# Blood, sweat, and *breakthroughs*

Human identification

## Integrated human identification (HID) solutions

# Together, we find the truth

When the world seeks the truth, it turns to you. But uncovering the truth presents complex challenges that require a partner you can depend on. That's why listening to and answering you is our highest priority, and it informs everything we do—so you can focus on making a difference.

Thermo Fisher Scientific offers simple, complete, end-to-end workflows for forensic DNA analysis to help you resolve difficult cases and provide investigative leads in a forensically responsible and relevant manner. We are committed to delivering world-class support and continued innovation to meet your needs today and tomorrow.

Ion GeneStudio S5 System

SeqStudio Flex Genetic Analyzer

RapidHIT ID System

SeqStudio Genetic Analyzer

HID NIMBUS Presto QNA System

**Forensic DNA–grade products produced under the ISO 18385 standard**

ISO 18385 is a standard that addresses growing concerns within the forensic industry regarding the potential presence of low-level human DNA contamination in consumables. The guidelines are intended to minimize the risk of human DNA contamination in products used to collect, store, and analyze biological material, as well as provide policies by which to assess products prior to release.

Applied Biosystems™ PrepFiler™ DNA extraction kits, Quantifiler™ DNA quantification kits, and short tandem repeat (STR) PCR amplification kits are manufactured at our location in Warrington, UK—a facility that meets the guidelines for ISO 18385 certification. As part of our long-standing commitment to the continual adoption of new methods that help ensure high-quality manufacturing, we have made significant investments across all aspects of production to minimize human DNA contamination. The result: powerful forensic DNA–grade solutions that enable you to provide answers with greater certainty and confidence.

# Contents



**Register** for our human identification product communications and newsletters.

# Forensic evidence collection solutions

Forensic samples are among the most difficult specimens to process, so it's important to use devices that collect, transport, and preserve your samples for the best possible results. Our patented sample collection devices are designed and manufactured according to ISO 18385 guidelines and are certified to be free of DNases, RNases, human DNA, and PCR inhibitors.

We offer a variety of Applied Biosystems™ 4N6FLOQSwabs™ collection devices. Each 4N6FLOQSwabs device includes a plastic applicator with a variable tip coated with nylon fibers that create a thin absorbent layer, which allows for quick sample uptake and complete sample elution. These swabs are better than cotton swabs because they:

- Help maximize DNA collection and elution efficiency
- Are purposefully designed with perpendicular nylon fibers to facilitate improved collection and elution of cellular material
- Contain nonabsorbent cores to prevent absorption of critical samples, enabling maximum sample recovery
- Allow samples to stay close to the swab surface for faster and more efficient elution

In addition, we offer the Applied Biosystems™ NUCLEIC-CARD™ Collection Device System as an alternative to 4N6FLOQSwabs devices. The NUCLEIC-CARD system is specifically designed for the collection, transport, and storage of human DNA from buccal cells, saliva, blood, and other sample types. The chemically treated NUCLEIC-CARD matrix can preserve DNA for 20 years or more at room temperature. These cards are:

- Chemically treated to enable cell lysis and protein denaturation for maximum DNA extraction
- Designed to enable direct PCR amplification from a card punch, eliminating extraction and quantification steps
- Excellent for long-term storage and well suited for databasing workflows


## Card Processing Automation 200 instrument

The Applied Biosystems™ Card Processing Automation 200 (CPA200™) instrument is a semi-automated puncher designed for processing human blood and saliva DNA samples collected on filter paper or cards in forensic and paternity laboratories. The CPA200 instrument combines ease of use with full sample traceability and integrity to help improve downstream results in low- and medium-throughput laboratories.

The CPA200 puncher:

- Is an easy-to-use, semi-automated device
- Includes an ionizer to remove static and a camera for sample control
- Uses filter paper or cards
- Can process a full plate in under 10 minutes

# Sample preparation and extraction

## PrepFiler forensic DNA extraction kits

Applied Biosystems™ PrepFiler™ and PrepFiler™ BTA forensic DNA extraction kits are part of an integrated solution designed to enable reliable, simplified, and efficient DNA extraction and purification according to various (low, medium, and high) throughput needs.

PrepFiler kits use magnetic particles with multi-component surface chemistry and are optimized to support extremely efficient DNA binding and maximum DNA recovery from a wide range of forensic sample types. With these kits, you can:

- Increase the overall yield, concentration, and purity of DNA isolated from forensic samples and effectively remove PCR inhibitors
- Improve the downstream genotyping success rate to enable critical and often limited casework samples to be analyzed
- Optimize binding and elution of DNA in a small volume with specially developed magnetic particles and reagents
- Streamline protocols to process an extensive variety of forensic sample types
- Successfully process more challenging samples with the included Applied Biosystems™ PrepFiler™ BTA Lysis Buffer

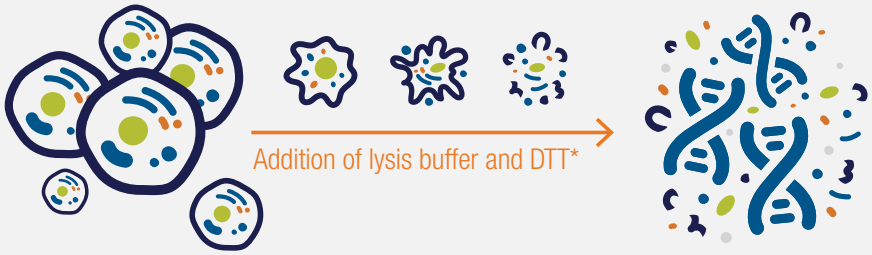

**PrepFiler forensic DNA extraction kits can be used for routine forensic sample types, such as:**

- Body fluids (blood, saliva, semen)
- Stains and swabs of body fluids
- Hair roots
- Touch or trace DNA samples

**PrepFiler BTA forensic DNA extraction kits can be used for the most challenging forensic sample types, including:**

- Bone
- Teeth
- Adhesive substrates (chewing gum, cigarette butts, tape lifts)
- Touch or trace DNA samples

## The PrepFiler DNA extraction and purification process




### Cell lysis

Cells and nuclear membranes are ruptured by the lysis buffer, releasing DNA.

### Binding

Magnetic particles and isopropanol are added, resulting in effective DNA capture.

### Washes

Particles are immobilized with a magnet, allowing impurities to be washed away.


### Elution

Isolated DNA is released from the immobilized particles.

DNA for downstream applications

* DTT = dithiothreitol. Proteinase K is also added during this step in the PrepFiler BTA kit protocol. The lysis buffer contains detergent for cell disruption and a high salt concentration for DNA capture. See individual protocol for lysis buffer preparation.

### Prep-n-Go Buffer

Applied Biosystems™ Prep-n-Go™ Buffer is a superior buffer designed to enable high-quality direct PCR amplification from single-source samples collected on untreated paper or buccal swabs. This product expands direct PCR amplification capability to laboratories that use a wide variety of substrates, and it is readily adaptable to both manual and automated workflows.

### PrepFiler and PrepFiler BTA Lysis Buffer

Applied Biosystems™ PrepFiler™ and PrepFiler BTA Lysis Buffers are included in the kits for the off-deck lysis process.

### PrepFiler LySep Columns

Applied Biosystems™ PrepFiler™ LySep™ Columns are designed for use with PrepFiler forensic DNA extraction kits and allow you to easily perform lysis and substrate removal in a single tube assembly. There is no transfer of the substrate to another tube for removal, thus minimizing hands-on time and helping to reduce the risk of cross-contamination and sample transposition events. The only analyst interaction and handling of the substrate occurs during the addition of the substrate to the PrepFiler LySep Column for lysis.

# For medium- to high-throughput labs: automated purification, normalization, and plate setup for quantification and amplification

The fully automated Applied Biosystems™ HID NIMBUS® Presto QNA System offers efficient purification of nucleic acids from lysed samples, with automated quantification and amplification setup as well as automatic dilution protocol calculations and normalization—all in one instrument. The system is specifically scripted, optimized, and validated for use with Applied Biosystems™ forensic extraction, quantification, and STR kits. With rapid and automated processing, forensic laboratories can benefit from faster turnaround times with increased confidence in their results.

With the HID NIMBUS Presto QNA System, forensic labs can streamline their operations and save up to 5 hours of hands-on time* so analysts can focus on more complex analyses.

* Results are based on internal data for purifying 96 samples on the Applied Biosystems™ AutoMate *Express*™ Forensic DNA Extraction System vs. the HID NIMBUS Presto QNA System.


