Illumina Genome Network

Delivering whole human genome sequencing services using the industry's most respected sequencing platforms.

Genome Network Highlights

- **Most Widely Adopted and Published Technology**
  Cited in over 1,800 publications
- **Uncompromising Data Quality**
  Highest sensitivity and specificity
- **Expert Sequencing Service Providers**
  CSPro® partners have extensive sequencing and data analysis experience
- **Cost-Effective Services with Fast Turnaround Times**
  As little as 12 weeks for 100 samples
- **Simplified Data Analysis**
  Standard analysis included, with raw data provided in the most widely adopted formats

Whole-Genome Sequencing When You Need It

Next-generation sequencing systems, such as the Illumina HiSeq™ 2000 and Genome Analyzer, provide the throughput and data quality necessary to support a broad range of applications to advance human genomics research. For example, whole-genome sequencing can identify the genetic underpinnings of human disease, determine the differences and similarities between distinct human populations, or identify the gene variations that make each person genetically unique. Follow-on studies such as targeted resequencing, SNP discovery, structural variation analysis, and RNA-Seq can provide in-depth information on exact genes and mutations, and their impact on gene expression.

The Illumina Genome Network enables researchers to leverage whole human genome sequencing—even if they have low sample volumes—without the time and expense of acquiring equipment and training personnel. It completes whole-genome sequencing projects quickly and affordably, by providing access to Illumina Certified Service Providers (CSPro)* and their expert sequencing teams using Illumina platforms.

What is the Illumina Genome Network?

The Illumina Genome Network is a group of leading institutions worldwide, all experts in Illumina technology, that offer sequencing services to individual researchers. Illumina acts as the primary point of contact, linking researchers with the Network partner of their choosing to create a service package that meets their individual needs.

Expert Genome Network Partners

Illumina hand picks its Genome Network partners to ensure that sequencing projects are completed to the highest standard of quality with rapid turnaround. All have proven their sequencing expertise with numerous publications and extensive training, enabling them to achieve Illumina CSPro status. Researchers benefit from their skill and vast amount of data analysis knowledge.

All Illumina Genome Network partners have multiple Illumina sequencing systems (Genome Analyzer or HiSeq 2000), ensuring the capacity and scalability necessary to manage large projects. Current members include the National Center for Genome Resources (NCGR), the Macrogen Genomic Medicine Institute, and the University of Washington, Department of Genome Sciences. For the most current list of Illumina Genome Network Partners, visit www.illumina.com/genomenetwork.

Proven Technology

Illumina sequencing platforms employ sequencing by synthesis (SBS) chemistry, the most effective, widely used, proven next-generation sequencing chemistry, with an unsurpassed 1,800 publications in just three years. Sequencing whole genomes with SBS chemistry yields the highest quality data, providing access to more rare variants, with the accuracy and reliablity needed to move research forward.

High-Quality Data

TruSeq™ technology is Illumina's latest advancement in next-generation sequencing technology, delivering the most accurate human genome at any coverage. Powering all Illumina sequencing systems, TruSeq technology provides the highest yield of error-free reads, with 7× fewer gaps, and fewer false negatives and false positives than competing technologies. With Illumina sequencing platforms, researchers can count on the highest data quality.

Sequence More Cost-Effectively, Quickly

Illumina has negotiated competitive prices with its Genome Network partners. The per genome cost will be at the same level as a similar service that uses less accepted technologies performed by less experienced users. In addition, the Illumina Genome Network is committed to providing industry-leading turnaround times—as little as 12 weeks for 100 samples†.

Analysis Assistance

Sequencing through the Illumina Genome Network provides more than a virtual instrument. Illumina Genome Network partners offer simplified data analysis solutions. Customers receive raw data in the most widely adopted formats with access to the broadest selection of commercial and open-source analysis tools in the industry. Standard analysis is included at no charge, with premium data analysis services also available.

Follow-On Study Support

The Illumina Genome Network offers researchers an affordable entry point to Illumina next-generation sequencing. Once a whole-genome sequencing project is completed, follow-on sequencing projects can be performed by Illumina Genome Network or CSPro partners using Illumina SBS-based platforms, ensuring efficient analysis.

