Seqera helps Gritstone Bio with targeted immunotherapies for cancer and infectious disease

CUSTOMER

https://gritstonebio.com/

LOCATION
Emeryville, CA

INDUSTRY
Immunotherapies research

OBJECTIVES
Gritstone Bio required a collaborative platform to support analysis and machine workloads to support its ongoing research into next generation vaccines for cancer and a variety of infectious diseases.

CHALLENGES
- Massive compute requirements
- Extensive machine learning (ML) workloads
- Requirements to run on-premises and in the cloud
- Need for reproducible auditable workflows

SOLUTION
- Nextflow
- Seqera platform
- Multiple AWS services including AWS Batch

RESULTS
- Increased capacity
- Improved collaboration
- Reliable, repeatable, auditable workflows
- Reduced cloud spending

Summary

Gristone Bio deployed Nextflow and the Seqera platform in support of their research efforts to develop new targeted immunotherapies for cancer and infectious disease. With Nextflow and Seqera, Gritstone has been able to increase their capacity for model training and analysis, improve research productivity, and scale usage while reducing spending by using resources more efficiently.

The business

Gritstone's approach seeks to generate a therapeutic immune response by leveraging insights into the immune system's ability to recognize and destroy diseased cells by targeting select antigens. They began with a focus on tumor-specific neoantigens, and more recently extended their programs to include viral antigens displayed on the surface of virally infected cells.

The challenge

Along with industry partners, Gritstone Bio has an impressive pipeline of personalized cancer and other vaccines at various stages of clinical trials. Focus areas include vaccines for solid tumors, prophylactic samRNA vaccines for SARS-CoV-2, and therapeutic vaccines for HIV.

To support ongoing research, the ability to securely share data was critical. Gristone also needed to adhere to GxP (good practice guidelines) and ensure that runs

were reproducible and auditable to satisfy regulatory requirements.

In order to develop ML-based predictive models for tumor classification, Gritstone required a solution that enabled them to easily scale capacity to the cloud and make compute resources available to their research communities.

The solution

Gritstone chose Nextflow to efficiently dispatch analysis and machine learning pipelines to the AWS cloud. They also deployed the Seqera platform, a collaborative portal for sharing data, pipelines, and compute environments and monitoring and managing workflows and results.

Seqera automatically deploys appropriate CPU and GPU-based resources as they are required by researchers via its integration with AWS Batch.

Gristone takes advantage of a combination of on-demand and spot instances along with Seqera's efficient task placement algorithms to maximize analysis throughput and minimize costs.

Results

INCREASED CAPACITY
By using fast, high-throughput Nextflow pipelines that maximize parallelism, Gristone has been able to boost their research productivity. By using AWS Batch they can efficiently access the latest cloud-based GPU instances and pay for only the resources they need.

IMPROVED COLLABORATION
With Seqera Workspaces, Gritstone has been able to segment their pipelines, datasets, and compute environments around their various research efforts and clinical trials for candidate vaccines. By controlling access to pipelines, runs, and data via rich role-based access controls (RBAC), Gristone is able to facilitate

sharing while protecting sensitive information and intellectual property.

"We are excited about the direction the Seqera team is taking their solutions and are looking forward to playing our part in advancing this technology for the industry as a whole."

Michael Kroell, Director Cloud Engineering - Gritstone Bio.

RELIABLE, REPEATABLE, AUDITABLE WORKFLOWS
Nextflow and Seqera's close integration with popular source code managers (SCMs) means that researchers can run different versions of analysis pipelines directly from code repositories with an auditable history of all runs and results.

REDUCED CLOUD SPENDING
By using AWS Batch to support computational requirements for analysis and ML pipelines, Gritstone have avoided the cost and complexity of deploying additional HPC resources on-premises.

Seqera Forge's automated resource provisioning and disposal means that researchers only pay for the resources they need. Furthermore, researchers can transparently access low cost spot instances without compromising pipeline reliability resulting in additional savings and a lower monthly cloud bill.

LEARN MORE
To learn more, visit www.seqera.io