

# Electronic Laboratory/Field Notebooks (ELN)

Marek Cebecauer

J. Heyrovsky Institute of Physical Chemistry

Czech Academy of Sciences



Spolufinancováno  
Evropskou unií



MUNI  
ICS

Registrační číslo IPs EOSC-CZ  
CZ.02.01.01/00/22\_004/0007682

(DNR/11)

24/1/96 Test of Pfu polymerase for adding of any base to the 3' end of product

I. 3 SYSTEMS (1) PCR with Taq polymerase  
 a 4 TUBES (2) and (3) PCR with Pfu polymerase

- the PCRs were done as usually (for Pfu was used 74°C, 1' elongation)
- add to the 4 tubes were collected and treated 1x phenol-chloroform  
 1x 2-intact precipitation

**ADDITIONAL:** SYSTEM (3) only

reaction with 1 $\mu$ l T4 polymerase (NEB, ) was done  
 2 $\mu$ l 10x T4 pol buffer  
 and DNA in total volume: 20 $\mu$ l 37°C 20'

→ the sample was used for cleavage with EcoI without cleaning

II. Cleavage with EcoI, separation on gel. ~~cutting~~ cleaning

ELTo:  
2h

The same as HT18

CO48-PCR sample

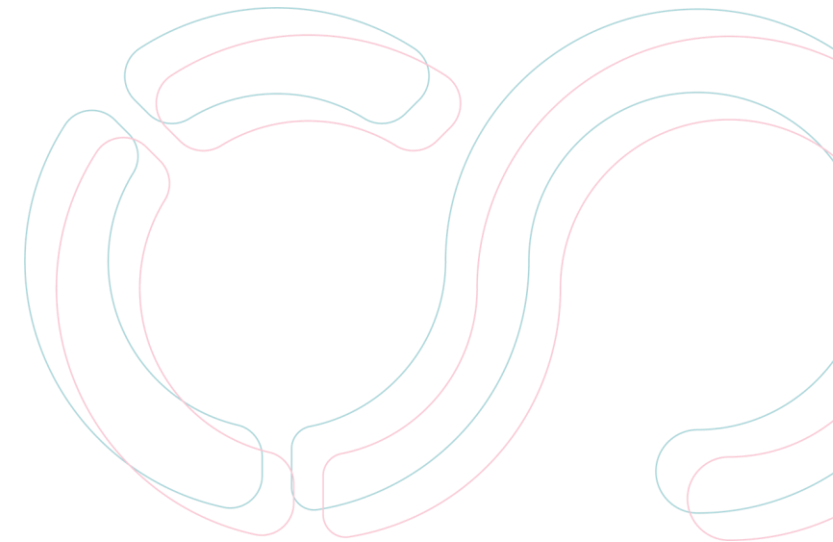
The same as HT18

separately cutted off

HT17 HT18 HT18 HT18

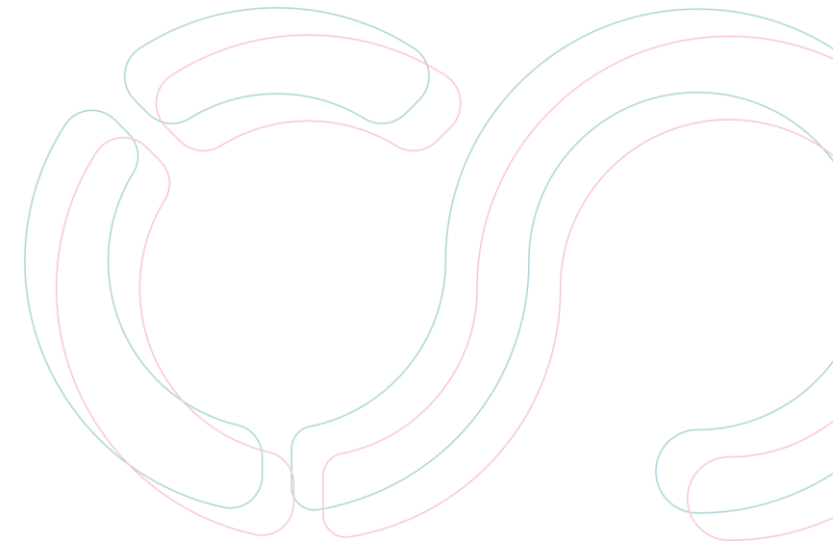
25/1/96 I. Elution of samples (CO48) from gel ligation and transformation of K803 cells for subcloning to pCO48-H21

- the samples from the gel were eluted separately as in "Extraction of DNA samples from LTP (1%) gel"
- all samples were washed 3x 70% EtOH and resuspended in 20 $\mu$ l H<sub>2</sub>O



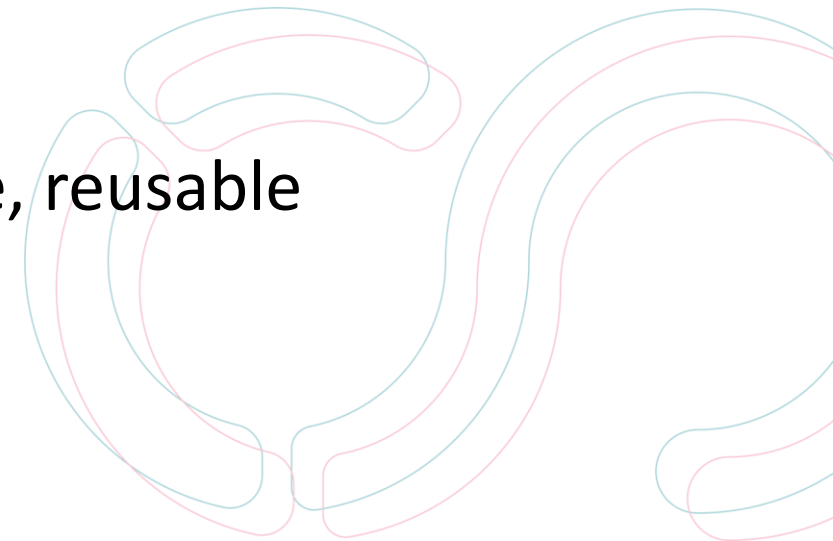
# Outline

- What is an electronic laboratory/field notebook – ELN?
- Why to use ELN?
- Which ELN is good for me?
- Comparison of selected ELNs
- Examples of use
- **Questions/Discussion**



