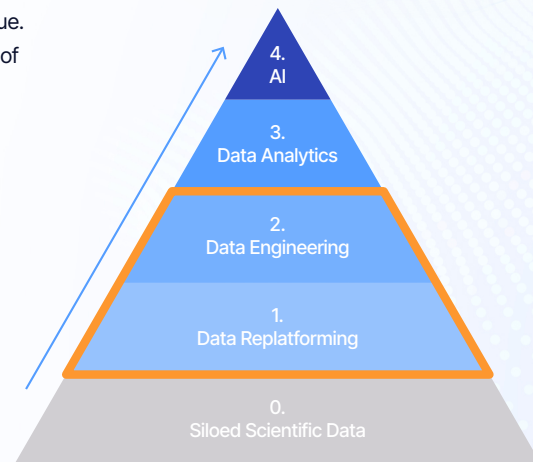| Case Study

Case Study Highlights:
Data Replatforming and Engineering

Modern biopharma generates vast volumes of scientific data, but raw, siloed data has limited value. To unlock its full potential, it must follow a defined sequence of operations. This journey consists of four layers:

1. **Data Replatforming:** Assemble scientific data into a centralized, purpose-built cloud while automating data workflows.

2. **Data Engineering:** Convert replatformed data into purpose-engineered, liquid, compliant, and large-scale datasets, which are optimized for advanced analytics and AI/ML.

3. **Data Analytics:** Visualize trends, monitor operations, and extract real-time insights using interactive dashboards and data applications.

4. **Scientific AI:** Build and train AI/ML models using high-quality datasets to predict and optimize scientific outcomes.

Here, we highlight real-world case studies from the first two layers—**data replatforming and engineering**. These stories showcase how the Tetra Scientific Data and AI Cloud™ drives greater productivity, efficiency, and scalability across the biopharmaceutical value chain.

Explore the case studies

Click any case study below to jump to its summary.

Discovery & Research

- mRNA stability analysis
- Antibody developability assessment
- High-throughput imaging
- Plasma protein binding
- Genotyping (with qPCR)
- Lead characterization (with SPR)
- High-throughput screening
- Cell profiling/sorting

Development/CMC

- Drug transport analysis
- Bioprocess purification development #1
- Bioprocess purification development #2
- Cell and gene therapy production
- Gene therapy production

Manufacturing & Quality

- Quality testing #1
- Quality testing #2

- CRO data management #1 (for biologics)
- CRO data management #2 (for small molecules)
- Instrument onboarding #1 (with Jira)
- Instrument onboarding #2 (for synthetic biology)

Scaling mRNA stability analysis with automated chromatography data workflows

Phase: Research & Discovery

Customer: Top 50 biopharma

Challenge

The mRNA stability workflow relied on manual peak detection in reversed-phase ion-pair (RP-IP) chromatography, which slowed throughput and produced inconsistent data. Scientists spent excessive time annotating peaks, exporting files, and working without key metadata. Meanwhile, static machine learning (ML) models offered no improvements over time.

Solution

The company implemented the Tetra Scientific Data and AI Cloud to automate data ingestion, contextualization, and engineering. This enabled scalable ML-driven peak prediction with continuous learning, eliminated manual exports, and enriched results with metadata.

Outcomes

- Saved up to 60 minutes of hands-on time per assay by automating data processing
- Reduced time to analysis by up to 24 hours through automated data transfer
- Enriched data with contextual metadata to unlock deeper insights
- Improved model performance through continuous feedback-driven learning

Read Full Case Study

Streamlining cross-interaction chromatography for faster antibody discovery

Phase: Research & Discovery

Customer: Top 50 biopharma

Challenge

Researchers relied on manual, error-prone processes to record and analyze data from cross-interaction chromatography (CIC). Each run required up to 384 manual steps, which slowed throughput, increased the risk of data errors, and discouraged regular assay execution.

Solution

The company adopted the Tetra Scientific Data and AI Cloud to automate CIC workflows—capturing raw data directly from Agilent ChemStation, engineering it with metadata, and pushing results seamlessly to LIMS and ELN platforms. This eliminated manual transcription and enabled the creation of AI-ready datasets at scale.

Outcomes

- Saved 3 to 4 hours per run by eliminating 384 manual steps
- Increased assay throughput
- Improved data accuracy by reducing errors and inconsistencies
- Enabled future use of data for advanced analytics and AI

Read Full Case Study

Scaling up high-content imaging through engineered BioTek Gen5 data

Phase: Research & Discovery

Customer: Leading biotech

Challenge

Researchers struggled to manage large, complex datasets from high-content imaging. Manual workflows were slow, error-prone, and unsustainable, with siloed data formats that limited cross-analysis and delayed decision-making.

