

Move forward with whatever's left behind

PrepFiler forensic DNA extraction kits

Applied Biosystems™ PrepFiler™ forensic DNA extraction kits feature a combination of uniquely structured magnetic particles and a multicomponent surface chemistry developed to enable efficient DNA binding capacity and maximum DNA recovery. PrepFiler DNA extraction kits are designed to optimize the purification of DNA from routine and challenging forensic samples. The unique combination of reagents and protocols enhances the yield and purity of DNA, improving downstream genotyping success rates and enabling reliable and reproducible results.

PrepFiler kits offer:

- High quantity and quality of DNA isolated from both routine and challenging samples
- Robust removal of inhibitors and improved overall yield, concentration, and purity of DNA
- Streamlined and validated automatable workflow
- Optimized method options for routine and challenging sample types
- Multiple formats for manual, automated, and cartridge-based workflows
- Flexibility for your laboratory needs and throughput requirements

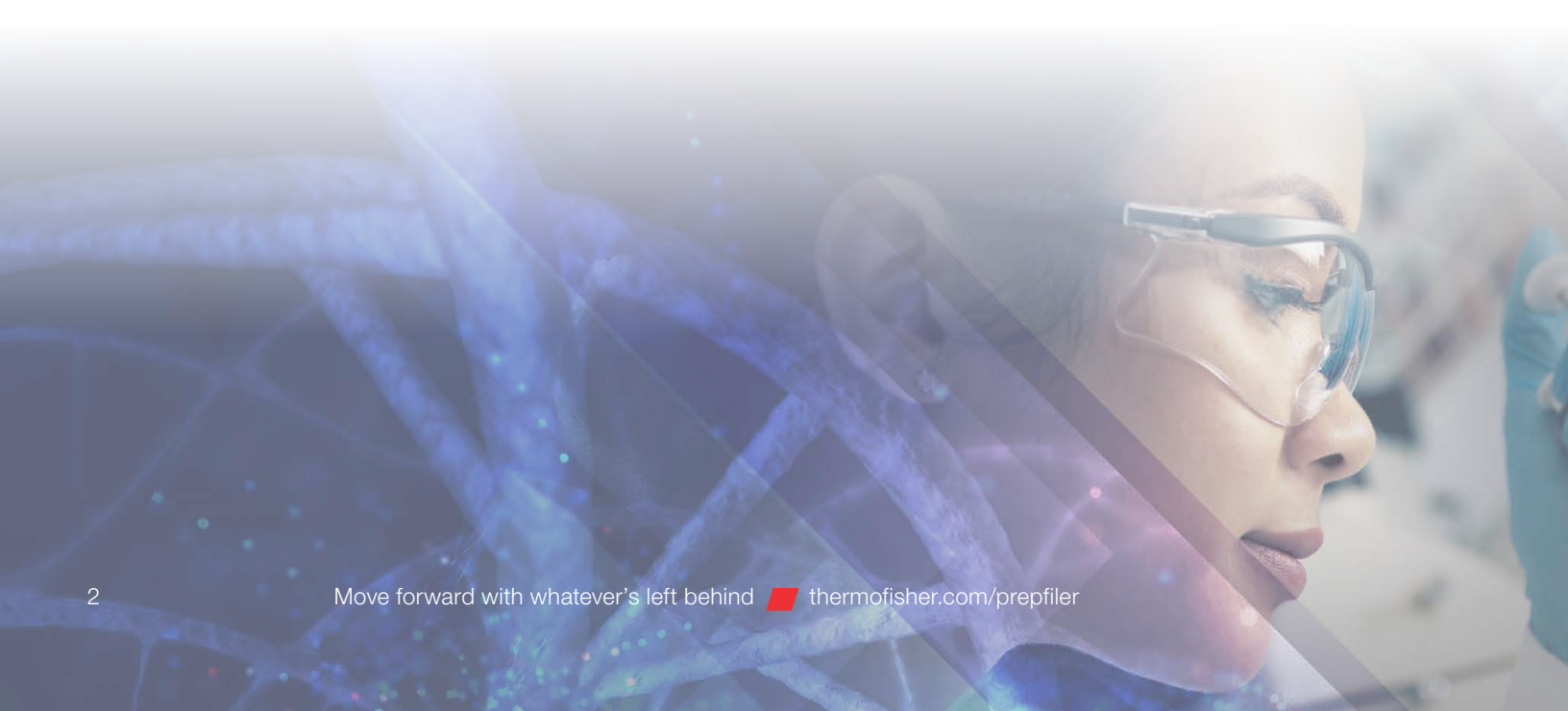


PrepFiler DNA extraction kits are well suited for many routine forensic sample types:

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

PrepFiler BTA extraction kits are designed for more challenging forensic samples:

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



German DNA Profiling (GEDNAP) proficiency tests for forensic DNA labs

Previously known as the Stain Commission, GEDNAP is a working group of the International Society for Forensic Genetics (ISFG) that organizes proficiency tests for DNA forensic laboratories. GEDNAP proficiency tests are one of the largest quality control approaches in the world for stain-DNA profiling. Since 2017, GEDNAP proficiency tests have included DNA extraction efficiency modules that analyze a number of commercially available forensic extraction kits. PrepFiler DNA extraction kits included in each biannual extraction efficiency module over a seven-year period (14 modules total) have demonstrated the highest yields across all but one >10 ng sample and the highest yields across all low-quantity (<10 ng) samples.

Proficiency test results demonstrated that for inputs of 0.25–100 ng, PrepFiler DNA extraction kits had superior performance relative to other kits. The PrepFiler kits exhibited the highest average DNA quantity in 13 out of 14 modules for all samples and DNA input amounts tested (Figure 1).

The PrepFiler kits outperformed other kits and displayed higher DNA yields, in seven tests, even when the DNA input was <10 ng (Figure 2) for kits included in the testing.

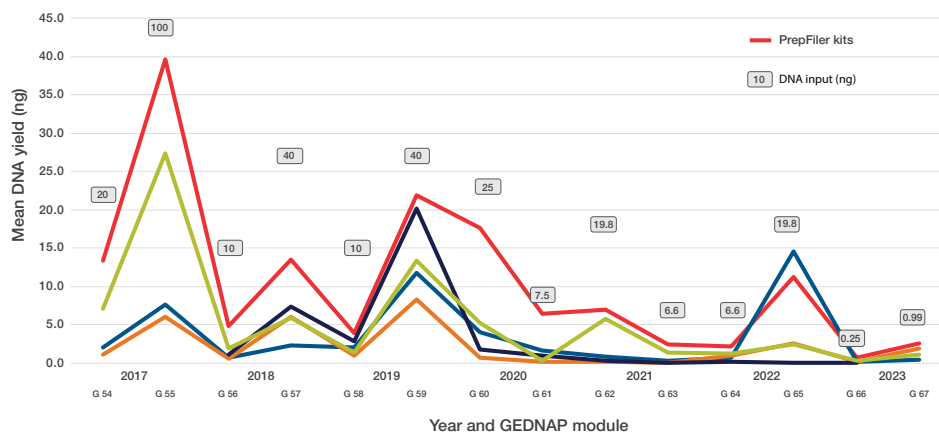


Figure 1. Average DNA yield by manufacturer for DNA input extraction efficiency modules (between 0.25 and 100 ng DNA input). DNA loads for each module are labeled. The red line represents PrepFiler forensic DNA extraction kits. Extraction kits from other manufacturers are also displayed. Not all manufacturers were represented at each DNA extraction efficiency module.

