RESCENTRIS

Collaborative Electronic Research Framework™ (CERF)

Defining the Requirements for an Electronic Lab Notebook (ELN) for Biologists

Summary: Biologists have diverse requirements for an ELN capable of managing lab records and improving their research performance. Rescentris designed its ELN product CERF specifically to meet the needs of Biology and multidiscipline life sciences R&D organizations.

Introduction

ELNs have demonstrated their scientific and business value for chemists in R&D organizations. Now, biologists are seeking these same benefits in an ELN product that fits their needs. Chemistry-focused ELNs have proven not to serve the demands of biologists, nor have these chemistry products been easily retrofitted for other user communities. Similarly, so-called *generic ELNs* – products that substitute electronic record-keeping using Microsoft Word-like editors for the old paper lab notebook have not been very successful (in general or in serving biologists). Such products may very well solve the 'record-keeping problem' – namely that paper records take too much effort to create and then too long to find and reuse later – but they do not help the scientists manage the complex data and processes associated with their R&D activities.

The inability of chemistry or generic ELN products to serve multidiscipline life scientists can be attributed in large part to differences in how biologists work. The varied nature of the biologist's work habits and information products includes free-form protocols, a complex mix of structured and unstructured data, a diversity of methods and materials, and a lack of common software applications, databases, and research workflows among a collection of biologists, even within a single organization. For these reasons, chemistry-based and generic ELNs lack the versatility to support the scientific work of biologists, and as a result, vendors of these products are failing to serve the multidiscipline life sciences market. In certain cases, chemistry ELNs have been used to support some record-keeping functions for biologists; however, the products are clearly not easily retooled to support the scientific work of biologists. Finally, many ELN products look like science but just capture Microsoft OLE objects or 'attachments' without the meaningful scientific metadata, tracking, annotating, reporting, or signing of the real data.

Rescentris is the only ELN vendor to develop its product specifically for biologists. This note describes the key distinctive requirements of an electronic lab notebook for biology and how Rescentris meets these in its CERF solution.

Key questions to ask about an ELN

- √ Does it solve real problems for me? For my team?
- √ Does it match the way we work?
- √ Is it both flexible and easy to use?
- √ Does it meet the needs of all of our stakeholders for their work in the lab, the office, and the boardroom?

CERF was designed to improve your record-keeping, your science, and research collaboration.

Methods

Rescentris developed an ELN product called CERF (Collaborative Electronic Research Framework™) specifically for robust support of life sciences R&D. CERF was designed by biologists to meet the demands of this field. It utilizes a leading edge extensible platform built on semantic web technologies to enable rapid integration and adaptability to meet the changing needs of the R&D enterprise and its diverse mix of knowledge workers. Rescentris focused on delivering its ELN and scientific content management solution to biologists. Rescentris has several distinct competitive advantages in the industry. In addition to being first to market with an ELN dedicated to biology, its CERF product is the only ELN system built not on legacy code but rather on the next generation Internet technology called 'semantic web,' which brings inherent intelligence to R&D information. Rescentris CERF is used today by hundreds of researchers across three continents to manage their research projects on a daily basis. Rescentris customers today include biotechnology and biopharma companies, academic and clinical research institutions, and government laboratories.

