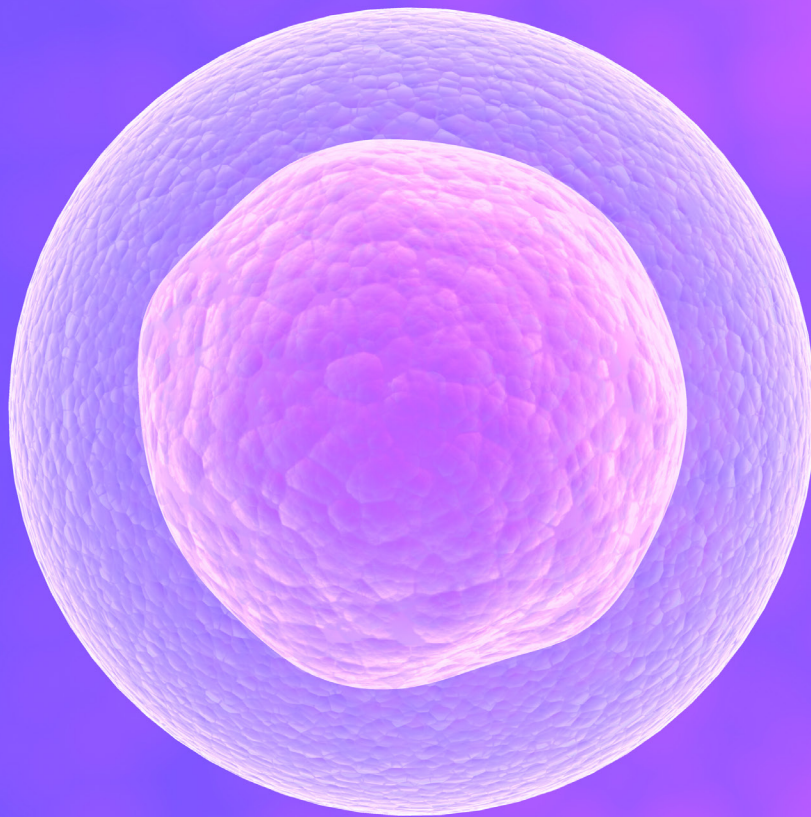


CASE STUDY

Startup unifies lab management to pave the way for Big Data analytics



Spotlight Therapeutics & Benchling: Startup unifies lab management to pave the way for Big Data analytics

Spotlight Therapeutics is pioneering cell-targeted in vivo CRISPR gene editing by creating a new class of programmable ribonucleoproteins called Targeted Active Gene Editors (TAGE). These modular biologic constructs are engineered to overcome the current limitations of viral and nanoparticle delivery. Spotlight was an early adopter of Benchling, initially using just Benchling Notebook to record experiments. As they've grown and matured their technology, they've expanded their Benchling usage to eliminate manual inventory management, enable big data queries, and increase the speed of collaboration.

COMPANY PROFILE

Number of employees: 11-50

Industry: Gene Therapy

Location: Hayward, CA

SPOTLIGHT'S GOAL

Enable gene editing in previously intractable gene therapy targets by unifying Spotlight's data and automating inventory management.

KEY RESULTS

25%

Scientists estimate
experiments progress
25% faster

2 hours

Saved per week per
scientist on data cleaning

61%

Increase in ease of
collaboration



“A year ago [...] I was the only one who knew where reagents were and how much we had left. The really big success we’ve had since we came back from the COVID shut down was being able to empower other people to go take out things and keep track of things themselves. It’s been a big improvement in my daily work.”



Aaron Cantor, Protein Scientist



CHALLENGES

Inventory Management

Having a single person responsible for managing a spreadsheet-based inventory system was prone to human error and created bottlenecks.

Data Harmonization

It was difficult to run large-scale analyses across sets of experiments. Data lacked the structure and standardization necessary for big data analytics.

Collaboration

Unconnected note-taking, lab management, and data interpretation systems encouraged siloed work rather than collaborative work.

