

COFFEE



LECTURE

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Electronic Laboratory Nootbook (ELN) and Laboratory Information Management Systems (LIMS)



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Bern University Library

Tuesday
16.05.2023
13:00, Zoom

Outline

- Best laboratory practices
- Electronic Laboratory Notebook (ELN) and Laboratory Information Management Systems (LIMS)
- What should be considered by selecting ELNs and / or LIMS?
- Where and how to find your ELN and LIMS
- Examples
- Take-home message
- Support

u^b Best laboratory practices

- Documentation of laboratory work
- Management of materials
- Management of protocols
- Description of experimental and computational procedures
- Secure data storage
- Reduce data loss
- Ethical and legal compliance
- Data management from funding bodies
- Facilitation of data sharing
- Data traceability and reproducibility of results
- Findable, Accessible, Interoperable and Reusable (FAIR) data principles



ELN and LIMS explained

Electronic Laboratory Notebooks (ELN) were designed to:

- replace traditional paper laboratory notebooks
- capture and describe experiments and observations, protocols, notes and other data using your computer or mobile device.

Laboratory Information Management Systems (LIMS) were developed to:

- manage samples and laboratory operations (samples storage, labeling, recording, reporting, barcode format, audit, certification)
- track your workflows in a step-by-step process and track all your materials inventory
- comply and complete [clinical lab management](#) operational platform

ELN and LIMS benefits



Searchable
Protocol, sample,
data set

Automated

Report generation,
manuscript writing,
or inventory
tracking



Consistent

Results are accurate
and reproducible

Collaborative

Knowledge exchange
among researchers and
stakeholders, regulatory
bodies, and funders



Traceable

Track experiments,
samples, protocols,
and results

ELN versus LIMS

Your primary need	ELN	LIMS
Manage documentation Describe experiments, observations, protocols, notes and other data using your computer or mobile device	Yes	Depending on needs
Manage samples Samples storage, labeling, recording, reporting, barcode format, audit, certification	No	Yes
Track all your materials inventory	Depending on software	Yes
Set up a workflow for repetitive tasks	No	Yes
Compliance regulatory requirements	Depending on software	Depending on needs
Track instrument calibration and integration	No	Yes
Share experiment or sample data	Yes	Yes
Create experiment protocol templates	Yes	Depending on needs

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An ELN or / and a LIMS

What should be considered?

- Lab's requirements, established practices and preferences
- Key field and specific features that you need
- Institutional policy
- Legal and ethical issues
- Security level of your data
- Get educated ([ELN guide](#), [RDM](#), [DSL](#)-Support)
- Resources (budget, human, time, infrastructure)
- Consider software integration
- Test drive
- Training
- Commitment
- Communication

Where and how to find your ELN and LIMS?

The **ELN Finder** helps you to search and select a suitable ELN for your purposes:

- More than 40 filter criteria available
- Filter criteria clearly divided into categories
- Result list of the identified ELN tools displayed in an overview
- Brief descriptions of the individual tools included



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

ELNs [\(link\)](#) available on the market

LIMS [\(link\)](#) available on the market

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Laboratory notebook and inventory manager

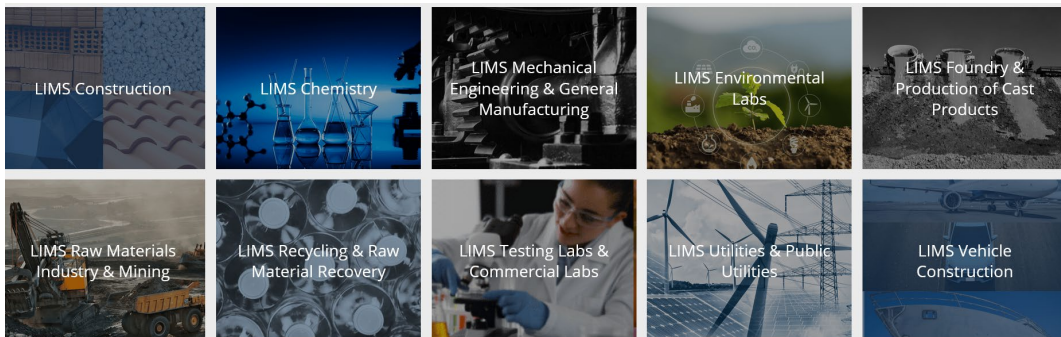
OpenBIS for life sciences

- **Inventory management** of laboratory samples, materials, protocols, equipment
- **Laboratory notebook**, to document lab experiments
- **Data management**, to store all data related to lab experiments (raw, processed, analysed data, scripts, Jupyter notebooks, etc.)



