

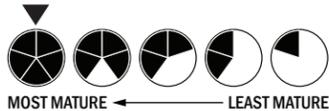
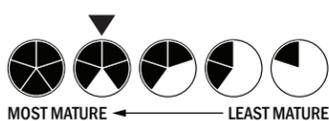
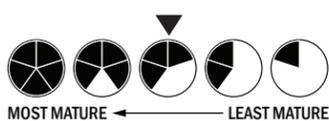
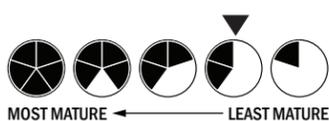
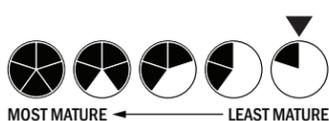
Nucleic Acid Purification Market Survey



Disclaimer

The findings in this report are not to be construed as an official Department of Defense position unless so designated by other authorizing documents.

LIST OF SYMBOLS

Symbol	Definition
	Instrument
	Kit
	Reagent
	Most Applicable
	Somewhat Applicable
	Least Applicable
	Commercially Available and Meets Military Specifications
	Commercially Available
	Brass Board
	Bread Board
	White Board

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INTRODUCTION

The nucleic acids DNA and RNA are commonly used to detect and identify biological agents relevant for national defense, healthcare, and biosurveillance. Relevant technologies, such as genomic sequencing, enzymatic digestion, and the polymerase chain reaction (PCR), often require preliminary extraction and purification of nucleic acids from source samples. A wide variety of commercial products are available to meet sample purification requirements, but it may be difficult to accurately compare products suited to a specific application or detection scenario. To meet these challenges, this market survey reports currently available instruments, kits, and reagents for the extraction and purification of nucleic acids. It provides a broad sampling of commercial technologies and reports the capabilities of the products based on vendor-supplied or open-sourced answers to a distributed survey. For comparison, purification instruments were evaluated on applicability to three environmental scenarios: field use, mobile laboratory use, and analytical laboratory use. Applicability was assessed based on 1) results from a weighted scoring system applied to the survey answers and 2) evaluation by subject matter experts (SMEs).

The purpose of this market survey is to provide the biodefense community a snapshot of available nucleic acid purification and sample preparation options and to assess broad differences in product capabilities as a starting point for acquisition discussions. Organizations should not assume this survey as an end-all-be-all ranking of nucleic acid purification products and are encouraged to contact companies of interest for further information on specific products.

THREE SCENARIOS OF USE

Product utility for nucleic acid sample processing and purification is highly dependent on the operational environment. To ensure the market survey is useful to a large audience in a variety of operational settings, products were evaluated based on appropriateness in three distinct scenarios/environments. Each scenario is provided, along with pertinent features of products predicted to be most suitable for each environment.

Field Use

Field-optimized products are generally lightweight, small, and easy to carry, even if battery packs are required for operation. These products may also be designed to withstand harsh or austere environmental conditions (e.g. heat, cold, humidity, and sunlight) and a variety of climes (e.g. desert, forest, plains, mountain, and urban). These products should be simple to operate, and may trade simplicity for level of purity or range of samples. Overly complicated cleaning procedures or maintenance procedures are not considered ideal and the signature during use should be minimal to reduce visibility during covert operations. Finally, sample collection may be required in contaminated or dangerous operating environments. Therefore, field-use products should be easily operable with heavy personal protection gear and able to withstand cleaning procedures or be of low enough cost to be discarded. For these reasons, disposable, one-use products are often advantageous for the field.

Mobile Laboratory Use

Nucleic acid purification products optimized for mobile laboratory environments feature a compact design, but less reliance on battery power due to the availability of electric generator systems. Mobile laboratory products usually handle low-medium throughput sample processing and process a wide range of sample types/matrices. Furthermore, products requiring additional laboratory items, such as centrifuges and heater blocks, may be viable in a mobile laboratory setting if the additional components are also of limited size. Since a mobile laboratory is often deployed for longer periods of time compared to strict field-based operations, consumables use and manpower must be carefully controlled. Generally, a mobile laboratory product offers a blend of compactness and performance.

Analytical Laboratory Use

Products for use in analytical laboratories (e.g. brick and mortar laboratories) are designed to maximize throughput and output, thus fully automated solutions are best utilized. Due to the permanent location, limitations on size, power consumption, and additional laboratory equipment are reduced. The ideal analytical laboratory nucleic acid purification product is capable of processing different sample types in a high-throughput fashion. Processed nucleic acids would also be of high purity and quality, with immediate applicability to various downstream uses.

EVALUATION PROCESS

In order to initially compare nucleic acid purification products and the expected performance in each of the above scenarios, an evaluation model was developed. Sixteen evaluation criteria were selected that effectively describe and differentiate system characteristics. The criteria were grouped into three master categories: Effectiveness, System Characteristics, and Operations (Figure 1).

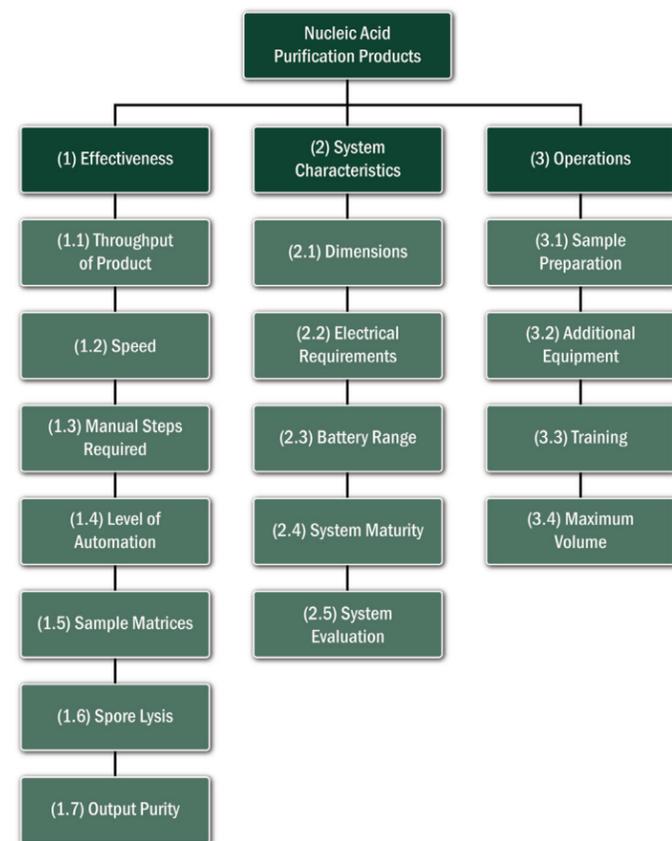


Figure 1. Master categories and associated evaluation criteria

The evaluation criteria were used to form a questionnaire, which was distributed to various manufacturers and suppliers of nucleic acid purification products, and survey responses were converted into scores for comparison. To generate numerical values from the survey responses, performance scales were defined by subject matter experts for the possible answers to each survey question (see Appendix A for survey questions and associated performance scales). Each answer was assigned a utility value based on the expected contribution of that characteristic to the overall system

performance. Utility values ranged from zero, for the lowest expected performance contribution, to 100, for the highest level of expected contribution. Using this approach, product characteristics were converted to point values according to defined evaluation criteria. Scores were then differentially weighted for each of the three environmental scenarios by applying an adjustment factor to each raw point value. The sum of adjustment factors was equivalent across scenarios, but factors were differentially distributed based on the importance of the evaluation criteria in a particular environmental scenario (Table 1). Higher adjustment factors indicate higher importance of an evaluation criterion for a particular environmental scenario.

Evaluation Criteria	Field Use	Mobile Laboratory	Analytical Laboratory
(1) Effectiveness			
(1.1) Throughput of Product	2	10	16
(1.2) Speed	12	8	6
(1.3) Manual Steps Required	8	8	5
(1.4) Level of Automation	4	6	12
(1.5) Sample Matrices	2	6	12
(1.6) Spore Lysis	3	3	3
(1.7) Output Purity	5	7	16
(2) System Characteristics			
(2.1) Dimensions	10	8	1
(2.2) Electrical Requirements	4	8	1
(2.3) Battery Range	14	0	0
(2.4) System Maturity	2	5	5
(2.5) System Evaluation	2	5	5
(3) Operations			
(3.1) Sample Preparation Solutions	10	8	5
(3.2) Additional Equipment Required	10	8	5
(3.3) Training	7	5	5
(3.4) Maximum Volume	5	5	3
Total	100	100	100

Table 1. Distribution of criteria weights based on environmental scenario

For each environmental scenario of use, weight-adjusted criteria scores were summed within the three master categories (Effectiveness, System Characteristics, and Operations), and the sum of the master categories was reported as the overall product score for initial comparison. In order to effectively compare products across scenarios, overall scores were normalized to the top performer for each scenario; the top performer received an adjusted overall score of 100. Scores were used as an initial basis for final conclusions on applicability. **Products were also evaluated by SMEs that provided additional insight into how the systems would perform in the three scenarios of use and, in some cases, overall applicability was adjusted based on the expert input.**

EVALUATION OF NUCLEIC ACID PURIFICATION PRODUCTS

Survey submissions capable of processing nucleic acids were divided into four categories: purification instruments, sample preparation instruments, kits, and reagents. Instruments were defined as self-contained systems using manual, battery, or electrical power. Submitted instruments ranged from handheld disposables to fully automated high throughput machines. Purification instrument output was considered a purified or concentrated sample containing nucleic acids. Sample preparation instruments do not purify nucleic acids, but perform initial processing steps such as cell concentration, cell lysis, and sample homogenization. Kits were defined as pre-packaged bundles of reagents and consumables for use with a standardized protocol to purify samples. Kits often require additional laboratory equipment, such as centrifuges, vortex spinners, and heating elements. Reagents were defined as single formulations or mixtures capable of purifying nucleic acids or reducing components within a matrix to effectively increase the abundance of nucleic acids. Reagents often require the use of additional laboratory or scientific equipment to fully complete a procedure.

The evaluation criteria and associated survey questions were conceived to best differentiate and score purification instruments, as opposed to sample preparation instruments, reagents and kits. Furthermore, highly similar sample preparation instruments, kits, and reagents with equal capabilities and technologies are produced by multiple vendors, making the ranking of these products difficult. Due to these limitations, sample preparation instruments, kits, and reagents were not included in the ranking process. To ensure completeness, product sheets for these categories are still included in this market survey for informational purposes. In total, 43 purification instruments, 8 sample preparation instruments, 9 kits, and 6 reagents were submitted or identified as appropriate for inclusion in this market survey.

Overall product scores were used to initially group nucleic acid purification products into three tiers, based on rank order. Final tier groupings were established after SMEs reviewed the initial scored groupings and made adjustments based on the expert input. Products in the top tier (Tier I) were considered “most applicable” for a particular environmental scenario, middle tier (Tier II) products were considered “somewhat applicable”, and the bottom tier (Tier III) products were considered “least applicable”. For ease of comparison, a simple shape/color scheme was applied to label products as belonging to a particular tier group (Figure 2). Overall product scores were also compared between scenarios of use and without SME input.

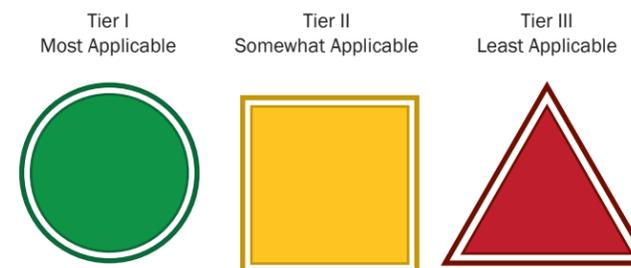


Figure 2. Tier group icons and definitions of product applicability

Field Use

The evaluation criteria weighted most heavily for field use included system characteristics and operations representing features that allow for portability and ease-of-use. The overall effectiveness of a system, including throughput and purity was downplayed, although speed of the protocol and a reduced number of manual steps were maintained as relatively important. Refer to Figure 3 for the specific weights (reported as adjustment factors) applied to each evaluation criterion for the field use scenario. The ideal field use system would be small, easily transportable, capable of battery operation or no power requirements, easy to use, and self-contained.

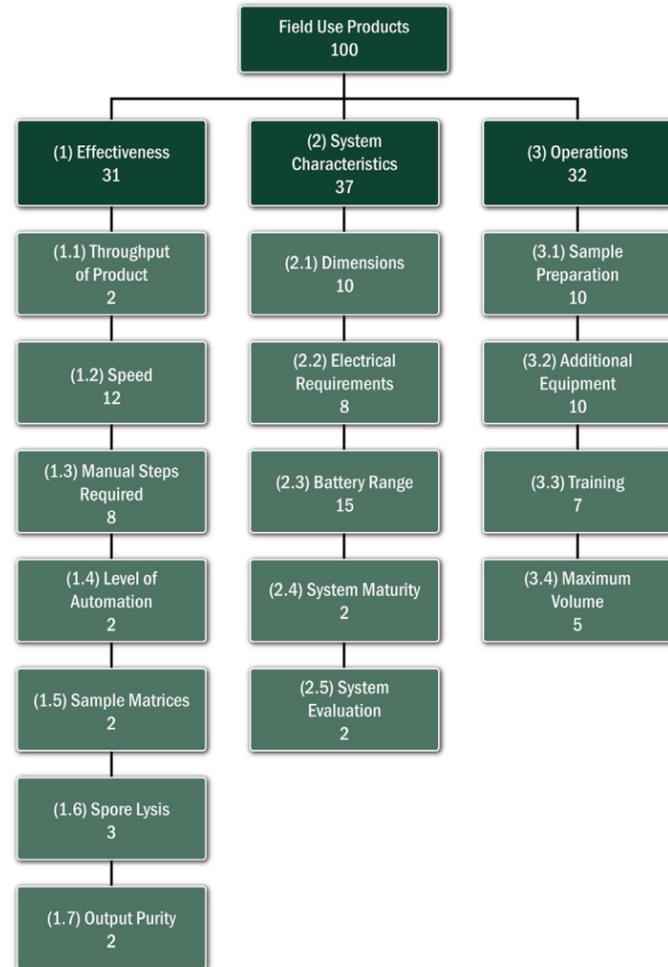


Figure 3. Field Use Weights

Results

Notable Tier I products most applicable for field use include the Integrated Nano-Technologies – Palladium and Advanced Liquid Logic - R110. Both products combine the convenience of automated sample preparation in disposable cartridges with the ability to operate as a portable battery powered unit. While most other products included in this survey are dedicated nucleic acid preparation instruments, the Palladium and R110 use an open architecture design so a number of common laboratory techniques, including nucleic acid purification, can be performed. In addition, the systems process a variety of sample matrices and offer fast preparation time. Disposable products that operate manually or under small battery power are also highly coveted in a field use scenario. Such offerings with high overall Tier I rankings include the Akonni Biosystems – TruTips and the Claremont Biosolutions-PureLyse. The complete field use rankings are displayed in Figure 8.



Figure 4. Integrated Nano-Technologies-Palladium



Figure 5. Advanced Liquid Logic-R110



Figure 6. Akonni Biosystems-TruTips



Figure 7. Claremont Biosolutions-PureLyse

Field Use	
Tier	Company - Product Name
●	Advanced Liquid Logic - R110
●	Akonni Biosystems - TruTip
■	Aurora Biomed - VERSA 110 NAP-PCR Workstation
■	Aurora Biomed - VERSA Gene Nucleic Acid Preparation Workstation
▲	AutoGen, Inc. - AutoGenPrep 965
▲	AutoGen, Inc. - FLEX STAR
▲	AutoGen, Inc. - GENE PREP
■	AutoGen, Inc. - QuickGene 610L
■	AutoGen, Inc. - QuickGene 810
■	AutoGen, Inc. - QuickGene Mini-80
▲	bioMérieux, Inc. - NucliSENS easyMAG
▲	bioMérieux, Inc. - NucliSENS miniMAG
▲	Boreal Genomics - Aurora Nucleic Acid Purification System
●	Claremont BioSolutions, LLC. - Automated Sample Prep Module
●	Claremont BioSolutions, LLC. - PureLyse
●	CUBRC, Inc. - DNAPro Extraction Pipette
●	Integrated Nano-Technologies, LLC. - Palladium
▲	Life Technologies - 6700 Automated Nucleic Acid Workstation
▲	Life Technologies - AB Library Builder System
▲	Life Technologies - Automate Express Forensic DNA Extraction System
▲	Life Technologies - BenchPro 2100 Plasmid Purification Station
▲	Life Technologies - iPrep Purification System
■	Life Technologies - MagMAX Express 24 Magnetic Particle Processor
▲	Life Technologies - MagMAX Express 96 Magnetic Particle Processor
▲	MP Biomedicals - RapidGene12
■	Precision System Science USA, Inc. - Magtration 12GC Plus
▲	Precision System Science USA, Inc. - Magtration 6Mx
■	Promega Corporation - Maxwell 16 (Forensic)
■	Promega Corporation - Maxwell 16 (Diagnostic)
■	Promega Corporation - Maxwell 16 (Research)
●	QIAGEN, Inc. - EZ-1 Advanced
▲	QIAGEN, Inc. - QIAcube
▲	QIAGEN, Inc. - QIASymphony SP/AS
▲	QIAGEN, Inc. - QIAextractor
●	QuickSilver Analytics, Inc. - LiNKs 2.1
▲	Roche Diagnostics Corporation - MagNA Pure 96
■	Roche Diagnostics Corporation - MagNA Pure Compact
▲	Roche Diagnostics Corporation - MagNA Pure LC 2.0
▲	STRATEC Molecular GmbH - InviGenius
■	STRATEC Molecular GmbH - InviMag Rack plus InviMag Kits
▲	Tecan US, Inc. - Freedom EVO Nucleic Acid Purification Workstation
▲	Thermo Fisher Scientific, Inc. - KingFisher Duo
■	Thermo Fisher Scientific, Inc. - Kingfisher Flex

Figure 8. Field Use Rankings

Mobile Laboratory

The evaluation of nucleic acid purification products for use in a mobile laboratory placed emphasis on throughput, dimensions, electrical requirements, reduced number of manual steps, and a limitation on additional required equipment. These features provide a blend of system characteristics best suited for medium throughput and the physical limitations inherent in a mobile laboratory setting with limited space. The weights applied to the mobile laboratory scenario are provided in Figure 9.

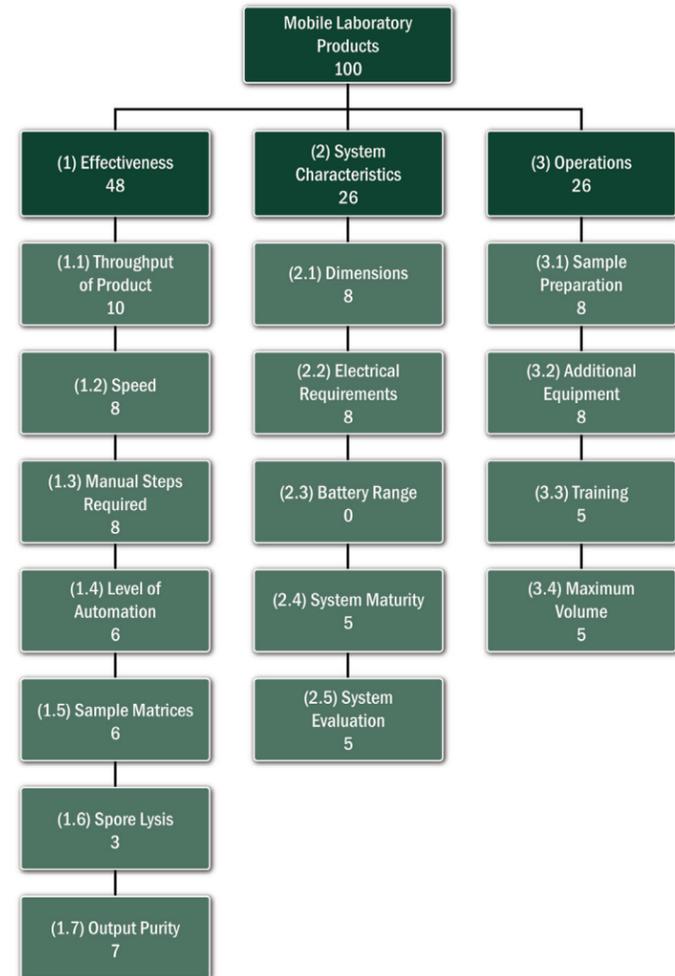


Figure 9. Mobile Laboratory Weights

Results

Notable products for mobile laboratory use include the Thermo Fisher Scientific, Inc. - KingFisher Flex, the Qiagen, Inc. - EZ-1 Advanced instruments, the Promega Corporation- Maxwell 16 line of instruments, and the Roche Diagnostics Corporation - MagNA Pure 96. It should be noted that the Life Technologies - MagMAX Express 96 Magnetic Particle Processor also ranked



Figure 10. Thermo Fisher Scientific, Inc.-Kingfisher Flex

highly, since it is a licensed version of the KingFisher Flex. These products all use magnetic particle capture technology for nucleic acid purification, enabling fast protocol times and a streamlined series of assay steps. Furthermore, the systems strike a compromise between size and throughput, and generally use reagent kits or cartridges with a low reliance on additional laboratory equipment. Similar to the field use scenario, the Advanced Liquid Logic - R110 and Integrated Nano-Technologies - Palladium also ranked highly. It should be noted that scores for this environmental scenario are closely clustered in the top tier of systems, suggesting many products reviewed in this survey are suitable for a mobile laboratory setting. The complete mobile laboratory rankings are displayed in Figure 14.



Figure 13. Roche Diagnostics Corporation-MagNA Pure 96



Figure 11. QIAGEN, Inc.-EZ-1 Advanced

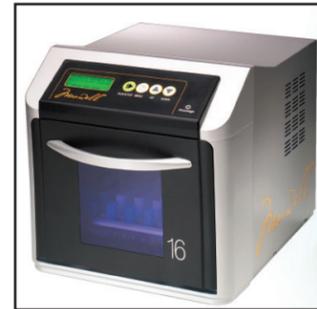


Figure 12. Promega Corporation-Maxwell 16

Mobile Laboratory	
Tier	Company - Product Name
●	Advanced Liquid Logic - R110
●	Akonni Biosystems - TruTip
●	Aurora Biomed - VERSA 110 NAP-PCR Workstation
■	Aurora Biomed - VERSA Gene Nucleic Acid Preparation Workstation
▲	AutoGen, Inc. - AutoGenPrep 965
▲	AutoGen, Inc. - FLEX STAR
▲	AutoGen, Inc. - GENE PREP
●	AutoGen, Inc. - QuickGene 610L
●	AutoGen, Inc. - QuickGene 810
●	AutoGen, Inc. - QuickGene Mini-80
●	bioMérieux, Inc. - NucliSENS easyMAG
●	bioMérieux, Inc. - NucliSENS miniMAG
■	Boreal Genomics - Aurora Nucleic Acid Purification System
▲	Claremont BioSolutions, LLC. - Automated Sample Prep Module
●	Claremont BioSolutions, LLC. - PureLyse
▲	CUBRC, Inc. - DNAPro Extraction Pipette
●	Integrated Nano-Technologies, LLC. - Palladium
▲	Life Technologies - 6700 Automated Nucleic Acid Workstation
▲	Life Technologies - AB Library Builder System
▲	Life Technologies - Automate Express Forensic DNA Extraction System
■	Life Technologies - BenchPro 2100 Plasmid Purification Station
■	Life Technologies - iPrep Purification System
■	Life Technologies - MagMAX Express 24 Magnetic Particle Processor
●	Life Technologies - MagMAX Express 96 Magnetic Particle Processor
●	MP Biomedicals - RapidGene12
■	Precision System Science USA, Inc. - Magtration 12GC Plus
●	Precision System Science USA, Inc. - Magtration 6Mx
●	Promega Corporation - Maxwell 16 (Forensic)
●	Promega Corporation - Maxwell 16 (Diagnostic)
●	Promega Corporation - Maxwell 16 (Research)
●	QIAGEN, Inc. - EZ-1 Advanced
■	QIAGEN, Inc. - QIAcube
■	QIAGEN, Inc. - QIASymphony SP/AS
●	QIAGEN, Inc. - QIAextractor
▲	QuickSilver Analytics, Inc. - LINKs 2.1
●	Roche Diagnostics Corporation - MagNA Pure 96
●	Roche Diagnostics Corporation - MagNA Pure Compact
●	Roche Diagnostics Corporation - MagNA Pure LC 2.0
●	STRATEC Molecular GmbH - InviGenius
●	STRATEC Molecular GmbH - InviMag Rack plus InviMag Kits
▲	Tecan US, Inc. - Freedom EVO Nucleic Acid Purification Workstation
●	Thermo Fisher Scientific, Inc. - KingFisher Duo
●	Thermo Fisher Scientific, Inc. - Kingfisher Flex

Figure 14. Mobile Laboratory Rankings

Analytical Laboratory

The evaluation of systems best suited for use in an analytical laboratory placed emphasis on throughput of product, level of automation, sample matrix flexibility, and output purity. Since analytical laboratories generally have adequate space, power supply, and a large array of ancillary laboratory equipment for various sample preparation procedures, the evaluation reduced weighting for these characteristics. Refer to Figure 15 for distribution of weights for a system most appropriate in an analytical laboratory environment.

