



Agilent Automation Solutions

## NEXT GENERATION SEQUENCING SAMPLE PREPARATION MADE EASY

The Measure of Confidence



**Agilent Technologies**

# COMPREHENSIVE, SCALABLE NGS AUTOMATION SOLUTIONS

## The Most Complete And Versatile System For Next Gen Sequencing (NGS) Sample Preparation

Agilent offers a coordinated and cohesive instrument and reagent solution for automating NGS sample preparation. As a result, you can achieve excellent reliability and reproducibility with easy scale up of your laboratory throughput using reagents, automation, protocols, and support from a single source.

### **Optimized Protocols**

Agilent's system includes optimized VWorks scheduling protocols for liquid handling and labware management so you can rapidly automate your NGS sample preparation. Protocols have already been developed and tested for Agilent SureSelect<sup>XT</sup> library preparation and target enrichment reagents. Additional automation protocols are also available for a variety of other reagents for various NGS applications.

### **Modular Automation**

A carefully designed group of components allows for customization and simplified scale up. Choose our preconfigured ready-to-go solutions or create a layout that is tailored to suit your experimental needs.

### **Open Platform**

Agilent's automation solutions have been developed and tested to work with major leading sequencers and complementary applications, such as PCR plate setup and nucleic acid purification.

### **Reproducible Data**

Automated liquid handling for library preparation and target enrichment leads to more consistent yields and higher quality data than manual processing.

### **Higher Throughput**

Agilent's comprehensive and flexible automation solutions reduce manual intervention to increase throughput and maximize your walkway time.

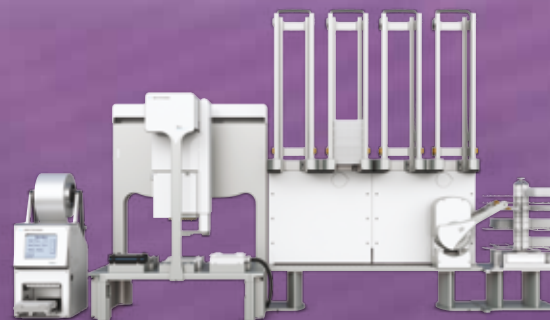
## Simplify Your Scale Up With Modular Automation Solutions



### Agilent NGS Option A

High throughput and improved reproducibility with a small footprint

- Agilent Bravo Automated Liquid Handling Platform
- Agilent PlateLoc Thermal Microplate Sealer
- Agilent Bravo accessories for heating, cooling, shaking, and magnetic separation



### Agilent NGS Workstation Option B

High throughput and improved reproducibility with more walkaway time

- Agilent NGS Option A
- Agilent BenchCel 4R Microplate Handler
- Agilent Labware MiniHub

### Agilent NGS Option A and Option B Both Deliver Higher Throughput with Less Hands-On Time

Automating your NGS sample preparation with either Agilent NGS Option A or Option B increases laboratory throughput up five-fold compared to manual sample preparation. For whole genome sequencing applications that require only library preparation, 96 samples can be prepared in less than 4 hours to increase laboratory output to 960 sequencer ready libraries in a single week. For more complex protocols, such as targeted resequencing using Agilent SureSelect<sup>XT</sup>, both systems can complete library preparation and target enrichment for 192 samples in a 5-day work week.

	Manual Sample Preparation		Automated Sample Preparation	
	Hands-On Time	Maximum Number of Samples Processed/Day	Hands-On Time	Maximum Number of Samples Processed/Day
Library Prep	375	20	25	96
Pre-Capture PCR	90	20	13	96
Hybridization Preparation	60	20	7	96
Capture	210	20	20	96
Post-Capture PCR	90	20	40	96
Total Minutes	825	20-40 per week	105	192 per week
Total Hours	13.75		1.75	

Comparing manual and automated sample preparation for target enrichment: hands-on time and weekly throughput estimate.

# REPRODUCIBLE GENOMICS PROTOCOLS MADE EASY

## The Bravo Platform is the Core of the Agilent NGS Automation Solution



### A Proven Standard for NGS Automation

Bravo liquid handlers deliver reliable performance for NGS at over 50 customer sites worldwide, including major genome research centers, biopharmaceutical companies, and academic research laboratories.

