

4 Reasons for Growing Biotechs to Adopt a Cloud R&D Data Platform Now



Benchling

How a robust informatics solution will support your business today and help you scale tomorrow.

A New Approach to Scaling

In this whitepaper, we'll cover four key areas where a cloud R&D informatics solution can help your biotech business innovate today — and ensure that your data, teams, and processes are prepared to scale tomorrow.

Data capture

Find the data
you need

Sample tracking

Save time
and resources

Collaborative project management

Work together
as a team

Streamlined processes and systems

Future-proof
your business

Introduction

It's an exciting time to be an innovator in life sciences R&D. The opportunities for transformative impacts on human health, agriculture, materials, and energy are truly endless. But with innovation comes substantial barriers and competition. These fields are moving faster than ever before. Early-stage biotech companies may have promising ideas and groundbreaking science already in progress, but to bring those ideas to market, it's mission-critical for them to manage complex data and processes with speed and accuracy.

No matter the exact stage of your company's growth, you're likely seeking informatics tools that will work for you right now. But even as a young company, you know that the work you do today is not just for today. Your charter is to grow and scale for the future. To walk the balance of building today and scaling tomorrow, you must set your organization up for long-term success — whether that's profitability, acquisition, or IPO.

Scaling from the start

What does growth really look like in biotech? In broad strokes, it might mean securing funding for your ideas and hiring more scientists to expand on those ideas. It could mean licensing part of the technology you've developed to a larger company, thus enabling enough stability to continue your research. But no matter the specific circumstances, growth has a number of tough challenges that come along with it.

Almost universally, growth means grappling with more and more data, more people, and managing more projects with greater complexity. Scaling people and projects means needing better standardization of data generation and collection as well as better communication and collaboration between scientists and teams. It means needing a reliable way to see, understand, and share your data — from both a bird’s-eye view and a contextualized, granular view — so that every decision you make is data-driven and you’re always able to clearly, concisely, and completely articulate your potential to the outside world.

These aren’t easy tasks. And they’re made more difficult without a robust, unified cloud informatics platform. That’s because even if isolated or generic solutions work today, such as standalone Electronic Lab Notebook (ELN) software or Excel spreadsheets, they simply cannot be counted on to continue to function as you grow. Without connected, built-for-biotech systems, it will become harder and harder to keep up with the speed of your own innovation. Proactively implementing the infrastructure to support the growth you envision will not only prepare you for a complex, fast-paced future, but also help you fast-track the future you want to see. What’s more; if you don’t prepare today, you’ll sentence your teams and innovations to a constant state of playing catch up.

“If you’re expecting to succeed at all, you should expect a lot of data quickly. It’s much more difficult to go back when you already have a vast amount of data. If you look at any experienced entrepreneur, many of them build systems early with the growth process in mind.”



Max Rye
Chief Strategist



Data capture

Find the data you need

The more experiments you perform, the more data you generate. It's a reality for the biotech industry. Yet that data is only truly useful if it is collected and documented in a consistent manner each time an experiment is performed. If there is any confusion about the exact details of what occurred, or if a critical piece of information is missing, it's difficult to make any decisions — or worse, your decisions are based on incomplete or inaccurate insights. For this same reason, all data needs context. Good data never exists in a vacuum; it is only useful if you can find it, aggregate it with all other related data, and glean insights that fuel your mission.

These nuances are intrinsic to biotech data, and the challenges surrounding them only compound as you scale. Having consistently recorded, easily-findable data within increasingly complex, interrelated processes means you'll be able to design and reproduce experiments more quickly and precisely, share accurate insights with potential partners, effectively track overall progress, and set realistic goals.

“The name of the game in data science is making progress really fast, but not so fast that [scientists] don't write things down. We want to know everything that we ever did, ever.”

Jake Jaffe, Ph. D

Head of Data Science, Inzen Therapeutics

The old way

Let's say you have a small number of scientists conducting a few different experiments. It may seem possible to use paper notebooks, Excel spreadsheets, or a standalone ELN to record information about samples, experiments, and results. But using these kinds of systems can present unwelcome challenges — both right now and when your company grows.

On paper and Excel, for instance, it's easy for actions to be recorded inconsistently, with key pieces of information mislabeled or omitted. Plus, because each of these solutions, including an ELN, is completely disconnected from other data or software systems you use, it can be difficult to get data in and out. Manual entry is tedious and error-prone; so is downloading data from one system and converting it into a new format for further analysis in another.

