ThermoFisher SCIENTIFIC

Microarray analysis

GeneTitan MC Fast Scan Instrument

Automated high-throughput microarray processing

applied biosystems

GeneTitan MC Fast Scan Instrument

The only fully integrated instrument for automated microarray research processing

Transform your research lab with an Applied Biosystems™ GeneTitan™ MC Fast Scan Instrument and experience the power of streamlined array processing for discovery, exploration, and screening research. The GeneTitan MC Fast Scan Instrument for genotyping seamlessly integrates hybridization, washing, and imaging in a single instrument to provide automated array processing—whether you are performing basic or applied research.

- **Scalable**—meets both medium- and high-throughput needs, enables fast time to data, and requires the least amount of manual intervention of all microarray processing instruments
- **Efficient**—condenses hands-on processing time to as little as 30 minutes, images an array in less than five minutes, and operates unattended overnight
- **Flexible**—supports genotyping studies on multiple array plate formats
- **Accurate**—enables high-quality, consistent data by processing multiple samples under identical conditions
- **Adaptable**—creates flexible workflows and sample registration via Applied Biosystems™ GeneChip™ Command Console™ Software

The flexibility you want

Multiple formats and customized solutions for genotyping studies

The GeneTitan MC Fast Scan Instrument, together with Applied Biosystems™ high-throughput (HT) array plates, provides an automated solution for microarray processing. With a broad selection of array plate formats (Figure 1), you can easily transition from discoveries through genome-wide single-nucleotide polymorphism (SNP) genotyping to comprehensive explorations of biological phenotypes for disease or drug response (Figure 2).

Figure 1. Multiple array plate formats. Predesigned and customizable array plates, shown in 24-, 96-, mini-96, and 384-array formats, give you the highest productivity with a scalable throughput.

Figure 2. Broad range of applications. The GeneTitan MC Fast Scan Instrument, together with Applied Biosystems array plates, enables a wide menu of applications in genetic variation studies. Blue: genotyping; gray: pharmacogenomics; and orange: reproductive genomics.

Multiple formats

Applied Biosystems™ Axiom™ genotyping array plates

Available in multiple formats; able to process 24–384 samples per plate

Applied Biosystems™ CarrierScan™ array plates

Available in 96-sample format

Scalable throughput

Process up to 3,000–9,000 samples per week

Increase throughput without additional manpower or instrumentation

Achieve high productivity

Array plates condense hands-on processing time, minimize user intervention, and are processed unattended overnight

Applied Biosystems™ Axiom™ myDesign™ custom genotyping array plates

Genomic coverage tailored for human and agrigenomics genotyping, focusing on the SNPs of interest to you

Applied Biosystems™ CarrierScan™ custom array plates

Custom content for scalable, expanded carrier screening research

Automated array processing

Less time acquiring data, more time for science

The GeneTitan MC Fast Scan Instrument takes your experiments from prepared samples to primary analysis without user intervention (Figure 3). And unlike any other system currently on the market, the instrument automates all array processing and plate transfers for a highly automated workflow. By processing multiple samples under identical conditions, you can achieve high-quality, consistent data.

The GeneTitan MC Fast Scan Instrument enables:

- Low labor and array costs
- High data consistency
- More time with biology—not the technology

Efficient

The instrument condenses 8 hours of hands-on time into as little as 30 minutes and multiplexes samples with minimal operator intervention, which helps reduce labor needs, freeing up lab personnel for other priorities.

Highest productivity

The instrument operates unattended overnight, and the unique degree of automation enables superior reproducibility and increased confidence in your results.

Figure 3. Manual or automated target prep for array processing. A single GeneTitan MC Fast Scan Instrument enables a throughput of over 3,000–9,000 genotyping samples per week with minimal hands-on time.

Propel your workflow

For customers who are performing high-volume genotyping research on human or agricultural samples, reaching more than 1 million samples per year, the Applied Biosystems™ Axiom™ Propel workflow offers a modular platform with flexibility for fast and easy scale-up. It also delivers high-throughput genotyping while providing results within 48 hours for time-sensitive critical decisions.

Reduce turnaround time by up to 2 hours

Increase sample processing volume by up to 50%

Genotyping solutions

A fast, accurate platform for all stages of research

The GeneTitan MC Fast Scan Instrument is featured in the following Applied Biosystems™ solutions:

- Axiom™ Genotyping Solution
- Axiom™ Precision Medicine Diversity Research Array
- PharmacoFocus™ solution
- PharmacoScan™ solution
- CarrierScan™ Assay full solution

They offer a highly automated workflow for a broad selection of research applications, including genome-wide association studies (GWAS), replication studies, candidate-gene association, expanded carrier screening research, pharmacogenomics, and targeted genotyping for human disease research and agricultural genomics.

Reduce complexity

The GeneTitan MC Fast Scan Instrument lets you generate robust and reliable genotypes with minimal user intervention, which helps to reduce costs and processing complexity. The Axiom Genotyping Solution and CarrierScan Assay include manual or automated target prep methods and automation-friendly reagent kits for preparing samples to process in the instrument.

