

Search



Search

Type: Location ▾

Folder ▾

Filters

Group by ▾

Save

Clear

< > 1-50 of 1159 items

 Barcode

Part 1

4C002

4C009

4C008

4C014

4C015

4C006

4C005

4C011

4C014

4C016

4C003

4C003

4C003

Name

4C EE&SB fridge transient storage

4C Fridge 00271

4C Fridge 01223

4C Fridge 01233

4C Fridge 01871

4C Fridge Aaron

4C Fridge Adam

4C Fridge ANALYTICS

4C Fridge CFB00266

4C Fridge CFB01478

4C Fridge CFB01653

4C Fridge DSP1

Location

DTU Buildi...

DTU Buildi...

DTU Buildi...

BioInnovati...

DTU Buildi...

DTU Buildi...

DTU Buildi...

Modified

10/12/2020

09/08/2019

09/08/2019

15/04/2021

19/11/2018

19/11/2018

09/08/2018

Schema

4°C Fridge

Reach out when struggling with Benchling:

Biosustain Benchling support
lims_support@biosustain.dtu.dk

Access Benchling:

biosustain.benchling.com
(login with DTU credentials)

The Basics of

Benchling

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

Check out our new Benchling Resources wiki

☰ Benchling resources

[✉ Contact us](#)[❓ FAQ](#)[🔐 Benchling access](#)[📚 Training for new employees](#)[📌 Benchling core concepts](#)

[Electronic Lab Notebook](#)

[→ Explore main functionalities](#)

[Data registration](#)

[→ Understand the Registry](#)[→ Upload sequences](#)[→ Register strains](#)[→ Register entire collections](#)[→ Register media](#)[→ Transfer your data \(for guests\)](#)

Search...

Search

[➤ Page contents:](#)[Welcome!](#)[Benchling in a nutshell](#)[Start exploring](#)[More resources](#)

Welcome!

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

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:





Check out our new Benchling Resources wiki

✉ Contact us

❓ FAQ

🔒 Benchling access

📚 Training for new employees

📌 Benchling core concepts

Data registration

- Understand the Registry
- Upload sequences
- Register strains
- Register entire collections
- Register media
- Transfer your data (for guests)

New functionalities

- Try out Plate Maps

Electronic Lab Notebook

- Explore main functionalities

In-house services

- Order lab materials
- Submit samples for analysis to DNA Foundry and PPP
- Submit samples for analysis to Analytics (new Workflows)
- Execute Analytics Workflows (for analysts only)



Agenda

Introduction to Benchling
and best practices

~ 30 min

Hands-on

~ 15 min



Agenda

Introduction to Benchling
and best practices

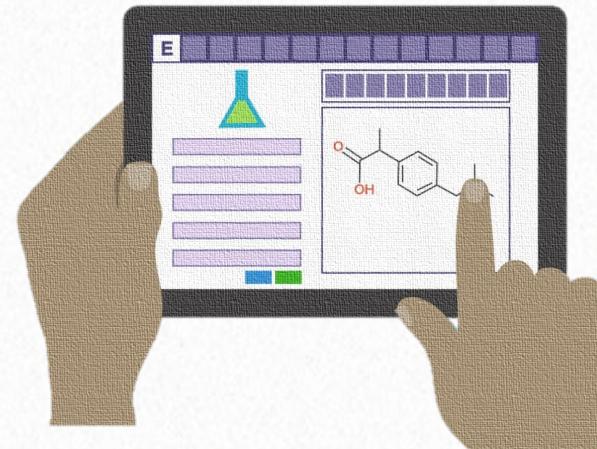
~ 30 min

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 Biosustain, we use **Benchling**, a Cloud-based platform



biosustain.benchling.com



Main functionalities

ELN

- Experiment notes
- Registration of samples



Samples storage

- Samples transfer in boxes/plates



Molecular Biology tool

- Import of sequences
- Plasmid design and annotation



Requests

- Samples submission for analysis
- Lab material order request



Working with Benchling

Benefits

- Facilitates **passing over** of projects
- Foster **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

- ✓ Make sure **not** to save relevant data in the **Biosustain Training** project folder

The screenshot shows a digital interface for managing projects. On the left, there is a vertical sidebar with three icons: a user profile, a briefcase, and a magnifying glass. The main area displays a navigation path: Projects / Biosustain Training / Inventory. Below this, there is a search bar labeled "Search". At the bottom, a pagination control shows "1-100 of 2227 items" with arrows for navigation. A red oval highlights this pagination area, and a red arrow points from the text "We noticed that the list include real data" to the oval.

We noticed that the list include real data



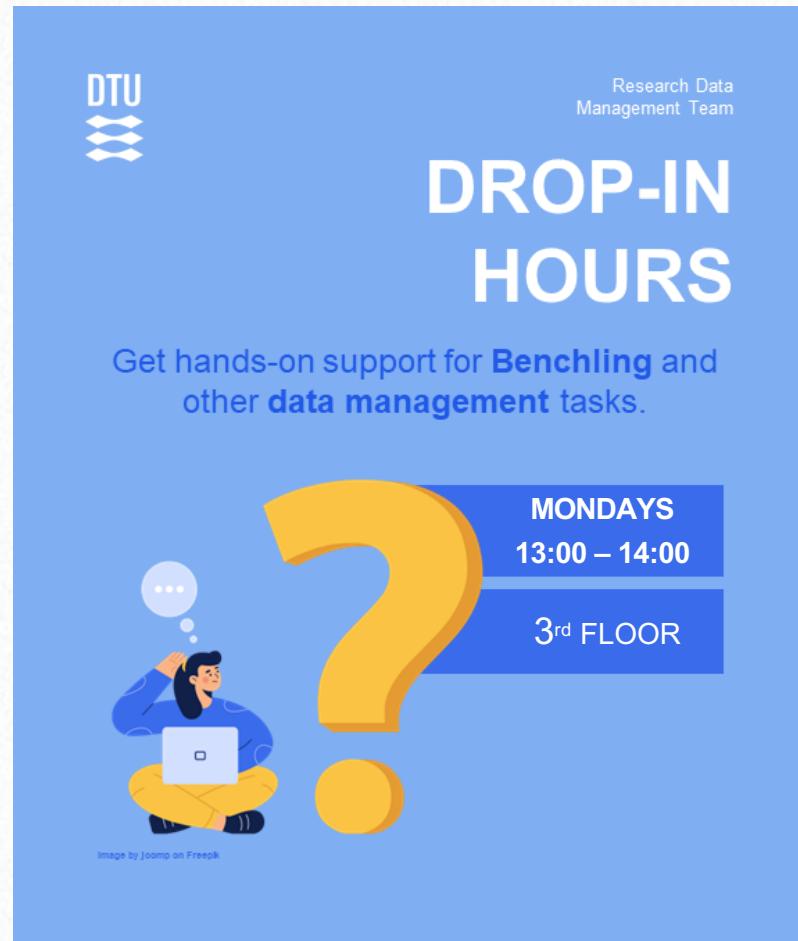
Good practices

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

Submit your questions to
lims_support@biosustain.dtu.dk

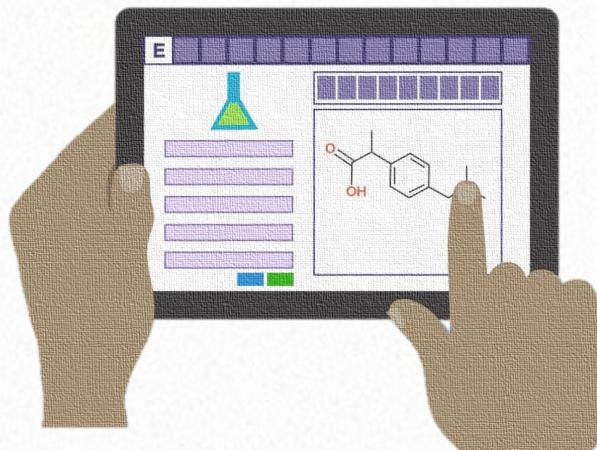
Get hands-on Benchling support

Mondays 13:00 -14:00 (Room 222)





Getting started



Step 1: Create your project folder

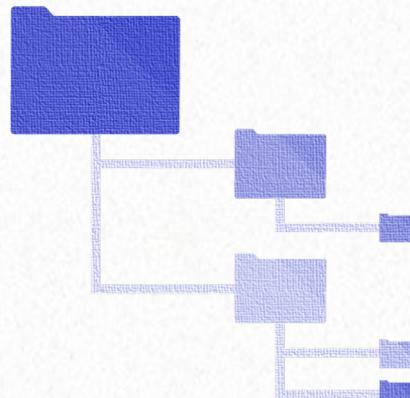
Step 2: Create your experiment ELN & register samples

Step 3: Navigate through your data



Step 1:

Create your project folder

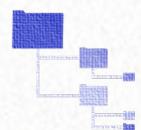




Project folder

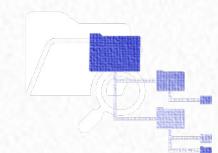
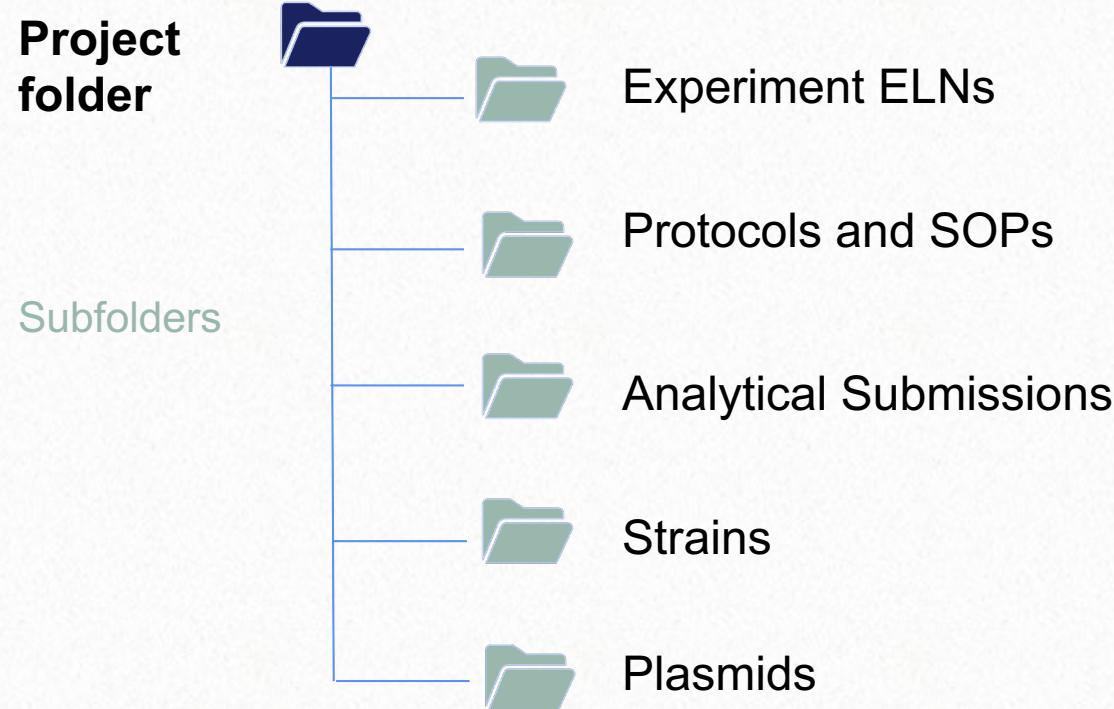
Your Project folder will contain:

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





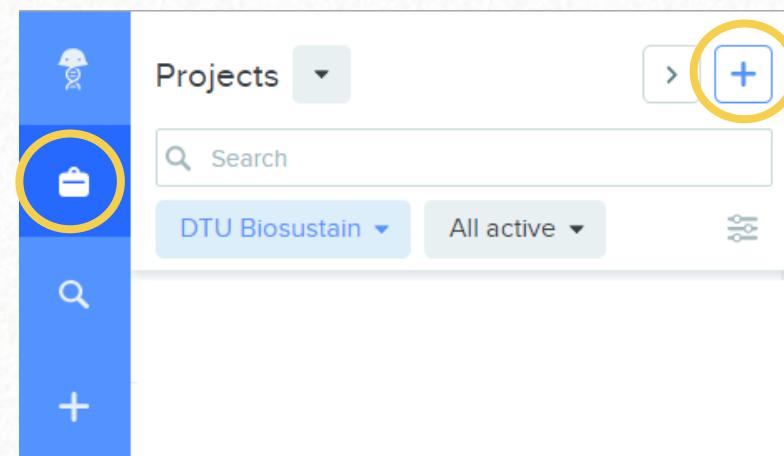
Example of folder structure



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)