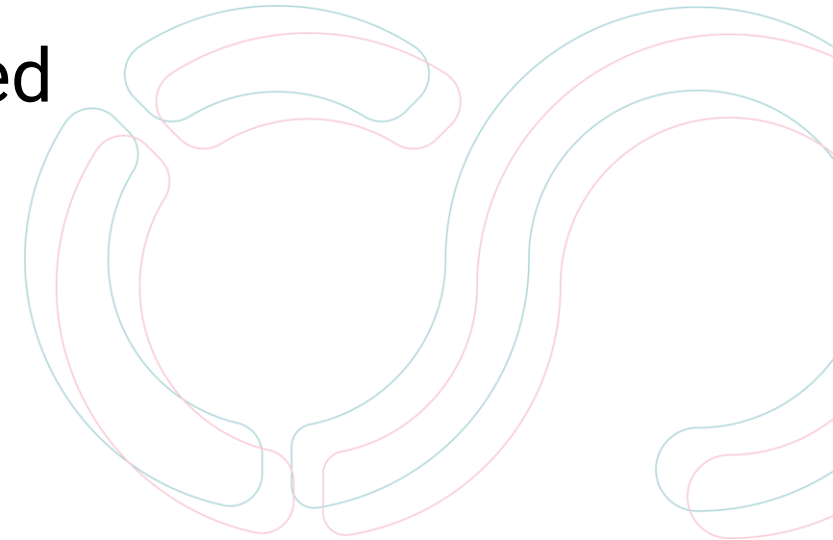
# Routine abbreviations

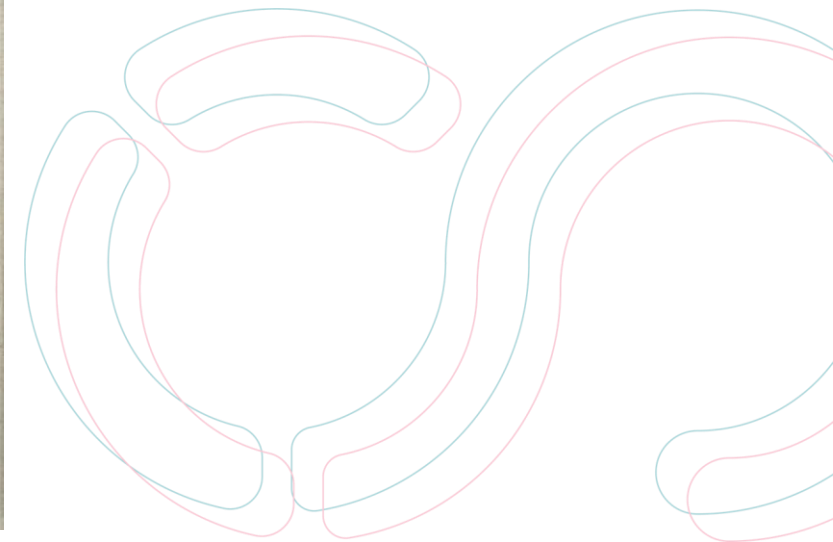
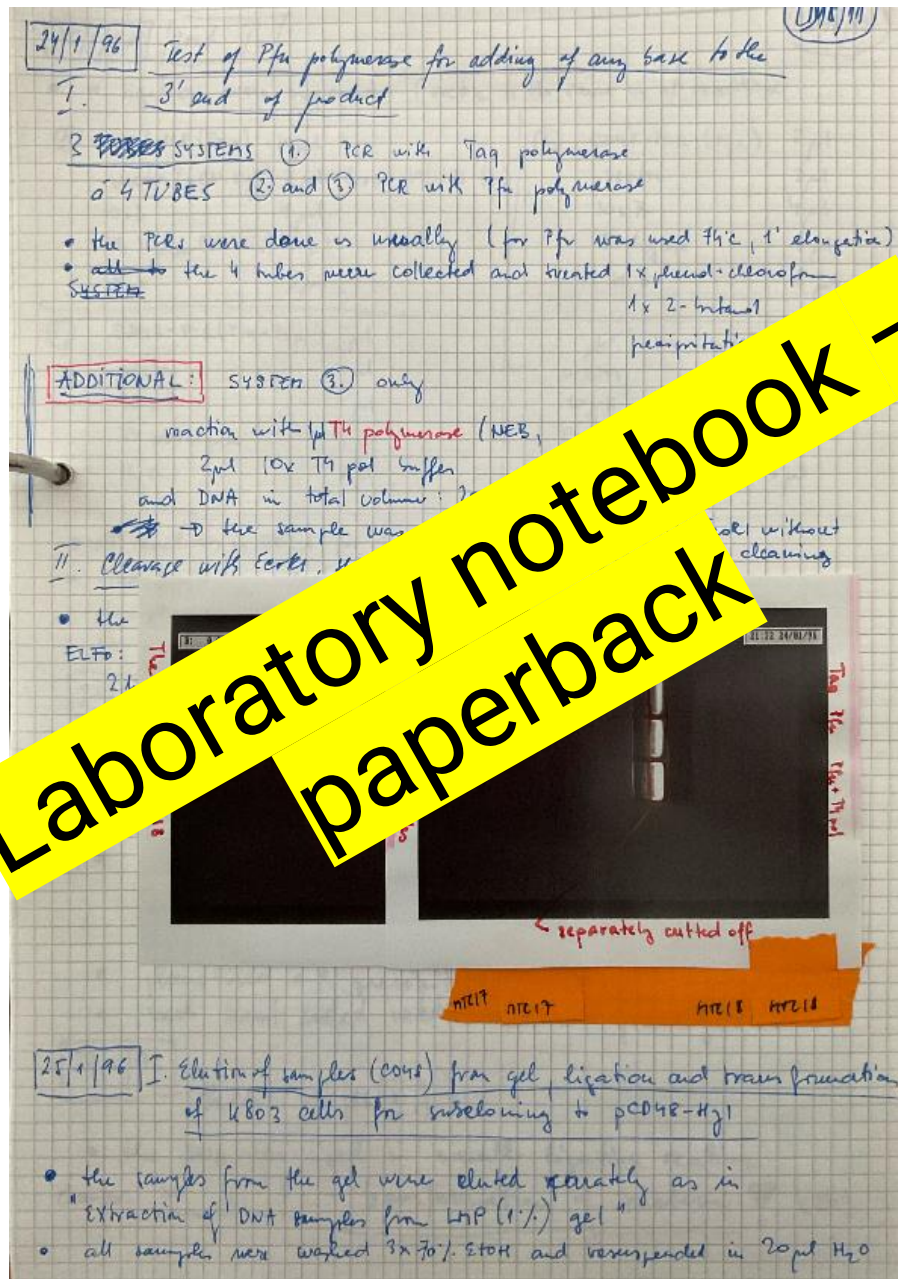
- Electronic laboratory (field) notebook (ELN)
- Laboratory Information Management System (LIMS)
- Research Data Management (RDM)
- National Repository Platform (NRP)
- FAIR principles .... Findable, accessible, interoperable, reusable
- Machine-actionable (MA)

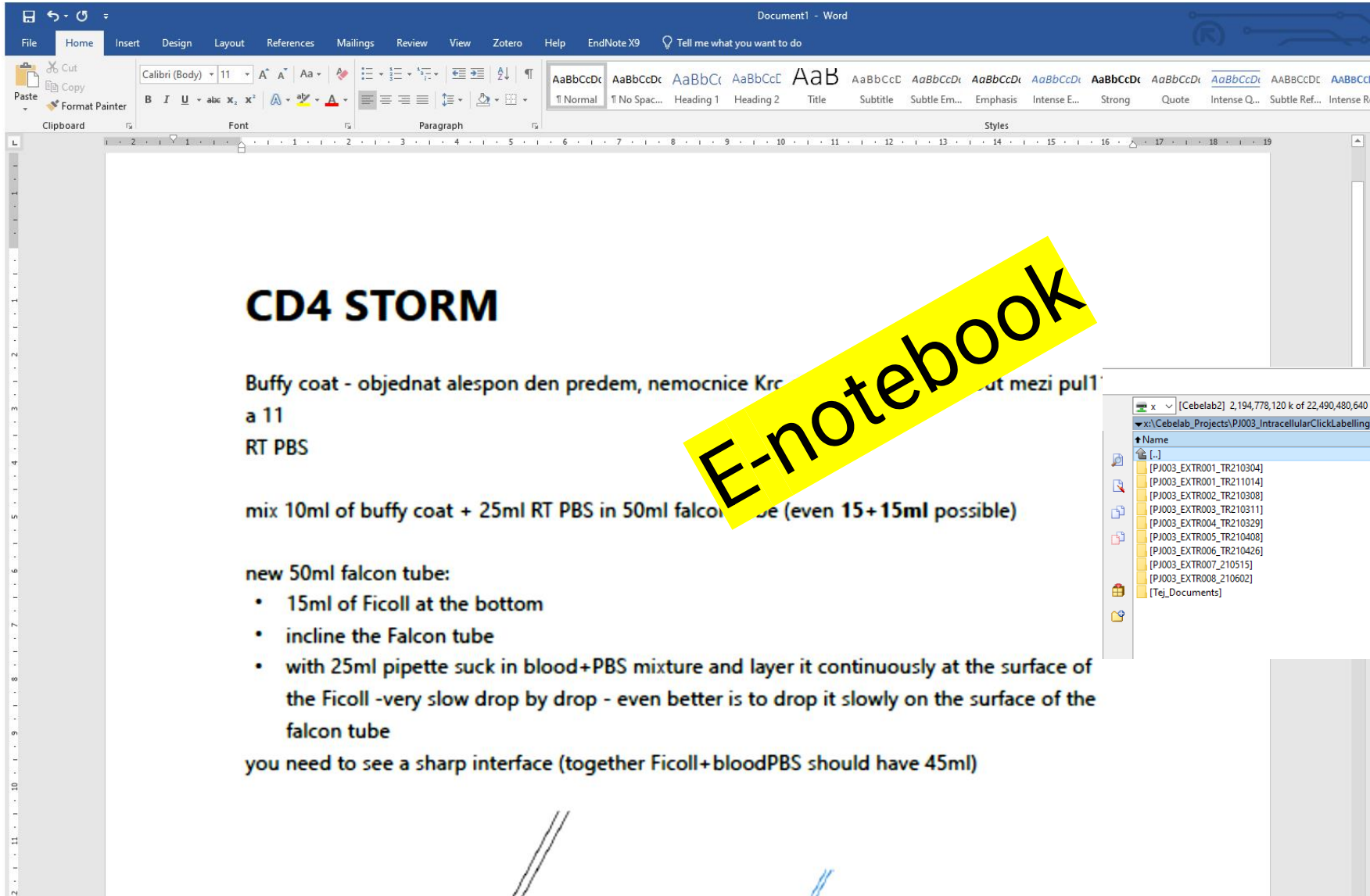


# Scientific notebook styles

- Paperback notebook
- Electronic notebook (e-notebook)
- Electronic laboratory (field) notebook – standard
- Electronic laboratory (field) notebook – advanced
- Inventory / LIMS







Document1 - Word

File Home Insert Design Layout References Mailings Review View Zotero Help EndNote X9 Tell me what you want to do

Calibri (Body) 11 A<sup>+</sup> A<sup>-</sup> Aa Font Paragraph Styles

# CD4 STORM

Buffy coat - objednat alespon den predem, nemocnice Krc... ut mezi pul1

a 11

RT PBS

mix 10ml of buffy coat + 25ml RT PBS in 50ml falcon tube (even 15+15ml possible)

new 50ml falcon tube:

- 15ml of Ficoll at the bottom
- incline the Falcon tube
- with 25ml pipette suck in blood+PBS mixture and layer it continuously at the surface of the Ficoll -very slow drop by drop - even better is to drop it slowly on the surface of the falcon tube

you need to see a sharp interface (together Ficoll+bloodPBS should have 45ml)

E-notebook

[Cebelab2] 2,194,778,120 k of 22,490,480,640 k free

Name	Ext	Size	Date
[.]			
[PJ003_EXTR001_TR210304]	<DIR>		21/06/2022 13:22
[PJ003_EXTR001_TR211014]	<DIR>		28/08/2022 12:44
[PJ003_EXTR002_TR210308]	<DIR>		01/11/2021 12:32
[PJ003_EXTR003_TR210311]	<DIR>		28/08/2022 12:59
[PJ003_EXTR004_TR210329]	<DIR>		28/08/2022 13:07
[PJ003_EXTR005_TR210408]	<DIR>		28/08/2022 18:52
[PJ003_EXTR006_TR210426]	<DIR>		28/08/2022 19:10
[PJ003_EXTR007_210515]	<DIR>		28/08/2022 20:43
[PJ003_EXTR008_210602]	<DIR>		28/08/2022 20:46
[Tej_Documents]	<DIR>		29/08/2022 21:18
	<DIR>		28/08/2022 11:51

Danca UMG notebook - Evernote

File Edit View Note Window Tools Help

Marek Cebecauer  
mcebecau@gmail.com

83 notes

Stay up to date!  
You have 7 unread notifications

Search

Note Task Event

Evernote is ready to update!  
Click to restart

Tasks Files Calendar

Notebooks

Administration & Import... Collaborations

Daily Notes Danca JHI notebook Danca JHI protocols Danca UMG notebook Danca UMG protocols Ljubi - cloning London RSC Septemb... Marek - Protein sortin... Moje Deti My Lab projects Penultimate Scanner Pro Skitch SwiftKey Notes

Danca UMG notebook > CD4 STORM

View Only Last edited on Sep 2, 2024

file:///C:/Users/Daniela/Down...

### CD4 STORM

Buffy coat - objednat alespon den predem, nemocnice Krc, volat rano, vyzved...

RT PBS

mix 10ml of buffy coat + 25ml RT PBS in 50ml falcon tube

new 50ml falcon tube:

- 15ml of Ficoll at the bottom
- incline the Falcon tube
- with 25ml pipette layer it continuously at the surface of the Ficoll -very slow drop by drop - even better is to drop it slowly on the surface

you need... (Ficoll+bloodPBS should have 45ml)

Blood+PBS

Ficoll

Centrifuge at ROOM temperature (23C) 1250g (2500rpm big eppendorf centrifuge) 30min brake 2

- balance properly

take out of cetrifuge carefully - there is gradient

Expansion microscopy

4x expansion microscopy (Chen et al., 2015; Tillberg et al., 2016) followed by Airyscan laser...

