

SK Life Science Labs Accelerates Drug Discovery with Signals Notebook



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Accelerating Biotech Innovation: The Transformation of CRO workflows with Signals Notebook

Emerging biotech companies often operate with a lean framework, keeping staffing small and working closely with external partners to conduct research. In such a structure, with ongoing communication and data sharing across multiple organizations, researchers can get bogged down in cumbersome processes and administrative tasks.

SK Life Science Labs, a subsidiary of global biotech company SK Biopharmaceuticals, was facing inefficiencies like these in its drug discovery research operations prior to its 2023 acquisition. As a small organization of about 40 scientists working with nearly a dozen contract research organizations (CROs), SK Life Science Labs discovered that harnessing the power of Signals Notebook®, a unified SaaS informatics platform from Revvity Signals, significantly streamlined its external collaborations while increasing traceability, improving inventory management, and boosting productivity.

Before: Slow, Manual Information Exchange with Poor Visibility into Data

SK Life Science Labs started as a small biotech operating out of the University of Michigan. Its research exploits the protein degradation mechanisms of the human body's ubiquitin-protease system (UPS) to discover and develop new medicines. This promising approach provides the opportunity to target proteins of interest, many of which were previously considered undruggable.

In its early days, the company and its CROs shared data, primarily in Microsoft® Excel and PowerPoint files, through an online cloud file platform. Internal scientists reviewed the data and analysis files provided by the CROs and used PowerPoint to share the information internally.

This data-sharing process was inefficient. It required multiple hands-on steps to capture data from Excel and PowerPoint files and was highly variable from one CRO to another. CROs often did not follow data-entry protocols, requiring back-and-forth communication to get errors corrected. Checking on the status of experiments and sharing inventory data was cumbersome and slow. The organization also wanted an easier way to visualize the entire operation.

After: A Signals Notebook Workflow to Streamline Drug Discovery Research

To address these challenges, SK Life Science Labs needed an effective informatics solution. They selected Signals Notebook, a secure, cloud-native electronic lab notebook (ELN) that enables users to capture, organize, and customize their data. With Signals Notebook managing permissions, internal and external colleagues can collaborate and share insights effortlessly, under managed permissions. Users can readily integrate data from multiples sources, streamlining research processes and enhancing productivity. Signals Notebook also natively integrates Spotfire®, a visual analytics and discovery platform that empowers teams and organizations to mine scientific data and gain insights to drive data-driven decisions.

Improved Collaboration and Operational Visibility

With Signals Notebook in place, the SK Life Science Labs team created templates and protocols, and undertook application programming interface (API) calls to streamline communication with their CROs about experiment initiation, experiment status, and protein inventories. They also set up a dashboard to increase visibility for senior management about progress and results. By doing so, they achieved noteworthy improvements in efficiency, traceability, communication, inventory management, and operational visibility.

Accelerating CRO Workflows from Days to Minutes

Before implementing Signals Notebook, interactions between the company and its CROs were slow and required a lot of manual intervention. The CRO's designed or synthesized molecules and sent the relevant data to the SK Life Science Labs team through a structured-data (SD) file. Internal chemists downloaded the file, registered the data, and then sent the registration identification (ID) back to the CRO. The CRO staff entered the registration ID in an Excel file, listing the compounds and amounts, and then sent the information to the external compound registry. That process took two days.

Signals Notebook has streamlined this workflow. With controlled access to secure workspaces, the CRO staff now directly record their experimental data in Signals Notebook, while in-house chemists can check the CROs' work in real time. Without intervention from SK Life Science Lab's staff, CROs can register samples, obtain a registration ID, and send the information to the external compound registry – recording every step in Signals Notebook. The new process takes a few minutes.