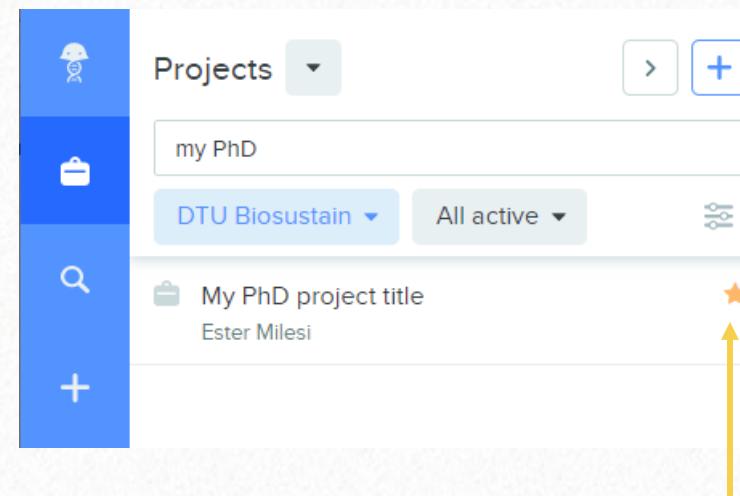




Project folder

Star ★ your Project:

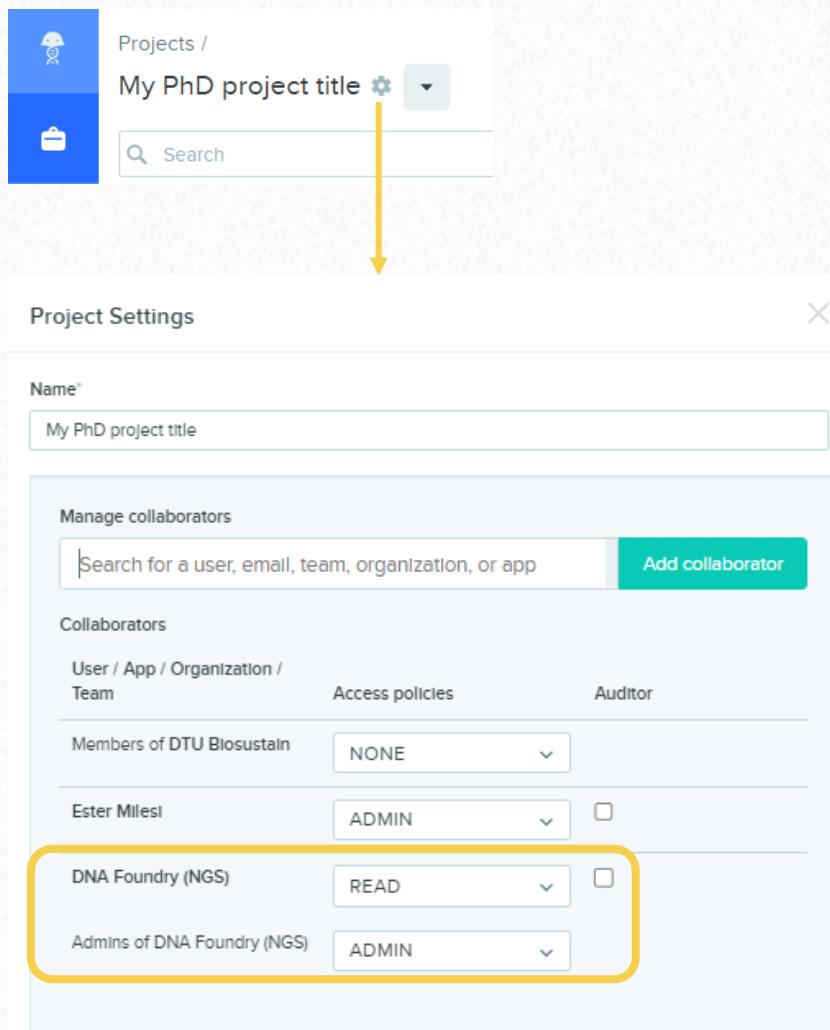
- This way, it will appear on top of every other Project that you have access to



Project folder

Give access to your team

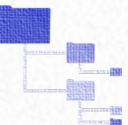
- Almost all Research groups have a **Benchling Team**
- When possible, add **your Team** among the collaborators of the Project



The screenshot shows the 'Project Settings' page for a project named 'My PhD project title'. A yellow arrow points from the top navigation bar to the 'Manage collaborators' section. The 'Collaborators' table lists:

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

The row for 'DNA Foundry (NGS)' is highlighted with a yellow box.

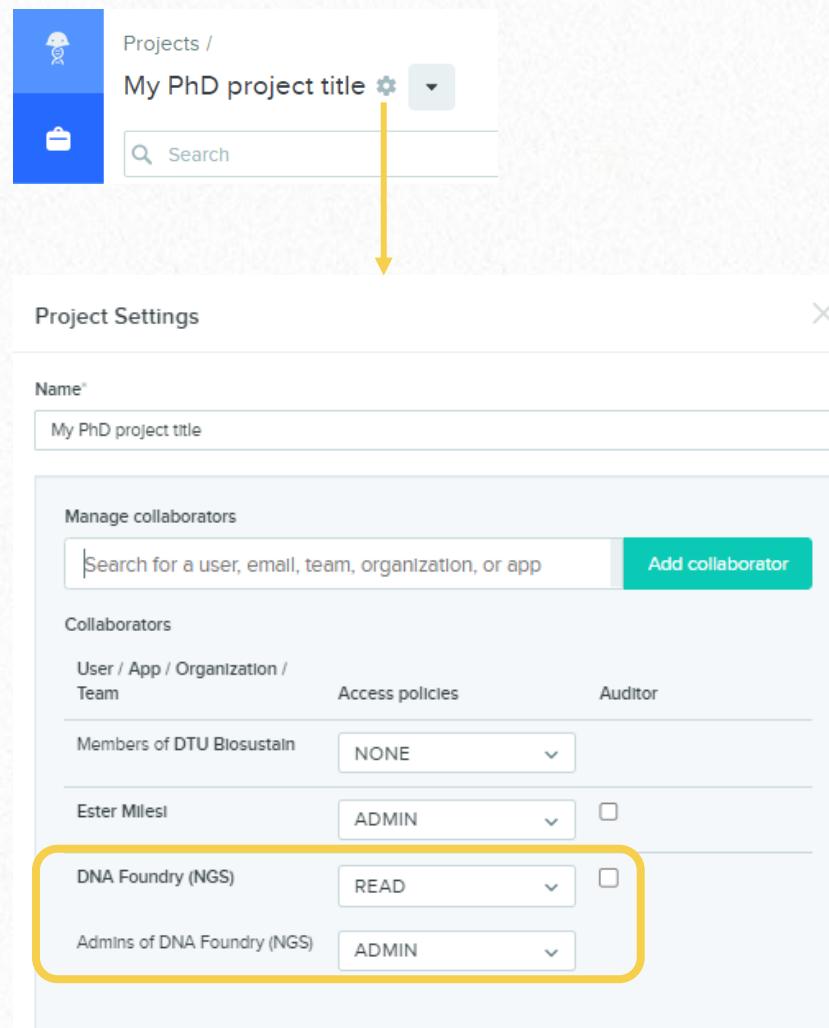




Project folder

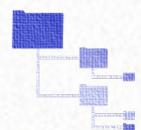
Benefits

- ✓ 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**



The screenshot shows a 'Project Settings' page for a project titled 'My PhD project title'. A yellow arrow points from the top navigation bar to the 'Manage collaborators' section. This section includes a search bar, an 'Add collaborator' button, and a table of users and their access levels. The table has three columns: 'User / App / Organization / Team', 'Access policies', and 'Auditor'. The first row, 'Members of DTU Biosustain', has an 'Access policies' dropdown set to 'NONE'. The second row, 'Ester Milesi', has an 'Access policies' dropdown set to 'ADMIN'. The third row, 'DNA Foundry (NGS)', has an 'Access policies' dropdown set to 'READ'. The fourth row, 'Admins of DNA Foundry (NGS)', has an 'Access policies' dropdown set to 'ADMIN'. The rows for 'Ester Milesi', 'DNA Foundry (NGS)', and 'Admins of DNA Foundry (NGS)' are highlighted with a yellow border.

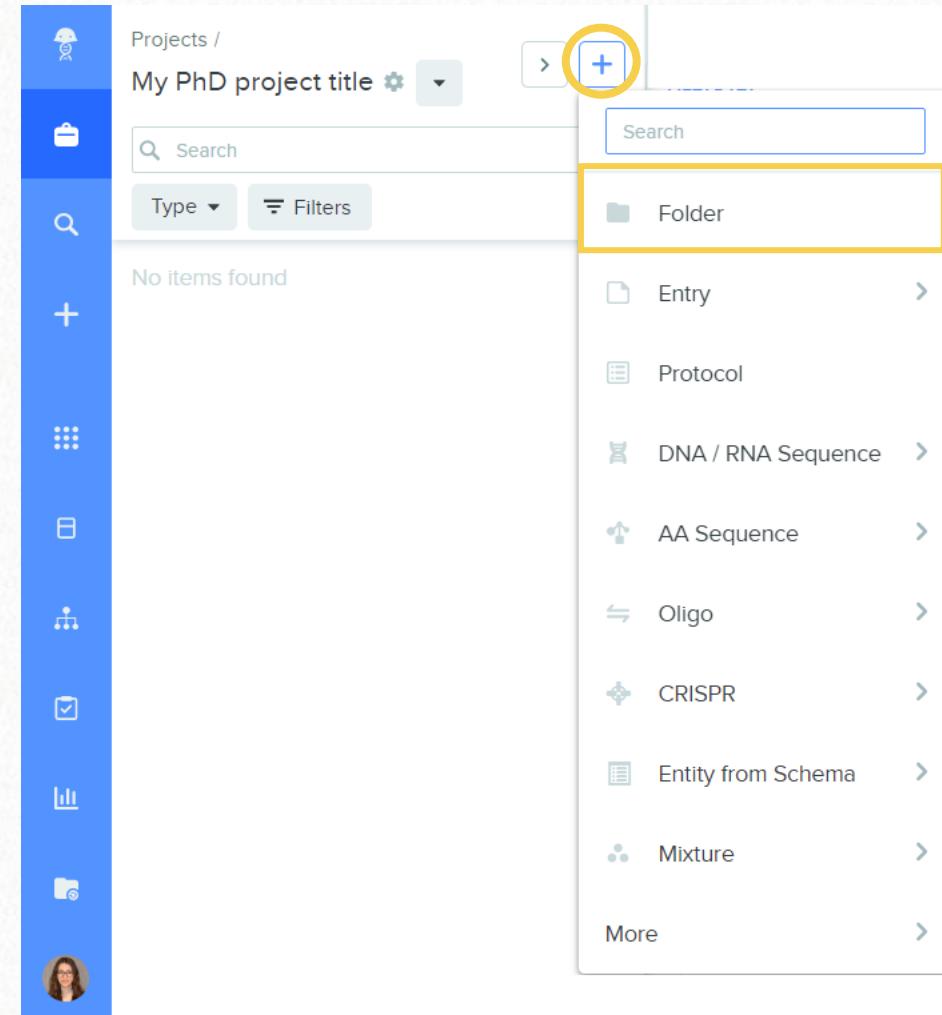
User / App / Organization / Team	Access policies	Auditor
Members of DTU Biosustain	NONE	
Ester Milesi	ADMIN	<input type="checkbox"/>
DNA Foundry (NGS)	READ	<input type="checkbox"/>
Admins of DNA Foundry (NGS)	ADMIN	



Creating subfolders

To create a subfolder:

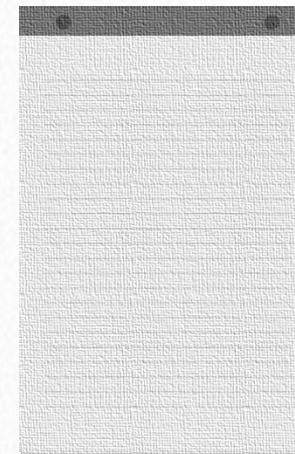
- Enter your newly created Project
- Click on the “+” icon
- Select “Folder”