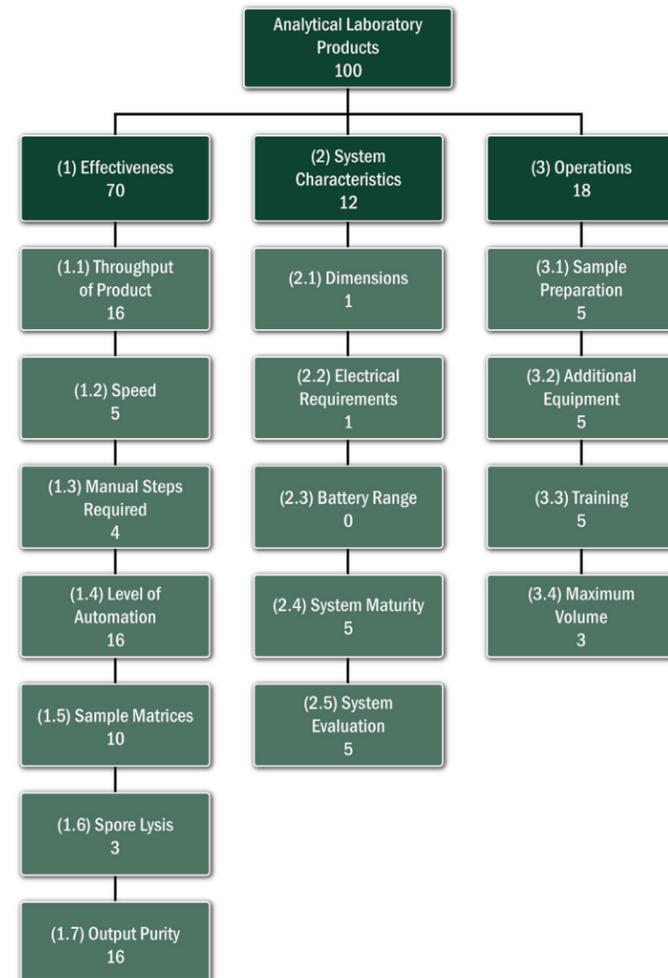


Figure 15. Analytical Laboratory Weights

Results

The Aurora Biomed - VERSA 110 NAP-PCR workstation scored well for analytical laboratory use, primarily due to its highly customizable configurations capable of nucleic acid purification in any format and throughput. This product relies on development of a custom protocol and reagents, or may utilize commercially available kits. Other high-throughput products of note include the Qiagen - QIASymphony SP/AS, Qiagen - QIAxtractor and the Autogen - FLEX STAR. These systems are capable of automated processing of hundreds of samples per

day, at high purity, and in a wide array of sample matrices. In general, products highly suitable for analytical laboratories were generally not suitable for field use, and vice-versa. Similar to the mobile laboratory scenario, a number of products scored well for analytical laboratory use. The complete analytical laboratory rankings are displayed in Figure 20.



Figure 17. QIAGEN, Inc.- QIASymphony SP/AS



Figure 19. AutoGen, Inc.- FLEX STAR



Figure 16. Aurora Biomed- VERSA 110 NAP-PCR Workstation

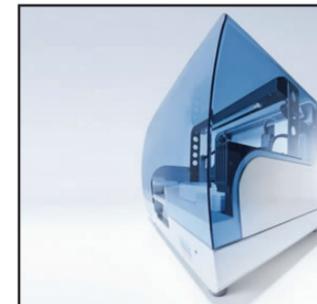


Figure 18. QIAGEN, Inc.- QIAxtractor

Analytical Laboratory	
Tier	Company - Product Name
●	Advanced Liquid Logic - R110
▲	Akonn Biosystems - TruTip
●	Aurora Biomed - VERSA 110 NAP-PCR Workstation
●	Aurora Biomed - VERSA Gene Nucleic Acid Preparation Workstation
■	AutoGen, Inc. - AutoGenPrep 965
●	AutoGen, Inc. - FLEX STAR
●	AutoGen, Inc. - GENE PREP
▲	AutoGen, Inc. - QuickGene 610L
■	AutoGen, Inc. - QuickGene 810
■	AutoGen, Inc. - QuickGene Mini-80
■	bioMérieux, Inc. - NucliSENS easyMAG
▲	bioMérieux, Inc. - NucliSENS miniMAG
▲	Boreal Genomics - Aurora Nucleic Acid Purification System
▲	Claremont BioSolutions, LLC. - Automated Sample Prep Module
▲	Claremont BioSolutions, LLC. - PureLyse
▲	CUBRC, Inc. - DNAPro Extraction Pipette
■	Integrated Nano-Technologies, LLC. - Palladium
●	Life Technologies - 6700 Automated Nucleic Acid Workstation
●	Life Technologies - AB Library Builder System
●	Life Technologies - Automate Express Forensic DNA Extraction System
■	Life Technologies - BenchPro 2100 Plasmid Purification Station
●	Life Technologies - iPrep Purification System
●	Life Technologies - MagMAX Express 24 Magnetic Particle Processor
●	Life Technologies - MagMAX Express 96 Magnetic Particle Processor
■	MP Biomedicals - RapidGene12
●	Precision System Science USA, Inc. - Magtration 12GC Plus
●	Precision System Science USA, Inc. - Magtration 6Mx
●	Promega Corporation - Maxwell 16 (Forensic)
●	Promega Corporation - Maxwell 16 (Diagnostic)
●	Promega Corporation - Maxwell 16 (Research)
■	QIAGEN, Inc. - EZ-1 Advanced
●	QIAGEN, Inc. - QIAcube
●	QIAGEN, Inc. - QIASymphony SP/AS
●	QIAGEN, Inc. - QIAxtractor
▲	QuickSilver Analytics, Inc. - LINKs 2.1
●	Roche Diagnostics Corporation - MagNA Pure 96
■	Roche Diagnostics Corporation - MagNA Pure Compact
●	Roche Diagnostics Corporation - MagNA Pure LC 2.0
■	STRATEC Molecular GmbH - InviGenius
▲	STRATEC Molecular GmbH - InviMag Rack plus InviMag Kits
●	Tecan US, Inc. - Freedom EVO Nucleic Acid Purification Workstation
■	Thermo Fisher Scientific, Inc. - KingFisher Duo
●	Thermo Fisher Scientific, Inc. - Kingfisher Flex

Figure 20. Analytical Laboratory Rankings

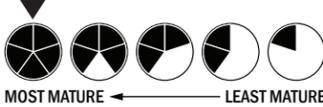
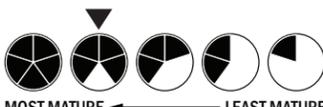
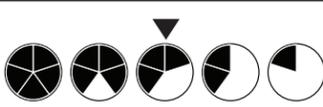
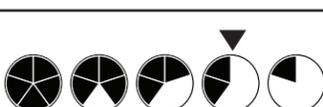
Summary

This survey utilized product information and subject matter expertise to rank various nucleic acid purification instruments for applicability in three environmental scenarios of use. Based on the summary results, products of interest should be identified and explored further using the Detailed Product Sheets. Multiple products should be compared, since specific operational needs will vary widely. While reviewing the results of this performance evaluation, the following considerations should be kept in mind:

1. Since tier groupings are partially based on rank order, members of the same tier may have relatively distinct scores and, thus, performance features. See Appendix B for system scores used to establish tier groupings.
2. Subject matter experts adjusted tier groupings if rank ordering inappropriately positioned a particular system. Therefore, tier groups may not be evenly distributed within an environmental scenario.
3. Each Detailed Product Sheet includes an Analytical Scoring Summary, which provides the rank order of overall scoring for each scenario without SME input.
4. Survey responses were mostly vendor-supplied and claims of performance or capabilities may require independent verification.
5. In some cases, answers were obtained from open-source internet searches.
6. Appendix D contains comments supplied by vendors for clarification or elaboration to specific responses. These comments were not converted to scores, yet may serve as a useful resource.
7. It is recommended that additional information should be sought directly from vendors before any final procurement decisions are made.

DETAILED PRODUCT SHEETS - INSTRUMENTS (NUCLEIC ACID PURIFICATION)

LIST OF SYMBOLS

Symbol	Definition
	Instrument
	Kit
	Reagent
	Most Applicable
	Somewhat Applicable
	Least Applicable
	Commercially Available and Meets Military Specifications
	Commercially Available
	Brass Board
	Bread Board
	White Board

Advanced Liquid Logic-R110



DESCRIPTION:

Advanced Liquid Logic, Inc. (ALL) has developed a patented liquid handling technology called “digital microfluidics” that enables low-cost automation of complex bioanalytical workflows including sample-to-answer diagnostic. The instrument and cartridge-based platform developed by ALL eliminates the need for cumbersome and failure-prone pumps, valves and tubes by manipulating liquid droplets on an array of electrodes. The key factors that differentiate the ALL system are: 1. Assay flexibility-adding and optimizing assay types is rapidly accomplished by editing software 2. Low cost-component manufacturing processes are cost-effective and well-established 3. Broadly deployable-suited to any setting, from research lab to zero resource field environment. An exhaustive range of complex bioanalytical and biopreparatory workflows relevant to clinical diagnostics, biothreat, forensics and general life sciences research have been translated onto ALL’s digital microfluidics platform. Some of the applications that have been implemented on our system include: Sample extraction & purification (from crude samples to pure: DNA, RNA or protein), Full sample-in-answer-out protocols, Newborn screening (enzymatic activity assays), Next-gen sequencing library prep, Real-time and Endpoint qPCR, Sample-to- sequence (pyrosequencing) for human and microbial ID, Cell-based assays, Coagulation monitoring, Immunoassays. ALL has also implemented multianalyte workflows that combine nucleic acid and immuno analysis on the same sample. The hallmarks of the ALL system are its flexibility and very low cost.



CONTACT INFORMATION

Advanced Liquid Logic
615 Davis Drive Suite 800
Research Triangle Park, NC 27709
919-287-9010

COST

• \$20,000 (instrument); \$10-200 per cartridge

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

R110 has been placed in the top tier of all evaluated products for field use, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

R110 has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

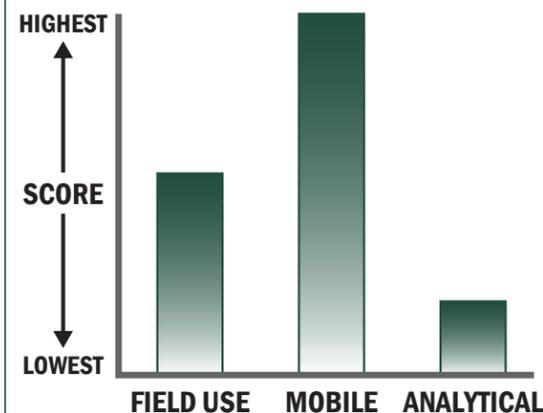
R110 has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Vendor supplied information

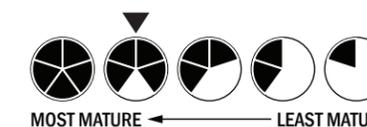
Evaluation Criteria

Effectiveness:

- Throughput of 32-95 samples/ batch
- 20 minutes or less for sample prep
- 1-2 steps required for prep
- System is currently fully automated
- Manual kit handles spore lysis
- The system output is DNA, RNA, cDNA from RNA, nucleic acids with background reduction, or nucleic acids with preferential selection
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- Battery lasts 4-8 hours
- The system is commercially available
- Government testing and scientific publication



Operations:

- System is designed for a single use
- 2 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Akonni Biosystems–TruTip



DESCRIPTION:

TruTip uses a nucleic acid binding matrix imbedded in a pipette tip to provide fast and low cost extraction of DNA and RNA. The modified pipette tips obviate the need for major equipment, such as centrifuges, if used in manual format. However, the tips can also be quickly adopted for use in automated instruments. Pipette tips from any manufacturer can be modified into TruTips, thus any instrument can be used. The concentrated nucleic acid preparation output contains a low level of PCR inhibitors and is comparable to all “gold standard” purification methods. TruTips are supplied in large porosity and small porosity formats to allow flexibility to handle thicker samples such as blood. TruTip kits accommodate a wide range of sample sources (i.e. blood, saliva, urine, sputum, and nasopharyngeal aspirate), sample viscosities, and sample types from human genomic DNA to microorganisms (bacterial or viral pathogens).



CONTACT INFORMATION

Akonni Biosystems Corporate Headquarters
400 Sagner Ave. Suite 300
Frederick, MD 21701
301-698-0101
sales@akonni.com

COST

• \$5.00 per extraction

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

TruTip has been placed in the top tier of all evaluated products for field use, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

TruTip has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

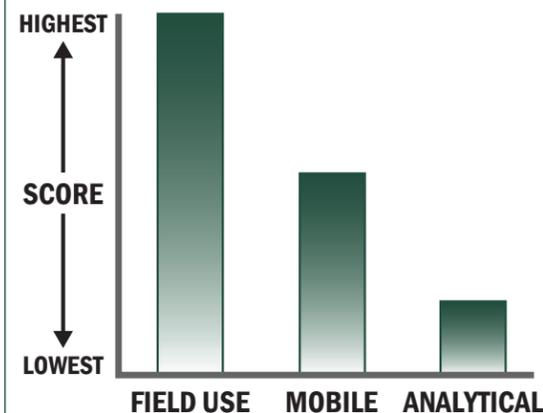
TruTip has been placed in the bottom tier of all evaluated products for analytical laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	✓
Stool	
Other	

Survey Source

Vendor supplied information

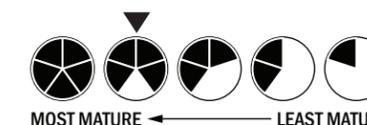
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/ batch
- 20 minutes or less for sample prep
- 3-5 steps are required for prep
- System easily adapted to full automation
- System does not lyse spores
- The system output is DNA or RNA
- Purity ratio less than 1.8

System Characteristics:

- Approximately the size of a soda can
- System has no electrical requirement
- System has no power requirement
- The system is commercially available
- Government testing, third party testing and scientific publication



Operations:

- System is designed for a single use
- 3 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Aurora Biomed–VERSA 110 NAP/PCR Workstation



DESCRIPTION:

The VERSA 110 NAP/PCR Workstation is a compact, automated nucleic acid preparation workstation designed to perform virtually every task for nucleic acid isolation and nucleic acid purification with high precision, throughput and accuracy. With a built-in multi-well plate shaker, temperature control and the option of a magnetic block or a vacuum manifold, the VERSA 110 NAP/PCR Workstation performs automated nucleic acid isolation and prepares nucleic acid samples for PCR or other downstream applications including sequencing. The workstation is also used in the isolation of bacterial plasmids and nucleic acid fragments. Laboratories are facing increasing demands on their resources as testing permutations dictate an increasingly large number of samples per trial while exposing technicians to dangerous chemicals. With such drawbacks against manual nucleic acid extraction methods, a growing number of labs are switching from manual to automated extraction solutions to overcome bottlenecks and save on expensive reagents involved in extraction processes.



CONTACT INFORMATION

Aurora Biomed
1001 E Pender St.
Vancouver, BC V6A 1W2 Canada

North America:
800-883-2918
info@aurorabiomed.com

International:
+1 604-215-8700
info@aurora-instr.com

COST

• \$45,000

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

VERSA 110 NAP-PCR Workstation has been placed in the middle tier of all evaluated products for field use, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

VERSA 110 NAP-PCR Workstation has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

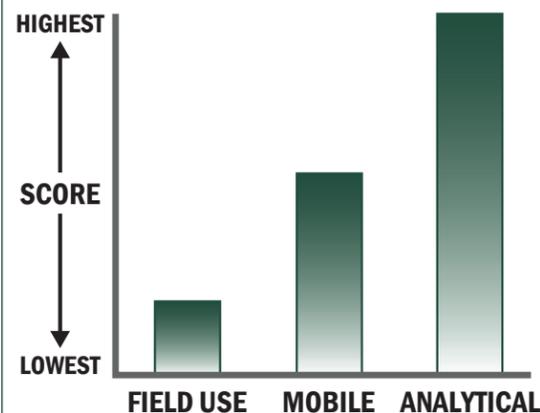
VERSA 110 NAP-PCR Workstation has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Vendor supplied information

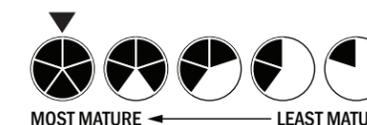
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/ batch or higher
- 60-120 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- Semi-automated spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a home dishwasher
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available and meets milspecs
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 4 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Aurora Biomed-VERSA Gene Nucleic Acid Preparation Workstation



DESCRIPTION:

The VERSA GENE workstation can streamline your laboratory and perform automated DNA extraction and automated RNA extraction tasks for downstream PCR and sequencing. This automated liquid handling workstation performs nucleic acid purification and PCR setup for end point or real time PCR with high precision, throughput and accuracy. This system is



capable of complete work-up of RNA or DNA samples from extraction through to preparation of the PCR plate for amplification. The VERSA GENE is ideal for nucleic acid purification and is applicable to a wide range of research areas such as: disease control (avian flu, SARS, HIV), forensics (DNA fingerprinting), molecular pathology (cancer, genetic susceptibility), environment/food (GMOs and pathogen identification), bacterial plasmid isolation and other molecular biology applications. While this system is dedicated for nucleic acid isolation and enables researchers to automate DNA extraction and RNA extraction, the underlying versatility of the workstation allows researchers to carry out many generic liquid handling tasks such as: serial dilution, cherry picking, plate reformatting, plate replication and normalization. This workstation is open to most 3rd party reagent kits and labware.

CONTACT INFORMATION

Aurora Biomed
1001 E Pender St.
Vancouver, BC V6A 1W2 Canada

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800-883-2918
info@aurorabiomed.com

International:
+1 604-215-8700
info@aurora-instr.com

COST

• \$75,000

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

VERSA Gene Nucleic Acid Preparation Workstation has been placed in the middle tier of all evaluated products for field use, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

VERSA Gene Nucleic Acid Preparation Workstation has been placed in the middle tier of all evaluated products for mobile laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

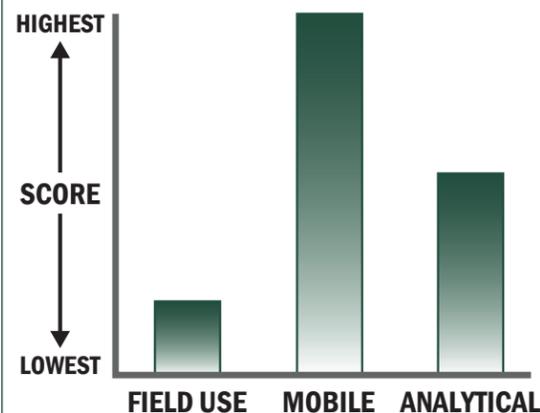
VERSA Gene Nucleic Acid Preparation Workstation has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Vendor supplied information

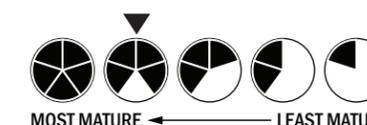
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/ batch or higher
- 40-60 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- Fully automated spore lysis
- The system output is DNA or RNA
- Purity ratio unknown

System Characteristics:

- Approximately the size of a home dishwasher
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 4 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

AutoGen, Inc.–AutoGenPrep 965



DESCRIPTION:
The AutoGenprep 965 is a fully automated high throughput system for DNA extraction. Employing the 96-well format, the system uses AutoGen’s solution-phase chemistry for high throughput whole blood extraction at a very low cost per prep. The 965 combines an automated 12-channel pipetting module, robotic plate movement and a built-in centrifuge to provide fast results in a consistent and reliable manner. The 965 is a fully automated system; after samples are loaded into deep well plates, start a protocol and walk away. The AutoGenprep 965 purifies DNA from up to 4 deep well plates in 4-6 hours. The resuspended and purified nucleic acid output can be used directly in your next application, such as PCR, Southern blotting, and restriction digestion. Autogen’s solution-phase DNA extraction chemistry does not require the use of expensive disposable columns or magnetic beads, resulting in low cost per prep and allows quick development of new extraction protocols for a wide variety of sample types. Available protocols include: whole blood, blood spots, buffy coats, ES cells, plant, tissue, cells, microbes, plasmids and BACs.



CONTACT INFORMATION

AutoGen, Inc.
84 October Hill Road
Holliston, MA 01746-1371
508-429-5965
dna@autogen.com

COST

• \$225,000

Tier Selection
Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking
AutoGenPrep 965 has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking
AutoGenPrep 965 has been placed in the bottom tier of all evaluated products for mobile laboratories, resulting in a “least applicable” ranking.



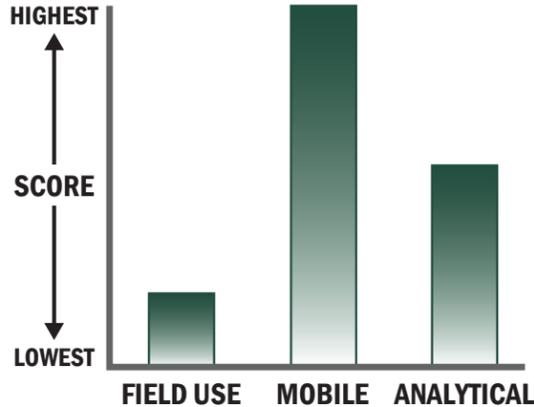
- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking
AutoGenPrep 965 has been placed in the middle tier of all evaluated products for analytical laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary
This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source
Vendor supplied information

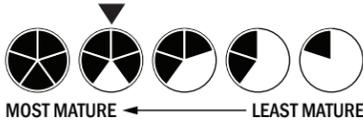
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/ batch or higher
- Greater than 120 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a home dishwasher
- System has 220V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Government testing and third party testing



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 5+ solutions, buffers, and/or reagents
- No additional equipment needed
- More than a day of training and significant technical skills required
- 100-500 µL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	✓

AutoGen, Inc.–FLEX STAR



DESCRIPTION:
The FLEX STAR is a fully automated system for extracting DNA from large volumes of whole blood, cells and saliva. Combining AutoGen’s instrumentation and Qiagen’s FlexiGene chemistry, the FLEX STAR extracts DNA from 1-10 mLs of whole blood. The FLEX STAR contains an onboard centrifuge, thus the system is completely automated with no manual intervention once samples are loaded. Reagents are delivered via 9 independent motor driven syringes and 2 separate waste bottles for biological and non-infectious waste allow for increased cleanup efficiency. Up to 30 whole blood samples can be processed per run. Bar code identification tracks each sample through the entire isolation process and the software documents the position of each sample and all conditions and parameters of each run. An interface to LIMS system allows for downloading reports to your database. Genomic DNA isolated by the FLEX STAR is suitable for all common downstream applications, or long-term storage in biorepositories. The system can also be used to isolate DNA from tissue samples, cells and saliva samples.



CONTACT INFORMATION

AutoGen, Inc.
84 October Hill Road
Holliston, MA 01746-1371
508-429-5965
dna@autogen.com

COST

• \$159,950

Tier Selection
Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking
FLEX STAR has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking
FLEX STAR has been placed in the bottom tier of all evaluated products for mobile laboratories, resulting in a “least applicable” ranking.

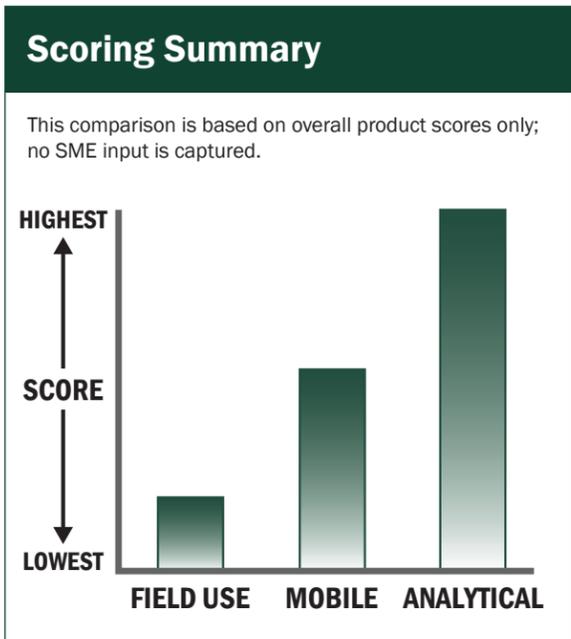


- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking
FLEX STAR has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable



Sample Matrices Handled by System

Soil	
Water	
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	Oragene saliva, buccal swabs

Survey Source
Vendor supplied information

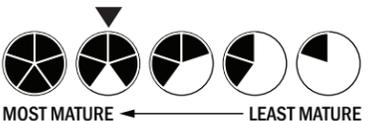
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/batch
- Greater than 120 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a home dishwasher
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Scientific publication alone



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 5+ solutions, buffers, and/or reagents
- No additional equipment needed
- More than a day of training and significant technical skills required
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

AutoGen, Inc.–GENE PREP



DESCRIPTION:
The GENE PREP is the latest fully automated medium to high-throughput genomic DNA extraction, purification and resuspension system from AutoGen. The system uses our proven solution phase extraction chemistry for extraction of high quality nucleic acids at a low cost per prep. The GENE PREP processes 48 samples in 2 hours, and an optional tube stacker can increase throughput to 192 samples in 8 hours. The GENE PREP is outfitted with an expandable reagent dispensing system. The option of 6, 9, or 12 independent reagent lines reduces the need to switch out reagents when changing protocols, eliminating contamination, error, and wash steps. A built-in centrifuge eliminates the need to collect bacteria pellets manually before the run. A heating shaker allows for quicker DNA drying as well as on board enzymatic digestion steps. These features enable a true automated solution for nucleic acid preparation. Protocols available include genomic DNA isolation from animal tissues, cells, plants, buffy coats, and saliva, as well as plasmid and BAC DNA isolation from bacterial cells. Reagents are supplied in kit format for ease-of-use and disposable tube unit is compatible with commercially available 8-channel pipettors. Nucleic acids prepared using the GENE PREP are suitable for PCR, restriction digestion, and other common downstream applications.



CONTACT INFORMATION

AutoGen, Inc.
84 October Hill Road
Holliston, MA 01746-1371
508-429-5965
dna@autogen.com

COST

• \$103,950

Tier Selection
Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking
GENE PREP has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking
GENE PREP has been placed in the bottom tier of all evaluated products for mobile laboratories, resulting in a “least applicable” ranking.