Scalable and customized solutions

Choose from a suite of predesigned global and population-specific Axiom genotyping array plates for genetic mapping. Or, design your own Axiom myDesign custom array plate with 1,500 to 900,000 SNPs per array by choosing from our database of 26 million SNPs and indels and your own proprietary target markers from sequencing initiatives.

Genotyping on the GeneTitan MC Fast Scan Instrument enables:

- Fast time to data
- Processing of thousands of samples by a single scientist
- High control over genotyping production

Flexible analysis workflow

With Applied Biosystems™ Axiom™ Analysis Suite software, get complete genotyping analysis of all Axiom arrays. Axiom Analysis Suite software integrates SNP genotyping, indel detection, and off-target variant (OTV) calling of simple and complex genomes in an easy-to-use graphical interface (Figure 4).

Automated Axiom Analysis Suite software

This software package enables analysis of the .cel files upon scan completion of an Axiom array plate without user intervention. Upon completion of plate scanning, a notification is sent to the Application Server Core and sample files are automatically uploaded to a designated folder.

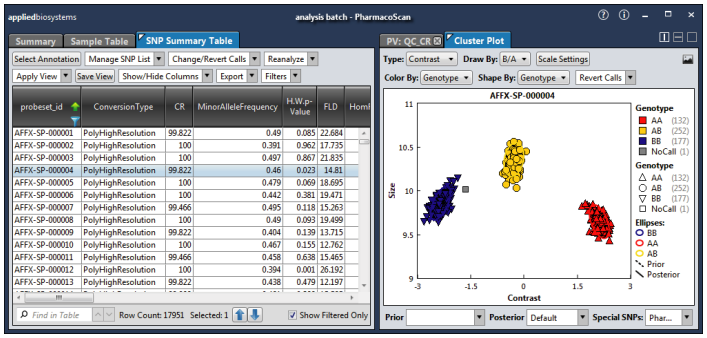

Figure 4. SNP genotyping analysis. The GeneTitan MC Fast Scan Instrument generates robust and reliable genotypes that can be analyzed and visualized quickly and easily using Axiom Analysis Suite software.

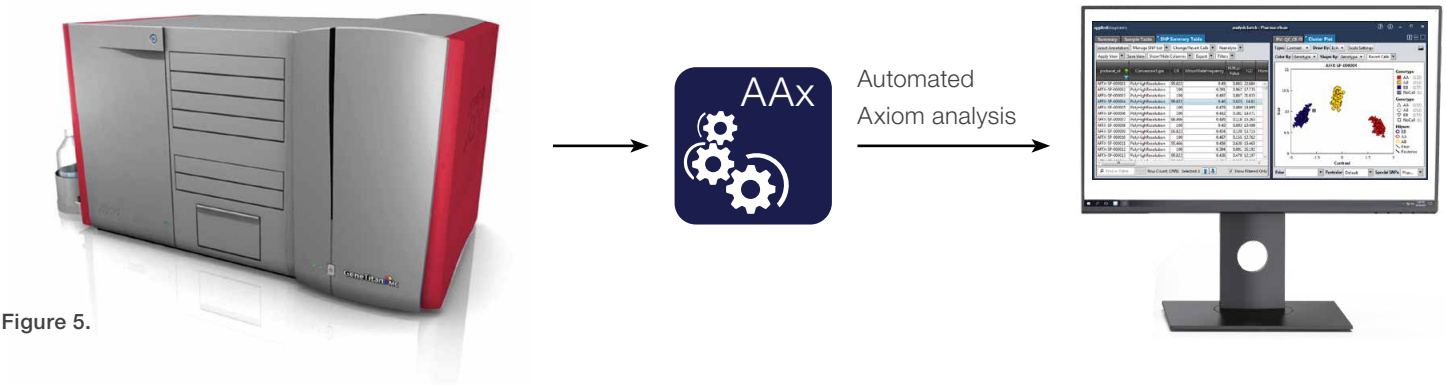

Figure 5.

Streamlined software

Easy-to-interpret results

The GeneTitan MC Fast Scan Instrument comes installed with the popular, file-based GeneChip Command Console Software for instrument control. Primary and secondary analysis can be completed using Axiom Analysis Suite software for genotyping and pharmacogenomics analysis, and CarrierScan Reporter Software for expanded carrier screening research.

