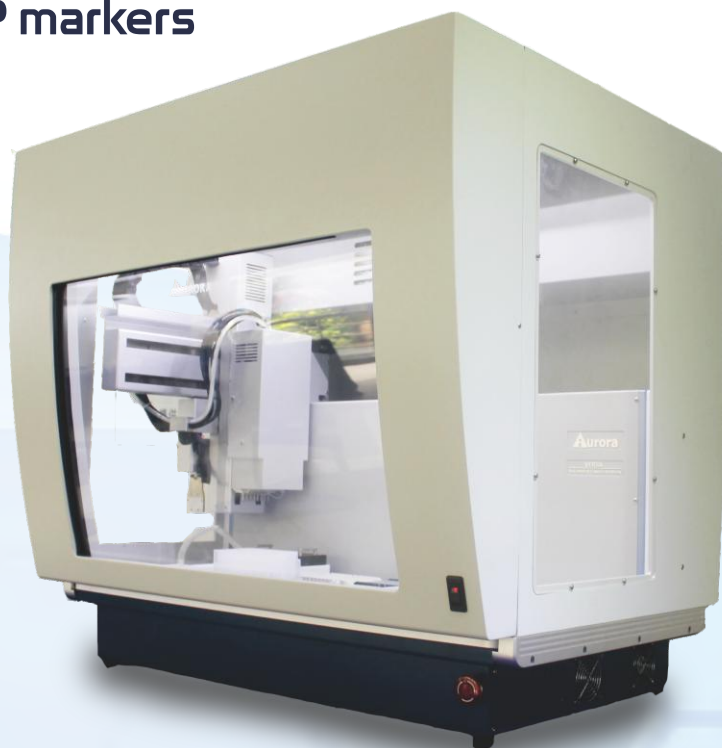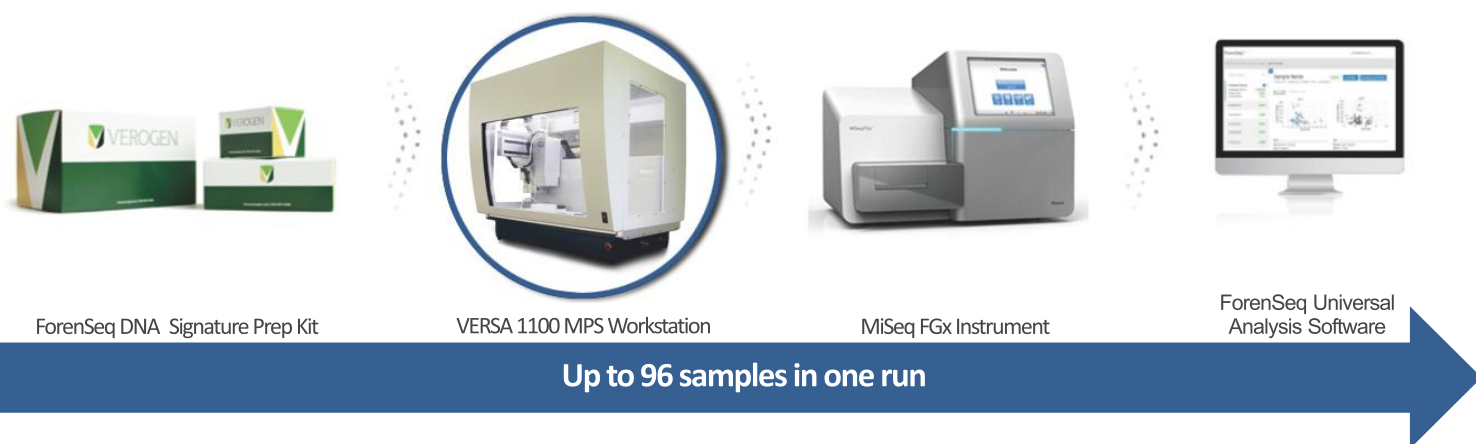# Aurora
ILLUMINATING SOLUTIONS