Jul 3, 2020

July 2020

V inkubatoru ve druhych tkanovkach Jurkat cells Katka se vraci v utery 7.7.2020 I. Lck-KO-OTI 253...

Jul 1, 2020

Calcium Flux Using Calcium Green and Fura...

Calcium Flux Using Calcium Green and Fura Red The following protocol is for calcium flux using...

Feb 6, 2020

LAT again

generation of G12L CS EGFP no leader; ligate colony screening...

Jan 14, 2020

To finish GAUK paper

Palmitoylation mutants of P8A and P17A are killing cells. used PP2 inhibitor (10uM is killing all...

Dec 1, 2019

CD4-LATwt...

midi from colony n. 10 (wt) and 29 (cs)

Nov 5, 2019



Google Calendar - Week of 25 Oct 2024  
Neutrophil and its role in immunology  
UFCH JH - Intranet | interni dok...  
STORM CD4 mutant X3

rseln.jh-inst.cas.cz/notebookEditor/640?initialRecordToDisplay=755

Google Calendar SVI FGU bookmarklet Save as PDF JHI Science Travel Family News Fun Administration Commercial Sites Namidas Project HeyRACK and HOST NRP EOSC CZ a MATECH RDA/EOSC Other Bookmarks

Workspace Gallery Messaging Apps Inventories

Last Modified Descending

CREATE

Home / Hard Work / STORM CD4 mutant X3

Show All Entries

Name: STORM CD4 mutant X3

Tags: CD4 STORM click

Search Notebook... Unique ID: SD755

Buffy coat - obtained from heparinized blood by centrifugation on a 10% Ficoll-pul11 a 11

at the bottom of the tube

25ml pipette suck in blood+PBS mixture and layer it continuously at the surface of the Ficoll -very slow drop by drop - even better is to drop it slowly on the surface of the falcon tube

you need to see a sharp interface (together Ficoll+bloodPBS should have 45ml)

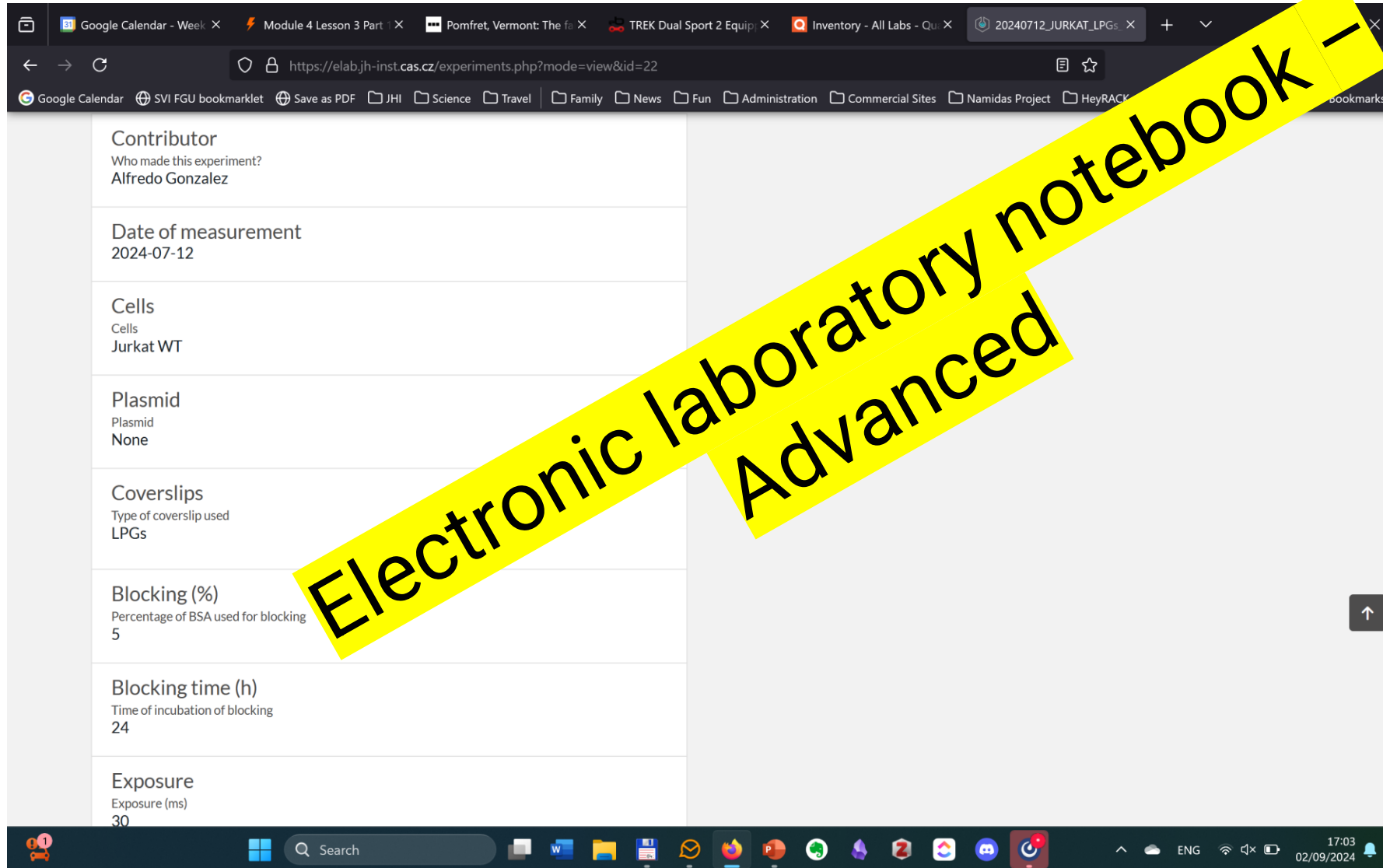
Centrifuge at ROOM temperature (23C) 1250g (2500rpm big eppendorf centrifuge) 30min brake 2 - balance properly

take out of centrifuge carefully - there is gradient

The screenshot shows a web browser window with the URL `https://elab.jh-inst.cas.cz/experiments.php?mode=view&id=22`. The page title is "Experiments > Viewing an entry". A navigation bar at the top includes "eLabFTW", "EXPERIMENTS", "RESOURCES", "TEAM", "SEARCH", and "DOCUMENTATION". A "Create" button is visible in the top right. The main content area shows an experiment entry with the following details:

- Owned by Alfredo Gonzalez
- Started on 2024-07-16
- Experiment ID: 20240712\_JURKAT\_LPGs\_CD54\_StrCy5 I
- Team: Cebecauer
- Category: LPGS COVERSIPS
- Status: SUCCESS
- Tags: Alfredo's Pojects, LPGs
- Visibility: Only members of the team
- Can write: Only owner and admins
- Next Step: Transfection (Optional)
- Main Text: Collaboration with Free Universitat Berlin
- Purpose: Evaluate if coverslips produced by Reiner Haag's group are suitable for use in SMLM microscopy.

The Windows taskbar at the bottom shows the date as 02/09/2024 and the time as 16:55.



The screenshot shows a web browser window displaying an ELN interface. The browser's address bar shows the URL <https://elab.jh-inst.cas.cz/experiments.php?mode=view&id=22>. The interface contains several data fields:

Contributor	Who made this experiment? Alfredo Gonzalez
Date of measurement	2024-07-12
Cells	Cells Jurkat WT
Plasmid	Plasmid None
Coverslips	Type of coverslip used LPGs
Blocking (%)	Percentage of BSA used for blocking 5
Blocking time (h)	Time of incubation of blocking 24
Exposure	Exposure (ms) 30

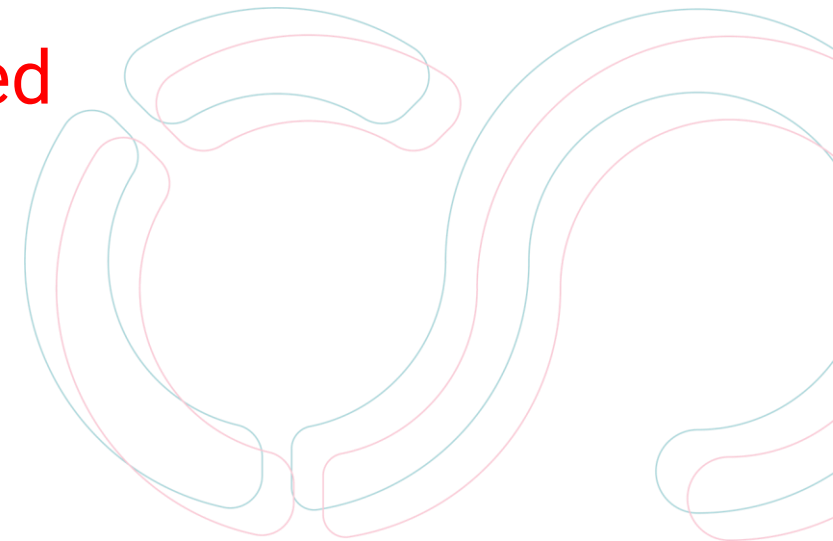
A large yellow diagonal watermark is overlaid on the screenshot, containing the text "Electronic laboratory notebook - Advanced".