*The Illumina CSPro program is a collaborative service partnership dedicated to ensuring delivery of the highest quality data available for genetic analysis applications. Learn more at www.illumina.com/cspro.

†Typical projects of 100 genomes may be completed in 12–16 weeks. For an additional cost, data can be delivered in <12 weeks.

Figure 1: The Illumina Genome Network Process

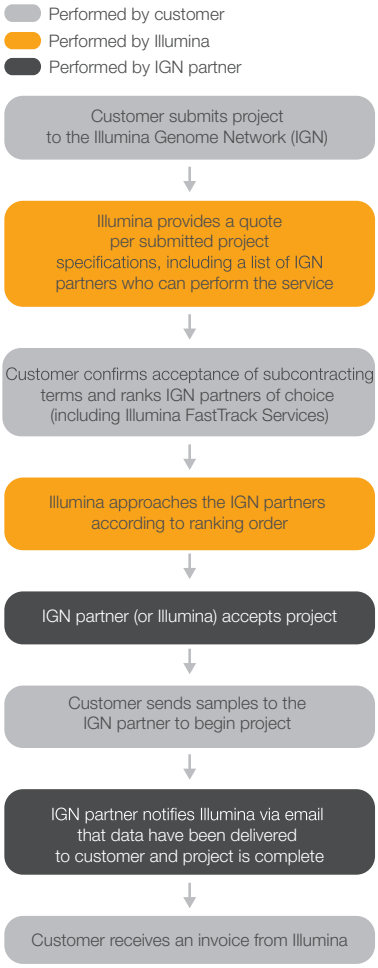

Table 1: Illumina Genome Network Service Details

Sample Input Requirements
Input DNA requirement = 5 µg
Service Performance Specifications
Average autosomal fold coverage of 30× (higher coverage offered)
Percent of non-N reference coverage > 90% for non-cancer samples
At least 3,000,000 SNPs detected for non-cancer samples
Genotype concordance > 99.5% for non-cancer samples
Data Deliverables
Variants
Single-nucleotide polymorphisms (SNPs)
Indels (1-150 bp)
Copy number variation (losses and gains)
Structural Variants (SVs)
Large insertions
Large deletions
Inversions
Annotations
dbSNP comparisons
Concordance with whole-genome genotyping arrays
Summary report
Raw data (reads and quality scores) and analyzed data in industry-standard format (archival BAM)
Delivery
Data visualization in GenomeStudio® software or third-party open-source tools
Premium data analysis packages available through select Genome Network partners
Data Quality
> 80% of sequencing reads passing filters align uniquely to the reference genome
> 80% of all reads passing filter have a Q value of Q30 or greater

How Does it Work?

To make accessing Illumina sequencing technology as easy as possible, Illumina remains an active part of the service, coordinating activities between customers and Genome Network partners to ensure the quality and timeliness of all projects (Figure 1). A project begins when the customer fills out a submission form (visit www.illumina.com/genomenetwork). The project size for a pilot project should be at least 50 samples, with an input DNA amount of 5 µg. An Illumina representative provides a quote and contacts the customer-designated Genome Network partners to initiate the project. If the chosen partners are unavailable, Illumina will take on the project in its FastTrack Services Laboratory. Customers then send samples to their Illumina Genome Network partner and look forward to receiving high-quality, accurate data.

What Does the Service Include?

Illumina Genome Network partners perform whole human genome sequencing at 30× average coverage, from short-insert paired-end reads using a single library (Table 1). Data analysis is performed using CASAVA (consensus sequence from ELAND alignment, called SNPs, and indels). The delivered data set will include reads and quality scores for further downstream analysis.

Whole Human Genome Sequencing Without Compromise

Reliable. Accurate. Affordable. Customers can trust their large whole human genome sequencing projects to Illumina Genome Network partners, with their proven ability to obtain results using the most widely adopted sequencing technology. Start today at www.illumina.com/genomenetwork.

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