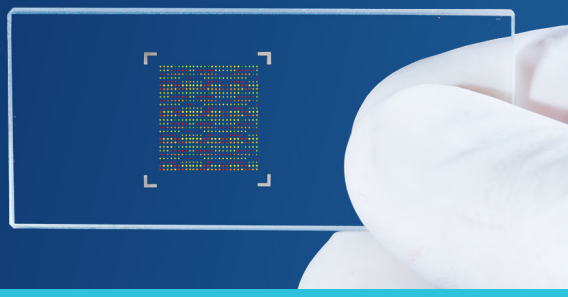
tetrascience

# Powering dashboards for faster drug discovery



CASE STUDY

A clinical-stage biopharmaceutical performs high-throughput screening using glass slides with covalently bound compounds. Scientists apply cell lysates containing the target protein to the slides and then measure the target's binding to each compound.

Multiple teams collaborate in the process:

- **Chemists** conduct the screens.
- **Computational biologists** analyze the results.
- **Biologists** perform additional tests on the most promising hits.

Each screen, with 50+ slides and dozens of compounds per slide, generates millions of data points. Although data sharing among the three groups of scientists is critical for lead identification, they lacked an efficient process to do so.

## The Challenge: A data bottleneck slows discovery

Chemists and biologists depended heavily on the computational biology team to access data from the screens (Figure 1). For instance, if they needed information on the top ten hits for a particular target, a computational biologist had to manually gather, process, analyze, and share the relevant data. This process was manually intensive and slow, creating a significant bottleneck. It also burdened the computational biologists, whose primary duties extend far beyond acting as data intermediaries.

### Challenge:

Scientists at a clinical-stage biopharma had limited access to high-throughput screening data, slowing drug discovery.

### Solution:

The Tetra Scientific Data and AI Cloud automatically replatforms and engineers screening data for visualization.

### Outcomes:

- Rapid data search and aggregation: reduced from 1–2 days to 10 minutes
- Higher productivity: refocused computational biologists on more valuable work
- Faster decisions in hit selection: decreased from 2 weeks to 1–2 days

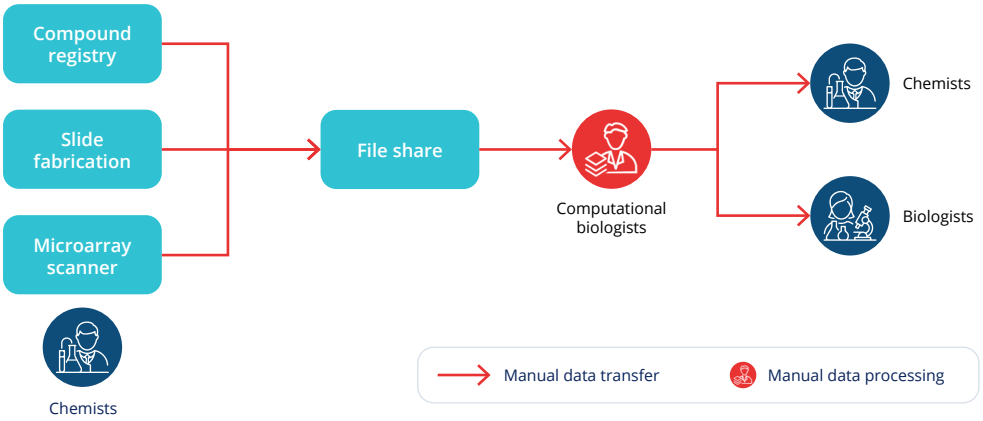



*Figure 1. Initial data workflow for high-throughput screening*

## The Solution: Liberating data for all scientists

The biopharma sought to make screening data more accessible to all discovery scientists and empower them with tools to easily find and visualize this data. It decided to implement a solution built on the Tetra Scientific Data and AI Cloud™, which provides the scalability to address current and future needs.

The Scientific Data and AI Cloud automatically centralizes all data from the screens—including raw image files, compound registry information, and slide fabrication data—and prepares it for visualization (Figure 2). The platform contextualizes the screening results by adding relevant metadata (e.g., compound ID, screen ID, and program name). It then converts this data into an open, vendor-agnostic format that is structured with scientific taxonomies and ontologies. These engineered datasets, known as Tetra Data, are fed into a dashboard developed by a third party. Within the dashboard, all scientists can rapidly search and visualize the screening data. Tetra Data has made it easier to build and maintain the dashboard, while also facilitating data reuse.

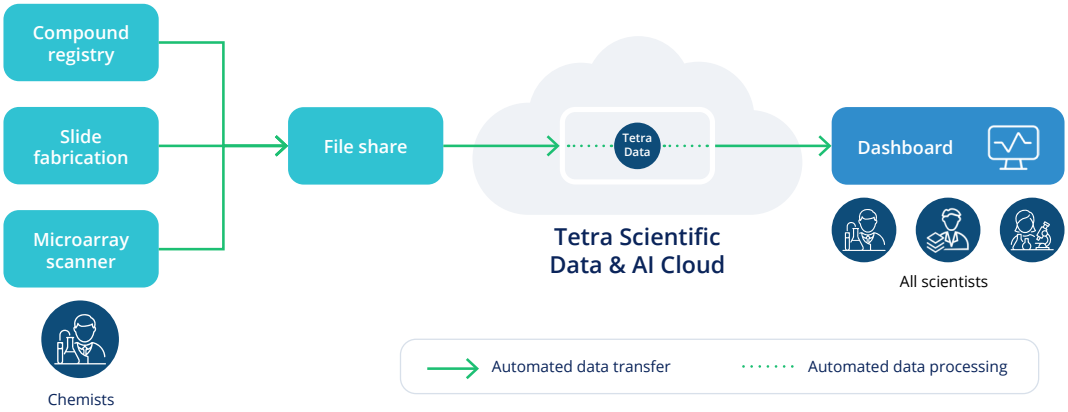



*Figure 2. Tetra-enabled data workflow*

## The Outcomes: Faster decisions and greater productivity

With the revised workflow, the discovery team can find and aggregate screening data much more rapidly. Searches that took 1 to 2 days can now be done in just 10 minutes. This enhanced data accessibility boosts the productivity of all discovery scientists. Computational biologists, in particular, benefit as they no longer function as data gatekeepers. Freed from handling data requests, they can now redirect several hours per week to more impactful work, such as gene expression analysis and predictive modeling.

Moreover, the Tetra-enabled solution speeds up decision making. Following a screen, the biology team identifies hits to test with bioassays and other methods. This selection process, which previously took around 2 weeks, now occurs in 1 to 2 days. The Tetra-powered dashboard allows scientists to explore the data on their own and gain insights rapidly. Thus, they make decisions faster, accelerating the discovery process.

With improved data accessibility, chemists can identify and terminate problematic screens early, saving time and resources. Previously, they had to either fully complete an assay and then analyze its data to detect any issues, or halt operations temporarily until partial results were analyzed. However, with dashboarding in place, the team can identify problematic trends in near real time, allowing them to end the assay early if warranted.

## AI Readiness

The biopharma plans to enhance its analytics capabilities in the discovery phase, with an eye toward artificial intelligence (AI) applications. By transforming its scientific results into Tetra Data, the company is generating the type of data needed for advanced analytics and AI—that is, liquid, large-scale, compliant, and purpose-engineered datasets. The open, vendor-agnostic format of Tetra Data also makes it future-proof, allowing the company to extract maximum value through data reuse.