



Data Sheet

■ Automated Genotyping Using the SNP Array 6.0

Good genotyping automation systems should let you run your laboratory with fewer technicians, less hands-on time and high consistency. They shouldn't lock you into inflexible production and informatics workflows that make you change the way you manage your lab. With industry-leading productivity and open-platform standards, Affymetrix automation technology offers the best of both worlds.

Affymetrix solutions for automated genotyping require minimal hands-on effort—time between interventions averages 2.5 hours—yet still provide the flexibility you need in your genotyping facility. The Affymetrix system is based on an open, scalable platform for sample tracking, assay processing, array processing and downstream data analysis. We designed our solution to give you the most control over genotyping production, letting you own your automation system—not the other way around.

Introduction

Affymetrix' solutions for automated genotyping include the liquid-handling robotics, optimized assay and modular array processing instrumentation you need to assay 96 to 1,152 samples per week or higher, depending on your throughput requirements. The system requires minimal hands-on time and interventions, yet still provides the flexibility you need in your genotyping facility. Automated genotyping from Affymetrix is based on an open, scalable platform for sample tracking, assay processing, array processing and downstream data analysis.

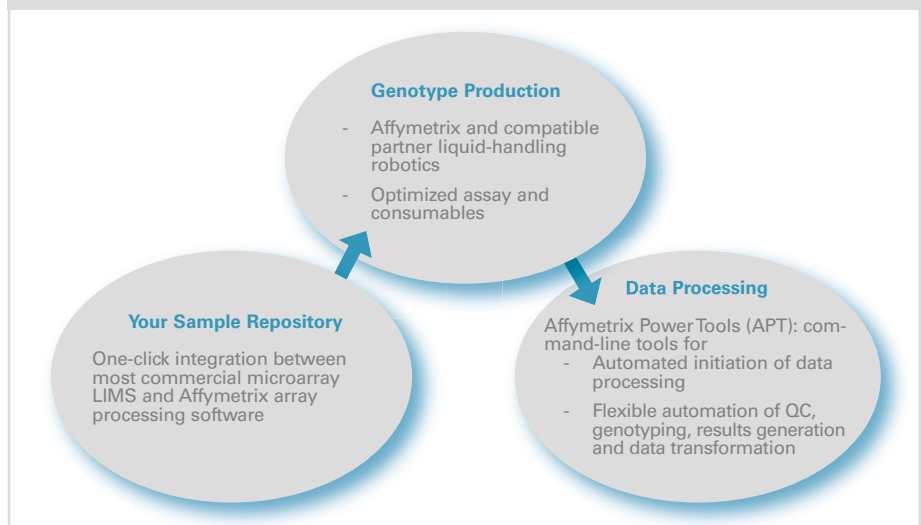
Powerful Sample Management Tools

The Affymetrix system for automated genotyping doesn't require a proprietary laboratory information management system (LIMS) to keep track of sample production or to

leverage sample attributes, such as phenotypic data or operator variability, in your quality control (QC) and analysis. This gives you the flexibility to use sample management systems you may already have implemented, including commercial software or custom databases.

Affymetrix has worked with multiple commercial sample management software companies to enable one-click integration with Affymetrix array processing software. We also provide programmer-friendly file formats that allow your lab to set up an integrated custom workflow for your data. This flexibility is especially important for multi-site studies in which each site may each have its own sample data repository, and for laboratories in which genotyping production is separate from the sample repository location. Affymetrix programming tools and the open-platform architecture make each unique workflow simple to implement in your laboratory.

Figure 1: Key automation tools for genotyping production on the Affymetrix platform.



Compatible with Robotic Systems

For automated target preparation, Affymetrix solutions incorporate an optimized assay compatible with the Affymetrix GeneChip® Array Station (GCAS) and other liquid-handling robotics. This platform allows you to leverage systems you may already have for expression production or other types of lab production. It also lets you choose the system most compatible in your laboratory space and setup. In addition, consumables come packaged with the automated genotyping assay.

The entire instrumentation system is modular, which allows you to easily ramp up production from 96 to 1,152 samples per week or higher, depending on your throughput needs.

Automated Downstream Analysis

In addition to Microsoft Windows-based graphical analysis tools, downstream genotyping analysis tools can be automated using command-line, programmer-friendly

tools incorporated into Affymetrix Power Tools (APT). These programming tools allow you to automate the initiation of data processing as well as steps for QC, genotype calling and data transformation into other software tools (i.e., Plink format). In addition, file formats are in binary code for efficient data storage, access and transfer between laboratories.