### Highly Capable Liquid Handler

- Compact design with a small footprint is compatible with most laboratory bench tops
- Open system for other genomics applications: PCR plate setup, serial dilutions, and nucleic acid purifications
- Fast and flexible processing of full or partial plates

### Reproducible and Accurate Pipetting Performance

- Dispenses from 300 nL to 250  $\mu$ L with 5 % CV  $\pm$  10 % accuracy
- Dispenses 2  $\mu$ L with 2.1 % CV  $\pm$  3.3 % accuracy

### Versatile Platform

- Easily swappable head expands your throughput to 384 wells
- Fully customizable with each position configurable for shaking, heating, cooling, and more
- Easy-to-change pipette heads expand dispensing volume from 300 nL to 250  $\mu$ L in 96, 384, and 1536-well formats



A unique, open-design pipetting deck allows for easy access and simple system integration.

## Agilent's Components Increase Throughput And Protect Precious Samples



### BenchCel 4R Microplate Handler

The BenchCel 4R Microplate Handler is a reliable, rapid robotic plate handler with high-capacity labware storage. It delivers labware and reagents between the Labware MiniHub and the Bravo platform. The BenchCel gives users substantially more walkaway time for liquid-handling intensive NGS sample preparation methods.



### PlateLoc Thermal Microplate Sealer

The programmable PlateLoc Thermal Microplate Sealer creates a high precision seal that preserves the integrity of low volume samples during heated incubations and even overnight. It is easy to use and flexible, accommodating a wide range of microplates and tube racks.



### Labware MiniHub

The Labware MiniHub is a rotating, random-access carousel for presenting and storing labware. Featuring user-configurable spacing to easily hold a mix of microplates, reagent reservoirs, and pipette tips, the Labware MiniHub is compact and flexible.



### Agilent VWorks Automation Control Software

Agilent VWorks is an intuitive scheduling program capable of driving the operation of over 140 liquid handling and robotic devices. The graphical user interface makes it easy for users to run existing protocols, develop new protocols, and monitor progress. Forms are available for SureSelect<sup>XT</sup> and a variety of other NGS reagents to save time and maximize productivity.

### Add Higher Throughput Sample QC

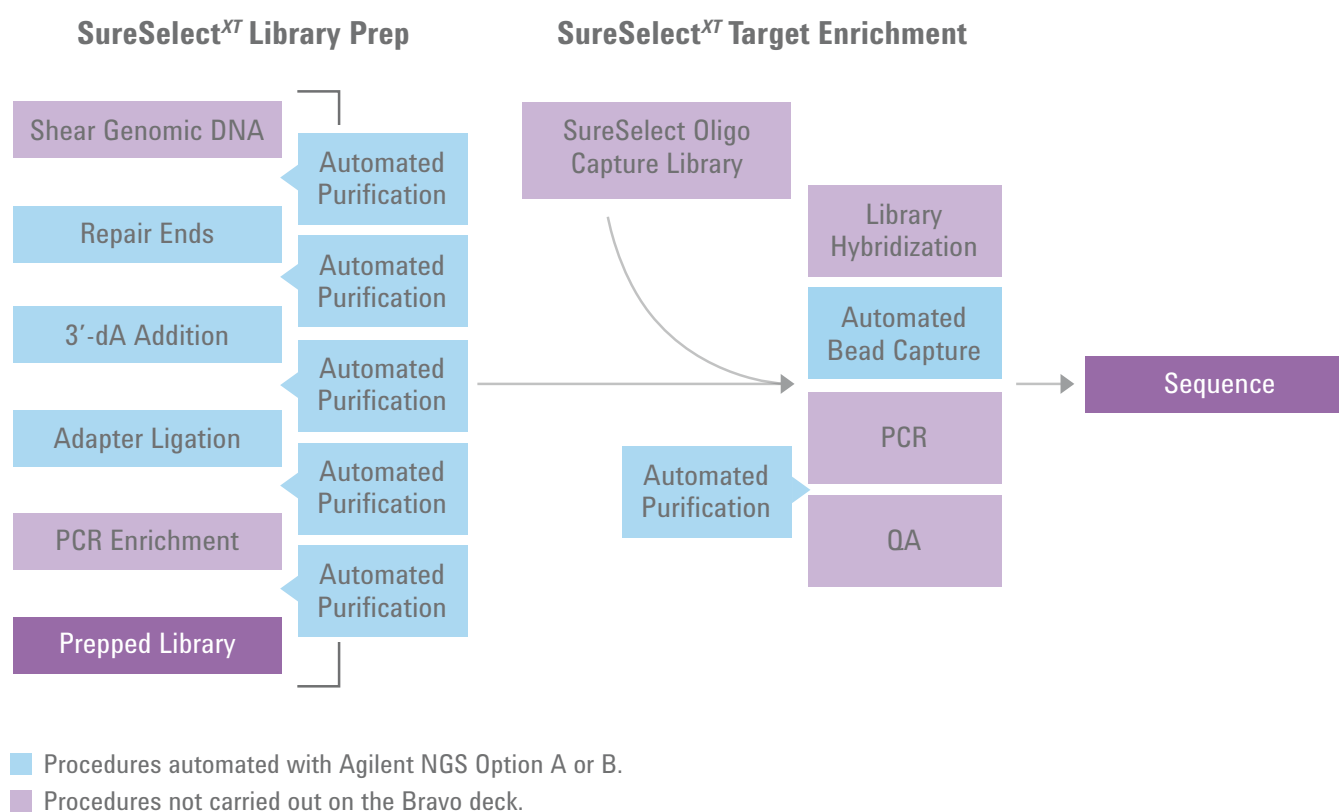
The Agilent 2200 TapeStation system simplifies and expedites DNA or RNA quality control for NGS applications. The easy-to-use system delivers results at the rate of 1 sample per minute to increase your walkaway time.



