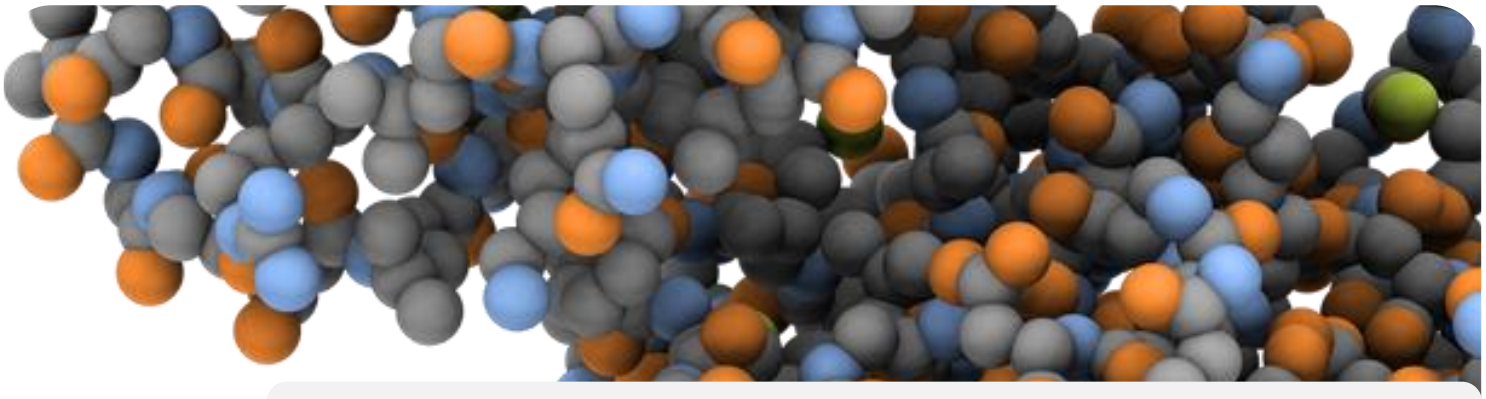

Nimbus Therapeutics optimizes discovery throughput with Spotfire visualization

Nimbus Therapeutics sought to gain deeper insights into workflows across their network of CRO partnerships. Using Spotfire visualization, the company transformed its understanding of complex research processes, enabling optimization of their distributed research model and acceleration of drug discovery timelines.

Principle Benefits:

- Cut typical data upload time to just 2 days.
- Reduced manual data interventions by half.
- Increased screening throughput by 50%

Nimbus Therapeutics specializes the discovery of novel small molecules for difficult-to-drug targets. The company employs a distributed research model that leverages a network of strategic CRO partnerships to accelerate drug discovery. This approach enables Nimbus to pursue multiple therapeutic programs simultaneously while maintaining the agility of a lean, scientifically-driven organization.

Building a Distributed Research Model

With a core team of 80 highly skilled professionals, Nimbus orchestrates research activities across a network of partners that includes approximately 300 scientists at various contract research organizations (CROs). This innovative model allows Nimbus to:

- Access specialized expertise and capabilities across multiple therapeutic areas
- Scale research efforts dynamically based on program needs
- Maintain operational efficiency while pursuing ambitious discovery goals
- Focus internal resources on strategic decision-making and program direction

The virtual labs approach offers distinct advantages in drug discovery. It enables Nimbus to assemble teams with deep expertise for each therapeutic program, investigate more compounds in parallel, and rapidly adjust research priorities without the overhead of maintaining physical laboratory infrastructure. When programs achieve key milestones, Nimbus can partner with major pharmaceutical companies to advance promising candidates through clinical development and commercialization.

Naturally, the distributed research model also brings its own challenges. Alex Benzell, Chemistry Scientist at Nimbus, comments, “Clearly, how we do our research is very important, because we're completely virtual and we don't have our own labs, and we rely on our CROs tremendously. We can't just go into the lab and see how projects are progressing. We ask ourselves how well and how smoothly our research is occurring in this distributed resource environment, because it's mission-critical for us.”