Solution

The company deployed the Tetra Scientific Data and AI Cloud, integrating it with BioTek Gen5 to automate data capture, contextualization, and harmonization. The streamlined workflow reduced manual effort and generated AI-ready datasets optimized for large-scale analysis and predictive modeling.

Outcomes

- Increased screening throughput by up to 35%
- Reduced scientists' hands-on time for plate reader runs by approximately 75%
- Decreased data processing time by 50%
- Enhanced data completeness, consistency, and quality
- Enabled cross-analysis through significantly improved data accessibility and reliability

[Read Full Case Study]

Simplifying ADME studies through data automation

Phase: Research & Discovery

Customer: Top 50 biopharma

Challenge

Scientists use rapid equilibrium dialysis followed by mass spectrometry (RED-MS) to measure how drugs bind to plasma proteins. Preparing assay data and performing statistical calculations manually was time-consuming and inefficient, slowing ADME screening. Earlier automation efforts relied on a fragile solution that failed to gain adoption.

Solution

Automated pipelines within the Tetra Scientific Data and AI Cloud ingest, contextualize, and analyze RED-MS data.

Outcomes

- Cut data preparation and processing time from hours to minutes
- Centralized and contextualized data for rapid search and retrieval
- Eliminated manual steps for improved scalability and data integrity

[Read Full Case Study]

Enhanced sample tracking boosts genotyping throughput

Phase: Research & Discovery

Customer: Top 25 biopharma

Challenge

A genotyping workflow using quantitative polymerase chain reaction (qPCR) operated at just 40% capacity due to poor sample tracking. Manual processes and partially filled plates made it difficult to trace individual wells, slowing throughput and increasing errors.

Solution

The Tetra Scientific Data and AI Cloud enabled automated, per-well sample tracking by replatforming and engineering data across instruments and systems. This streamlined workflows, improved traceability, and produced AI-ready datasets to support scalable, high-throughput genotyping.

Outcomes

- 33% increase in genotyping throughput so far; expected to increase by 150% total soon
- Higher-quality, future-proof data

Read Full Case Study

Faster lead characterization by automating SPR data workflows

Phase: Research & Discovery

Customer: Top 10 biopharma

Challenge

Scientists manually processed surface plasmon resonance (SPR) assay data for lead characterization, with quality control taking up to 80% of scientists' time. This was a bottleneck for throughput, introduced errors, and limited capacity for new projects.

Solution

The Tetra Scientific Data and AI Cloud automated SPR data ingestion and contextualization. Raw data from Cytiva Biacore systems is enriched with metadata, linked to the ELN, and processed via a custom web app to streamline QC.

Outcomes

- Over 3x higher assay throughput
- Better quality data

Read Full Case Study

Powering Scientific Process Automation and Workflow Management

Phase: Research & Discovery

Customer: Prelude Therapeutics

Challenge

Prelude Therapeutics relied on a highly manual data workflow, involving the movement of raw CSV files between instruments and desktop tools, local processing, and manual uploading to downstream systems. This cost scientists significant time and limited data integration across platforms.

Solution

TetraScience implemented a cloud-based data processing platform that automates workflows across Tecan, Titian, and Dotmatics software. With vendor-agnostic integrations, scientists can now access instrument data, informatics tools, and visualizations in a single platform. This eliminates the need for manual file transfers and updates across disparate systems.

Outcomes

- Saved 1 hour/run for data aggregation, shifting ~3 FTEs to higher-value work
- Increased compound screening by 4x per week
- Reduced manual errors
- Centralized compound management through automation
- Improved data-driven decision-making
- Streamlined reporting and transparency across the organization

Read Full Case Study

How a Biotech Organization is Transforming Vital Flow Cytometry Processes

Phase: Research & Discovery

Customer: Leading biotech

Challenge

The flow cytometry workflow for cell therapy studies was slowed by manual processes. File transfers, metadata transcription, IND package preparation, and data analysis were time-consuming, error-prone, and fragmented across multiple systems. These inefficiencies delayed insights, increased the risk of data loss, and placed a heavy burden on scientific teams.

Solution

The Tetra Scientific Data and AI Cloud automated data collection, enrichment, transfer, and publication—eliminating file size limits and manual steps. Scientists gained secure, centralized access to both raw and processed data, enabling faster and more accurate analysis, streamlined IND preparation, and real-time collaboration across teams.

Outcomes

- Reduced number of manual data collection and processing steps
- Decreased average time to transfer and process experimental data
- Accelerated IND package preparation and improved data integrity
- Simplified processes to prepare and publish data for analysis and visualization

Read Full Case Study

Unlocking the Value of Big Data in a Global Biopharma

Phase: Research & Discovery, Development/CMC

Customer: Top 25 biopharma

Challenge

A biopharma faced a surge in data from contract research organizations (CROs) and internal labs. Scientists were overwhelmed by the manual curation, cleansing, and uploading of inconsistent data formats. These tasks consumed more time than analysis, slowing discovery and risking data integrity. The existing infrastructure couldn't support real-time access, collaboration, or advanced analytics, and struggled to scale with growing demands.