### Automated workflow on the HID NIMBUS Presto QNA System

| Workflow | Purification | Quantification setup | Normalization | Amplification setup |
|---|---|---|---|---|
| **Automated functions** | • Purifies up to 96 lysed samples | • Quantification setup (choose from 5-point, 6-point, or virtual standard curves) | • Normalizes DNA samples<br>• Calculates dilution protocols | • Amplification setup |
| | **Automatically calculates labware and chemistry requirements** | | | |
| **Chemistries** | PrepFiler and PrepFiler BTA automated forensic DNA extraction kits | Applied Biosystems™ Quantifiler™ Trio DNA Quantification Kit | – | Applied Biosystems™ GlobalFiler™, GlobalFiler™ IQC, VeriFiler™ Plus, Yfiler™ Plus, and NGM Detect™ PCR amplification kits |
| | **Saves time, improves reproducibility, and helps ensure consistent results** | | | |

## Key features

### High reproducibility

- Consistent, reliable, and accurate system that provides results for a variety of forensically relevant sample types (Figure 1)
- Minimal variation between samples, runs, and analysts
- Increased process standardization

### Less hands-on time

- Plug-and-play (optimized and validated for use with PrepFiler, PrepFiler BTA, and Applied Biosystems™ STR kits)
- Process more samples with less hands-on time
- Simple set-up-and-walk-away workflow
- Minimal manual touchpoints to help reduce human error and contamination risk
- Reduces demand on highly skilled forensic scientists so they have more time to focus on more complex analyses

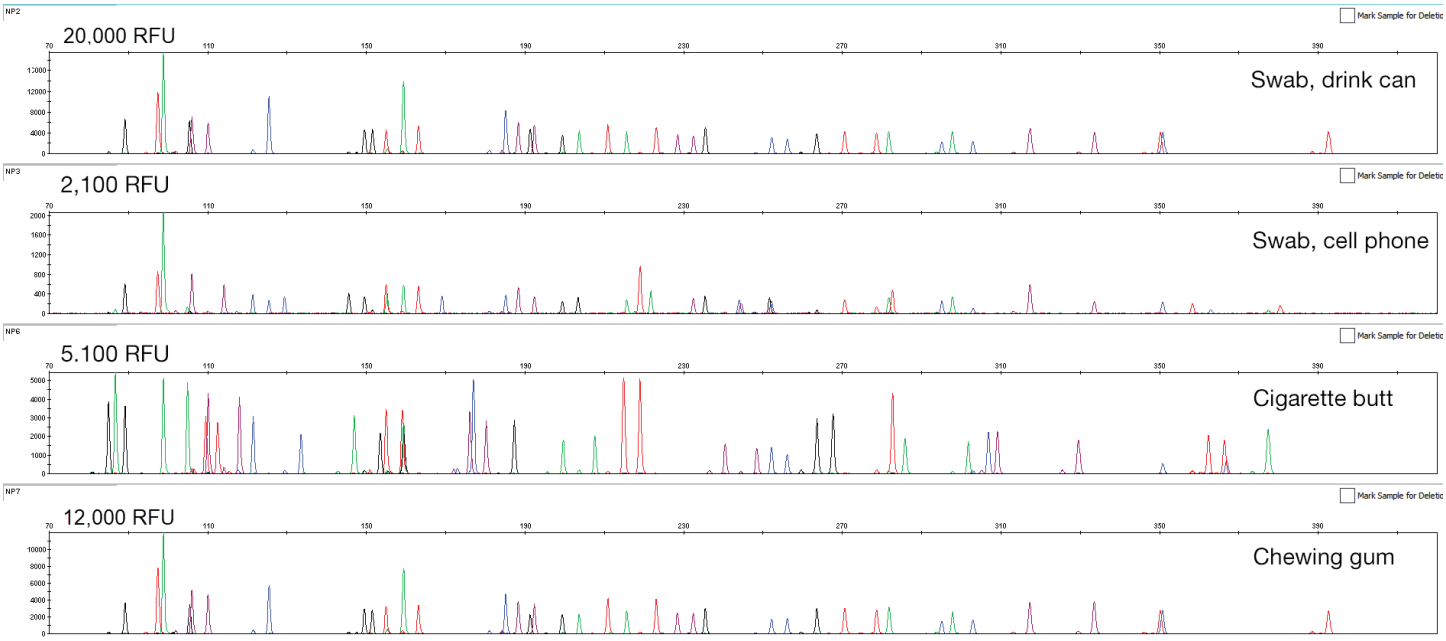



**Figure 1. Applied Biosystems™ 3500xL Genetic Analyzer electropherograms of case-type samples purified on the ID NIMBUS Presto system with PrepFiler chemistry and amplified with the GlobalFiler PCR Amplification Kit.**

# Automated purification for low-throughput workflows

The Applied Biosystems™ AutoMate *Express*™ Forensic DNA Extraction System is an easy-to-use, robust benchtop instrument for low-throughput workflows. It offers outstanding flexibility and utilizes Applied Biosystems™ PrepFiler *Express*™ and PrepFiler *Express* BTA™ (bone, tooth, and adhesive) reagents packaged in prefilled, foil-sealed cartridges.

## Key features

- Designed to maximize results for a variety of samples—from high-quantity reference samples to compromised crime scene samples
- Offers easy setup and reduced hands-on time for faster time-to-results while reducing the risk of contamination
- Optimized for the latest generation of Applied Biosystems™ quantification tools and STR kits
- Processes 1–13 samples in a single run
- Integrated circuit (IC) card has a comprehensive range of elution options from 20 µL to 250 µL (Figure 2)


**Figure 2. The AutoMate *Express* system comes with a preprogrammed card with a wide range of elution volumes.**


# DNA quantification

The quantification step of the casework workflow is key to determining how a sample will be processed downstream. Our quantification solutions enable informed integrated workflow decision-making for downstream processing of forensic samples.

## Key features and benefits

### Accuracy

More informative and comprehensive casework sample assessment for improved downstream results

### Efficiency

Increased workflow efficiency with faster time-to-results and flexible sample processing protocols

### Flexibility

Flexible protocols allow for configurable output and display features

## DNA quantification solutions

Applied Biosystems™ Quantifiler™ DNA quantification kits can be used with the Applied Biosystems™ QuantStudio™ 5 Real-Time PCR System for HID and contain targets that measure both the quantity and quality of total human DNA and Y-specific DNA. The innovative quality index functionality enables a more comprehensive assessment of sample quality (degradation and PCR inhibition), and the assays target multicopy loci for enhanced sensitivity. This enables you to screen samples and make critical workflow decisions (e.g., autosomal vs. Y-STR) with greater confidence. It can also help streamline processing of samples from sexual assault kits by assessing swab evidence directly to rapidly detect the presence of a male contributor, facilitating a Y-screen “direct to DNA” workflow.

The **QuantStudio 5 Real-Time PCR System** is designed for forensic scientists who need a simple, reliable, and affordable real-time PCR system that does not compromise on performance or quality. The QuantStudio 5 system is a sensitive, robust solution for forensic DNA quantification. With maximum dye versatility, this HID solution offers accurate, trusted results in a small benchtop footprint.

**Applied Biosystems™ HID Real-Time PCR Analysis Software** is specifically designed for HID applications to help you take full advantage of the data and capabilities offered by Quantifiler kits while maximizing sample processing efficiency. The software offers the ability to calculate DNA quantity from sample data with a virtual standard curve, which is defined by the user and reduces variation. The software includes quantification and STR setup features as well as data quality review functionality (Figure 3). Since we have provided predefined templates for Quantifiler and STR kit runs, sample setup time is minimized.

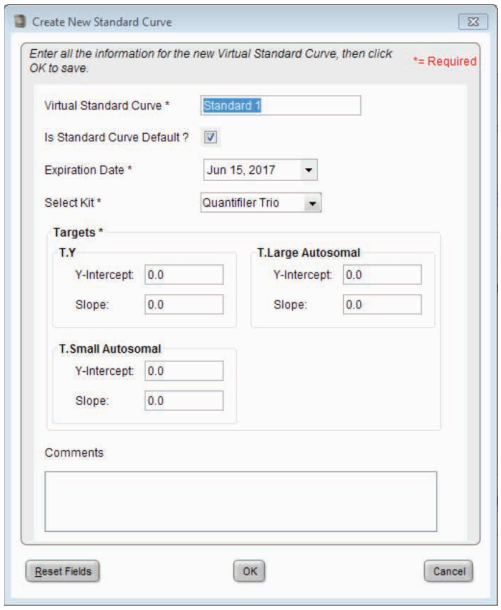



**Figure 3. Enhanced data analysis using virtual standard curve functionality.**

# GlobalFiler PCR amplification kits

Around the world, forensic laboratories are being asked to do more with less. That is why GlobalFiler STR kits are tailored to combine maximum data recovery power with reduced amplification time. As part of our fully integrated and validated forensic workflow, this 6-dye, 24-locus panel is designed to deliver exceptional laboratory performance—all facilitated by our comprehensive training, service, and support. One of the GlobalFiler kits is also available with an internal quality control (IQC) system as part of a fully integrated and verified forensic workflow.

Applied Biosystems™ GlobalFiler™, GlobalFiler™ IQC, and GlobalFiler™ Express kits are approved for use by laboratories that generate DNA profiles for inclusion in the US National DNA Index System (NDIS) Combined DNA Index System (CODIS) database.

NDIS Approved

GlobalFiler kits contain all of the STR loci commonly used in major global databases, including all markers recommended for inclusion by the CODIS Core Loci Working Group and markers commonly used in Europe (Figure 4).

- Probability of identity (PI) values: 3.24 x $10^{-24}$ (Asian), 3.09 x $10^{-26}$ (US Hispanic), 3.71 x $10^{-26}$ (US Caucasian), 6.18 x $10^{-27}$ (African American)
- Includes 10 powerful mini-STR loci for increased information recovery from highly degraded samples
- Enhanced buffer system enables outstanding performance on samples containing inhibitors
- Expanded sensitivity and the flexibility to add up to 15 µL of sample enables increased allele recovery from low-quantity DNA samples

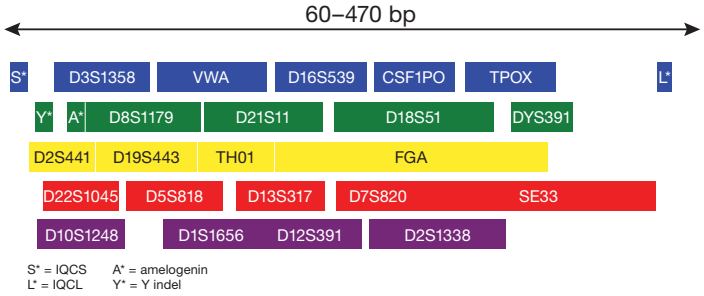



**Figure 4. Multiplex configuration of the GlobalFiler kit.** The kit includes all 24 loci, with only 1 locus partially exceeding 400 bp. Ten mini-STR loci are smaller than 220 bp, and all gender-specific markers are detected in the green VIC™ dye channel for convenient interpretation. The IQC small (IQCS) and IQC large (IQCL) markers are only present in the GlobalFiler IQC kit.