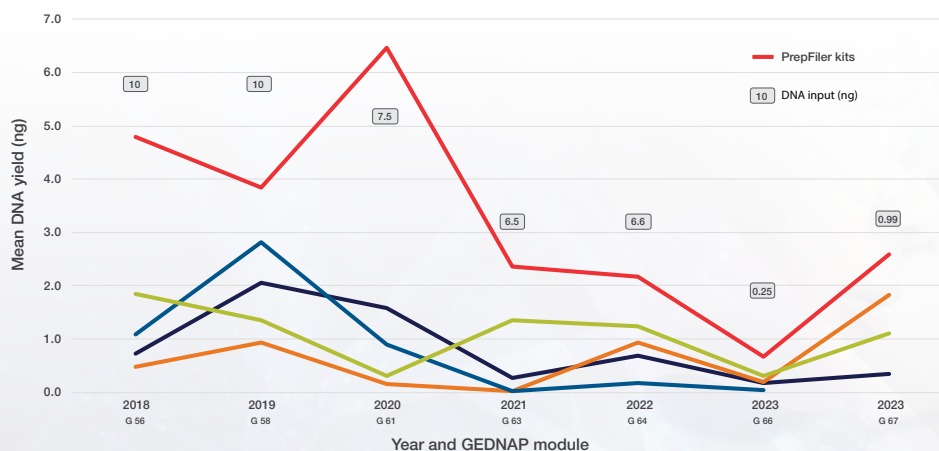
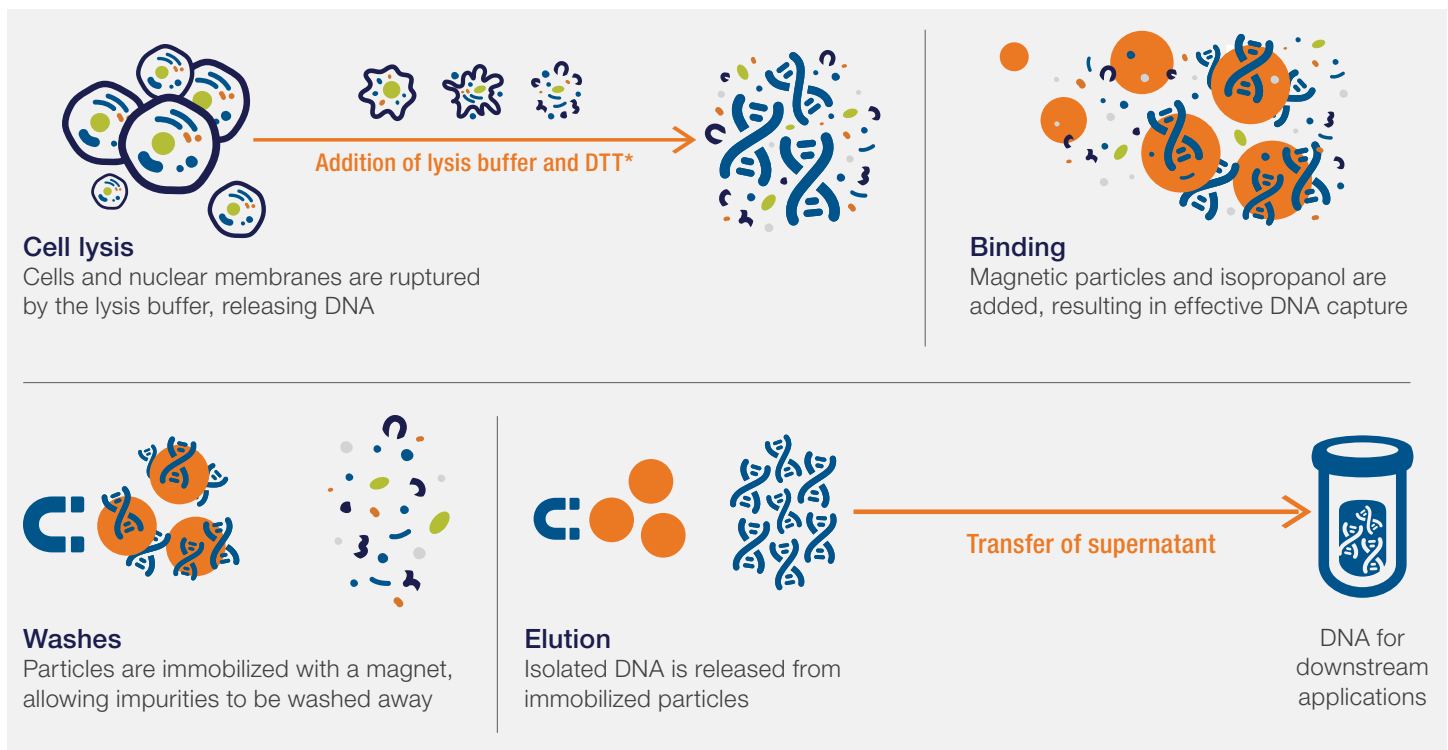


Figure 2. Average DNA yield by manufacturer for DNA input extraction efficiency modules (10 ng DNA input or less). DNA loads for each module are labeled. The red line represents PrepFiler forensic DNA extraction kits. Extraction kits from other manufacturers are also displayed. Not all manufacturers were represented at each DNA extraction efficiency module.