Inconsistency in data or having data in different places can create big problems, from daily frustrations to large roadblocks. Comparing results across experiments or across time can be extremely difficult, and without easy access to a certain piece of information, an entire experiment could be compromised, forcing scientists to unnecessarily repeat their work

The new solution

If you invest in a modern, unified cloud platform that provides the structure needed for consistency and context in data collection and documentation, you'll save a tremendous amount of frustration — and be able to iterate and progress your research that much faster.

Imagine, for instance, being able to automate data capture. Instead of relying on time-consuming manual entry in a variety of disparate places, a new cloud platform can record every detail of your experiments and host related data in one location. This platform can handle bulk data uploads as well as connect crucial data as it's entered. Experiment results, for instance, can automatically be linked to all of their associated data throughout the platform, including previous lab notebook entries as well as related samples, reagents, and DNA sequences. Each piece of data is natively linked with its necessary context; click on any one element and easily see the whole picture.

With this level of consistency and traceability, you'll have far better data integrity to lean on when sharing with investors or partners, as well as when preparing IND filings or patent applications. You'll also have the consistency needed to understand your research and your progress — and make key research decisions faster. Because all future decisions will be based on past decisions, these early choices are some of the most critical your company will ever make.

“With Benchling, it’s so much faster and easier to find the information that you want, and share information even in real time. Series of experiments go faster, program timelines go faster, and it shortens the timelines for the development of our therapeutics.”



Cherylene Plewa
Vice President of Molecular Biology

Sample tracking

Save time and resources

As a young company, you want to move fast and don't have a lot of time or resources to spare. You will likely soon find that you need an inventory and registration system — and not only to avoid waste, but because effective scientific progress relies on end-to-end sample tracking. To move quickly and accurately, you need to be able to know the lineage of a derivative entity; you need to know where specific samples came from, how they were made, and how to make more of them; and you need to know what experiments each sample has been involved in and what the results were. If specific reagents or samples can't be found at a critical moment, or if much-needed information about them isn't available, scientists can't do their work effectively. Having to delay experiments because of inventory concerns puts a huge drain on momentum.

All of these needs and concerns will only grow more crucial as you scale. Often, scientists in a growing company begin to specialize in different projects or disparate steps in a complex process. Each aspect of that process may require very different types of samples, and each of those samples may have new, specific types of associated data that need to be tracked.

The old way

Keeping track of samples and inventory in a spreadsheet or notebook — especially complex tasks like lineage tracing and component mapping — is extremely time-consuming and complicated, and tends to have low compliance. If your company's sample tracking systems aren't up to date, scientists may assume they have all the materials needed for an experiment until they get to the bench. Missing a key sample or reagent, or having to conduct extra experiments to confirm a sample's identity, leads to avoidable delays in progress.

Using standalone software to manage inventory can also be a burden. It may show you how much of a certain sample you have, but it will not connect with all the other data you need to know about it, such as results from past experiments. Bouncing between inventory systems, sample tracking software, molecular biology tools, and lab notebooks is not only laborious, but prevents scientists from easily gaining insight into precisely what is working and why.

The new solution

With a new, unified informatics platform, you can rely on flexible systems which can be configured for precisely the kind of science you are doing and the data you need to record. When lab notebooks are seamlessly integrated with sample and inventory management systems, you can better standardize and track all of the samples used in each experiment, as well as have an immediate view into critical data associated with every vial in your lab refrigerator and freezer. With a couple of clicks, you can even customize and adapt your tracking structure to suit your evolving company's specific needs.

All of this is useful immediately, of course, but it's also even more critical as you grow. With a unified platform, there is a single, centralized source of truth for everyone in the company, containing all the information needed about the ever-increasing number of samples and reagents. Not only can this consolidation eliminate the headaches and maintenance time required for disparate spreadsheets and software tools, but it will inevitably speed up routine processes—and, because of better visibility into each sample's effectiveness, deepen scientific insights.

“With Benchling, We have been able to centralize all of our scientific data in one location. It has significantly facilitated deriving deeper insights from data and helped our company move a step closer to being an insights-driven organization.”