Higher-throughput Productivity

Automated genotyping provides significant productivity gains and reduced technician costs. Figure 2 illustrates the time required to complete a 1,250-to 6,000-sample study with three technicians using the fully automated assay on GCAS. The average time between interventions on the Affymetrix platform is 2.5 hours, an industry-leading metric for automated genotyping systems.

The automated target preparation assay is divided into pre-PCR and post-PCR steps. The pre-PCR steps in the assay can be performed manually or using equipment manufactured by an approved provider, such as the Beckman Coulter Biomek FX or Biomek NX.

Post-PCR steps of the assay can be performed on GCAS, or by using liquid-handling robotics and scripts from Beckman Coulter.

High-quality, Consistent Results

The automated assay for the SNP Array 6.0, the whole-genome sampling assay (WGS), has been optimized for robotic liquid handling to reduce inter-operator variability. Table 1 shows the results of automated genotyping performance on GCAS.

Table 1: Performance of the Automated SNP Array 6.0.

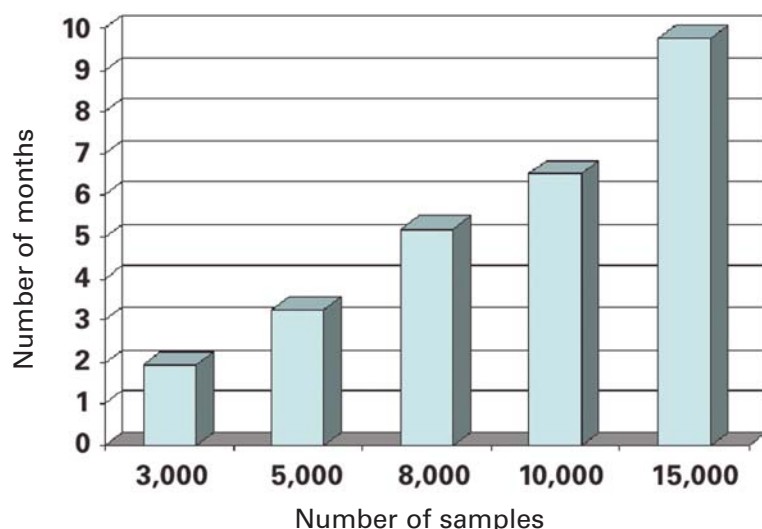
	Site 1	Site 2	Site 3
Call rate	99.4	99.6	99.2
HapMap concordance	99.6	99.7	99.3
Reproducibility	99.9	99.9	99.6

Automation Platform Components

Affymetrix provides the following components for automating the post-PCR portion of the genotyping assay on GCAS:

- **Affymetrix® Human SNP 6.0 Assay Kit for Automated Target Preparation** – Contains the validated and qualified reagents for the most critical steps in the Genome-Wide SNP Array 5.0/6.0 for 96-sample processing. The reagents are identical to the components of the manual assay but specially packaged with appropriate fill volumes and color coding to enable simple automation with compatible liquid-handling robots.
- **Affymetrix Genome-Wide Human SNP Array 6.0** – A single array featuring more than 906,600 single nucleotide polymorphisms (SNPs) and more than 946,000 probes for the detection of copy number variation.

Figure 2: Time to complete a study using the automated assay and two technicians.



- **Consumables kit** – Includes plasticware consumables required for processing up to 960 samples on GCAS. The consumables are available through one simple part number from Affymetrix.
- **Liquid-handling robotics** – GCAS or compatible robotic systems. To learn more about GCAS, please refer to the GCAS data sheet, which can be found on the Affymetrix website. If you would like more information about Beckman Coulter products, contact an Affymetrix account representative or call Beckman Coulter directly at 1-800-742-2345.

Ordering Information

Affymetrix Automated Genotyping

GeneChip® Human SNP Assay Kit 6.0 for Automated Target Preparation

901192 Sufficient for 96 reactions

Affymetrix® SNP Assay 6.0 Consumables Kit for Automated Target Preparation

901199 Plastic-ware consumables sufficient for 10 x 96 reactions

Affymetrix® Genome-Wide Human SNP Array 6.0

901153 Contains 50 arrays

901150 Contains 100 arrays

GeneChip® Array Station

00-0162 GeneChip Array Station, North America/Japan

00-0346 GCAS Hardware Upgrade Kit for North America/Japan (110v)

00-0235 GeneChip® Array Station, International

00-0355 GCAS Hardware Upgrade Kit, International (220v)

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