VEROGEN

Automating the ForenSeq DNA Signature Prep kit workflow

Analyse up to 231 STR and SNP markers

VERSA 1100 MPS

VERSA MPS – Automated Liquid Handling Workstation

Generating DNA profiling libraries for MPS

ForenSeq DNA Signature Prep Kit   VERSA 1100 MPS Workstation   MiSeq FGx Instrument   ForenSeq Universal Analysis Software

Up to 96 samples in one run

Recent DNA sequencing technological advances have greatly increased the information that can be gained about a suspect from analyzing DNA evidence. To maximize the benefits of MPS based sequencing, Aurora Biomed is collaborating with Verogen and ForenSeq™ DNA Signature Prep Kit users to automate the library preparation workflow. The ForenSeq™ DNA Signature Prep Kit is fully validated and tailored for forensic DNA library construction. To achieve high accuracy and resolution, a combination of up to 231 STR and SNP markers, covering; autosomal, X and Y-STRs, as well as phenotypic and ancestry indicative SNPs are leveraged to provide the most complete genetic forensic profile possible. This eliminates the need for using multiple STR kits. The detection power of massively parallel sequencing, also called next generation sequencing, is invaluable when samples are degraded, limited or are mixtures. This ability to tease out a useable profile can provide the break a case needs.

Verogen's ForenSeq DNA Signature Prep Kit offers a simplified library preparation workflow designed to capitalize on the benefits of automation. Aurora Biomed's VERSA MPS system routinely automates the ForenSeq workflow. In short, the VERSA MPS instrument automates the enrich targets, purify libraries, normalize libraries and pool libraries components of the workflow (Figure 1). PCR amplification steps are done on a separate thermocycler with the user manually placing the PCR plate in the thermocycler. The VERSA MPS's built in HEPA filtration system and optimized liquid transfer process greatly reduces the risk of cross-contamination to ensure accurate, reproducible results.
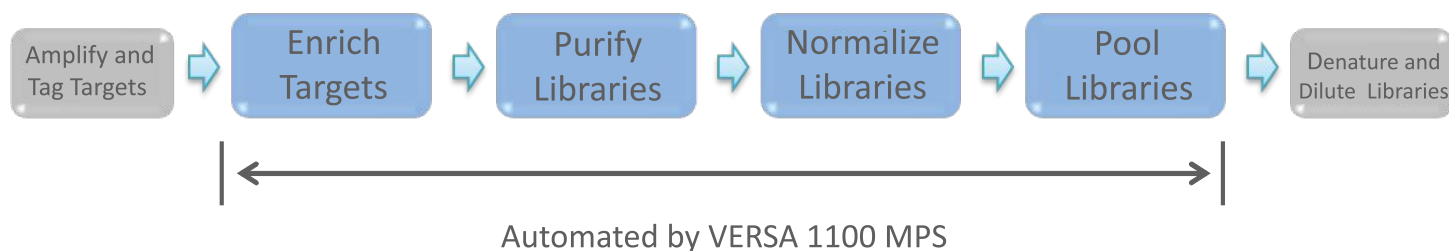

Automated by VERSA 1100 MPS

Figure 1. *ForenSeq DNA Signature Library Prep Kit workflow with components automated by the VERSA MPS automated workstation indicated.*

Scientists at the Hebei Medical University in China are using the VERSA MPS to automate the ForenSeq Kit. In order to assess the VERSA MPS's success in automating workflow, staff at Hebei Medical University performed an independent test. They generated sequencing libraries, both manually and with the VERSA MPS to automate library preparation. Seven DNA samples and one negative control were used in this study. Sequencing of the libraries showed that similar read depths were achieved for manual and automation prepared libraries (Figure 2a and 2b).

