhD project title

Manage collaborators

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

Collaborators

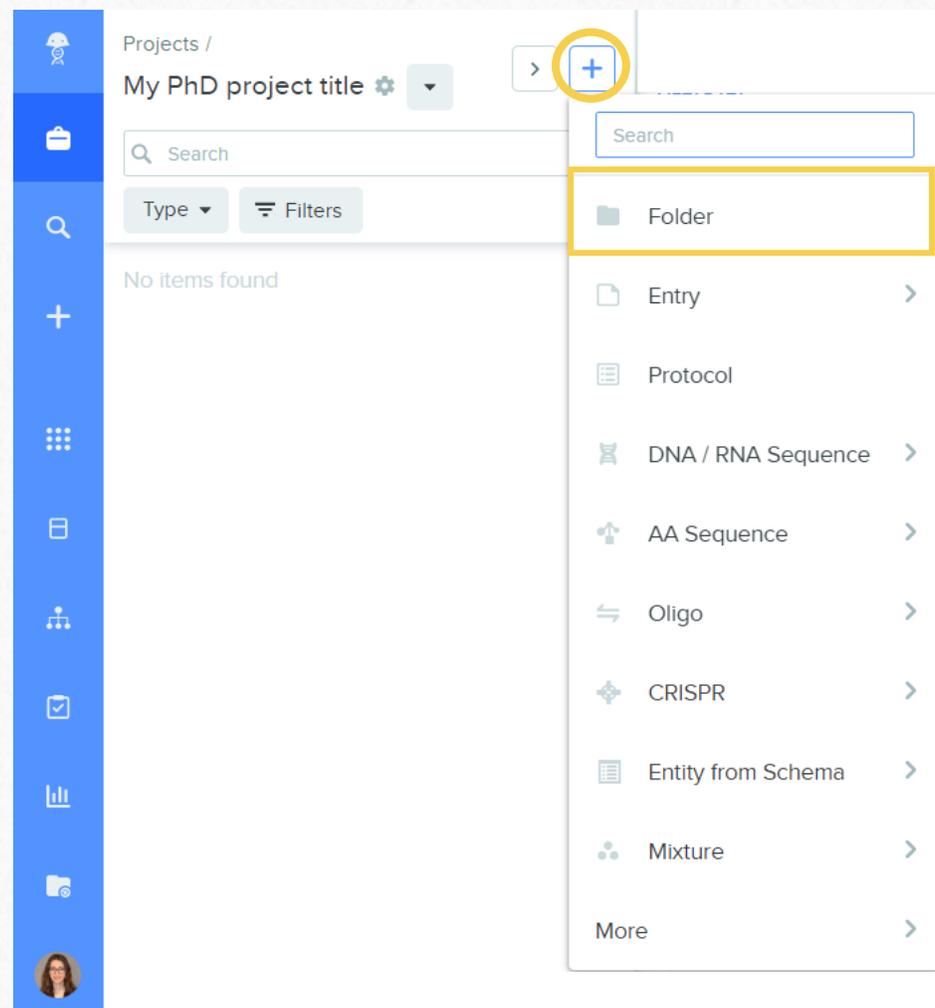
User / App / Organization / Team	Access policies	Auditor
Members of DTU Biosustain	NONE	<input type="checkbox"/>
Ester Milest	ADMIN	<input type="checkbox"/>
DNA Foundry (NGS)	READ	<input type="checkbox"/>
Admins of DNA Foundry (NGS)	ADMIN	<input type="checkbox"/>



Creating subfolders

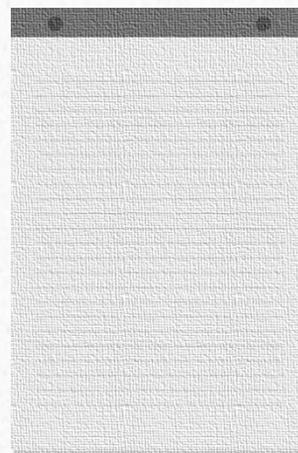
To create a subfolder:

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



Step 2:

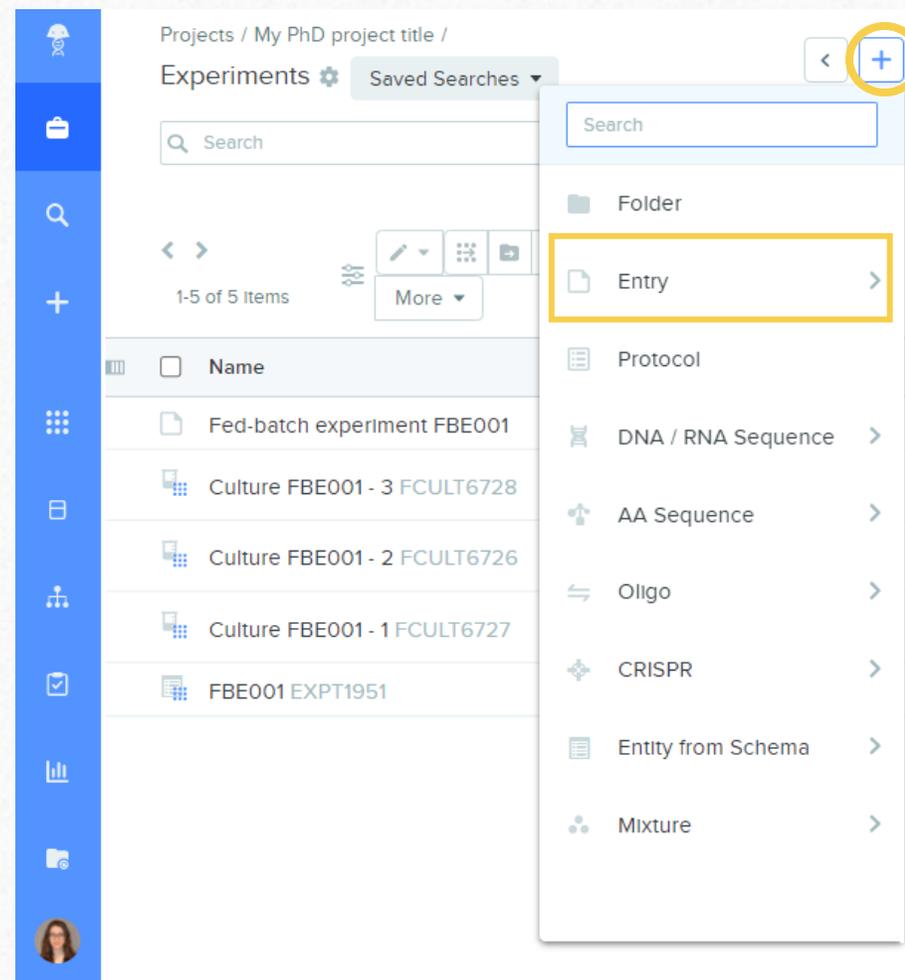
Create your experiment ELN & create samples



Electronic notebook

To create a new Entry:

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



Electronic notebook

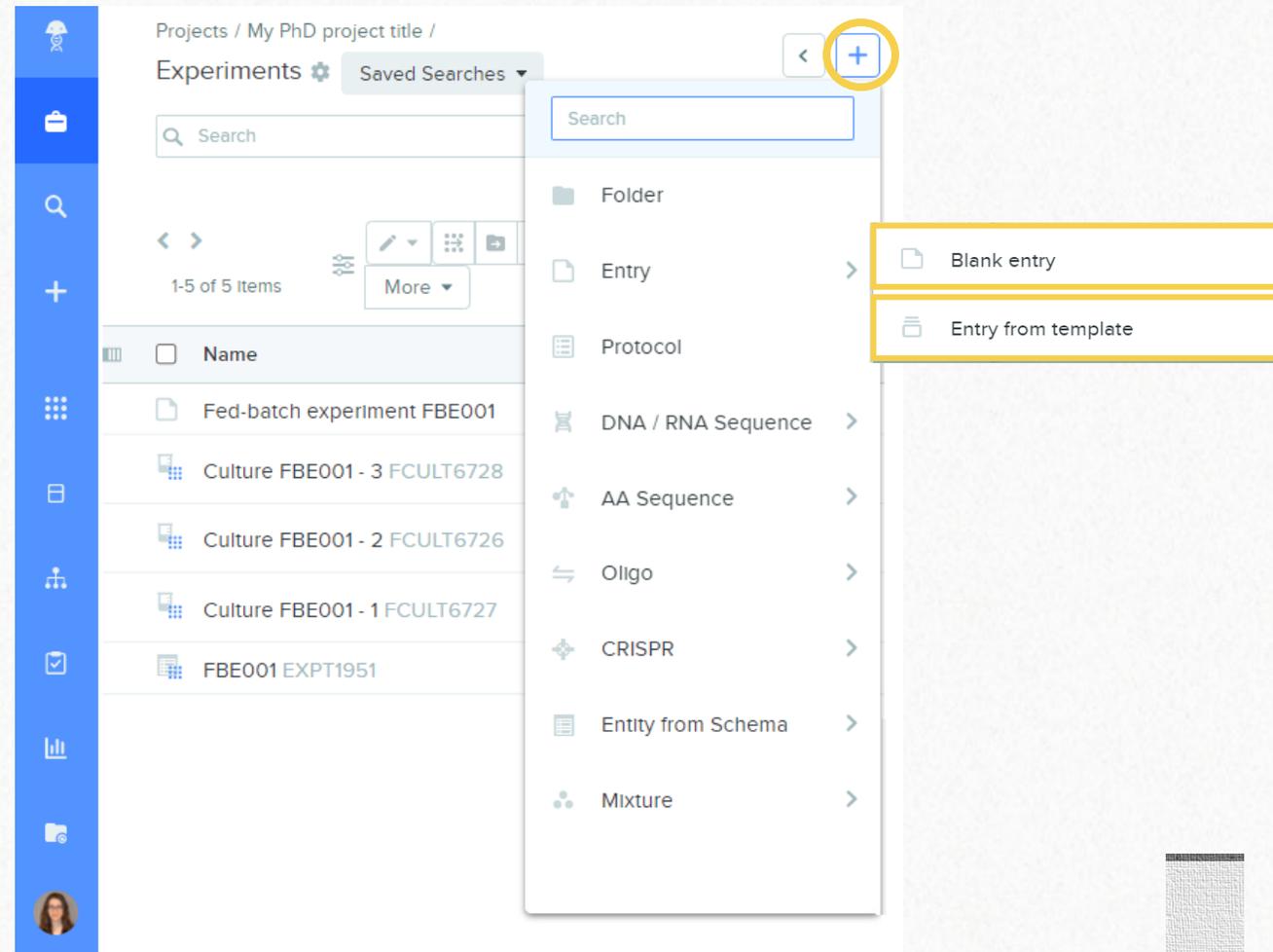
Option 1:

Blank entry

Option 2:

New Entry from Template

--- you can create your own!



