

CASE STUDY

Cue Biopharma & Benchling: Evolving into a clinical-stage organization





GOAL

Build the digital infrastructure required to run a clinical-stage company that can drive safe, efficacious immunotherapies to reach patients faster.

Cue Biopharma is engineering a novel class of injectable biologics to selectively engage and modulate targeted T cells directly within the patient's body to transform the treatment of cancer, infectious disease and autoimmune disease. This approach leverages a natural immune response with innovative protein engineering to achieve a more controlled immune response providing greater patient benefit while reducing toxicity — areas that have traditionally challenged broadly-acting immunotherapies on the market. In a push to move new safe and efficacious immunotherapies to patients, Cue Biopharma has scaled and grown into a clinical-stage company by expanding its development work in-house. To establish the data management infrastructure required for such work and establish a bidirectional flow of information between the Research and Development groups, Cue Biopharma has utilized Benchling as their unified cloud solution.

COMPANY PROFILE

Number of employees: 50-100	Industry: Biopharma	Location: Cambridge, MA
F	,	

KEY RESULTS

Consistent, structured data capture in templates allowed deeper insights to be drawn across experiments. Collaboration and handoffs between teams — particularly between research and development — are efficient and effortless. Cue Biopharma is clinicalstage ready and has a 360-degree view of scientific progress driving outcomes.



"Benchling, as a combined ELN and LIMS ecosystem, is more than just a backup of your data; it helps bring your science forward [...] Benchling helps save time [at] every step of the experiment."



Zohra Merazga, Scientist





CHALLENGES

Non-standardized data capture

Excel sheets were flexible but difficult to manage at scale. This led to tedious data reconciliation when attempting larger analysis.

Barriers to communication and handoffs between teams

Rapid scaling, combined with the difficulty inherent in bridging research and development, led to collaboration challenges.

Growing into early development

Cue Biopharma wanted to evolve into a clinical-stage organization and needed to put in place the digital infrastructure necessary to do so.

THE STORY

Since 2014, Cue Biopharma has been designing novel biologics to modify the immune system in a targeted and specific manner to fight diseases — from cancer to autoimmune disease. To bring these promising new therapeutics to market, they chose to evolve as a company and transition from a research-centric organization to a clinical-stage organization. A key aspect of this growth was bringing early development activities, such as cell line development, in-house to achieve greater control over the types and quality of work done by their teams. The research teams still required flexibility in their informatics solution. The early development teams, by contrast, needed more structure and control to define and conduct repeatable processes. Both research and development teams wanted fluid handoffs so knowledge and data could flow bidirectionally between the groups.

Samantha Povlich, a Principal Scientist and Head of Analytical Outsourcing and Stability at Cue Biopharma, knew about Benchling from her previous companies. She saw how using Benchling as Cue Biopharma's information management system would provide both the structure and the flexibility needed to unite discovery and process development.



Templates capture each team's unique workflows, allowing different scientists to work in ways familiar to them while ensuring consistent data capture

Early on, Cue Biopharma used shared spreadsheets to manage all the information they created and collected. There was a master spreadsheet of all the sequences and a team-specific nomenclature system. Although the spreadsheets were flexible, relying upon them posed inherent risks, such as unintended edits and duplicates. This was an annoyance for research, but a danger in early development work. Furthermore, it was easy to overwhelm an unstructured system made of Excel sheets as Cue Biopharma grew and as the number of protein samples, cell lines, and patient samples to track grew.

Samantha immediately improved tracking and information management by building a data model within Benchling by herself — no onsite software development team needed. With the name, location, history, and results of all samples now stored in an interconnected suite of applications, the throughput of information shared between scientists within and across teams immediately increased, making tracking much more robust and knowledge transfer much more efficient.

Samantha also created templates to empower scientists to input all experiment-relevant information into this newly centralized system. A key strategy to driving data consistency and uniformity was tailoring different templates to each team's unique workflows. By matching the processes and needs of each team, Benchling made data input an intuitive user experience for everyone, while still centralizing and standardizing all of that data across teams. This templatized approach allows Benchling to collate related Notebook entries as collections of scientific questions and answers, providing deeper context and improving R&D productivity. For example, researchers can see why a certain peptide is more effective at activating T-cells to fight a type of cancer since all the experiments associated with answering this question are packaged together. Cue Biopharma now records over 90% of their experiments using a template.



Structured request systems and normalized ontologies between different teams enable collaboration and simplify handoffs as entities move from research to development

Previously, Cue Biopharma relied heavily on personal interactions to share information. It was easy to talk about a problem in a room and then execute as a small group. However, as they tripled in size, it became increasingly difficult for key pieces of information to efficiently flow through the organization. Data and knowledge transfer were further complicated by the different naming conventions, organization methods, and record-keeping strategies home-grown by each team, creating time-consuming obstacles to communication and tracking when moving samples downstream.

Benchling helps all teams across Cue Biopharma work efficiently and stay in sync. Along with a common language to speak about experiments across the company, Benchling enabled Cue Biopharma to design a request system to accommodate all testing that happens with all the different permutations of candidate molecules. With over 4000 engineered constructs to consider, it has been critical for an efficient operation to have an interconnected system automatically managing each completed step, batching together handoffs to the next team, and recording sample history. This more streamlined approach to coordinating samples and data transfers not only reduces time spent asking for status updates but also enables Cue Biopharma to understand result trends over time.

A clear data structure establishes a culture of trust that accelerates development and drives more informed decision-making

Benchling has facilitated a cultural shift at Cue Biopharma. Everyone is now comfortable entering data in a structured manner and trusts the data they pull to be the most accurate and up-to-date. The shift has simplified and accelerated the transition of the company into downstream development and preclinical work. For future audits, Cue Biopharma is prepared to easily and quickly pull together the necessary documentation because of how thoroughly information has been captured, how user-friendly it is to obtain, and how confidently they trust the records.



Furthermore, the benefits of collaboration extend beyond the bench to leadership. For example, Benchling enhances Cue Biopharma's patenting process by providing a secure interface through which company scientists can give patent counsel access to documents—but not the database. Team leaders and hiring managers also benefit from faster onboarding of development teams like cell line development thanks to consistent data handoffs across internal teams upstream.

Conclusion

With the focus on getting treatments to patients faster, Cue Biopharma has made the data infrastructure investments that will allow them to move efficiently and effectively as an organization from early ideas to products that will improve lives. By bringing on Benchling, they have been able to meet their scientists' needs for specific workflows, as well as cross-organization needs for collaboration and communication. The rigor, consistency, and quality achieved by Cue Biopharma are helping create safer and more efficacious therapies for those that need them most.



"Benchling has allowed us to incorporate internal process development because we have implemented things like a bioregistry, templates, and process workflows for our discovery engine. It has allowed us to have the flexibility of both worlds: very structured process development data and less structured discovery data, where there is no set process or workflows in place yet while we do cutting edge research."



Samantha Povlich, Principal Scientist and Head of Analytical Outsourcing and Stability





www.benchling.com