The average STR loci call rate for manual preparation and VERSA MPS-prepared libraries was 100% for the STR markers (Figure 3). iSNP loci call rates were 99.8% and 100% respectively (Figure 3). This data demonstrates the precision of the VERSA MPS's automation platform and its suitability for the preparation of ForenSeq sequencing libraries. Reducing both human error and possible cross-contamination makes the VERSA MPS the natural choice to automate ForenSeq DNA Signature Prep Kit work flow in forensic labs.
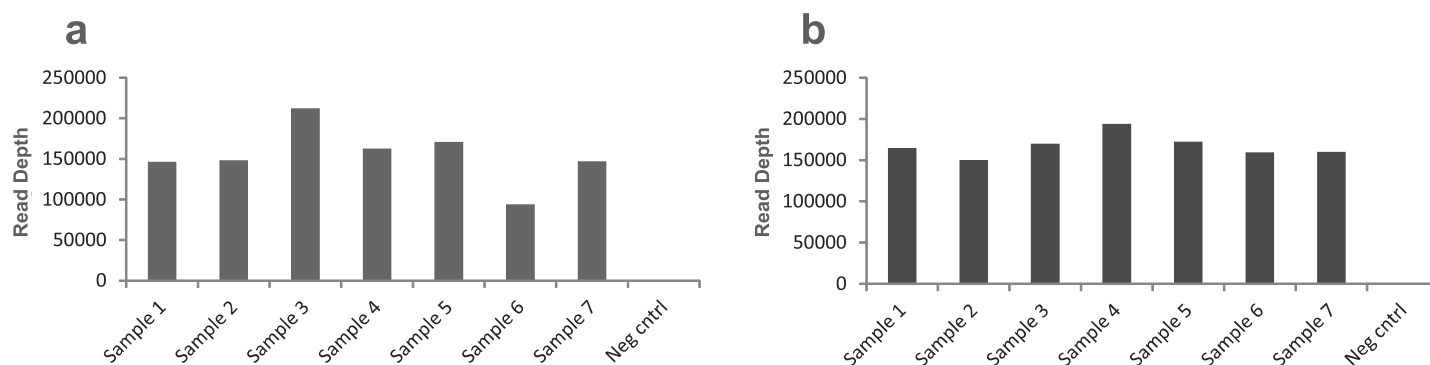
Figure 2. *Read depths for (**a**) manually prepared libraries and (**b**) automated, VERSA MPS prepared libraries*
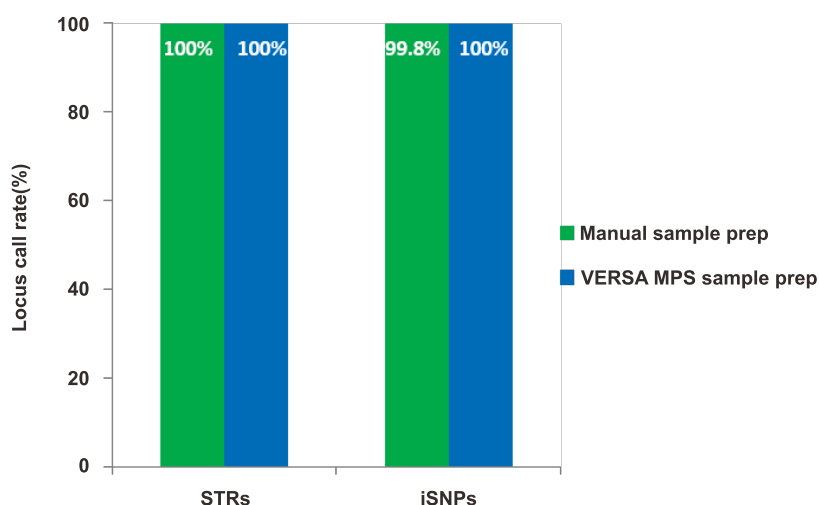
Figure 3. *Average STR and iSNP locus call rate for ForenSeq DNA Signature Prep Kit, for manually prepared libraries (green bars) vs. VERSA MPS prepared libraries (blue bars)*
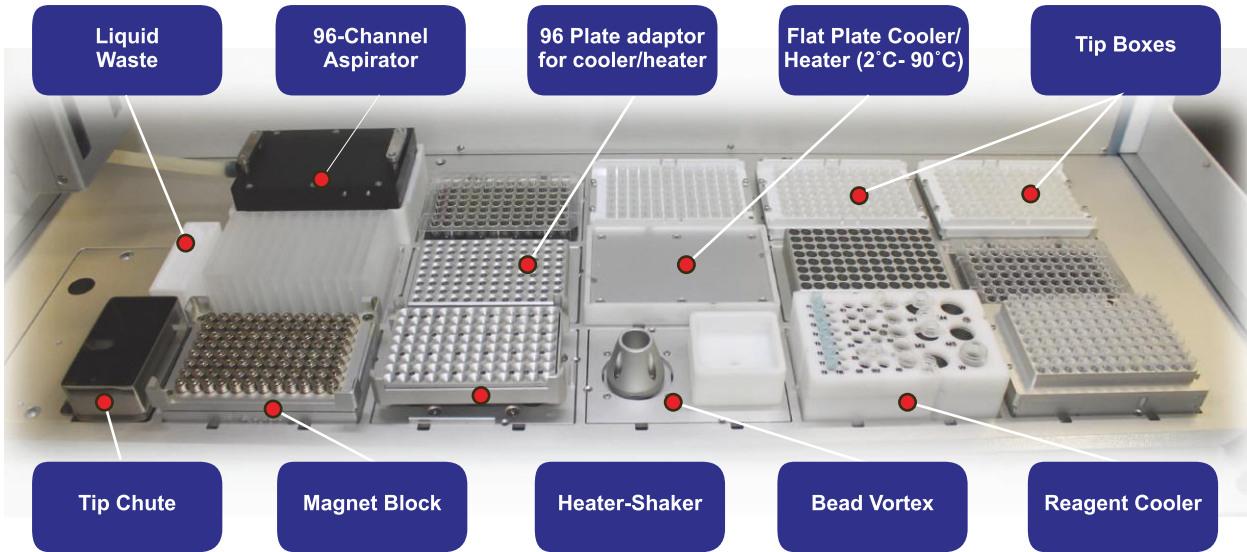
DECK LAYOUTS