The screenshot displays the BRiGHT electronic notebook interface. The top navigation bar shows the current project path: "Projects / My PhD project title / Experiments". A search bar is visible, and a "Saved Searches" dropdown menu is open. The main content area displays a list of experiments with columns for "Name" and "Actions". The list includes:

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

A "More" dropdown menu is open, showing a list of entry types:

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

Two options are highlighted with yellow boxes:

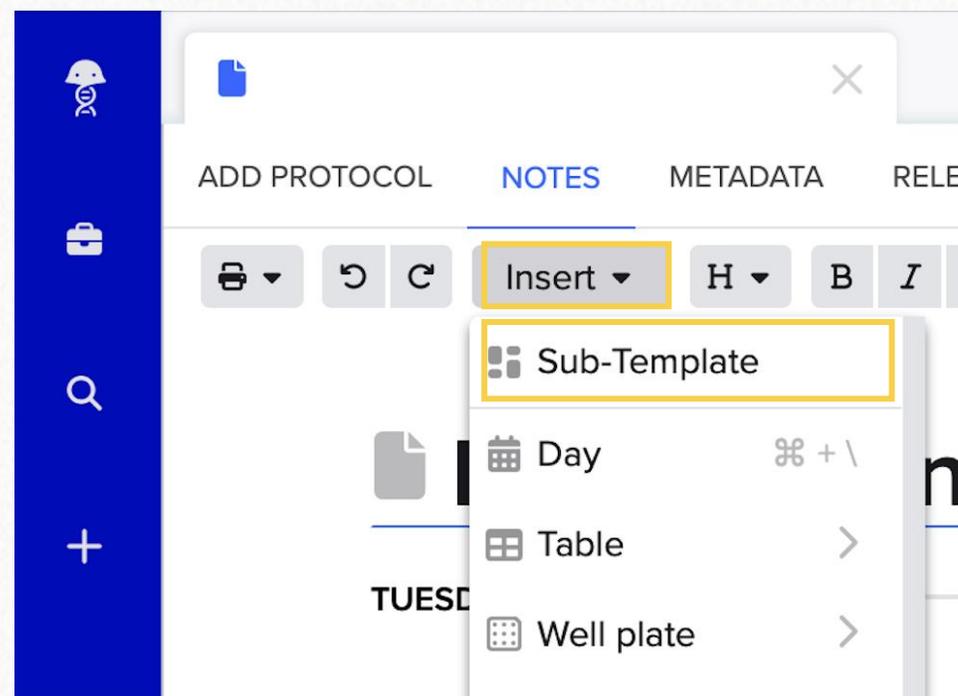
- Blank entry
- Entry from template

Electronic notebook

Option 3:

Blank entry + Sub-Template

--- you can create your own!

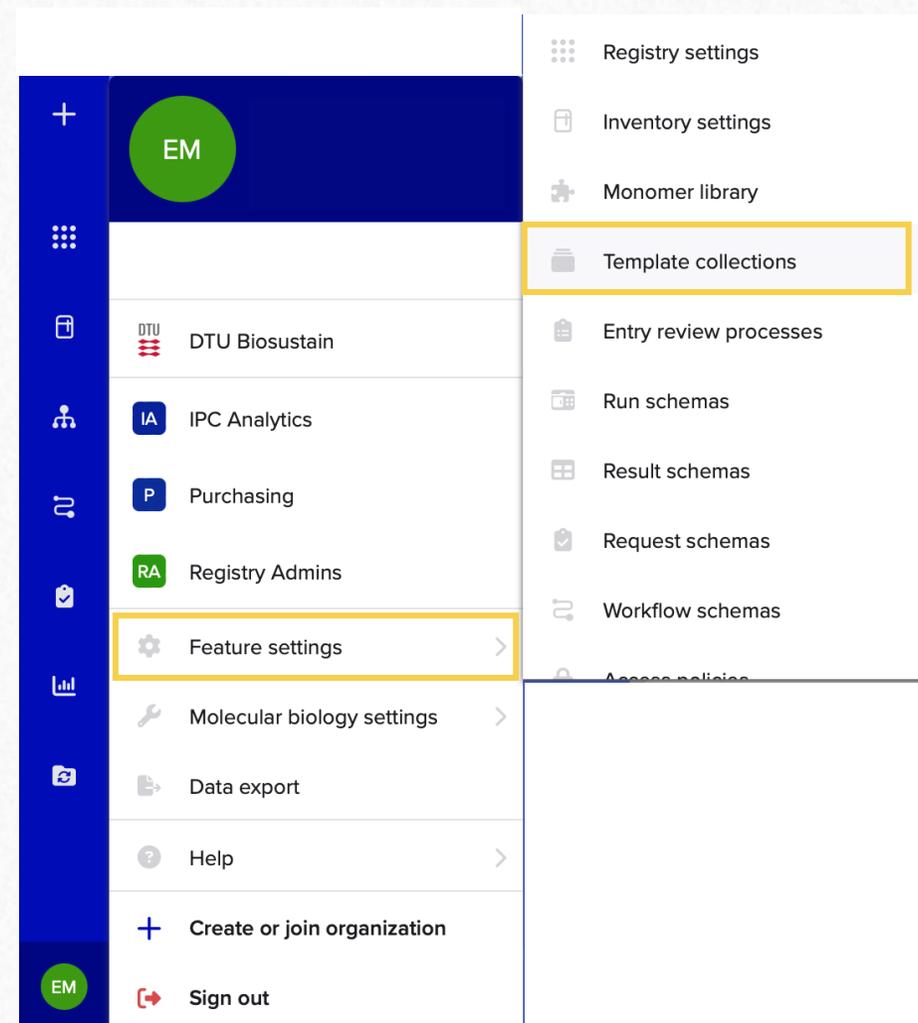


Electronic notebook

To create a Template or a Sub-template:

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

Create your own!

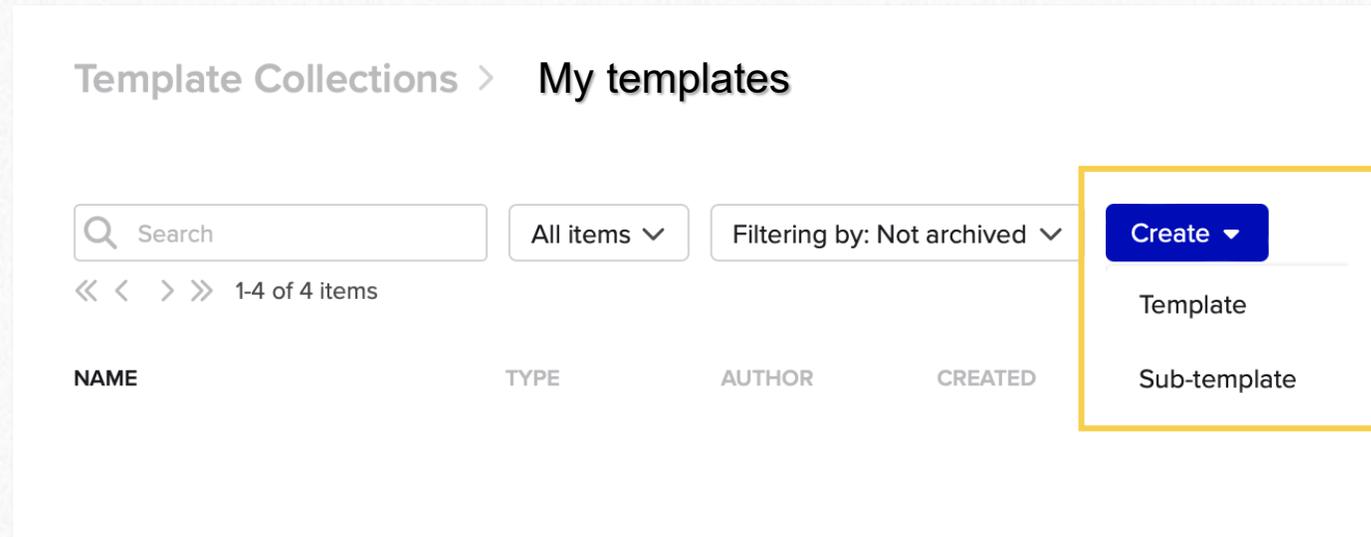


Electronic notebook

To create a Template or a Sub-template:

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

Create your own!



Template Collections > My templates

Search [] All items ▾ Filtering by: Not archived ▾ **Create ▾**

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

NAME	TYPE	AUTHOR	CREATED

Template
Sub-template

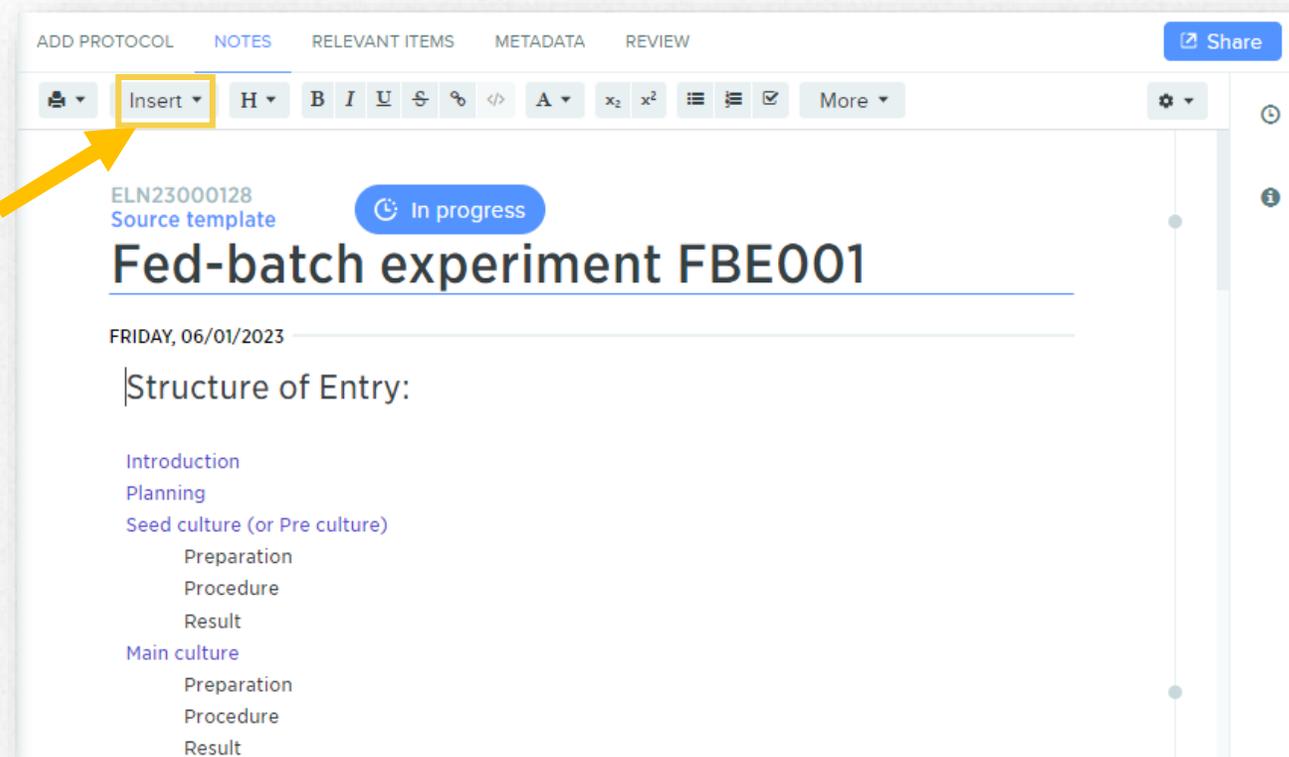


Electronic notebook

In your Entry you can:

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

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



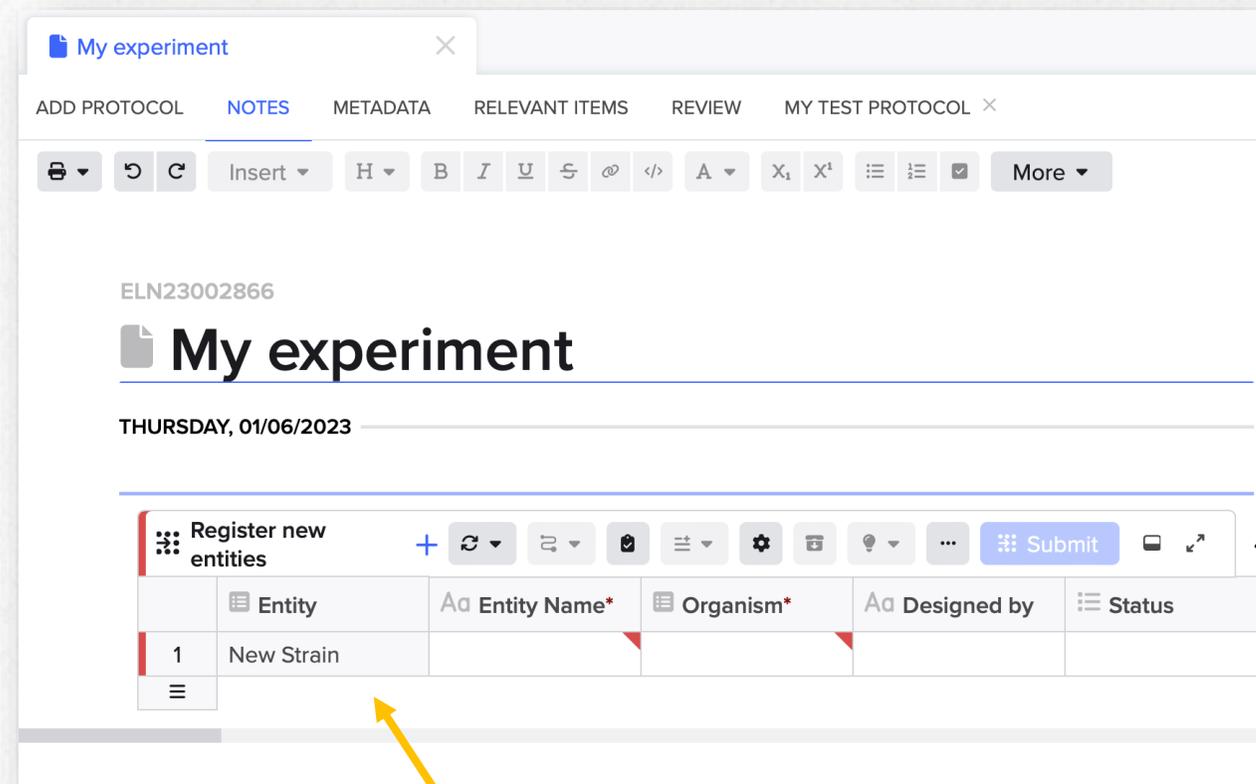
The screenshot displays the BRiGHT electronic notebook interface. At the top, there are navigation tabs: 'ADD PROTOCOL', 'NOTES', 'RELEVANT ITEMS', 'METADATA', and 'REVIEW'. A 'Share' button is located in the top right corner. Below the navigation is a rich text editor toolbar with various icons for text formatting (bold, italic, underline, strikethrough, link, unlink, code), alignment, and list creation. The 'Insert' menu is highlighted with a yellow box, and a yellow arrow points to it. The main content area shows an entry titled 'Fed-batch experiment FBE001' with a status 'In progress' and a date 'FRIDAY, 06/01/2023'. The entry content includes a heading 'Structure of Entry:' followed by a list of sections: 'Introduction', 'Planning', 'Seed culture (or Pre culture)', 'Preparation', 'Procedure', 'Result', and 'Main culture', each with its own sub-sections.

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*



The screenshot shows the 'My experiment' entry in the BRiGHT electronic notebook. The interface includes a top navigation bar with tabs for 'ADD PROTOCOL', 'NOTES', 'METADATA', 'RELEVANT ITEMS', 'REVIEW', and 'MY TEST PROTOCOL'. Below the navigation bar is a rich text editor toolbar with various formatting options. The main content area displays the entry ID 'ELN23002866' and the title 'My experiment'. The date 'THURSDAY, 01/06/2023' is shown below the title. A 'Register new entities' table is visible, which is used for registering strains. The table has columns for 'Entity', 'Entity Name*', 'Organism*', 'Designed by', and 'Status'. A yellow arrow points to the 'Entity' column, which contains the text 'New Strain'.

	Entity	Aa Entity Name*	Organism*	Aa Designed by	Status
1	New Strain				

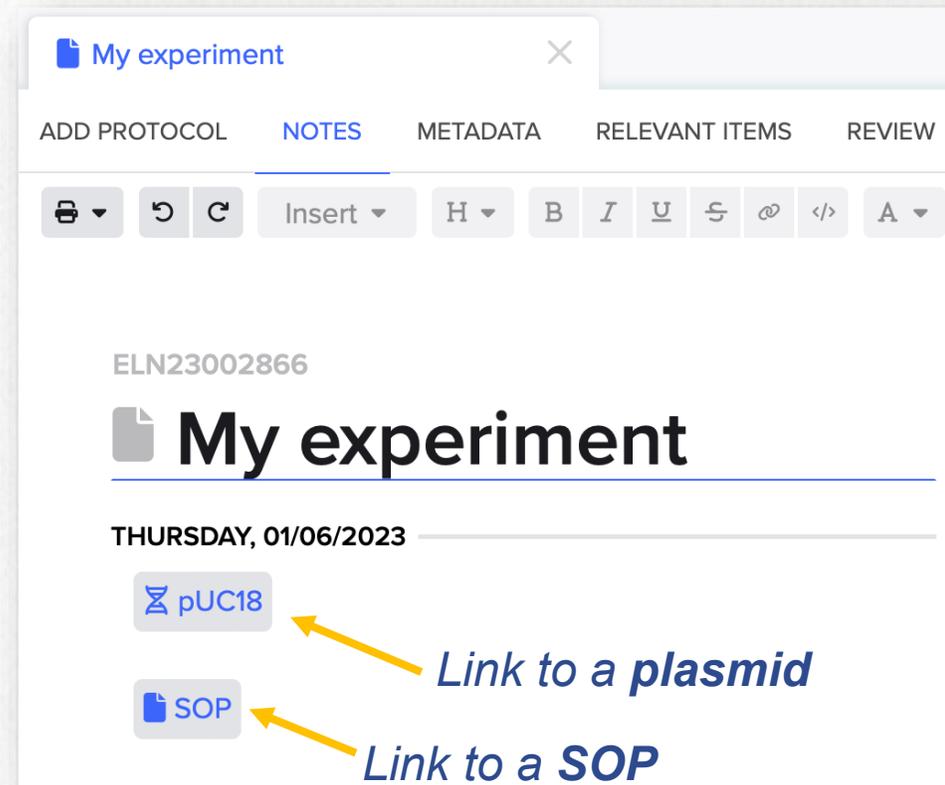
A Registration table for strains

Electronic notebook

In your Entry you can:

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

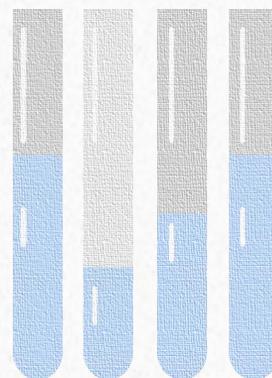
To tag an object, type @...



The screenshot shows a window titled "My experiment" with a close button. Below the title bar are tabs for "ADD PROTOCOL", "NOTES", "METADATA", "RELEVANT ITEMS", and "REVIEW". A rich text editor toolbar is visible with icons for undo, redo, insert, heading, bold, italic, underline, strikethrough, link, code, and text color. The main content area shows the ID "ELN23002866" and the title "My experiment" underlined. Below the title is the date "THURSDAY, 01/06/2023". Two tags are present: "pUC18" (with a plasmid icon) and "SOP" (with a document icon). Yellow arrows point from the text "Link to a plasmid" to the "pUC18" tag and from "Link to a SOP" to the "SOP" tag.

Step 3:

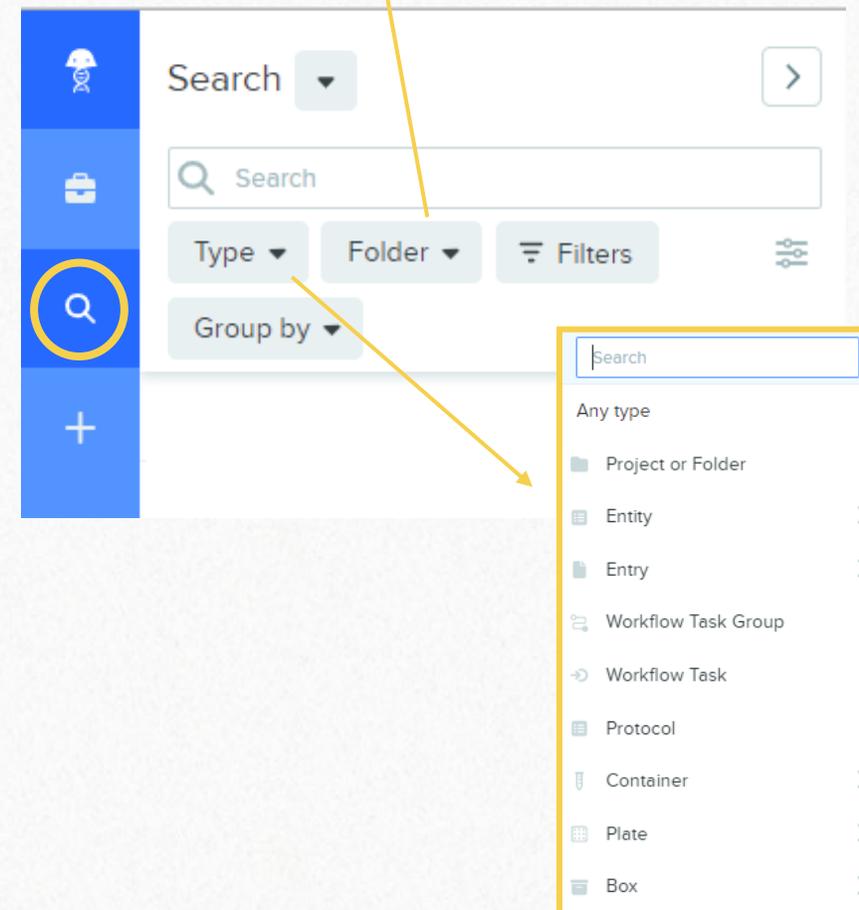
Navigate through your data



Global search

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

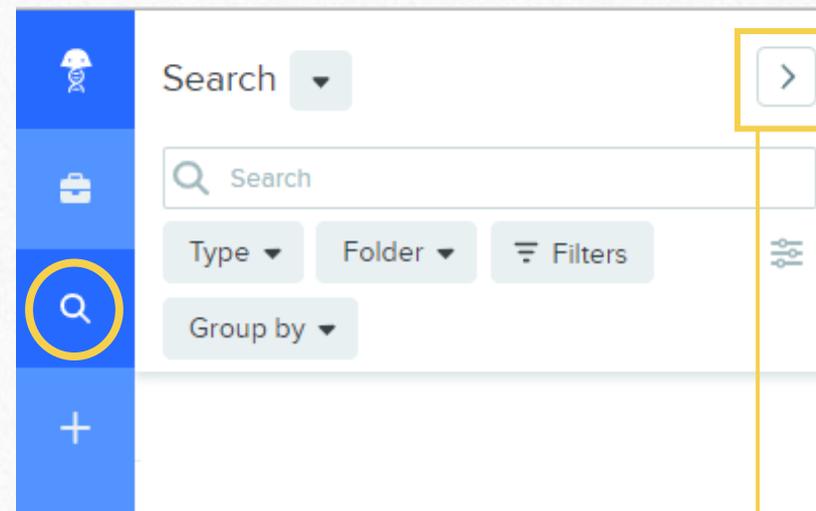
- Data type (samples, boxes...)
- Folder
- Metadata field



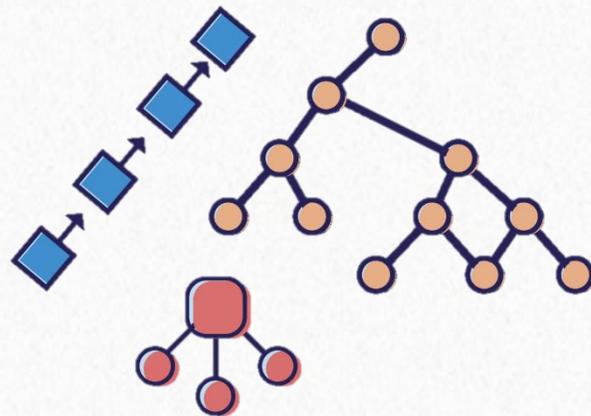
Global search

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:

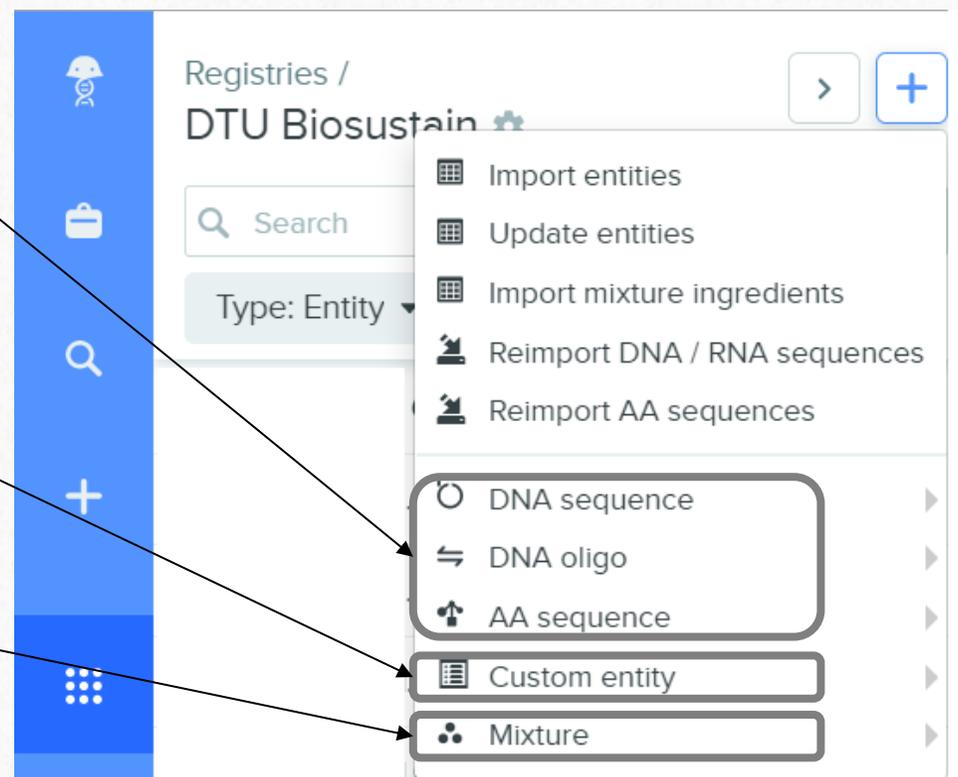
- metadata
- a sequence

Entity type that can store:

- metadata

Entity type that can store:

- metadata
- media ingredients and recipe

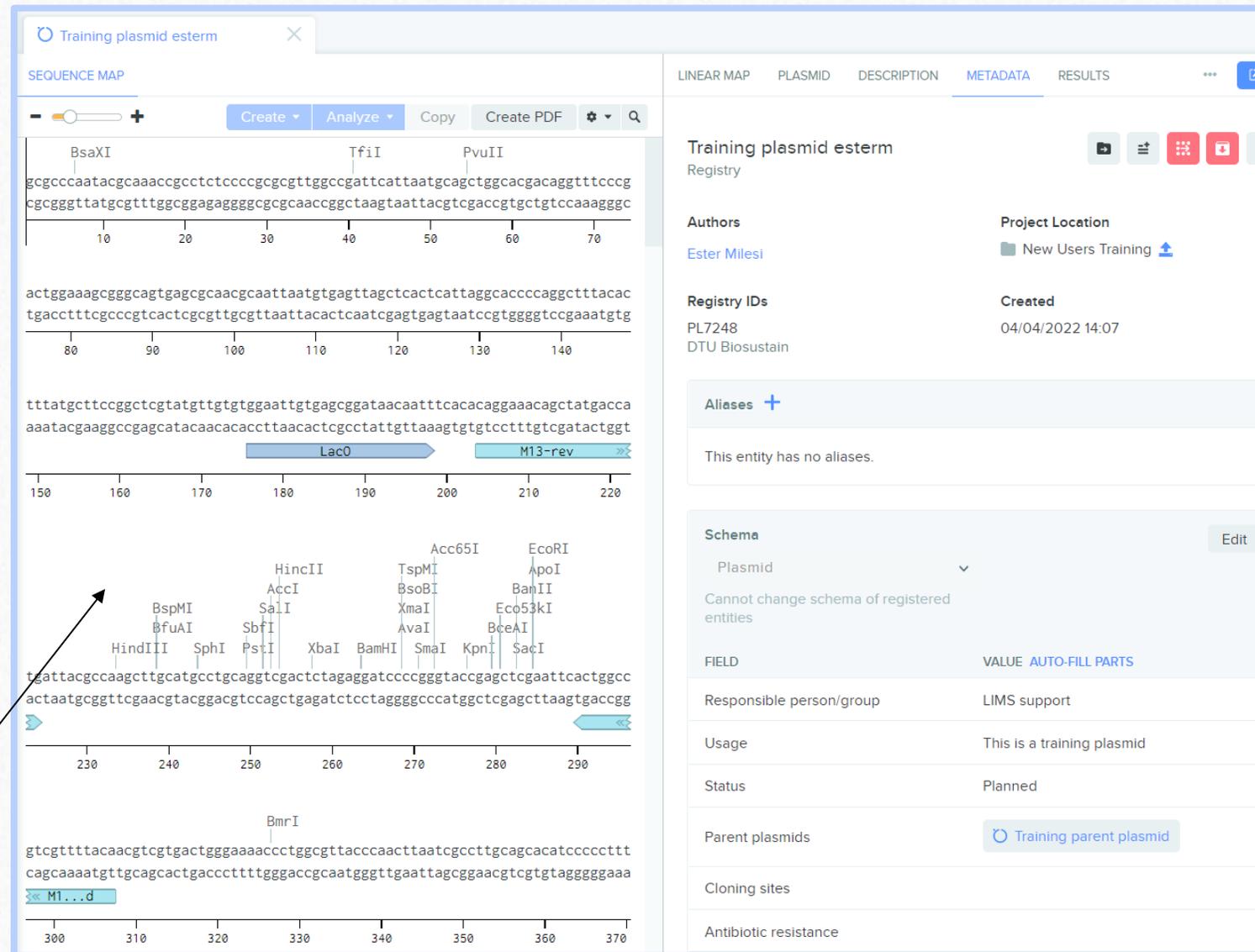


Entity types that can store:

- metadata
- a sequence

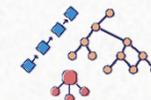
-  DNA sequence
-  DNA oligo
-  AA sequence

Sequence



The screenshot displays the BRiGHT interface for a 'Training plasmid esterm' entity. The 'SEQUENCE MAP' view shows a DNA sequence with various restriction enzyme sites (BsaXI, TfiI, PvuII, BspMI, BfuAI, SbfI, HindIII, SphI, PstI, XbaI, BamHI, SmaI, KpnI, SacI, Acc65I, EcoRI, ApoI, BanII, Eco53kI, BceAI) and features like 'Lac0' and 'M13-rev'. The 'METADATA' table on the right provides details about the entity, including its registry ID (PL7248), location (DTU Biosustain), and creation date (04/04/2022 14:07). The table also lists the responsible person/group (LIMS support), usage (This is a training plasmid), status (Planned), and parent plasmid (Training parent plasmid).

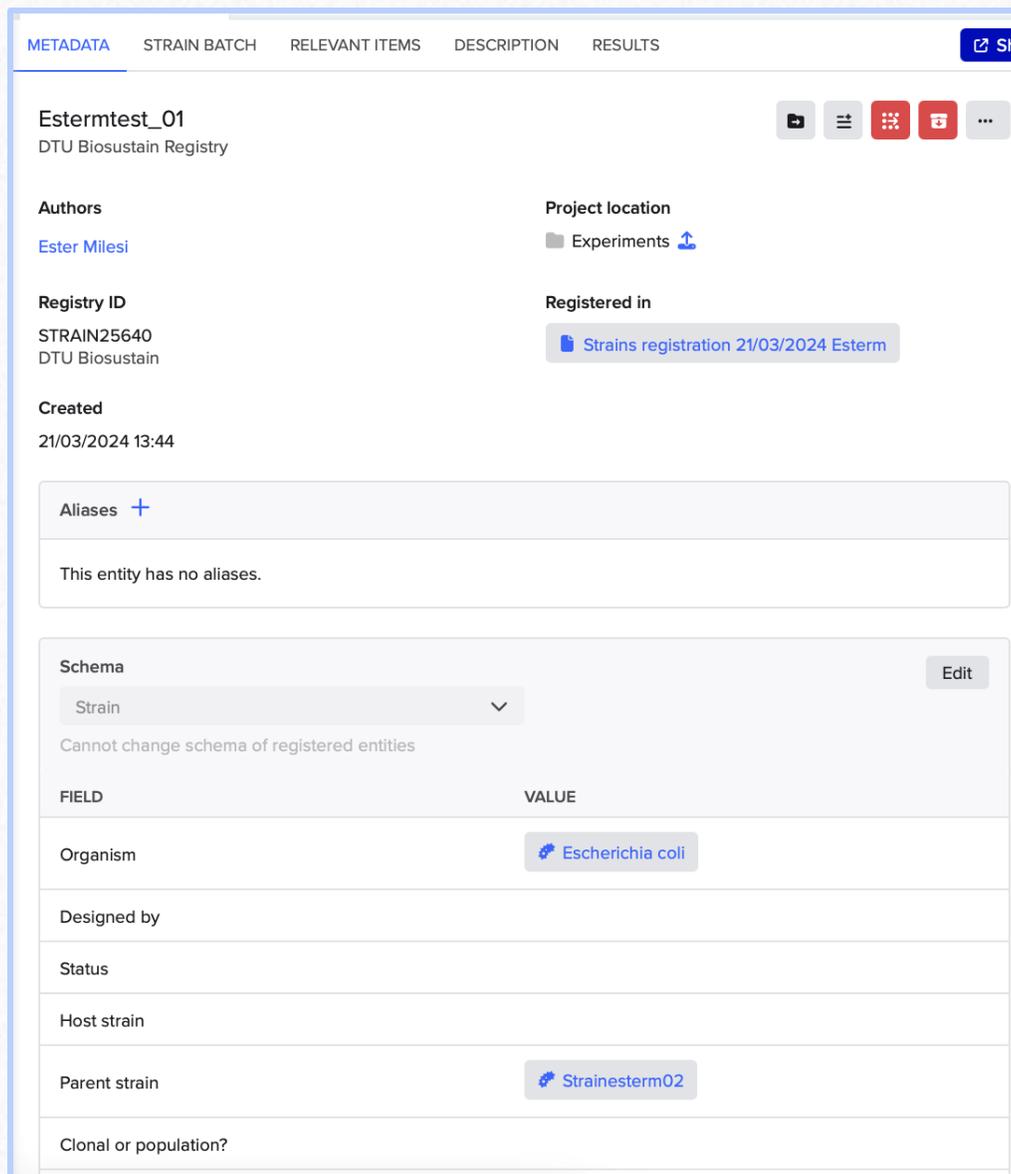
FIELD	VALUE
Responsible person/group	LIMS support
Usage	This is a training plasmid
Status	Planned
Parent plasmids	Training parent plasmid



Entity types that can store:

- metadata

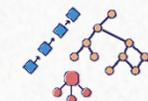
Custom entity



The screenshot displays the 'METADATA' tab for the entity 'Estermtest_01' in the DTU Biosustain Registry. The interface includes a top navigation bar with tabs for METADATA, STRAIN BATCH, RELEVANT ITEMS, DESCRIPTION, and RESULTS. The main content area is divided into several sections:

- Entity Information:** 'Estermtest_01' (DTU Biosustain Registry) with a share button.
- Authors:** Ester Milesi.
- Registry ID:** STRAIN25640 (DTU Biosustain).
- Created:** 21/03/2024 13:44.
- Project location:** Experiments.
- Registered in:** Strains registration 21/03/2024 Esterm.
- Aliases:** A section with a plus icon and the message 'This entity has no aliases.'
- Schema:** A dropdown menu set to 'Strain' with an 'Edit' button. A note states 'Cannot change schema of registered entities'.
- Fields and Values:**

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



Entity types that can store:

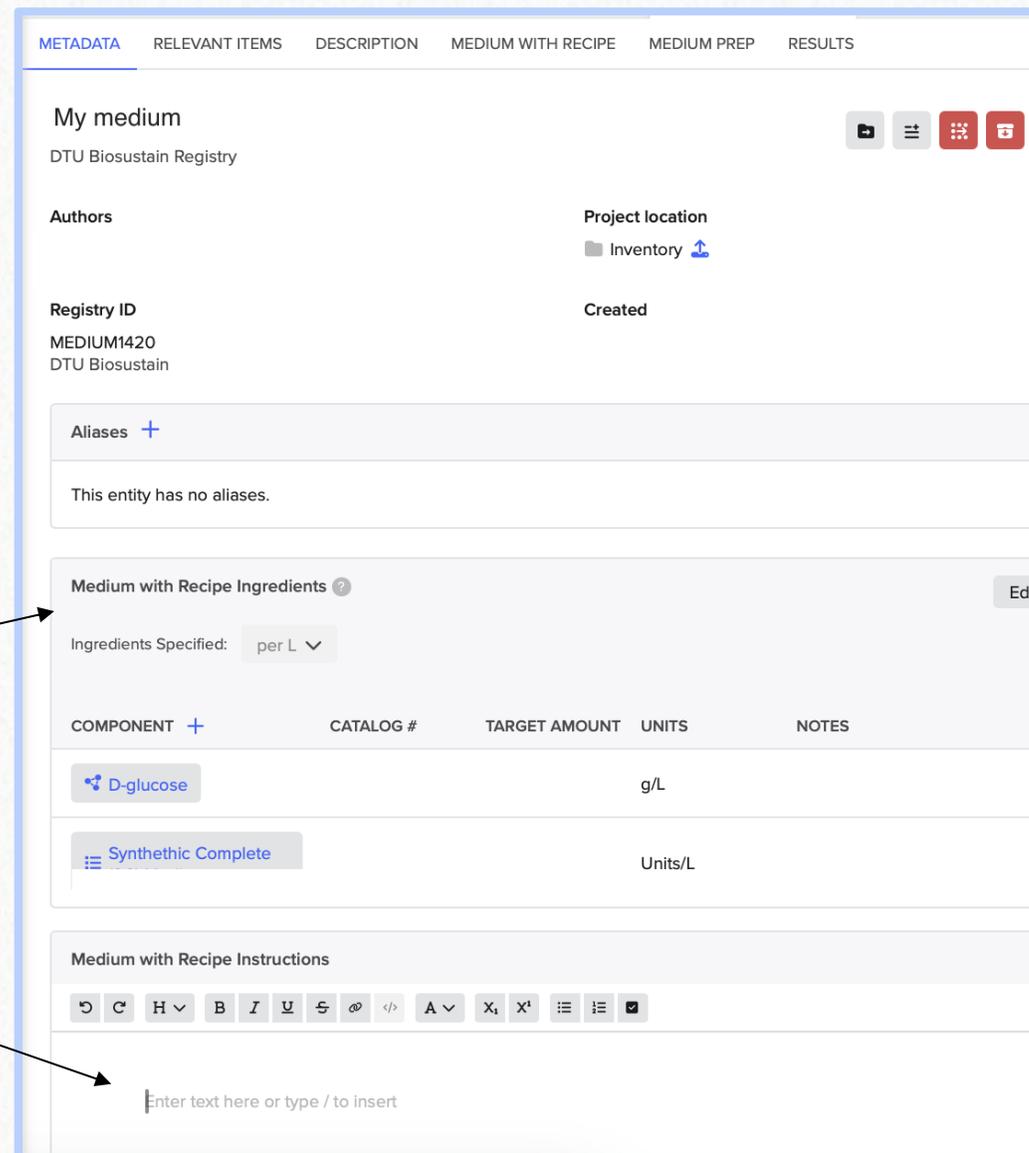
- metadata
- media ingredients and recipe

 Mixture

**Component list
(with amount)**

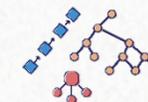
Recipe

Metadata



The screenshot shows the 'Metadata' page for 'My medium' in the DTU Biosustain Registry. The page is divided into several sections:

- Metadata:** Shows the entity name 'My medium', its source 'DTU Biosustain Registry', authors, registry ID 'MEDIUM1420', project location 'Inventory', and creation date.
- Aliases:** A section indicating that this entity has no aliases.
- Medium with Recipe Ingredients:** A table listing ingredients with columns for Component, Catalog #, Target Amount, Units, and Notes. Two ingredients are listed: 'D-glucose' (g/L) and 'Synthetic Complete' (Units/L).
- Medium with Recipe Instructions:** A text editor area with a rich text toolbar and a text input field containing the placeholder 'Enter text here or type / to insert'.

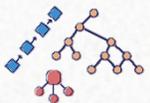
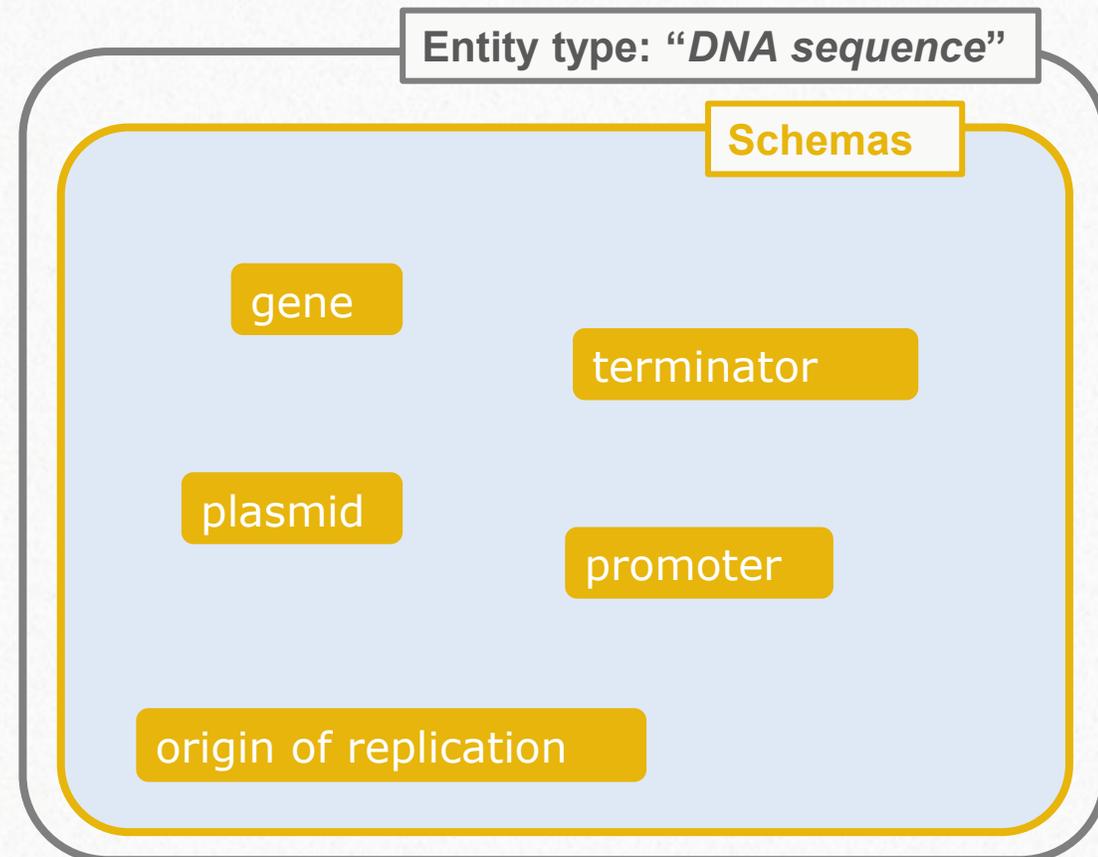


Registering entities: what to consider

2. Entities are assigned a “schema”

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

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

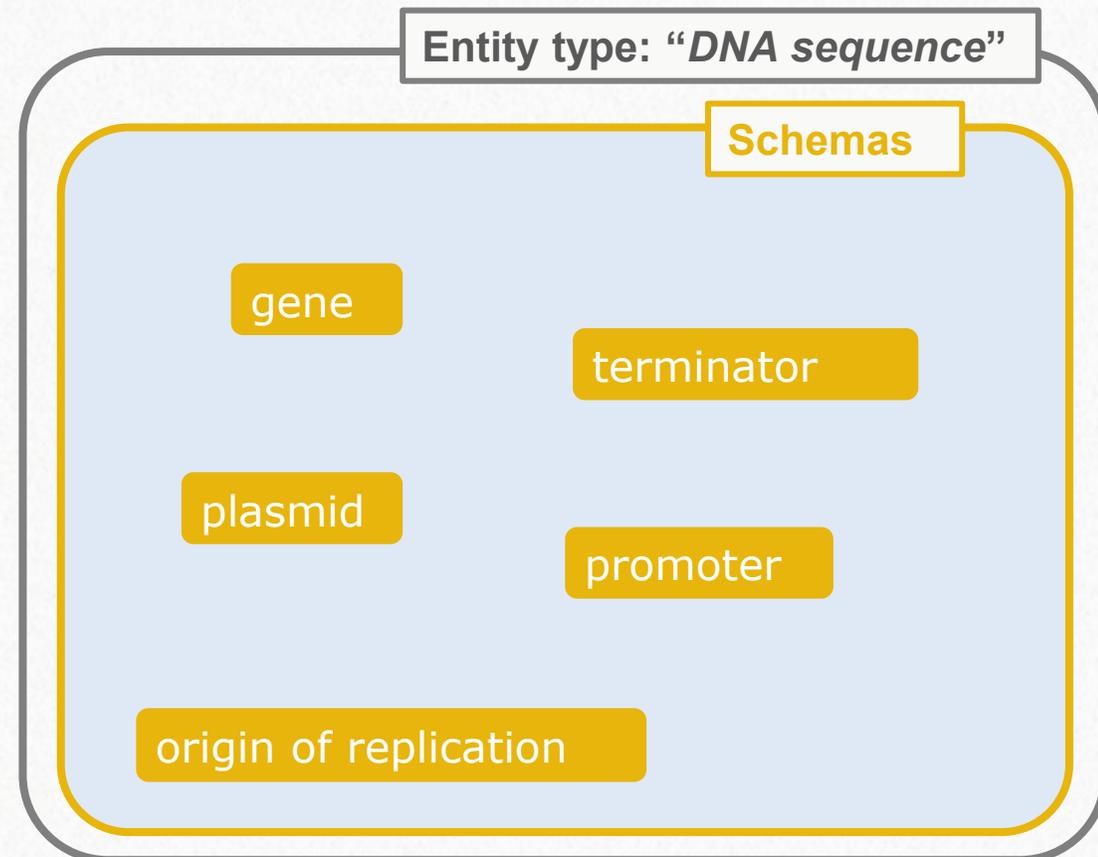


Registering entities: what to consider

2. Entities are assigned a “schema”

A schema specifies:

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

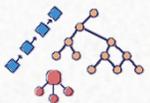
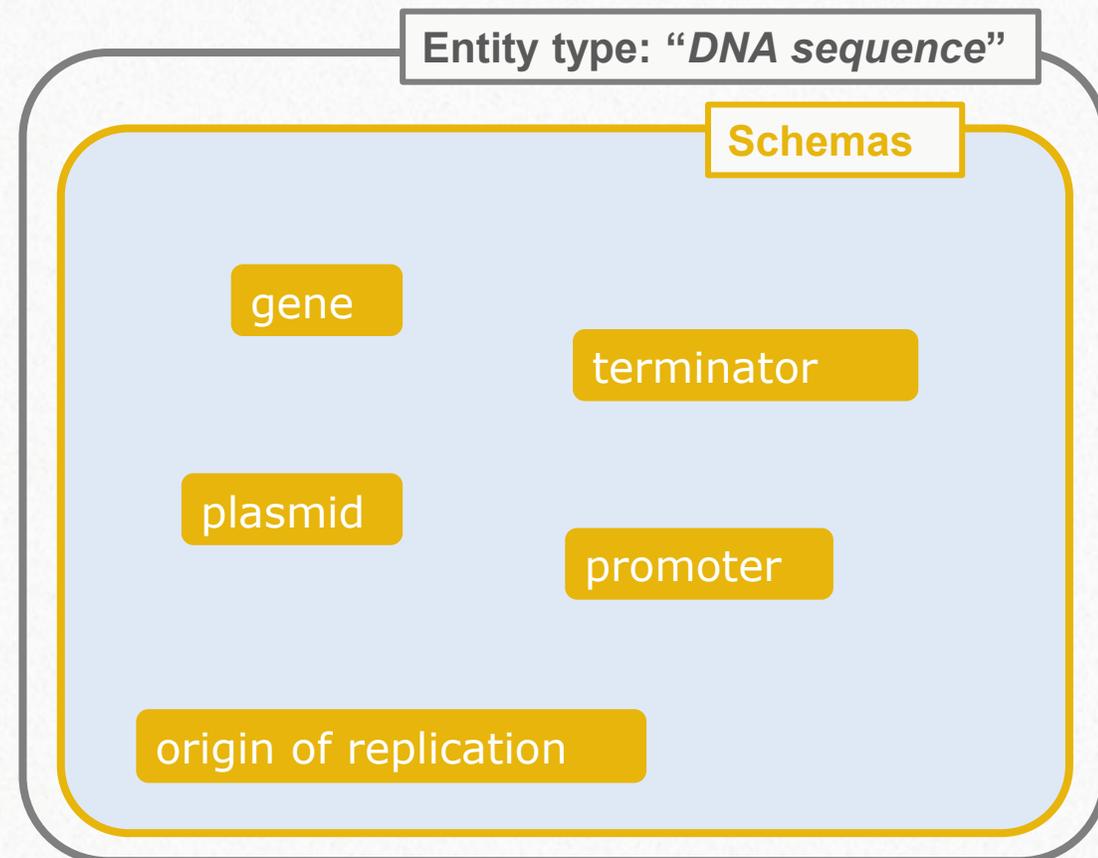


Registering entities: what to consider

2. Entities are assigned a “schema”

A schema specifies:

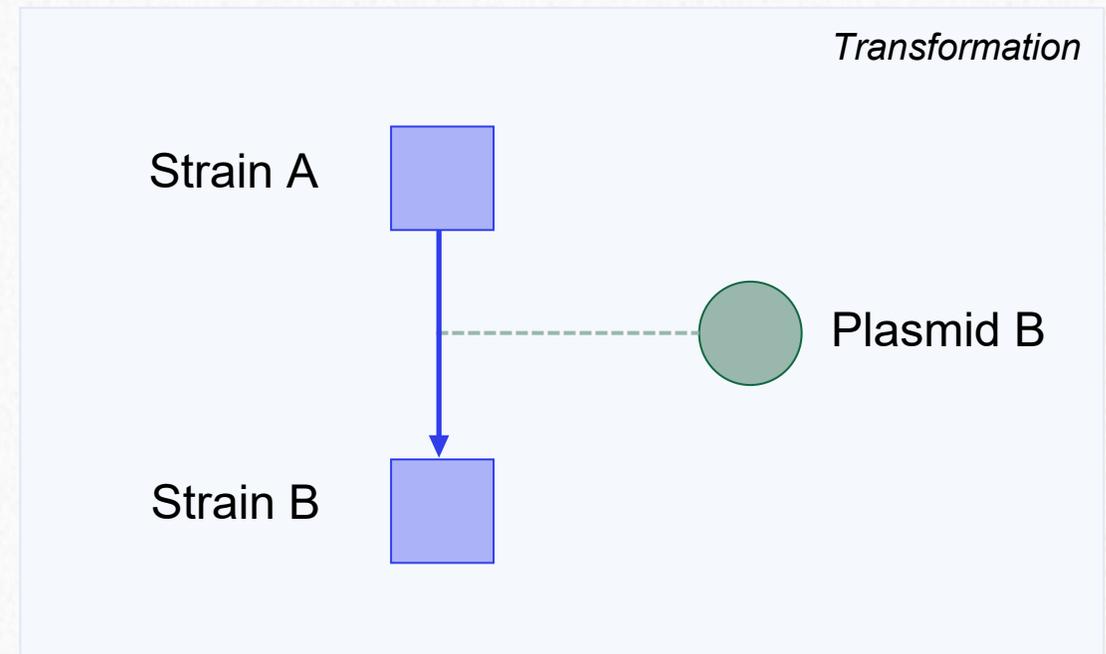
- sample type
- required information to fill-in
- links to other schemas



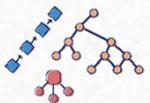
Registering entities: what to consider

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”

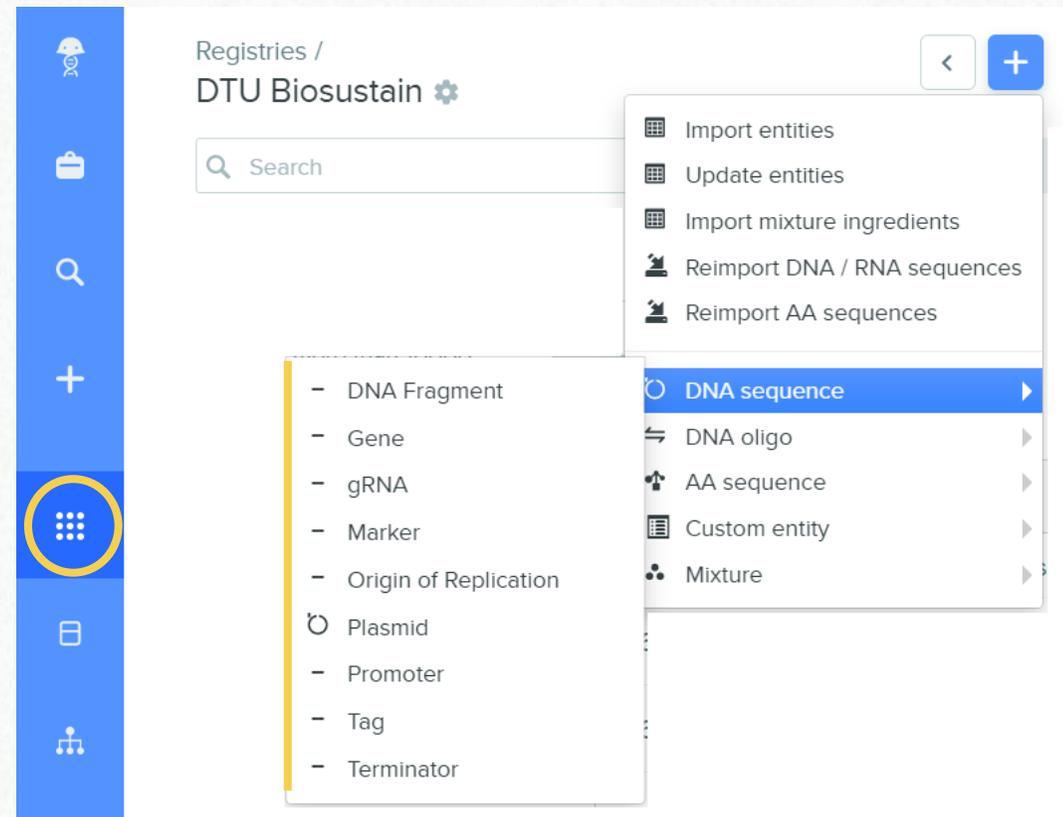


Registering entities: what to consider

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”



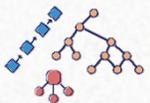
Registries / DTU Biosustain

Search

- Import entities
- Update entities
- Import mixture ingredients
- Reimport DNA / RNA sequences
- Reimport AA sequences

- DNA sequence
- DNA oligo
- AA sequence
- Custom entity
- Mixture

- DNA Fragment
- Gene
- gRNA
- Marker
- Origin of Replication
- Plasmid
- Promoter
- Tag
- Terminator



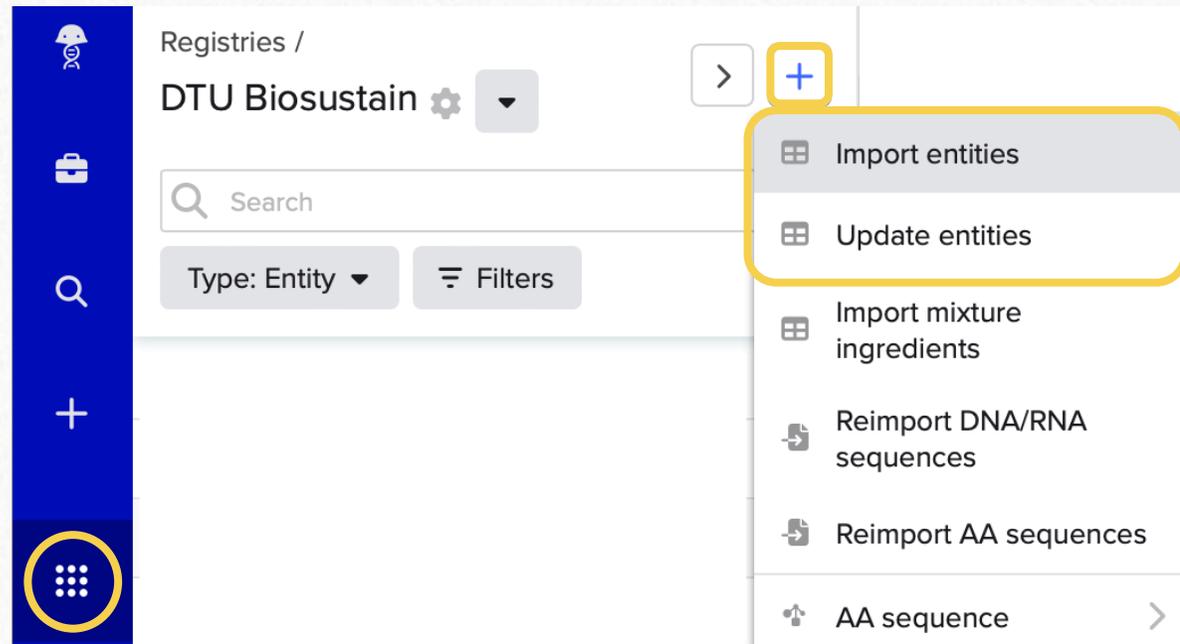
Registering entities: what to consider

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

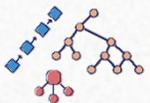
To create entities in bulk:

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

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



The screenshot shows the Benchling interface for the 'DTU Biosustain' registry. A blue sidebar on the left contains icons for home, folder, search, plus, and a grid icon (highlighted with a yellow circle). The main content area shows the registry name 'DTU Biosustain' with a settings gear and a dropdown arrow. Below this is a search bar and a 'Type: Entity' dropdown. A yellow box highlights a plus sign icon in the top right corner, which has opened a dropdown menu. The menu contains the following options: 'Import entities' (highlighted with a grey background), 'Update entities', 'Import mixture ingredients', 'Reimport DNA/RNA sequences', 'Reimport AA sequences', and 'AA sequence' with a right-pointing arrow.