Step 2:

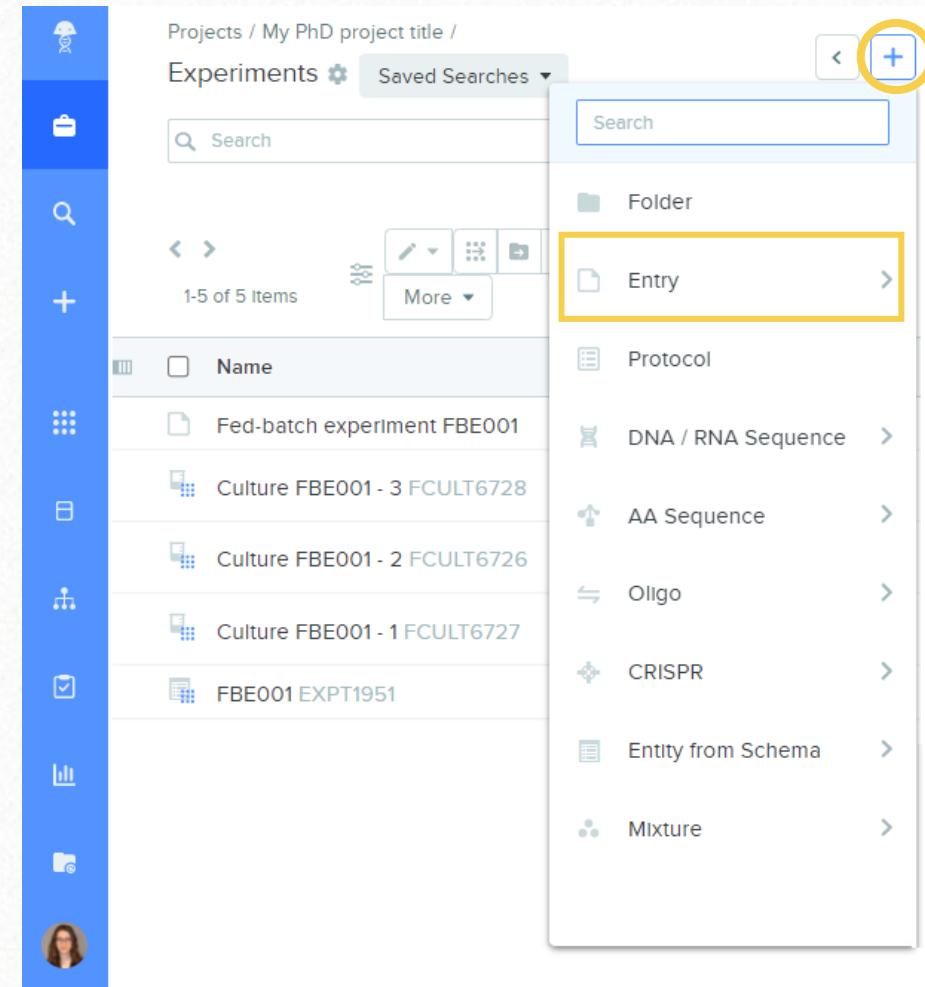
Create your experiment ELN & create samples



Electronic notebook

To create a new Entry:

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



Electronic notebook

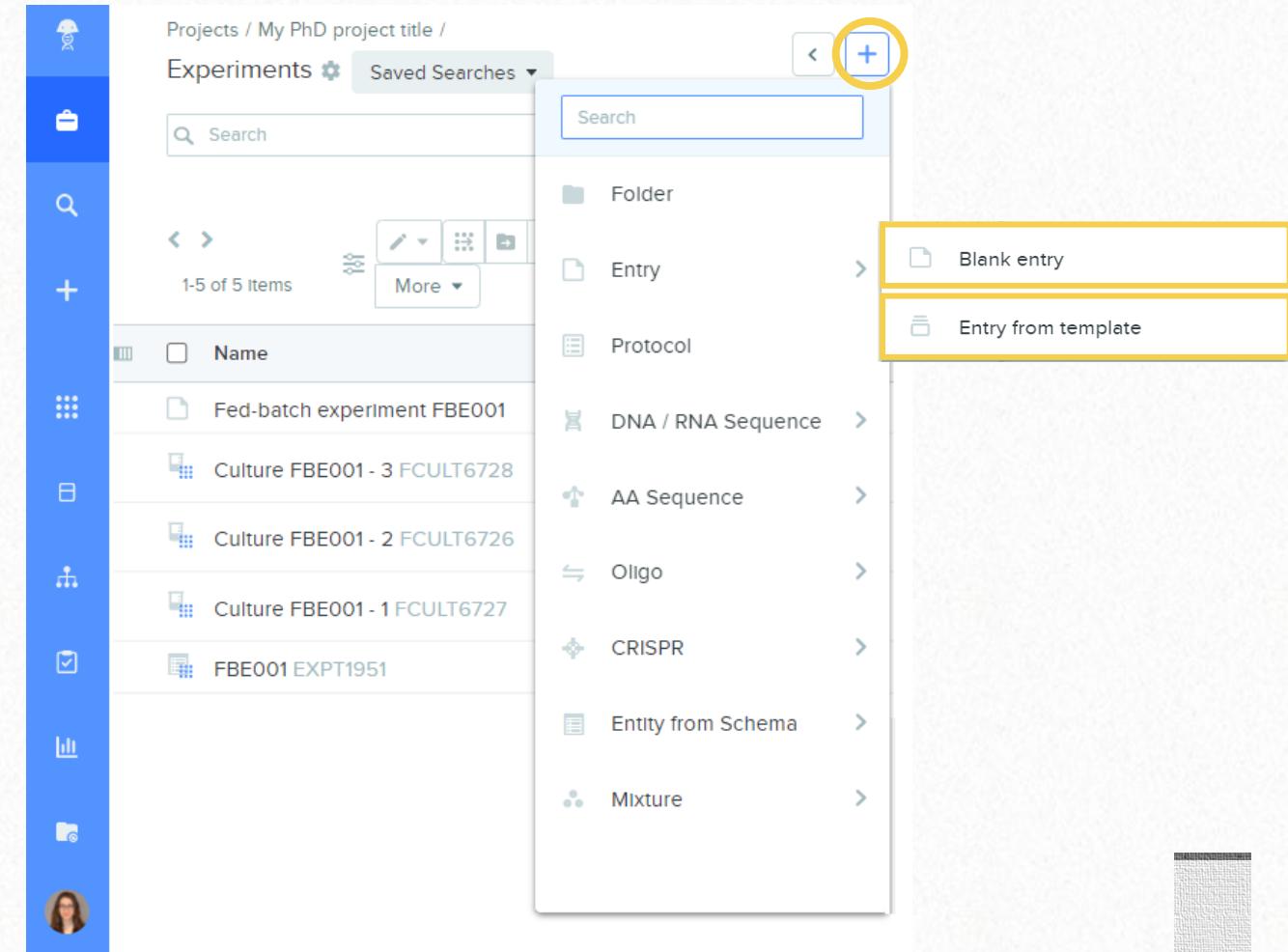
Option 1:

Blank entry

Option 2:

New Entry from Template

--- you can create your own!

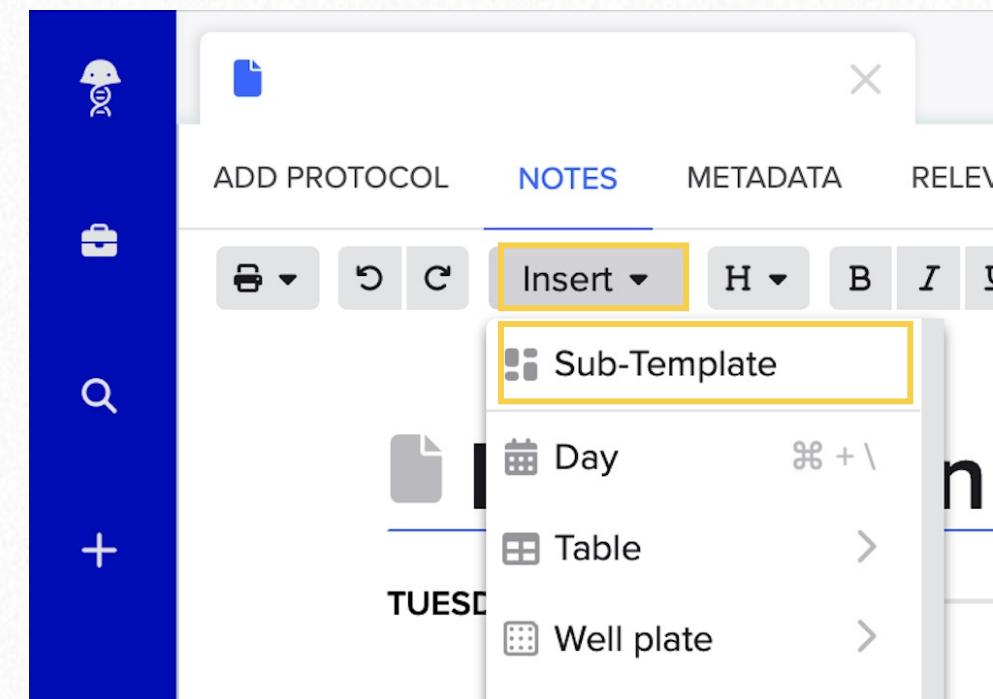


Electronic notebook

Option 3:

Blank entry + Sub-Template

--- you can create your own!

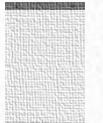
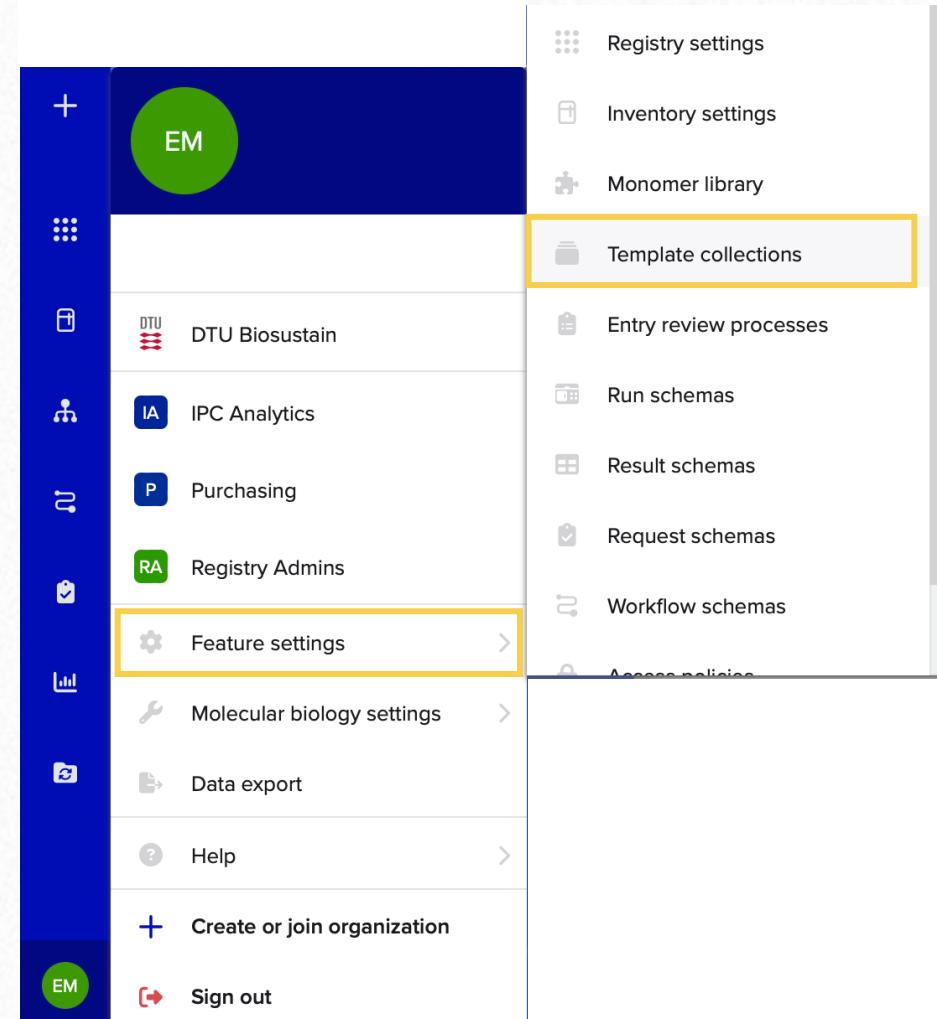


Electronic notebook

To create a Template or a Sub-template:

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

Create your own!