Nimbus deploys a broad range of software tools to manage both business operations and drug discovery workflows. The CROs upload their data to the Nimbus Egnyte site, with content security, compliance and collaboration provided by Egnyte software, and tracked using JIRA to provide project management.

“We realized we were having a systemic issue with loading data,” reports Alex Benzell. “The upload process often required manual intervention – and when there’s manual intervention, that means we have scientists who aren’t doing science. In early 2021, up to 15% of data uploads failed, rising to more than 20% at the end of 2022 as volumes increased. That’s not an efficient utilization of resources, whether it’s Nimbus scientists or CRO scientists.”

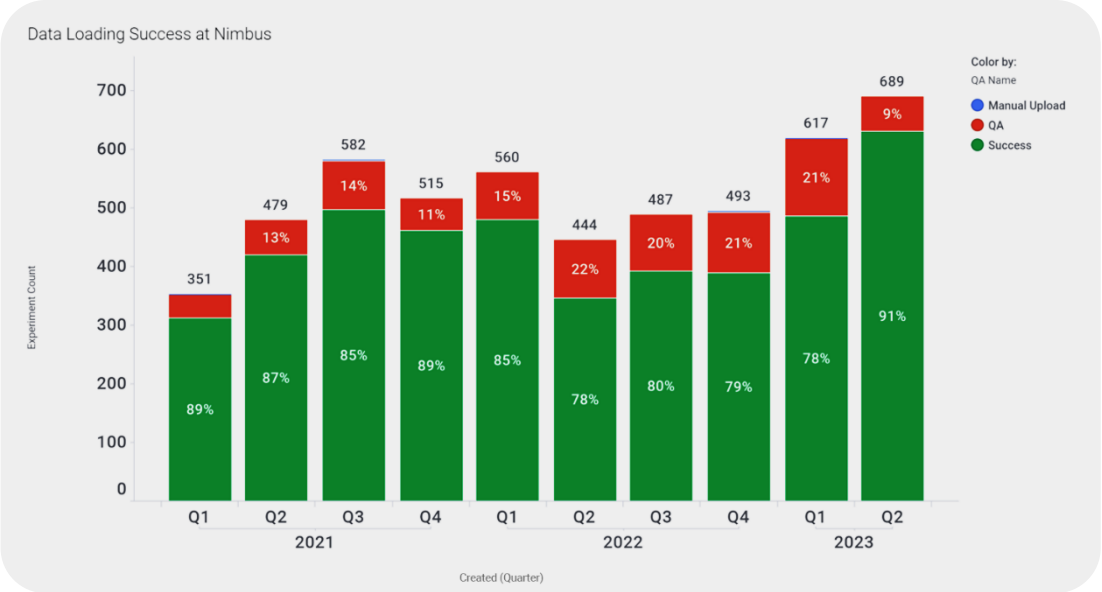

Figure 1. Spotfire analysis showed that up to 15% of CRO reports failed to load in 2021 and by 2022 that value had increased to 20%. Failed data uploads required manual intervention which took time away from researchers conducting science.

In another example, Nimbus noticed that data from one of the CROs arrived at very variable intervals after the experiment was completed. It significantly impacted project team planning and research momentum. The Nimbus team wanted to know where the issues lay, either with the CROs or within Nimbus, and find ways to maximize efficiency wherever possible.

Use Spotfire visualization to reveal key issues

To help identify bottlenecks, Nimbus looked at ways to extract and visualize key metrics. With a clear picture of what was actually happening, Nimbus could understand how best to orchestrate the virtual biotech teams and allocate tasks to the most-efficient CROs.

The Nimbus team engaged Workflow Informatics to deploy Spotfire, the enterprise-class advanced analytics and visualization discovery platform that enables researchers to mine scientific data. As Revvity Signals is the only source of Spotfire for life sciences R&D and clinical development, the Revvity team played a pivotal role with both Nimbus and Workflow Informatics during the Spotfire implementation.