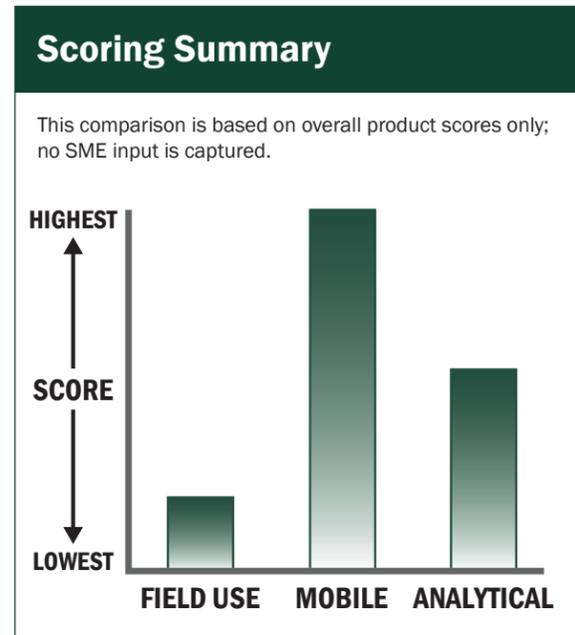


- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking
GENE PREP has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable



Sample Matrices Handled by System

Soil	
Water	
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	✓
Stool	
Other	

Survey Source
Vendor supplied information

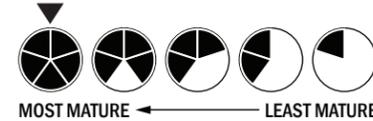
Evaluation Criteria

Effectiveness:

- Throughput of 32-95 samples/ batch
- Greater than 120 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a home dishwasher
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available and meets milspecs
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 5+ solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- 500 µL-1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	✓

AutoGen, Inc.–QuickGene 610L



DESCRIPTION:

The QuickGene 610L is a compact benchtop automated extraction system for rapid isolation of genomic DNA from up to 2.0 mLs of whole blood and saliva. The QuickGene technology utilizes an ultra-thin polymer membrane for efficient capture of nucleic acids. This novel extraction technology process allows for isolation of high quality genomic DNA with high yields, suitable for a wide range of applications. The technology is also low pressure and gentle, resulting in less fragmentation of DNA molecules compared to spin-column procedures. The 610L will process up to 6 whole blood samples of 2 mLs each in 12 minutes, saving valuable time and labor in your lab. The entire process, including pretreatment of whole blood, is completed within 25 minutes. After pretreatment, samples are loaded into a cartridge and inserted into the machine for automated processing. DNA isolated with the 610L is of high purity and can be directly applied to downstream applications such as sequencing, SNP validation, linkage analysis, and PCR.



CONTACT INFORMATION

AutoGen, Inc.
84 October Hill Road
Holliston, MA 01746-1371
508-429-5965
dna@autogen.com

COST

• \$16,950

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

QuickGene 610L has been placed in the middle tier of all evaluated products for field use, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

QuickGene 610L has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

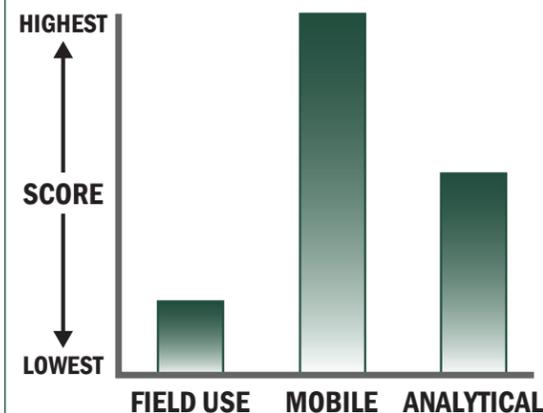
QuickGene 610L has been placed in the bottom tier of all evaluated products for analytical laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	
Insects	
Blood	✓
Cell Cultures	
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	Oragene saliva

Survey Source

Vendor supplied information

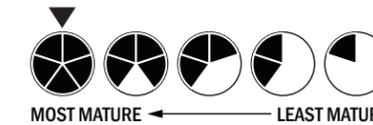
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/batch
- 20 minutes or less for sample prep
- 3-5 steps are required for prep
- System is currently semi-automated
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- Battery lasts < 1 hour
- The system is commercially available
- Government testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 4 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	✓

AutoGen, Inc.–QuickGene 810



DESCRIPTION:

The QuickGene 810 is built by FujiFilm Life Sciences and offered in North America by AutoGen. This is a compact and semi-automated bench top nucleic acid extraction machine for rapid isolation of DNA or RNA from a variety of samples. The QuickGene technology utilizes an ultra-thin polymer membrane for efficient capture of nucleic acids. This novel technology allows for isolation of high quality RNA or DNA with high yields, suitable for a wide range of applications. Three pressurizing stages, binding, washing and elution, occur automatically in the unit. Because of the outstanding adsorptive and desorptive properties of the membrane high-purity nucleic acid can be obtained easily at low pressure, resulting in purified nucleic acids at much larger fragment sizes compared to centrifugation processing technologies. The QuickGene 810 processes 8 samples in 10 minutes, saving valuable time and labor in your lab. The system has protocols for RNA extraction from blood, cells and tissue and protocols for DNA extraction from plasmid, blood, cells and tissues. Nucleic acids processed with this system are suitable for all PCR-based technologies and sequencing reactions.



CONTACT INFORMATION

AutoGen, Inc.
84 October Hill Road
Holliston, MA 01746-1371
508-429-5965
dna@autogen.com

COST

• \$14,350

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

QuickGene 810 has been placed in the middle tier of all evaluated products for field use, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

QuickGene 810 has been placed in the top tier of all evaluated products for field use, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

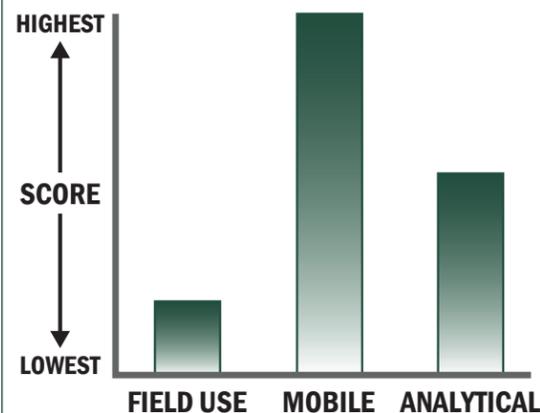
QuickGene 810 has been placed in the middle tier of all evaluated products for analytical laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Vendor supplied information

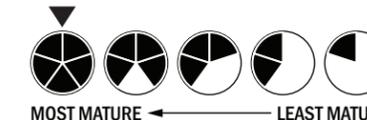
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20 minutes or less for sample prep
- 3-5 steps are required for prep
- System is currently semi-automated
- System does not lyse spores
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available and meets milspecs
- Government testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 4 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- 100-500 µL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	✓

AutoGen, Inc.–QuickGene Mini-80



DESCRIPTION:

The QuickGene Mini-80 is built by FujiFilm Life Sciences and offered in North America by AutoGen. This is a compact personal extraction system for rapid isolation of DNA or RNA from a variety of samples. The QuickGene extraction device utilizes an ultra-thin polymer membrane for efficient capture of nucleic acids. This novel technology allows for isolation of high quality RNA or DNA with high yields, suitable for a wide range of applications. The QuickGene-Mini80 processes 8 samples in 15 minutes, saving valuable time and labor in your lab. The system has protocols for rapid RNA extraction from blood, cells and tissue. It also has protocols for rapid DNA extraction from plasmid, blood, cells and tissues. FujiFilm QuickGene-Mini80 is a compact system requiring no centrifugation in the extraction process, giving less strain to samples and enabling rapid nucleic acid extraction. DNA/RNA can be easily and rapidly extracted from various samples including human/mouse/plants/cells/fungi and others.



CONTACT INFORMATION

AutoGen, Inc.
84 October Hill Road
Holliston, MA 01746-1371
508-429-5965
dna@autogen.com

COST

• \$1,500

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

QuickGene Mini-80 has been placed in the middle tier of all evaluated products for field use, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

QuickGene Mini-80 has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

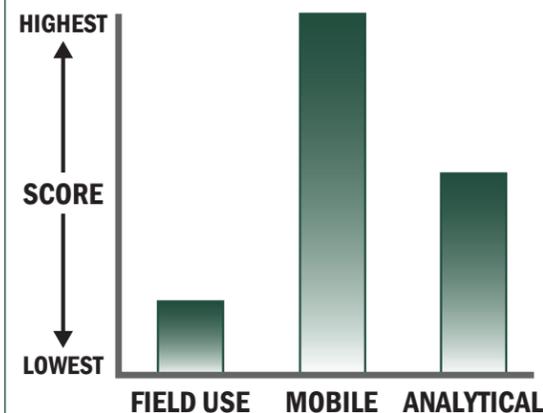
QuickGene Mini-80 has been placed in the middle tier of all evaluated products for analytical laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Vendor supplied information

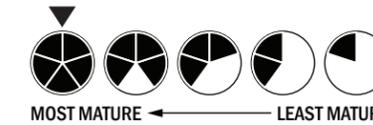
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20 minutes or less for sample prep
- 3-5 steps are required for prep
- System is currently semi-automated
- System does not lyse spores
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available and meets milspecs
- Government testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 4 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- 100-500 µL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	✓

bioMérieux, Inc.–NucliSENS easyMAG



DESCRIPTION:
NucliSENS easyMAG is an automated system for total nucleic acid extraction from a variety of sample types and volumes. The easyMAG is a breakthrough platform specifically optimized for total nucleic acid extraction from biological samples. The system automates an enhanced magnetic silica version of bioMérieux’s proprietary BOOM technology for the universal extraction of RNA and DNA. Extraction and purification takes place in a single well and only one aspiration tip is required per sample. This simplified operation increases reliability of the procedure and eliminates the need for multiple racks of disposable tips and sample processing plates. The system enables processing of various sample volumes and flexibility of eluate volumes for all common nucleic acid downstream applications. Validated sample types processed using this system include plasma, serum, whole blood, CSF, urine, stool, and respiratory samples.



Tier Selection
Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking
NucliSENS easyMAG has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking
NucliSENS easyMAG has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking
NucliSENS easyMAG has been placed in the bottom tier of all evaluated products for analytical laboratories, resulting in a “least applicable” ranking.



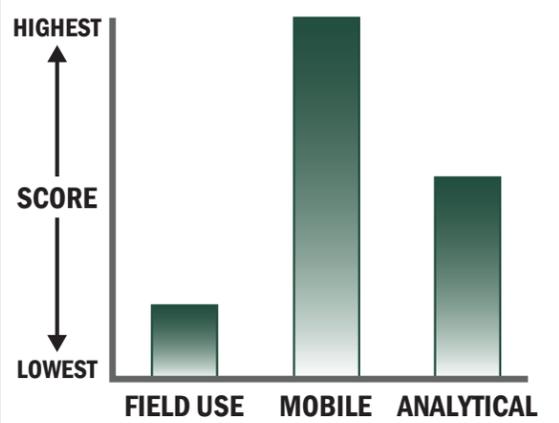
- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

CONTACT INFORMATION
bioMérieux, Inc.
100 Rodolphe St.
Durham, NC 27712
800-682-2666

Point of Contact:
Laura Clark
704-989-3035
laura.clark@biomerieux.com

COST
• \$79,500

Scoring Summary
This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source
Open source internet information

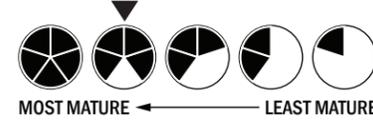
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 40-60 minutes for sample prep
- 1-2 steps required for prep
- System is currently semi-automated
- Add on capability for spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a home dishwasher
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 5+ solutions, buffers, and/or reagents
- No additional equipment needed
- An afternoon of training and some technical skills required
- 500 µL-1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

bioMérieux, Inc.–NucliSENS miniMAG



DESCRIPTION:
NucliSENS miniMAG offers users a manual system for extraction of total nucleic acid using the enhanced magnetic silica version of bioMérieux’s proprietary BOOM chemistry. The miniMAG is an IVD-labeled system that is simple to use, compact, and flexible. Parallel processing of different sample types in one run is possible and the system is simple enough to allow one user to easily run 2 miniMAG units concurrently. The system can fit on a benchtop or in a hood and is capable of processing a variety of sample types and volumes.



CONTACT INFORMATION
bioMérieux, Inc.
100 Rodolphe St.
Durham, NC 27712
800-682-2666

Point of Contact:
Laura Clark
704-989-3035
laura.clark@biomerieux.com

COST
• \$12,000

Tier Selection
Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking
NucliSENS miniMAG has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking
NucliSENS miniMAG has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



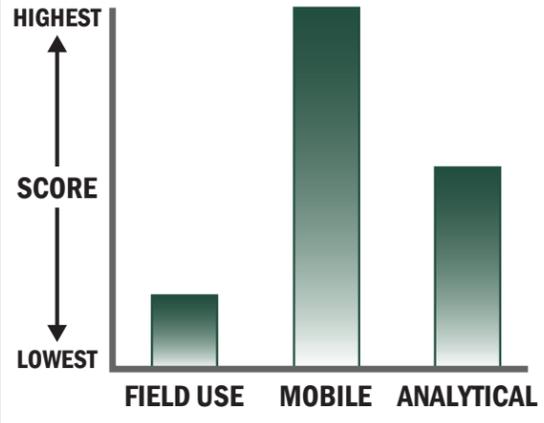
- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking
NucliSENS miniMAG has been placed in the bottom tier of all evaluated products for analytical laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary
This comparison is based on overall product scores only; no SME input is captured.



FIELD USE **MOBILE** **ANALYTICAL**

Sample Matrices Handled by System

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source
Open source internet information

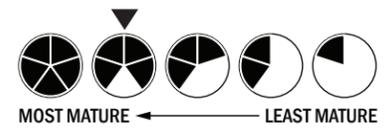
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 40-60 minutes for sample prep
- 9-12 steps are required for prep
- System not amenable to full or semi-automation
- Add on capability for spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 4 solutions, buffers, and/or reagents
- No additional equipment needed
- An afternoon of training and some technical skills required
- 500 µL-1 mL maximum volume reagents

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Boreal Genomics–Aurora Nucleic Acid Purification System



DESCRIPTION:

The Aurora is a semi-automated instrument for purification and concentration of nucleic acids from virtually any sample in life science, metagenomics, forensic, ag-bio, and clinical applications. Boreal's electrophoretic extraction technology has been proven to provide high yield and high purity nucleic acids from low abundance and heavily inhibited samples including soils, sediments, water, stool and other challenging environmental matrices. The system uses a unique cartridge-based approach for electrophoretic separation and purification of nucleic acids in agarose gel. The system also performs nucleic acid purification from virtually any lysate or partially purified sample with residual inhibition. Non-mechanical isolation allows recovery of high molecular weight DNA between 100 kb and 1 mb. Raw samples are prepared and lysed prior to loading onto the instrument for processing. Nucleic acids processed using the Aurora system are high-purity and suitable for various downstream applications including PCR, restriction digestion, and sequencing.



CONTACT INFORMATION

Boreal Genomics
2386 East Mall
Vancouver, BC Canada V6T 1Z3
800-681-5644
info@borealgenomics.com

COST

• \$45,000

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

Aurora Nucleic Acid Purification System has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

Aurora Nucleic Acid Purification System has been placed in the middle tier of all evaluated products for mobile laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

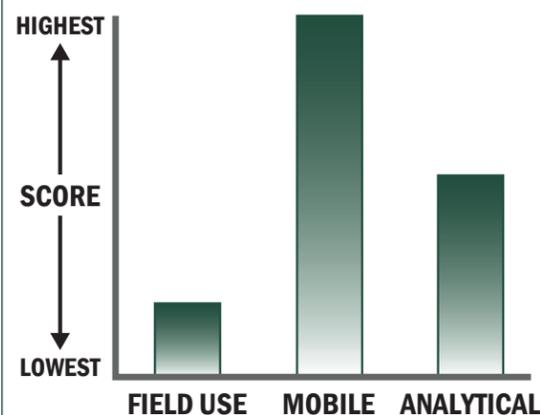
Aurora Nucleic Acid Purification System has been placed in the bottom tier of all evaluated products for analytical laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Vendor supplied information

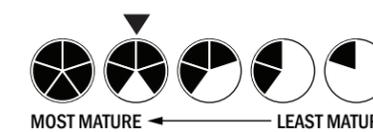
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/ batch
- Greater than 120 minutes for sample prep
- 6-8 steps are required for prep
- System adapted to automation with some effort
- Add on capability for spore lysis
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Government testing and scientific publication



Operations:

- System is designed for a single use
- 5+ solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- An afternoon of training and some technical skills required
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Claremont BioSolutions, LLC.–Automated Sample Prep Module



DESCRIPTION:

The PureLyse sample prep system is now getting integrated into a fully automated, battery-powered sample prep module. It will enable point-of-field DNA extraction in 3 steps and 5 minutes. The cartridge and the embedded motor are disposable after one use. This is an outgrowth of a Phase II NIH funded project to process pathogen DNA from human stool. Successful data from the phase I project based on a prototype integrated cartridge, from which this module is modeled, has been presented.



CONTACT INFORMATION

Claremont BioSolutions, LLC.
1182 Monte Vista Ave. Suite 11
Upland, CA 91786
877-310-2189

Point of Contact:
Dr. Bob Doebler, President
rdoebler@claremontbio.com

COST

- \$2,000/instrument (estimated)
- \$5-6/disposable cartridge (estimated)

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

Automated Sample Prep Module has been placed in the top tier of all evaluated products for field use, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

Automated Sample Prep Module has been placed in the bottom tier of all evaluated products for mobile laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

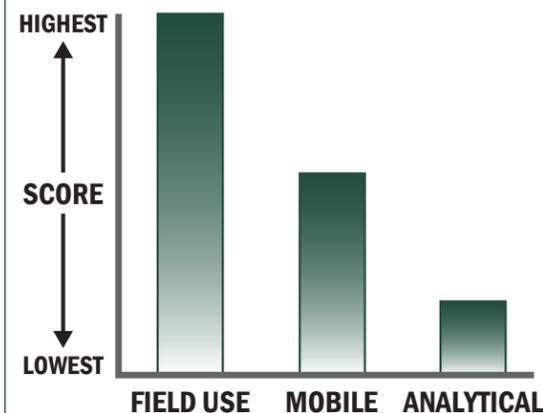
Automated Sample Prep Module has been placed in the bottom tier of all evaluated products for analytical laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	
Insects	
Blood	
Cell Cultures	✓
Environmental Vegetation	
Food	✓
Nasal/Throat Swabs	
Stool	✓
Other	

Survey Source

Vendor supplied information

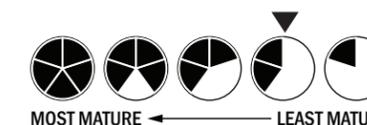
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20 minutes or less for sample prep
- 3-5 steps are required for prep
- System not amenable to full or semi-automation
- Fully automated spore lysis
- The system output is DNA, RNA, and nucleic acids with background reduction
- Purity ratio of 1.8 to 2.0 or bound DNA

System Characteristics:

- Approximately the size of a soda can
- System uses batteries
- Battery lasts 2-4 Hours
- Only one incomplete device or system exists (bread board)
- Third party independent testing and scientific publication



Operations:

- System is designed for a single use
- 3 solutions, buffer, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Claremont BioSolutions, LLC.–PureLyse



DESCRIPTION:

PureLyse is a miniature, disposable flow-through cartridge packed with 100 µm beads that are used to mechanically lyse cells and, under the specific conditions, bind and release DNA. PureLyse contains a lead-free disposable micro-motor equipped with a precision-cut impeller. The motor can be purchased in large quantities for as little as \$0.60 each. A proprietary method is used for entrapping and retaining the beads within the lysis chamber during the activation of the motor up to 30,000 rpm operating at 6VDC and ~100mA. In the presence of beads, the shear forces generated are sufficient to lyse tough-walled organisms, such as bacterial spores, mycobacterium, and Giardia cysts. The miniature size and disposable nature of the PureLyse unit makes it ideal for integration into disposable platforms for use in the field or Point-of-Care systems. Released DNA from samples can be used directly in PCR reactions.



Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

PureLyse has been placed in the top tier of all evaluated products for field use, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

PureLyse has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

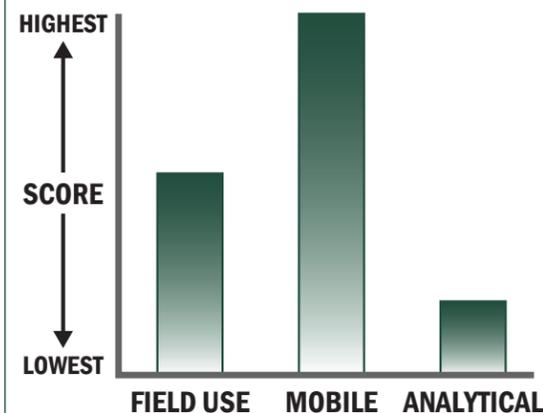
PureLyse has been placed in the bottom tier of all evaluated products for analytical laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	✓
Insects	
Blood	
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	✓
Stool	✓
Other	Milk and sputum

Survey Source

Vendor supplied information

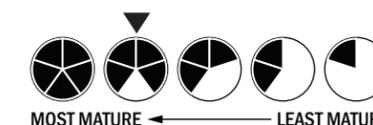
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/ batch
- 20 minutes or less for sample prep
- 1-2 steps required for prep
- System easily adapted to full automation
- Semi-automated spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a soda can
- System uses batteries
- Battery lasts < 1 hour
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for a single use
- 2 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	✓

CONTACT INFORMATION

Claremont BioSolutions, LLC.
1182 Monte Vista Ave. Suite 11
Upland, CA 91786
877-310-2189

Point of Contact:
Dr. Bob Doebler, President
rdoebler@claremontbio.com

COST

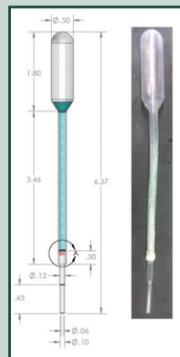
• \$7.50 per unit

CUBRC, Inc.–DNAPro Extraction Pipette



DESCRIPTION:

The CUBRC DNAPro Extraction Pipette is a single-use tool based on the principles of solid phase extraction intended to sequentially isolate the nucleic acid and protein content of a sample in austere environments. The solid phase extraction chemistries utilized for the extraction processes provide for versatility in sample type and for a broad range of user defined modifications and adaptations. To date, this tool has successfully been tested with laboratory, water and sewage sample matrices



CONTACT INFORMATION

CUBRC, Inc.
4455 Genesee Street
Buffalo, NY 14225
716-204-5100

Point of Contact:
David Pawlowski, Ph.D.
716-418-6600
pawlowski@cubrc.org

COST

• \$5-6

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

DNAPro Extraction Pipette has been placed in the top tier of all evaluated products for field use, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

DNAPro Extraction Pipette has been placed in the bottom third of all evaluated products for mobile laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

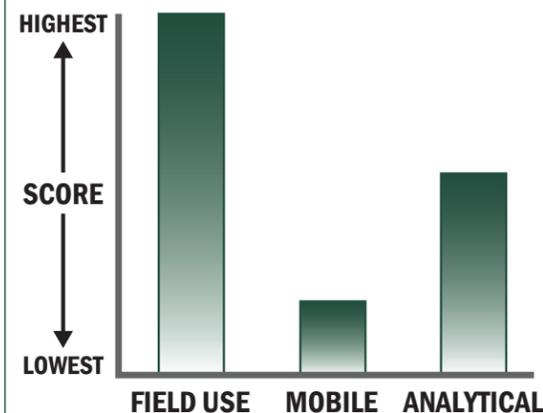
DNAPro Extraction Pipette has been placed in the bottom tier of all evaluated products for analytical laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	✓
Insects	
Blood	
Cell Cultures	
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	✓
Other	

Survey Source

Vendor supplied information

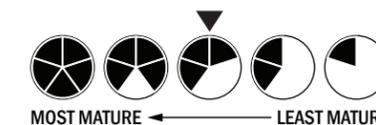
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/ batch
- 20 minutes or less for sample prep
- 9-12 steps are required for prep
- System not amenable to full or semi-automation
- Add on capability for spore lysis
- The system output is DNA
- Purity ratio less than 1.8
- Unknown

System Characteristics:

- Approximately the size of a soda can
- System has no electrical requirement
- System has no power requirement
- A few devices or systems exist (brass board)
- Scientific publication alone



Operations:

- System is designed for a single use
- 5+ solutions, buffer, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- 500 µL-1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	
Unknown	✓

Integrated Nano-Technologies, LLC.-Palladium



DESCRIPTION:

Integrated Nano-Technologies' Palladium system has fully automated sample preparation capability for use in the field or in laboratories. The system consist of a portable battery powered unit and a plastic disposable cartridge. The cartridge can automate a number of common laboratory techniques, including sample disruption (chemical and ultrasonic bead beating), magnetic separation, filtration, desalting or ion exchange chromatography, and PCR amplification in a single cartridge. Isolation of nucleic acids has been carried out from a wide variety of samples including blood, tissue, insects, soil and air filters. RNA, DNA or protein can be isolated from the samples with high efficiency. RNA and DNA isolated from samples has been PCR amplified and is also suitable for use in automated gene sequencing systems. Two separate PCR amplification chambers are built in to allow for multiplexed PCR reactions. The cartridges have also been designed with an archiving chamber to preserve part of the sample for alternative analytic processes if needed. The disposable can handle samples up to 0.5mL and can concentrate the output material to as little as 20µL. The disposable cartridge has more than 20 chambers and utilizes a revolver valve system to address chambers and move fluids. Additional processing steps, including enzymatic steps, can be carried out in temperature controlled reaction chambers. The system has an open architecture and the process flow can be modified depending upon the needs of the user. A multi-channel system is also being built which can process 10 samples simultaneously.



Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

Palladium has been placed in the top tier of all evaluated products for field use, resulting in a "most applicable" ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

Palladium has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a "most applicable" ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

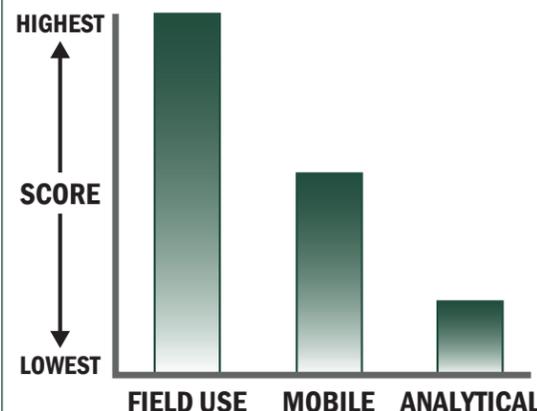
Palladium has been placed in the middle tier of all evaluated products for analytical laboratories, resulting in a "somewhat applicable" ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	
Stool	
Other	Tissue samples

Survey Source

Vendor supplied information

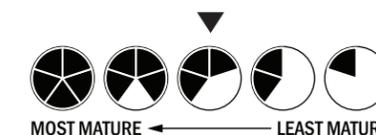
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/ batch
- 20 minutes or less for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- Fully automated spore lysis
- The system output is DNA, RNA, cDNA from RNA, nucleic acids with background reduction, or nucleic acids with preferential selection
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System uses batteries
- Battery lasts 4-8 hours
- A few devices or systems exist (brass board)
- Government testing and third party testing



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 1 solution, buffer, and/or reagent
- No additional equipment needed
- Very brief training and minimal technical skills
- 500 µL-1 mL maximum volume reagent

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	

CONTACT INFORMATION

Integrated Nano-Technologies, LLC
999 Lehigh Station Road
Henrietta, NY 14467
585-334-0170

Point of Contact:
Michael Connolly
585-334-0170 x 202
mconnolly@integratednano.com

COST

- \$15,000 (estimated)

Life Technologies—6700 Automated Nucleic Acid Workstation



DESCRIPTION:

The Applied Biosystems PRISM 6700 Automated Nucleic Acid Workstation is a specially engineered robotic system that automates all the repetitive, labor-intensive tasks associated with analysis, from nucleic acid sample purification and reaction preparation to PCR tray set-up and sealing. The fully automated system makes sample and reaction preparation for nucleic acid synthesis a seamless process. Unparalleled sample throughput, in 96 well or 384 well plate formats, helps you realize the full potential of your analysis instrument, and cost-effective sample preparation enables you to launch projects that might be cost-prohibitive without automation. The 6700 workstation speeds production of PCR-quality templates with good yields. With the 6700 workstation, nucleic acid purification, PCR reactions and RNA-PCR conversion to cDNA are less expensive than other, less automated procedures. Finally, the 6700 workstation is compatible with existing sequence detection systems to support real-time PCR.



Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

6700 Automated Nucleic Acid Workstation has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

6700 Automated Nucleic Acid Workstation has been placed in the bottom tier of all evaluated products for mobile laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

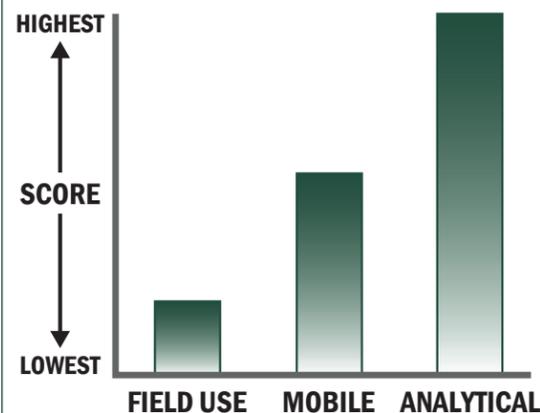
6700 Automated Nucleic Acid Workstation has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	
Insects	
Blood	
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	

Survey Source

Open source internet information

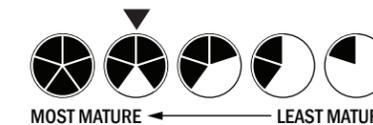
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/ batch or higher
- 60-120 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- System does not lyse spores
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a home dishwasher
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- No additional equipment needed
- An afternoon of training and some technical skills required
- 500 µL-1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Life Technologies—AB Library Builder System



DESCRIPTION:

The AB Library Builder System provides semi-automated, low to medium throughput, DNA purification and DNA fragment library preparation for next-generation sequencing technologies (SOLiD 4 Systems, 5500 Series Genetic Analysis Systems, and Ion Torrent Systems). Purification protocols can be adopted and used for downstream applications besides sequencing, such as PCR and restriction digestion. The instrument is scalable, allowing multiple libraries (up to 13) to be prepared at once. The system uses predefined software protocols and Agencourt AMPure XP plug-and-play reagent kits in cartridge format for DNA purification. Library builder kits are also available for next-generation sequencing applications.



CONTACT INFORMATION

Life Technologies
5791 Van Allen Way
Carlsbad, CA 92008
800-955-6288
www.lifetech.com

COST

• \$35,000

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

AB Library Builder System has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

AB Library Builder System has been placed in the bottom tier of all evaluated products for mobile laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

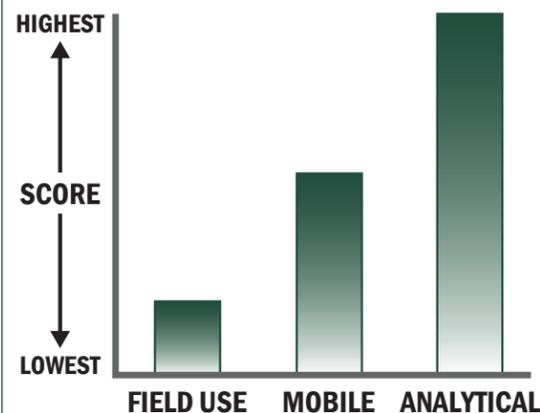
AB Library Builder System has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	Genomic DNA

Survey Source

Vendor supplied information

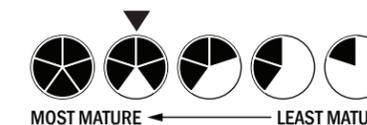
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/batch
- Greater than 120 minutes for sample prep
- 3-5 steps are required for prep
- System is currently semi-automated
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has a greater than 220V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Scientific publication alone



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 5+ solutions, buffers, and/or reagents
- 3- 5 additional pieces of equipment
- An afternoon of training and some technical skills required
- 100-500 µL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	

Life Technologies—AutoMate Express Forensic DNA Extraction System



DESCRIPTION:

The AutoMate Express Forensic DNA Extraction System is an easy to use, robust bench-top instrument that utilizes the PrepFiler Express and PrepFiler Express BTA chemistries packaged in pre-filled, foil sealed cartridges. Life Technologies has designed the PrepFiler chemistry specifically to improve the quantity and quality of DNA isolated from forensic samples. The PrepFiler Express Forensic DNA Extraction Kit is suitable for the majority of standard sample types encountered in forensic laboratories such as bodily fluids on different substrates including FTA paper, cotton swabs, cotton cloth, denim and many others. The PrepFiler Express BTA Forensic DNA Extraction Kit was designed specifically for challenging samples such as bones, teeth and adhesive based samples such as cigarette butts and tape lifts. Both formats come with all the reagents and plastic components including the PrepFiler LySep Columns needed to perform 52 DNA extractions on the AutoMate Express Instrument. Plastics-only kits are also available in the 2 formats including 52 sets of all the plastic components. The instrument is designed to improve the yield and overall purity of DNA isolated from both routine and challenging forensic samples. Isolated DNA is free of PCR inhibitors and suitable for downstream applications such as quantitative real-time PCR and short tandem repeat (STR) analysis. It utilizes a quick and easy run setup with ready-to-use pre-filled cartridges. The Automate Express is a closed system to minimize the risk of contamination and transposition errors, and offers reliable DNA extraction to improve downstream genotyping success rate and profile quality.



CONTACT INFORMATION

Life Technologies
5791 Van Allen Way
Carlsbad, CA 92008
800-955-6288
www.lifetech.com

COST

• \$38,000

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

Automate Express Forensic DNA Extraction System has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

Automate Express Forensic DNA Extraction System has been placed in the bottom tier of all evaluated products for mobile laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

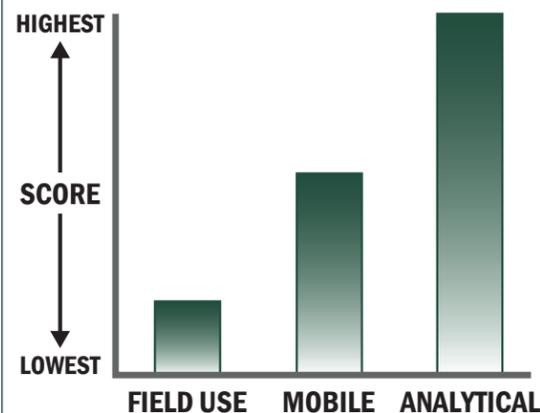
Automate Express Forensic DNA Extraction System has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	Common forensic samples (e.g., bone, cloth, cigarette butts)

Survey Source

Open source internet information

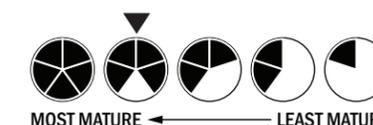
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/batch
- 60-120 minutes for sample prep
- 1-2 steps required for prep
- System is currently semi-automated
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 220V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 4 solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- An afternoon of training and some technical skills required
- 500 µL-1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Life Technologies—BenchPro 2100 Plasmid Purification Station



DESCRIPTION:

The BenchPro 2100 MaxiCard Plasmid Purification Instrument is an automated bench-top instrument that uses electronic solenoid technology to control the transfer of on-board compressed air and vacuum to a disposable card for automated, easy, and reproducible maxiprep purification of high-quality plasmid DNA from E. coli in less than 90 minutes. The BenchPro 2100 instrument allows parallel processing of up to two experimental samples. The BenchPro 2100 instrument is a complete walk-away maxiprep purification system that provides high-quality plasmid DNA using a series of capture and purification membranes. Each BenchPro Maxiprep Card encompasses an entire plasmid purification protocol from the harvesting of cells to the final precipitation and elution of purified plasmid DNA with low endotoxin levels. The BenchPro 2100 instrument eliminates routine manual processing steps for maxiprep plasmid DNA purification while maintaining a similar performance to manual processing. The purified plasmid DNA is ultrapure and suitable for a variety of downstream applications, including those requiring the highest purity, such as transfection of mammalian cells, PCR, sequencing, and cloning.



Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

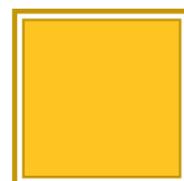
BenchPro 2100 Plasmid Purification Station has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

BenchPro 2100 Plasmid Purification Station has been placed in the middle tier of all evaluated products for field use, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

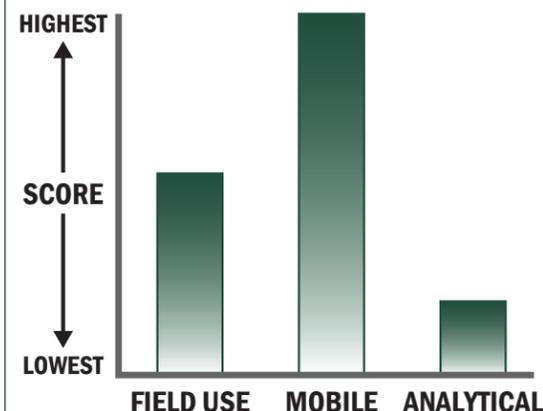
BenchPro 2100 Plasmid Purification Station has been placed in the middle tier of all evaluated products for analytical laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	
Insects	
Blood	
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	

Survey Source

Open source internet information

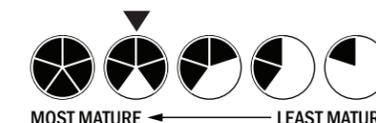
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/batch
- 60-120 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 1 solution, buffer, and/or reagent
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	

CONTACT INFORMATION

Life Technologies
5791 Van Allen Way
Carlsbad, CA 92008
800-955-6288
www.lifetech.com

COST

• \$8,000

SUBJECT MATTER EXPERT COMMENT

- Purifies bacterial plasmids only.

Life Technologies–iPrep Purification System



DESCRIPTION:

The iPrep Purification System consists of the iPrep Instrument, iPrep Protocol Cards, and iPrep Kits that allow automated, fast, and reliable nucleic acid purification from various samples within 20-30 minutes (depending on the type of iPrep Kit used). The iPrep Purification Instrument performs magnetic bead based nucleic acid purification using ChargeSwitch or GeneCatcher Technology, for optimized collection of DNA, RNA, and gDNA from biological samples. Various kits are optimized for a wide range of sample types including blood, buccal, and forensic. Utilizing a simple bind-wash-elute procedure to purify high-quality DNA, the system does not require the use of centrifugation or vacuum separation methods. Furthermore, magnetic beads are trapped against the sidewall of the pipetting tip to improve the washing of beads and DNA recovery compared to other magnetic based purification systems that trap magnetic beads on the bottom of the reaction well. The iPrep Purification System eliminates filtration and centrifugation from nucleic acid purification. The purified DNA is suitable for use in various downstream applications including PCR, STR (short-tandem repeat analysis), and restriction enzyme digestion.



Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

iPrep Purification System has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

iPrep Purification System has been placed in the middle tier of all evaluated products for mobile laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

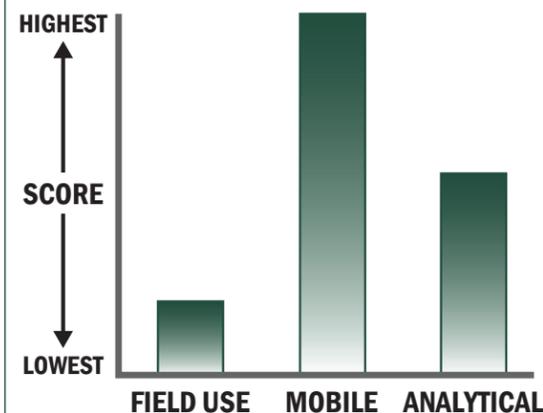
iPrep Purification System has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	✓
Stool	
Other	

Survey Source

Open source internet information

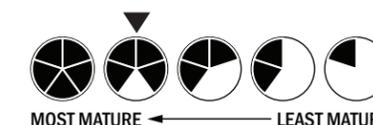
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20-40 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- Add on capability for spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 3 solutions, buffers, and/or reagents
- No additional equipment needed
- An afternoon of training and some technical skills required
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Life Technologies–MagMAX Express 24 Magnetic Particle Processor



DESCRIPTION:

The MagMAX Express 24 is a low to medium-throughput automated system for the purification of nucleic acids using the broad selection of MagMAX magnetic particle kits. Most automated liquid handling systems move reagents into and out of a single well to perform the different steps of nucleic acid isolation. In contrast, the MagMAX Express 24 magnetic particle processor utilizes permanent rods to collect magnetic beads and associated nucleic acids from solution and releases the beads into the well containing reagents for the next step of isolation. Up to 24 samples can be processed per run. Samples compatible with the MagMAX magnetic kits include cultured cells, blood, swabs, feces, soil, food products, tissues, and clinical samples. After manual homogenization, enzyme digestion, and centrifugation, samples can be loaded into the MagMAX Express 24 for automated processing. Nucleic acids purified with this system are suitable for PCR, restriction digestion, and other common downstream applications.



Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

MagMAX Express 24 Magnetic Particle Processor has been placed in the middle tier of all evaluated products for field use, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

MagMAX Express 24 Magnetic Particle Processor has been placed in the middle tier of all evaluated products for mobile laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

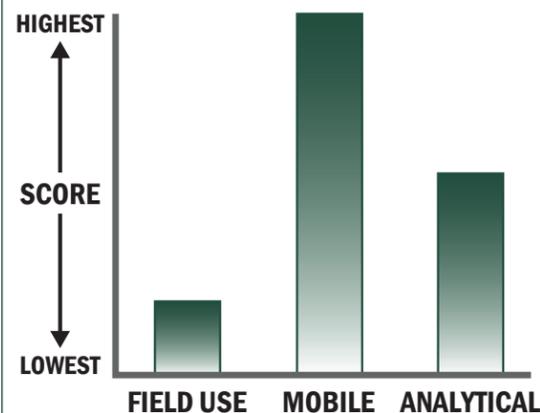
MagMAX Express 24 Magnetic Particle Processor has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Vendor supplied information

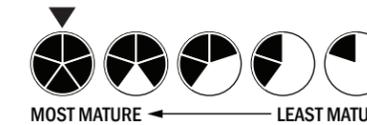
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 60-120 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- Manual kit handles spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available and meets milspecs
- Government testing, third party testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 5+ solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

CONTACT INFORMATION

Life Technologies
5791 Van Allen Way
Carlsbad, CA 92008
800-955-6288
www.lifetech.com

COST

• \$15,000

Life Technologies–MagMAX Express 96 Magnetic Particle Processor



DESCRIPTION:

The MagMAX Express 96 is a high-throughput automated system for the purification of nucleic acids using the broad selection of MagMAX magnetic particle kits. Most automated liquid handling systems move reagents into and out of a single well to perform the different steps of nucleic acid isolation. In contrast, the MagMAX Express magnetic particle processor utilizes permanent rods to collect magnetic beads and associated nucleic acids from solution and releases the beads into the well containing reagents for the next step of isolation. 96 well plates are loaded with various wash reagents for serial washing and elution steps. The effectiveness of bead collection and transfer leads to superior washing, elution efficiency, and rapid processing. The deep well configuration of the instrument allows for larger sample inputs. Samples compatible with the MagMAX magnetic kits include cultured cells, blood, swabs, feces, soil, food products, tissues, and clinical samples. After manual homogenization, enzyme digestion, and centrifugation, samples can be loaded into the MagMAX Express 96 for automated processing. Nucleic acids purified with this system are suitable for PCR, restriction digestion, and other common downstream applications.



Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

MagMAX Express 96 Magnetic Particle Processor has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

MagMAX Express 96 Magnetic Particle Processor has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

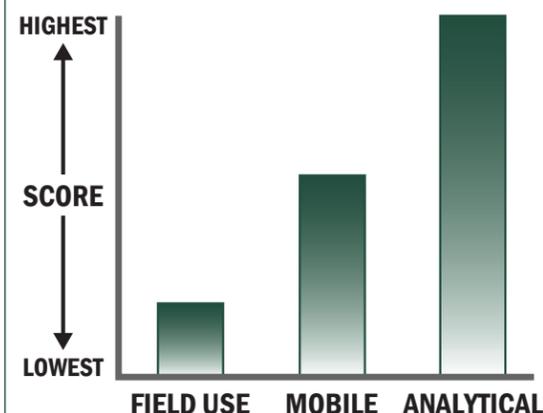
MagMAX Express 96 Magnetic Particle Processor has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Vendor supplied information

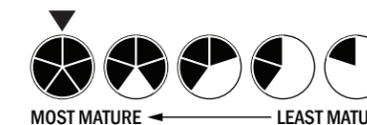
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/ batch or higher
- 60-120 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- Manual kit handles spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available and meets milspecs
- Government testing, third party testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 3 solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

MP Biomedicals–RapidGene 12



DESCRIPTION:

The MP Biomedicals-RapidGene 12 is a compact, automated nucleic acid purification instrument for the extraction and purification of high quality DNA and RNA based on magnetic bead technology. The instrument utilizes this technology for the purification of nucleic acids from a variety of specimen types. The MP Biomedicals-RapidGene 12 is able to process 1-12 samples with downloadable pre-configured protocols. An interchangeable pump/tip assembly allows for variable sample input volumes. The self-contained pipetting system is disposable and, coupled with integrated UV-decontamination, provides protection against contamination. The machine is compatible with MP Biomedicals kits and reagents, supplied in single-sample cartridges. There are also programs and kits available for purified cell separation applications.



CONTACT INFORMATION

MP Biomedicals
3 Hutton Centre Drive
Santa Ana, CA 92707
800-854-0530

COST

• \$21,900

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

RapidGene12 scored in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

RapidGene12 scored in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

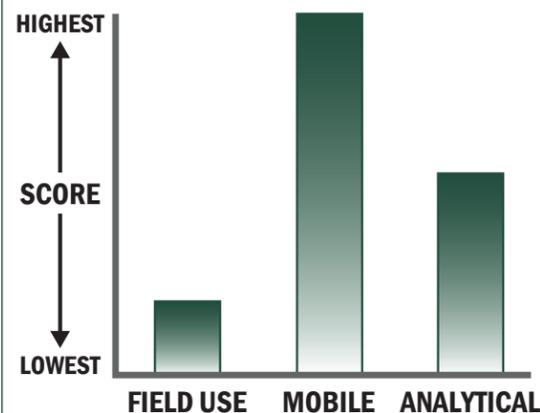
RapidGene12 scored in the middle tier of all evaluated products for analytical laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	
Nasal/Throat Swabs	✓
Stool	
Other	

Survey Source

Vendor supplied information

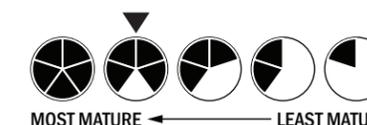
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20-40 minutes for sample prep
- 3-5 steps are required for prep
- System is currently fully automated
- System does not lyse spores
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 4 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- 500 µL-1mL maximum volume reagents

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Precision System Science USA, Inc.–Magtration 6Mx



DESCRIPTION:

The Magtration System 6Mx is a medium throughput platform for DNA/RNA purification from middle volume samples (up to 1 mL). It uses magnetic filtration as a separation and purification technology to immobilize and wash nucleic acids on beads. Designed for general DNA/RNA purification applications, the Magtration System 6Mx has 6-channel pipettor and 6 samples are simultaneously processed. Up to 48 samples can be loaded into the instrument at a time and all reagents are pre-filled into reagent cartridges. The system purified nucleic acids from a variety of sample types and the product is suitable for PCR, restriction digestion, and sequencing. The instrument also includes 2 heating well positions and 1 cooling block for the elution plate and nucleic acid temporary storage.



CONTACT INFORMATION

Precision System Science USA, Inc.
5673 West Las Positas Blv. #202
Pleasanton, CA 94588
925-960-9180

COST

- Not available

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

Magtration 6Mx has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

Magtration 6Mx has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

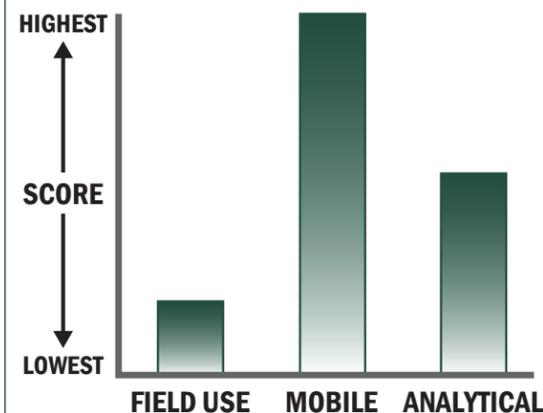
Magtration 6Mx has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Open source internet information

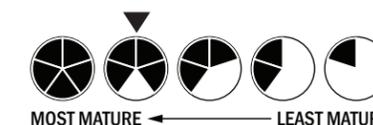
Evaluation Criteria

Effectiveness:

- Throughput of 32-95 samples/ batch
- 20-40 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- System does not lyse spores
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 5+ solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skill
- 100-500 µL maximum volume reagents

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Precision System Science USA, Inc.–Magtration 12 GC Plus



DESCRIPTION:

The Magtration 12 GC Plus is a fully automated nucleic acid purification instrument. Using magnetic purification with magnetic beads, the system extracts and purifies nucleic acids. It is compact and considered a benchtop instrument, but automatically processes genomic DNA and RNA isolated from 100-200 µL of whole blood, cells, tissues, bacteria, and viruses. No hands-on time is required for reagent dispensing since the instrument utilizes pre-filled reaction cartridges. The instrument also includes a UV lamp and optional barcode reader for traceability and sample tracking. Final elution volumes can also be set for 50, 100, or 200 µL. Nucleic acids processing using this system are purified for PCR, restriction digest, and preparation of sequencing reactions.



CONTACT INFORMATION

Precision System Science USA, Inc.
5673 West Las Positas Blv. #202
Pleasanton, CA 94588
925-960-9180

COST

• Not available

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

Magtration 12GC Plus has been placed in the middle tier of all evaluated products for field use, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

Magtration 12GC Plus has been placed in the middle tier of all evaluated products for mobile laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

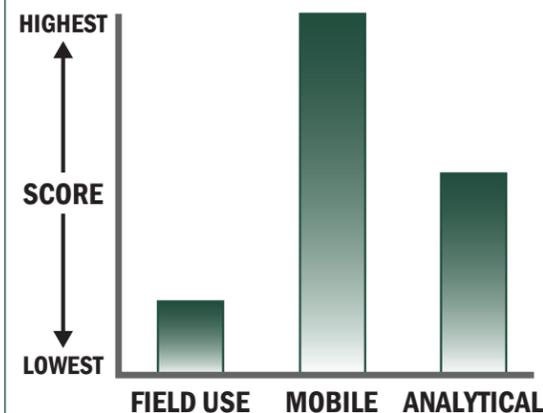
Magtration 12GC Plus has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Open source internet information

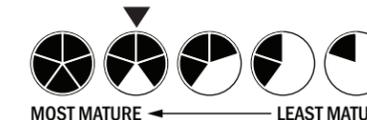
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20-40 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- System does not lyse spores
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 5+ solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- 100-500 µL maximum volume reagents

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Promega Corporation–Maxwell 16 (Diagnostic)



DESCRIPTION:

The Maxwell 16 (Diagnostic) System automates extraction of nucleic acids from up to 16 samples in 30 to 40 minutes using a novel paramagnetic particle processing technology. Optimized for clinical research, the Maxwell 16 (Diagnostic) is outfitted with a barcode reader, Sample Track software, and UV decontamination, and prevents cross-contamination by eliminating splashing, aerosols and drops from pipette tips during extraction. The instrument is supplied with two sets of magnet probes, so you can work with large or small samples: Standard Elution Volume (SEV) 300-400µL or Low Elution Volume (LEV) 50-100µL. The instrument speeds front-end processing, enabling you to do more molecular tests for clinical research without adding personnel. The Maxwell 16 (Diagnostic) System for research provides everything you need for extraction, including pre-filled reagent cartridges, specialized disposable plastics and easy-to-understand instructions. Separate protocols and kits are designed for specific extraction requirements for gDNA, total DNA, and total RNA in various sample backgrounds such as blood, buffy coat, cells, tissue, formalin-fixed paraffin embedded tissues, buccal swabs, and plant tissues. The purified nucleic acids are suitable for downstream applications such as sequencing, PCR, and restriction digestion.



