

Improving Protein Purification through Data Science

CASE STUDY

EMPOWERING ALEXION SCIENTISTS THROUGH INTUITIVE DATA APPLICATIONS

Alexion Pharmaceuticals, Inc. tackles rare diseases using biologic therapeutics. These transform the lives of many patients affected by devastating conditions such as generalized Myasthenia Gravis (gMG) and Hypophosphatasia (HPP). Development-stage research requires harmonization of heterogeneous data and constant refinement of the data curation process. Through use of the Tetra Data Platform (TDP), Alexion can more easily access protein purification data FPLC so that scientists can directly probe, test, and identify their best protein purification strategy with only a few clicks. Alexion can execute a digital pharma strategy and AI/ML-powered drug discovery through data harmonization in the cloud.

SUCCESS METRICS

Saved Time	Reduced Complexity
<ul style="list-style-type: none"> • Save 2+ hours per week, per scientist of manual file transfer work • Provide structured and clean data integration for other systems to consume 	<ul style="list-style-type: none"> • Reduce manual errors; Results are directly calculated and derived from raw data • Automation allows streamlined downstream analysis via data science applications (e.g. Streamlit apps)
Accelerated Insights	Improved Transparency and Future-Proofing
<ul style="list-style-type: none"> • Improved data-driven decision making (Result is calculated and generated much faster) • Harmonized, vendor-agnostic data accelerates Alexion's ability to run AI/ML and data science projects on top of it 	<ul style="list-style-type: none"> • Versatile pipelines are configurable and extensible to handle rich set of technologies and formats • Streamlined reporting and transparency across the Alexion organization

Who Should Read this Study?

Bench researchers, data scientists & engineers, scientists, IT professionals, lab operations professionals, instrument specialists



Company Profile

- Alexion Pharmaceuticals, Inc. (NASDAQ: ALXN), a biopharmaceutical company, focuses on serving patients with devastating and rare disorders through the development and commercialization of life-transforming therapeutics, including ANDEXXA[®], ULTOMIRIS[®], SOLIRIS[®], STRENSIQ[®] and KANUMA[®].

Product Focus

- Research novel molecules and targets in the complement cascade and the development efforts in the core therapeutic areas of hematology, nephrology, neurology, metabolic and cardiology

Industry

- Biopharmaceuticals

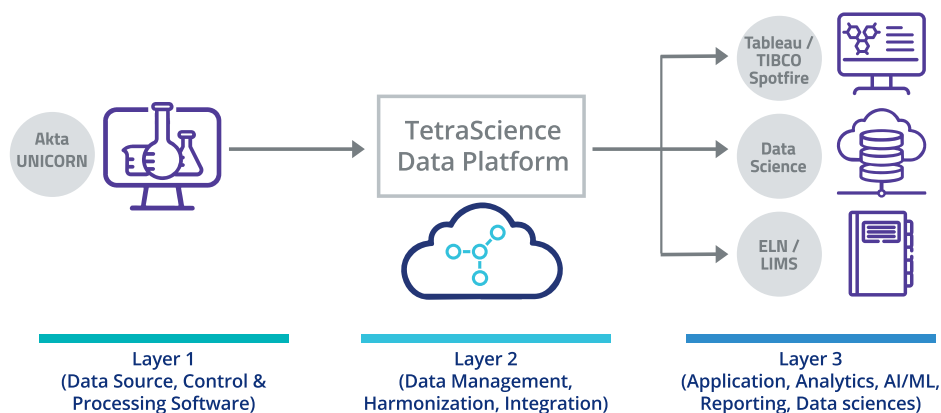
Therapeutic Areas

- Neurology, Hematology, Nephrology, Metabolics, Cardiology

SIGNIFICANCE

Alexion's relentless pursuit of operational excellence requires an in-depth data strategy. Scientific results from Cytiva (formerly known as GE UNICORN) and new data sources can now easily be added to and automated on the TDP. By ensuring that scientists can tackle higher-value tasks, Alexion realizes higher data quality, achieves greater scalability and increases efficiency at multiple levels within its Downstream Process Development operations. Going forward, the TDP will continuously standardize and harmonize instrument datasets, molecule databases and ELNs, empowering scientists to identify the best protein purification strategy.

Scheme 1 - Tetra UNICORN Data Science Link



WHY CHANGE AND RE-PLATFORM?

Alexion needs a fully automated data platform that helps its downstream process development teams gain instantaneous access to scientific datasets from protein purification systems, molecular databases and file systems.

EXPECTED OUTCOMES

Alexion scientists will free their valuable time from manual data collection and curation and can focus on their core research activities. By minimizing human intervention, data integrity and accuracy can be ensured which accelerates the discovery time from weeks to potentially minutes. Additionally, the Tetra Data Platform surfaces raw, harmonized, and processed data to a variety of visualization and search tools, further expediting R&D efficiency.

“Alexion’s downstream process development, while functional for a fast-growing company, presented scalability issues. With the Tetra Data Platform implemented, many tasks that once took weeks will be completed in minutes. The transition to automated, cloud-based workflows will build efficiencies across multiple levels of Alexion’s downstream process organization and eliminate constraining scalability barriers.”

- Trung Thieu, Associate Scientist V, Alexion

DATA SILOS

Challenge:

- Instrument vendors do not necessarily integrate with one another. Data movement is manual
- Vendor's own data format requires its proprietary tools. Lack of data standardization hampers 3rd party

The TetraScience Solution:

- TetraScience transfers, standardizes, and harmonizes siloed data in the cloud.
 - New data is indexed via Elasticsearch and structured into SQL tables to enable searches and queries
-

MANUAL TRANSFERS

Challenge:

- Informatics leads manually move, update and curate files from multiple locations
- Scientists have to enter peak information into analytical software themselves

The TetraScience Solution:

- TetraScience's pipelines standardize and structure data for downstream visualization, storage, or AI/ML insights.
 - Data flows from source to the cloud to ELN and data science targets without any manual intervention.
-

SELF-SERVICE

Challenge:

- Existing dashboarding tools have steep learning curves
- Scientists constantly need to test their hypotheses and derive useful insights from heterogeneous data sources.
- Existing data evaluation tools cannot manage metadata

The TetraScience Solution:

- TetraScience API can be used to funnel harmonized data into data science applications.
- Consuming this data in customizable data science applications like Streamlit provides scientists full control over chromatogram overlays and integration.

To learn more on how to accelerate discovery and fuel innovation, visit tetrascience.com



TetraScience is the Scientific Data Cloud™ company with a mission to accelerate scientific discovery and improve and extend human life.

To learn how you can unlock the power of harmonized, FAIR data in the cloud with the only open, cloud-native platform purpose-built for science, visit tetrascience.com

Corporate Headquarters | 177 Huntington Avenue, Suite 1703, Boston, MA 02115

Atlanta | 3280 Peachtree Road NE, 7th Floor, Atlanta, GA 30305

© 2022 TetraScience, Inc.



tetrascience.com