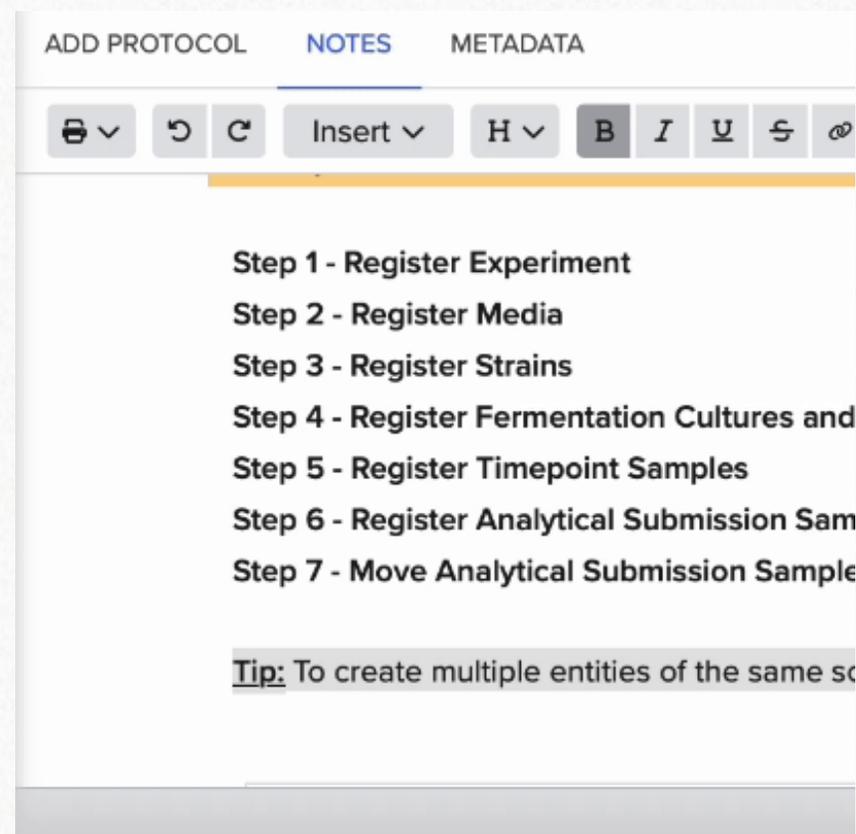
Registering entities: what to consider

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 Electronic Notebook interface with three tabs: ADD PROTOCOL, NOTES, and METADATA. The NOTES tab is active. The interface includes a toolbar with icons for undo, redo, insert, heading, bold, italic, underline, strikethrough, and link. Below the toolbar, a registration table is displayed with the following steps:

- 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

A tip is provided at the bottom: 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

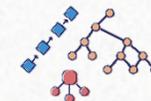
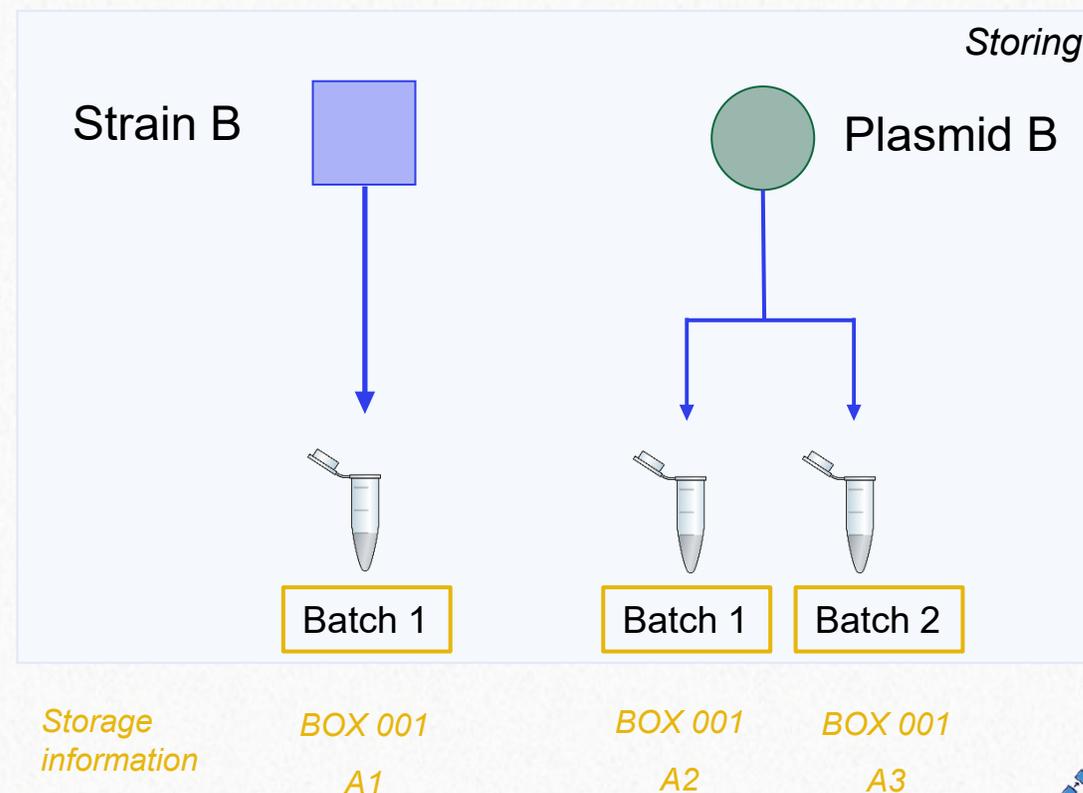


Registering entities: what to consider

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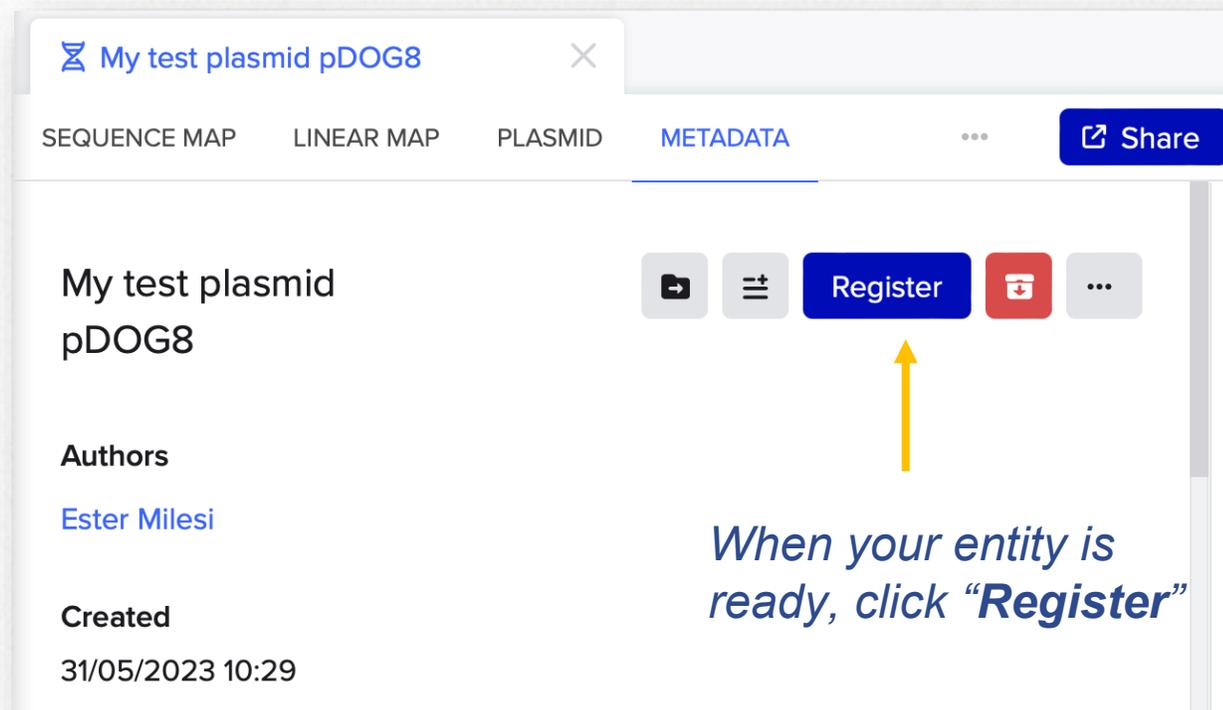


Registering entities: what to consider

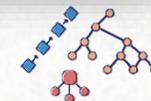
5. Entities can exist outside of the Registry

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



The screenshot shows a web interface for a plasmid entity named "My test plasmid pDOG8". The interface includes tabs for "SEQUENCE MAP", "LINEAR MAP", "PLASMID", and "METADATA". A "Share" button is visible in the top right. Below the entity name, there are several action buttons: a camera icon, a list icon, a blue "Register" button, a red button with a plus sign, and a three-dot menu icon. A yellow arrow points to the "Register" button. Below the screenshot, the text reads: "When your entity is ready, click 'Register'".

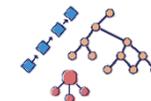


Good practices

(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



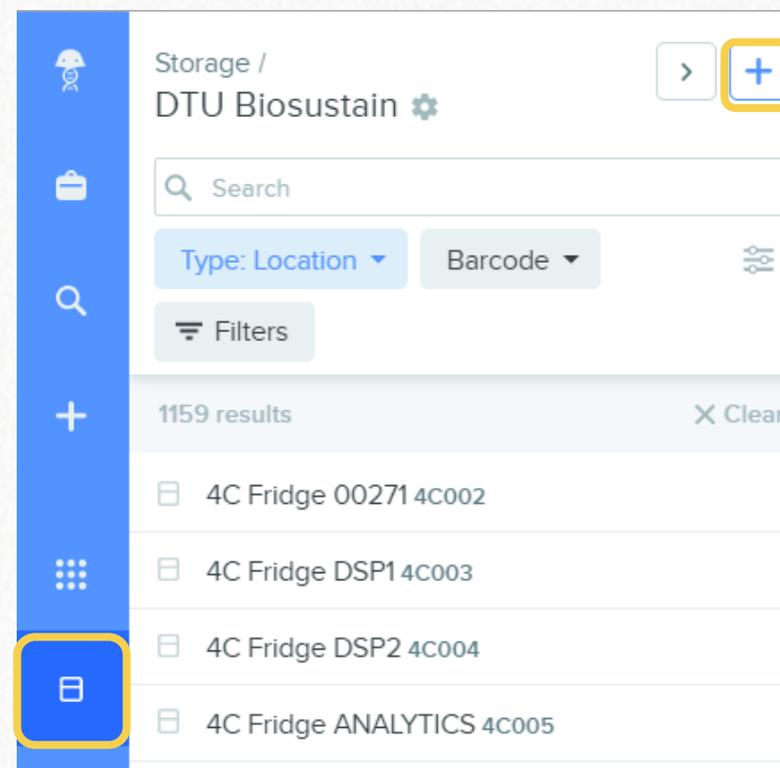
The Inventory

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 screenshot shows the BRiGHT inventory management interface. On the left is a blue sidebar with icons for home, inventory, search, add, filters, and a grid view. The main content area shows the path 'Storage / DTU Biosustain' with a settings gear icon and a plus sign icon highlighted by a yellow box and an arrow pointing to the text 'Create new box/plate/vial'. Below this is a search bar, filter buttons for 'Type: Location' and 'Barcode', and a 'Filters' button. A results section shows '1159 results' with a 'Clear' button. The results list includes:

- 4C Fridge 00271 4C002
- 4C Fridge DSP1 4C003
- 4C Fridge DSP2 4C004
- 4C Fridge ANALYTICS 4C005

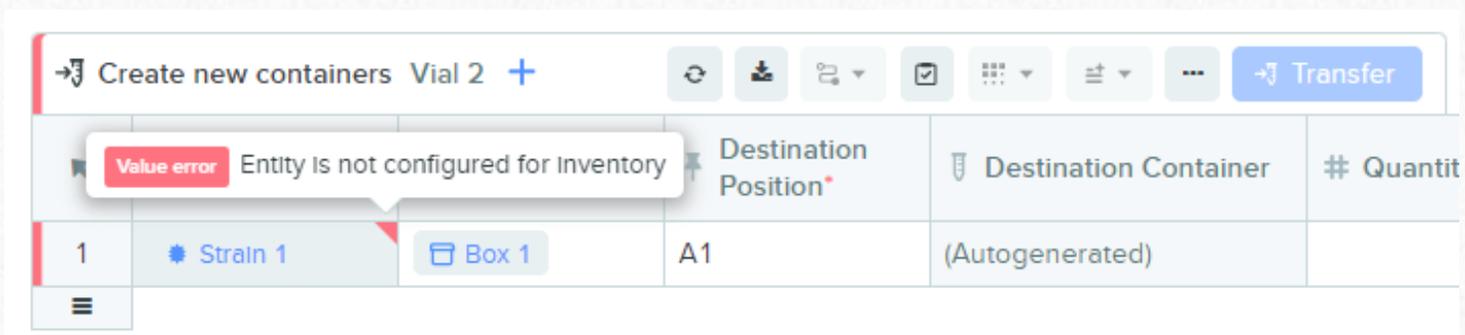
The grid view icon in the sidebar is also highlighted with a yellow box.



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	Box 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	New quantity*	New units*
Not specified	<input type="text" value="20"/>	<input style="border: none; border-bottom: 1px solid #ccc; background-color: #f9f9f9; width: 100%;" type="text" value="uL"/>

Training box esterm ✕

METADATA RESULTS

Training box esterm
Move

Barcode 81BOX984
Location DTU Building 220 / Training Location

	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
<input type="checkbox"/>	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

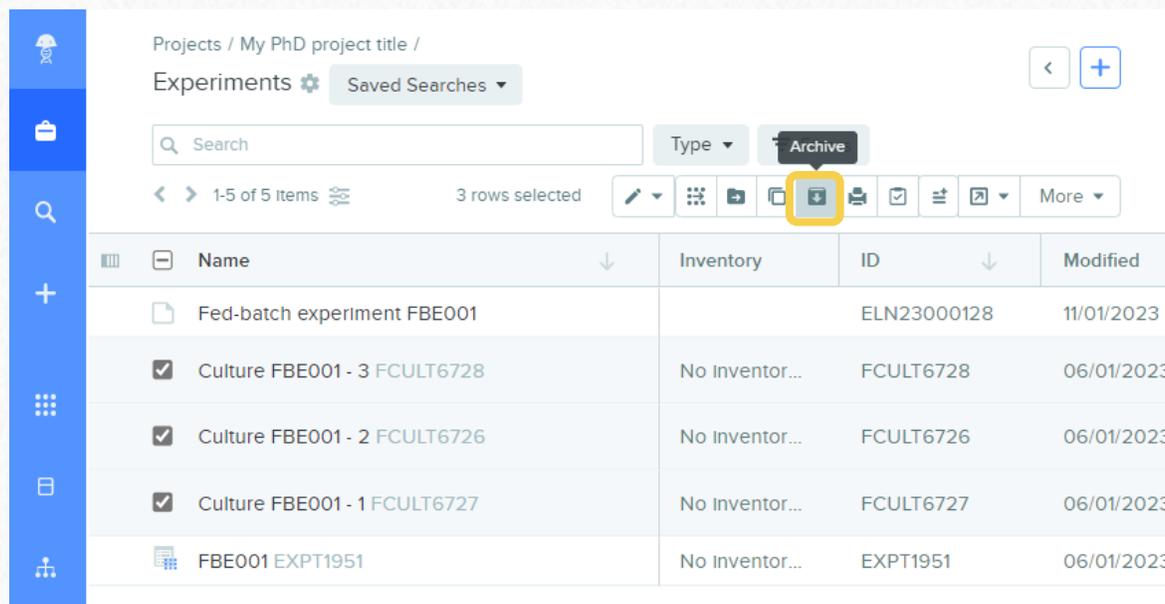


Archiving entities

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". A search bar and a "Type" dropdown are visible. A toolbar contains an "Archive" button, which is highlighted with a yellow box. Below the toolbar is a table with 5 rows. The first row is "Fed-batch experiment FBE001" with ID "ELN23000128" and modified date "11/01/2023". The next three rows are "Culture FBE001 - 3 FCULT6728", "Culture FBE001 - 2 FCULT6726", and "Culture FBE001 - 1 FCULT6727", all with "No Inventor..." in the Inventory column and modified date "06/01/2023". The last row is "FBE001 EXPT1951" with ID "EXPT1951" and modified date "06/01/2023".

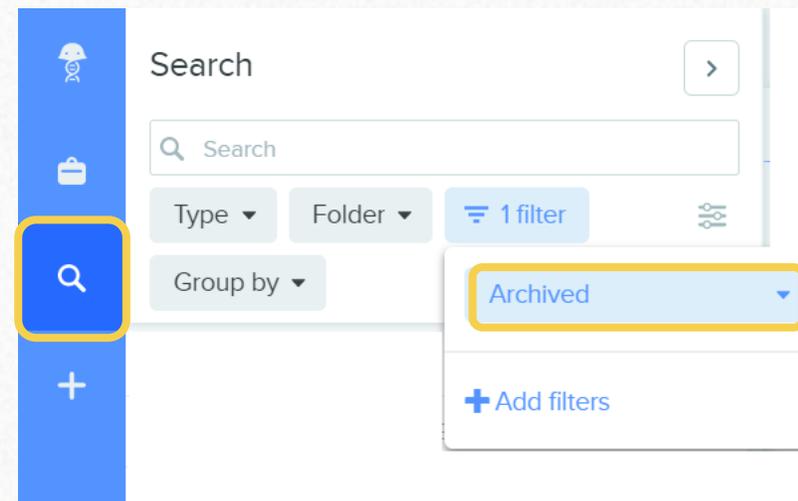
Name	Inventory	ID	Modified
Fed-batch experiment FBE001		ELN23000128	11/01/2023
✓ Culture FBE001 - 3 FCULT6728	No Inventor...	FCULT6728	06/01/2023
✓ Culture FBE001 - 2 FCULT6726	No Inventor...	FCULT6726	06/01/2023
✓ Culture FBE001 - 1 FCULT6727	No Inventor...	FCULT6727	06/01/2023
FBE001 EXPT1951	No Inventor...	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

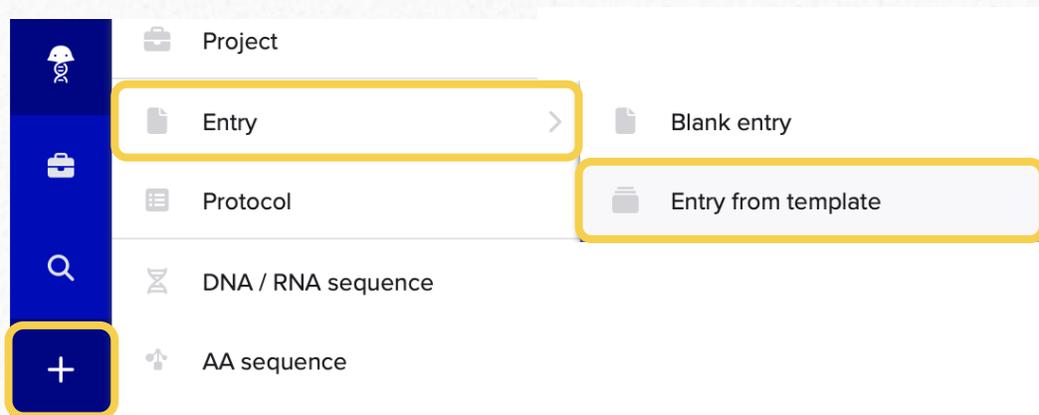
~ 30 min

Hands-on

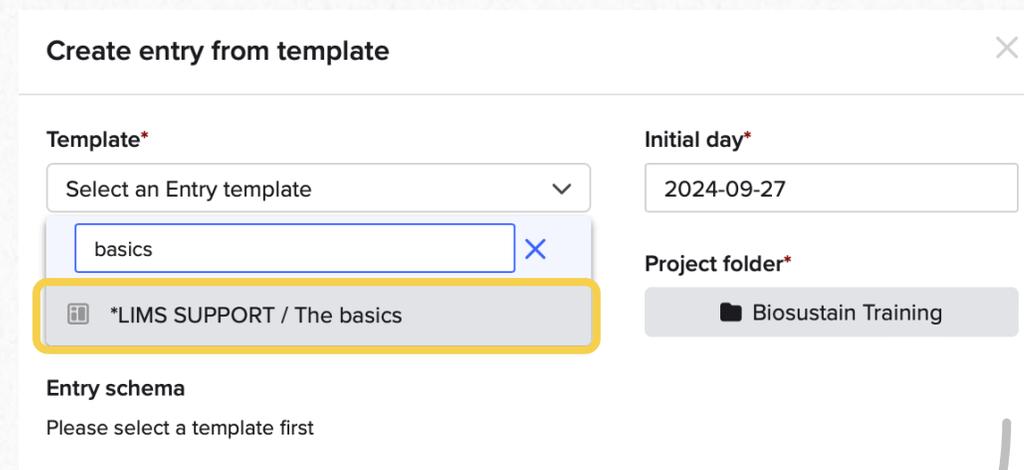
~ 15 min

Explore the Notebook functionalities

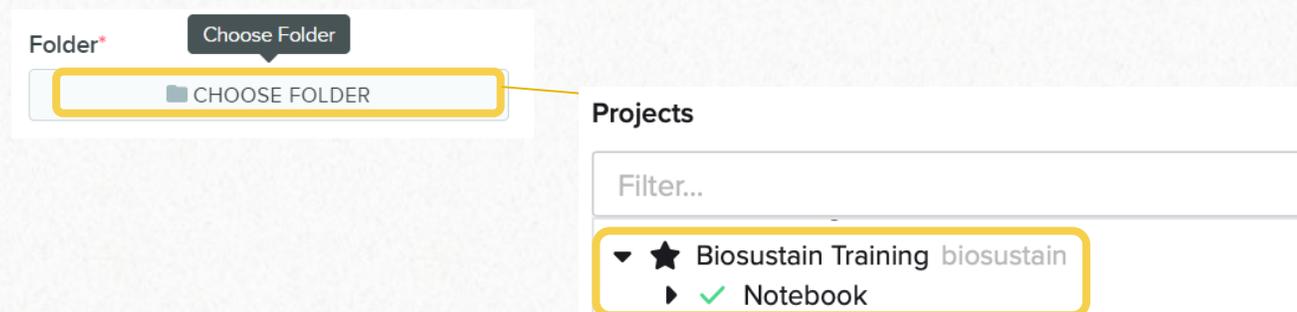
1 CREATE ENTRY FROM TEMPLATE



2 CHOSE "THE BASICS" TEMPLATE



3 SAVE IT IN THE BIOSUSTAIN TRAINING FOLDER



Questions?

