



Harnessing the Efficiencies of Modern Informatics for Life Sciences R&D

Merck Life Sciences, a division of Merck KGaA, Darmstadt, Germany, realized significant advantages in data management by deploying an electronic laboratory notebook (ELN) in its research and development (R&D) operations. Previously, relying on paper laboratory notebooks and a few scattered electronic tools, the organization suffered from a lack of data standardization, inefficient communication, and limited collaboration.

To enable its scientists to streamline workflows, manage data efficiently, and collaborate more effectively, Merck selected Signals Notebook, the cloud-native ELN from Revvity Signals. For the overall Merck Life Sciences organization, four capabilities of Signals Notebook, in particular, have provided significant gains:

- Sample management
- Integration with existing informatics systems
- Hands-free data entry
- Highly customized security access

“Electronic lab notebooks are not just a tool. They are the catalyst for innovation, collaboration, and progressing in the real world of science.”

-Yi Sun, Head of IT R&D Applications, Merck Life Science

Benefits Across 25 Locations and 50 Laboratories

Merck Life Sciences, a global science and technology company, has implemented Signals Notebook across 40 R&D groups, with over a thousand users spread over 50 laboratories and 25 sites. Importantly, it has tailored the solution to fit its needs: It has defined more than 60 security rules for 250 user groups and set up more than 70 templates, 60 administrator-defined tables, 90 attributes, and 15 libraries and external data sources.

Signals Notebook enables users to capture and organize data in a modern, user-friendly interface, search millions of experiments quickly and efficiently, and share insights with colleagues on a permission-managed platform. It also enables easy integration with third-party software, an important capability for Merck Life Sciences.

Merck Life Sciences is experiencing substantial benefits with this rollout across a complex organization. These include enhanced collaboration across teams and departments, more informed decision-making, reduced errors and duplication, streamlined workflows, and increased productivity. Scientists are now freed from manual tasks, allowing them to focus more on their research.

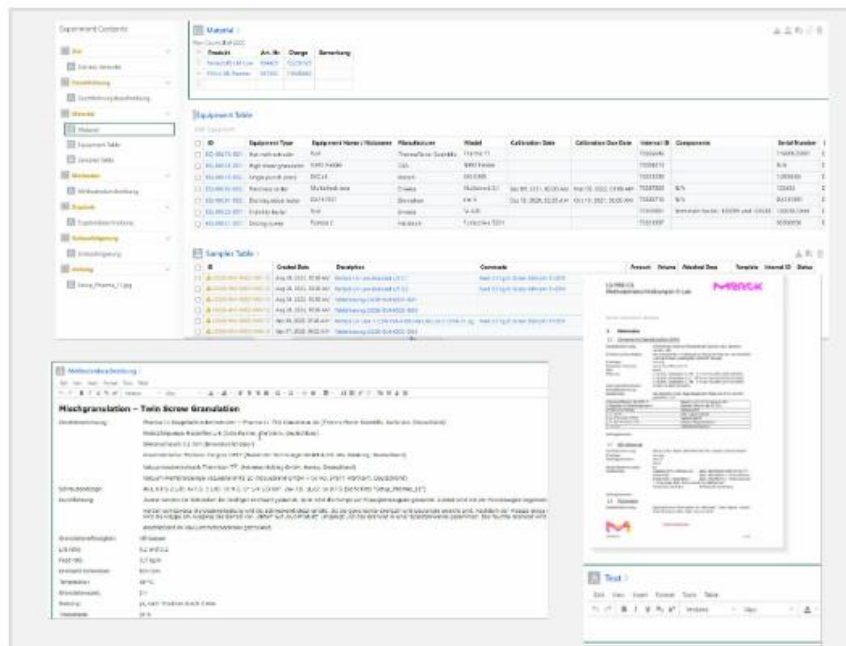
Researchers across various departments have praised specific features of the new ELN platform. One scientist, specializing in cell line research, appreciates the interactivity gained by transitioning from paper to an electronic notebook. His team now receives real-time feedback on experiments from managers, aiding in better project decisions. He also values the increased visibility of his group's work within the R&D organization.

Another researcher finds Signals Notebook more user-friendly than other ELNs he has used. Most importantly, he appreciates the time savings. With Signals Notebook integrated with Microsoft Office applications, he saves an hour daily on data transfers and processing raw data. By reducing manual tasks, he can put more focus and time into research and innovation.

Key Highlights

- Better visibility
 - Centrally shared documentation
 - Process tracking via workflow
- Enhanced transparency
 - Seamless and automated handover of centrally linked documentation that's searchable, traceable and auditable
- Improved efficiency
 - Reusable assets, templates and centralized reporting reduce scientists time spent on finding data

Figure 1: How Signals Notebook can be deployed in the lab using molecular biology lab as an exemplar.