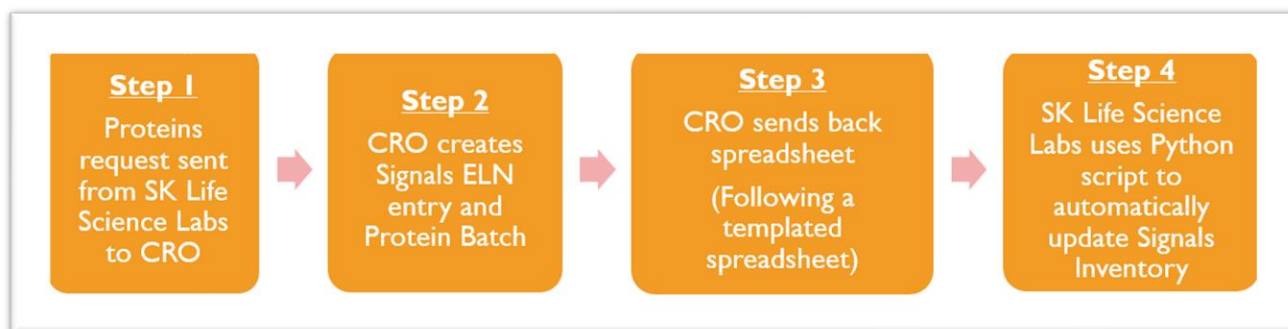


Figure 1. The protein inventory process implemented using Signals Notebook that enables SK Life Science Labs to track and inventory all protein preparation requests from their CRO partners.

Consistent Processes Regardless of Data Source

Signals Notebook has also enabled the company to standardize workflows across its many external partners. Previously, CROs often failed to follow precise protocols when submitting data, leading to time-consuming efforts to get corrections made.

The SK Life Science Labs team knew it could harness Signals Notebook to automate protocol-driven data capture to minimize human intervention. One aspect of their solution was to create a naming convention that requires CROs to enter essential information, such as the cell line, in the file name. This consistency in data capture facilitates tracking: researchers can now easily look

up data about a specific cell line, because the cell line name is tracked all the way through the experimental workflow.

Similarly, other aspects of the new templates ensure consistency across all the company's research. Now, data are entered the same way, calculated the same way, and published in the same place, whether an experiment is conducted in-house or by any of its CROs.

Operational Visibility for Monitoring Progress of Experiments

The SK Life Science Labs R&D team also wanted to visualize data in graphical formats, to track experimental progress more easily. At the same time, senior leadership wanted visibility into productivity and results. The organization was able to achieve both goals by harnessing the synergies between Signals Notebook and Spotfire®.

“Signals Notebook has been a great resource [for our researchers] and our leadership team needed visualization of experiments in a dashboard. Spotfire has been a great visualization for these tools and the applications of the dashboard creation.” - Nina Mucciolo, Senior Research Associate, Research Informatics at SK Life Science

The team used API calls to create a data dashboard in Spotfire that displays research progress and results in intuitive graphics and charts. The dashboard is populated with information stored in Signals Notebook and ties together key metadata, connecting user numbers to usernames, experiments, and experimental status. The dashboard is automatically updated as experiments are performed, so it is always current and accurate.

With these visualization tools at their fingertips, researchers can readily track experimental status, and upper management can easily assess progress and productivity.

