

Speeding Development of Biologics at Beryllium

Solving data management challenges with an integrated platform

Key benefits to Beryllium

- 95% decrease in reporting time from 20 hours a month to about one hour.
- Dramatic increase in data quality and consistency due to rules and required fields in the LIMS.
- Holistic dashboards provide real-time metrics, replacing manually maintained SharePoint sites and spreadsheets.

Beryllium's need for data integration

Prior to implementing Thermo Fisher™ Platform for Science™ software, Beryllium was already handling 20-50 projects at any one time. The company was managing requests through a maintenance-intensive, home-grown system consisting of Microsoft SharePoint lists and other spreadsheets that kept track of the queues for every group and for every function. These lists handled workflows, schedules, and prioritization.

“People lived on those lists and ran their jobs and their daily lives based on what was in those lists,” said Dr. Arturo Morales, Vice President, Technology and Data Sciences at Beryllium. Managing the lists was time consuming, there were meetings to decide priorities and then group leaders would manually add tasks to calendars and other places where they were keeping track of data. There was a lack of consistency between the lists and there was no way to see a holistic view of what the company was doing without a lot of manual work. According to Dr. Morales, “These lists ran the company.”

The intensive manual curation still did not ensure consistency or accuracy of data. There was always the possibility of introducing human error, including copying and pasting mistakes, and there was no way to report on what was happening without hours of time consuming work to pull information for reports.

The team at Beryllium knew they needed a better way to track their data. They wanted to track all data entities and relationships within one system. For instance: for a specific protein within a request, they needed to see what plasmid that protein came from, what vector was used, and all additional connections and conditions, as well as the status and results of the workflow.

“The Platform for Science software was the best, most flexible data model on the market, which enabled us to introduce structure and consistency into our system. That data model is the major reason we chose to work with the company.”

– Arturo Morales, Ph.D., Vice President, Technology and Data Sciences at Beryllium

Choosing the Thermo Fisher™ Core LIMS™ Software

Beryllium chose to work with the former Core Informatics (now a part of Thermo Fisher Scientific) due to the quality and flexibility of their data model, which would also introduce structure and consistency into the company's operations. The integrated structure of the Platform for Science software, the underlying platform for the Core LIMS software, ensures the existence of one key identifier per entity which can be referenced across the system, instead of multiple instances of the same data.

The implementation team at Thermo Fisher implemented the Core LIMS software project with Beryllium to manage their scientific data. The project standardized the process of data entry into the system, instituting controlled vocabularies and other rules where previously users could enter free-text. These rules were introduced across the company to enable reporting and comparisons based on certain fields.

“We've implemented a LIMS that covers our entire process from genes to proteins and all of the different workflows that are happening, from cloning to protein purification to expression testing,” said Dr. Morales. “It's not just about managing what's happening, but managing the entities. We're now able to track all of the different entities from vectors to plasmids to proteins to cells, and how everything is related. We can track back and understand our inventory, understand the provenance of all of our samples and this also helps us when we need to troubleshoot experiments.”

Solving reporting challenges

Prior to using the Core LIMS software, pulling reports at Beryllium took approximately 20 hours a month, involving cleaning data and retrieving information from notebooks, spreadsheets, and SharePoint lists. Now, the reporting is virtually instantaneous, taking approximately one hour—a dramatic 95% improvement.

The flexibility of the Core LIMS software gave Beryllium a tool-kit to build additional functionalities in the system. Their leadership team wanted the ability to view their processes holistically, so they built SQL reports that are now presented back to users and filtered for their specific needs. These reports are also accessed through external tools such as Microsoft Power BI and Tableau® Software to show integrated reports that include other parts of the business such as sales, project plans and financials.

About Beryllium

Beryllium is a biologics partner company which specializes in proteins, structural biology, and biophysics. Their goal is to combine their expertise in structure-guided drug discovery with insights from functional biology to help partners to advance their research projects. Beryllium has a strong track record of working on difficult targets and at any time has many projects running in conjunction with a variety of partners.

As a bi-coastal research and drug discovery company, Beryllium can provide services at any point across the entire research process. Their collaborations range from modular projects such as molecular engineering, biophysical screening, phenotypic screening or gene-to-structure, to integrated drug-discovery programs where their partners utilize the full capability of their platform to develop drugs for challenging drug targets.

Improving data consistency

Data consistency has also improved. Now, when a problem is identified and fixed, due to the integrated structure of the LIMS, it is fixed throughout the system. "In the old system, it was sometimes difficult to find the most up-to-date version of a particular set of data and now, because the data is all integrated in the LIMS, we know that we only need to look in one place for it," said Dr. Morales. "It was an advantage we expected and now we are seeing it realized."

Beryllium's registration system is now based on a common, well-defined vocabulary. Data quality has increased significantly as vocabulary and other data validation rules have been implemented. In addition, manual copy and paste errors and free-text data entry errors have decreased.

The Core LIMS software allows the company to refer to only one entity between different locations and projects with a unique ID, allowing users to track the lineage and provenance of all samples. This allows Beryllium to not only track things as they happen, but to also look back and improve upon their processes.



fig.1. Beryllium uses the Platform for Science software for many aspects of its work involving a variety of sample types.

Laboratory Data Management Solutions

“This is a system that understands science. It is purpose built...The quality of our data has changed significantly.”

– Arturo Morales, Ph.D., Vice President, Technology and Data Sciences at Beryllium

Next steps

Beryllium is now bringing the Thermo Fisher™ Core ELN™ (Electronic Lab Notebook) software to its two locations. The company is adding the ELN to current projects and plans to backload some data for historical tracking.

Beryllium's instance of the Core LIMS software is hosted on Amazon Web Services (AWS) in a private multi-tenant cloud. This ensures fast response time at both of its sites, reducing any potential latency as data travels across the country. Subsequently the company will also be establishing partner portals where collaborators will have access to the system. Partners will be able to submit requests as well as have secure, real-time dashboard views of their projects.

Final thoughts

Beryllium's entire process, from gene to protein, is managed within the Core LIMS software. The workflow is now standardized and everything from ordering plasmids to purifying and tracking proteins is managed within the system.

The Core LIMS software has dramatically increased the speed, efficiency, and quality of data at Beryllium. Now groups within the company are consistent in how the data is managed, and how requests are handled and integrated with data entities.

Find out more at coreinformatics.com

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