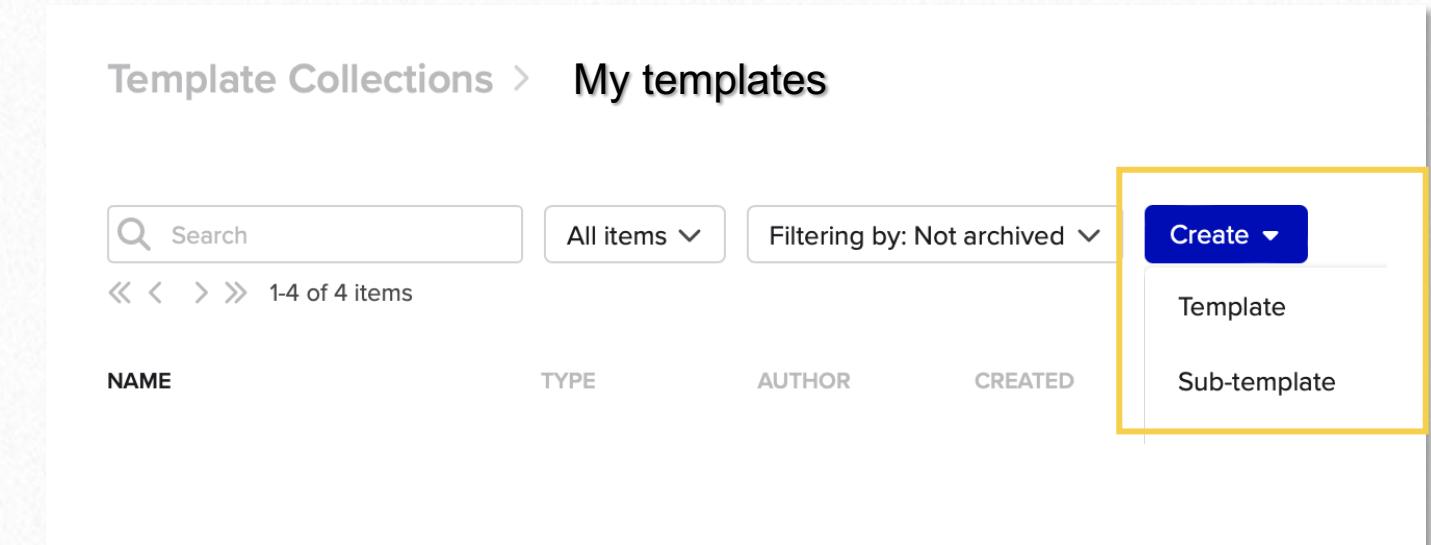


Electronic notebook

To create a Template or a Sub-template:

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

Create your own!



The screenshot shows a user interface for managing templates. At the top, there is a breadcrumb navigation: 'Template Collections > My templates'. Below the navigation are three buttons: 'Search' (with a magnifying glass icon), 'All items ▾', and 'Filtering by: Not archived ▾'. To the right of these buttons is a blue 'Create ▾' button, which is highlighted with a yellow box. A dropdown menu from this button lists two options: 'Template' and 'Sub-template'. The main area displays a table with four columns: NAME, TYPE, AUTHOR, and CREATED. Below the table, there are navigation arrows and the text '1-4 of 4 items'.

NAME	TYPE	AUTHOR	CREATED
(No items)			

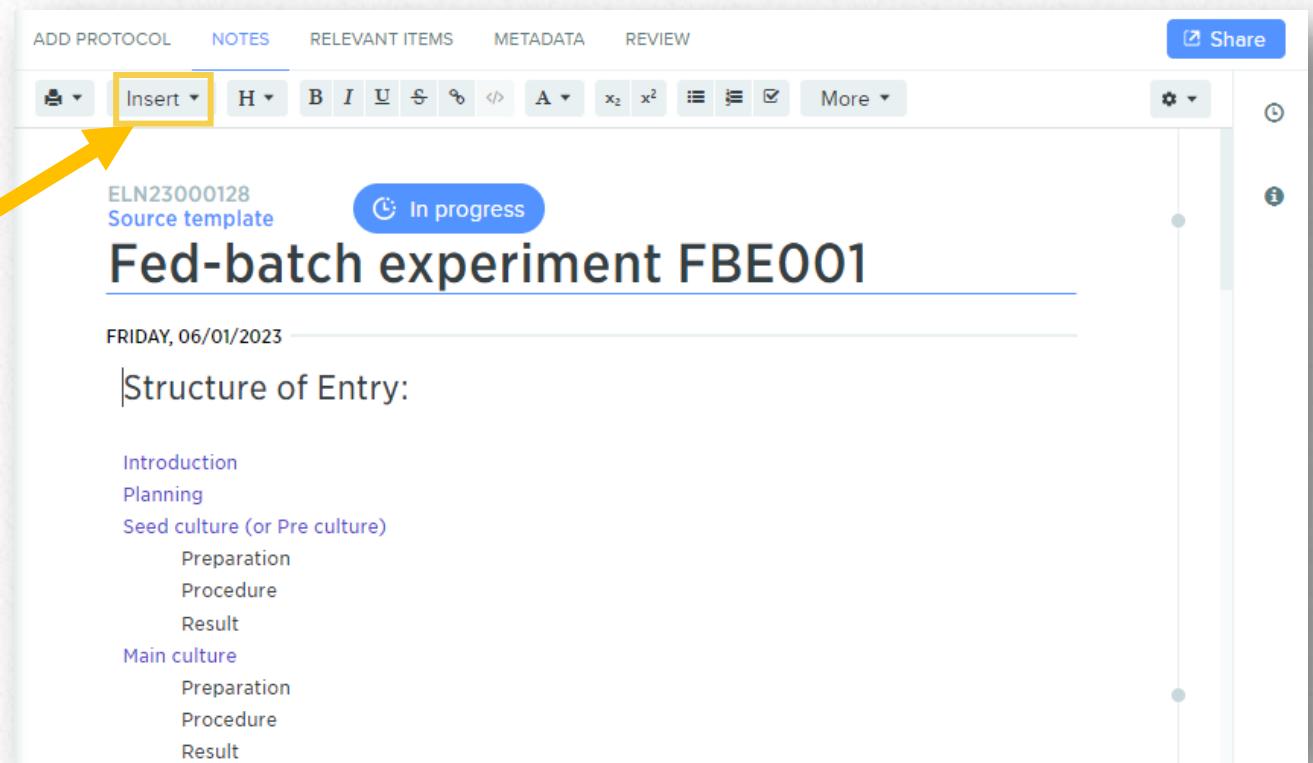


Electronic notebook

In your Entry you can:

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

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



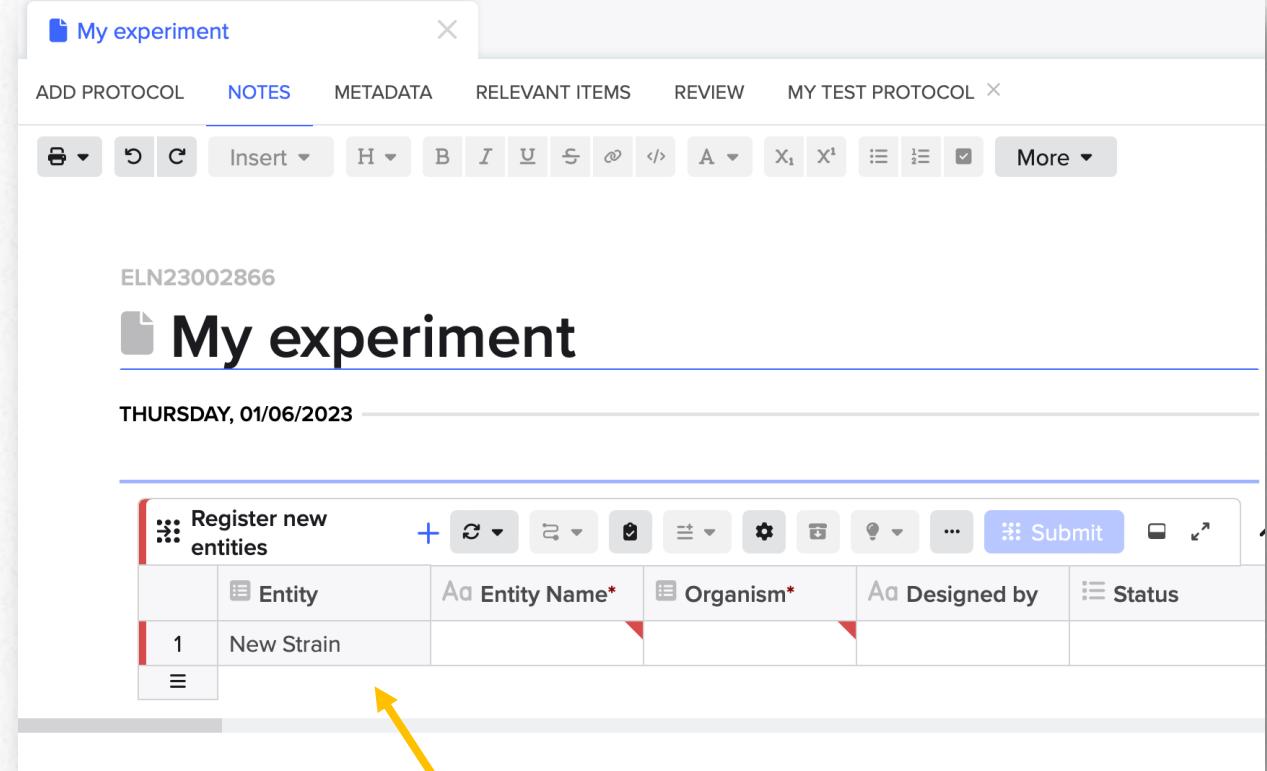
The screenshot shows a software interface for an electronic notebook. At the top, there's a toolbar with various icons and buttons. One button, labeled 'Insert', is highlighted with a yellow arrow pointing to it. The main area displays a template entry titled 'Fed-batch experiment FBE001'. The entry is dated 'FRIDAY, 06/01/2023' and is in 'In progress' status. Below the title, the text 'Structure of Entry:' is followed by a list of sections: 'Introduction', 'Planning', 'Seed culture (or Pre culture)', 'Preparation', 'Procedure', 'Result', 'Main culture', 'Preparation', 'Procedure', and 'Result'. The entire interface has a clean, modern design with a light gray background.

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 a software interface titled "My experiment". At the top, there are tabs: ADD PROTOCOL, NOTES (which is selected), METADATA, RELEVANT ITEMS, REVIEW, and MY TEST PROTOCOL. Below the tabs is a toolbar with various icons for file operations and text styling. The main area has a header "ELN23002866" and a section title "My experiment". A date "THURSDAY, 01/06/2023" is also present. At the bottom, there is a "Register new entities" table with the following data:

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

A yellow arrow points from the text "A Registration table for strains" to the "Register new entities" table.