PrepFiler DNA extraction kits—how they work



* 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.

The advantages of the magnetized DNA complex from PrepFiler kits include:

- Efficient DNA binding capacity
- Stable binding during wash steps while removing PCR inhibitors
- Consistent yields of purified DNA separated from the magnetic particles at the elution step
- Smaller magnetic bead particles, resulting in larger surface-area-to-volume ratios and maximizing DNA capture

PrepFiler kits are part of an integrated solution including novel reagents, consumables, and automated options to enable reliable, simplified, and time-saving DNA purification. The kits may help improve downstream genotyping (i.e., STR analysis) success rates and help ensure that critical and limited casework

samples can be successfully analyzed. Additionally, the simple and rapid separation of substrate from lysate with unique Applied Biosystems™ PrepFiler™ LySep™ Columns offers an easy run setup with ready-to-use prefilled cartridges and a closed system that reduces the risk of contamination and transposition errors.

PrepFiler LySep Columns—how they work

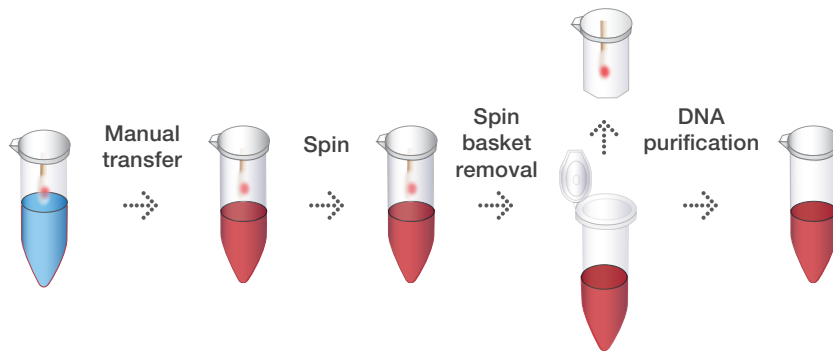
PrepFiler LySep Columns are intended for use with PrepFiler forensic DNA extraction kits and allow users to easily perform cell lysis and substrate removal in a single tube assembly. There is no transfer of the substrate to another tube for removal, thus minimizing hands-on time and helping to reduce the risk of cross-contamination and sample transposition events.



1. Applied Biosystems™ PrepFiler™ Lysis Buffer or PrepFiler™ BTA Lysis Buffer is added directly into the PrepFiler LySep Columns along with the sample for incubation.
2. The PrepFiler LySep Columns are briefly centrifuged, causing the lysate to flow through the burstable membrane while the substrate remains behind in the column.
3. The sample tube is then ready to be purified.

A comparison of offline license workflows highlights the differences between the commonly used spin basket workflow (Figure 3) and the PrepFiler LySep Column workflow (Figure 4). The PrepFiler LySep Column workflow offers a streamlined process with fewer steps, reduced risk of cross-contamination, and less hands-on time compared to the commonly used spin basket workflow.