CONTACT INFORMATION

Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
608-274-4330

Point of Contact:
Herly Karlen
608-298-4680
herly.karlen@promega.com

COST

• Not available

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

Maxwell 16 (Diagnostic) has been placed in the middle tier of all evaluated products for field use, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

Maxwell 16 (Diagnostic) has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

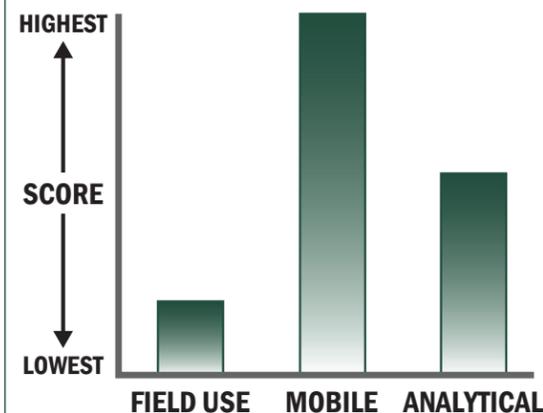
Maxwell 16 (Diagnostic) has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	Fixed tissue, fungi, mouse tail, viruses

Survey Source

Vendor supplied information

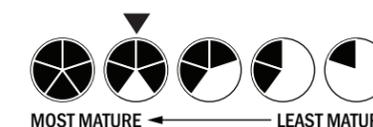
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20-40 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- System does not lyse spores
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 1 solution, buffer, and/or reagent
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- 100-500 µL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Promega Corporation–Maxwell 16 (Forensic)



DESCRIPTION:

The Maxwell 16 Forensic System is an automated instrument for nucleic acid extraction optimized for forensic sample tracking and processing. Using paramagnetic particle processing technology and optimized kits with pre-filled reagent cartridges, the system can purify up to 16 samples in 20-30 minutes. The instrument is outfitted with software to ensure access and identify of operators by PIN entry on a touchscreen interface, and a bar code scanner for tracking kit lots, expiration dates, sample IDs, and instrument maintenance schedule. The cartridge and plunger is designed to reduce cross-contamination risks and a UV decontamination mode is built in. The Forensic System is supplied with two sets of magnet probes, so you can work with large or small samples: Standard Elution Volume (SEV) 300-400µL or Low Elution Volume (LEV) 50-100µL. Specialized Forensic Reference Samples and Forensic Casework Sample Kits are available for optimized use with the instrument.



CONTACT INFORMATION

Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
608-274-4330

Point of Contact:
Herly Karlen
608-298-4680
herly.karlen@promega.com

COST

• Not available

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

Maxwell 16 (Forensic) has been placed in the middle tier of all evaluated products for field use, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

Maxwell 16 (Forensic) has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

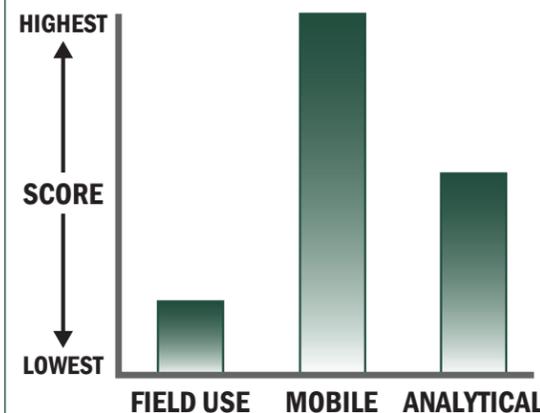
Maxwell 16 (Forensic) has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	Fixed tissue, fungi, mouse tail, viruses

Survey Source

Vendor supplied information

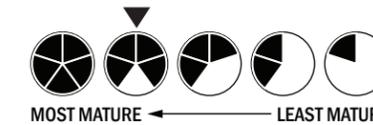
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20-40 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- System does not lyse spores
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 1 solution, buffer, and/or reagent
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- 100-500 µL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Promega Corporation–Maxwell 16 (Research)



DESCRIPTION:

The Maxwell 16 Research instrument is a small, benchtop system that extracts high-quality DNA, RNA, viral total nucleic acid or recombinant proteins from up to 16 samples in 35-50 minutes. Using a novel paramagnetic particle processing technology, the instrument offers automation and walk-away purification that saves time and labor by eliminating reagent preparation, pipetting and centrifugation steps. Pre-filled kits for specific protocols, nucleic acids, and sample backgrounds enable simplistic and convenient use. The instrument is supplied with two sets of magnet probes, so you can work with large or small samples: Standard Elution Volume (SEV) 300-400µL or Low Elution Volume (LEV) 50-100µL. The Maxwell 16 is a particle processor, not a liquid handler, so there are no clogs and no drips. The unique design offers mixing, capture of paramagnetic particles, binding, then purification through a series of capture and release washes. The Maxwell 16 is proven with a variety of sample types, including blood, cells, and tissues, as well as a wide range of downstream applications including PCR and sequencing.



Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

Maxwell 16 (Research) has been placed in the middle tier of all evaluated products for field use, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

Maxwell 16 (Research) has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

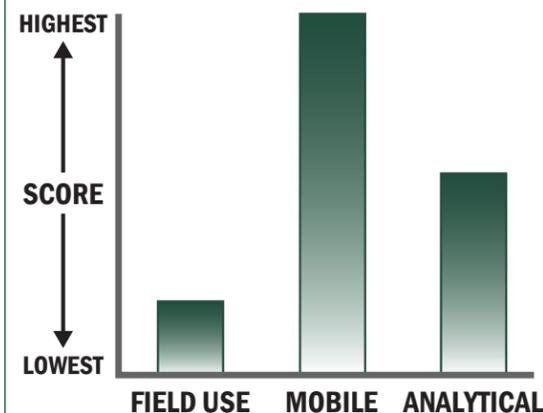
Maxwell 16 (Research) has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	Fixed tissue, fungi, mouse tail, viruses

Survey Source

Vendor supplied information

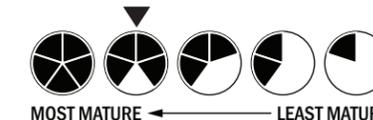
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20-40 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- System does not lyse spores
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 1 solution, buffer, and/or reagent
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- 100-500 µL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

CONTACT INFORMATION

Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
608-274-4330

Point of Contact:
Herly Karlen
608-298-4680
herly.karlen@promega.com

COST

• \$24,995

QIAGEN, Inc.–EZ1 Advanced



DESCRIPTION:

The EZ1 Advanced instruments provide walkaway automation for nucleic acid purification based on magnetic particle purification chemistries. All processing steps are performed by the instruments from piercing reagent cartridges to elution of pure nucleic acids. A separate computer is not required for operation, and EZ1 Kits include all reagents and accessories required to process your samples. EZ1 Kits provide prefilled, foil-sealed reagent cartridges that remain sealed until the instrument door is closed and the protocol run started, reducing the risk of contamination during setup. A wide range of protocols is available for purification of high-quality genomic DNA, RNA, or viral nucleic acids from blood, tissues, paraffin-embedded tissues, buccal swabs, forensic samples, biopsies, cell cultures, respiratory samples, or any type of animal tissue. The EZ1 Advanced processes 1-6 samples and the EZ1 Advanced XL processes 1-14 samples. Both workstations are operated via a keypad, and workstation information is displayed on the VFD (vacuum fluorescent display). To enable you to easily adapt to changing sample preparation requirements, up to 4 EZ1 Advanced or EZ1 Advanced XL instruments can be connected to an external computer (supplied by QIAGEN), expanding your throughput up to 56 samples per run. Nucleic acids purified using the EZ1 systems are relevant for molecular diagnostics, human identity testing, forensics, biomedical research, and gene expression analysis.



CONTACT INFORMATION

QIAGEN, Inc.
19300 Germantown Road
Germantown, MD 20874
800-362-7737

Point of Contact:
Joe Lucero
773-230-4728
joe.lucero@qiagen.com

COST

- \$37,116 (EZ-1 Advanced)
- \$45,585 (EZ-1 Advanced XL)

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

EZ-1 Advanced has been placed in the top tier of all evaluated products for field use, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

EZ-1 Advanced has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

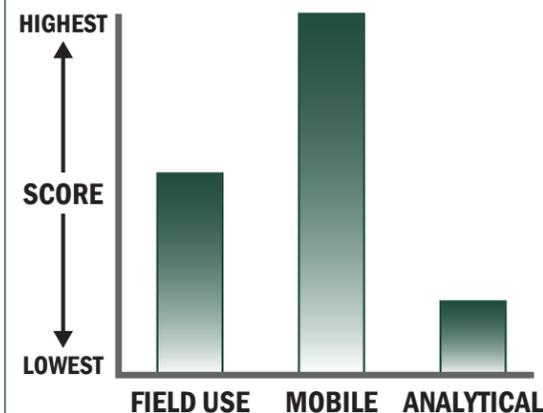
EZ-1 Advanced has been placed in the middle tier of all evaluated products for analytical laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	Sputum, urine, touch and trace samples (forensic)

Survey Source

Vendor supplied information

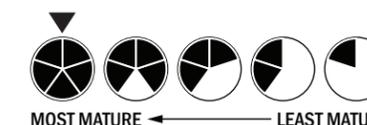
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20 minutes or less for sample prep
- 1-2 steps required for prep
- System is currently fully automated
- Manual kit handles spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- Battery lasts 1-2 hours
- The system is commercially available and meets milspecs
- Government testing, third party testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 4 solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	

QIAGEN, Inc.-QIAcube



DESCRIPTION:

The QIAcube automates nucleic acid purification steps used in silica-based spin-column kits. The instrument integrates a centrifuge, heated shaker, pipetting system, and robotic gripper to allow full automation of more than 40 QIAGEN spin-column kits using a simple lyse, bind, wash, elute procedure. The QIAcube is preinstalled with a variety of protocols and dedicated QIAcube kits are available to further simplify automated spin preps. Kits are currently available for purification of RNA, genomic DNA, and viral RNA. Rotor-adapters supplied with the kits are preloaded with spin columns and elution tubes. Up to 12 samples can be processed per run and recovered nucleic acids are of similar quality and purity to manual kit results. Purified nucleic acids are suitable for cloning, restriction digestion, PCR, and sequencing.



CONTACT INFORMATION

QIAGEN, Inc.
19300 Germantown Road
Germantown, MD 20874
800-362-7737

Point of Contact:
Joe Lucero
773-230-4728
joe.lucero@qiagen.com

COST

• \$17,802

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

QIAcube has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

QIAcube has been placed in the middle tier of all evaluated products for mobile laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

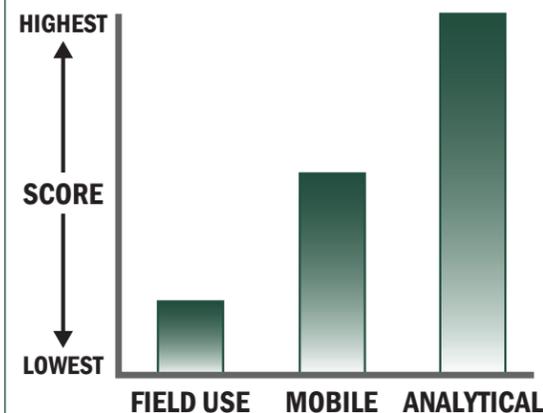
QIAcube has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	Spores

Survey Source

Vendor supplied information

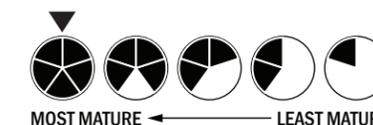
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 40-60 minutes for sample prep
- 3-5 steps are required for prep
- System is currently fully automated
- Add on capability for spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- The system is commercially available and meets milspecs
- Government testing, third party testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 3 solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- An afternoon of training and some technical skills required
- 500 µL-1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

QIAGEN, Inc.–QIASymphony SP/AS



DESCRIPTION:

The QIASymphony SP/AS is a modular system for the fully integrated automation of complete workflows of nucleic acid purification from a wide range of sample types. The QIASymphony SP instrument can process 1-96 samples, in batches of 24, with sample volumes up to 1 mL. Dedicated QIASymphony kits with pre-filled reagent cartridges and optimized protocols provide increased laboratory efficiency to cover an extensive range of samples and applications including clinical sample types such as swabs, aspirates, blood, sputum, cell cultures, and nasal secretions. Nucleic acids can be processed from virtually any sample type using silica- or Ni-NTA-based purification with the convenient handling of magnetic particles. If automated processing of nucleic acids for PCR is desired, the QIASymphony AS can be easily integrated with the SP instrument. This option results in a fully integrated system that can automate complete workflows of complex PCR assays. The QIASymphony AS delivers more accurate pipetting than even highly experienced laboratory staff; pipetting of master mix and sample transfer for 96 samples takes less than 25 minutes. Other features include active cooling of reagents, eluates, and assays, setup of multiple assays per run or sample, and support of artus products and QIAGEN PCR and RT-PCR kits. The QIASymphony SP/AS instruments are suitable for laboratories performing molecular diagnostics, human identity testing, biosecurity research, genomics, and veterinary applications.



Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

QIASymphony SP/AS has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

QIASymphony SP/AS has been placed in the middle tier of all evaluated products for mobile laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

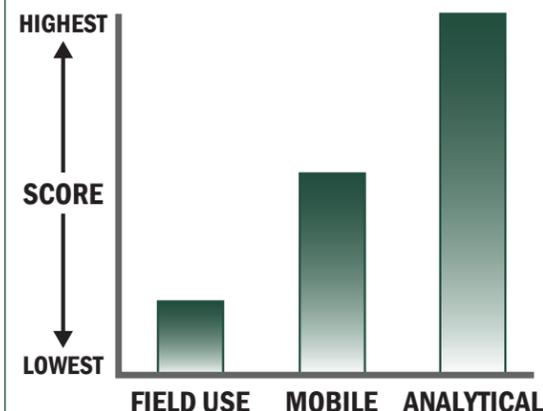
QIASymphony SP/AS has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	Spores

Survey Source

Vendor supplied information

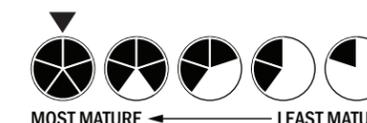
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/ batch or higher
- Greater than 120 minutes for sample prep
- 3-5 steps are required for prep
- System is currently fully automated
- Add on capability for spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a home dishwasher
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available and meets milspecs
- Government testing and third party testing



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 2 solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- An afternoon of training and some technical skills required
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

QIAGEN, Inc.-QIAextractor



DESCRIPTION:

The QIAextractor is an automated nucleic acid purification station capable of processing 96 samples in 96 minutes. Two product lines are available to enable purification of either genomic DNA or viral nucleic acids. Reagents are supplied in pre-packaged containers to maximize user convenience and prevent accumulation of partially used reagents. Optimized protocols are also built into the system for liquid or tissue processing. Sample types including body fluids, cell suspensions, biopsy tissues, mouse tail, and organ tissues have all been processed using the QIAextractor. The software allows full traceability with pre- and post-run documentation and the instrument also includes a UV light and HEPA filters to prevent contamination. Purified nucleic acids are collected in 96 tubes specifically designed to enable integration into your workflow. The elution plate containing tubes of purified nucleic acids can be transferred for automated PCR setup and analysis by real-time PCR or RT-PCR. The QIAextractor is designed for use in sensitive applications such as genotyping, biomedical, and genomics research.



CONTACT INFORMATION

QIAGEN, Inc.
19300 Germantown Road
Germantown, MD 20874
800-362-7737

Point of Contact:
Joe Lucero
773-230-4728
joe.lucero@qiagen.com

COST

• \$47,755

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

QIAextractor has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

QIAextractor has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

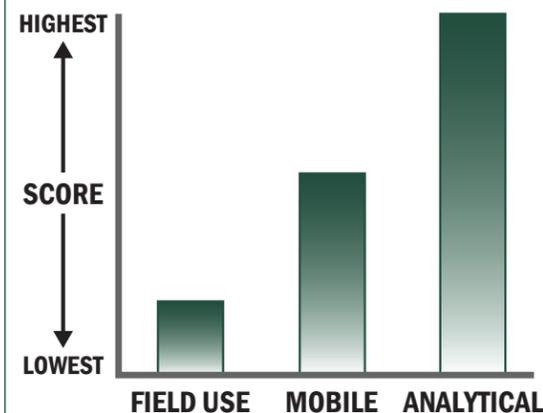
QIAextractor has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Vendor supplied information

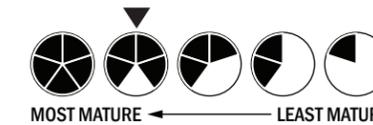
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/ batch or higher
- 60-120 minutes for sample prep
- 3-5 steps are required for prep
- System is currently semi-automated
- Add on capability for spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Government testing, third party testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 4 solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- An afternoon of training and some technical skills required
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

QuickSilver Analytics, Inc.–LiNKs 2.1



DESCRIPTION:

The LiNKs 2.1 is an easy-to-use, disposable, no-power cartridge that collects and purifies environmental samples in the field, yielding DNA-containing eluate that is compatible with PCR machines, including the RAZOR from Idaho Technologies. The LiNK 2.1 can be used to collect liquid and wipe samples and process them to produce purified DNA. Once the sample is collected, the LiNK 2.1 can be either processed immediately (using the PCR-grade water included with each device) to produce a PCR-compatible eluate, or returned to its desiccant filled shipping container and stored at room temperature, with no degradation of the DNA. The LiNK 2.1 has also been designed to simplify transfer of the sample into a RAZOR sample-processing pouch.



CONTACT INFORMATION

QuickSilver Analytics, Inc.
1309 Continental Dr.
Suite N
Abingdon, MD 21009
877-725-7587

Point of Contact:
Ryan Deady
ryan.deady@qckslvr.com

COST

• \$59.00/unit

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

LiNKs 2.1 has been placed in the top tier of all evaluated products for field use, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

LiNKs 2.1 has been placed in the bottom tier of all evaluated products for mobile laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

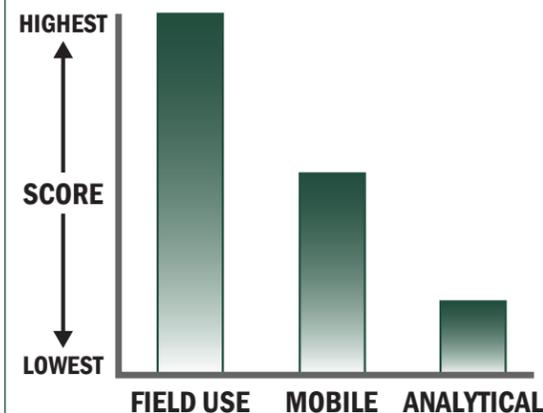
LiNKs 2.1 has been placed in the bottom tier of all evaluated products for mobile laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	
Blood	✓
Cell Cultures	
Environmental Vegetation	
Food	✓
Nasal/Throat Swabs	
Stool	
Other	

Survey Source

Vendor supplied information

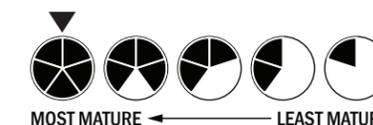
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/ batch
- 20 minutes or less for sample prep
- 9-12 steps are required for prep
- System not amenable to full or semi-automation
- Semi-automated spore lysis
- The system output is DNA
- Purity ratio unknown

System Characteristics:

- Approximately the size of a soda can
- System has no electrical requirement
- System has no power requirement
- The system is commercially available and meets milspecs
- Government testing, third party testing and scientific publication



Operations:

- System is designed for a single use
- 1 solution, buffer, and/or reagent
- No additional equipment needed
- Very brief training and minimal technical skills
- 100-500 µL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Roche Diagnostics Corporation–MagNA Pure 96



DESCRIPTION:

The MagNA Pure 96 provides automated extraction of nucleic acids from various biological samples using magnetic glass particle technology. The instrument reduces hands-on time and error by using barcoded prefilled reagent trays and disposables. Protocols for various samples are preprogrammed in the instrument software and result in high-purity and high-yield nucleic acids for a broad range of downstream applications, including PCR and restriction digestions. The system processes up to 96 standard-volume samples simultaneously in less than an hour. The system is also capable of being connected to a laboratory information management system (LIMS) via standard computer interface.



CONTACT INFORMATION

Roche Diagnostics Corporation
Roche Applied Science
9115 Hague Road
P.O. Box 50414
Indianapolis, IN 46250-0414
317-521-2000

COST

• \$160,000

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

MagNA Pure 96 has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

MagNA Pure 96 has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

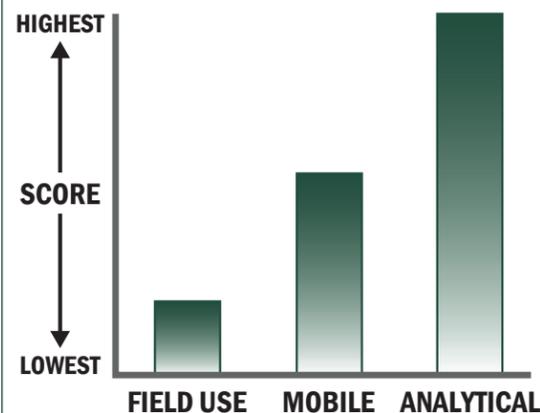
MagNA Pure 96 has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Open source internet information

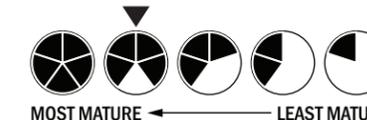
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/ batch or higher
- 40-60 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- Fully automated spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a home dishwasher
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 5+ solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- 500 µL-1 mL maximum volume reagents

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Roche Diagnostics Corporation–MagNA Pure Compact



DESCRIPTION:

The MagNA Pure Compact is a benchtop system for low throughput automated processing and extraction of nucleic acids from various biological and environmental matrices. One to eight samples are able to be processed in a single run. Similar to Roche's other MagNA Pure instruments, nucleic acids are isolated and purified using magnetic glass separation technology. This process is fully automated and enables high-quality nucleic acid isolation for use in a



broad range of applications in nucleic acid research, including gene expression PCR analysis, microarray analysis, genotyping reactions, and many other downstream technologies. The MagNA Pure Compact software is controlled by an integrated computer, and navigated by a touch-screen monitor, guiding the user through the setup procedure and run. Preinstalled isolation protocols are selected by scanning the bar-code on the reagent kits. The MagNA Pure Compact instrument utilizes synchronized stage movement, integrated HEPA filter, UV decontamination, and pre-filled and sealed reagents and disposables. The instrument also includes a sensor for tip loss, clot and cartridge detection. Isolation protocols for blood and plasma automate pipetting of an internal control during the isolation process directly into the lysis buffer, to avoid its degradation by extracellular nucleases present in these specimens.

CONTACT INFORMATION

Roche Diagnostics Corporation
Roche Applied Science
9115 Hague Road
P.O. Box 50414
Indianapolis, IN 46250-0414
317-521-2000

COST

• \$35,000

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

MagNA Pure Compact has been placed in the middle tier of all evaluated products for field use, resulting in a "somewhat applicable" ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

MagNA Pure Compact has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a "most applicable" ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

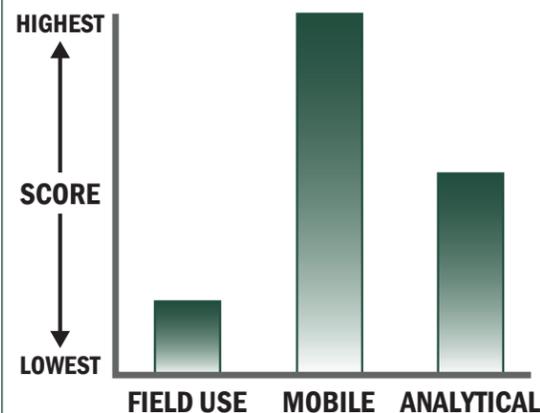
MagNA Pure Compact has been placed in the middle tier of all evaluated products for analytical laboratories, resulting in a "somewhat applicable" ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	

Survey Source

Open source internet information

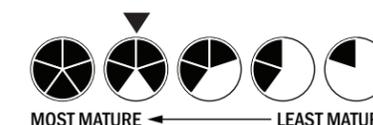
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/batch
- 20-40 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- Fully automated spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 5+ solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- 500 µL-1 mL maximum volume reagents

Product Fragment Size

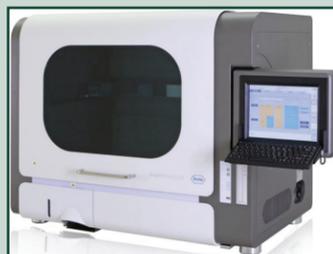
Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Roche Diagnostics Corporation–MagNA Pure LC 2.0



DESCRIPTION:

The MagNA Pure LC 2.0 is an instrument for rapid, cross-contamination free and automated preparation of nucleic acids. The system is designed to handle medium-throughput purification jobs, up to 32 samples, and uses Roche's magnetic glass particle technology. Nucleic acids (e.g., cellular, viral, bacterial, or fungal DNA, RNA, or mRNA) from a broad variety of samples such as blood, blood cells, cultured cells, plasma, serum, sputum, stool, BAL, plant tissues or food products can be purified in approximately one to three hours. A completely closed housing unit, automatic clot and tip loss detection, as well as sample tracking, makes the MagNA Pure LC 2.0 a true "walk-away" instrument for general laboratory use; filtration, centrifugation, and any other manual steps are completely eliminated. The MagNA Pure LC 2.0 utilizes a controlled, piston-driven 8-nozzle pipetting head and positive displacement, without vacuum pumps or tubing and, therefore, the risk of cross-contamination is reduced to a minimum. All required reagents are filled into nuclease-free, disposable reagent tubs; samples are loaded into sample cartridges with a capacity of 32 wells and set in place by the user. The inside of the housing unit can easily be cleaned with commonly used disinfectants and decontaminated with a built-in UV-lamp. The UV decontamination and the HEPA-filter system guarantee maximum safety for both samples and environment. The instrument allows the use of a bar-code scanner and bar-code printer as well as download of sample information from a LIMS or network (filesharing). Vice versa, run result data can be uploaded to a LIMS or network. The instrument hardware offers user convenient features like an integrated PC, touch screen, new interfaces and device, solid waste management, hardware coded cooling block for downstream PCR plate production.



