seqera

Seqera Labs helps Arcus Biosciences improve research productivity and position itself for future growth

CUSTOMER

ARCUS BIOSCIENCES

https:/arcusbio.com

LOCATION
Hayward, CA, USA

INDUSTRY
Biopharmaceutical research, Oncology

OBJECTIVES
Provide self-service access to scalable, repeatable pipelines to a broader community of users. Improve efficiency, collaboration, and improve cloud resource utilization.

CHALLENGES
- Previous systems were difficult to use
- Pipeline monitoring & traceability
- Issues with efficiency and overspending
- Need to evolve to a hybrid cloud model

SOLUTION
- Nextflow and the Seqera platform
- AWS cloud environment: Amazon EKS, AWS Batch, and Amazon S3
- On-premises HPC cluster

RESULTS
- Dramatic productivity gains
- A consistent user experience
- Ability to segment research from clinical trials
- Improved flexibility for future growth
- 40-50% reduction in cloud spending

Summary

Arcus Biosciences is at the forefront of designing combination therapies, with best-in-class potential, in the pursuit of cures for cancer. By using Nextflow and the Seqera platform, Arcus was able to improve productivity, ensure pipeline traceability, and use cloud resources more efficiently. They were also able to prepare for future growth by scaling capacity for research and clinical trials while providing an intuitive, collaborative user experience to researchers and clinicians.

The business

Arcus is a clinical-stage, global biopharmaceutical company focused on developing differentiated molecules and combination therapies for people with cancer. With a world-class discovery engine and a highly experienced team, Arcus is focused on targeting well-understood biological targets and pathways where there is an opportunity to develop new medicines with a potentially improved safety and efficacy profile. Arcus has multiple investigational medicines in Phase 3 trials and additional investigational candidates at various stages of development in areas of high unmet needs.

The challenge

To support the evaluation of novel combinations of investigational medicines, Arcus relies heavily on bioinformatics pipelines for gene sequencing and expression, protein quantification, and T-cell profiling. Arcus supports both a pure research environment, as well as an environment supporting clinical trials where the handling of personally identifiable information is a paramount concern.

To scale research and clinical trials, accessibility, ease of use, and the ability to organize pipeline runs and datasets are major issues. The previous pipeline manager used by Arcus was command-line based and difficult for researchers with limited Linux skills to use. As a result, research teams relied on a few skilled individuals to submit and monitor bioinformatic pipelines creating a significant bottleneck. Ideally, Arcus needed a system providing self-service access to researchers with the ability to share results selectively and securely with clinicians and other stakeholders.

Issues such as traceability, repeatability, and auditability are critical. Arcus needed to keep pipeline runs related to specific candidates and clinical trials organized and securely partitioned to meet rigorous documentation requirements.

Another challenge faced by Arcus was using cloud resources efficiently. While the previous pipeline manager could dispatch tasks to the AWS cloud, it was inefficient in terms of resource utilization leading to unnecessarily long runs and overspending.

The solution

Arcus began shifting pipelines to Nextflow approximately two years ago to take advantage of high-quality community-curated pipelines and build a more scalable foundation for research and clinical trials.

Shortly after, Arcus deployed the Seqera platform, a portal for Nextflow workflows designed to enable collaborative data analysis at scale. Seqera provided an intuitive interface for researchers and clinicians and supported the notion of workspaces, enabling Arcus to logically partition their research environments and grant access selectively to teams working on clinical trials or various early-stage molecules.

Seqera also insulates researchers and clinicians from underlying compute environments, providing Arcus with the flexibility to run pipelines on AWS, third-party clouds, or on local infrastructure, depending on evolving needs.

An attractive feature of Seqera was that it offered mature integrations with popular cloud services, including AWS Batch, Amazon S3, and Amazon FSx for Lustre. With minimal optimization, pipeline tasks could be packed more efficiently into available cloud resources translating into faster execution and more capacity per unit expenditure in cloud resources.

Results

DRAMATIC PRODUCTIVITY GAINS
According to Arcus Biosciences, "**The results were almost immediate. After deploying Seqera, our researchers rapidly became self-sufficient in launching and monitoring pipelines. This has freed up significant technical resources allowing us to focus on high-value tasks. Today, approximately 95% of our workload is managed by Nextflow**."

SIGNIFICANT COST SAVINGS
The combination of Seqera's mature cloud integrations and effective resource controls has also helped significantly reduce costs. **Arcus estimates that with minimal tuning, the average cost per run decreased by 40-50%**. Given their monthly six-figure cloud bill, this is significant. Even more important is that these improvements have provided additional capacity enabling researchers and clinicians to perform additional analysis, improving quality, confidence, and helping accelerate discovery.

A FOUNDATION FOR FUTURE GROWTH
By providing users with an intuitive environment supporting early-stage research and clinical trials, Arcus has improved the effectiveness of its research environment and positioned itself for future growth. By decoupling the research portal from underlying compute environments, Arcus has the flexibility to deploy workloads where it makes the most sense – either tapping scalable cloud resources or taking future workloads in-house.

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