



## CASE STUDY

# Verici Dx Drives Innovation with Next-Generation Sequencing for Kidney Transplant Prognosis Using Illumina® Connected Analytics on AWS

Parallel processing on the cloud accelerates personalized diagnostic testing

In collaboration with



## Implementing a faster, more reliable clinical testing process

Verici Dx is a developer of advanced clinical diagnostics in organ transplant using next-generation sequencing to define a personalized and precise risk profile of each patient. A substantial amount of data generated across multiple Verici Dx assays created data organization and management challenges. These challenges increased the risk of errors associated with manual intervention in data handling and pipeline configuration.

To take an innovative approach to addressing data management and analysis challenges, Verici Dx worked with AWS Partner Illumina to implement data science-driven processing and machine-learning pipelines on [Illumina Connected Analytics](#). Deployed on AWS, Illumina Connected Analytics is a comprehensive environment with multi-layered data protection. With a single, intuitive platform, Verici Dx can accelerate testing with parallel processing on the cloud while also scaling data management and analysis in a highly secure environment. Illumina Connected Analytics on AWS enabled Verici Dx to initiate parallel processing for various runs, significantly reducing

run time and the amount of hands-on time. Illumina Connected Analytics empowers Verici Dx to integrate powerful workflow solutions and tools such as Docker, Nextflow, Common Workflow Language (CWL), Jupyter Notebook, it also supports storage, processing and querying of high dimensional data to build robust Artificial Intelligence (AI) and machine learning (ML) models that help predict critical outcomes for transplant patients such as acute rejections, chronic injury, graft loss, and more.

With Illumina Connected Analytics on AWS and [NextSeq™ 2000](#) as a part of their workflow, Verici Dx significantly reduced the required workflow runtime and resourcing needs for sequencing and data analysis. Using a scalable, highly secure data management platform hosted on the cloud, Verici Dx is able to store their RNA sequencing results while processing and analyzing large volumes of sequencing data. Illumina Connected Analytics on AWS enables Verici Dx to provide faster, more tailored insights for clinicians, enabling improved kidney transplant management.

## KEY DETAILS

## Verici Dx sought a highly secure, scalable platform that enables data management and analysis to operationalize informatics and facilitate novel insights

Verici Dx needed to optimize its initial data management and analysis platform for streamlined clinical workflows. Verici Dx wanted to deliver on critically important key performance indicators for laboratory medicine: accuracy and turnaround time to results. The company required a flexible platform with advanced security and data management features that could deliver rapid, accurate insights to help increase overall graft survival and promote successful outcomes for patients.



### The challenge

As Verici Dx worked to transfer its workflows into [Illumina Connected Analytics](#), it continued to accumulate large amounts of data generated from the processing of clinical trial samples. As more and more data was generated across the multiple Verici Dx assays, data management in terms of storage and organization presented new challenges.

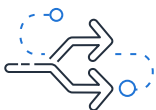


### The solution

Verici Dx implemented Illumina Connected Analytics deployed on Amazon Web Services (AWS). Illumina Connected Analytics is a highly scalable genomics data platform with advanced security features that streamlines the complex processes required to create and customize data analysis pipelines.

**Illumina Connected Analytics' powerful parallel processing capabilities enables organizations such as VericiDx to:**

- Make sequencing runs of clinical samples faster
- Enable more accurate secondary analysis
- Explore data and share results more easily
- Leverage Illumina's professional services program to quickly get up to speed



### The results

Prior to implementing Illumina Connected Analytics, it took Verici Dx about five hours to process one sequencing run at a time from raw data to interpretation-ready reports. With Illumina Connected Analytics on AWS, VericiDx is now able to process multiple runs using parallel processing while also bringing down the processing time to about 2.5 hours per run. This significantly reduces run time and hands-on data management, while freeing up the valuable time of bioinformaticians.



## ILLUMINA CONNECTED ANALYTICS ON AWS ALLOWS CUSTOMERS TO:

### Operate Production Workflows

Easily import, build, and edit workflows with tools like CWL and Nextflow

Leverage DRAGEN™ bioinformatics pipelines

### Manage Your Data Centrally

Organize data in a secure workspace and share it globally in a compliant manner

Keep your data in your cloud environment while using our platform

### Analyze Data with Interactive Tools

Visualize and interpret your data with a flexible analysis environment, including JupyterLab Notebooks

Aggregate, query, and analyze sample and population data in a scalable data warehouse



“At Verici, we spend a lot of time focused on quality—so ‘better’ means an environment that preserves data integrity and allows us to archive our findings in a manner that preserves the ability to take novel approaches to data interrogation in the future.”

**Patti Connolly**  
Chief Operating Officer



## About Illumina

Illumina is a leading developer, manufacturer, and marketer of life-science tools and integrated systems for large-scale analysis of genetic variation and function. These systems are enabling studies that were not even imaginable just a few years ago and moving us closer to the realization of personalized medicine. With rapid advances in technology taking place, it is mission-critical to offer solutions that are not only innovative, but flexible and scalable, backed by comprehensive support and service. Illumina strives to meet this challenge by placing a high value on collaborative interactions, rapid delivery of solutions, and meeting the needs of customers. Illumina's innovative sequencing and software technologies are fueling advancements in life science research, translational and consumer genomics, and molecular diagnostics.

## About Verici Dx

Verici Dx is a developer of advanced clinical diagnostics in organ transplant. Verici Dx kidney transplant assays are developed using next-generation sequencing science and leverages access to deep clinical insights derived from immunological, transcriptomic, clinical, and pathological data to define a personalized, precise risk profile related to risk and diagnosis of kidney injury and graft loss for each patient over the course of their transplant journey.