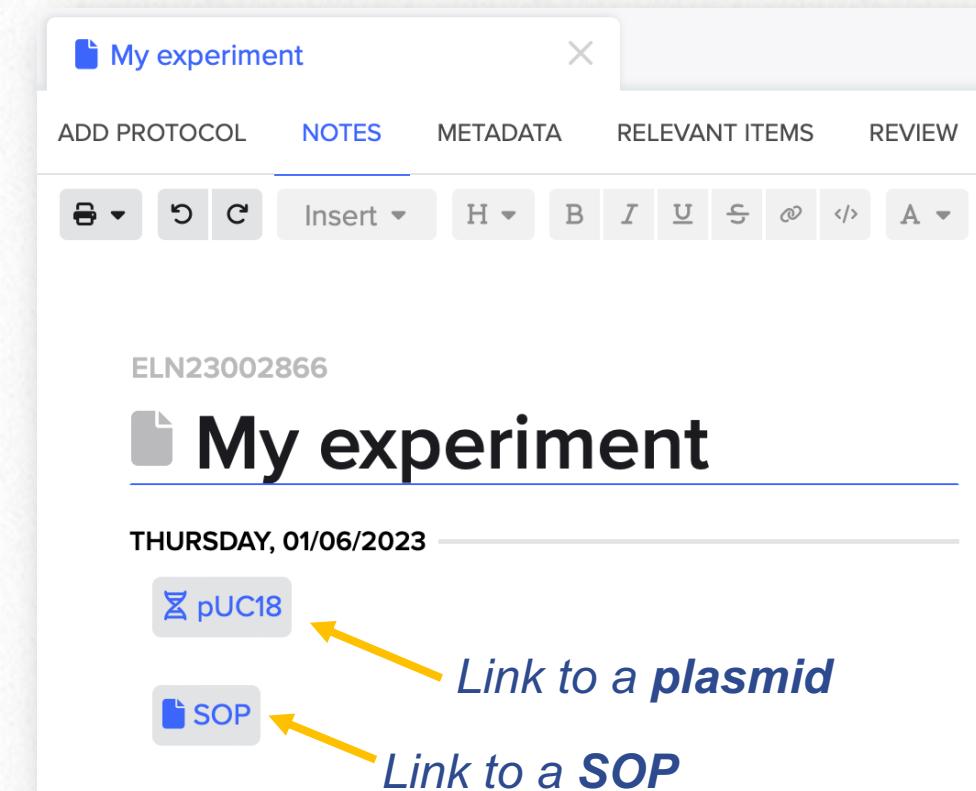
A Registration table for strains

Electronic notebook

In your Entry you can:

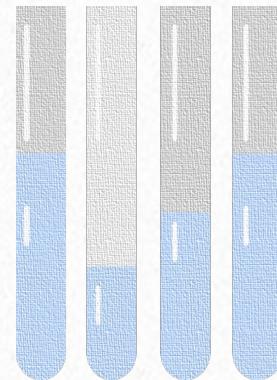
- Tag your plasmids, sequences, etc. (everything that you create)
- Tag another ELN or SOP

To tag an object, type **@...**





Step 3:
**Navigate through
your data**





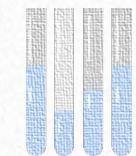
Global search

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

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

The screenshot shows a search interface with the following elements:

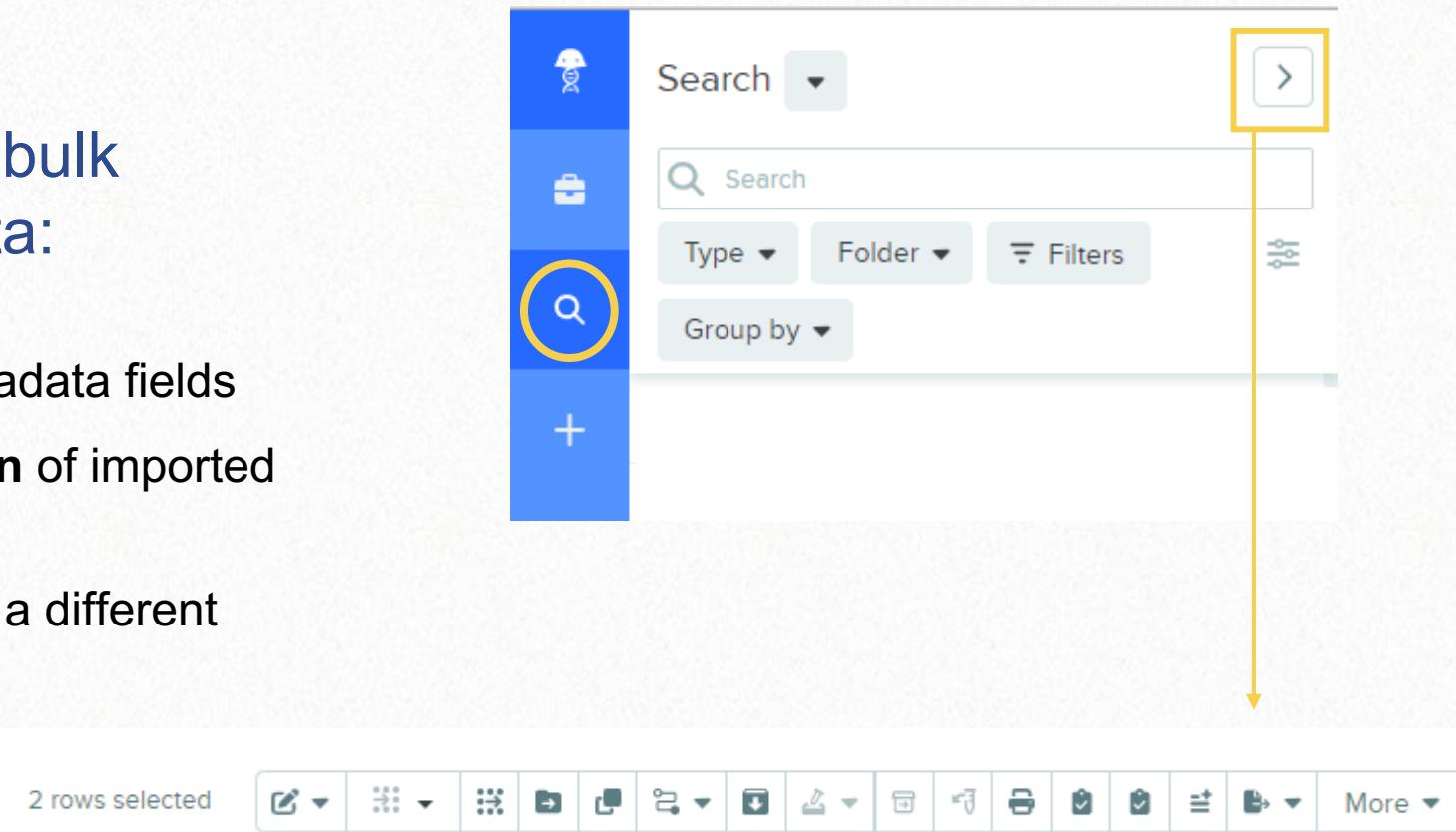
- Search Bar:** A large input field with a magnifying glass icon labeled "Search".
- Filter Buttons:** Three buttons labeled "Type", "Folder", and "Filters".
- Group by:** A button labeled "Group by".
- Search Results:** A list of items under the heading "Filter...". The items are:
 - None (selected)
 - LIMS administration biosustain
 - LIMS administration - shared biosustain
 - My PhD project title biosustain
 - Purchasing system - Processed Orders & Suppliers biosustain
 - Registry biosustain
- Data Type Dropdown:** A dropdown menu titled "Search" with the following options:
 - Any type
 - Project or Folder
 - Entity
 - Entry
 - Workflow Task Group
 - Workflow Task
 - Protocol
 - Container
 - Plate
 - Box



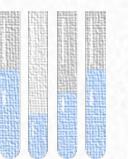
Global search

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**

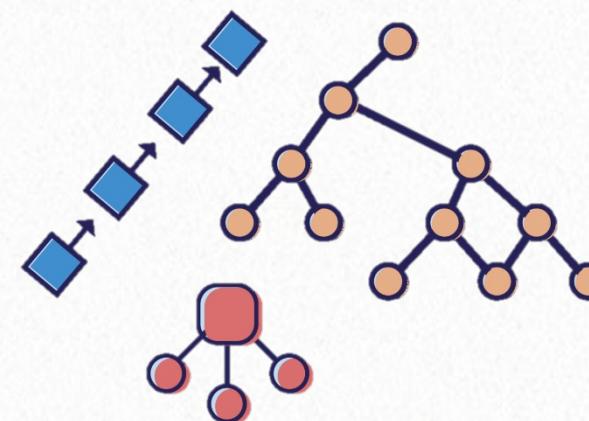


The screenshot shows a user interface for a global search. On the left, there is a vertical sidebar with icons for user profile, search, and other functions. The main area has a header with a search bar, type, folder, filters, and group by dropdowns. A large orange arrow points from the 'bulk archive' section of the text above down to the 'More' button in the toolbar at the bottom, which is highlighted with a yellow box. The toolbar contains various icons for file operations like edit, delete, and transfer.





Benchling entities: what you need to know



Registering entities: what to consider

1. Entities can store different information

Entity types that can store:

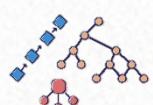
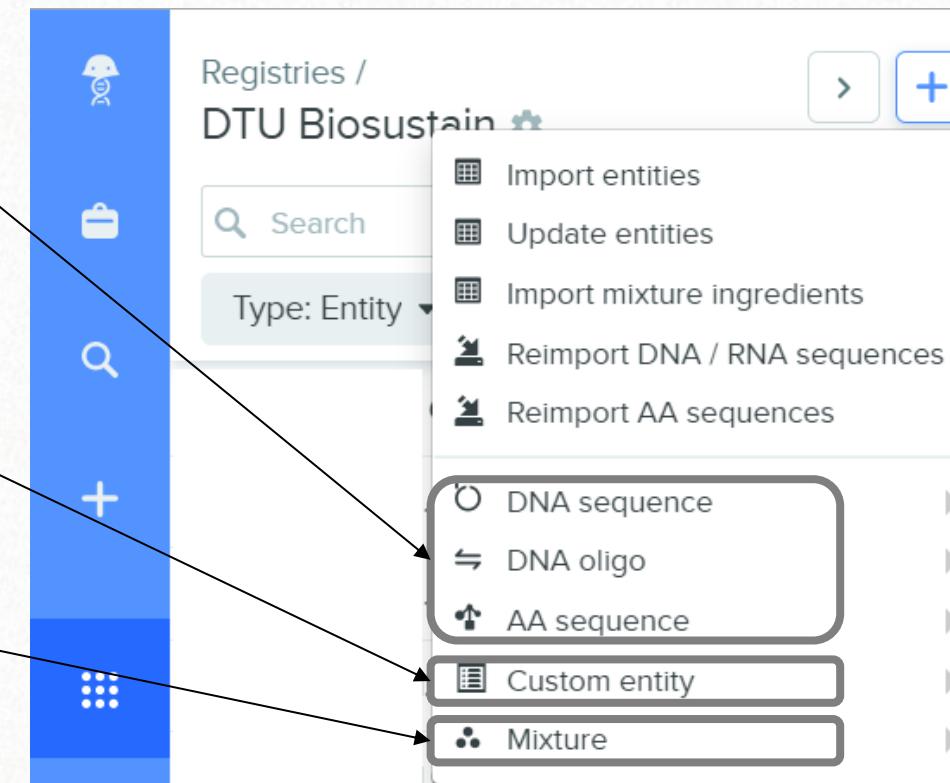
- metadata
- a sequence

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

Training plasmid esterm

SEQUENCE MAP

BsaXI TfiI PvuII

gcccccaatacgcaaaaccgcctcccccgcgtggccattatcataatgcacgtggcacaggtttcccg
cgccgggttatgcgtttggccgagagggggcgcaaccggtaagaattactgcgtacgtgttccaaaggcc

10 20 30 40 50 60 70

actggaaagcggcagtggcgcaacgcaattaatgtgagtttagctcactcattggcacccaggctttacac
tgacccttcggccgtactcgcgttgcttaatttactcaatcgagtggataatccgtgggtccgaaatgt

80 90 100 110 120 130 140

ttagatgttccggctgtatgttgtgaatttgtgagccgataacaatttacacaggaaacagctatggcca
aatatacgaaaggccgaggataacaacacactttaacactcgccattgttaaagtgtgccttttgcatactgtt

150 160 170 180 190 200 210 220

LacO M13-rev

HindIII BspMI BfuAI SphI PstI SalI AccI XbaI BamHI SmaI KpnI SacI HincII TspMI BsoBI XmaI AvI Acc65I EcoRI ApoI BanII Eco53kI BceAI BmrI

230 240 250 260 270 280 290

tzattacgccaagcttgcattgcctgcaggctgactctagaggatccccggatccggatcgatcgatggcc
actaatgcgttgcacgtacggacgtccagctgagatctcttagggccatggctcgatctaattgtggcc

300 310 320 330 340 350 360 370

M1...d

Training plasmid esterm Registry

Authors Ester Milesi

Project Location New Users Training

Registry IDs PL7248 DTU Biosustain

Created 04/04/2022 14:07

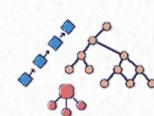
Aliases +

This entity has no aliases.