Solution

The Tetra Scientific Data and AI Cloud enabled automated data collection, standardization, and migration from instruments and applications to LIMS, ELNs, and assay repositories. Dozens of pipelines now deliver near real-time, cross-departmental access to scientific data from anywhere.

Outcomes

- Replatformed and standardized 17 million files across 13 departments
- Automatically migrated ~2 million samples from CROs into the LIMS
- Shifted 76 hours per week away from manually preparing data for CROs
- Reduced time for data prep and analysis from 10 days to 10 minutes
- Detected pipetting errors 90% faster in high-throughput screening workflows

Read Full Case Study

Driving Cost-Effective CRO Collaboration

Phase: Research & Discovery, Development/CMC

Customer: Two clinical-stage biotechs

Challenge

Companies outsourcing ADME/PK assays to CROs face delays and inefficiencies due to unformatted, Excel-based data reports. Manually transcribing these proprietary formats slows down drug development and burdens scientists, especially when working with multiple CROs.

Solution

The Tetra Scientific Data and AI Cloud automates and harmonizes ADME/PK data from multiple CROs.

Outcomes

- Saved 2+ hours per week per scientist of manual file transfer work
- Reduced manual errors
- Streamlined downstream analysis via data science applications
- Improved data-driven decision-making

Read Full Case Study

An optimized data workflow for drug transporter assays

Phase: Development/CMC

Customer: Leading contract research organization (CRO)

Challenge

Scientists relied on manual, error-prone workflows to process data from drug transporter assays. Spreadsheets and lab notebooks lacked consistency and traceability, which burdened quality assurance (QA) teams and made it difficult to scale testing operations.

Solution

The Tetra Scientific Data and AI Cloud automated data replatforming and engineering—capturing assay data, harmonizing it with metadata, and integrating with the ELN. This eliminated manual steps, improved traceability, and enabled the automated generation of reports with AI-ready data.

Outcomes

- Decreased manual data entry by 50%
- Reduced items for QA to review by 80%
- Reallocated 3,000 hours per year toward increasing throughput

Read Full Case Study

Increasing efficiency in purification process development

Phase: Development/CMC

Customer: Top 10 biopharma

Challenge

Scientists relied on manual data transcription between Cytiva UNICORN, Waters Empower, and Signals Notebook to document chromatography data for CMC work. Data was siloed, hard to search, and difficult to connect across systems. This slowed analysis, increased errors, and consumed hundreds of hours annually.

Solution

The Tetra Scientific Data and AI Cloud automated data capture and contextualization across fast protein liquid chromatography (FPLC) and ultra performance liquid chromatography (UPLC) workflows. It eliminated manual transcription, enabled seamless data flow between systems, and created AI-ready datasets to accelerate purification method development and predictive analysis.

Outcomes

- Eliminated 25 to 100 hours per week of manual data transcription
- Reduced data search times by up to 8 hours
- Streamlined report preparation, saving 10 to 20 days per year
- Sped up process development by predicting optimal purification conditions to maximize yield and purity
- Reclaimed $375,000 per year in scientists' time

Read Full Case Study

Accelerating bioprocessing purification at Alexion

Phase: Development/CMC

Customer: Alexion, AstraZeneca Rare Disease

Challenge

Alexion relied on manual data transfers and fragmented storage to manage fast protein liquid chromatography (FPLC) workflows in downstream development. This caused transcription errors, delayed data retrieval, and slowed chromatography analysis—putting patients, data integrity, and time to market at risk.

Solution

By implementing the Tetra Scientific Data and AI Cloud, Alexion fully automated data capture and enrichment from Cytiva UNICORN to their analytics tools. The platform centralized FPLC data in the cloud, contextualized it with metadata, and enabled near-instant access and visualization.

Outcomes

- Decreased time-to-insight from 1 week to 1 day
- Reallocated ~5000 hours per year
- Reduced transfer times from 2 hours to 10 minutes, saving 80 hours per month
- Cut turnaround time for chromatogram merging and overlay from 1 day to 5 minutes, saving 340 hours per month
- Increased FPLC throughput

Read Full Case Study

Optimizing cell and gene therapy production with LabVantage and TetraScience

Phase: Development/CMC; Manufacturing & Quality

Customer: Leading contract development and manufacturing organization (CDMO)

Challenge

Scientists relied on paper records and spreadsheets to develop and manufacture cell and gene therapies. This resulted in slow, error-prone workflows that limited efficiency, traceability, and readiness for advanced analytics or AI.