Deven Dharm
Director of Software Engineering



Collaborative project management

Work together as a team

With a small number of scientists and a small number of projects, “collaborative project management” may seem unnecessary or a distant problem in the future. If there aren’t that many team members, working together just means picking up the phone, sending an email, or crossing the room.

But as your company scales and projects become more complex, team collaboration gets more complex, too. You may find that not only are new scientists joining the team, but new, specialized teams may need to start working on multiple, interrelated projects. Being able to design and iterate workflows, not just create temporary solutions on an as-needed basis, will reduce confusion and miscommunication and greatly speed up your progress toward your goals.

The old way

Scientists need to access up-to-date information about their colleagues’ experiments. Storing data across desktops, hard drives, and notebooks instead of in one centralized, cloud-based platform can make experimental data handoffs between individual contributors and teams confusing, redundant, and time-consuming. If one team member doesn’t have easy access to the latest version of something — such as experiment results or general lab protocols — entire projects can be thrown off track.

Very small teams might be able to manage in this situation, even if it slows them down. But as companies scale, this kind of delay and confusion can become prohibitive. What’s more, when data is siloed and difficult to access, team members lack the crucial insights that help them iterate and innovate. Silos also make it harder to pass on institutional knowledge — another vital task during a company’s growth.

The new solution

In a single, cloud-based informatics platform, all team members can have the access to the data they need in a few simple clicks. Not only can crucial data be passed instantly from one team to the next, but each scientist can more completely perform his or her own tasks with better access to related data. An example of this is a cell line development team who might need access to data about the plasmids designed upstream of them.

A cloud-based collaborative platform can provide contextualized data capture and sample tracking, but it can also be a communication platform, allowing team members to alert one another when they need another set of eyes on something, for instance. And anyone looking for any piece of information can perform a global search, essentially Googling the entire organization's database for the information they need.

“What Benchling has provided us is a single solution for multiple different problems, from sequence design and alignment to a centralized database. Our speed has doubled, communication has improved exponentially, and it’s decreased scientist frustration level beyond measure.”



Brenda Minesinger
Principal Scientist

Streamlined processes and connected systems

Future-proof your business

As your organization grows, you'll find more and more need to boost the efficiency of all your processes—including every step in each process, such as recording sample data or ingesting lab instrument runs. Teams will become more specialized and cross-functional, making effective collaboration, transparency, and efficiency that much more challenging, and that much more crucial. Delays and confusion can cost precious time, creating bottlenecks that can stymie research breakthroughs, IND filings, or product approvals.

In order to improve the efficiency of your scientific workflows, you need to have an integrated data system that centralizes and connects them. This might seem too complex for now, or it may feel far off in the future, but as the pace of biotech research and innovation accelerates, you may find designing for growth now is exactly what you need to stay competitive.

“It feels good to have something automated with just a single click, where before it took half an hour. As more people are getting familiar with the software, we’re saving even more time.”

Tim Hoogervorst
Technician, uniQure

The old way

You may already have some specialized lab equipment or software that you need to do your research, but as long as it's siloed from your other solutions, it can still be inefficient to use and lack sufficient connectivity with other systems. Your company may decide to invest in expensive, high-throughput lab instruments, for example, such as liquid handlers or plate readers, that generate tens to hundreds of thousands of data points in a single run. But if the data lives only on that instrument, or in a lone CSV file disconnected from your other systems, its usefulness is limited. help them iterate and innovate. Silos also make it harder to pass on institutional knowledge—another vital task during a company's growth.

For example, strain engineering companies need to optimize fermentation runs. If they can't efficiently gather and synthesize data across all the relevant time points and adjust their software to accommodate improvements, it's much harder for them to identify and execute on opportunities to optimize the process. This not only slows teams down on day-to-day tasks, but also can push back entire project timelines. Your successful growth relies on your ability to quickly and efficiently iterate and improve scientific processes, so if your systems for running processes are disconnected, it becomes very difficult to both identify and resolve bottlenecks, or test out new process variations.

The new solution

Now there are software solutions that help you centralize all of the work you do in a single, powerful platform, connecting your experiment data, inventory, specialized scientific processes, 3rd party software, and even lab instruments. This allows your growing company to streamline, standardize, and optimize your increasingly complex processes, and reduce time spent between data acquisition, interpretation, and decision-making.