- The workflows enable amplification times of 45 minutes with the GlobalFiler Express kit and 80 minutes with GlobalFiler and GlobalFiler IQC kits (Figure 5)
- The GlobalFiler Express kit is compatible with Prep-n-Go Buffer, which significantly expands throughput capability while maximizing sample integrity and data quality
- The GlobalFiler IQC kit has the added benefit of two internal quality control (IQC) markers to help assess degradation and inhibition in casework samples
- GlobalFiler and GlobalFiler IQC kits are validated for use with HID NIMBUS QNA Systems and can save up to 5 hours of hands-on time

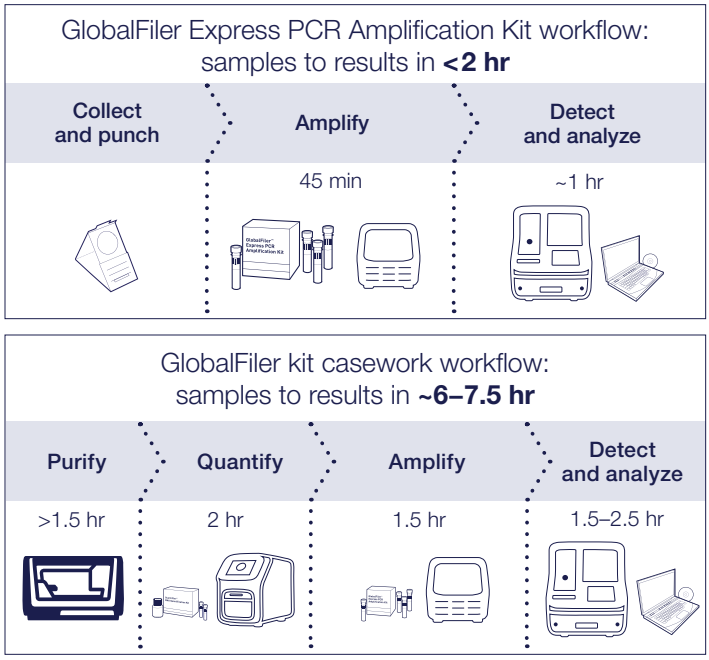



**Figure 5. Typical workflow for up to 48 samples using Applied Biosystems™ thermal cyclers, genetic analyzers, and robust analysis software.**

# NGM PCR amplification kits

The Applied Biosystems™ NGM™ family of kits delivers exceptional data quality and robustness along with powerful discrimination to support European cross-border data-sharing initiatives. NGM kits amplify all 10 Applied Biosystems™ SGM Plus™ kit loci together with 5 additional loci in the expanded European Standard Set (Figure 6). The kits are supported by our training, service, and applications teams.

Applied Biosystems™ AmpFLSTR™ NGM SElect™ kits amplify the expanded set of loci together with the highly discriminating SE33 locus. These kits leverage significant advances in PCR amplification technology to deliver high sensitivity and improved STR performance for forensic and database samples in one easy workflow. The NGM SElect Express Kit utilizes the same primer sequences as the NGM SElect kit but employs a master mix optimized to enable high-quality, direct amplification of single-source samples, like swabs and treated or untreated paper substrates, with rapid PCR cycling (<1 hr).

The Applied Biosystems™ NGM Detect™ PCR Amplification Kit offers excellent sensitivity and provides an alternate marker configuration to the NGM SElect PCR Amplification Kit format to help maximize information recovery even from degraded casework samples. With 7 mini-STRs, an optimized position for SE33 at <350 bp in the FAM™ dye channel, and a fast cycling time of <1 hr, the NGM Detect kit is the perfect companion product to NGM SElect kits for a dual amplification strategy to help generate maximum allele recovery and confidence in experimental replicates. In addition, the NGM Detect kit contains an additional gender marker and two IQC markers to help assess degradation and inhibition in casework samples (Figure 7).

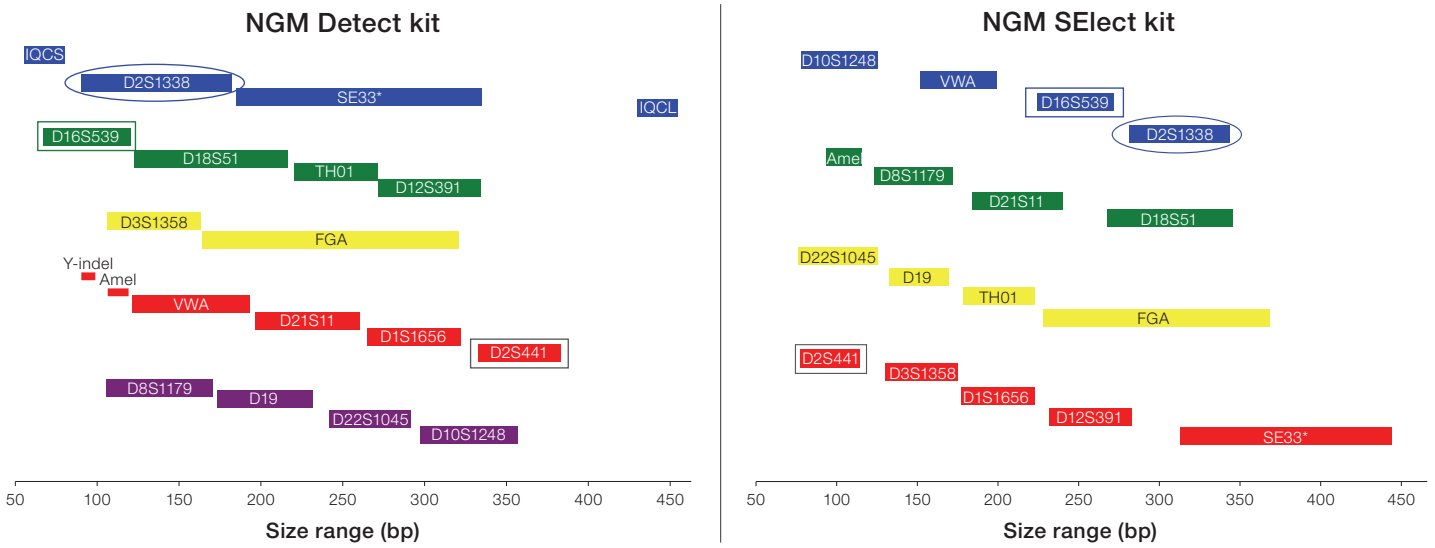
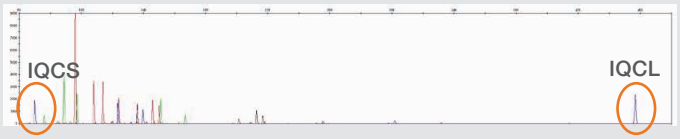
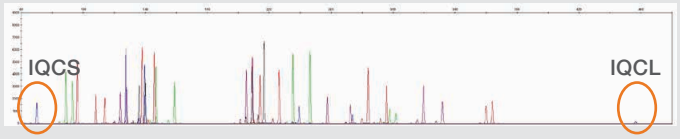



**Figure 6. Relative positioning of markers in the NGM Detect and NGM SElect kits.** Some of the low MW markers in the NGM Detect kit, including SE33*, are high MW markers in the NGM SElect kit and vice versa.




Balanced IQCS and IQCL peaks, partial profile

**Conclusion: degradation**




Reduced IQCL peak height, partial profile

**Conclusion: inhibition**

**Figure 7. Analysis of samples using the IQC small (IQCS) and IQC large (IQCL) quality markers of the IQC system to differentiate between sample degradation and inhibition.**

# VeriFiler PCR amplification kits

Applied Biosystems™ VeriFiler™ Plus and VeriFiler™ Express PCR amplification kits meet challenging forensic casework and databasing needs globally. Incorporating our 6-dye STR chemistry, VeriFiler kits contain a total of 25 markers—23 autosomal STRs, including Penta D and Penta E, and 2 gender discrimination markers (Figure 8). The kits are supported by our comprehensive training, service, and applications teams.

The VeriFiler Express kit offers superior discrimination power and high throughput with efficient processing—from single-source sample to profile in as little as 2 hours. With 11 mini-STRs, the VeriFiler Plus kit is specifically designed for challenging samples like touch, inhibited, and degraded samples, with improved sensitivity and robustness to inhibition.

NDIS Approved

In addition, an IQC system assesses for the presence of inhibitors in samples to enable distinction between degradation and PCR inhibition. The VeriFiler Plus kit also offers a direct amplification protocol for single-source reference samples, enabling laboratories to process all sample types with a single amplification kit.

VeriFiler Plus and VeriFiler Express kits are approved for use by laboratories that generate DNA profiles for inclusion in the United States National DNA Index System (NDIS) CODIS database. The specifications for the VeriFiler Plus and VeriFiler Express kits are summarized in Table 1.