Schema Plasmid

Cannot change schema of registered entities

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





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

Mixture

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 Created
MEDIUM1420 DTU Biosustain

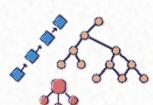
Aliases +
This entity has no aliases.

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

Enter text here or type / to insert

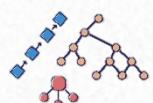
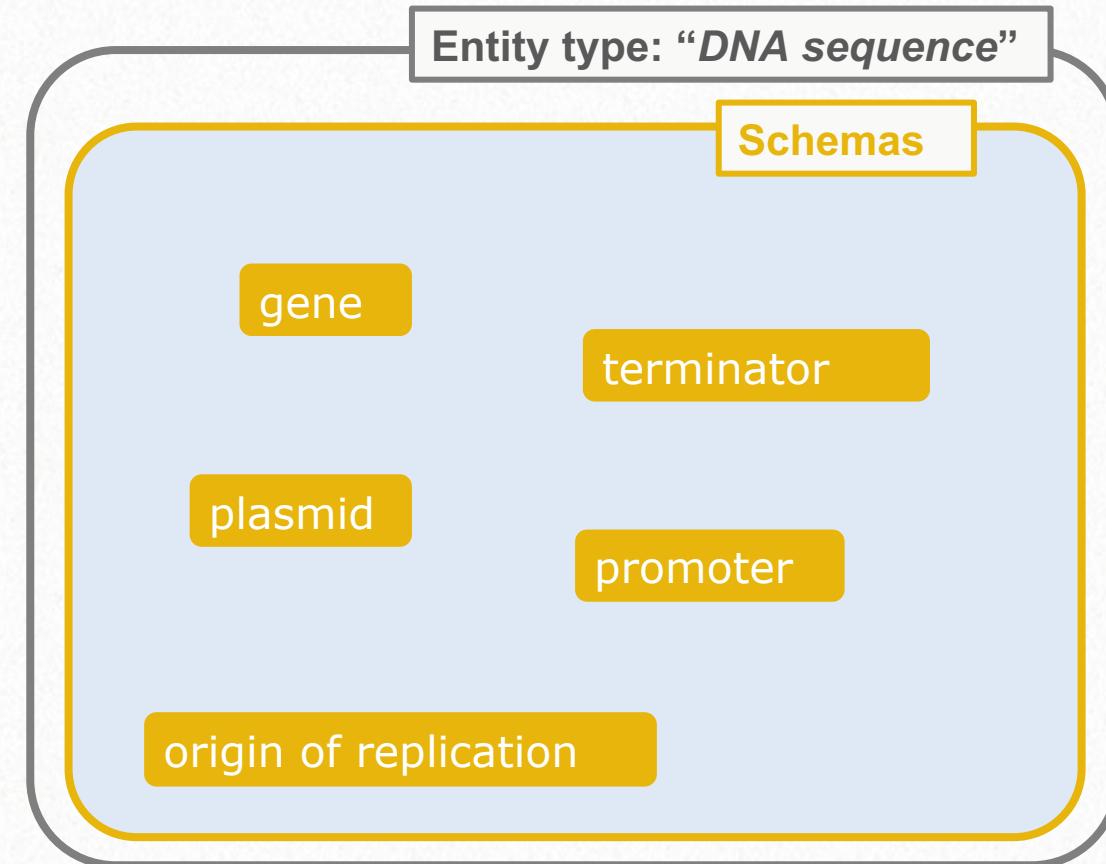


Registering entities: what to consider

2. Entities are assigned a “schema”

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

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

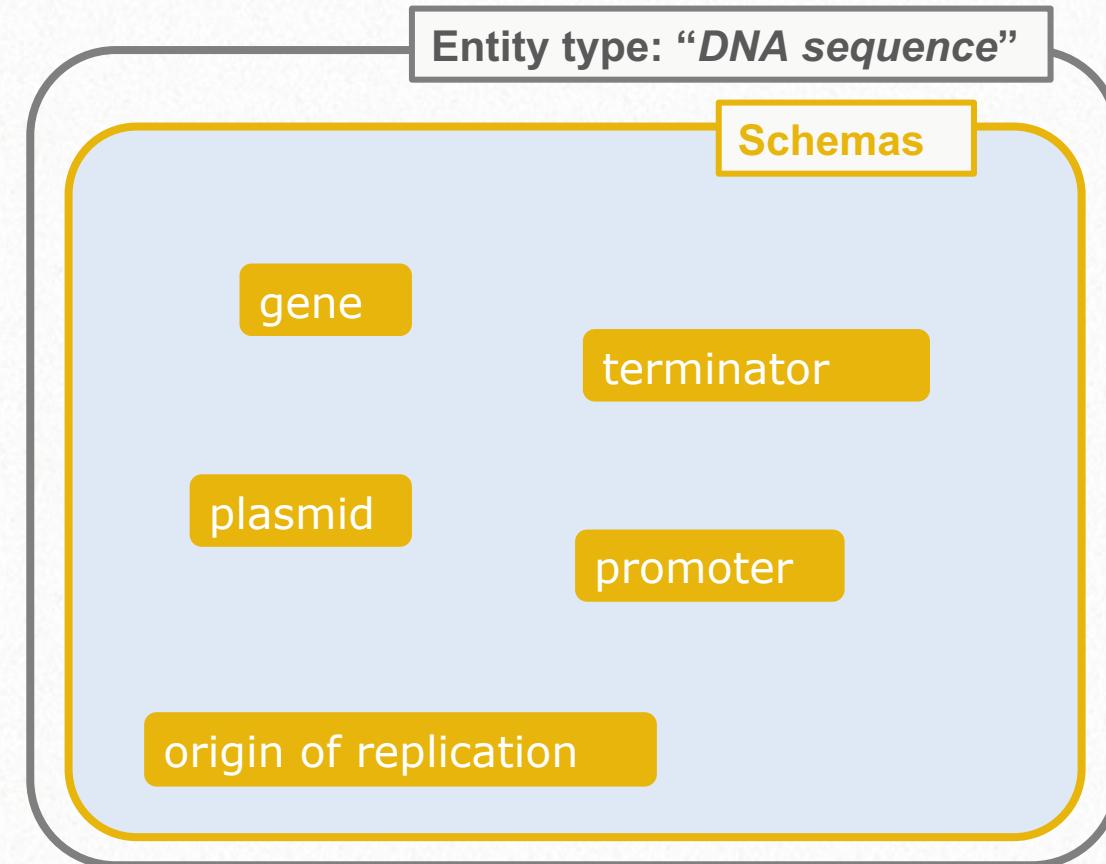


Registering entities: what to consider

2. Entities are assigned a “schema”

A schema specifies:

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

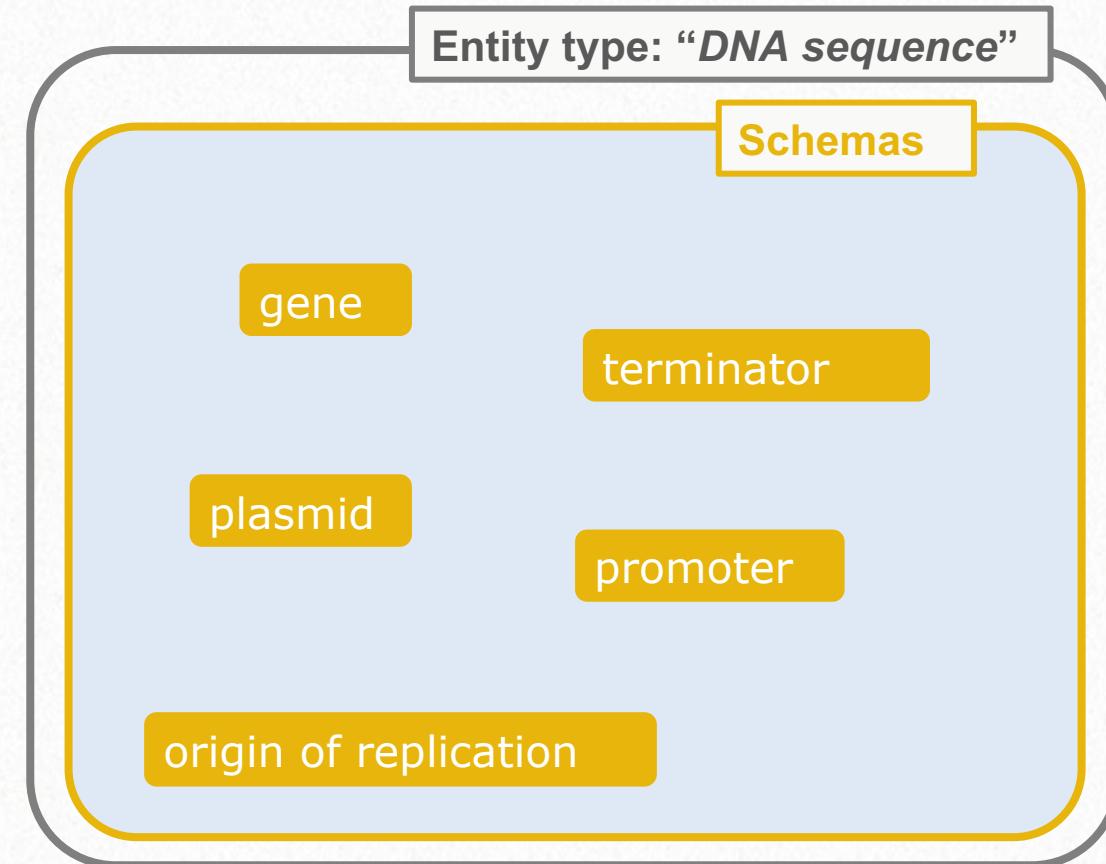


Registering entities: what to consider

2. Entities are assigned a “schema”

A schema specifies:

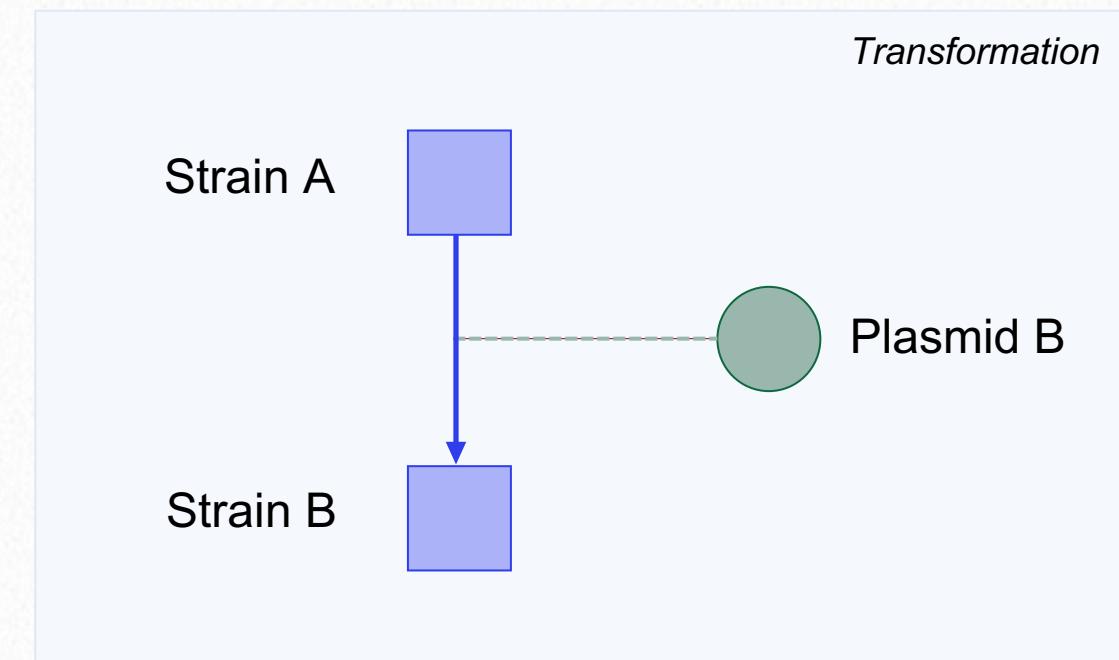
- sample type
- required information to fill-in
- links to other schemas



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”