Inventory

Item Name	Vendor	Updated	Request	Archive
HEK293T Wuerzburg		Sep 19, 2017	Request	Archive
HEK293 ATCC	Marek Cebecauer	Sep 19, 2017	Request	Archive
4 units Liquid nitrogen D4	Marek Cebecauer	Sep 19, 2017	Request	Archive

# Scientific notebook styles

- Paperback notebook
- Electronic notebook (e-notebook)
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- **Electronic laboratory (field) notebook – advanced**
- **Inventory / LIMS**

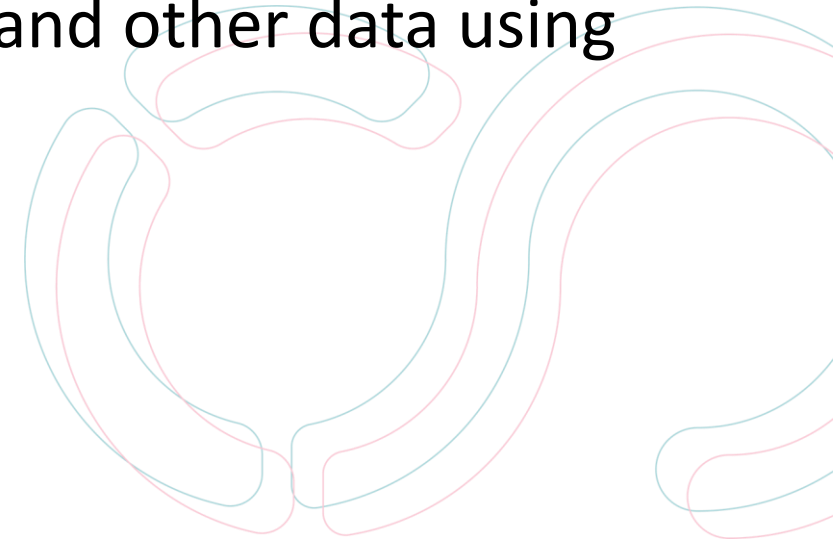


# What is ELN?

... definitions ...

*Harvard Medical School:*

An Electronic Lab Notebook (ELN) is a software tool that in its most basic form replicates an interface much like a page in a paper lab notebook. In an ELN you can enter protocols, observations, notes, and other data using your computer or mobile device.



# What is ELN?

... definitions ...

*Imperial College London:*

Lab notebooks are a way for researchers to remember vital information about their research through an organised and systematic manner. They may be considered part of your research data and will need to be archived along with your other data.

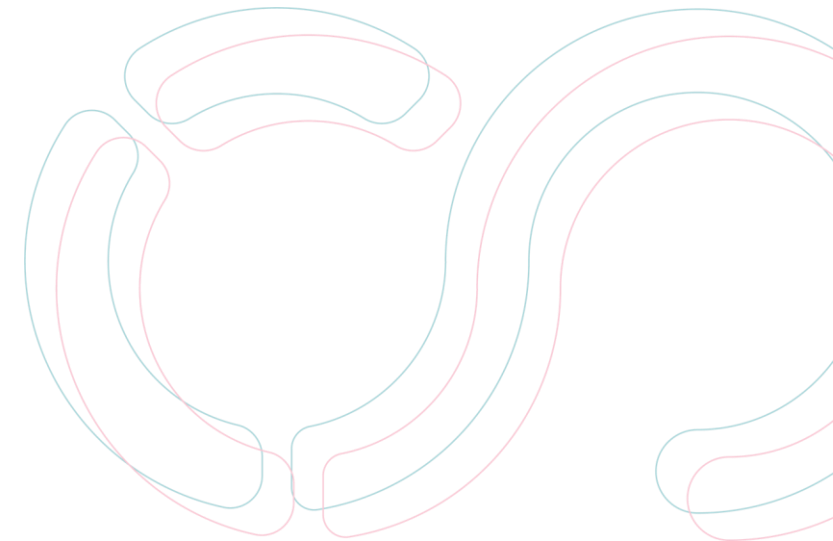


# What is ELN?

... definitions ...

*Imperial College London:*

Easy, real-time collaboration and data sharing. Custom and template experiment records. Protocol library. Version-controlled repository (datasets) ...





# What is ELN?

... definitions ...

## *Harvard Medical School:*

Some ELNs can also manage inventories of samples, reagents, and other supplies, as well as keeping track of equipment and equipment maintenance schedules (LIMS functions). Additionally, some ELNs provide specialist scientific tools for chemical drawing or molecular biology.

# What is ELN?

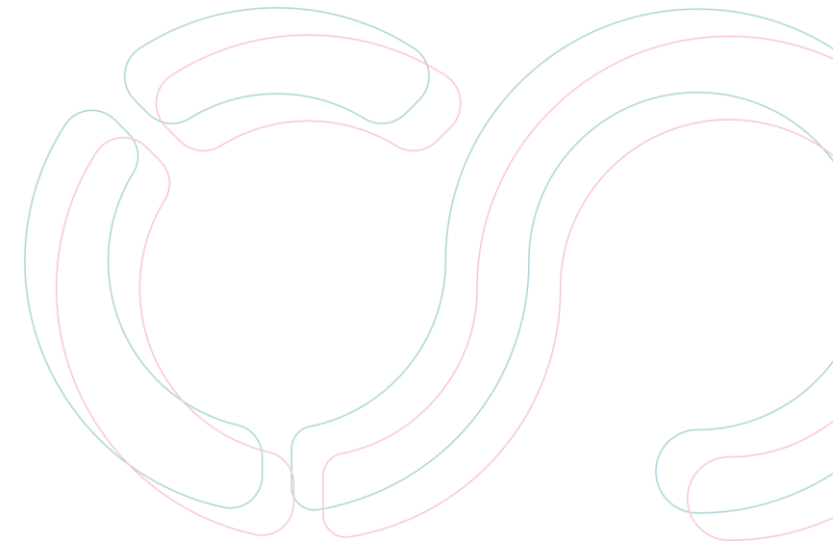
... definitions ...

*Research.com:*

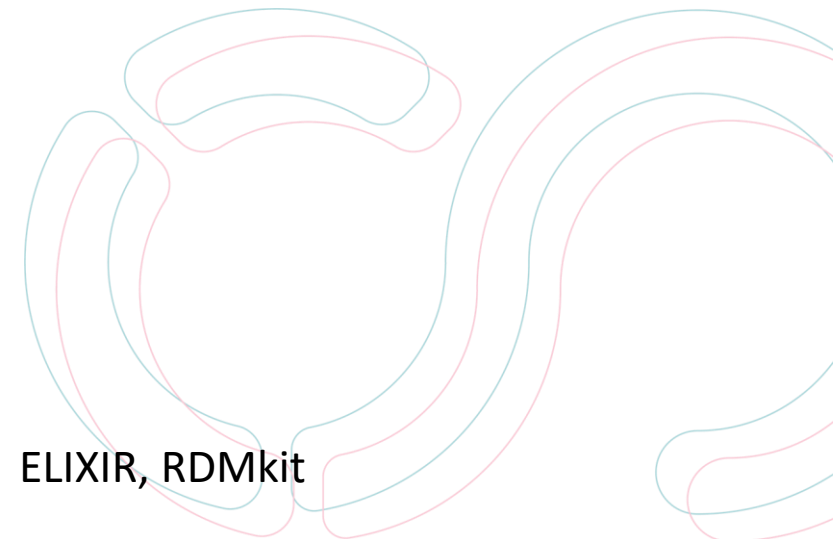
An ELN can automate many of the manual elements of laboratory note-taking. In laboratory processes, automation simplifies experimental procedures and helps researchers save more time for other tasks such as data analysis. ELNs also use advanced technologies to automate different data input and acquisition processes.

# Why to use ELN? ... Summary

- Records of experiments with relevant annotation and comments – structured/templates/links
- Register of digital objects including digital representations of physical and abstract entities
- Versioning
- Access control to (meta)data. Collaborative functions.
- Protocols/procedures/workflows
- Links to the relevant data
- Optional: Data storage
- Optional: Inventory (samples, supplies, literature, data files)
- Optional: Instrument booking/scheduler
- Optional: Offline functions (electronic filed notebook)
- Optional: Timestamps (e.g., legal support)
- Optional: Signatures/witnesses
- Optional: Scientific tools (e.g. data visualisation, schemas)
- Optional: Automatisations of RDM processes

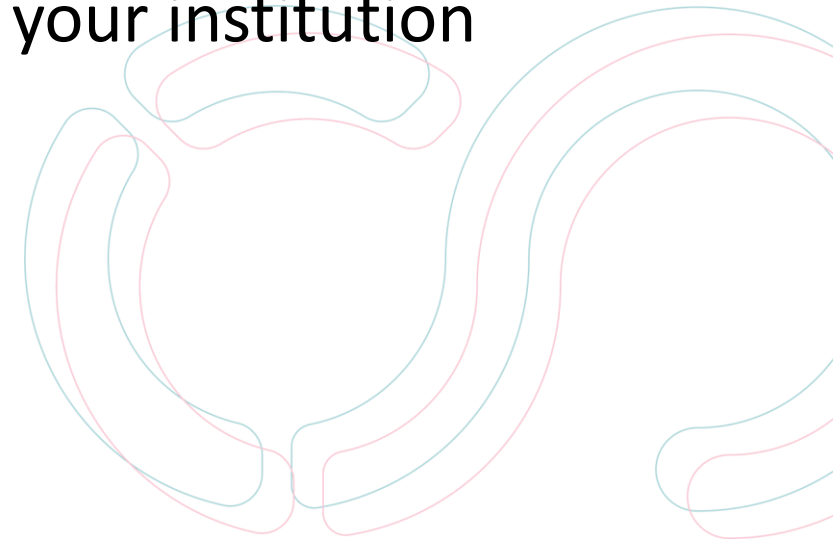


# Why to use ELN? ... Summary



## Which ELN?

- **Avoid 'one size fits all' solution**
- Personal preferences – the principal investigator's (PI) responsibility
- Provide recommendations and support – the PIs have to make the decision whether to use ELN or other tools.
- Offer more solutions (ideally diverse) for the RDM in your institution





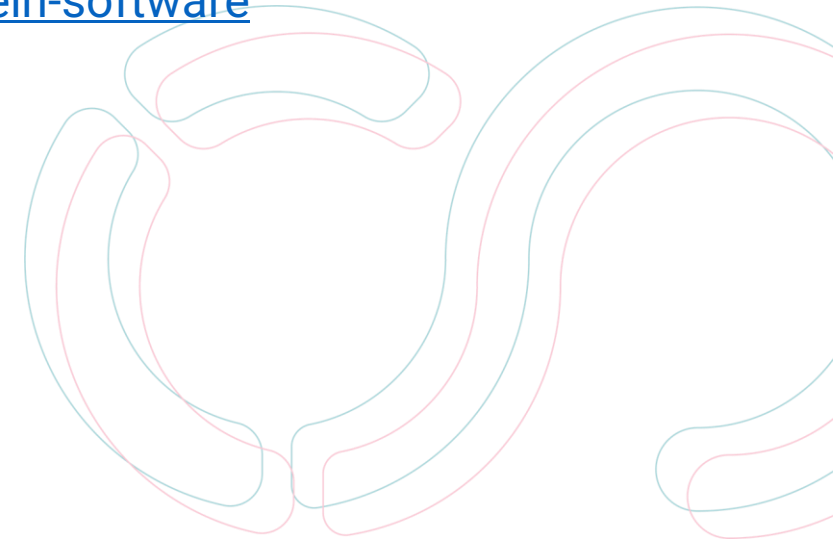
# Find the right ELN for you.