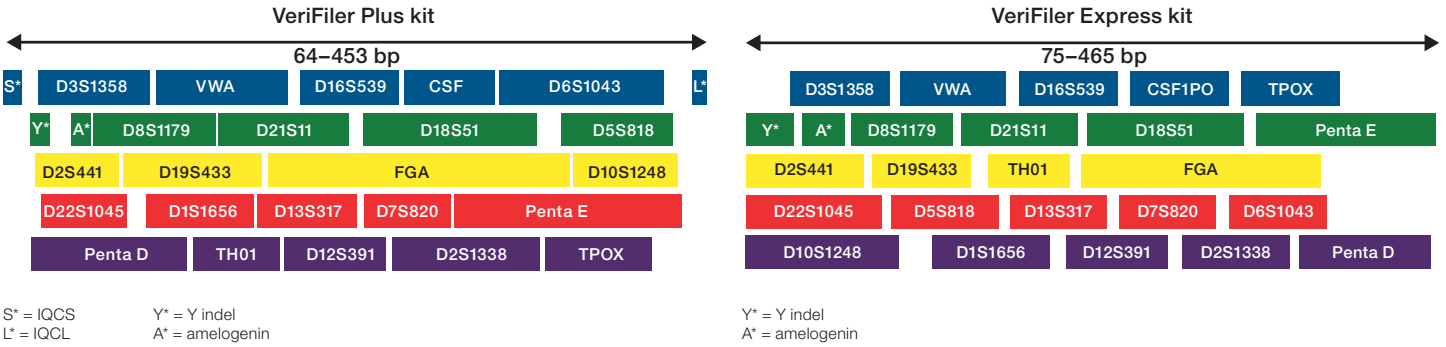



**Figure 8. Marker layout comparison for the VeriFiler Plus and VeriFiler Express kits.**

**Table 1. Specifications for VeriFiler kits.**

| | VeriFiler Plus kit | VeriFiler Express kit |
|---|---|---|
| **Improved sensitivity** | Kit allows adding up to 17.5 µL of sample volume per 25 µL of reaction | – |
| **Applications supported** | • Casework: optimized chemistry for challenging sample types (touch, inhibited, or degraded samples)<br>• Reference/database: validated with multiple sample collection devices, including treated paper, untreated paper, and swabs, for direct amplification of single-source samples | Reference/database: validated with multiple sample collection devices, including treated paper, untreated paper, and swabs |
| **IQC system** | Yes: for distinguishing inhibited and degraded samples; positive control for PCR amplification | No |
| **DNA input** | • 500 pg of purified DNA or up to 17.5 µL of sample volume<br>• Treated or untreated paper: 1.2 mm punch<br>• Swab: 2 µL (of 400 µL) Prep-n-Go Buffer | • Treated or untreated paper: 1.2 mm punch<br>• Swab: 2 µL (of 400 µL) Prep-n-Go Buffer |
| **PCR cycling time** | 76 min for casework samples | 45 min in direct amplification mode for single-source samples |

# Yfiler Plus PCR amplification kit

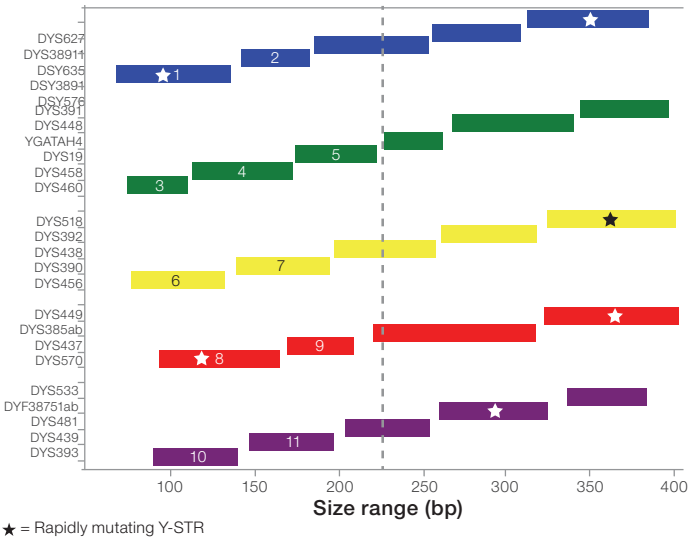
Y-STR loci can be valuable in forensic investigations because the Y chromosome can be used to trace male lineage due to its unique genetic inheritance from father to son. Y-STR loci have been serving as a supplementary tool for relationship testing, ancestry identification, familial searching, missing person identification, and mass disaster victim identification. Additionally, Y-STR loci analysis is used in sexual assault cases to detect minor contributions of male DNA in a high background of female DNA (Figure 9).

The Applied Biosystems™ Yfiler™ Plus PCR Amplification Kit can be used for extracted casework samples or in a direct amplification protocol for single-source reference samples.

NDIS Approved

The Yfiler Plus PCR Amplification Kit enables multiplex amplification of the 17 Y-STR marker set included in Applied Biosystems™ AmpFLSTR™ Yfiler™ kits as well as 10 new Y-STRs. The 6-dye Yfiler Plus kit provides more information with its 25 Y-STR markers (or 27 Y-STR loci), including 7 rapidly mutating Y-STR loci and 11 mini-STRs of <220 bp (Figure 10), from low-quantity or low-quality casework samples with high sensitivity and improved inhibitor tolerance. In particular, the inclusion of 7 rapidly mutating Y-STRs with mutation rates above 1 x $10^{-2}$ helps to improve resolution of paternal lineages and discriminate between closely related males.

The Yfiler Plus kit is suitable for fast thermal cycling conditions, enabling shorter time-to-results. The kit is also designed to process single-source reference samples using direct PCR amplification (Figure 11).




★ = Rapidly mutating Y-STR

**Figure 10. Marker design in the Yfiler Plus kit.**

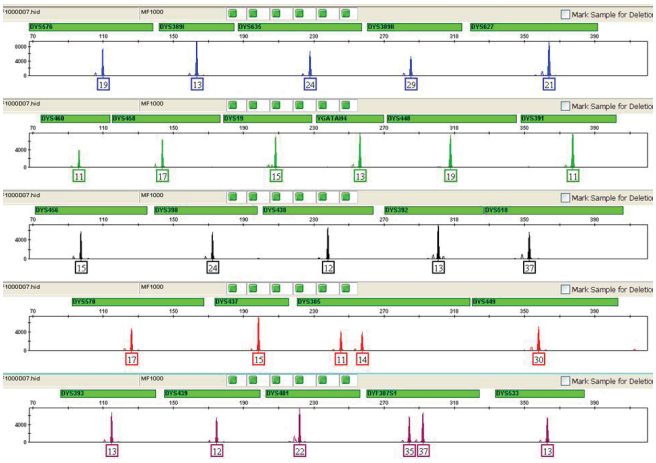


**Figure 9. A 1:1,000 male:female mixture amplified using the Yfiler Plus kit and 30 cycles on an Applied Biosystems™ 3500 Series Genetic Analyzer.**

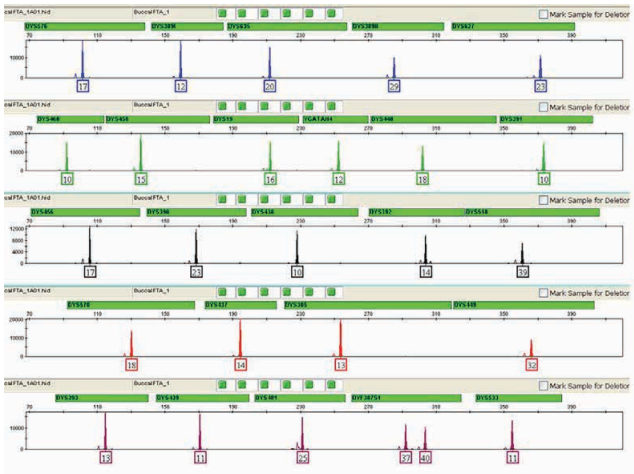


**Figure 11. Direct amplification using the Yfiler Plus kit on a 1.2 mm Whatman™ FTA™ punch of buccal cells and 27 cycles on a 3500 Series Genetic Analyzer.**

# Thermal cyclers

## HID VeritiPro Thermal Cycler

The Applied Biosystems™ HID VeritiPro™ Thermal Cycler delivers high-end performance and proven reliability with advanced temperature control technology. It has been validated according to the Scientific Working Group on DNA Analysis Methods (SWGDAM) December 2016 guidelines in the 96-well, 0.2 mL configuration with Applied Biosystems™ STR PCR amplification kits and Precision ID NGS panels.

## ProFlex PCR System

The Applied Biosystems™ ProFlex™ PCR System combines reliability and performance with flexible configuration and control features that fit how you work. Interchangeable block formats allow you to maximize your throughput or run independent experiments concurrently. The ProFlex PCR System has five different blocks that can be changed with the flip of a switch, including a first-of-its-kind 3 x 32-well block. A dual 96-well block is also available for your high-throughput needs.

## MicroAmp 96-well plates, PCR tubes, PCR strip tubes, and adhesive films

Applied Biosystems™ MicroAmp™ plastic consumables offer excellent performance in formats developed to meet your experimental needs. All of our plastic consumables are validated with Applied Biosystems™ instruments for optimal fit and performance.

# DNA analysis

Designed with capillary electrophoresis (CE) technology trusted by human identification (HID) labs for over 25 years, Applied Biosystems™ SeqStudio™ Flex Genetic Analyzers deliver the flexibility and accuracy your work demands. Innovative features like a continuously accessible four-plate deck can help you achieve reliable STR results efficiently. Features such as lab-friendly connectivity and easy-to-follow, on-instrument training videos can help get you started quickly and minimize downtime.