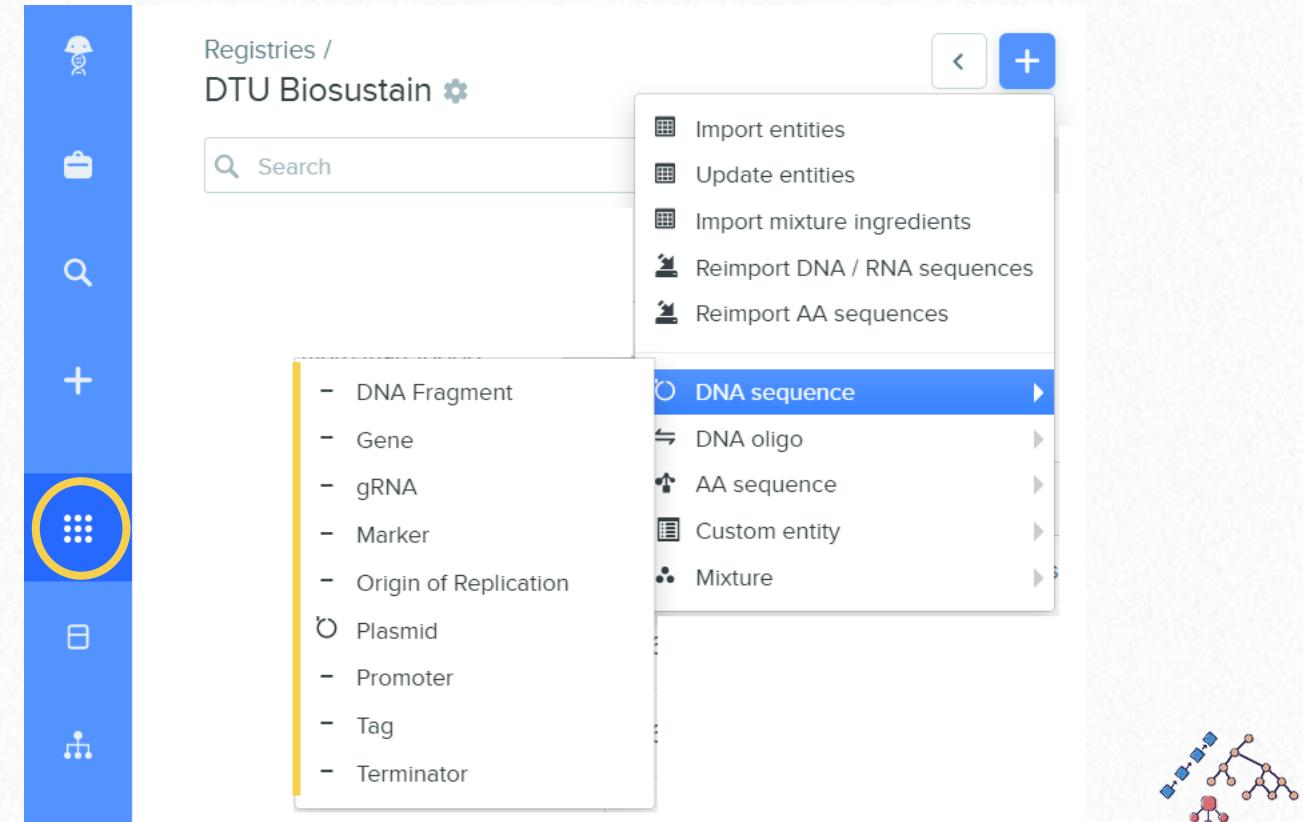


Registering entities: what to consider

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**”



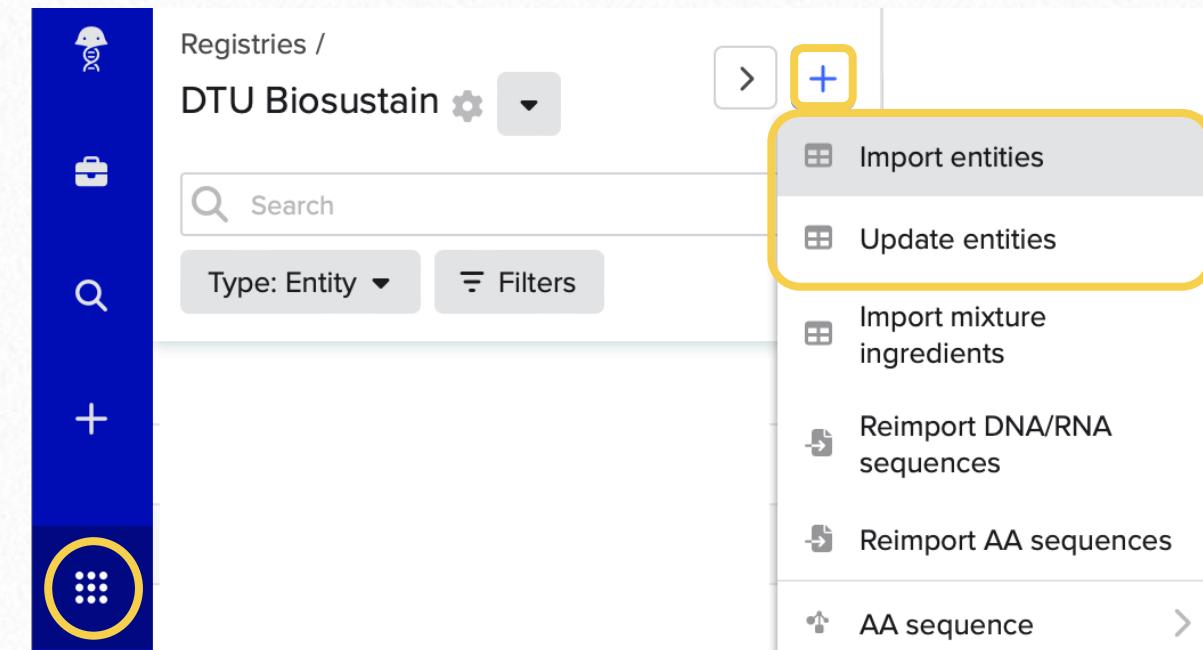
Registering entities: what to consider

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)



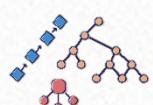
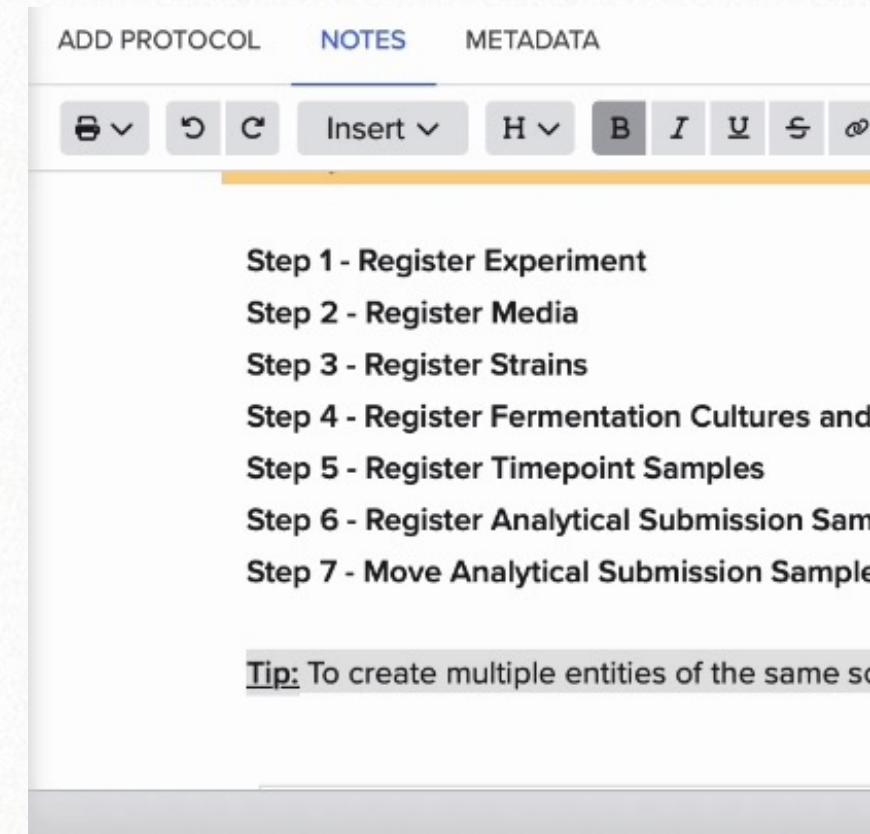
Registering entities: what to consider

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



Registering entities: what to consider

4. Some entities have “batches” schemas

Batches = physical samples

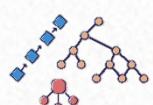
- When storing your sample long-term, create **batches** in **Benchling**
- This helps your team to track where samples are stored

Plasmid

Strain

Plasmid batch

Strain batch

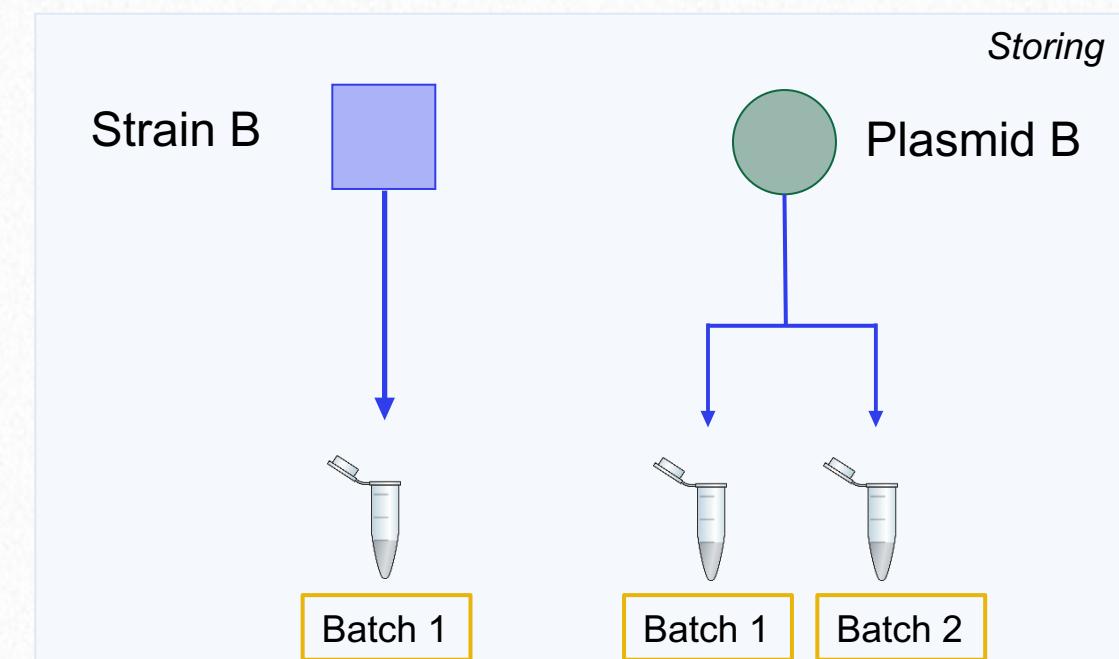


Registering entities: what to consider

4. Some entities have “batches” schemas

Batches = physical samples

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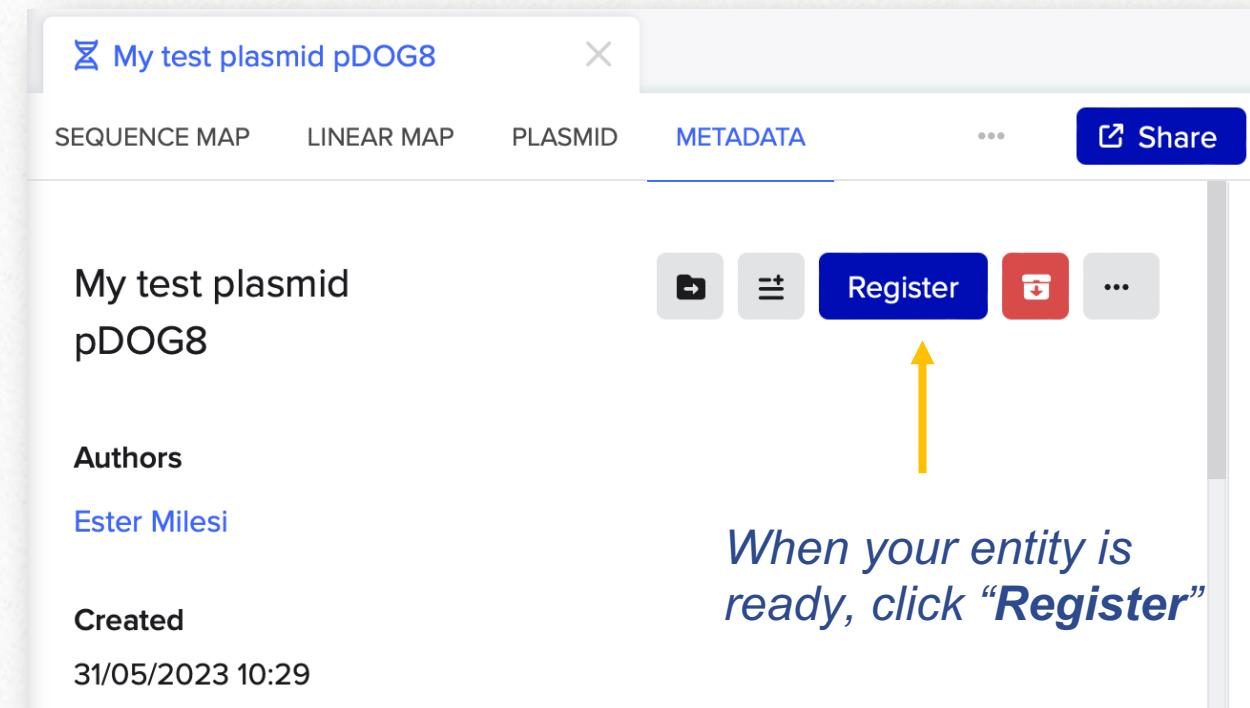


