Microsoft

Microsoft Genomics

Today's medical centers, integrated delivery networks, and labs are looking for agility, easier management, and access to more capacity to enable the increased demand for next-generation sequencing (NGS).

Together with our partners, Microsoft Genomics provides a highly secure and compliant solution that significantly accelerates application processing and gene sequencing, providing a cost-effective way for you to quickly uncover new opportunities.

Microsoft computing method makes key aspects of **genomic sequencing**

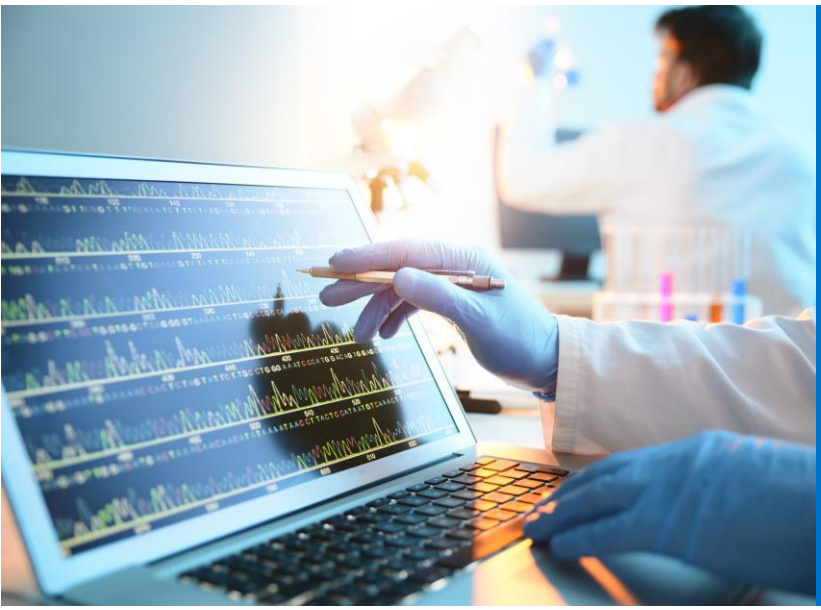
7x faster.

Quickly uncover new opportunities

Decrease the time to sequence a genome, driving innovation and enabling accelerated future NGS demand with access to genomics tools created by Microsoft. Microsoft's method of running the Burrows-Wheeler Aligner (BWA) and the Broad Institute's Genome Analysis Toolkit (GATK) on our cloud computing system is seven times faster than the previous version, allowing researchers and medical professionals to get results in just four hours instead of 28 hours.

Benefit from hyper-scale infrastructure in the cloud

Deliver precision and personalized medicine with true Infiniband RDMA capabilities, close to bare metal GPU visualization and compute performance, and FPGA support. The Microsoft Genomics solution provides health and life sciences organizations with infinite storage and processing services built on Microsoft's decades of experience running exabyte-scale workloads on Cosmos.



Microsoft Genomics provides a high capacity, highly secure and compliant solution enabling next-generation genome sequencing, helping accelerate innovation while reducing time and cost.

Optimize costs with on-demand computing

Decrease costs with sustainable storage and processing that grows or shrinks with demand on a pay-as-you-go model. The Microsoft Genomics solution can scale to the required levels to run simulations such as Nano Molecular Dynamics.

Meet security and compliance obligations

To help organizations comply with national, regional, and industry requirements, Microsoft offers the most comprehensive set of certifications and attestations of any cloud service including ISO 27001, ISO 27018, HIPAA, FedRAMP, SOC 1 and SOC 2, as well as country-specific standards like Australia IRAP, UK G-Cloud, and Singapore MTCS.

Solution overview
Genomics

Seamlessly connect any Next Generation Sequencer to Azure, provide ultra-high speed and highly secure data transfer for genomics, provide primary analysis, predictive maintenance, monitoring and field maintenance for equipment.

Secondary Analysis

Alignment with reference genome

Variant Calling

Pipeline Management and Orchestration

Tertiary Analysis

Querying whether the genome contains variants that have already been discussed in the literature and are known to be associated with disease.

Treatment

Delivery of actionable insights to the clinician. Includes reporting, consults, and integration into the electronic medical record.

Rich partner ecosystem of applications to deliver genomics applications.

Microsoft Genomics Services

Algorithm Accelerators (BLAST & BWA)

Reference Data

Toolkits

Capabilities to run genomics workloads seven times faster, access to research data

Compliant Cloud Infrastructure

Express Route (Signiant, Aspera)

High Performance Compute (RDMA)

GPU Compute and Visualization

FPGA

Storage (Blob, Data Lake, Database, NOSQL)

Advanced Analytics (R, Hadoop, Spark, ML)

Integration

Provide a cost-effective, trusted and high performance platform to run genomics workloads and store data very securely. Access to high performance advanced analytics capabilities that can run in thousands of nodes in parallel.

Why Microsoft

Health and life sciences organizations can benefit from Microsoft's industry-leading expertise and ecosystem of innovative partners, while ensuring high security, privacy, and local compliance in the cloud.

Deep expertise. Microsoft Research has been working in the area of genomics for more than a decade. Its innovation continues with projects like FaST-LMM for GWAS, homomorphic encryption, and the Literome project. More than 1,000 Microsoft scientists and engineers collaborate in research labs worldwide, with many teams working on genomics.

Ecosystem of innovative partners. Microsoft has recruited the most important partners in the genomics industry to run their solutions on Microsoft Azure as SaaS and IaaS. These partners bring unique intellectual property and solutions which are being used by our customers.

Focus on compliance and security. From HIPAA certification to data sovereignty requirements, Microsoft's large network of hosting partners and existing published guidelines make it an easy decision to choose Microsoft Genomics.

"Life scientists and their institutions no longer have to find millions of dollars to establish their own supercomputing center."

Wu Feng
Professor of Computer Science

VirginiaTech

Virginia Tech, one of the country's leading research institutions, wants to capture data from DNA sequencers which are generating 15 PB of genome data each year by using Compliant Cloud for Genomics.

UKE HAMBURG

The Hamburg-Eppendorf university hospital wants to use DNA analysis to gain a better understanding of the immune system in cancer cases. To do this, they need to automate and accelerate the DNA analysis process while keeping it simple and maintaining extreme accuracy.

"Our team automated former manual established as well as complex processes in genome analysis and could therefore fastened dramatically the analysis cycles and at the same time increased the quality of studies."

Prof. Dr. Mascha Binder
Professor of Immuno-Oncology

Learn more

microsoft.com/genomics

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