<https://eln-finder.ulb.tu-darmstadt.de/home>



<https://research.com/software/best-eln-software>



# RDM tool selection/Which ELN?

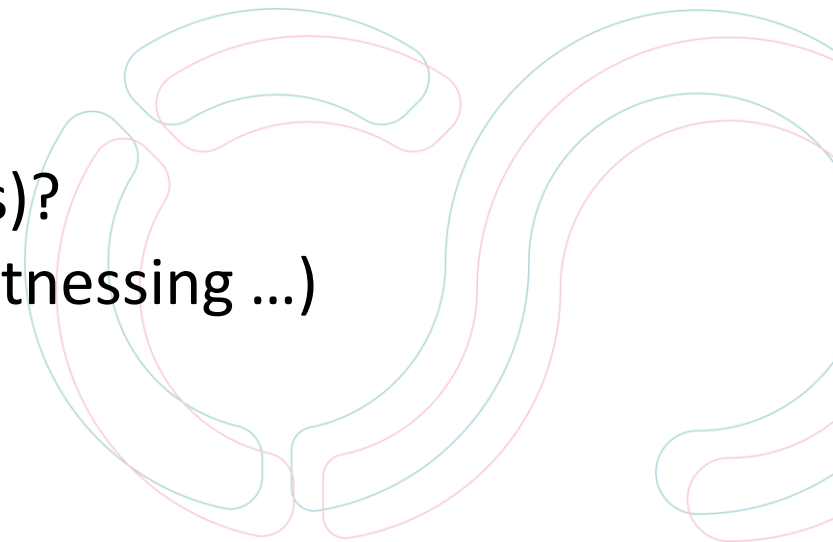


- Simple vs. complex
- Commercial vs. open-source
- Institutional instance vs. cloud version
- Does it support the export of FAIRified data?
- Sharing/collaborative options
- With LIMS vs. w/o LIMS (including scheduler and sample/equipment manager)
- Are specific scientific tools essential/needed?
- Integration with external scientific tools essential/needed?
- Is offline functionality essential/needed?
- Advanced functions: timestamping, signing, witnessing ... legal issues.



# Selection of ELNs for NRP/MATECH

- From simple to more complex
- Open-source
- Institutional/national instances
- Must support the export of FAIRified and machine-actionable data?
- Sharing/collaborative options
- With LIMS and w/o LIMS
- Specific scientific tools: non-essential/favourable?
- Offline functionality: non-essential/favourable (expenses)?
- Optional: Advanced functions (timestamping, signing, witnessing ...)
- Automatisation processes: ready or not?
- Team of developers





# Simple ELN for NRP/MATECH

- Basic functionalities: Records, Collections, Groups, Templates
- Open-source
- Easy to install and maintain institutional instances
- Supports the export of FAIRified/MA data: RO-Crate, RDF, JSON
- Sharing/collaborative options - limited
- No extra LIMS functions
- No additional scientific tools: as off Sept 2024
- Offline functionality: NO
- Advanced functions: Publishing in ZENODO (simplistic version 😊), workflows
- Prepared for automatisation: YES, advanced
- Prepared for integration with external scientific tools: YES, very advanced



# Intermediate ELN for NRP/MATECH

- Basic functionalities: Projects, Experiments, Users, Protocols, Templates
- Open-source
- Standard installation and maintenance of institutional instances
- Supports the export of FAIRified/MA data: RO-Crate (ELN), JSON
- Sharing/collaborative options – within an instance
- Limited LIMS functions, equipment registry and booking
- Specific scientific tools: drawing chemical structures
- Offline functionality: NO
- Advanced functions: scheduler (calendar), timestamping (legally: extra charge)
- Prepared for automatisation: Partially
- Prepared for integration with external scientific tools: Limited

# Complex ELN for NRP/MATECH I.

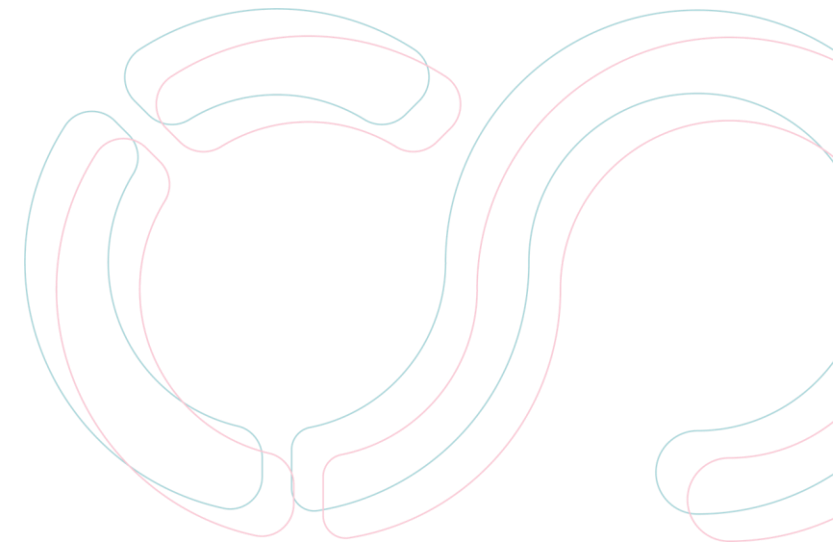
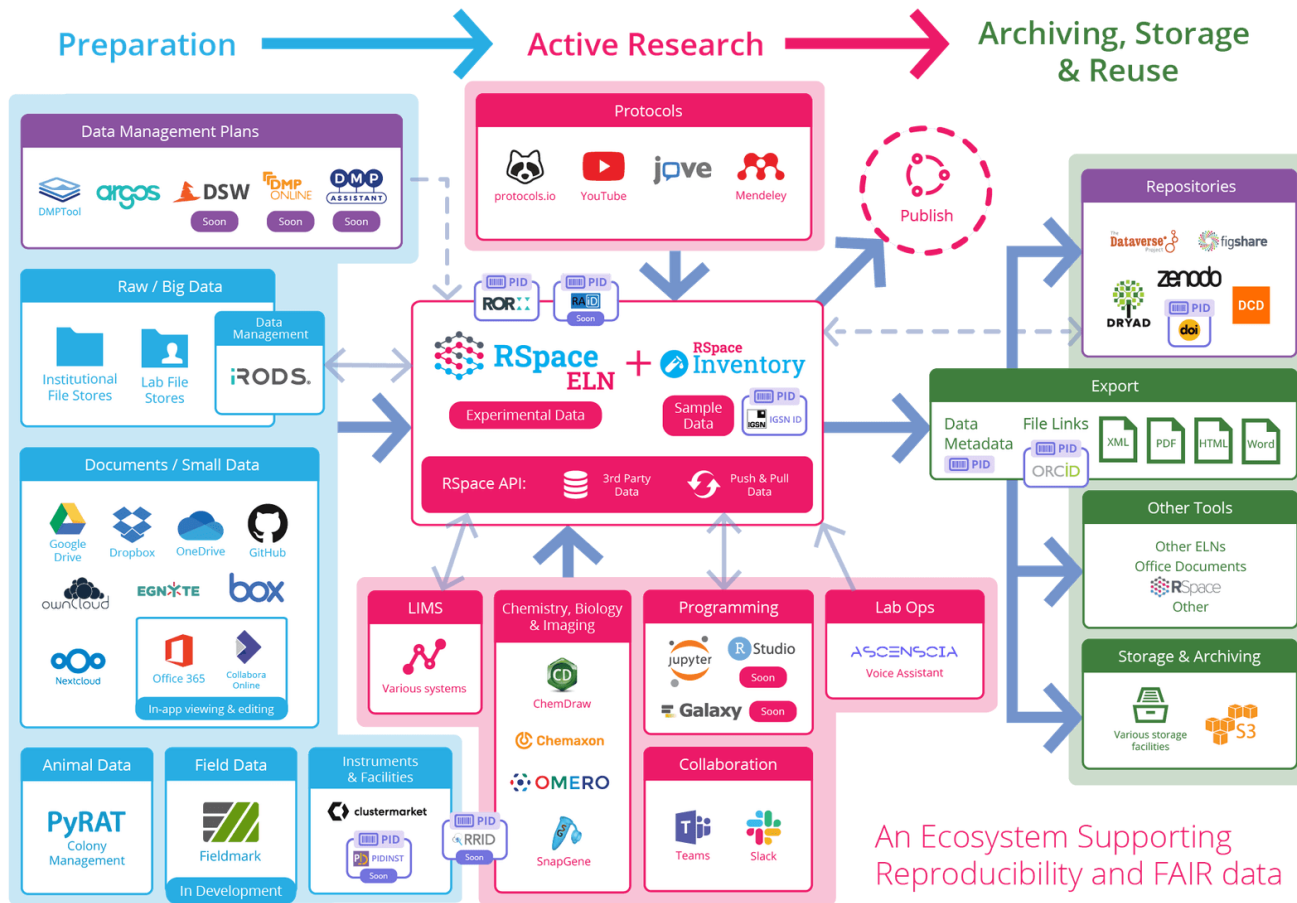
- Functionalities: Spaces/users, Projects, Objects, Protocols, Publications, Templates
- Open-source
- Standard installation and maintenance of institutional instances
- Supports the export of FAIRified/MA data: JSON
- Sharing/collaborative options – supported
- Advanced LIMS
- Specific scientific tools: molecular biology tools, big data, ...
- Offline functionality: NO
- Advanced functions: publish to ZENODO, scheduler (calendar), timestamping (extra charge)
- Prepared for automatisation: YES
- Prepared for integration with external scientific tools: YES, very advanced