Using Spotfire visualizations, Nimbus uncovered areas where action to resolve a single, isolated bottleneck could accelerate the entire business process. For example, the Spotfire visualization showed Nimbus that in some cases half-maximal inhibitory and effective concentration (IC50 and EC50) data took four days to arrive from certain CROs, or perhaps the format required work before the results could be loaded. “In just the period of a month from implementing this at the beginning of 2023, we were able to dramatically reduce turnaround times. Highlighting the

problem prompted Nimbus to provide XLfit templates, and saw average data upload time sink from 3.8 to less than 1.8 median days, and it's been durable since, and that's been very important to this team," comments Alex Benzell. "In addition, manual intervention is now required on average on only 9% of occasions, halving our previous workload."

Figure 2. Bottleneck identified through Spotfire analysis that showed a spike in CRO report upload in March 2023 to 3.8 days. Nimbus Therapeutics developed an XLfit template to automatically process incoming CRO reports and dramatically reduced upload times down to 1.8 days in April 2023.

From an initial success with IC50 and EC50 data, Nimbus expanded Spotfire to review experiment upload times. In this case, visualizations showed that some CROs clearly performed well on some programs, yet on others Nimbus scientists might wait for up to ten days for results.

Alex Benzell remarks, "Waiting over an extra week for data is a lot of lost time, and it prompted a serious reassessment of where we want to do this type of experiment. The aim is to get faster turnaround times and ensure we are not overly reliant on individual CROs."

With the Spotfire data visualization, Nimbus can ensure that tasks are assigned optimally to CROs, increasing efficiency and raising total throughput. Simple visualization of experiments analyzed by days-to-load showed that some CROs hugely outperform others, ranging from more than 7 to just two days.

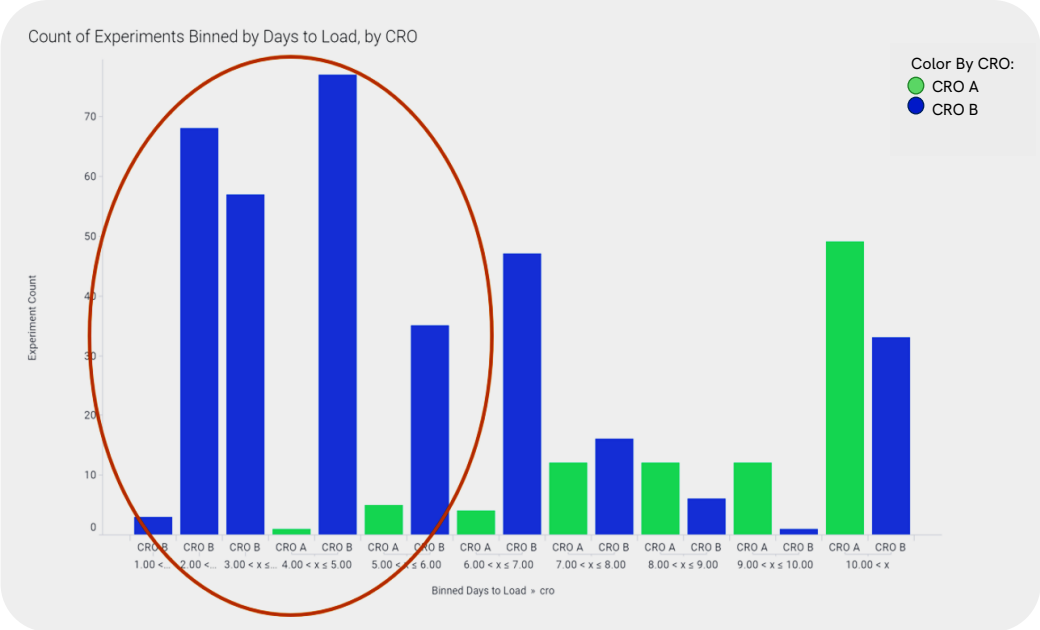

Figure 3. Spotfire analysis of two CROs labeled CRO A (green) and CRO B (blue). CRO B systematically took approximately 7 days to upload data while CRO A consistently uploaded data in about 2 days.