CONTACT INFORMATION

Roche Diagnostics Corporation
Roche Applied Science
9115 Hague Road
P.O. Box 50414
Indianapolis, IN 46250-0414
317-521-2000

COST

• \$85,000

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

MagNA Pure LC 2.0 has been placed in the bottom tier of all evaluated products for field use, resulting in a "least applicable" ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

MagNA Pure LC 2.0 has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a "most applicable" ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

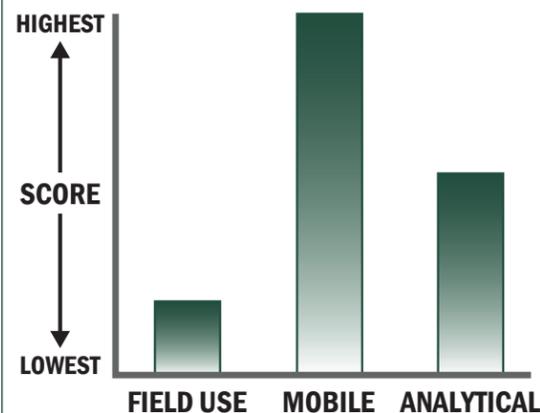
MagNA Pure LC 2.0 has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a "most applicable" ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Open source internet information

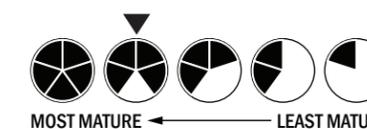
Evaluation Criteria

Effectiveness:

- Throughput of 32-95 samples/ batch
- 60-120 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- Fully automated spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 5+ solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- 500 µL-1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

STRATEC Molecular GmbH–InviGenius



DESCRIPTION:

The InviGenius is a walk-away, automated DNA/RNA sample preparation instrument that uses magnetic-particle chemistry to purify nucleic acids from up to 12 samples per run. No user intervention is necessary from sample loading to extracted nucleic acid. A number of kits, using the InviMag technology from Stratec Molecular, are available for use with the InviGenius instrument. The kits contain optimized protocols and reagents for DNA and RNA purification from a variety of sample sources including blood, serum, swab liquids, sputum, cell lysates, and stool. The InviGenius controls an array of magnetic rods that can collect or release magnetic particles. After sample lysis, the nucleic acids are bound to the magnetic particles and transferred through the extraction, purification, and elution processes to circumvent pipetting errors. The eluted pure nucleic acids are ready-to-use for subsequent downstream applications such as PCR, restriction digestion, and sequencing. The instrument also delivers exceptional process safety in a completely monitored operation environment. Elaborate software control and intuitive user guidance enable full process documentation and prevent sample tracking errors.



Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

InviGenius has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

InviGenius has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

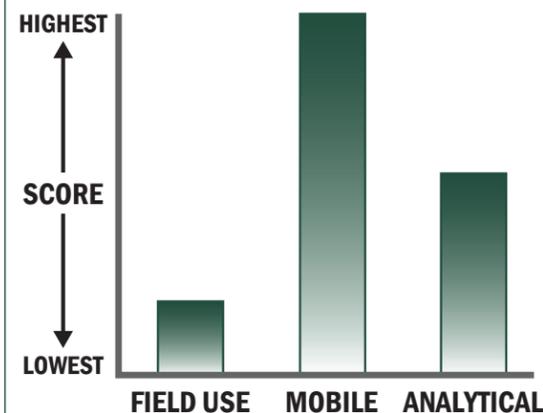
InviGenius has been placed in the middle tier of all evaluated products for analytical laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Open source internet information

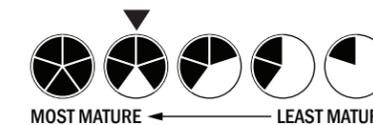
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 60-120 minutes for sample prep
- 0 steps required/automatic prep
- System is currently fully automated
- System does not lyse spores
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 4 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

STRATEC Molecular GmbH–InviMag Rack plus InviMag Kits



DESCRIPTION:

The InviMag Rack is a separator tool for magnetic separation and extraction of nucleic acids using manual methods, thus providing a cost-effective purification alternative to automated magnetic instrumentation. The rack is commonly used with Stratec Molecular's InviMag kits, but can also be used with any other vendor's nucleic acid magnetic separation kit. Standard sample tube sizes, including 1.5 mL microfuge tubes and 15 mL or 50 mL conical tubes, are supported. The separator rack allows parallel processing of up to 12 purifications and is compatible with any magnetic particle type. The magnetic core of the rack is neodymium-iron-boron and its magnetic field intensity is bead-optimized. Magnetic separation of nucleic acids provides simple and fast operation, does not require additional laboratory instrumentation such as centrifuges, and results in low wash losses.

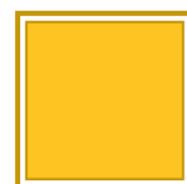


Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking*

InviMag Rack plus InviMag Kits has been placed in the middle tier of all evaluated products for field use, resulting in a "somewhat applicable" ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking*

InviMag Rack plus InviMag Kits has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a "most applicable" ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking*

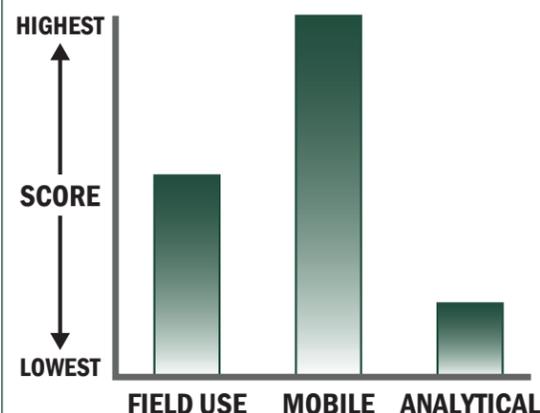
InviMag Rack plus InviMag Kits has been placed in the bottom tier of all evaluated products for analytical laboratories, resulting in a "least applicable" ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Open source internet information

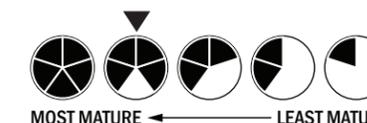
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20 minutes or less for sample prep
- 6-8 steps are required for prep
- System not amenable to full or semi-automation
- System does not lyse spores
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has no electrical requirement
- System has no power requirement
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 3 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

CONTACT INFORMATION

STRATEC Molecular GmbH
Robert-Roessle-Str. 10
13125 Berlin
Germany
info.berlin@stratec.com

Point of Contact:
Lara Cardy
B-Bridge International, Inc.
408-252-6200 x32

COST

- \$144.00 (Rack only)

Tecan US, Inc.–Freedom EVO Nucleic Acid Purification Workstation



DESCRIPTION:

The Freedom EVO Nucleic Acid Purification workstation is a fully scalable and flexible system enabling automated nucleic acid purification for a wide range of downstream applications. It is compatible with all major nucleic acid purification techniques, from commercial kits to traditional recipes. Kits offered by major suppliers such as Macherey-Nagel, Life Technologies, and Promega have been validated and easily converted to automation on the Freedom EVO. The workstation is open concept, allowing a wide range of options for specific application needs. Configurations come pre-optimized for running extraction protocols using solid-phase extraction, magnetic bead separation, or centrifugation. Various storage modules are available and nucleic acid quantification can be added to the automated workflow by integration of Tecan's Infinite series of microplate readers.



CONTACT INFORMATION

Tecan US, Inc.
9401 Globe Center Drive Suite 140
Morrisville, NC 27560
800-352-5128
Sales-Americas@Tecan.com

COST

- Not available

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

Freedom EVO Nucleic Acid Purification Workstation has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

Freedom EVO Nucleic Acid Purification Workstation has been placed in the bottom tier of all evaluated products for mobile laboratories, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

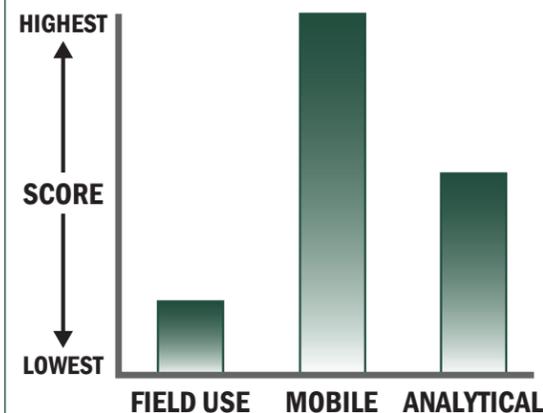
Freedom EVO Nucleic Acid Purification Workstation has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Open source internet information

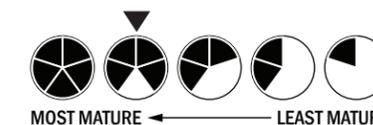
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/ batch or higher
- 0 steps required/automatic prep
- System is currently fully automated
- Add on capability for spore lysis
- The system output is DNA or RNA
- Purity ratio unknown

System Characteristics:

- Approximately the size of a home dishwasher
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- No additional equipment needed
- A day of training and technical skills required
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Thermo Fisher Scientific, Inc.–KingFisher Duo



DESCRIPTION:

The KingFisher Duo is a low- to medium-throughput automated system consisting of the KingFisher Duo magnetic particle processor instrument, optimized DNA/RNA isolation kits, plastics consumables and BindIt software. As a fast, compact system, the KingFisher Duo has a small benchtop footprint making it ideal for space-restricted laboratories. This easy-to-use system is ideal for research and diagnostic laboratories requiring nucleic acid purification, while it is easily modified for use in proteomics and cell isolation. Two protocols can run sequentially without interruption, raising throughput up to 24 samples per load. The Duo system also includes large volume processing up to 5 mL. The flexible, open system allows selection from a variety of starting materials, from blood and other body fluids to cells and tissue samples, allowing a single instrument to be used for a variety of applications. Optimized KingFisher purification kits enable users to perform nucleic acid extraction protocols for blood DNA, total RNA, cell and tissue DNA, viral DNA and plant DNA.



CONTACT INFORMATION

Thermo Fisher Scientific, Inc.
22 Friars Drive
Hudson, NH 03051
800-345-0206
applications.alhd@thermofisher.com

COST

• \$23,630

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

KingFisher Duo has been placed in the bottom tier of all evaluated products for field use, resulting in a “least applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

KingFisher Duo has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

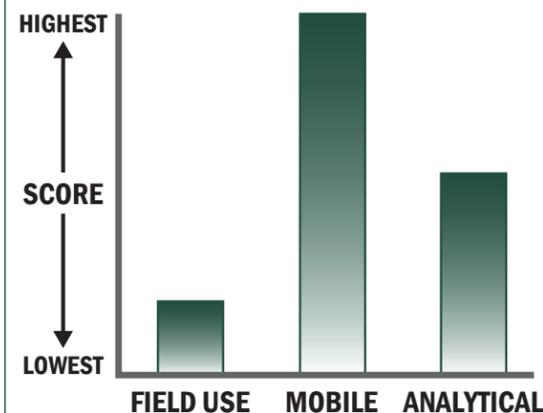
KingFisher Duo has been placed in the middle tier of all evaluated products for analytical laboratories, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

Survey Source

Vendor supplied information

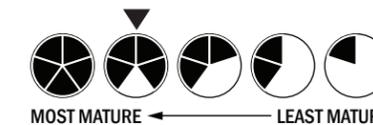
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20-40 minutes for sample prep
- 1-2 steps required for prep
- System is currently semi-automated
- Manual kit handles spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0 or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 4 solutions, buffer, and/or reagents
- No additional equipment needed.
- Very brief training and minimal technical skills
- > 1 mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

Thermo Fisher Scientific, Inc.–Kingfisher Flex



DESCRIPTION:

The KingFisher Flex system offers highly versatile, and fully automated magnetic particle processing for DNA/RNA, protein or cell purification from virtually any source. The system is based on the use of magnetic rods covered with a disposable, specially designed tip comb and plates. The instrument functions without any dispensing or aspiration parts or devices and provides the fastest and easiest way for sample preparation from variety of sample material with excellent reproducibility and quality. In fact, up to 96 samples can be processed in under 20 minutes. While Thermo Scientific KingFisher Kits are optimized for use, the instrument is open and flexible, allowing customers to use any magnetic particle-based kit to meet application needs. Customers can also raise the processing volume up to 5mL resulting in increased yield of the purified product. Additional advantages of the Flex system include automation of complicated manual steps, simultaneous processing and purification, heating to enhance binding and elution, and sample concentration during processing. Purified nucleic acids are suitable for downstream applications such as PCR, cloning, restriction digestion, and sequencing.



CONTACT INFORMATION

Thermo Fisher Scientific, Inc.
22 Friars Drive
Hudson, NH 03051
800-345-0206
applications.alhd@thermofisher.com

COST

• \$53,518

SUBJECT MATTER EXPERT COMMENT

• Underlying system components are identical to the Life Technologies - MagMAX Express 96 Magnetic Particle Processor

Tier Selection

Final icon assignment is based on overall product score and SME input/adjustment.

FIELD USE System Ranking

Kingfisher Flex has been placed in the middle tier of all evaluated products for field use, resulting in a “somewhat applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

MOBILE Laboratory Ranking

Kingfisher Flex has been placed in the top tier of all evaluated products for mobile laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

ANALYTICAL Laboratory Ranking

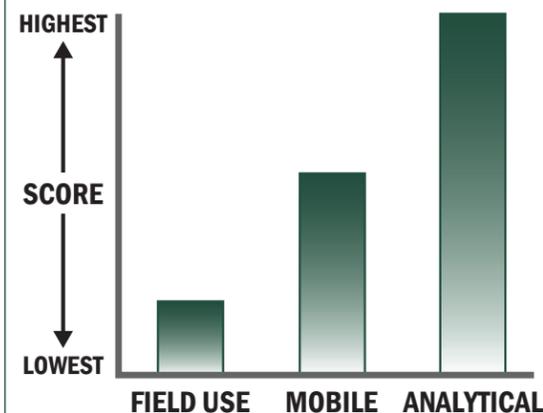
Kingfisher Flex has been placed in the top tier of all evaluated products for analytical laboratories, resulting in a “most applicable” ranking.



- Most Applicable
- Somewhat Applicable
- ▲ Least Applicable

Scoring Summary

This comparison is based on overall product scores only; no SME input is captured.



Sample Matrices Handled by System

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	
Other	

Survey Source

Vendor supplied information

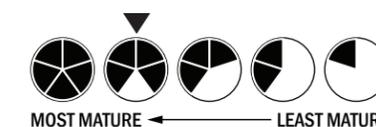
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/ batch or higher
- 20-40 minutes for sample prep
- 1-2 steps required for prep
- System is currently fully automated
- Manual kit handles spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0 or bound DNA

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required.
- 4 solutions, buffer, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1mL maximum volume

Product Fragment Size

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

DETAILED PRODUCT SHEETS - INSTRUMENTS (SAMPLE PREPARATION)

Note: This section includes detailed product sheets from eight instruments that do not purify nucleic acids but, rather, perform initial sample preparation steps common to a purification process such as cell concentration, sample homogenization, and cell lysis. Nucleic acids released after such steps may be further purified or concentrated using instruments, reagents, or kits described in other sections of this survey book. The sample preparation instruments may also improve nucleic acid recovery yields for particularly difficult sample matrices such as spores or fibrous plant tissue. The instruments are representative of typical offerings in a larger commercial market. Therefore, readers are encouraged to use this section to explore sample preparation options while keeping in mind that other commercial offerings not included here may match specific needs more closely.

LIST OF SYMBOLS

Symbol	Definition
	Instrument
	Kit
	Reagent
	Most Applicable
	Somewhat Applicable
	Least Applicable
	Commercially Available and Meets Military Specifications
	Commercially Available
	Brass Board
	Bread Board
	White Board

Fraunhofer USA-CMI-Bacterial Concentrator



DESCRIPTION:

The bacterial concentrator is a device for the isolation and concentration of microorganisms from blood. The instrument uses a series of preferential lysis steps to lyse the blood cells while keeping the microorganisms, and associated nucleic acids, intact. The microorganisms are concentrated via centrifugation and transferred via a metering valve to a second compartment. The input to the system is 10 mLs of whole blood with an output of 12 µL of purified and concentrated microorganism pellet. The pellet contains total nucleic acids from bacteria and is clean enough to be used with a number of downstream nucleic acid detection technologies including PCR and novel biosensor technologies.



CONTACT INFORMATION

Fraunhofer USA-CMI
15 Saint Mary's St
Brookline, MA 02446

Point of Contact:
Alexis Sauer-Budge, PhD
617-353-1895
asauerbudge@fraunhofer.org

COST

• < \$10.00 (estimated)

SURVEY SOURCE

Vendor supplied information

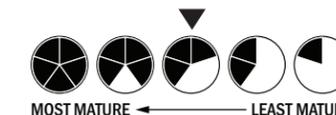
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 60-120 minutes for sample prep
- 9-12 steps are required for prep
- System adapted to automation with some effort
- Add on capability for spore lysis
- The system output is nucleic acids with preferential selection
- Purity ratio unknown

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- Battery lasts <1 Hour
- A few devices or systems exist (brass board)



Operations:

- System is designed for a single use.
- 3 solutions, buffer, and/or reagents
- No additional equipment needed
- An afternoon of training and some technical skills required.
- > 1 mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	
Water	
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	

InnovaPrep, LLC.–InnovaPrep Concentrating Pipette



DESCRIPTION:

The Concentrating Pipette is a mechanical enrichment instrument developed as a front-end to rapid microbial detection in food and beverage, biodefense, water, environmental and other applications. The novel, rapid, one-pass method provides sample volume reduction and removal of matrix-associated inhibitors for direct detection—eliminating the need for culture enrichment before diagnostic testing. The system is able to concentrate up to 100 mL of liquid sample or more per minute. As liquid samples are drawn into the single-use tip, particles are captured with an internal membrane filter. When the entire sample has been processed, InnovaPrep’s patented “wet foam elution” process is triggered to efficiently recover the captured particles in a highly concentrated form. The extraction fluids come in easy, snap-in cans and are compatible with most rapid analytical methods including immunoassay and PCR. During the entire process captured particles are retained within the single-use tip, thereby eliminating the potential for sample-to-sample carryover.



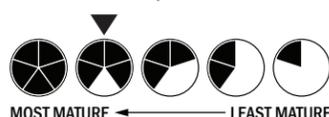
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/ batch
- 20 minutes or less for sample prep
- 1-2 steps required for prep
- System is currently fully automated
- System does not lyse spores
- The system output is nucleic acids with background reduction
- Purity ratio unknown

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for a single use
- 1 solution, buffer, and/or reagent
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

CONTACT INFORMATION

InnovaPrep, LLC.
132 East Main Street
Drexel, MO 64742
816-619-3375

Point of Contact:
Ann Packingham
apack@innovaprep.com

COST

• \$10,000

SURVEY SOURCE

Vendor supplied information

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	
Environmental Vegetation	
Food	✓
Nasal/Throat Swabs	
Stool	
Other	Urine, beverages, produce wash waters

MoBio–PowerLyzer 24



DESCRIPTION:

The PowerLyzer 24 is a bench top bead-based instrument designed to lyse and homogenize almost any biological sample. In approximately 30 seconds, the PowerLyzer 24 homogenizer is capable of processing up to 24 samples in 2 mL tubes. Difficult samples such as pine needles, seeds, spores, fungal mats, bone, and skin are easily and effectively lysed using the PowerLyzer 24 homogenizer and MO BIO's high-quality nucleic acid isolation kits. By adjusting the run times and rotation speeds, precise optimization of individual sample type may be achieved. The instrument has been validated and optimized with MO BIO nucleic acid isolation kits.



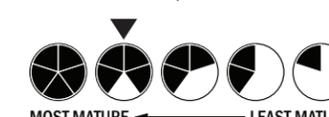
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20 minutes or less for sample prep
- 1-2 steps are required for prep
- System is currently semi-automated
- Semi-automated spore lysis
- The system output is lysed cells
- Purity ratio unknown

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 0 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

CONTACT INFORMATION

MO BIO Laboratories, Inc.
2746 Loker Avenue West
Carlsbad, CA 92010
800-606-6246

COST

• \$9,650

SURVEY SOURCE

Open source internet information

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	
Unknown	✓

SAMPLE MATRICES

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	Fungi, Seeds, Bone

MP Biomedicals–FastPrep24



DESCRIPTION:

The MP Biomedicals-FastPrep24 is a high-speed benchtop homogenizer for the lysis of biological samples. Simultaneous homogenization of up to 24 samples takes place within 40 seconds. The FastPrep24 uses a unique, optimized motion to disrupt cells through the multidirectional, simultaneous beating of specialized Lysing Matrix beads on the sample material. Developed for difficult and resistant samples, the FastPrep24 lyses thoroughly and quickly any tissues and cells and thus allows reproducible isolation of stable RNA, active proteins and full-length genomic DNA. Samples and buffers are added to a 2.0 mL Lysing Matrix tube containing specialized Lysing Matrix beads. The homogenization speed and duration times are digitally controlled. The removal of the sample holder from the instrument allows its use as a tube rack for further purification experiments.



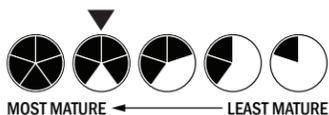
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20 minutes or less for sample prep
- 6-8 steps are required for prep
- System adapted to semi-automation with some effort
- Semi-automated spore lysis
- The system output is lysed cells
- Purity ratio unknown

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Scientific publication alone



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 0 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	
Unknown	✓

SAMPLE MATRICES

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	Fungi, Seeds, Bone

CONTACT INFORMATION

MP Biomedicals
3 Hutton Centre Drive
Santa Ana, CA 92707
800-854-0530

COST

• \$9,990

SURVEY SOURCE

Open source internet information

MP Biomedicals–FastPrep96



DESCRIPTION:

The MP Biomedicals-FastPrep96 is a high-throughput homogenizer for grinding and lysis of biological samples and DNA, RNA, and protein extractions. The FastPrep96 utilizes high-speed linear motion to disrupt samples using specialized Lysing Matrix beads. The system is offered with a wide variety of sample holding adapters (2 x 96 deep well plates, 96 x 2 mL, 48 x 4.5 mL, 24 x 15 mL, 8 x 50 mL, and 1 x 250 mL tubes) and is compatible with MP Biomedical and other suppliers' nucleic acid purification kits.



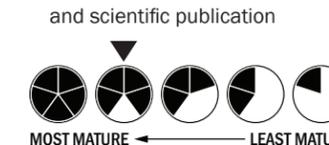
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/ batch or higher
- 20 minutes or less for sample prep
- 1-2 steps are required for prep
- System is currently semi-automated
- Semi-automated spore lysis
- The system output is lysed cells
- Purity ratio unknown

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 0 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

CONTACT INFORMATION

MP Biomedicals
3 Hutton Centre Drive
Santa Ana, CA 92707
800-854-0530

COST

• \$16,000

SURVEY SOURCE

Open source internet information

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	
Unknown	✓

SAMPLE MATRICES

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	Fungi, Seeds, Bone

Precellys–Precellys24



DESCRIPTION:

The Precellys24 is a sample homogenizer and cell lysis instrument capable of 8-figure multi-directional motion that moves beads to grind up to 24 samples at a time. The homogenizer can efficiently grind or homogenize diverse sample types (bone, hair, plant, animal tissues, bacteria, etc.) for DNA, RNA or protein extraction. The Precellys24 is designed to prepare samples from soft and hard tissues, and from 1 mg to 5000 mg. The system allows sample preparation in 0.5mL, 2mL, or 7mL tubes. Typical homogenization time is 30 seconds for a large majority of samples. Nucleic acid or proteins are separated from the tissue matrix, and pipetted after a short centrifugation step to pellet the debris. The instrument is also available with a cooling option to enable preservation of RNA or other sensitive molecule sample extraction. The instrument has been designed to be used in high-throughput conditions, with 50-100 runs per day.



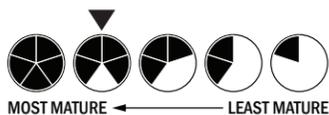
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20 minutes or less for sample prep
- 1-2 steps are required for prep
- System is currently semi-automated
- Semi-automated spore lysis
- The system output is lysed cells
- Purity ratio unknown

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- Battery lasts <1 hour
- The system is commercially available
- Scientific publication alone



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 0 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	
Unknown	✓

SAMPLE MATRICES

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	Fungi, Seeds, Bone

CONTACT INFORMATION

Manufacturer:
Precellys
240-428-1047
+33-139-306-160 (Intl.)

Distributor:
Bertin Corp USA
9700 Great Seneca Highway
Suite # 662
Rockville, MD 20850
240-428-1047

COST

• \$9,300

SURVEY SOURCE

Open source internet information

Pressure Biosciences, Inc.–PBI Barocycler NEP2320



DESCRIPTION:

The Barocycler NEP2320 is a sample preparation system (SPS) for the efficient lysis of biological particles and release of nucleic acids. The system uses pressure cycling technology (PCT) to subject samples to alternating cycles of ambient and high pressure, up to 35,000 psi, in a hydrostatic reaction chamber. Compressed air is sourced by the Barocycler from available laboratory compressed air, bottled compressed air, or a stand-alone compressor to create high and ultra-high hydrostatic pressure inside the reaction chamber. PCT SPS offers extraction of nucleic acids from a wide variety of cells and tissues, including samples considered hard to lyse. Released nucleic acids in solution can be used directly for downstream applications such as PCR.



