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saphyr®

Only Bionano Saphyr® reveals the critical structural variants you're missing.

INTRODUCING SAPHYR®

Saphyr, Bionano's high-speed, high-throughput genome mapping solution, detects and analyzes large structural variations with exceptional sensitivity and specificity to reveal the true structure of any genome. Saphyr's breakthrough speed and throughput combined with unmatched structural variation sensitivity make it the ideal solution for human and translational research applications.

Saphyr enables Bionano's optical genome mapping. The instrument scans Bionano's proprietary NanoChannel arrays to image extremely long, single DNA molecules in their native state. This technology allows for unparalleled structural variation sensitivity, improved genome assembly contiguity up to 1000 times that of short-read sequencing alone and the accuracy to correct sequencing-based assembly errors.

STRUCTURAL VARIATION DISCOVERY PLATFORM

Resolve structural variations missed by next-generation sequencing (NGS) and cytogenetic systems

Structural variations are responsible for many diseases and conditions, including cancers and developmental disorders. Saphyr detects structural variations and chromosomal abnormalities ranging from 500 bp to megabase pairs in length and offers assembly and discovery algorithms that far outperform sequencing-based technologies in sensitivity.

- **99% sensitivity** for homozygous insertions/deletions larger than 500 base pairs
- **95% sensitivity** for heterozygous insertions/deletions larger than 500 base pairs
- **95% sensitivity** for balanced and unbalanced translocations larger than 50,000 base pairs
- **99% sensitivity** for inversions larger than 30,000 base pairs
- **97% sensitivity** for duplications larger than 30,000 base pairs
- **97% sensitivity** for copy number variants larger than 500,000 base pairs

In mosaic samples or complex heterogeneous tumors, Saphyr can detect all above mentioned structural variant types with 90% sensitivity in as low as 5% allele fraction. Saphyr provides this performance typically with a false positive rate of less than 2%. Saphyr also measures repeats and solves complex rearrangements.

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ENHANCED SPEED AND THROUGHPUT

Rapid optical mapping ideal for human research applications

Saphyr features enhanced optics with adaptive loading of DNA utilizing machine learning. The Saphyr Instrument and high-capacity Saphyr Chip® combine to deliver genome maps at the speed and scale your research demands.

- Long molecules from 100,000 bp to megabase pairs
- 3900 Gbp throughput per Saphyr Chip per run for human samples for deep structural variant discovery (1300 Gbp per flowcell of molecules larger than 150 kbp)
- Run up to 42 samples per week at 100x depth of coverage for each sample
- Sample to structural variation calls or genome scaffolding in as little as 4 days

SIMPLIFIED WORKFLOW

Automation features and intelligent sample preparation simplify the process

Saphyr offers automated features that minimize hands-on time while upgradable components ensure Saphyr delivers value over the long term.

- New sample prep offers 3-hour turnaround time for DNA isolation
- Requires less than 3 minutes hands-on instrument time per chip
- Automatic optimization of run conditions based on sample characteristics to maximize throughput
- Saphyr Chip Clip protects sample integrity and eliminates the need for instrument wash cycles between runs

WIDE RANGE OF APPLICATIONS

Explore a variety of experimental design options

Apply high-resolution physical genome maps to understand genome structure in many areas of research.

- **Undiagnosed genetic disorders –** complete the diagnostic odyssey by detecting large structural events missed by NGS and cytogenetic methods
- **Gene discovery and therapy development –** identify genes of interest, their locations and how structural variations impact them to inform effective therapy development
- **Hematologic malignancy –** detect relevant mutations at 1,000 times higher resolution with next-generation karyotpying
- **Solid tumor research –** detect somatic rearrangements in heterogeneous tumors with the highest sensitivity
- **Cell line studies –** monitor genomic integrity of cell lines and off-target effects of genetic engineering
- **Genetic engineering studies –** identify areas of biological interest for achieving desirable traits in livestock or crops
- **Evolutionary biology –** see the complete picture of how genomes have evolved and have been reorganized
- **Reference genome assembly –** perform *de novo* assembly and correct assemblies generated by sequencing-based systems

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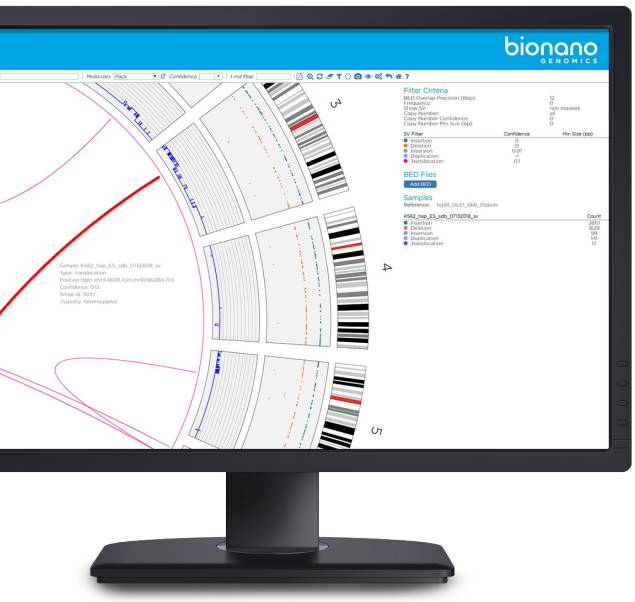

INTELLIGENT DATA SOLUTIONS

Manage and monitor data generation on Saphyr and generate genome assemblies and variation reports in one place.

Bionano Access®, your web-based hub for Saphyr® operations, provides all the software you need for experiment management and Bionano applications, including bioinformatics and variant annotation and reporting.

- Set up runs and monitor real-time data quality metrics remotely to flag potential sample quality issues early
- Perform one-click structural variation calling and annotation
- Filter and generate variation reports
- Automate the detection of *de novo* and somatic variants by comparing multiple samples and export in a dbVar-compliant VCF file
- Generate *de novo* assemblies for population-specific reference genomes and plant and animal research

Unparalleled processing power

The Saphyr and Bionano Compute Servers offer cluster-like performance in an affordable, compact solution.

- Perform *de novo* assembly of a human genome in approximately 28 hours
- Simple web-based interface enables integration into virtually any network setup
- Cloud-based solutions available

ORDERING INFORMATION

- **Saphyr® System with Bionano Access Server:** Catalog #90023
- **Saphyr Chip® 3x1300*:** Catalog #20366
- **Saphyr Chip® 2x1300*:** Catalog #20367
- **Saphyr Compute Server:** Catalog #80013
- **Bionano Compute Server:** Catalog #80014
- **Bionano Compute On-Demand:** Catalog #90047

*Compatible only with Saphyr® System #90023 (Saphyr® Instrument #60325)

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Contact us to learn more about the Saphyr platform.

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Part #30149 Rev D