## Complex ELN for NRP/MATECH II.

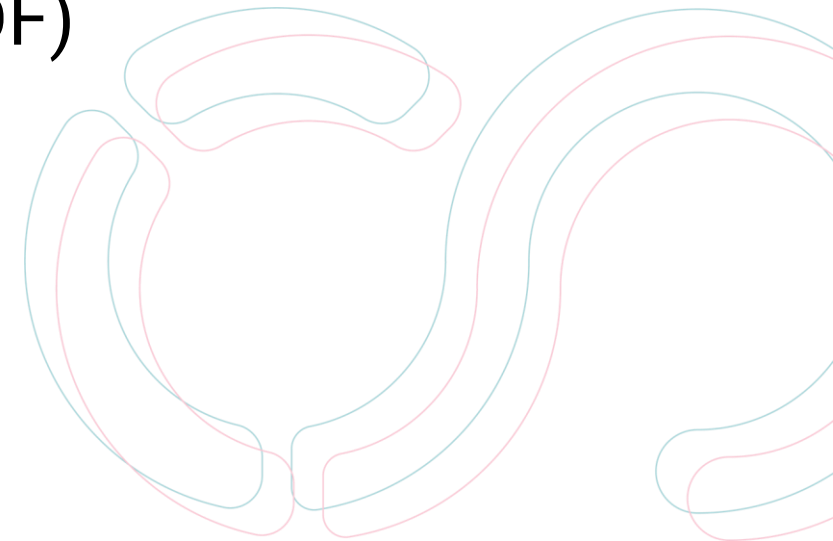
- Basic functionalities: Notebooks, Experiments, Users/Groups, Forms and Templates
- Open-source (from July 1, 2024)
- Standard installation and maintenance of institutional instances
- Supports the export of FAIRified/MA data: RO-Crate (ELN), XML
- Sharing/collaborative options – within an instance
- Advanced LIMS, including IGSN registration
- Specific scientific tools: extensive integration with RDM tools, chemical structures
- Offline functionality: NO
- Advanced functions: scheduler (calendar), signing/witnessing, Dataverse and Protocols.io integration
- Prepared for automatisation: ??
- Prepared for integration with external scientific tools: YES

# Complex ELN for NRP/MATECH II.



# Common features

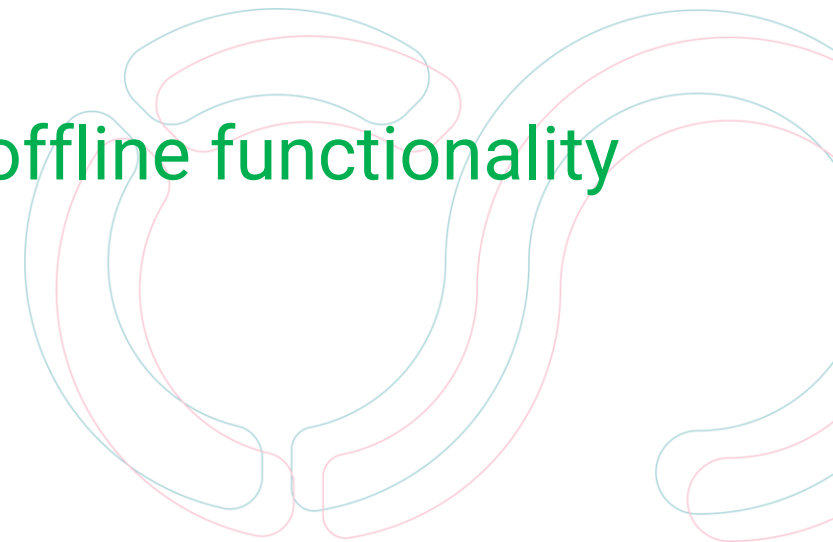
- Creation of user groups and projects
- Access control (individual experiments, collections, (meta)data)
- Mandatory\*/Recommended metadata fields
- A panel formats of metadata export (including human and machine-readable formats (PDF, XML, JSON, RDF))
- **Customisable templates**
- Python scripts/APIs



# Distinguishing features – focusing on

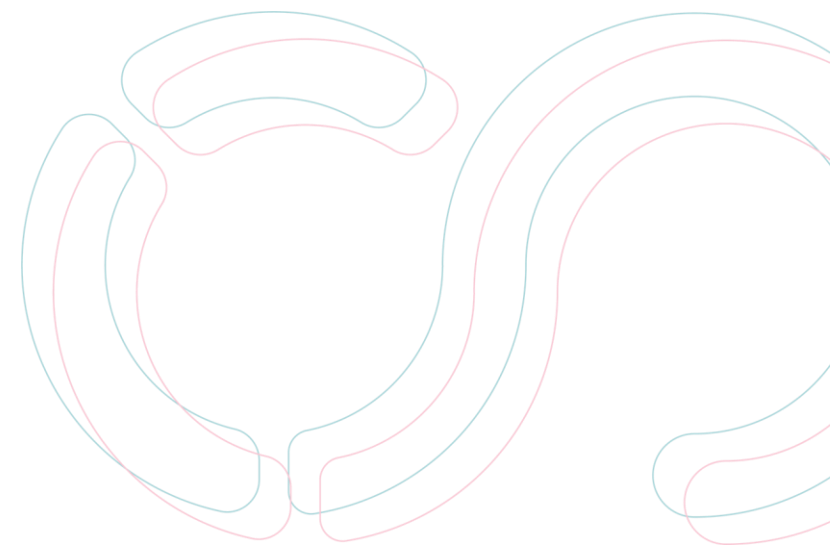


- Kadi4Mat: simple, workflows
- eLabFTW: protocols, scheduler
- RSpace: sample management/EOSC integration
- openBIS: professional RDM tool, domain-specific tools
- **FAIMS3/Fieldmark: electronic field notebook – offline functionality**



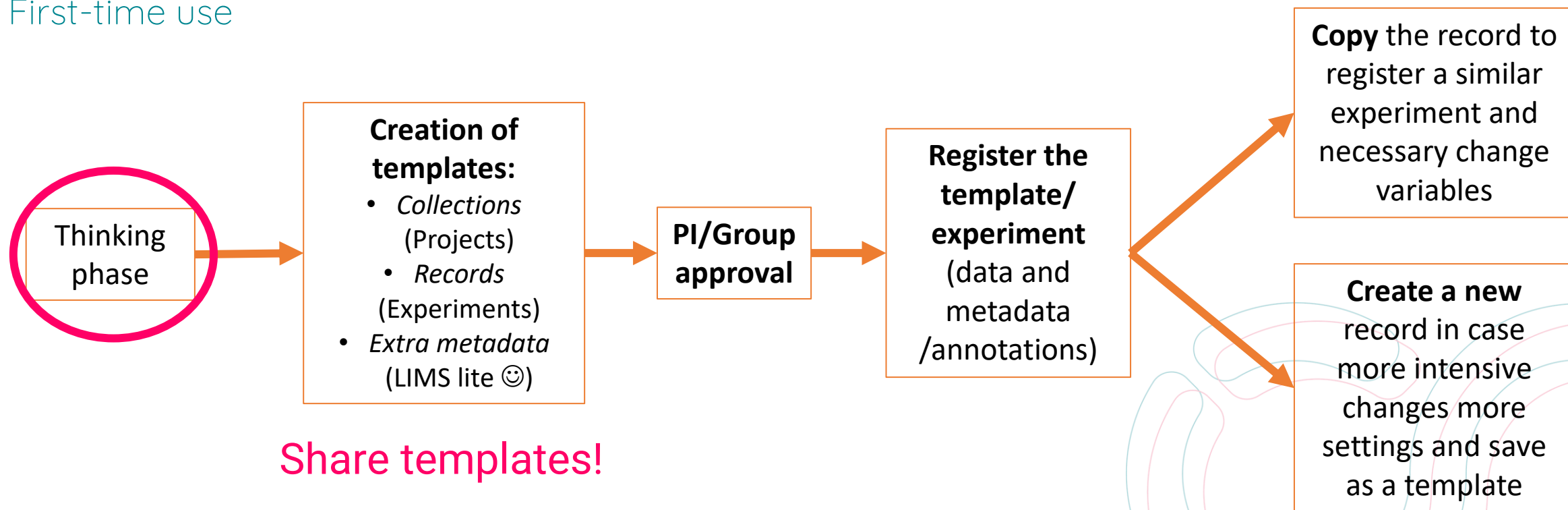


## ELN in praxis



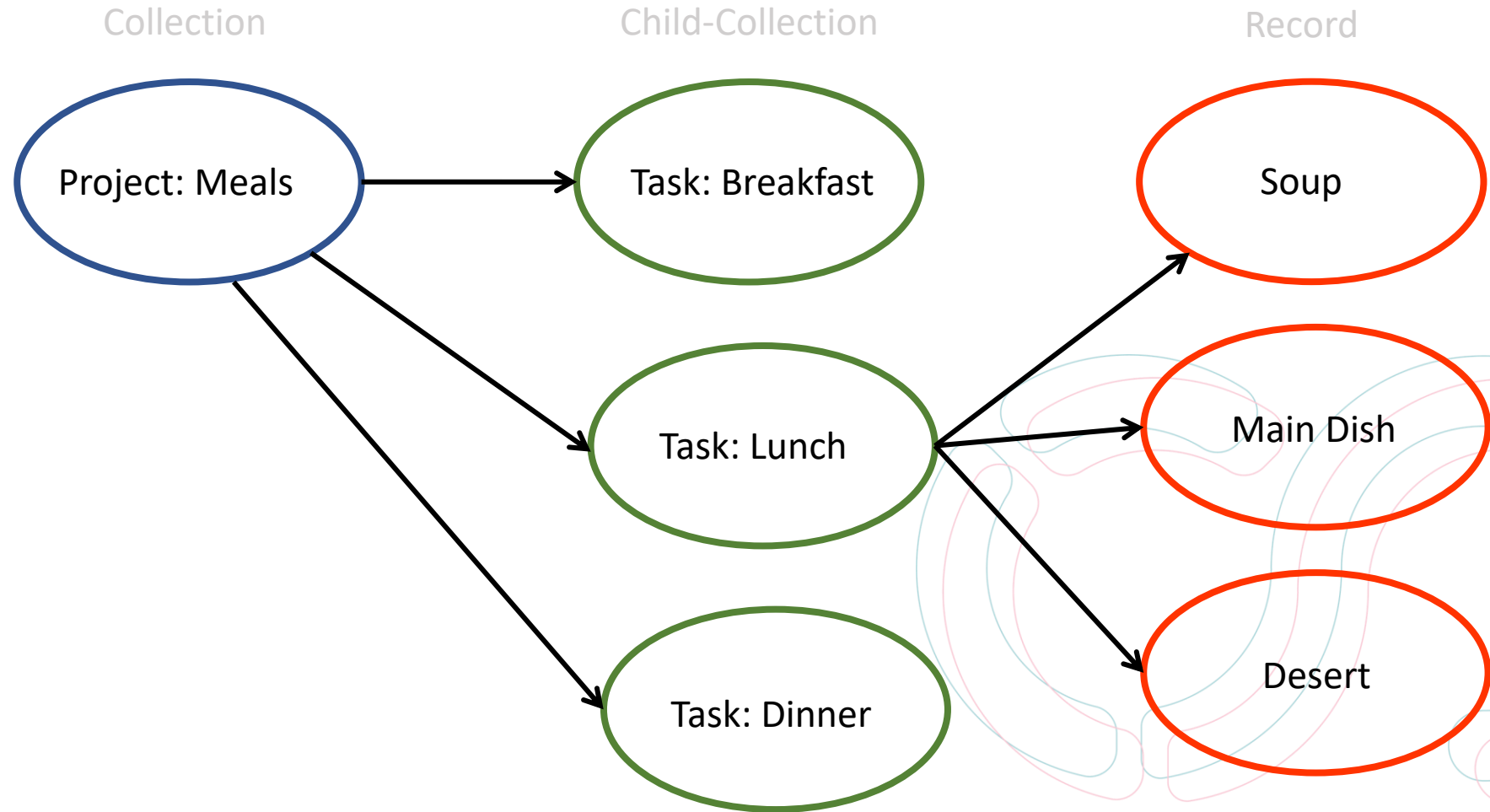
# How to use ELNs?