## Features

- **Configuration**—8- and 24-capillary systems, each with a four-plate deck and flexible loading options
- **Results you can trust**—optimized data collection software and validated performance with Applied Biosystems™ STR kits, compatible with other 5- and 6-dye kits
- **Reduced pull-up (false secondary peak) editing**—auto-spectral calibration that utilizes sample-specific spectral data to reduce pull-up editing
- **Easily integrated data interpretation**—with Applied Biosystems™ GeneMapper™ *ID-X* Software v1.7
- **Web-enabled services**—remote monitoring, run setup, and instrument control
- **Lab-friendly connectivity**—integrate your instrument into the lab with local area network (LAN), Wi-Fi, USB, and laboratory information management system (LIMS) compatibility
- **Get up and running quickly**—every SeqStudio Flex system includes expert service installation and a one-day HID field application specialist (FAS) training to help you get started faster
- **Protection and traceability**—with optional security, audit, and e-signature (SAE) software

## Flexibility

- **Versatile scheduling**—continually load plates and reprioritize urgent samples without having to terminate the current run
- **Increased walkaway capacity**—four plate positions that accommodate 8-tube strips and 96-well plates for samples
- **Work when and where you want**—set up your plate and monitor run progress from anywhere using the Thermo Fisher™ Connect Platform

## Usability

- **Designed for all levels of experience**—simple one-button startup, autocalibration, and on-screen step-by-step routine maintenance instructions as well as onboard self-help training videos
- **Simplified capillary array installation**—redesigned, more robust arrays with “click-and-slide” retractor tabs and enhanced detection cell housing, enabling improved capillary protection, insertion, positioning, and ease of handling
- **Easy inventory management**—compatible with Applied Biosystems™ 3500 Series Genetic Analyzer buffers and polymers, with onboard radio frequency identification (RFID)-enabled tracking of consumables usage
- **No desktop computer required**—integrated touchscreen computer, intuitive software, walk-through wizards, and Applied Biosystems™ Plate Manager software for simplified plate setup and instrument operation

## Serviceability

Applied Biosystems instrument innovation continues through a digital service ecosystem for remote troubleshooting.*

- **Less instrument downtime**—remotely resolve issues in minutes, not days, using onboard Smart Help and Remote Support features
- **Real-time audio/video collaboration**—the Remote Support feature brings our technicians into your laboratory using advanced, security-minded digital tools
- **Secure transfer of instrument performance data**—send log and run files directly from the instrument with the push of a button using Smart Help

**70%** of issues resolved in minutes, not days, using our remote digital support tools

* Network connectivity is required for Smart Help, Remote Support, and remote monitoring.

The Applied Biosystems™ SeqStudio™ Genetic Analyzer for HID is an easy-to-use 4-capillary benchtop system that delivers trusted STR fragment analysis and Sanger sequencing with a simple click. It is easily used across a broad range of STR kits and applications to help you get answers you can trust. The system offers the same data quality, service, and support you have come to expect from Applied Biosystems™ genetic analyzers, with a modernized experience at an affordable price.

## Key features

- **Universal all-in-one cartridge**—unique functionality that integrates Applied Biosystems™ POP-1™ polymer, anode buffer, a polymer delivery system, and a 4-capillary array to minimize instrument setup and maintenance time
- **Novel system design**—on-instrument reagent life of up to 6 months; 250 injections (1,000 samples) with no hard stops
- **Results you can trust**—optimized data collection software and validated performance according to the SWGDAM December 2016 guidelines
- **Concordant results**—compared with 3500 Series Genetic Analyzers (Table 2)
- **Reduced pull-up (false secondary peak) editing**—autocalibration utilizing sample-specific spectral data and marker-to-marker calibration reduces pull-up editing (Table 3)
- **Integrated data interpretation**—with GeneMapper *ID-X* Software v1.6
- **Protection and traceability**—with security, audit, and e-signature (SAE) software
- **Easy inventory management**—with RFID-enabled tracking of consumables usage
- **Get up and running quickly**—every SeqStudio system includes service installation and one-day FAS training

**Table 2. Concordance between results obtained with the 3500xL and SeqStudio genetic analyzers.***

| Applied Biosystems™ kit | Concordance (%) |
|---|---|
| GlobalFiler | 100 |
| GlobalFiler IQC | 100 |
| VeriFiler Plus | 100 |
| NGM Detect | 100 |
| NGM SElect | 100 |
| Identifiler Plus | 100 |
| MiniFiler | 100 |
| Yfiler Plus | 100 |
| Yfiler | 100 |
| GlobalFiler Express | 100 |
| VeriFiler Express | 100 |

* Nine casework kits were used with 23 gDNA samples plus the positive control, and two direct amplification kits were used with 20 buccal and blood samples plus the positive control, at the kit-recommended inputs of DNA. Samples were injected on 4 instruments, with a minimum of 3 injections each.

**Table 3. Low pull-up percentage across sample data.****

| Average pull-up peaks per injection | Mean pull-up percentage | Average percent of pull-up ≤3% |
|---|---|---|
| 1.3 | 1.6% | 88% |

** Results are shown for 947 pull-up peaks observed in 730 injections of positive control and 5 gDNA samples amplified with the MiniFiler, Identifiler Plus, NGM SElect, Yfiler, GlobalFiler, Yfiler Plus, NGM Detect, or VeriFiler Plus kit at the recommended input. n = 92 injections per kit on 4 SeqStudio instruments; n = 86 for the NGM Detect kit due to failed injections being omitted from the analysis.

# GeneMapper *ID-X* software

Advances in instrumentation and amplification technology have shifted the bottleneck in forensic laboratories from sample processing to data analysis. GeneMapper *ID-X* Software is a comprehensive solution that combines expert system and expert assistant capabilities to streamline data review and mixture interpretation. It offers user-defined thresholds and automated tools for sample review, editing, processing, and estimating the number of contributors to DNA mixtures. With one click, the software easily takes you from analysis to mixture interpretation with Applied Biosystems™ GeneMapper™ *PG* Software. Leverage decades of experience with GeneMapper *ID-X* Software, the industry standard and NDIS-approved expert system for exceptional accuracy in forensic data analysis.

GeneMapper *ID-X* Software v1.7 continues the legacy of trusted analysis algorithms while adding new functionality and expanding compatibility. The software now includes powerful functionality for estimating the number of contributors (NOC) in a DNA mixture and utilizing multiple algorithms from GeneMapper *PG* Software. GeneMapper *ID-X* Software v1.7 supports data analysis from the SeqStudio Flex Genetic Analyzer for HID as well as legacy CE instrumentation going back to the Applied Biosystems™ ABI PRISM 310 Genetic Analyzer and includes support for Microsoft™ Windows™ 11 Software.

## New database

GeneMapper *ID-X* Software v1.7 utilizes a new PostgreSQL™ database implemented in compliance with Center for Internet Security™ CIS Benchmarks™ guidelines. The incorporation of the database includes new features and maintenance improvements in GeneMapper *ID-X* Software v1.7. Your lab will now be able to schedule automated database backups (Figure 12). Manual (ad hoc) database backups and the restore function are also available in GeneMapper *ID-X* Software v1.7 along with the new scheduled backup feature.

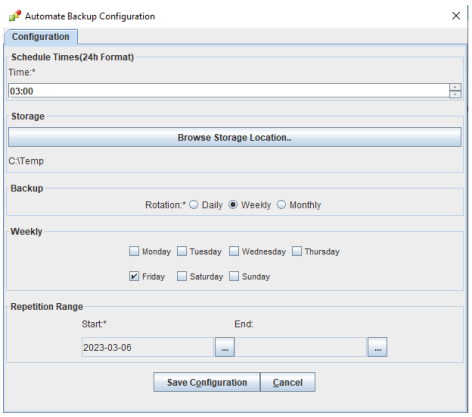



**Figure 12. The automated backup configuration menu contains options to best suit your laboratory requirements.**

## NOC estimation

GeneMapper *ID-X* Software offers a comprehensive suite of innovative algorithms designed to assist you in estimating the NOC in a DNA mixture (Figure 13). To address the inherent complexity of forensic data, the software employs metrics ranging from maximum allele count (MAC) and total allele count (TAC) to more advanced machine learning methods like decision trees. With enhanced visualizations and clear, detailed explanations, it's easy to track the logic and compare different models for informed and confident interpretation.


**Figure 13. Number of contributors (NOC) estimation with the decision tree feature.**

## User interface

With new options for multiple projects and multiple plots, GeneMapper *ID-X* Software v1.7 allows analysts to open multiple projects at once (Figure 14) and compare samples across all open projects using the Profile Comparison tool as well as compare annotation differences between multiple projects. Analysts can open electropherograms in separate windows and compare them side by side rather than scrolling back and forth between the profiles.

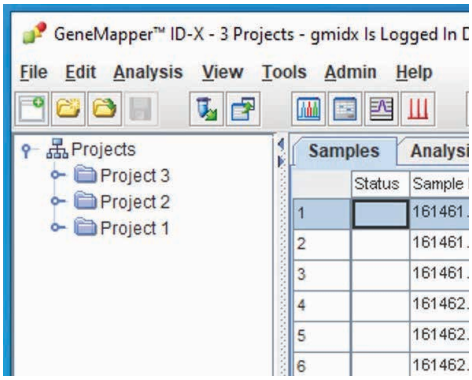



**Figure 14. Multiple projects are open at the same time in the left-hand navigation panel.**

You can annotate directly on sample plots, and notes can be moved anywhere within the dye channel by clicking and dragging. The notes are auditable and all changes are recorded. The notes are printed on the PDF export and any associated printouts.

## Analysis parameters

Forensic DNA laboratories have requested the ability to add their own data filters. In GeneMapper *ID-X* Software v1.7, forensic DNA laboratories can add data filters using a variety of optional settings. You can add your own allele-specific stutter parameters (Figure 15), marker-specific filters, and spectral pull-up filter settings.

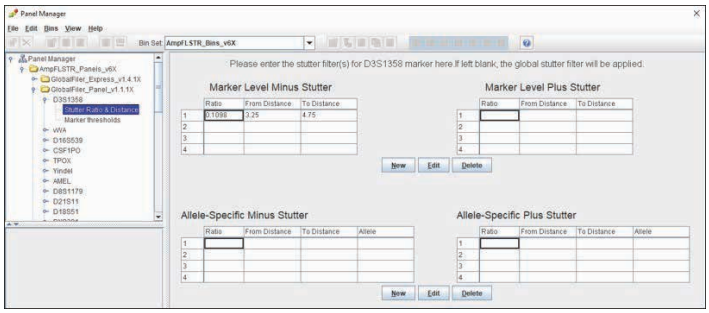



**Figure 15. Optional allele-specific stutter and additive stutter options enabled in the Analysis Method menu.**

# GeneMapper *PG* software

Over the years, there have been incredible advances in DNA extraction, STR chemistry, and CE instrumentation that have increased the amount of DNA that can be recovered, from more samples than ever before. With improvements in sensitivity and the high demand for DNA evidence, mixture interpretation remains a foremost challenge. GeneMapper *PG* Software extends industry-standard GeneMapper *ID-X* Software with an easy-to-use, intuitive software suite designed to help you gain clarity, deeper insight, and confidence in your mixture analysis. With GeneMapper *PG* Software, transparency isn't just a feature—it's the foundation. With visualizations and clear explanations, you can track the logic, compare models, and be confident in your results.