Spin basket method

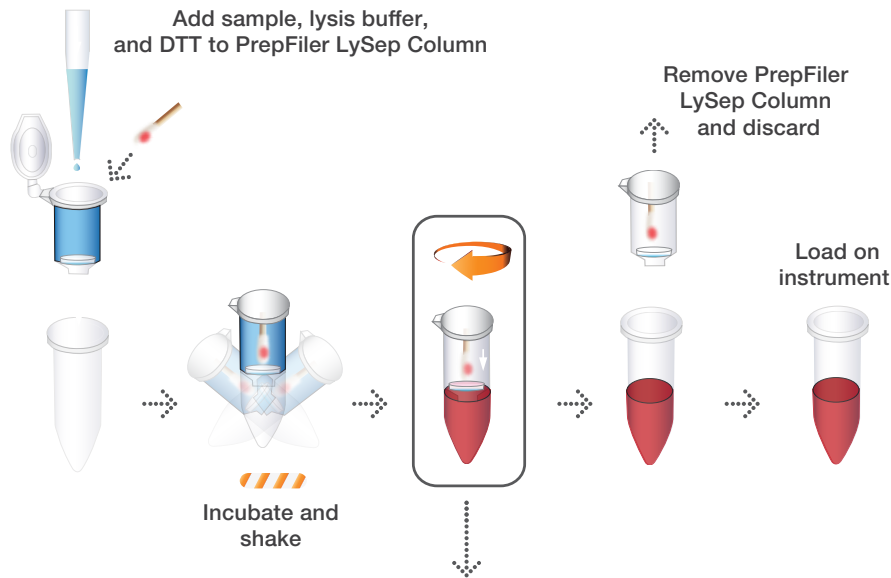


Substrate removal materials needed

- Tweezers/forceps
- Spin basket
- Pipette
- Decontamination supplies (bleach, alcohol, wipes)
- Centrifuge
- Transfer tubes

Figure 3. Workflow for the spin basket method of substrate removal. Methodological challenges include the following. Substrate transfer: requires the use of sterile tweezers or other tools to transfer the substrate to the spin basket. These tools may need cleaning between uses. Tube handling: the tube must be opened multiple times during the process of placing the substrate in the spin column and removing the spin column, which increases the potential for cross-contamination. Centrifugation: an additional centrifugation step may be necessary, followed by the transfer of the sample lysate to a new tube. Residual substrate: any residual substrate can influence the proper isolation of DNA if it is loaded directly onto an instrument or processed manually.

Improved PrepFiler LySep Column method



Substrate removal materials needed

- Centrifuge

High-speed centrifugation enables simple and efficient separation of lysate from substrate

Figure 4. Workflow for the PrepFiler LySep Column method of substrate removal. Methodological improvements include the following. Lysis and substrate removal: allows users to easily perform cell lysis and effective substrate removal in a single tube assembly. Reduced handling: there is no need to transfer the substrate to another tube for removal, which helps reduce hands-on time and the risk of cross-contamination and sample transposition events. Analyst interaction: the only interaction and handling required by the analyst are during the addition of the substrate into the PrepFiler LySep Columns for lysis.

PrepFiler forensic DNA extraction kits are available in manual, express,* and automated formats for use with the Applied Biosystems™ AutoMate Express™ Forensic DNA Extraction System and the Applied Biosystems™ HID NIMBUS® Presto QNA System, both of which offer:

- Optimized workflows to support improved downstream results
- Rapid implementation with prevalidated, preprogrammed instrument protocols
- Enhanced results for a variety of sample types—from high-quantity reference samples to compromised crime scene evidence
- Reduced hands-on time for faster time-to-results while minimizing the risk of contamination



The AutoMate Express Forensic DNA Extraction System for low-throughput labs. Runs up to 13 samples at a time in about 30 minutes.



The HID NIMBUS Presto QNA System for medium- to high-throughput labs. Runs 1–90 samples at a time in less than 90 minutes.

Ordering information

Product	Quantity	Cat. No
PrepFiler Forensic DNA Extraction Kit	100 reactions	4463351
PrepFiler BTA Forensic DNA Extraction Kit	100 reactions	4463352
PrepFiler Automated Forensic DNA Extraction Kit	960 reactions	4463353
PrepFiler BTA Automated Forensic DNA Extraction Kit	960 reactions	4463354
PrepFiler Express Forensic DNA Extraction Kit*	52 preps	4441352
PrepFiler Express BTA Forensic DNA Extraction Kit*	52 preps	4441351
PrepFiler LySep Columns	500 columns	4468323
PrepFiler Capless Sample Tubes	500 tubes	A48397
PrepFiler 96-Well Processing Plates	10 plates	4392904
PrepFiler 96-Well Spin Plates and Filter Plates, ethylene oxide–treated	10 plate assemblies	4476031
PrepFiler Spin Tubes and Filter Columns, ethylene oxide–treated	100 columns/300 tubes	A36853
AutoMate Express Forensic DNA Extraction System	1 system	4441763
HID Nimbus Presto System	1 system	A55395
HID Nimbus Presto QNA System	1 system	A55769

* PrepFiler Express kits are for use with the AutoMate Express Forensic DNA Extraction System.

Find out more at thermofisher.com/prepfilers

applied biosystems