First-time use



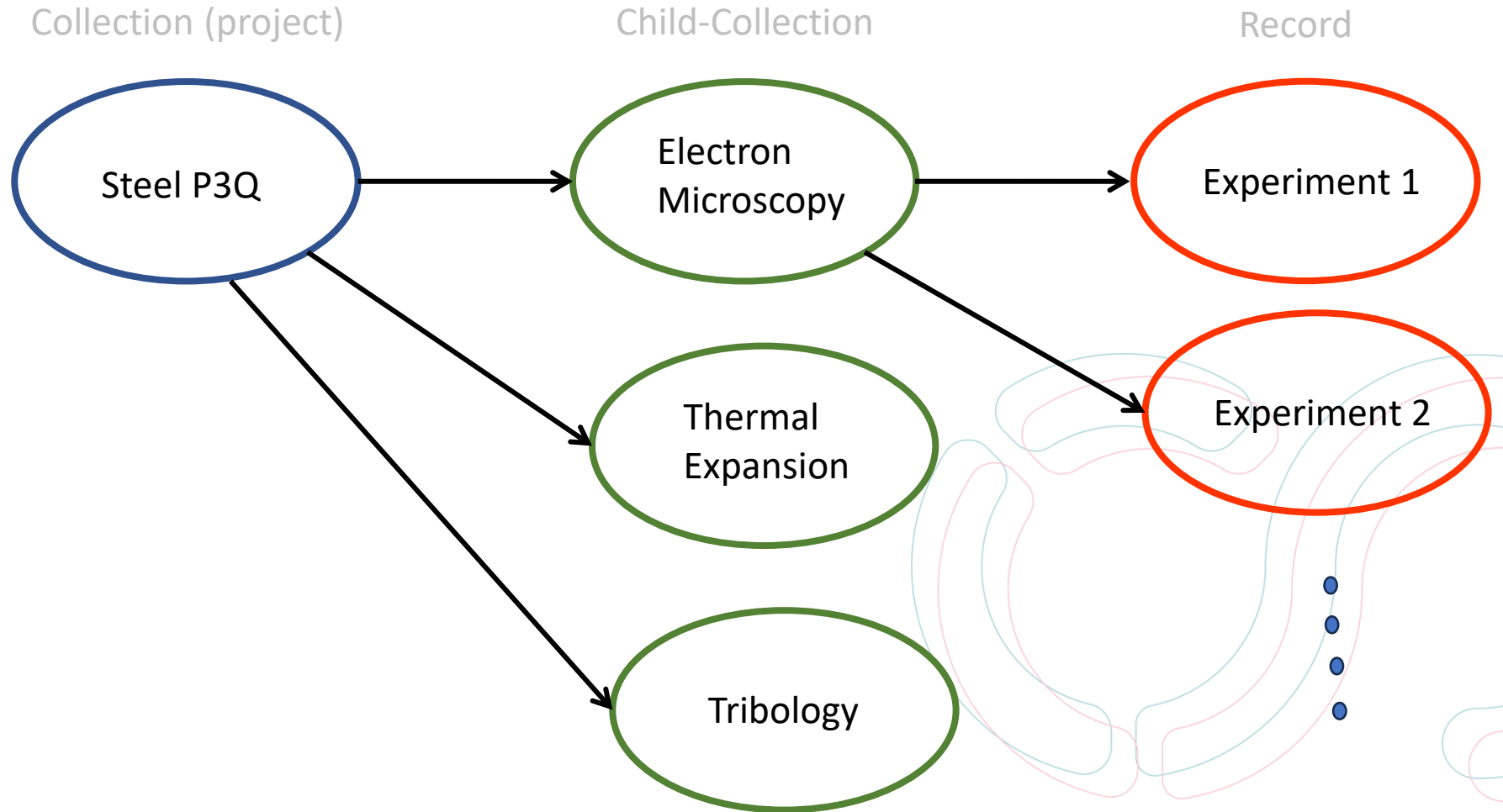
# How to use ELNs?

## Structure of my project

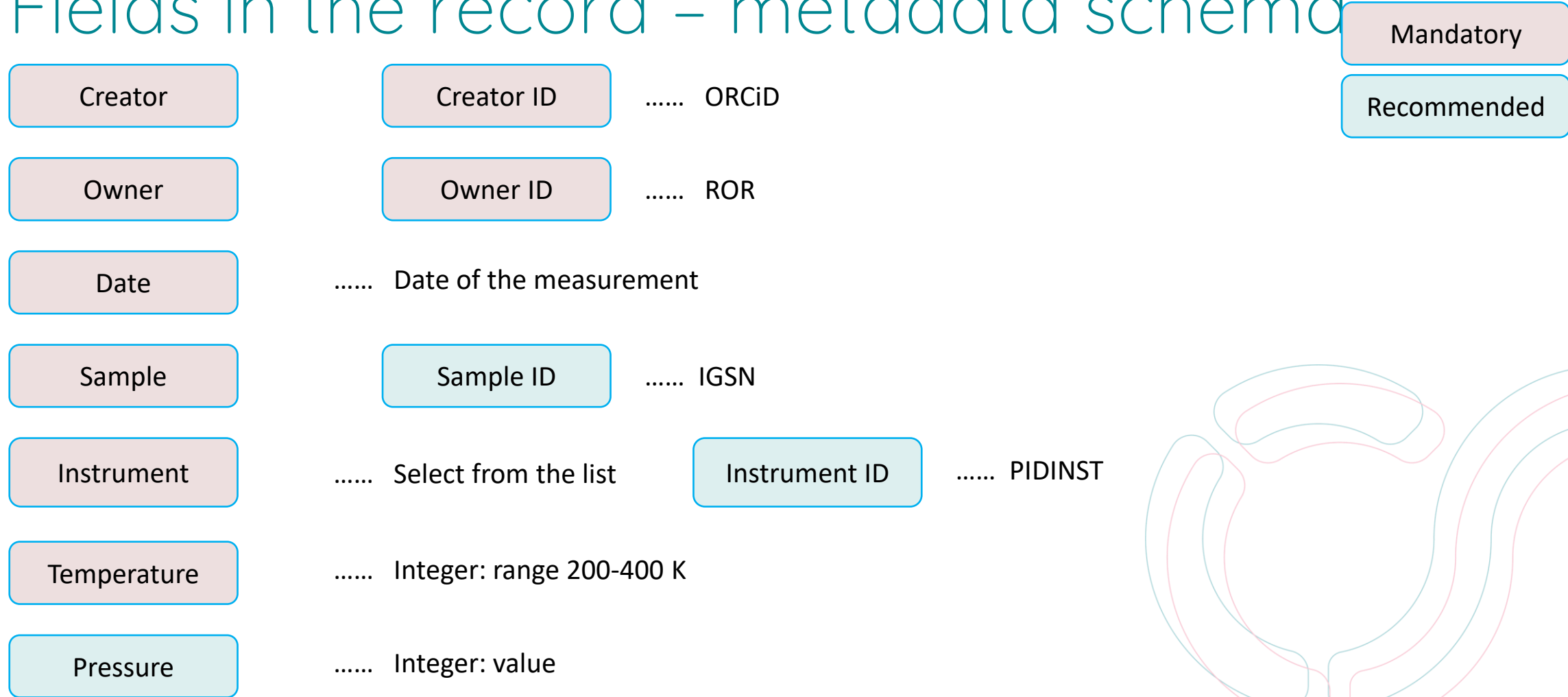


# How to use ELNs?

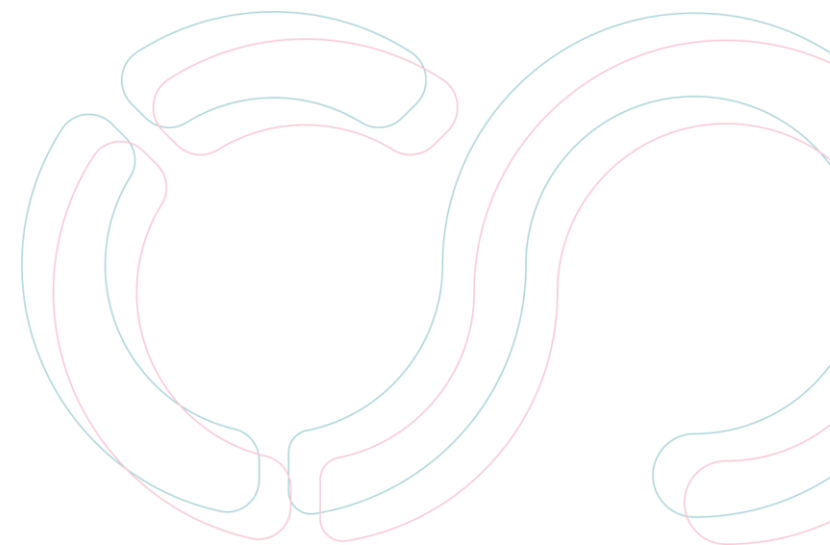
## Structure of my project



# Fields in the record – metadata schema



Live demo



# Collection

Kadi4Mat | Records | Collections | Templates | Users | Groups | Workflows | Beta | Quick search