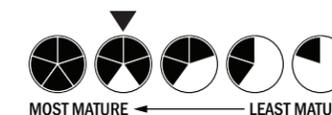
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 40-60 minutes for sample prep
- 3-5 steps are required for prep
- System is currently semi-automated
- Semi-automated spore lysis
- The system output is DNA or RNA
- Purity ratio unknown

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Government testing, third party testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 3 solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- An afternoon of training and some technical skills required
- > 1 mL maximum volume

CONTACT INFORMATION

Pressure BioSciences, Inc.
14 Norfolk Avenue
South Easton, MA 02375
508-230-1828 x 134

COST

• \$25,000

SURVEY SOURCE

Vendor supplied information

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	
Other	

Spex-Geno/Grinder



DESCRIPTION:

The Spex-Geno/Grinder is a high-throughput plant & tissue homogenizer with an adjustable clamp that accommodates a variety of formats ranging from deep-well titer plates to centrifuge tubes. Specifically designed for rapid cell disruption, lysis, and tissue homogenization while preserving temperature sensitive samples, the Spex-Geno/Grinder provides an automated solution to nucleic acid release from cells. Typical samples include plant and animal tissue, cell cultures, seeds, yeast and bacteria. Output can be further purified using a variety of standard methods, such as magnetic or silica-based membrane kits, for downstream applications including PCR and cloning. The instrument can be used with a variety of tube sizes and titer plate formats.



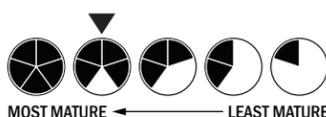
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/ batch or higher
- 20 minutes or less for sample prep
- 1-2 steps are required for prep
- System is currently semi-automated
- Semi-automated spore lysis
- The system output is lysed cells
- Purity ratio unknown

System Characteristics:

- Approximately the size of a carry-on luggage suitcase
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Government testing, third party testing and scientific publication



Operations:

- System is designed for multiple purifications with little or no cleaning required
- 0 solutions, buffers, and/or reagents
- No additional equipment needed
- Very brief training and minimal technical skills
- > 1 mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	
Unknown	✓

SAMPLE MATRICES

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	Fungi, Seeds, Bone

DETAILED PRODUCT SHEETS - KITS

Note: This survey includes detailed product sheets from eight commercially available kits capable of nucleic acid purification and/or extraction. The commercial market, however, is extensive and multiple companies offer kits with identical or near-identical capabilities and characteristics. To avoid redundancy, kits included in this survey were selected by subject matter experts as representative of typical market offerings. If particular purification requirements are not presented here, organizations are encouraged to search the marketplace for appropriate alternatives.

LIST OF SYMBOLS

Symbol	Definition
	Instrument
	Kit
	Reagent
	Most Applicable
	Somewhat Applicable
	Least Applicable
	Commercially Available and Meets Military Specifications
	Commercially Available
	Brass Board
	Bread Board
	White Board

Idaho Technology, Inc.–IT 1-2-3 Sample Purification Kits



DESCRIPTION:

IT 1-2-3 Sample Purification Kits are extraction and purification kits to enable nucleic acid recovery from pathogens found in food, water, blood, and other sources. All kits contain easy to follow protocols requiring minimal training to reduce the risk of operator error. They have been designed to purify samples for analysis with Idaho Technology's R.A.P.I.D., R.A.P.I.D. LT, and JBAIDS detection systems. Each kit contains enough material to purify up to 40 or 50 samples and do not require time-consuming enrichment steps. There are nine unique protocols to extract DNA/RNA from bacteria and viruses from seventeen sample types. Purification buffers are pre-loaded in a strip tube to maximize ease of use and purification times. Nucleic acids are extracted from the sample (e.g. cells or spores) through lysis. This is achieved by physical agitation and chemical disruption of the cells with bead-beating. The Platinum Path Sample Purification kit uses magnetic beads to capture the released nucleic acids and the nucleic acid-bead complexes are serially transferred into the prefilled reagent tubes for washing, purification, and removal of cellular debris and inhibitors. After elution from the beads, the nucleic acids are clean enough to be utilized in downstream applications such as real time PCR. Additional IT 1-2-3 kits are available for the purification of a variety of sample types including swipes, swabs, liquids, stool, and soil. Kits for minimally trained technicians are also available.



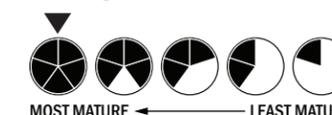
Evaluation Criteria

Effectiveness:

- Throughput of 32-95 samples/ batch
- 20 minutes or less for sample prep
- 6-8 steps are required for prep
- System easily adapted to full automation
- Manual kit handles spore lysis
- The system output is DNA or RNA
- Purity ratio unknown

System Characteristics:

- Approximately the size of a soda can
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available and meets milspecs
- Government testing, third party testing and scientific publication



Operations:

- System is designed for a single use
- 5+ solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- 500 µL-1mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	
Nucleic acid fragment size of 100000 bases or greater	
Unknown	✓

SAMPLE MATRICES

Soil	✓
Water	✓
Insects	
Blood	✓
Cell Cultures	
Environmental Vegetation	
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

CONTACT INFORMATION

Idaho Technology, Inc.
390 Wakara Way
Salt Lake City, UT 84108
Domestic and Military Sales: 801-736-6354 x 454
International Sales: 801-736-6354 x 412

COST

- \$463.00 per 40 preps (Platinum Path Kit)

SURVEY SOURCE

Vendor supplied information

MO BIO Laboratories, Inc.–UltraClean Blood DNA Isolation Kit



DESCRIPTION:

The UltraClean Blood DNA Isolation Kits are manual kits for the isolation of high quality genomic, mitochondrial or viral (if associated with white blood cells) DNA from 300 µL, 3 mL and up to 10 mL of mammalian whole blood, buffy coat, bone marrow cells, culture cells, buccal swabs. The DNA is ready for restriction digestion, PCR amplification, Southern hybridization, DNA sequencing, cloning and can be archived for years. Use of the UltraClean Blood DNA Isolation Kit (Non-spin) provides a means for isolation of high molecular weight genomic DNA from whole blood, buffy coat, bone marrow, cultured cells and other body fluids. The non-spin kit is a solution-based kit that does not require spin filters and, as a result, it is possible to isolate high molecular weight DNA greater than 100 kb. When isolating DNA from whole blood or bone marrow, the red blood cells, which lack genomic DNA, are first lysed to be separated from the leukocytes using RBC lysis buffer. DNA is isolated from cells such as leukocytes, cells contained in body fluid or animal tissue by lysing the cells with an anionic detergent as a first step. An optional RNase A treatment can be used to efficiently remove any contaminating RNA. Cellular debris and proteins are precipitated using salt solution. DNA is finally precipitated by the addition of alcohol, washed in 70% ethanol, and resuspended in hydration buffer. This hydration buffer can be used to archive DNA for indefinite periods when stored at -80 °C.



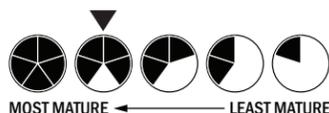
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20-40 minutes for sample prep
- Greater than 12 steps for prep
- System adapted to semi-automation with some effort
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has no electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Scientific publication alone



Operations:

- System is designed for a single use
- 5+ solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- > 1 mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	
Water	
Insects	
Blood	✓
Cell Cultures	
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	

CONTACT INFORMATION

MO BIO Laboratories, Inc.
2746 Loker Avenue West
Carlsbad, CA 92010
800-606-6246
orders@mobio.com

COST

• \$945.00 (1000 preps)

SURVEY SOURCE

Vendor supplied information

MO BIO Laboratories, Inc.–UltraClean Tissue and Cells DNA Isolation Kit



DESCRIPTION:

The UltraClean Tissue & Cells DNA Isolation Kit is ideal for isolating genomic DNA from cultured cells or animal tissues, including rodent tails. Isolated DNA is high quality and ready for PCR, restriction digests, and other downstream applications. The UltraClean Tissue & Cells DNA Isolation Kit is safe and user-friendly because it avoids the use of organic solvents like phenol and chloroform. The UltraClean Tissue & Cells DNA Isolation Kit is designed for isolating DNA from 1-25 mg tissue samples or up to 5 x 10⁶ cells. Fresh or frozen tissue samples are homogenized using bead beating technology to lyse the cells. Lysates are loaded onto a silica spin filter. DNA binds to the silica spin filter while contaminants pass through. Remaining contaminants and enzyme inhibitors are removed by a wash step. Pure DNA is then eluted into Tris buffer. This kit requires a micro-centrifuge, vortex and our Vortex Adapter. This kit contains an optional step for tough tissue samples such as bone, hair and mouse tails. Lyophilized Proteinase K has been included in this kit for processing these tissue samples.



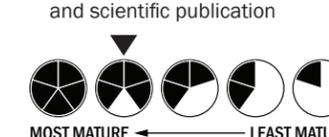
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/ batch
- 20 minutes or less for sample prep
- Greater than 12 steps for prep
- System adapted to semi-automation with some effort
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has no electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for a single use
- 5+ solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- > 1 mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	

SAMPLE MATRICES

Soil	
Water	
Insects	
Blood	
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	Animal tissues

CONTACT INFORMATION

MO BIO Laboratories, Inc.
2746 Loker Avenue West
Carlsbad, CA 92010
800-606-6246
orders@mobio.com

COST

• \$115.00 (50 preps)

SURVEY SOURCE

Vendor supplied information

Molzym GmbH–MoYsis



DESCRIPTION:

MoYsis is an innovative nucleic acid sample purification method for enrichment of bacterial nucleic acids from a variety of sample types including tissue, culture, body fluids. MoYsis products allow for enrichment of bacteria from up to 10mL of blood. The kits can be combined with any commercial DNA extraction and isolation kit. Use of the reagent results in host DNA removal and pathogen DNA enrichment for PCR analysis.



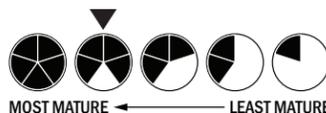
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/batch
- 40-60 minutes for sample prep
- 6-8 steps are required for prep
- System adapted to semi-automation with some effort
- Manual kit handles spore lysis
- The system output is nucleic acids with background reduction and preferential selection
- Purity ratio unknown

System Characteristics:

- Approximately the size of a soda can
- System has no electrical requirement
- No battery; not intended for portable use
- The system is commercially available.
- Government testing, third party testing and scientific publication



Operations:

- System is designed for a single use
- 5+ solutions, buffers, and/or reagents
- 3-5 additional pieces of equipment
- Very brief training and minimal technical skills
- > 1 mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	✓
Stool	✓
Other	

CONTACT INFORMATION

Manufacturer:
Molzym GmbH
Mary-Astell-Str. 10, D-28359
Bremen, Germany
011-49-421-2208-777-0
www.molzym.com

Distributor USA:
CaerusBio Inc.
1349 Pennsridge Pl.
Downingtown, PA 19335
610-518-0397
info@caerusbio.com

COST

• \$7.20 per isolation (MoYsis Basic)

SURVEY SOURCE

Vendor supplied information

Promega Corporation–ReliaPrep Blood gDNA Miniprep System



DESCRIPTION:

The ReliaPrep Blood gDNA Miniprep System provides a complete, ready-to-use method for purification of gDNA from up to 200µL of blood or body fluid, consistently isolating pure, intact gDNA without the use of alcohol washes or precipitations. Genomic DNA can be prepared from fresh or frozen blood in less than 40 minutes with expected DNA yields of 4–10µg, depending on the white blood cell count of the blood sample. Samples are processed using a binding column in a microcentrifuge tube. The genomic DNA isolated is of high-quality and can be used in common applications such as agarose gel analysis, restriction enzyme digestion and PCR analysis.



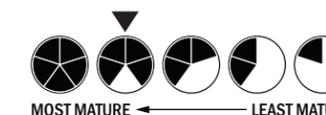
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/batch
- 40-60 minutes for sample prep
- Greater than 12 steps for prep
- System not amenable to full or semi-automation
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a soda can
- System has no electrical requirement
- System has no power requirement
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for a single use
- 4 solutions, buffers, and/or reagents
- 3-5 additional pieces of equipment
- Very brief training and minimal technical skills
- 100-500 µL maximum volume

CONTACT INFORMATION

Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
608-274-4330

COST

• \$2.35 per sample

SURVEY SOURCE

Open source internet information

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	
Water	
Insects	
Blood	✓
Cell Cultures	
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	

Promega Corporation–Wizard Genomic DNA Purification Kit



DESCRIPTION:

The Wizard Genomic DNA Purification Kit is designed for isolation of DNA from white blood cells, tissue culture cells and animal tissue, plant tissue, yeast, Gram-positive and Gram-negative bacteria. The Wizard Genomic DNA Purification Kit uses silica membrane separation technology in spin tube format and is based on a four-step process. The first step in the purification procedure lyses the cells and the nuclei. For isolation of DNA from white blood cells, this step involves lysis of the red blood cells in the Cell Lysis Solution, followed by lysis of the white blood cells and their nuclei in the Nuclei Lysis Solution. An RNase digestion step may be included at this time; it is optional for some applications. The cellular proteins are then removed by a salt-precipitation step, which precipitates the proteins but leaves the high molecular weight genomic DNA in solution. Finally, the genomic DNA is concentrated and desalted by isopropanol precipitation. DNA purified with this system is suitable for a variety of applications, such as amplifications, restriction endonuclease digestions and membrane hybridizations (e.g., Southern and dot/slot blots).



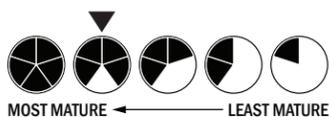
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/batch
- 40-60 minutes for sample prep
- 6-8 steps are required for prep
- System easily adapted to full automation
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a soda can
- System has no electrical requirement
- System has no power requirement
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for a single use
- 4 solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- > 1 mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	

CONTACT INFORMATION

Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
608-274-4330

COST

• \$1.56 per sample

SURVEY SOURCE

Open source internet information

QIAGEN, Inc.–PAXgene Blood DNA System



DESCRIPTION:

The PAXgene Blood DNA System is an integrated and standardized system for collection and stabilization of whole blood specimens and isolation of their genomic DNA. The system requires the combined use of PAXgene Blood DNA Tubes for blood collection and stabilization, followed by DNA isolation using the PAXgene Blood DNA Kit. Blood is collected into PAXgene Blood DNA Tubes, which contain a proprietary blend of reagents that both prevents blood coagulation and stabilizes white blood cells. Blood samples can be stored in the tubes for up to 14 days at room temperature for storage or transport. For DNA isolation, the blood is transferred to processing tubes (supplied already filled with cell lysis buffer), and the solution is mixed to lyse red and white blood cells. Cell nuclei and mitochondria are pelleted by centrifugation, washed, and resuspended in digestion buffer. Protein contaminants are removed by incubation with a protease. DNA is precipitated in isopropanol, washed in 70% ethanol, dried, and resuspended in resuspension buffer. Highly pure genomic DNA is obtained, suitable for use in a wide range of downstream applications.



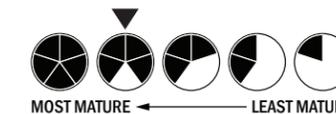
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/batch
- 40-60 minutes for sample prep
- 6-8 steps are required for prep
- System not amenable to full or semi-automation
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a soda can
- System has no electrical requirement
- System has no power requirement
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for a single use
- 4 solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- > 1 mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	
Water	
Insects	
Blood	✓
Cell Cultures	
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	

CONTACT INFORMATION

QIAGEN, Inc.
19300 Germantown Road
Germantown, MD 20874
800-362-7737

COST

• \$11.52 per sample

SURVEY SOURCE

Open source internet information

QIAGEN, Inc.–DNeasy and REPLI-g Kits



DESCRIPTION:

DNeasy Blood & Tissue Kits simplify purification of DNA from a wide range of sample types, including cultured cells, fixed tissues, or Gram-positive and -negative bacteria. Specialized online protocols are also available for DNA purification from yeast, insects, hair, and other sample types. The kits use silica-membrane technology in convenient spin-column or 96-well formats, to ensure fast and reproducible DNA purification, eliminating the need for organic extraction and alcohol precipitation. Purified DNA is free from PCR inhibitors, enabling sensitive detection in standard and multiplexed formats. For sequencing and more demanding downstream applications, DNeasy products can be used as starting material in REPLI-g Kits. The REPLI-g Kits provide optimized reagents for whole genome amplification (WGA) from samples using innovative Multiple Displacement Amplification (MDA) technology. Unique REPLI-g technology uses the innovative, high-fidelity enzyme Phi 29 polymerase to amplify complex genomic DNA combined with a gentle alkaline denaturation step to amplify genomic loci uniformly. The typical yield of the REPLI-g Mini Kit is up to 10 µg, and can be easily scaled up according to your needs with the REPLI-g Midi Kit, since both kits are based on the same protocol and use the same reaction volumes. The easy reaction set-up and very low handling time of approximately 15 minutes makes REPLI-g an easy and reliable method to use when complete and unbiased locus representation is needed from limited or precious samples. This simple and reliable method is capable of accurate and unbiased amplification of genomic DNA that can be applied without further purification or quantification for downstream applications that do not require labeling. In contrast to PCR-based WGA technologies, high fidelity rates are increased up to 1000-fold, avoiding costly false positive or negative results. Genomic DNA amplified with these kits is suitable for genotyping applications, such as SNP genotyping with TaqMan primer/probe sets, sequencing, and STR/microsatellite analysis.



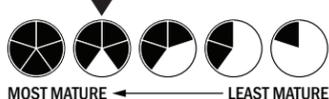
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/batch or higher
- 60-120 minutes for sample prep
- 9-12 steps are required for prep
- System easily adapted to full automation
- System does not lyse spores
- The system output is DNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has no electrical requirement
- System has no power requirement
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for a single use
- 5+ solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- An afternoon of training and some technical skills required
- > 1 mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

CONTACT INFORMATION

QIAGEN, Inc.
19300 Germantown Road
Germantown, MD 20874
800-362-7737

COST

- \$144.00 (DNeasy kit, 50 spin columns)
- \$186.00 (REPLI-g kit, 25 reactions)

SURVEY SOURCE

Open source internet information

ZyGEM–PrepGEM, ForensicGEM, and RNAgem Kits



DESCRIPTION:

The PrepGEM, ForensicGEM, livestockGEM, and RNAgem family of products are kits that enable nucleic acid extraction from diverse sample types. The kits have been formulated and optimized for downstream applications such as PCR, DNA sequencing, and RFLP analysis. The DNA extraction technology is based on ZyGEM's proprietary EA1 enzyme and can extract high quality nucleic acids from a broad range of sample materials in less than 20 minutes. Most processes only require 1-2 steps and a short heating step. Unlike most DNA preparation methods that require multiple steps and special handling, which increase the risk of error or contamination, ZyGEM's DNA extraction technology uses a single tube and a simple two-step temperature cycle to prepare DNA for analysis, greatly reducing sample preparation time and the risk of sample contamination. Across ZyGEM's range of products, a large number of sample types can be processed including soil, tissues, bacteria, fungi, insects, and saliva.



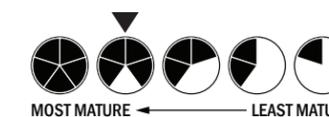
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/batch or higher
- 20 minutes or less for sample prep
- 3-5 steps are required for prep
- System easily adapted to full automation
- Semi-automated spore lysis
- The system output is DNA, RNA, or nucleic acids with background reduction
- Purity ratio unknown

System Characteristics:

- Approximately the size of a soda can
- System has no electrical requirement
- System has no power requirement
- The system is commercially available
- Third party independent testing and scientific publication



Operations:

- System is designed for a single use
- 2 solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- 100-500 µL maximum volume

CONTACT INFORMATION

ZyGEM
705 D. Dale Ave
Charlottesville, VA 22903
434-293-5019

Point of Contact:

Ian Silber, Director of Sales
708-310-1965
isilber@zygem.com

COST

- \$0.50-3.00 per sample

SURVEY SOURCE

Vendor supplied information

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	✓
Water	✓
Insects	✓
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

DETAILED PRODUCT SHEETS - REAGENTS

LIST OF SYMBOLS

Symbol	Definition
	Instrument
	Kit
	Reagent
	Most Applicable
	Somewhat Applicable
	Least Applicable
	Commercially Available and Meets Military Specifications
	Commercially Available
	Brass Board
	Bread Board
	White Board

Beckman Coulter–Agencourt AMPure XP



DESCRIPTION:

The Beckman Coulter-Agencourt AMPure XP system is a highly efficient, easily automated PCR purification reagent that delivers superior quality DNA with no salt carryover. The Agencourt AMPure method utilizes Solid Phase Reversible Immobilization (SPRI) magnetic bead-based technology, which requires no centrifugation or filtration, to bind PCR amplicons to para-magnetic particles and draws them out of solution for subsequent rinsing and removal of primers, primer dimers, salts, and unincorporated dNTPs. Using a simple, three-step protocol, the Agencourt reagent is added to a PCR reaction solution for contaminant removal and washing of nucleic acids to improve downstream performance in applications such as sequencing and SNP genotyping, cloning, and fragment analysis. The reagent can be used manually, in conjunction with a magnetic plate, or adapted to automation on three Beckman Coulter liquid handlers including the Biomek 3000, Biomek NX, and Biomek FX laboratory workstations. Single microfuge tube, 96 well plate, and 384 well plate protocols are available.



CONTACT INFORMATION

Beckman Coulter, Inc.
Life Science Division Headquarters
5350 Lakeview Parkway S Drive
Indianapolis IN 46268
800-742-2345

COST

• \$288.00 (5 mL bottle); \$756.00 (96 well magnet plate)

SURVEY SOURCE

Vendor supplied information

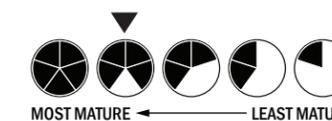
Evaluation Criteria

Effectiveness:

- Throughput of 96 samples/batch or higher
- 20 minutes or less for sample prep
- 6-8 steps are required for prep
- System easily adapted to full automation
- System does not lyse spores
- The system output is nucleic acids with background reduction and preferential selection
- Purity ratio of 1.8 to 2.0 or bound DNA

System Characteristics:

- Approximately the size of a soda can
- System has no electrical requirement
- System has no power requirement
- The system is commercially available
- Government testing, third party testing and scientific publication



Operations:

- System is designed for a single use
- 3 solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment use
- Very brief training and minimal technical skills
- > 1 mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	✓
Water	
Insects	
Blood	
Cell Cultures	
Environmental Vegetation	
Food	
Nasal/Throat Swabs	
Stool	
Other	

Bio-Rad Life Science Research—InstaGene Matrix



DESCRIPTION:

InstaGene matrix, made with a specially formulated 6% w/v Chelex resin, makes DNA sample preparation fast, easy, and cost-effective, providing PCR-quality template DNA in less than an hour. The Chelex matrix binds to PCR inhibitors rather than DNA, preventing DNA loss due to irreversible DNA binding. The InstaGene matrix eliminates the time-consuming and labor-intensive deproteinization, organic extraction, dialysis, and alcohol precipitation protocols required in traditional DNA purification procedures. Whole blood, cultured cells, and bacteria can be purified with this product. Place the cells in a microcentrifuge tube, add the InstaGene matrix, boil, and spin. The matrix adsorbs cell lysis products and leaves DNA in the supernatant. The matrix provides a cost-effective method for quick DNA purification for downstream applications such as PCR and restriction digestion.



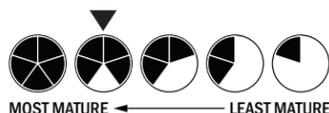
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/batch
- 20-40 minutes for sample prep
- 6-8 steps are required for prep
- System not amenable to full or semi-automation
- Manual kit handles spore lysis
- The system output is nucleic acids with background reduction
- Purity ratio unknown

System Characteristics:

- Approximately the size of a soda can
- System has no electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Scientific publication alone



Operations:

- System is designed for a single use
- 1 solution, buffer, and/or reagent
- 3- 5 additional pieces of equipment
- Very brief training and minimal technical skills
- 500 µL-1mL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	

SAMPLE MATRICES

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	
Environmental Vegetation	
Food	
Nasal/Throat Swabs	✓
Stool	
Other	

CONTACT INFORMATION

Bio-Rad Life Science Research
2000 Alfred Nobel Drive
Hercules, CA 94547
800-424-6723
diagcs@bio-rad.com

COST

- \$1.75 per sample

SURVEY SOURCE

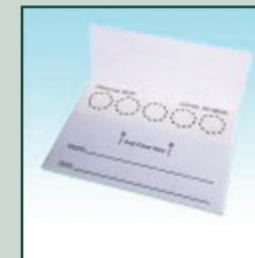
Open source internet information

GE Healthcare Biosciences—903 Specimen Collection Paper



DESCRIPTION:

903 Specimen Collection paper is used for body fluid and other sample collection, transport, analysis and archiving. The paper is manufactured from 100% pure cotton linters with no wet- strength additives and offers superior consistency. 903 paper is manufactured and tested according to FDA Quality System Regulations and is an in vitro Class II medical device, requiring adherence to strict performance standards in sample absorbency, serum uptake and circle size for a specified volume of sample or blood.