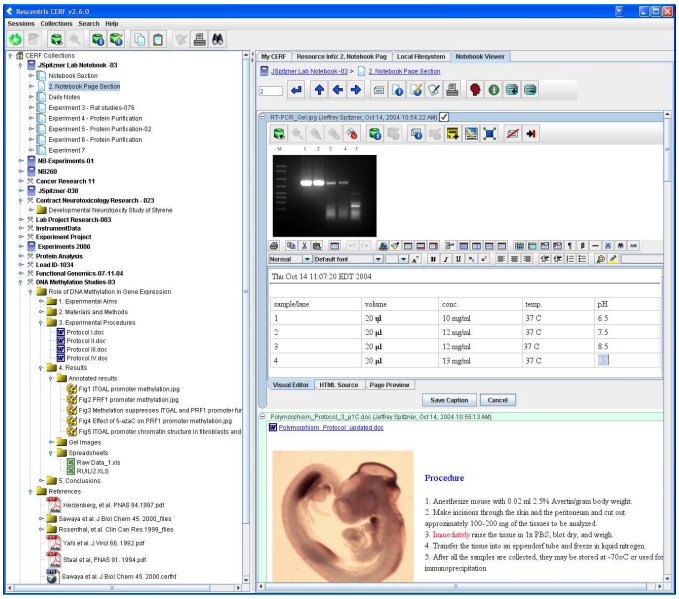
Results

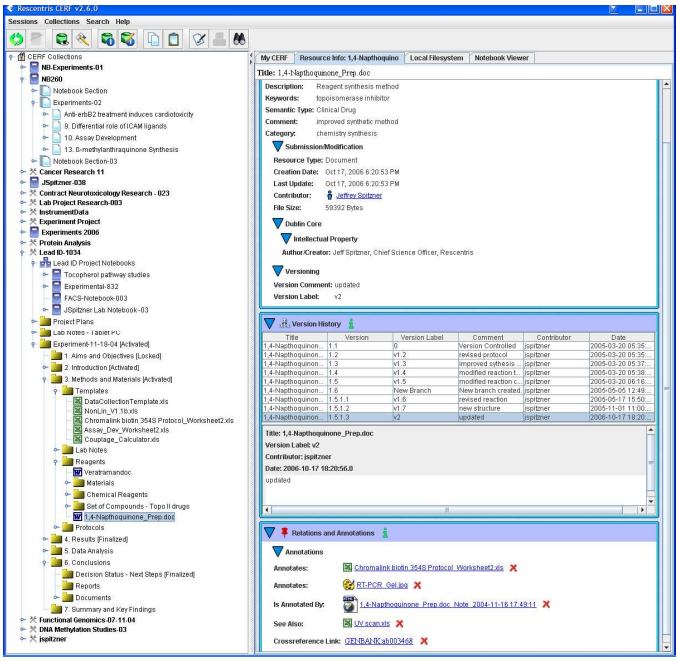
Rescentris developed CERF to solve the problems biologists have creating, organizing, finding, sharing, and reusing their research records and scientific knowledge. Biology covers diverse disciplines, methods, data types, tools, workflows, and work habits – making it difficult to organize personal and team content and activities within a common framework. CERF was designed to accomplish this and unify the scientists' information universe – bringing together (and making visible) their notebooks, SOPs, and information otherwise scattered across PCs, databases, and network file systems.

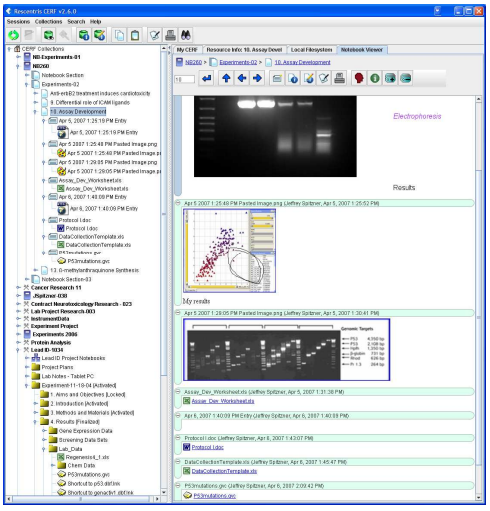
It is hard to change the habits of scientists, so CERF is "your data, applications, and workflows – just better™." CERF's rich ELN environment supports multiple modes and flexibility for data entry/editing, the ability to 'work in the notebook' to author and edit content, and management of data in integrated file/notebook views. CERF combines structured and unstructured work in an integrated framework that includes automated data collection and a complete document control system to streamline science and recordkeeping.

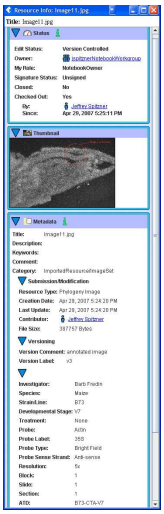
What makes CERF The Biologist's Notebook™ ?

CERF product screenshots









Conclusions

An ELN system for Biology must support the complexity of the science and the diversity of workflows, data, and work habits. These are the requirements:

►A rich electronic lab notebook environment supporting multiple modes and flexibility for data entry and editing

►Ability to 'work *in* the notebook' as well as management of content in integrated file/notebook views and capability to combine highly structured, loosely structured, and unstructured work

►Creation and reuse of all content in the ELN environment – including templates that may contain documents, notebook entries, forms, placeholders, project management data, and rich metadata and scientific data (users create templates while working, not separately, at 'design time')

►Scientific data models, metadata (including semantic metadata and hierarchical controlled vocabularies), and domain-specific workflows

►Support for the data that biologists use – images, MS Office documents, rich text entries, files and datasets – with capability to define editors/viewers, workflows and processing for specific scientific content (object types)

►Automated data collection, processing, and distribution across the enterprise

►Complete scientific content management solution with comprehensive document control and workflow system

►Data/systems integration platform, open systems architecture, cross-platform use, and a highly flexible and extensible framework

►True support for regulatory compliance including 21CFR11, and IP management – at the system, notebook, and individual contents/files levels

►Integrated research project management and collaborative knowledge management

►The Biologist's Notebook™ must unify the scientists' information universe – bringing together their notebooks, the files otherwise scattered on PCs and network file systems, their reference information and SOPs. It must also organize personal, team, and organizational content and activities within a common framework

CERF was designed specifically for the multidiscipline life sciences organization. The Rescentris product is the only ELN that achieves the complex requirements of Biology.

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