Solution

The CDMO implemented the Tetra Scientific Data and AI Cloud with bidirectional integration to LabVantage LIMS, automating data capture, contextualization, and engineering. This streamlined operations, improved data integrity, and delivered AI-ready datasets to support scalable, compliant, and insight-driven production.

Outcomes

- Increased productivity for scientists
- Improved data integrity
- Generated future-proof, AI-ready data

Read Full Case Study

Creating "The Digital CDMO" with Andelyn Biosciences

Phase: Development/CMC, Manufacturing & Quality

Customer: Andelyn Biosciences

Challenge

Andelyn Biosciences aimed to build two new gene therapy CDMO facilities as fully digital operations. However, their existing data environment was highly fragmented, relying on manual processes, USB transfers, and 40+ disconnected data stores. This hindered compliance, limited data access, and posed a barrier to AI readiness, rendering it impossible to support scalable and efficient manufacturing.

Solution

Andelyn implemented the Tetra Scientific Data and AI Cloud to build "The Connected Plant." The platform unified and contextualized data from 90% of instruments, eliminated manual transfers, and centralized all assay data. This approach established a secure, compliant, and AI-ready infrastructure to power its Digital CDMO vision.

Outcomes

- Laid the foundation for AI-enabled workflows
- Powered an easy-to-use search for all assay data
- Consolidated 40+ data stores into a single source of truth
- Replatformed 100% of Andelyn's legacy gene therapy data

Read Full Case Study

Optimizing quality testing with LabWare and TetraScience

Phase: Manufacturing & Quality

Customer: Large biopharma

Challenge

QC scientists relied on manual, paper-based workflows for batch release testing. Data was transcribed between instruments, notebooks, and LabWare LIMS, slowing throughput while increasing the risk of errors and compliance issues.

Solution

The Tetra Scientific Data and AI Cloud—integrated with LabWare LIMS and instrument software like Mettler Toledo LabX, Metrohm Tiamo, and Waters Empower CDS—automated data collection, replatforming, and engineering.

Outcomes

- Accelerated batch release testing
- Increased productivity for scientists
- Enhanced data integrity
- Generated analytics-ready data for future chromatography dashboards

Read Full Case Study

Streamline Batch Release Workflows Between Signals Notebook, LabX, and Tiamo

Phase: Manufacturing & Quality

Customer: Large biopharma

Challenge

Manual data handling between Revvity Signals Notebook, Mettler Toledo LabX, and Metrohm Tiamo for batch release workflows introduced frequent errors and slowed turnaround times, placing a heavy burden on compliance and QA teams.

Solution

The Tetra Scientific Data and AI Cloud automated data flow between the ELN and instrument software, eliminating manual entry and enabling real-time, AI-ready data engineering. This enhanced efficiency, traceability, and support for downstream analytics.

Outcomes

- Increased lab productivity by 40%
- Reduced errors by 4x
- Decreased FTEs required for QC review
- Generated AI-native data for prediction and troubleshooting

Read Full Case Study

Automated instrument onboarding with Atlassian Jira and TetraScience

Phase: All phases

Customer: Top 25 biopharma

Challenge

A biopharma company needed to integrate over 350 instruments across 50+ labs, but manually configuring each Tetra File-Log Agent took 5 minutes. This made enterprise-scale deployment slow and prone to errors.

Solution

The company integrated Jira with the Tetra Scientific Data and AI Cloud to automate the setup of the File-Log Agent. Configuration parameters entered into Jira are retrieved via API and applied automatically, enabling rapid, error-free onboarding at scale.

Outcomes

- Accelerated instrument onboarding by 25x through automation
- Greatly reduced the risk of transcription errors

Read Full Case Study

Streamlining synthetic biology at Ginkgo Bioworks

Phase: All phases

Customer: Ginkgo Bioworks

Challenge

Ginkgo Bioworks needed to reduce the burden on software engineers who were spending excessive time building and maintaining custom tools to collect, parse, and manage data from scientific instruments. The company also aimed to streamline instrument onboarding, improve data quality and contextualization, and scale lab operations to support rapid business growth and AI initiatives.

Solution

Ginkgo implemented the Tetra Scientific Data and AI Cloud to automate data collection, parsing, and contextualization from over 120 instruments. This vendor-agnostic platform replaced brittle, home-grown parsers, providing a higher level of scalability, robustness, and operational excellence.

Outcomes

- Gained access to functionality previously unavailable with in-house solutions

- Refocused software engineers on higher-value tasks

- Streamlined onboarding of scientific instruments by removing complexity and reducing 60% of steps

- Enhanced data contextualization, preparing data for analytics applications and ultimately AI

Read Full Case Study