MAINTAINING THE SCHOLARLY RESEARCH RECORD IN THE CLOUD (Executive Track)

INTRODUCING LABARCHIVES ELECTRONIC LABORATORY NOTEBOOK
Presenters

EARL BEUTLER, CEO, LABARCHIVES
JAN CHEETHAM, UNIVERSITY OF WISCONSIN-MADISON
BEN MOSS, CORNELL UNIVERSITY
Changes in the nature of data collection

- Volume and formats
- Automated and computation-intensive
  - Instrumentation software
  - Imaging
  - Analysis pipelines and workflows
- Collaborative
- Paper notebooks are less useful for many
Changes in requirements

- **Funder requirements**
  - Data management plans
  - Data retention
  - Public sharing

- ** Protected information**
  (PHI, human subjects, select agent, export control)

- **Desire for institutional long-term preservation**
Other concerns

• Protect intellectual property
• Reproducibility
• Academic misconduct
• Ability to track provenance of data
  – audit trail, time and date stamps
  – versioning data files and annotating
  – recording information about data linked from ELN
• Internal laboratory records management
Why do we use a lab notebook?

Today, over 95% of laboratory notebooks in academia are paper...in spite of the fact that most data ARE digital!

Isn’t there a better way than using ground up carbon on wood pulp?

- To provide a complete record of who, what when, where and why
- To protect your intellectual property
- A place to collect the reams of data
- A forum to talk to yourself, to ask questions, to jot down important thoughts and comments about the experimental design and how your results might eventually be interpreted.
- To provide information to a person who is interested in continuing your research project...or in repeating your experiments.
First ELNs

In the mid-2000’s, a series of ELN solutions were launched:

- Most targeted the big pharma market
- Solutions were very expensive
- Required installation and maintenance of a local server
- Almost no penetration in the academic community
Academic Community

• Most data are now digital (images, spreadsheets, proprietary files, etc.)
• Most academic labs use a combination of paper notebooks, various files, and other software tools
• Many of these tools are NOT secure
Problems...

...with current solutions

• Management of laboratory staff
• Ability to protect / retain IP Data
• Analog technology in a digital age
• Lost / misplaced / overwritten Data
• Incomprehensible Data
• Difficulty in sharing / collaboration
• No search capabilities
The COMPLETE Solution –

Whether managing a research lab as a Principal Investigator, reviewing students lab work as an instructor or securing the integrity of your institutions research data as an RIO, LabArchives as the complete data management solution.
What is LabArchives?

• A secure cloud-based collaborative platform for the storage, organization, sharing and publication of scientific data
• A “living repository” for scientific data – Cross between a data repository and Lab Notebook
• Combining the features of collaboration software, wikis, search engines, and software tools
Company History

2009 LabArchives founded
2010 Professional Edition commercially released
2011 Classroom Edition commercially released
2013 Mobile Apps released (both iOS and Android)
2014 Approved Internet2 NET+ Provider
2015 Site Licenses at Tuffs University
2010 Professional Edition commercially released
2012 Site License at CalTech
2013 Site Licenses at Yale and Cornell
2014 Site Licenses at UT Southwestern, University of Wisconsin, University of Sydney
2015 Site Licenses at Tuffs University

Headquartered in:

Carlsbad, CA
LabArchives is the ONLY Internet2 NET+ approved Electronic Laboratory Notebook (ELN) Service Provider

Institutions such as Caltech, Cornell University, Yale University, UT Southwestern, University of Wisconsin - Madison along with many others have become early adopters of LabArchives with campus-wide licenses

Cornell University sponsored LabArchives to meet Internet2’s NET+ program requirements, which required an extensive vetting process including a review of security, features, usability and documentation

“We chose LabArchives to meet the growing number of requests that we had received for a lab notebook software. It met all of our requirements, including security and usability requirements, at a reasonable price. That is why we were proud to sponsor their service inclusion within the Internet2 NET+ program.”

- Barbara Friedman, interim director, Academic Technologies, Cornell University
• Support research staff productivity and efficiency
• Data stored with multiple redundancy
• ALL data preserved and versioned on U.S. based servers
• 3rd party (NIST) date and time stamp
• Support funding agencies' Data Stewardship and Data Management Plans requirements (i.e. NIH, NSF)
• Standard HTML format
• Single Sign on via Shibboleth
Security

- Servers are protected by redundant, industry standard firewalls and security devices
- All network and application traffic is logged and monitored for any suspicious or unusual activity
- SSL certificates provide full-time HTTPS security for all user interactions
- Supports both a proprietary login option and allows for integration with Shibboleth
- LabArchives has successfully passed numerous network and application security tests from multiple vendors
Compliance

• Federal Funding Agency Data Management Policy Compliant

  “Investigators are expected to share with other researchers, at no more than incremental cost and within a reasonable time, the primary data, samples, physical collections and other supporting materials created or gathered in the course of work under NSF grants. Grantees are expected to encourage and facilitate such sharing.” - NSF Data Sharing Policy

• Amazon Web Services (AWS) Compliant
• FDA - 21 CFR Part 11 Compliant
• HIPAA (Health Insurance Portability and Accountability Act) Compliant
• FERPA (Family Educational Rights and Privacy Act) Compliant
• Shibboleth single sign-on Integration
LabArchives will improve **compliance** with your data management plans, **secure** your research data and **ensure control** over your intellectual property.