GeneChip Command Console Software

- Enhances automated processing with wizard interfaces and workflow monitoring
- Easy data sharing and scalable data management with a convenient file-based format
- Includes remote notification of instrument status for walk-away automation
- Enables seamless integration with downstream analysis applications

Axiom analysis options

- Copy number detection and visualization capabilities
- Generate genotyping research applications and quality control metrics, and filter SNPs into defined classifications
- Axiom Analysis Suite for desktop enables you to visualize data as heat maps, box plots, scatter plots, and individual SNP cluster plots
- Automated Axiom Analysis software enables analysis of .cel files following microarray scan completion without intervention by a user
- Further analyze data with companion tools such as Applied Biosystems™ Axiom™ HLA Analysis Software
- Convert data to long format for seamless integration with current bioinformatics pipelines using the Applied Biosystems™ Axiom™ Long Format Export Tool
- Star allele and translation tables for predictive genomics arrays

CarrierScan Reporter Software

- Annotate variants with our curated, wide range of public or custom annotations
- Customize data by selecting only those variants relevant to the sample or paired samples
- Export variants and annotations easily to create a report suited to your specific needs

Genotyping solutions

Broad research applications for the GeneTitan MC Fast Scan Instrument

Application	Product	Analysis software
GWAS and longitudinal cohort studies	Axiom Precision Medicine Diversity Array UK Biobank Axiom Array Axiom myDesign custom arrays	• Axiom Analysis Suite software • Automated Axiom analyses • Additional application-specific companion software modules • Command-line tools • Star allele and translation tables for pharmacogenomic arrays
Fine mapping and candidate genes	Axiom myDesign custom targeted genotyping arrays	
Agricultural genomics	Axiom genotyping catalog arrays for plants and animals Axiom myDesign custom arrays	
Pharmacogenomics	PharmacoScan Solution PharmacoFocus Solution	
Reproductive health	CarrierScan Assay CytoScan HT-CMA Assay	CarrierScan Reporter Software Reproductive Health Analysis Software

Microarray Research Services Laboratory

Our Microarray Research Services Laboratory (MRSL) is a high-throughput facility that offers affordable and fast genotyping services for large-scale, microarray-based studies. With one of the largest microarray capacities in the world, MRSL generates high-quality data and enables academic and research institutions to complete their large-scale proof of principle (PoP) studies quickly. Our short turnaround times allow our customers to conduct their data analysis rapidly, improving their time to publication and grant submission.

If you would like to place a genotyping order with MRSL, please contact us via email at bioinformaticsservices@thermofisher.com.

Comprehensive service and support for when you need an expert

Our factory-trained and certified field service engineers (FSEs) are focused on delivering the highest quality of workmanship.

We provide comprehensive post-warranty support to help you maintain productivity, maximize the value of your investment, and optimize performance with professional consulting services.

To find your local support or technical support team, go to **thermofisher.com/contactus**. For product FAQs, protocols, training courses, and webinars, go to **thermofisher.com/technicalresources**.

Specifications

	GeneTitan MC Fast Scan Instrument
Supported applications	Human genotyping, reproductive health, agrigenomics, pharmacogenomics
Weight	325 lb (147.4 kg)
Instrument dimensions	W x H x D: 55 x 33 x 26 in. (139.7 x 83.82 x 66 cm) External xenon arc lamp system (W x H x D): 10.5 x 9.5 x 10 in. (26.7 x 24.1 x 25.4 cm) External shutter controller (W x H x D): 2.88 x 0.66 x 3.88 in. (7.32 x 1.68 x 9.86 cm)
Illumination	200–700 nm output range, 300 W external xenon lamp, warranted for 500 hr
Imaging optics	Dual-excitation and emission filters with ability to expand to four filters Excitation filter: 532 nm ± 20 nm; 609 nm ± 20 nm Emission filter: 593 nm ± 20 nm; 676 nm ± 20 nm
Pixelation	0.667 µm
Current	6.2–2.6 A
Array plate processing	
Throughput	2–3* array plates per day
Hybridization oven temperature	37.0°C–70.0°C in 0.1°C increments; temperature uniformity of ±1°C from set point temperature
Wash B temperature	Ambient room temperature to 60.0°C in 0.1°C increments with ±1°C accuracy
Imaging time	Less than three minutes per array
Work environment	
Clearance	12 in. (30.48 cm) in rear and on left side
Temperature	5°C–23.9°C (41°F–75°F)
Humidity	Maximum: 80% relative humidity for temperatures up to 75.2°F (24°C); Minimum: 30 ± 7% relative humidity
Pollution degree	2 environment
Altitude	<2,000 m
Warranty	One year parts and labor
Electrical supply	Provide voltage, frequency, or power rating per unit label; circuit breaker
Main supply voltage fluctuations	Not to exceed ±10% of the nominal supply voltage
Site preparation	Refer to site prep guide for additional information on operating requirements

* When paired with the Axiom Propel workflow.

Ordering information

Description	Cat. No.
GeneTitan MC Fast Scan Instrument, North America/Japan (110 V) includes: • Complete GeneTitan MC Fast Scan Instrument with integrated hybridization oven, fluidics processing, and imaging device • Computer workstation with monitor • External barcode reader • Uninterruptible power supply for 110 V • GeneChip Command Console Software	00-0372
GeneTitan MC Fast Scan Instrument, International (220 V) includes: • Complete GeneTitan MC Fast Scan Instrument with integrated hybridization oven, fluidics processing, and imaging device • Computer workstation with monitor • External barcode reader • Uninterruptible power supply for 220 V • GeneChip Command Console Software	00-0373

Learn more at **thermofisher.com/microarrays**

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