## Key features

- Step-by-step explanations, logic, and visualization tools that offer a clear rationale for each decision, streamline validation, and strengthen expertise
- Multiple models for reliable NOC estimation
- A fully continuous probabilistic model for precise, reproducible mixture deconvolution
- Likelihood ratio calculation tools to build scenarios from simple to complex, and robustness analysis with simulations to test the results

## Profile review

Start interpretation with a big-picture view of your entire project. Manage, evaluate, and compare multiple samples at once. In the Profile screen, you will find genotypes, electropherograms, sample quality information, and NOC estimates (Figure 16).

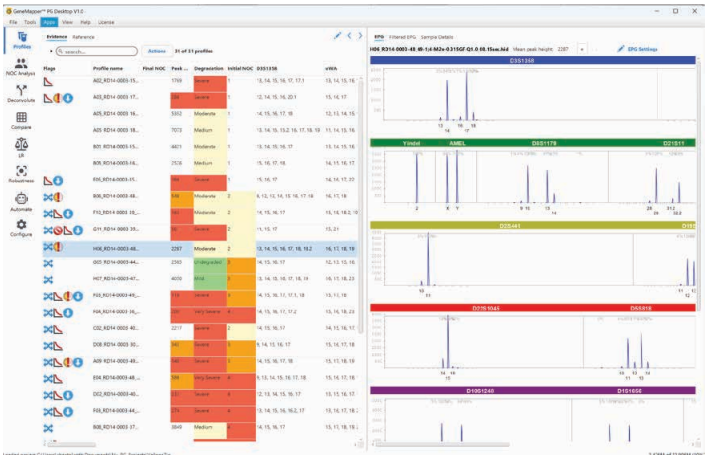


**Figure 16. Manage, review, and edit sample information across a project in the Profile screen, where sample quality, electropherograms, and analysis details are displayed (e.g., degradation, height distribution, analysis performed).**

## NOC estimation

Multiple algorithms are available in GeneMapper *PG* Software to estimate the number of contributors to a mixture, which is a critical step in the interpretation process. From simple methods like MAC and TAC (Figure 17) to more advanced methods like machine learning–based decision trees (Figure 18), you can guide the estimation process with full transparency. No matter which method you choose, each is fully traceable and easy to explain.

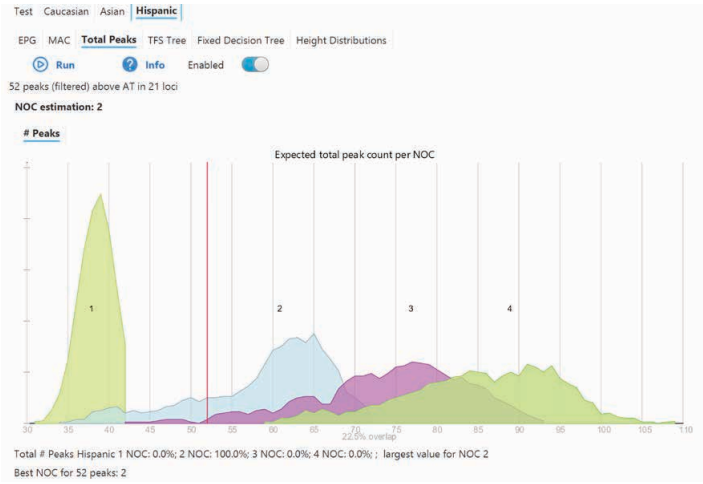



**Figure 17. NOC estimation using TAC across all loci.**

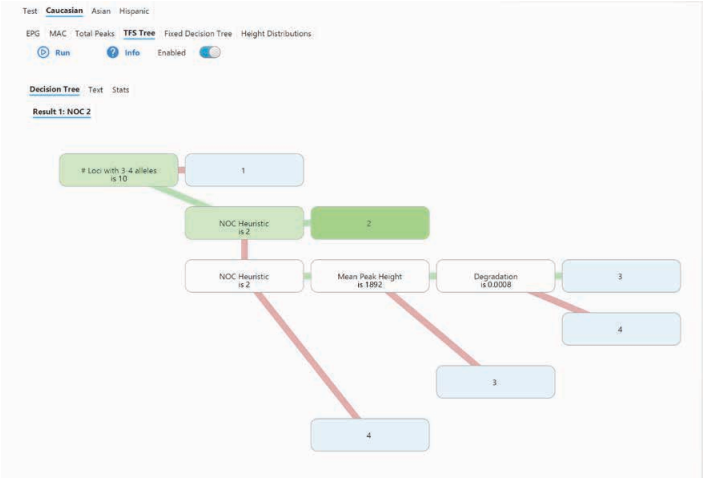



**Figure 18. NOC decision tree with inputs related to the DNA profile: the number of alleles within the profile, minimum and maximum number of alleles at a locus, and allele heights.**

## Fully continuous probabilistic model

GeneMapper *PG* Software mirrors your expertise by modeling all biological aspects of forensic DNA profiles, including stutter (all types: minus-4, minus-2, plus stutter), noise, peak height ratio, interlocus balance, degradation, drop-in/drop-out, and DNA amount. These are user-definable for locus, laboratory, STR kit, and instrument-specific values. For the mixture deconvolution step, GeneMapper *PG* Software employs a structured, systematic approach that follows a set of rules executed in fixed order through a deterministic algorithm that drives efficiency and precision. You can analyze the same sample multiple times with the same parameters and generate the same result every time. The software also offers clear, detailed explanations and visualization tools (Figure 19), such as learning and implementation.

Instantly view electropherograms to compare observed DNA profiles to expected solutions, extract major contributors, export CODIS-compatible files for database searches, and search deconvoluted profiles against other samples in your project—all in one place.

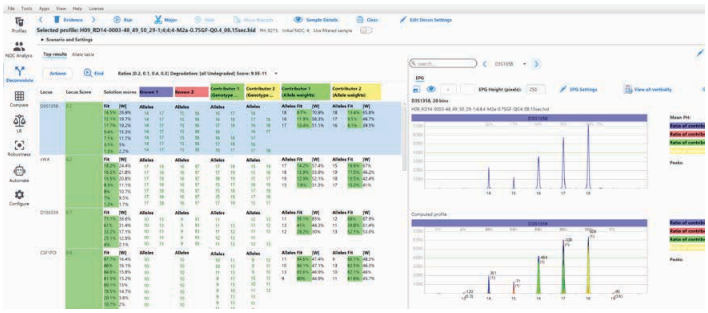


**Figure 19. Deconvolution analysis.** View profile electropherograms, fit (how well they match the actual evidence profile), and weight values (how strong a solution is compared to other values) in one place, and compare the observed DNA profile to the expected solution.

## Likelihood ratio (LR) calculations

Calculate even the most complex LR scenarios with an intuitive interface (Figure 20) where you can easily build the scenario, visualize the result, and drill down into the calculation details. The LR robustness analysis tool simulates thousands of profiles, which are visualized through an empirical cumulative distribution plot to help you determine whether your LR result is truly significant or the result of a fortuitous match. The simulated profiles can be configured to be either unrelated to the person of interest or linked by a specific family relationship.

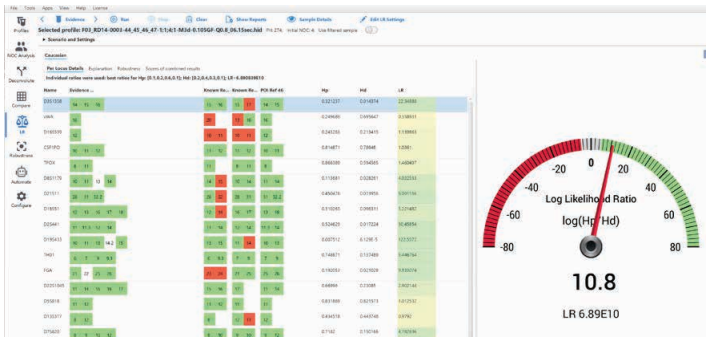



**Figure 20. Likelihood ratio estimation.** After entering the scenario, results are displayed with color-coded guidance (including the gauge on the right) and a tab that provides detailed explanations of the result.

## Transparency

At the end of the day, it's not just about getting an answer—it's about interpreting the data with clarity and communicating your findings with ease. With GeneMapper *PG* Software, you gain access to step-by-step explanations, logical workflows, and powerful visualization tools that make the analysis process transparent and easy to understand. The fully continuous deterministic model delivers consistent results. Embrace the future of forensic genotyping with GeneMapper *PG* Software and experience the difference in every detail.

# Rapid DNA analysis

With minimal training and just one minute of hands-on time, the fully automated, mobile-ready Applied Biosystems™ RapidHIT™ ID System is an exceptional platform for generating lab-quality forensic DNA profiles from reference crime scene and human remains samples in the laboratory or in the field. Compatible with established databases, the system generates DNA profiles using FBI NDIS–approved* GlobalFiler Express chemistry from the self-contained Applied Biosystems™ RapidHIT™ ID ACE GlobalFiler™ Express or RapidINTEL™ Plus sample cartridge.

Paired with Applied Biosystems™ RapidLINK™ Software, the system offers full control of DNA results with powerful sample matching, familial search, kinship, and staff elimination database applications.

### Insert swab or sample into cartridge

Bring the analysis tools to the point of action, whether in the lab or in the field.