- Replace the Paper Notebook and Lab Manuals to better protect, monitor, engage and evaluate your PI teams’ lab work
- Complete audit control - tracks and stores ALL revisions, by users, for every entry - NO entry can be deleted - Protect IP -
- Notebook user access can be managed to allow access rights to certain notebooks, pages and/or entries
- Create and adhere to funding agency Data Management Plans which require data sharing (via public URL or DOI)
LabArchives will improve **compliance** with your data management plans, **secure** your research data and **ensure control** over your intellectual property.
Classroom Edition

- Enable 24/7 real-time feedback and collaboration
- Discipline-agnostic tool
- Detect students' misconceptions and underperformance
- Improve student success rates
- Students prefer the electronic notebook to paper
- Easy to set up. Simple to use.
- Reduce carbon footprint (24 students x 50 + 1,200)
Adoption in Higher Ed

• ELN Pilots
  – Goals
  – What was learned

• Beyond Pilots
  – Hosted vs cloud?
  – Other decision factors in selecting an ELN
  – Procurements (RFPs)
  – Funding
  – NET+ service validation

(http://www.internet2.edu/products-services/cloud-services-applications/lab-archives/)
Implementation at Cornell

- Initial 6 month pilot; site license as of June 2013
- Visit our other talk for more details about Cornell’s implementation of LabArchives

Maintaining the Scholarly Research Record in the Cloud: Introducing LabArchives Electronic Laboratory Notebook

*Wednesday, April 29, 3-4 PM*

**ROOM:** Meeting Room 10/11
**SPEAKERS:** Earl Beutler / Jan Cheetham
**PRIMARY TRACK:** Applied Research & Scholarship
Campus Data Policy

- PI is steward
  - Notebook “owner”
  - Sets roles, access, edit/view rights
  - Approves exporting and sharing
- 7 year retention (minimum)
- Transfer
  - Exporting copies
  - Migrating original
Lab Onboarding

• Lab meetings
• Data and security policies
• Roles, rights
• How to organize notebooks
• Sharing, printing, exporting
• Data management
  – File naming, version tracking
  – Linking to large files
• Backup and migration strategy
Partial Customer List

DEPAUW UNIVERSITY
THE UNIVERSITY OF SYDNEY
UC
THE UNIVERSITY OF WISCONSIN MADISON
Tufts UNIVERSITY
THE UNIVERSITY OF BRITISH COLUMBIA
UNIVERSITÉ DE PARIS SUD
UNIVERSITY OF WOLVERHAMPTON
UNIVERSITY OF OXFORD
SOUTHERN CROSS UNIVERSITY
NORTHWESTERN UNIVERSITY
UNIVERSITY OF ICELAND
NATIONAL INSTITUTES OF HEALTH
OUTH WESTERN MEDICAL CENTER
STANFORD UNIVERSITY
VANDERBILT UNIVERSITY
GEORGE MASON UNIVERSITY
UNIVERSITY OF FLORIDA
Universidad de nutrición
LAB ARCHIVES
CHANCE FAVORS THE ORGANIZED LAB
“I found that LabArchives was one of the more intuitive programs around and provided the type of record keeping that enabled easy sharing of data and lab notebooks, but at the same time was also secure and kept track of all revisions made…”

- Richard van Rijn PhD, Dep. Medicinal Chemistry and Molecular Pharmacology, Purdue University

“LabArchives has been transformative for researchers at the University of Sydney, delivering multiple benefits. Fundamentally, researchers have found that LabArchives integrates seamlessly into their research practices, rather than changing the way they do research. Uniformly it is saving people time and making their research more efficient. For some that means increasing the amount of experimentation they do each day, and with others it has enabled more thorough analysis of research findings and writing. LabArchives has supported researchers in organizing their information in ways that are impossible with normal files, giving them the ability to search all their experiments and manage data and IP much more coherently, for example. One researcher even commented that LabArchives is like having their own Personal Assistant in the lab! “

-Dr. Black., Director, Research Development and Collaboration, University of Sydney

"UT Southwestern Medical Center selected LabArchives as a platform for our research community to maintain their valuable research data as well as to facilitate collaborations and assist in compliance with government regulations. It has been a very smooth and easy transition with little impact on Information Resources, and I have received very positive feedback from our investigators in using LabArchives“

-Dr. Dipti Ranganathan, Associate Vice President, Academic Information Systems, UT Southwestern Medical Center
Visit our Full Session

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