THE STORY

Early on, it was clear that setting up the data foundation at Spotlight Therapeutics would be critical to generating deep, actionable insights from their data. Spotlight was working on how to enable in vivo delivery of CRISPR/Cas9 – a rather cutting edge technology in 2017 — as a biologic. The team chose Benchling, and its leading Notebook, to record their experimental results.

As early adopters of Benchling Notebook, they had the benefits of a clear historical record and templated protocols. However, as Spotlight matured, other parts of their lab management lagged behind. Their inventory management system consisted of a single individual maintaining an Excel spreadsheet, leading to errors and bottlenecks. They also realized they lacked a data infrastructure that would allow them to run big data analysis, putting a ceiling on their discovery platform.

An integrated Inventory system provided visibility, reduced human error, and improved productivity

As a small startup, faster progress towards scientific goals can be the difference between sink or swim. When Aaron Cantor joined Spotlight, he became the de-facto inventory system.



However, having a single person use spreadsheets to track requests and then retrieve vials for the entire lab was an error-prone and inefficient process. He realized he could instead expand Spotlight's Benchling usage to automate this manual process. Implementing Benchling Registry and Inventory empowered the team to track usage and availability of common reagents. Now that every scientist knows what is available in which freezers, they can retrieve stocks themselves, significantly reducing administrative time and freeing up time to make scientific progress.

Standardized, accessible data makes big data queries possible

In addition to improving inventory visibility, Benchling has helped Spotlight answer pivotal questions. Spotlight constructs modular TAGE candidates from a library of "parts." Spotlight had matured to a stage where scientists and leadership alike were eager to ask more directed questions such as, "Which combinations of parts work on which kinds of cells?" And, "Have we tried a molecule that looks like these other ones?" These questions were a great match for Benchling Registry and Results. In addition to improving inventory visibility, Aaron also unified naming conventions and established standard fields for data capture. With uniform data fields, the team can quickly query across all affinity experiments to find patterns and trends, whereas when data fields weren't established, they could easily miss pieces of the puzzle if data was sitting in a Notebook entry, under a scientist's ad hoc naming scheme. Setting up a clear structure for their data has opened up a world of interesting questions that Spotlight can now explore. For example, it allows them to more quickly identify the highest-performing gene editors and which parts made them that way – critical insights for program-level decision making.

The newly-standardized data also had benefits beyond data analysis. Having a reliable framework to store and share data was key to tracking continuous scientific progress, which is crucial to attract future investors. Standardized data capture, coupled with custom tools Aaron has built on Benchling's APIs, also saves scientists time both for uploading new data and gathering insights. These custom-tailored tools have made it even easier for scientists to incorporate Benchling into their day-to-day work.



Realizing the benefits of a unified platform enables cross-functional collaboration

Now that Spotlight is using Benchling to manage the lab, they're reaping the benefits of using a unified system throughout their research. The level of traceability of samples is unmatched; for any given sample, scientists can quickly surface all its metadata, related samples, and results simply by mentioning the name of a molecule in a Benchling Notebook entry. They can quickly flip between other entries that involve the molecule and pull up the corresponding context to understand usage and performance. Enabling high-context information to flow freely between scientists has empowered Spotlight to work in a highly collaborative way. Three or more scientists typically work together on any given experiment or workflow, whether they are doing screening, hit confirmation, or mechanism of action studies. Hand-offs and requests between teams are smooth since all information is collected in a singular location and easily accessible.

Aaron is excited for the future of Spotlight and Benchling working together. At Spotlight, a growing team means more people are collecting more data, which increases the challenge for data analysis. More discoveries are being made – all of which Spotlight is accelerating with Benchling. Spotlight will continue to evolve their Benchling usage as they continue to develop the next generation of in vivo CRISPR gene editing therapeutics.

“Having a good framework to store and share data, and a way to systematically go through and look at all of our progress, is really key to anything we're going to be able to do and anything we're going to do in the future.”

Aaron Cantor, Protein Scientist





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