[OpenBIS](#) ETH Zürich
[Support at UniBE Data Science Lab](#)

Environmental sciences



Flexible LIMS for your head start in the lab

- ✓ Industry-independent: For all application areas
- ✓ Cost-effective: Proven LIMS at fair prices
- ✓ Powerful: Many functions included by default

 Arrange your LIMS Demo NOW!

[LIMS Pricing Calculator](#) 

Settings and functionalities can be configured or individualized



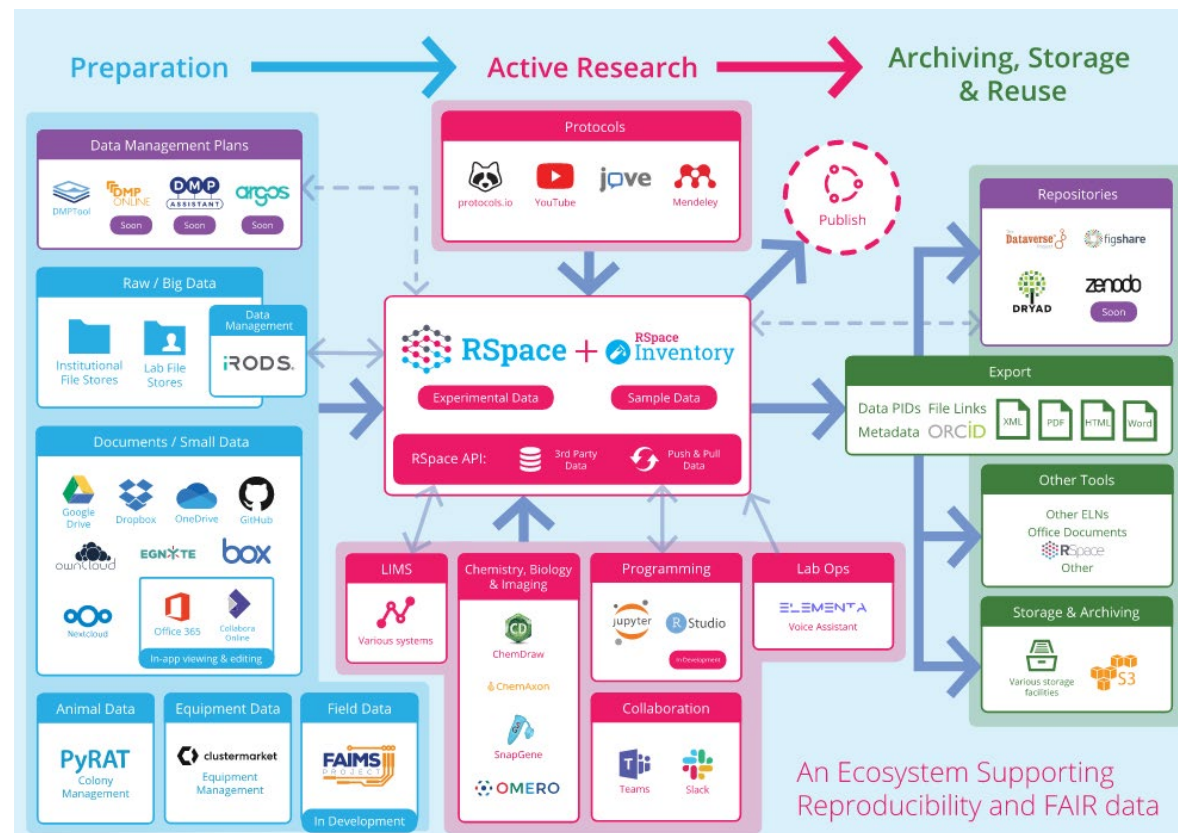
<https://www.fp-lims.com/en/>

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LIMS Software with an ELN

Rspace - generic, life sciences, chemistry

- Flexible, searchable, secure and easy to use electronic lab notebook.
- Organize, manage, version, and share documents. Old versions of documents are never deleted or overwritten and the full history of the document is easy to access.
- Collaborations with scientists inside or outside your organization.
- Create, manage, and access data and lab records across any platform (PC's, Macs, Linux, tablets and smartphones).

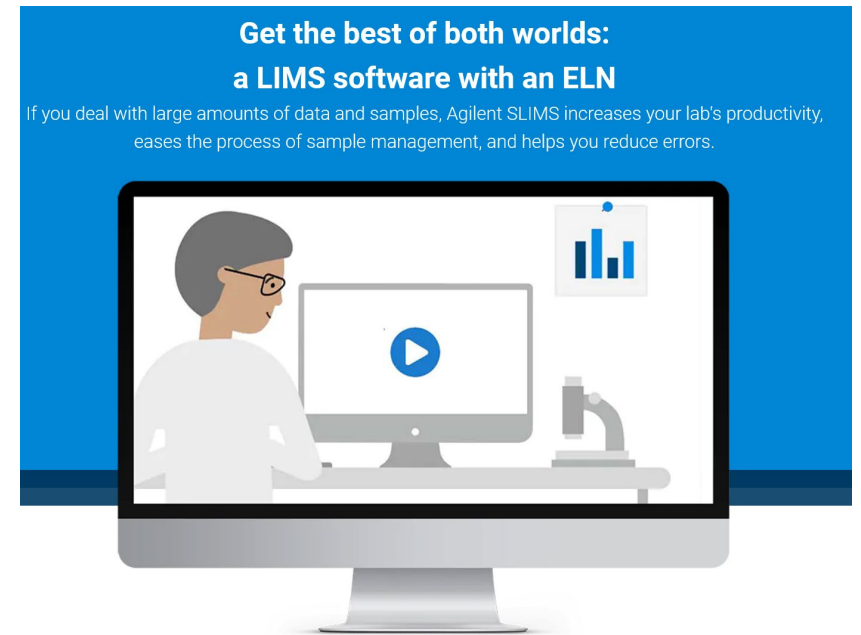


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LIMS Software with an ELN

SLIMS for analytical labs, pharma

- SLIMS combines the best of a LIMS and an ELN in a single Laboratory execution system (LES)
- SLIMS made for biobanks, pharma, analytical labs, research
- Overview of samples, status, workflows, storage location
- Highly configurable sample annotations
- Integration with freezer management systems, instruments and hospital EMR systems
- Longitudinal studies with different collection time points
- Support of ISO 20387:2018 requirements, ISBER recommendations and SPREC nomenclature



<https://explore.agilent.com/AgilentSlims>

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Take-home message

- Identify your needs and priorities
- Compatibility with existing lab workflow and infrastructure
- Institutional policy
- Ethical and legal issues
- Sponsorship and commitment
- Training
- Communication: Research IT, Lab manager, Principal Investigator, etc.
- Use an ELN to capture, analyse, manage, document and share scientific data
- Use a LIMS to track of data associated with samples, experiments, laboratory workflows, barcode, audit and instruments
- Or use combination of both an ELN and LIMS

Research Data Management Support

- Transferable Skills Course: Introduction to research data management
- How to comply with the SNSF OA and ORD requirements
- Data documentation and metadata
- How to publish your research data in 5 easy steps
- Boris Portal research data and projects at UniBE
- Research data management in the Humanities
- Data Management Plans: Funding agencies' requirements
- Ethics in research data management
- An ELN vs. LIMS an overview

Is something missing? Please provide your feedback!
This survey is anonymous <https://t1p.de/RDMsurvey>



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Now there is time for...

Questions & Discussion

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Next Coffee Lectures:



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Slides and Screencast:

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