Registering entities: what to consider

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



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:

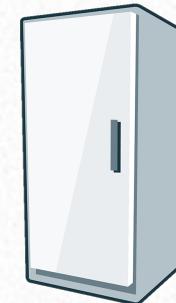
- ✓ **Re-organize** your registered samples and entries and **give access** to your team
- ✓ Register **important strains/other samples** and their **location**, and print the label for the Box before moving it in the freezer





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

The screenshot shows the Benchling inventory interface. On the left is a blue sidebar with icons for User, Location, Sample, and Plate. The main area has a header 'Storage / DTU Biosustain' with a search bar and filters for 'Type: Location' and 'Barcode'. A button labeled 'Create new box/plate/vial' with a plus sign is highlighted with a yellow box and arrow. Below is a list of results: '1159 results' and 'Clear'. The list includes: '4C Fridge 00271 4C002', '4C Fridge DSP1 4C003', '4C Fridge DSP2 4C004', and '4C Fridge ANALYTICS 4C005'.



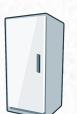
The Inventory

Storable samples include:

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

A screenshot of a software interface for managing biological samples. At the top, there's a toolbar with various icons: a blue arrow pointing right, "Create new containers", "Vial 2", a blue plus sign, and other standard file and application icons. Below the toolbar is a table with four columns: "Destination Position*", "Destination Container", and "# Quantit". A tooltip box is overlaid on the table, containing the text "Value error Entity is not configured for Inventory". In the table, the first row shows a value of "1" in the first column, "Strain 1" in the second, "Box 1" in the third, and "A1" in the fourth. The fifth column is partially visible with "(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

	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
2 A2	Training vial fc	40 uL

Position 2 (A2)

Barcode: VIAL25349 Quantity: 40 uL
No contents in Position 2 (A2).



Lastly: Archiving

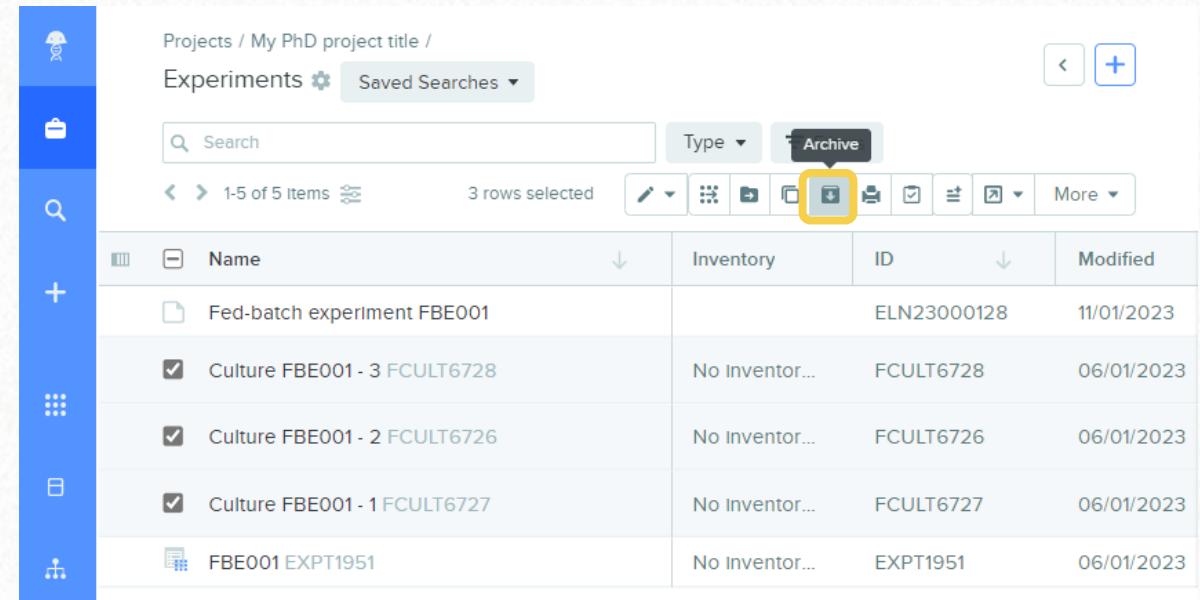


Archiving entities

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 a software interface for managing experimental data. On the left is a vertical blue sidebar with icons for user profile, search, add, and other functions. The main area has a header "Projects / My PhD project title / Experiments" with "Saved Searches" dropdown. Below is a toolbar with "Search", "Type", "Archive" (which is highlighted with a yellow box), and other icons. A message "1-5 of 5 items" and "3 rows selected" is displayed. The main table has columns "Name", "Inventory", "ID", and "Modified". The data is as follows:

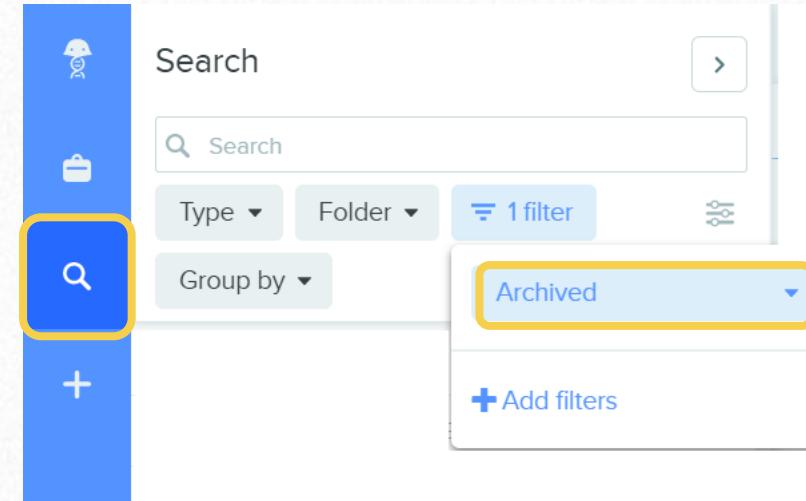
Name	Inventory	ID	Modified
Fed-batch experiment FBE001		ELN23000128	11/01/2023
Culture FBE001 - 3 FCULT6728	No Inventor...	FCULT6728	06/01/2023
Culture FBE001 - 2 FCULT6726	No Inventor...	FCULT6726	06/01/2023
Culture FBE001 - 1 FCULT6727	No Inventor...	FCULT6727	06/01/2023
FBE001 EXPT1951	No Inventor...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

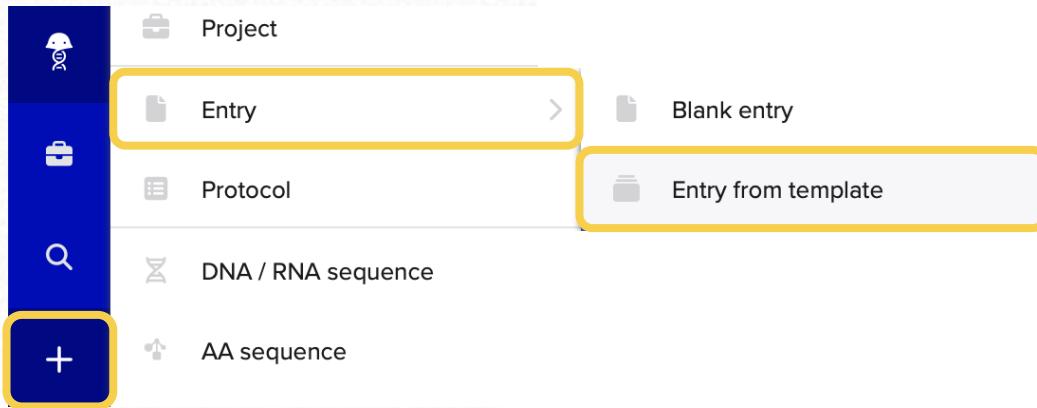
~ 30 min

Hands-on

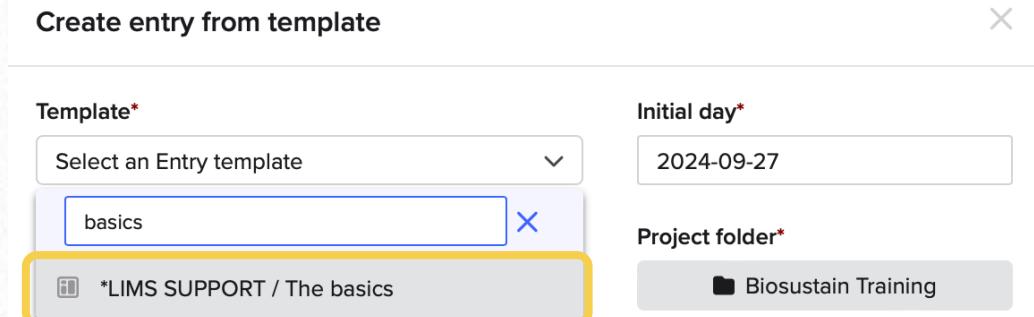
~ 15 min

Explore the Notebook functionalities

1 CREATE ENTRY FROM TEMPLATE

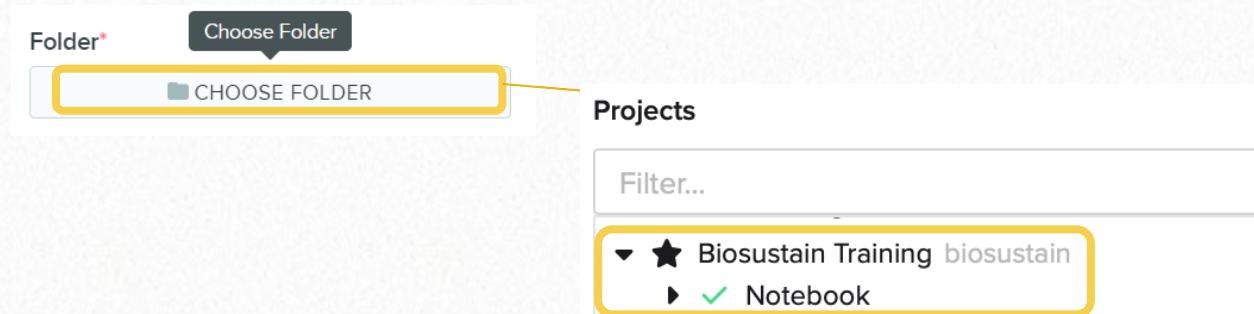


2 CHOSE "THE BASICS" TEMPLATE



The dialog box has fields for 'Template*' (set to 'Select an Entry template') and 'Initial day*' (set to '2024-09-27'). The 'Project folder*' field is set to 'Biosustain Training'. The 'basics' template is selected in the dropdown. A blue circle with the number 2 is positioned above the 'Template*' field. The 'basics' template is highlighted with a yellow box.

3 SAVE IT IN THE BIOSUSTAIN TRAINING FOLDER





Questions?