These solutions can also help you design automated workflows that eliminate tedious tasks, reduce errors, and ensure accuracy. Fully integrated, connected, easily configurable, and adaptable systems mean that you'll be able to evolve faster and make better organizational decisions, with full visibility into what's working and what's not, and much greater insights into the data and results you produce.

“Would you rather implement that system after you scale, or would you rather have that system be the thing that helps you scale?”



Fengru Lin
CEO



Conclusion

You have big goals. You want your organization to thrive and your mission to have the worldwide impact you know it can—whether it be saving human life with breakthrough pharmaceuticals, feeding people with drought-resistant crops, or protecting the environment through cleaner consumer products. Today, this aspiration may seem like a distant dream, but the truth is, designing today for tomorrow's growth is a win-win. If you invest now in an informatics solution that will save time and money, improve data integrity and operational efficiency, speed up processes and reduce scientist frustration, then you won't have to switch systems halfway through, incurring painful delays and ultimately, costs. You will be prepared right now for the data, process, and systems complexity of the future. You will be ready when growth happens. And, because implementing efficient cloudbased systems means faster cycles of innovation, growth will happen faster than you think.

With Benchling, a modern R&D platform, not only are you proactively futureproofing your business, you're scaling it with a competitive edge.

“It almost feels like an unfair advantage compared to companies not using these types of systems.”

Fengru Lin
CEO, TurtleTree Labs

And the numbers don't lie...

1 in 5

biotech companies IPO on Benchling

About Benchling

Benchling's R&D Cloud makes it easier to capture and access the data you need, collaborate as a team, and accelerate decision making. Benchling has helped hundreds of innovative biotech startups to establish solid data foundations for future growth. With our Benchling for Startups program, early-stage life science companies get rapid access to a unified platform for core functions including molecular design, lab notebook, biological registration, and inventory management — all at a price that works with your budget. We provide everything you need to be successful today, and as your team grows, Benchling will be able to grow with you. If you're ready to get started, request a demo, and our biotech experts will personalize one for your team.



Notebook

The most user-friendly electronic lab notebook in the industry — reduce time to data entry by 85% with the first cloud-based notebook built for modern life science.



Molecular Biology

A comprehensive molecular biology suite of 10+ tools in one collaborative environment — build, share, and record DNA and amino acid sequences in one unified platform.



Registry

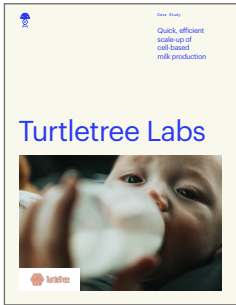
A convenient and easy-to-use registration system built from the ground up for large molecule R&D — model biological entities and easily enter and extract the data you need.



Inventory

Laboratory inventory management — track the locations of vials, wells, batches, and more, and automatically link results to them.

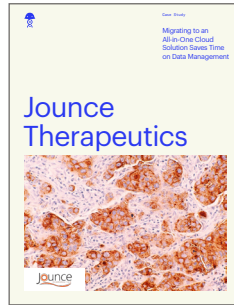
Additional Resources



Case Study

TurtleTree Labs: A Data Foundation to Rapidly Scale Clean Milk Production

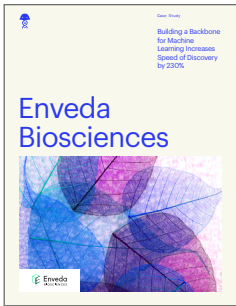
[Read the Case Study](#)



Case Study

Jounce Therapeutics Migrating to an all-in-one informatics solution for immunotherapy R&D

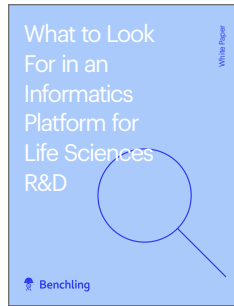
[Read the Case Study](#)



Case Study

Enveda Biosciences: Building a Backbone for Machine Learning in the Life Sciences

[Read the Case Study](#)



Whitepaper

What to Look for in an Informatics Platform for Life Sciences R&D

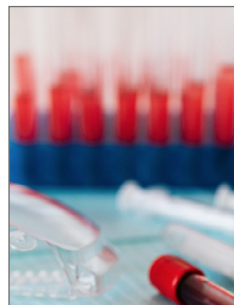
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