# PROVEN PROTOCOLS STREAMLINE NEXT GEN SEQUENCING SAMPLE PREPARATION

## Automated Sample Preparation for Leading NGS Platforms

Agilent has developed a complete automation protocol for SureSelect<sup>XT</sup> library preparation and target enrichment reagents for both Illumina and SOLiD sequencers.

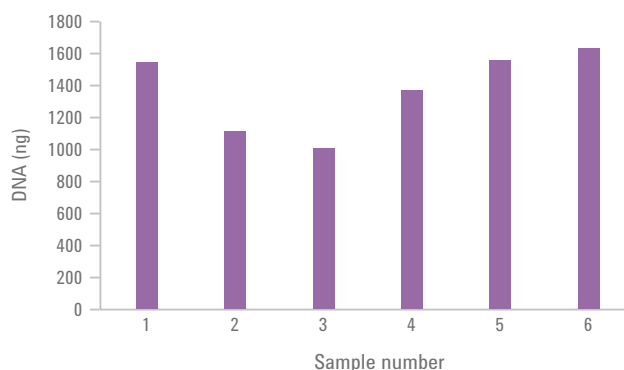
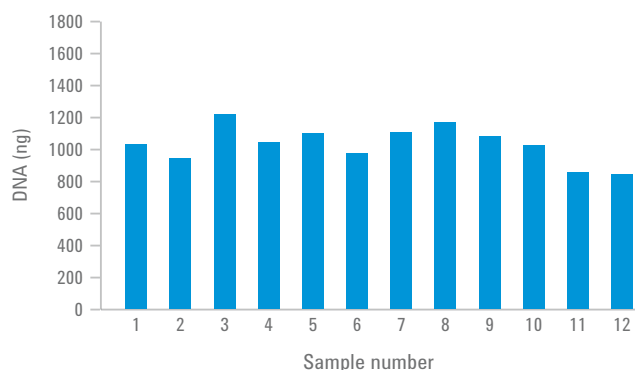


## Demonstrated High Throughput Success for NGS Sample Preparation

In a recent publication, the Bravo Liquid Handling platform was cited as instrumental in scaling up laboratory throughput to process 1200 samples per week. (Fisher, S. *et al.*, *Genome Biology*, 2011, 12:R1)

## Automating Liquid Handling Protocols Reduce Variability

DNA yields in NGS libraries prepared on the Bravo platform display higher reproducibility as shown by a lower coefficient of variance (CV) compared to manual preparation.



In a comparison of library preparation DNA yield between manual and automated protocols, the automated samples show a tighter reproducibility of 11 % CV compared to 18 % CV for the manually prepared samples.

## Flexible Automation Solutions From Sample to Analysis

### Automate Common NGS Applications

The full-featured NGS Bravo is capable of automating most whole genome or targeted resequencing protocols, including DNA or RNA purification, library preparation, and target enrichment. In addition to SureSelect<sup>XT</sup>, VWorks protocols have been developed for a variety of commercially available reagents. The VWorks form editor also lets you keep your options open by simplifying protocol writing so you can create protocols for novel NGS applications.

### Customize Completely with Modular Architecture

Agilent Automation Solutions offers expertise in building custom automation solutions using Agilent devices along with more than 140 third party instruments. Our automation scientists can help develop solutions when higher throughput is needed or to automate novel NGS applications.

Learn more

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