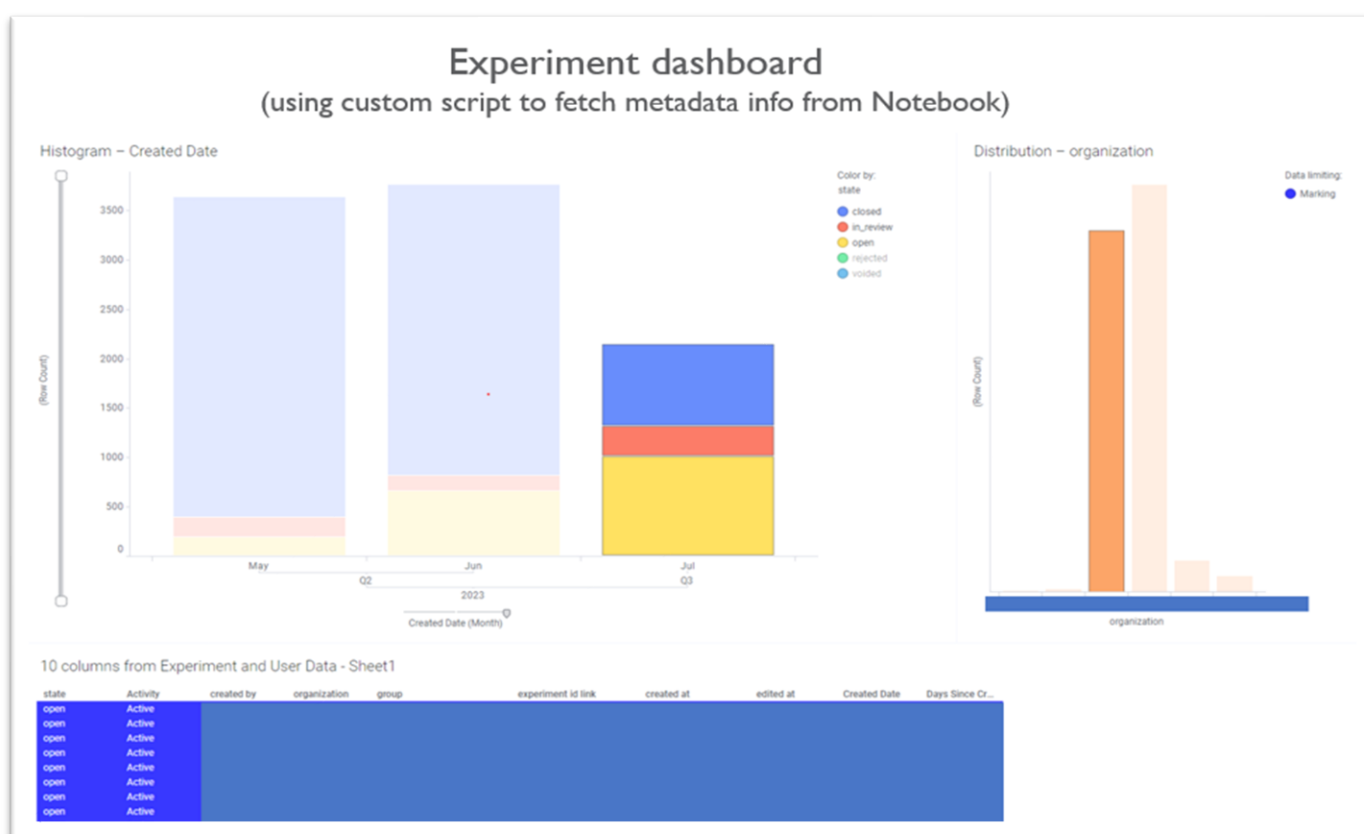


Figure 2. Spotfire dashboard using custom script to fetch metadata from Signals Notebook. The dashboard facilitated compliance and operational efficiency. Note: Usernames and other identifying information blocked out in bottom blue box, but this table enables SK Life Science Labs to easily find and hyperlink to Signals Notebook experimental records.

Improved Traceability and Accessibility of Experiments and Inventory

This Spotfire data dashboard also facilitates the use of data for compliance and operational efficiency. Users can see the status of experiments over time, from different CROs, regardless of whether experiments are closed or open. For more details, they can follow a link to the full experiment.

Signals Notebook also enabled SK Life Science Labs and its CRO partners to track and inventory all the proteins that are created, requested, and used throughout its discovery operations. Now, as CROs work with proteins and record experimental data within Signals Notebook, a script automatically updates the inventory, including all details about each protein batch and its physical location. This automated inventory makes it easy for all researchers, both internal and external, to find and access proteins for their use.

Summary: Streamlining Collaborative Research with Signals Notebook

SK Life Science Labs harnessed the power of Revvity Signals Notebook to streamline its drug discovery operations, accelerating CRO processes from days to minutes while establishing consistent data workflows. They gained greater data visibility, improving experimental traceability and operational monitoring. Their blueprint demonstrates how an integrated data platform can enable a small biotech company to improve collaboration with its external partners for increased productivity.