Liquid Waste · **96-Channel Aspirator** · **96 Plate adaptor for cooler/heater** · **Flat Plate Cooler/Heater (2°C- 90°C)** · **Tip Boxes** · **Tip Chute** · **Magnet Block** · **Heater-Shaker** · **Bead Vortex** · **Reagent Cooler**

Figure 4. *Sample VERSA MPS Deck Layout*

FEATURES

- **Magnetic Bead Vortex** - ensures homogenous bead suspension
- **ReagentDrop** - provides accurate dispensing of bulk reagents without the use of pipette tips
- **Gripper**- for moving plates or tubes racks to different deck positions
- **UV HEPA Filtered Enclosure** - ensures no free floating DNA, minimizing risk of cross contamination
- Highly accurate **Air Displacement Pipette Technology**
- On deck **Temperature Regulation Modules** for precise temperature control of reagents and samples

SPECIFICATIONS

	BASIC CONFIGURATION	RECOMMEND CONFIGURATION
SYRINGE PIPETTOR(disposable tips)	8-channel	8 or 96-channel
REAGENTDROP CHANNELS (multiple reagents)	5	8
LIQUID-LEVEL SENSING	Optional	Optional
PLATE SHAKER	1	1
96-TIP ASPIRATOR	1	1
TEMPERATURE REGULATION BLOCK	2	2
REAGENT COOLING BLOCK	1	1
MAGNETIC BLOCK	Included	Included
PLATE GRIPPER	Included	Included
HEPA / UV / FLUORESCENT LIGHT ENCLOSURE	Optional	Included
LENGTH	98.5 cm / 38.8 in	98.5 cm / 38.8 in
DEPTH	75.2 cm / 29.6 in	75.2 cm / 29.6 in
HEIGHT	89 cm / 35 in	108.2 cm / 46.2 in
WEIGHT	162 kg / 357 lbs	225 kg / 496 lbs
DECK CAPACITY	15	15

NOTE: Instrument specifications may change without notice as an ongoing effort of product improvement.