Alex Benzell comments, "Seeing that one CRO takes considerably longer to analyze and post data prompted serious reassessment of where to do the types of experiment. By orchestrating resources at the CRO level, Nimbus is able to create the virtual biotech teams that are best-configured for each drug discovery program, offering a critical business advantage."

Balancing resources drives discovery results

With Spotfire now firmly part of the Nimbus landscape, the company continues to find more ways to highlight opportunities for optimization. These range from analysis of the number of compounds per full-time employee as a metric to describe total productivity, to the number of molecules screened each month as a way of assessing chemical entities registered.

"The visualizations showed that by balancing resources and moving some chemists from one program to another that Nimbus could maintain chemistry, maintain efficiency, and also get what we need to be able to deliver for our program," explains Alex Benzell.

> *"Just balancing a couple of resources or a couple of FTEs led to a substantial increase of more than 50% in terms of the amount of new chemical entities that were registering and screening, and the more chemical matter screened means you can get to your drug candidate faster."*

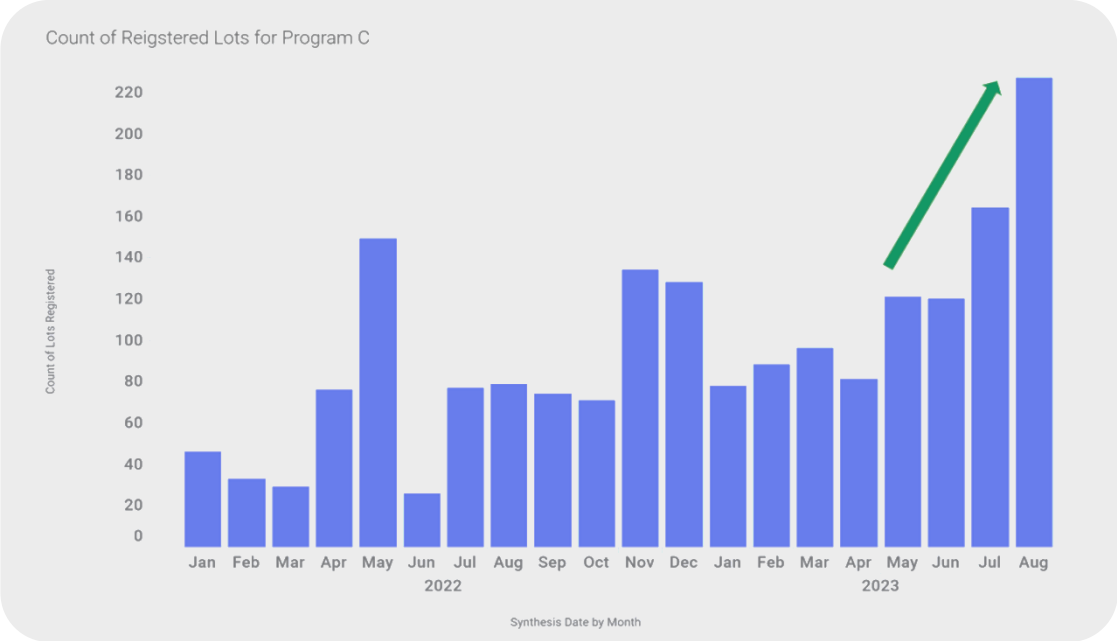

Figure 4. Insightful analysis in Spotfire demonstrates that by reassigning a couple of FTEs from one CRO to another in June, Nimbus Therapeutics was able to increase the number of compounds screened and registered by 50%.

Alex Benzell concludes, "Whether you're looking at biology turnaround times or chemistry KPIs, Spotfire visualizations enable Nimbus to improve research efficiency by bringing everything together in one place for meaningful insights. Enabling Spotfire involves many moving parts before you can simply open up a dashboard or a template and look at anything you want, and then be able to slice it and dice it the way that you need. Workflow Informatics provided outstanding assistance with creating the Spotfire visualizations, combined with the team from Revvity Signals, all to help Nimbus deliver novel molecules that become breakthrough medicines."

Learn more: https://revvitysignals.com/products/spotfire-visual-analytics

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