Recently visited

- Steel P3Q @steel-p3q (Collection) - Last visited 41 minutes ago
- Electron Microscopy @electron-microscopy (Collection) - Last visited 42 minutes ago
- SteelP3Q\_EM\_clean @p3q\_em\_clear (Record) - Last visited 43 minutes ago
- Electron Microscopy @electron-microscopy-workshop (Collection) - Last visited 44 minutes ago
- Steel P3Q Project @steel-p3q-project (Collection) - Last visited 44 minutes ago

Home / Collections / Steel P3Q

Overview | Links | Permissions | Revisions

Edit collection | Copy collection | Link record | Export as | Publish via | Star

### Steel P3Q

@steel-p3q  
Persistent ID: 24

bla

Created by Test User  
Created at November 16, 2023 11:10:26 AM (10 months ago)  
Last modified at September 4, 2024 4:08:14 PM (42 minutes ago)

Tags: props, steel

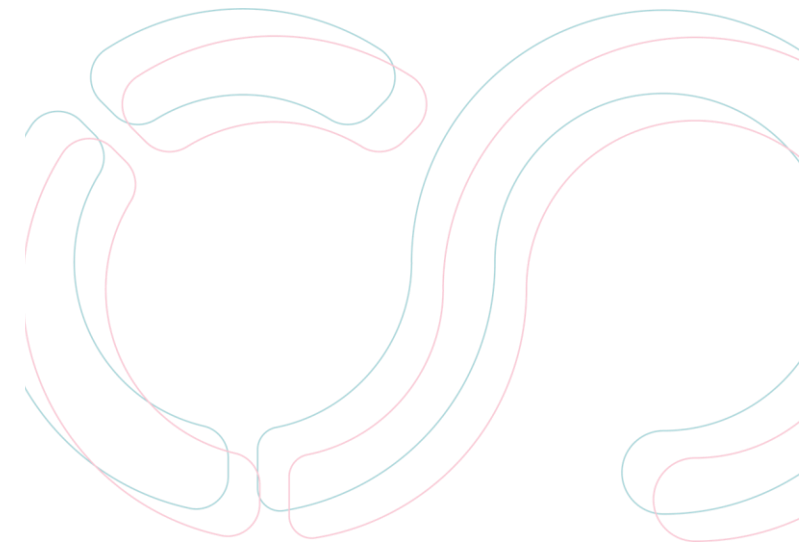
Records 1

- SteelP3Q\_EM\_clean @p3q\_em\_clear (dataset) - Last modified 42 minutes ago

Filter

Child collections 1

- Electron Microscopy @electron-microscopy - Last modified 42 minutes ago



## Template

Kadi4Mat
Records
Collections
Templates
Users
Groups
Workflows
Beta
Quick search

**Steel P3Q** Collection

@steel-p3q

Last visited an hour ago

**Electron Microscopy** Collection

@electron-microscopy

Last visited an hour ago

**SteelP3Q\_EM\_clean** Record

@p3q\_em\_clear

Last visited an hour ago

**Electron Microscopy** Collection

@electron-microscopy-workshop

Last visited an hour ago

Edit template
Copy template
Apply template

Export as
☆

**Electronic microscopy experiment** Record

@electronic-microscopy-experiment

Persistent ID: 43

description of the method

Created by Test User Created at November 23, 2023 3:26:46 PM (9 months ago)

Last modified at September 4, 2024 3:47:46 PM (an hour ago)

**Template data**

Collections -

Description -

Identifier -

License -

Record links -

Roles -

Tags electron microscopy temperature

Title Electron Microscopy

Type dataset

Extras Hide null values

Creator (ORCID)	null	String	✎
Owner	null	String	✎
Date of experiment	null	Date	✎
Sample Name	null	String	✎
Temperature of treatment	null K	Integer	✎

21 October 2024

Electronic Laboratory/Field Notebooks (ELN)

40






# Record

🏠 / Records / SteelP3Q\_EM\_clean / Edit record











⬅ Back to record

Save changes and quit Save changes Delete record


**Title\***  
SteelP3Q\_EM\_clean

**Identifier\*** p3q\_em\_clear  **Type** dataset    
Unique identifier of this record. Optional type of this record, e.g. dataset, experimental device, etc.

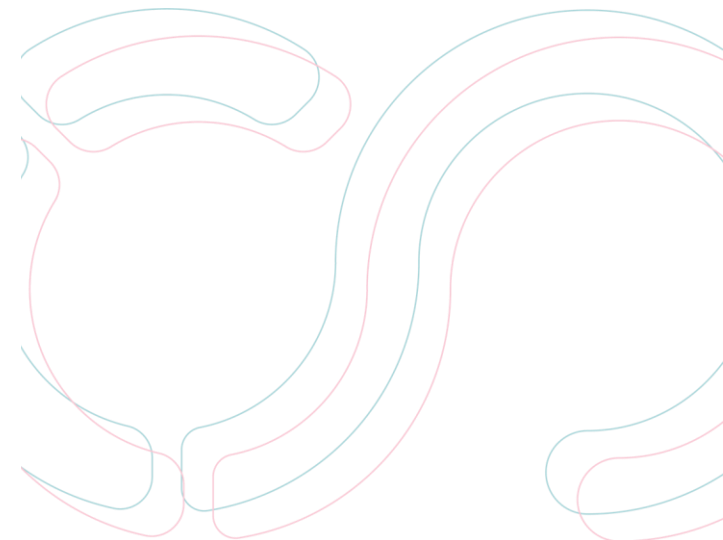
**Description**

Preview | H B I   $x^1$   $x_1$    $\sqrt{x}$    “ -      


Important measurement|

This editor supports Markdown, including math written in LaTeX syntax rendered with  KaTeX. Note that HTML tags and external images are not supported.

**Tags**



# Record – from template

This editor supports Markdown, including math written in LaTeX syntax rendered with  KaTeX. Note that HTML tags and external images are not supported.













**Tags**

steel x

An optional list of keywords further describing the record.

**Extra metadata**

Simple mode Tree view

Type	String	Key	Creator	Value*	Marek Cebecauer	+	x				
Type	String	Key	Creator ID	Value*	orcid 5555	+	x				
Type	Date	Key	Date of measurement	Value	November 16, 2023 12:00:00 AM	+	x				
Type	String	Key	Instrument	Value*	JEOL 333	+	x				
Type	Integer	Key	Temperature	Value	300	Unit	K	+	x		
Type	String	Key		Value		+	x				

+ Add extra

Select a template

**License**

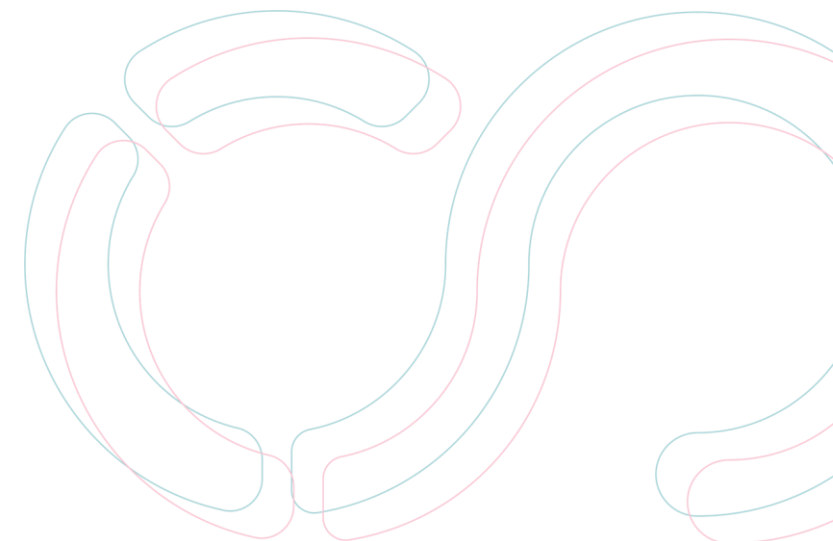
Search for a license

Specifying an optional license can determine the conditions for the correct reuse of data and metadata when the record is published or simply shared with other users. A license can also be uploaded as a file, in which case one of the "Other" licenses can be chosen.

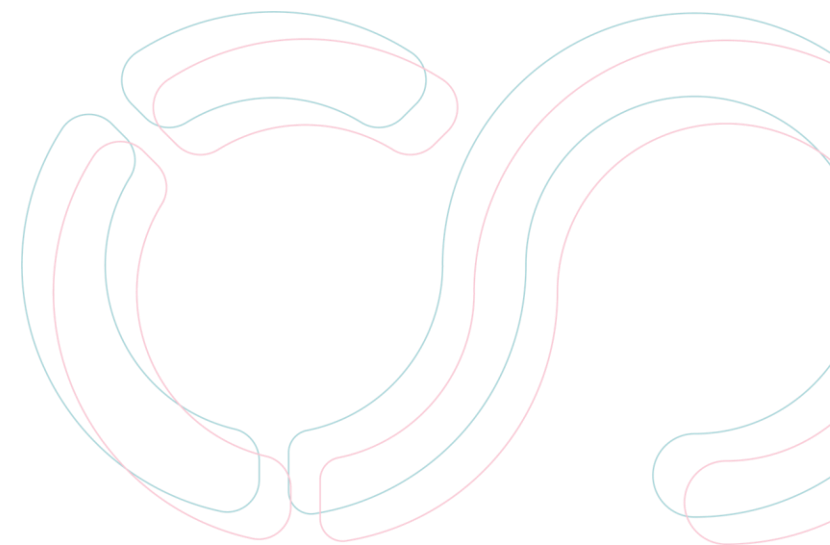
**Visibility**

Private

Public visibility automatically grants EVERY logged-in user read permissions for this record.



## Discussion



# Thank you for your attention.

marek.cebecauer@jh-inst.cas.cz



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