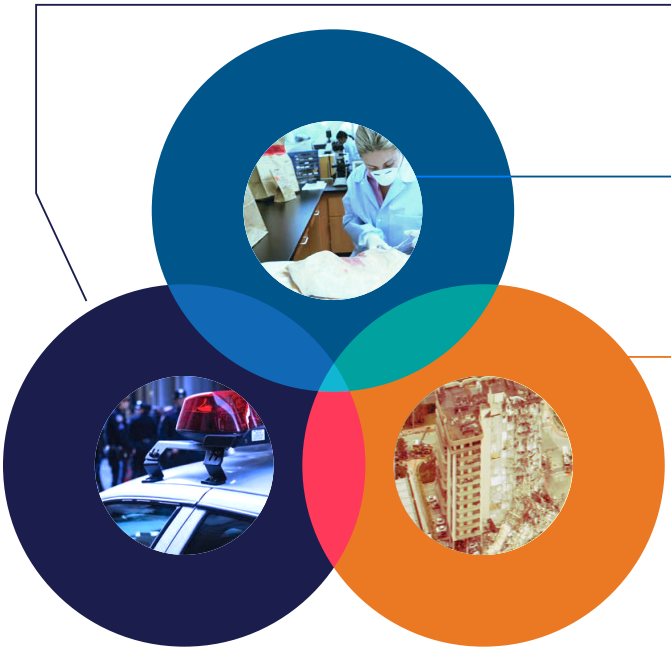
### Insert cartridge into instrument

The fully automated system performs cell lysis, amplification, and CE without human intervention.

### DNA results in 90 minutes

RapidLINK Software centralizes data and provides full control of results.


## DNA-led investigations and identifications: find more answers together



### In the police station or booking agency

Law enforcement can generate investigative leads and identify or eliminate suspects while they are still in custody.

### In the laboratory

Help generate investigative leads for crime scene samples, identify deceased individuals, and confirm biological relationships to help reunite families.

### In the field

Conduct rapid identification for mass casualty events, unidentified persons, or suspected human trafficking situations to help provide answers and reunite families—all thanks to the system's portability and ease of use.

* FBI NDIS–approved for use by booking stations and accredited forensic DNA laboratories with known reference DNA samples and the RapidHIT ID ACE GlobalFiler Express Sample Cartridge.

# Next-generation sequencing applications

The Applied Biosystems™ Precision ID Next-Generation Sequencing (NGS) System for human identification with Applied Biosystems™ Converge™ Software can help you solve tough cases by obtaining more information from challenging samples. Analysis of alternative marker types (e.g., SNPs) to complement CE-STR results can help generate investigative leads in cold cases.

Our panels utilize Ion AmpliSeq™ technology, which applies the simplicity of PCR to targeted sequencing and enables tens to thousands of genomic regions to be amplified simultaneously in a single PCR tube (Table 4). With as little as 125 pg of DNA as input, you can go from extracted DNA to profile in as little as 5 pipetting steps and 45 minutes of hands-on time (Figure 21). Start processing unsolved and missing person cases with NGS in your laboratory.

## Converge Software

Simplify the complexities of forensic DNA analysis with streamlined solutions for NGS analysis, CE-NGS comparison, and kinship and paternity analysis with Applied Biosystems™ Converge™ Software. Designed to centralize all case data under one powerful solution, it's an intuitive and integrated system for getting answers. Modules are available for:

- Mitochondrial DNA (mtDNA) analysis (Figure 22)
- SNP analysis
- STR analysis
- Kinship and paternity
- Case management

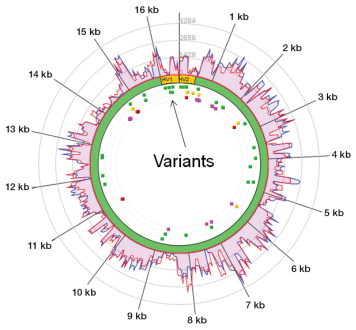



**Figure 22. Circular plot analysis of the whole mtDNA genome from the "Converge mtDNA Analysis" module, used to visualize read depth across the genome and variant positions relative to the Cambridge Reference Sequence (CRS).**

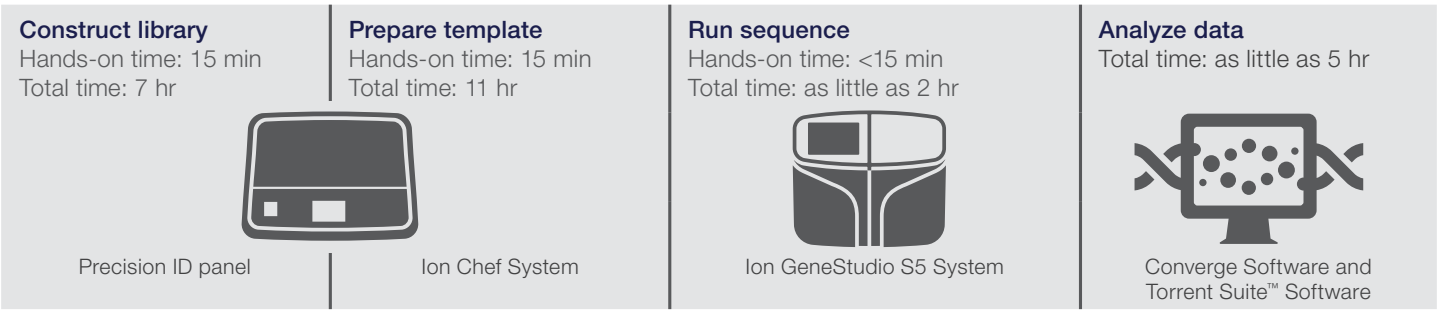



**Figure 21. Adopting NGS for forensic DNA analysis in your laboratory is simpler than ever when you combine the Ion Chef™ System and Ion GeneStudio™ S5 series systems with optimized Applied Biosystems™ Precision ID library preparation, template preparation, sequencing kits, and forensically relevant panels.**

### Table 4. HID applications and suggested panels.

| Application | Panel |
|---|---|
| **Victim identification, disaster victim identification, missing person investigation** | Precision ID mtDNA Whole Genome Panel<br>Precision ID mtDNA Control Region Panel<br>Precision ID Identity Panel<br>Ion AmpliSeq HID Y-SNP Research Panel v1<br>Combination: Ion AmpliSeq VISAGE-Basic Tool Research Panel, Ion AmpliSeq HID Y-SNP Research Panel v1, and Precision ID mtDNA Whole Genome Panel |
| **Investigative leads** | Precision ID Ancestry Panel<br>Ion AmpliSeq PhenoTrivium Panel<br>Ion AmpliSeq VISAGE-Basic Tool Research Panel |
| **Externally visible traits** | Ion AmpliSeq PhenoTrivium Panel<br>Ion AmpliSeq VISAGE-Basic Tool Research Panel<br>Ion AmpliSeq DNA Phenotyping Panel |
| **Biogeographic ancestry** | Precision ID Ancestry Panel<br>Ion AmpliSeq PhenoTrivium Panel<br>Ion AmpliSeq VISAGE-Basic Tool Research Panel<br>Ion AmpliSeq MH-74 Plex Research Panel |
| **Number of contributors, mixture deconvolution** | Ion AmpliSeq MH-74 Plex Research Panel<br>Precision ID GlobalFiler NGS STR Panels |
| **Body fluid identification** | Ion AmpliSeq Body Fluid Identification DNA and RNA research panels |

# NGS applications (continued)

## Panels

### Precision ID panels

**The Applied Biosystems™ Precision ID mtDNA Whole Genome Panel** is an innovative approach to mitochondrial DNA sequencing specifically developed for forensic applications, particularly in missing persons investigations and disaster victim identification. The Precision ID mtDNA Whole Genome Panel, using the control region data for analysis, is approved for inclusion in the US NDIS CODIS database.

**Applied Biosystems™ Precision ID mtDNA Control Region Panels** are based on the same tiling approach used for the Precision ID mtDNA Whole Genome Panel. This targeted control region panel spans the entire 1.2 kb control region, which encompasses HV-I, HV-II, and HV-III, and it can be used when whole genome sequencing is prohibited.

**Applied Biosystems™ Precision ID Ancestry Panels** contain 165 SNPs and can help provide you with biogeographic ancestry information and investigative leads.

**Applied Biosystems™ Precision ID Identity Panels** contain 34 upper Y-clade SNPs and 90 autosomal SNPs, and they provide unique genotypes to identify degraded samples for HID applications. They enable discrimination of individuals similar to STR genotype match probabilities used by forensic analysts (between 1 x $10^{-31}$ and 6 x $10^{-35}$).

**Applied Biosystems™ Precision ID GlobalFiler™ NGS STR Panels** v2 include 36 markers. These include the same 21 autosomal STRs along with Y markers and amelogenin sex markers found in the GlobalFiler PCR Amplification Kit, as well as 14 additional informative markers for forensic analysis. When analyzed with NGS, these markers reveal more alleles (74%) than can be identified with traditional CE analysis, due to sequence diversity within CE alleles of the same size. These isometric alleles can be used to help resolve complex profiles and mixtures.

### Ion AmpliSeq community panels

Growing research on the application of alternative markers in the field of forensic genetics has aided in identifying methods to obtain more genetic information from challenging samples. The use of biogeographic ancestry, DNA phenotyping, and lineage markers can help provide investigative leads in cold cases and cases in which there are no suspects.

**Ion AmpliSeq™ PhenoTrivium™ Panels** contain ancestry, DNA phenotyping, and male lineage markers for a total of 200 autosomal SNPs and 120 Y chromosome SNPs in a single panel.

**Ion AmpliSeq™ VISAGE (visible attributes through genomics) basic tool research panels** consist of 153 SNPs, allowing prediction of EVCs and biogeographic ancestry, and incorporating 41 SNPs of the HIrisPlex-S assay and 115 BGA markers chosen for differentiation of seven continental populations.