**Sample Management Tools Optimize Asset Utilization**

With a sample management library, users can create a list of up to a thousand samples within Signals Notebook, recording all sample parameters, properties, and related information. During experiments, scientists may simply cite the sample ID instead of replicating data. All results are connected to the sample, making it easy for other researchers to reference. This single source of data has allowed Merck Life Sciences to optimize asset utilization, reduce errors, and improve data integration.

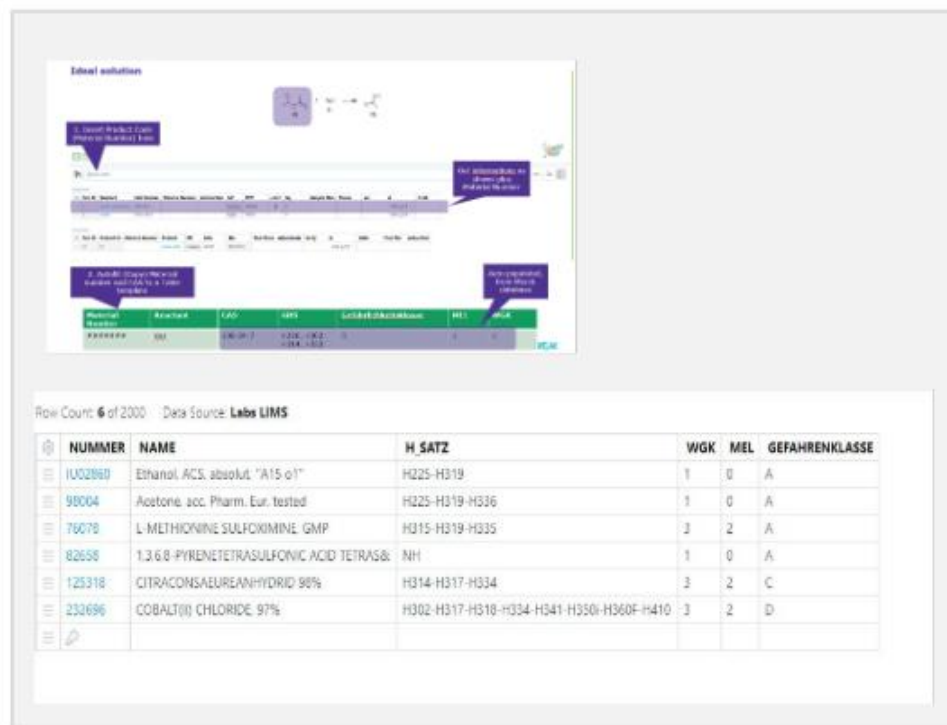
LIMS Integration Provides Ready Access to Material Safety Data

Merck Life Sciences has leveraged the integration capabilities of Signals Notebook to connect to its laboratory information management system (LIMS). One example of the benefit provided by this feature is the ability to pull raw material safety data into Signals Notebook. Now, as scientists conduct research, they click a button, and material safety data is transferred instantly from the LIMS, where it is already stored, to an experiment in Signals Notebook. This ready access to this information is improving laboratory safety.

Key Highlights

- Efficient data transfer
 - Eliminate manual data entry
 - Reduce human errors and save time
- Real-time data availability
 - Up-to-date data
 - Enhanced ability for informed decision
- Streamlined workflows
 - Focus on experiment rather than data management
- Scalability
 - Increase data volumes for complex experiments

Figure 2: How Signals Notebook is integrated into LIMS at Merck Life Science Labs.



Hands-Free Data Entry Means Richer Experimental Records

The Merck Life Sciences team has also taken advantage of the capability to integrate voice assistance software into Signals Notebook. With this integration, researchers can capture information, hands-free, as they conduct experiments—recording all steps, descriptions, data, and results. With a voice command, a scientist can also turn on a camera, take screenshots, and scan barcodes from instruments and raw materials.

Enabling scientists to capture notes and observations verbally improves data quality. Notes now include complex descriptions that scientists were unlikely to type out. This richer experimental record enhances the context around experimental data, capturing a scientist's thought process and any unusual observations.

Six Levels of Customized Security Access

With this broad rollout to a large, diverse organization, Merck Life Sciences needed to address varied security needs. To do so, it has implemented six levels of access: public, restricted, confidential, lab-only, department-only, and project-only. Laboratories and teams use these configurations to customize access according to specific local needs, enabling the organization to ensure security while fostering collaboration.

Summary: Enabling Efficient Research and Secure Collaboration in a Large R&D Organization

With more than a thousand users spread over 40 R&D groups at 25 locations, Merck Life Sciences needed a modern, cloud-native ELN to remain competitive. With Signals Notebook in place, researchers now efficiently capture experimental data, improving accuracy and compliance, while saving time on manual tasks. Easy, real-time data sharing increases collaboration, while quick data review leads to informed project decisions. The integration of voice assistant software enables hands-free data capture for richer experimental records, while interfaces to LIMS and office software reduce manual data handling. Customized security protocols, meanwhile, ensure controlled access. In sum, implementing Signals Notebook has led to a more efficient and productive R&D environment.

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