DNA phenotyping can be useful for generating investigative leads in cases where STR profiles have not resulted in a database match. The **Ion AmpliSeq™ DNA Phenotyping Panel** is used to predict hair and eye color with 24 phenotype SNPs from the HIrisPlex system. This panel targets 23 SNPs and one indel.

Microhaplotypes enable enhanced mixture analysis and biogeographic ancestry prediction capabilities that favor their use for forensic samples. The **Ion AmpliSeq™ MH-74 Plex Research Panel** is a 157–325 bp assay covering 74 microhaplotypes. These markers can enhance mixture deconvolution and provide biogeographic ancestry prediction capability.

Y chromosome haplogroups assigned from male-specific Y chromosome single nucleotide polymorphisms (Y-SNPs) allow paternal lineage identification and paternal biogeographic ancestry inference, both being relevant in forensic genetics. The **Ion AmpliSeq™ HID Y-SNP Research Panel** enables analysis of 859 Y-SNPs to infer 640 Y haplogroups.

Learn more about **Ion AmpliSeq community panels**.

# HID Professional Services

Since 2007, our HID Professional Services (HPS) team has been partnering with forensic laboratories and law enforcement agencies to help optimize their forensic workflows for efficiency and reliability. HPS offers a wide array of services, including validation, education and training, verification and performance checks, and implementation support programs based on internationally recognized standards. Our technical project managers and field specialists bring extensive knowledge and experience to each project, helping forensic labs to seamlessly implement new workflows while minimizing impact on daily operations. You can rely on the HPS team to deliver high-quality services to help you achieve your goals.

HID Professional Services cover a wide range of validated solutions, spanning the entire HID product catalog. These services are designed to help ensure your casework, database, and rapid DNA workflows are optimized for forensic applications:

- Validation
- Performance checks and verifications
- SOP templates
- Competency test design
- Consultancy
- Operational efficiency packages
- HID education programs
- Lab relocation support
- Rapid DNA solutions

### Experience

The HPS team has the depth of experience to meet your specific workflow needs. The team is available to work with customers nearly everywhere worldwide and works closely with local support, including field application specialists (FASs) and distributors, to enable a seamless experience before, during, and after projects.

## Service spotlights

### Rapid DNA services


A rapid DNA workflow adds a powerful investigative tool to your laboratory or law enforcement agency. Understanding the performance of your RapidHIT ID System enables you to establish informed procedures and an effective rapid DNA program. The HPS team delivers services that are carefully designed to meet the needs of your agency, including:

- A test plan that correlates to your rapid use case
- Remote or on-site wet work assistance to complete your workflow implementation
- An optional mock sample set to help accelerate your implementation

### HID education programs

The training programs required in accredited labs can be time-consuming to maintain and deliver. Whether you need training for new analysts, new workflows, or continuing education, the HID Education Program course catalog offers education programs that are flexible and range from basics to practical hands-on training to suit a variety of needs.

- Virtual content with flexible, self-paced, and budget-friendly options
- In-person training at your site or at a local Thermo Fisher Customer Experience Center that includes classroom lectures and practical laboratory exercises
- Personalized training packages that offer a unique opportunity for a hands-on experience of the full HID workflow

**1. Project planning**

HPS specialists and project managers consult with you and develop a scope of work designed to meet your project's objectives.

**2. Wet work**

HPS provides the consumables, stock DNA samples, and on-site specialists needed to develop the laboratory data for your service. Once the work is complete, HPS will provide the instrument data files associated with your project.

**3. Data analysis and report writing**

HPS completes a thorough and detailed data analysis. The data are converted to a comprehensive report package that is reviewed by an independent technical project manager and includes detailed figures, tables, and references.

**4. Teachback training**

Teachback trainings provide a summary of the key results from your validation. Teachback and supplemental trainings engage your staff to actively listen, and to participate in and understand their workflow.

## Ordering information

| Product | Quantity | Cat. No. |
|---|---|---|
| **Collection and sample preparation*** | | |
| 4N6FLOQSwabs, regular tip, 2-mL cuvette, peel-pouch | 100 swabs | 4479431 |
| 4N6FLOQSwabs, regular tip, peel-pouch | 100 swabs | 4473979 |
| NUCLEIC-CARD matrix, 1 spot | 50 cards | 4474001 |
| PrepFiler Express Forensic DNA Extraction Kit | 52 reactions | 4441352 |
| PrepFiler Express BTA Forensic DNA Extraction Kit | 52 reactions | 4441351 |
| PrepFiler Automated Forensic DNA Extraction Kit | 960 reactions | 4463353 |
| PrepFiler BTA Automated Forensic DNA Extraction Kit | 960 reactions | 4463354 |
| PrepFiler Forensic DNA Extraction Kit | 100 reactions | 4463351 |
| PrepFiler BTA Forensic DNA Extraction Kit | 100 reactions | 4463352 |
| **Amplification kits** and consumables*** | | |
| Quantifiler Trio DNA Quantification Kit | 400 reactions | 4482910 |
| Quantifiler Trio Automated DNA Quantification Kit | 960 reactions | A58787 |
| Quantifiler HP DNA Quantification Kit | 400 reactions | 4482911 |
| GlobalFiler IQC PCR Amplification Kit | 200 reactions | A43565 |
| GlobalFiler PCR Amplification Kit | 200 reactions | 4476135 |
| GlobalFiler Express PCR Amplification Kit | 200 reactions | 4476609 |
| NGM Detect PCR Amplification Kit | 200 reactions | A31832 |
| NGM SElect PCR Amplification Kit | 200 reactions | 4457889 |
| NGM SElect Express PCR Amplification Kit | 200 reactions | 4472193 |
| VeriFiler Express PCR Amplification Kit | 200 reactions | A32014 |
| VeriFiler Plus PCR Amplification Kit | 200 reactions | A35495 |
| Yfiler Plus PCR Amplification Kit | 500 reactions | 4482730 |
| RapidHIT ID ACE GlobalFiler Express 50-Sample Kit with Swab† | 50 reactions | A46069 |
| RapidINTEL Plus 50 Sample Cartridge Kit† | 50 reactions | A54338 |
| RapidHIT ID ACE GlobalFiler Express Kit† | 50 reactions | 441831 |
| RapidHIT ID Primary Cartridge GlobalFiler Express 150 Kit† | 150 reactions | A53084 |
| Precision ID GlobalFiler NGS STR Panel v2 | 96 reactions (manual) | A33114 |
| Precision ID Ancestry Panel | 96 reactions (manual) | A25642 |
| Precision ID Identity Panel | 96 reactions (manual) | A25643 |
| Precision ID mtDNA Whole Genome Panel | 96 reactions (manual) | A30938 |
| Precision ID mtDNA Control Region Panel | 96 reactions (manual) | A31443 |
| Optical 96-Well Reaction Plates, without barcode | 10 plates | N8010560 |
| Optical 96-Well Reaction Plates, without barcode | 500 plates | 4316813 |
| Optical 96-Well Reaction Plates, with barcode | 20 plates | 4306737 |
| Optical 96-Well Reaction Plates, with barcode | 500 plates | 4326659 |

## Ordering information (cont.)

| Product | Quantity | Cat. No. |
|---|---|---|
| **Instrumentation** | | |
| AutoMate *Express* Forensic DNA Extraction System | 1 system | 4441763 |
| AutoMate *Express* Forensic DNA Extraction System, with service install | 1 system | 4456582 |
| HID NIMBUS Presto System | 1 system | A55395 |
| HID NIMBUS Presto QNA System | 1 system | A55769 |
| CPA200 Instrument | 1 system | A34329 |
| QuantStudio 5 Real-Time PCR System for Human Identification, 96-well, 0.2 mL, laptop | 1 system | A34321 |
| QuantStudio 5 Real-Time PCR System for Human Identification, 96-well, 0.2 mL, desktop | 1 system | A34322 |
| SeqStudio 8 Flex Genetic Analyzer for Human Identification | 1 system | A56532 |
| SeqStudio 24 Flex Genetic Analyzer for Human Identification | 1 system | A56534 |
| SeqStudio Genetic Analyzer for Human Identification, laptop, with training | 1 system | A46228 |
| SeqStudio Genetic Analyzer for Human Identification, desktop, with training | 1 system | A46229 |
| RapidHIT ID System† | 1 system | A41810 |
| RapidHIT ID DNA Booking System† | 1 system | A51271 |
| HID Ion Chef System | 1 system | A30070 |
| HID Ion GeneStudio S5 System | 1 system | A41431 |
| HID Ion GeneStudio S5 Plus System | 1 system | A41432 |
| HID Ion GeneStudio S5 Prime System | 1 system | A41433 |
| HID VeritiPro Thermal Cycler | 1 system | A52127 |
| ProFlex 96-Well PCR System | 1 system | 4484075 |
| **Software*** | | |
| HID Real-Time PCR Analysis Software v1.3 | 1 license | A31150 |
| HID Real-Time PCR Analysis Software v1.4 | 1 license | A78901 |
| GeneMapper *ID-X* Software v1.7, full installation | 1 license | A71700 |
| GeneMapper *ID-X* Software v1.7, client installation | 1 license | A71701 |
| GeneMapper *ID-X* Software v1.7, demo installation | 1 license | A71702 |
| GeneMapper *PG* Software v1.0 | 1 license | A77500 |
| RapidLINK Software DNA Booking Station v1.0† | 1 license | A43976 |
| RapidLINK Software v2.0† | 1 license | A59138 |
| Matching Suite v1.0† | 1 license | A59805 |
| Converge Software and Server | 1 system | A35131 |
| Case Management and Kinship & Paternity Analysis Module | 1 user, 3 years | A31002 |
| Case Management and NGS Data Analysis License | 1 user, 3 years | A35987 |

Additional package sizes are available. Please contact your representative for more information.

* For Research, Forensic, or Paternity Use Only. Not for use in diagnostic procedures.

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