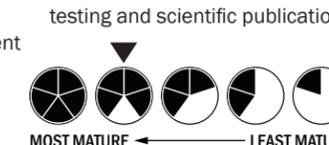
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/batch
- 20 minutes or less for sample prep
- 1-2 steps required for prep
- System not amenable to full or semi-automation
- System does not lyse spores
- No output; sample transport only
- Purity ratio unknown

System Characteristics:

- Approximately the size of a soda can
- System has no electrical requirement
- System has no power requirement
- The system is commercially available
- Government testing, third party testing and scientific publication



Operations:

- System is designed for a single use
- 1 solution, buffer, and/or reagent
- No additional equipment needed
- Very brief training and minimal technical skills
- < 100 µL maximum volume

CONTACT INFORMATION

GE Healthcare Biosciences
P.O. Box 643065
Pittsburgh, PA 15264-3065
800-526-3593
cs-us@ge.com

COST

- \$1.75 per sample

SURVEY SOURCE

Open source internet information

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

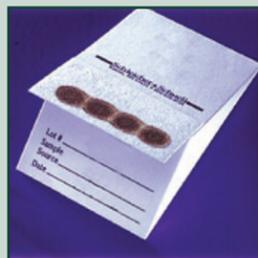
Soil	✓
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

GE Healthcare Biosciences–Isocode Specimen Collection Paper



DESCRIPTION:

IsoCode paper, a unique specimen collection paper, releases DNA template from dried body fluid samples with a simple water elution for PCR analysis, DNA sequencing or identity testing using STR analysis. IsoCode paper yields high quality DNA from a variety of body fluid samples, including blood, saliva and urine. IsoCode greatly simplifies the sample collection process, making it ideal as a component in at-home monitoring and testing kits, and for field sample collection. IsoCode paper can be manufactured in a variety of formats including automation-ready cassettes, multiple part forms or 96-well plate sizes. The paper is used as a DNA isolation and archiving device. It lyses bacterial and fungal cells and disrupts virus particles on contact to the matrix and irreversibly binds PCR inhibitors. DNA can be released after addition of water and a simple heating step. The paper also stabilizes DNA for long-term storage at ambient temperature. Samples are safe to ship by mail, saving money over shipping samples overnight using dry ice. Applications include: HLA typing, forensic samples, epidemiological studies, DNA library archiving, and DNA sample transport.



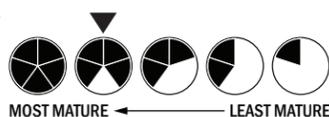
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/batch
- 20 minutes or less for sample prep
- 1-2 steps required for prep
- System not amenable to full or semi-automation
- Semi-automated spore lysis
- The system output is nucleic acids with background reduction
- Purity ratio unknown

System Characteristics:

- Approximately the size of a soda can
- System has no electrical requirement
- System has no power requirement
- The system is commercially available
- Government testing, third party testing and scientific publication



Operations:

- System is designed for a single use
- 1 solution, buffer, and/or reagent
- 1-2 additional pieces of equipment
- Very brief training and minimal technical skills
- < 100 µL maximum volume

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	✓
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	✓
Nasal/Throat Swabs	✓
Stool	✓
Other	

CONTACT INFORMATION

GE Healthcare Biosciences
P.O. Box 643065
Pittsburgh, PA 15264-3065
800-526-3593
cs-us@ge.com

COST

- Not available

SURVEY SOURCE

Open source internet information

Phenol/Chloroform



DESCRIPTION:

Phenol/chloroform extraction is a technique widely used in molecular biology for isolating nucleic acids from aqueous samples. A common mixture used in the procedure is a Tris-buffered solution of 50% phenol, 48% chloroform, and 2% isoamyl alcohol. Vortexing the mixture with an aqueous sample, followed by brief centrifugation, results in partitioning of proteins to the lower organic phase and nucleic acids to the upper aqueous phase. RNA extractions are usually carried out in lower pH and in the presence of guanidinium thiocyanate, a protein denaturing agent, to prevent RNA degradation. The aqueous phase containing the nucleic acids is commonly transferred to a new tube and subjected to ethanol precipitation to concentrate the nucleic acids and remove excess phenol and chloroform, which often inhibit downstream applications. This method is labor-intensive and utilizes hazardous materials, but results in highly pure and intact samples of both short and long nucleic acids, unlike silica-based spin-columns.



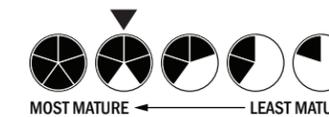
Evaluation Criteria

Effectiveness:

- Throughput of 2-31 samples/batch
- Greater than 120 minutes for sample prep
- Greater than 12 steps for prep
- System not amenable to full or semi-automation
- Manual kit handles spore lysis
- The system output is DNA or RNA
- Purity ratio of 1.8 to 2.0, or bound DNA

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Government testing, third party testing and scientific publication



Operations:

- System is designed for a single use
- 5+ solutions, buffers, and/or reagents
- More than 5 additional pieces of equipment
- More than a day of training and significant technical skills required
- > 1 mL maximum volume

CONTACT INFORMATION

N/A (reagent is widely available)

COST

- \$1.00 per extraction (estimated)

SURVEY SOURCE

Molecular Cloning: A Laboratory Manual
By Michael R. Green, Howard Hughes Medical Institute, University of Massachusetts Medical School; Joseph Sambrook, Peter MacCallum Cancer Institute, Melbourne, Australia

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	✓

SAMPLE MATRICES

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	
Food	
Nasal/Throat Swabs	✓
Stool	
Other	

Sigma Aldrich-Extract-N-Amp



DESCRIPTION:

The Extract-N-Amp PCR Kits contains all the reagents needed to rapidly extract and amplify DNA from a variety of sample matrices, including mouse tails and other animal tissues, buccal swabs, hair shafts, saliva, whole blood, plant leaves, and plant seeds. Briefly, the DNA is released from the starting material by incubating the sample with a mixture of the Extraction Solution and the Tissue Preparation Solution at room temperature for 10 minutes. There is no need for mechanical disruption, organic extraction, column purification, or precipitation of the DNA. After adding Neutralization Solution B, the extract is ready for PCR. An aliquot of the neutralized extract is then combined with the Extract-N-Amp PCR Reaction Mix and user-provided PCR primers to amplify target DNA. The Extract-N-Amp PCR Reaction Mix is a 2X ready mix containing buffer, salts, dNTPs, and Taq polymerase. It is optimized specifically for use with the extraction reagents. It also contains the JumpStart Taq antibody for hot start PCR to enhance specificity. Some kits, such as the SYBR Green Extract-N-Amp Plant PCR Kit offer real-time detection of amplicons.



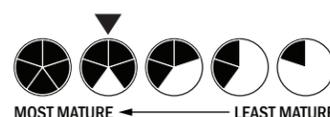
Evaluation Criteria

Effectiveness:

- Throughput of 0-1 samples/ batch or higher
- 60-120 minutes for sample prep
- 6-8 steps are required for prep
- System adapted to semi-automation with some effort
- System does not lyse spores
- The system output is DNA
- Purity ratio is less than 1.8

System Characteristics:

- Approximately the size of a toaster
- System has 110V electrical requirement
- No battery; not intended for portable use
- The system is commercially available
- Third party testing and scientific publication



Operations:

- System is designed for a single use
- 4 solutions, buffers, and/or reagents
- 1-2 additional pieces of equipment
- An afternoon of training and some technical skills required
- 100-500 µL maximum volume

CONTACT INFORMATION

Sigma-Aldrich
3050 Spruce Street
St. Louis, MO 63103
800-521-8956

COST

• \$211.00 (Tissue PCR Kit, 100 preparations)

SURVEY SOURCE

Open source internet information

PRODUCT FRAGMENT SIZE

Nucleic acid fragment size of 100 or fewer bases	✓
Nucleic acid fragment size of 200 bases	✓
Nucleic acid fragment size of 1000 bases	✓
Nucleic acid fragment size of 10000 bases	✓
Nucleic acid fragment size of 100000 bases or greater	

SAMPLE MATRICES

Soil	
Water	✓
Insects	
Blood	✓
Cell Cultures	✓
Environmental Vegetation	✓
Food	
Nasal/Throat Swabs	✓
Stool	
Other	

APPENDIX A

Survey Questions with Assigned Utility Scores

The following sixteen survey questions were used as a basis to calculate purification instrument evaluation scores. Utility values, used to convert answers into numerical values, are indicated to the left of each potential answer. Utility values ranged from zero to 100, with 100 associated with the highest expected contribution and zero associated with the lowest expected contribution toward nucleic acid purification. Each question explored a particular evaluation criterion and questions are labeled to cross-reference with evaluation criteria labels. For example, Question 1.2 is associated with Evaluation Criterion 1.2 (Speed). Scores were used as an initial method for evaluation. Once data was tabulated, it was reviewed by subject matter experts and, in some cases, subjected to clarification or modification to ensure consistency.

1. EFFECTIVENESS

1.1 What is the throughput of the sample preparation, measured in sample/batch size?

- 100 Throughput of 96 samples/batch or higher
- 75 Throughput of 32-95 samples/batch
- 50 Throughput of 2-31 samples/batch
- 25 Throughput of 0-1 samples/batch

1.2 What is the total time required to perform sample preparation?

- 100 20 minutes or less for sample prep
- 80 20 - 40 minutes for sample prep
- 60 40 - 60 minutes for sample prep
- 40 60 - 120 minutes for sample prep
- 20 Greater than 120 minutes for sample prep

1.3 Given a sample, which of the following is an appropriate statement regarding the number of manual steps required to perform a single sample preparation?

- 100 0 steps required/automatic prep
- 90 1-2 steps required for prep
- 70 3-5 steps are required for prep
- 40 6-8 steps are required for prep
- 10 9-12 steps are required for prep
- 0 Greater than 12 steps for prep

1.4 Given a collected sample that has not undergone any sample preparation, what is the most appropriate statement concerning the level of automation of the system or the potential for automation? (Full automation assumes no human interface once the sample run has been initiated while semi-automated assumes that a limited amount human interface is necessary during the sample testing.)

- 100 System is currently fully automated
- 80 System is currently semi-automated
- 60 System easily adapted to full automation
- 40 System adapted to automation with some effort
- 20 System adapted to semi-automation with some effort
- 0 System not amenable to full or semi-automation

1.5 How many of the following sample matrices have been successfully processed through the system: soil, water, insects, blood, cell cultures, environmental vegetation, food, nasal/throat swabs, stool?

- 10 1 sample matrix
- 20 2 sample matrices
- 30 3 sample matrices
- 40 4 sample matrices
- 50 5 sample matrices
- 60 6 sample matrices

- 70 7 sample matrices
- 80 8 sample matrices
- 90 9 sample matrices
- 0 0 sample matrices

1.6 Please choose the best response in regards to the lysis of spores by the device or system:

- 100 Fully automated spore lysis
- 80 Semi-automated spore lysis
- 50 Add on capability for spore lysis
- 25 Manual kit handles spore lysis
- 0 System does not lyse spores

1.7 What is the A260/A280 ratio (purity ratio) of the product?

- 100 Purity ratio of 1.8 to 2.0, or bound DNA
- 50 Purity ratio less than 1.8
- 50 Purity ratio greater than 2.0
- 0 Purity ratio unknown

2. SYSTEM CHARACTERISTICS

2.1 What are the dimensions (footprint) of the sample preparation system? This includes associated computers or other devices required to enable the system to function.

- 100 Approximately the size of a soda can
- 75 Approximately the size of a toaster
- 50 Approximately the size of a carry-on luggage suitcase
- 25 Approximately the size of a home dishwasher

2.2 What is the electrical requirement for the detection device or system NOT including other equipment needed (e.g., centrifuge, shaker, laptop)?

- 100 System has no electrical requirement
- 90 System uses batteries
- 70 System has 110V electrical requirement
- 60 System has 220V electrical requirement
- 40 System has a greater than 220V electrical requirement
- 10 System requires multiple outlets or a dedicated circuit breaker

2.3 If the system is designed for portable use, how long can it operate on battery power while performing analyses?

- 0 No battery; not intended for portable use
- 20 Battery lasts less than 1 hour
- 50 Battery lasts 1 – 2 hours
- 80 Battery lasts 2 – 4 hours
- 100 Battery lasts 4 – 8 hours
- 100 System has no power requirement

2.4 What best describes the maturity of the system?

- 100 The system is commercially available and meets military specifications
- 80 The system is commercially available
- 40 A few devices or systems exist (brass board)
- 10 Only one incomplete device or system exists (bread board)
- 0 Only a concept on paper exists (white board)

2.5 Has your system been featured in any peer reviewed scientific publication or independent evaluation?

- 100 Government testing, third party testing and scientific publication
- 80 Government testing and third party testing
- 60 Government testing and scientific publication
- 60 Third party independent testing and scientific publication
- 40 Government testing alone
- 40 Third party independent testing alone
- 20 Scientific publication alone

3. OPERATIONS

3.1 What is the total number of solutions, buffers, or reagents (not including water) that are used in the sample preparation?

- 100 0 solutions, buffers, and/or reagents
- 90 1 solution, buffer, and/or reagent
- 70 2 solutions, buffers, and/or reagents
- 50 3 solutions, buffers, and/or reagents
- 50 4 solutions, buffers, and/or reagents
- 50 5+ solutions, buffers, and/or reagents

3.2 Number of non-automated heating, cooling, centrifugation, bead-beating, magnetic separating, vacuum, etc. equipment required for sample preparation?

- 100 No additional equipment needed
- 80 1 - 2 additional pieces of equipment
- 40 3- 5 additional pieces of equipment
- 0 More than 5 additional pieces of equipment

3.3 What best describes the training necessary for operation of the system?

- 100 Very brief training and minimal technical skills
- 75 An afternoon of training and some technical skills required
- 50 A day of training and technical skills required
- 25 More than a day of training and significant technical skills required

3.4 What is the maximum volume of the sample allowed?

- 25 Less than 100 μ L maximum volume
- 50 100 – 500 μ L maximum volume
- 75 500 μ L - 1 mL maximum volume
- 100 More than 1 mL maximum volume

The following survey questions were used to further differentiate nucleic acid purification systems, but were not included as evaluation criteria and were not scored. No utility values are associated with the possible answers (-).

1. EFFECTIVENESS

1.8 What best describes the output of this device? Check all that apply:

- The system output is DNA
- The system output is RNA
- The system output is cDNA from RNA
- The system output is nucleic acids with background reduction
- The system output is nucleic acids with preferential selection

1.9 What nucleic acid fragment size does the system deliver in its current configuration? Check all that apply:

- Nucleic acid fragment size of 100 or fewer bases
- Nucleic acid fragment size of 200 bases
- Nucleic acid fragment size of 1000 bases
- Nucleic acid fragment size of 10000 bases
- Nucleic acid fragment size of 100000 bases or greater

3. OPERATIONS**3.5 Is the system disposable or designed for single use?**

- System is designed for a single use
- System is designed for multiple purifications with little or no cleaning required
- System is designed for multiple purifications with extensive cleaning required

APPENDIX B

Complete Product Scores

(*Final icon assignment is based on overall product score and SME input/adjustment)

COMPLETE PRODUCT SCORES BASED ON FIELD USE

Company - Product Name	Tier*	Overall	Effectiveness	System Characteristics	Operations
Integrated Nano-Technologies, LLC. - Palladium	●	100	37.19	30.17	32.64
Advanced Liquid Logic - R110	●	96.27	34.72	29.73	31.82
Akonni Biosystems - TruTip	●	90.40	26.11	34.67	29.62
Claremont BioSolutions, LLC. - Automated Sample Prep Module	●	86.89	29.84	27.43	29.62
Claremont BioSolutions, LLC. - PureLyse	●	86.12	33.24	21.06	31.82
STRATEC Molecular GmbH - InviMag Rack plus InviMag Kits	■	85.68	25.01	31.05	29.62
QuickSilver Analytics, Inc. - LiNKs 2.1	●	84.48	18.10	35.11	31.27
QIAGEN, Inc. - EZ-1 Advanced	●	82.89	34.83	20.63	27.43
CUBRC, Inc. - DNAPro Extraction Pipette	●	79.70	19.42	32.04	28.25
AutoGen, Inc. - QuickGene 610L	■	76.69	29.62	17.44	29.62
Promega Corporation - Maxwell 16 (Forensic) System	■	75.70	32.25	14.37	29.07
Promega Corporation - Maxwell 16 (Diagnostic) System	■	75.70	32.25	14.37	29.07
Promega Corporation - Maxwell 16 (Research) System	■	75.70	32.25	14.37	29.07
Thermo Fisher Scientific, Inc. - KingFisher Duo	▲	75.32	31.32	14.37	29.62
Thermo Fisher Scientific, Inc. - Kingfisher Flex	■	74.55	33.30	11.63	29.62
Roche Diagnostics Corporation - MagNA Pure Compact	■	74.11	34.23	11.63	28.25
AutoGen, Inc. - QuickGene Mini-80	■	72.85	31.16	14.81	26.88
Life Technologies - iPrep Purification System	▲	72.13	32.80	11.63	27.70
Precision System Science USA, Inc. - Magtration 6Mx	▲	72.02	32.14	11.63	28.25
MP Biomedicals - RapidGene12	▲	71.59	28.96	14.37	28.25
Life Technologies - BenchPro 2100 Plasmid Purification Station	▲	71.42	25.23	14.37	31.82
Roche Diagnostics Corporation - MagNA Pure 96	▲	70.49	33.35	8.89	28.25
Roche Diagnostics Corporation - MagNA Pure LC 2.0	▲	70.27	30.39	11.63	28.25
AutoGen, Inc. - QuickGene 810	■	70.10	31.16	12.07	26.88
Precision System Science USA, Inc. - Magtration 12GC Plus	■	69.88	31.38	11.63	26.88
Aurora Biomed - VERSA 110 NAP-PCR Workstation	■	69.67	30.72	9.33	29.62
Life Technologies - MagMAX Express 96 Magnetic Particle Processor	▲	69.06	28.69	12.95	27.43
Life Technologies - MagMAX Express 24 Magnetic Particle Processor	■	67.96	27.59	12.95	27.43
STRATEC Molecular GmbH - InviGenius	▲	67.80	26.55	11.63	29.62
Aurora Biomed - VERSA Gene Nucleic Acid Preparation Workstation	■	67.03	28.52	8.89	29.62
QIAGEN, Inc. - QIAcube	▲	65.72	28.63	12.95	24.14
QIAGEN, Inc. - QIAextractor	▲	64.23	26.22	12.51	25.51
bioMérieux, Inc. - NucliSENS easyMAG	▲	63.63	28.41	8.89	26.33

COMPLETE PRODUCT SCORES BASED ON FIELD USE

Company - Product Name	Tier*	Overall	Effectiveness	System Characteristics	Operations
QIAGEN, Inc. - QIAasymphony SP/AS	▲	61.93	24.47	9.76	27.70
AutoGen, Inc. - GENE PREP	▲	61.16	23.59	9.33	28.25
bioMérieux, Inc. - NucliSENS miniMAG	▲	58.80	18.10	14.37	26.33
Life Technologies - 6700 Automated Nucleic Acid Workstation	▲	56.06	26.33	8.89	20.84
AutoGen, Inc. - AutoGenPrep 965	▲	55.02	25.01	8.89	21.12
AutoGen, Inc. - FLEX STAR	▲	54.69	22.82	8.01	23.86
Life Technologies - Automate Express Forensic DNA Extraction System	▲	54.64	24.79	11.19	18.65
Boreal Genomics - Aurora Nucleic Acid Purification System	▲	54.47	17.33	11.63	25.51
Tecan US, Inc. - Freedom EVO Nucleic Acid Purification Workstation	▲	48.16	18.98	8.89	20.30
Life Technologies - AB Library Builder System	▲	46.68	18.87	9.43	18.38

COMPLETE PRODUCT SCORES BASED ON MOBILE LABORATORY USE

Company - Product Name	Tier*	Overall	Effectiveness	System Characteristics	Operations
Advanced Liquid Logic - R110	●	100	48.69	22.61	28.69
Integrated Nano-Technologies, LLC. - Palladium	●	99.51	47.05	23.34	29.12
Thermo Fisher Scientific, Inc. - Kingfisher Flex	●	98.91	51.98	20.18	26.75
Life Technologies - MagMAX Express 96 Magnetic Particle Processor	●	96.96	48.33	23.83	24.80
Aurora Biomed - VERSA 110 NAP-PCR Workstation	●	96.78	51.06	18.97	26.75
QIAGEN, Inc. - EZ-1 Advanced	●	96.47	47.84	23.83	24.80
Claremont BioSolutions, LLC. - PureLyse	●	95.93	40.24	26.99	28.69
Roche Diagnostics Corporation - MagNA Pure 96	●	94.53	51.55	17.75	25.23
Promega Corporation - Maxwell 16 (Forensic) System	●	94.22	45.96	22.61	25.65
Promega Corporation - Maxwell 16 (MDx) System	●	94.22	45.96	22.61	25.65
Promega Corporation - Maxwell 16 (Research) System	●	94.22	45.96	22.61	25.65
Thermo Fisher Scientific, Inc. - KingFisher Duo	●	93.80	44.44	22.61	26.75
Roche Diagnostics Corporation - MagNA Pure LC 2.0	●	92.71	47.29	20.18	25.23
Precision System Science USA, Inc. - Magtration 6Mx	●	92.22	46.81	20.18	25.23
QIAGEN, Inc. - QIAxtractor	●	91.49	45.59	22.61	23.28
Life Technologies - MagMAX Express 24 Magnetic Particle Processor	■	90.88	42.25	23.83	24.80
Roche Diagnostics Corporation - MagNA Pure Compact	●	90.64	45.23	20.18	25.23
QIAGEN, Inc. - QIAasymphony SP/AS	■	90.52	45.11	20.18	25.23
AutoGen, Inc. - QuickGene Mini-80	●	90.33	42.80	23.83	23.71
Aurora Biomed - VERSA Gene Nucleic Acid Preparation Workstation	■	89.73	45.23	17.75	26.75
Life Technologies - iPrep Purification System	■	89.54	44.13	20.18	25.23
MP Biomedicals-RapidGene12	●	88.69	40.85	22.61	25.63
QIAGEN, Inc. - QIAcube	■	88.51	42.92	23.83	21.76
Akonn Biosystems - TruTip	●	88.27	31.12	30.40	26.75
AutoGen, Inc. - QuickGene 810	●	87.90	42.80	21.40	23.71
Life Technologies - BenchPro 2100 Plasmid Purification Station	■	87.54	36.23	22.61	28.69
STRATEC Molecular GmbH - InviGenius	●	87.54	40.61	20.18	26.75
AutoGen, Inc. - QuickGene 610L	●	87.05	37.69	22.61	26.75
Precision System Science USA, Inc. - Magtration 12GC Plus	■	86.93	43.04	20.18	23.71
STRATEC Molecular GmbH - InviMag Rack plus InviMag Kits	●	86.32	34.04	25.53	26.75
AutoGen, Inc. - GENE PREP	▲	82.98	38.78	18.97	25.23
Claremont BioSolutions, LLC. - Automated Sample Prep Module	▲	82.80	36.96	19.09	26.75

COMPLETE PRODUCT SCORES BASED ON MOBILE LABORATORY USE

Company - Product Name	Tier*	Overall	Effectiveness	System Characteristics	Operations
AutoGen, Inc. - AutoGenPrep 965	▲	81.88	44.74	17.99	19.15
bioMérieux, Inc. - NucliSENS easyMAG	●	81.22	39.76	17.75	23.71
Life Technologies - 6700 Automated Nucleic Acid Workstation	▲	78.91	42.31	17.75	18.84
QuickSilver Analytics, Inc. - LiNKs 2.1	▲	78.78	19.57	31.61	27.60
Life Technologies - Automate Express Forensic DNA Extraction System	▲	74.29	38.18	19.21	16.90
Tecan US, Inc. - Freedom EVO Nucleic Acid Purification Workstation	▲	74.16	37.57	17.75	18.84
bioMérieux, Inc. - NucliSENS miniMAG	●	73.19	26.87	22.61	23.71
AutoGen, Inc. - FLEX STAR	▲	72.52	35.02	15.32	22.19
Boreal Genomics - Aurora Nucleic Acid Purification System	■	71.43	27.96	20.18	23.28
CUBRC, Inc. - DNAPro Extraction Pipette	▲	69.60	21.28	23.10	25.23
Life Technologies - AB Library Builder System	▲	60.36	29.18	14.83	16.35

COMPLETE PRODUCT SCORES BASED ON ANALYTICAL LABORATORY USE

Company - Product Name	Tier*	Overall	Effectiveness	System Characteristics	Operations
Aurora Biomed - VERSA 110 NAP-PCR Workstation	●	100	72.54	10.05	17.41
Thermo Fisher Scientific, Inc. - Kingfisher Flex	●	99.44	72.82	9.21	17.41
Life Technologies - MagMAX Express 96 Magnetic Particle Processor	●	98.20	69.34	12.58	16.28
Roche Diagnostics Corporation - MagNA Pure 96	●	96.01	70.52	8.93	16.56
QIAGEN, Inc. - QIASymphony SP/AS	●	95.68	68.50	11.17	16.00
AutoGen, Inc. - FLEX STAR	●	94.05	65.19	12.58	16.28
Advanced Liquid Logic - R110	●	93.66	65.64	9.49	18.53
QIAGEN, Inc. - QIAxtractor	●	93.49	67.15	11.45	14.88
Roche Diagnostics Corporation - MagNA Pure LC 2.0	●	91.80	66.03	9.21	16.56
Promega Corporation - Maxwell 16 (Forensic) System	●	89.89	63.56	9.49	16.84
Promega Corporation - Maxwell 16 (MDx) System	●	89.89	63.56	9.49	16.84
Promega Corporation - Maxwell 16 (Research) System	●	89.89	63.56	9.49	16.84
Precision System Science USA, Inc. - Magtration 6Mx	●	89.78	64.01	9.21	16.56
Life Technologies - MagMAX Express 24 Magnetic Particle Processor	●	89.22	60.36	12.58	16.28
QIAGEN, Inc. - QIAcube	●	88.83	62.21	12.58	14.04
Integrated Nano-Technologies, LLC. - Palladium	■	88.49	61.09	8.59	18.81
Thermo Fisher Scientific, Inc. - KingFisher Duo	■	88.04	61.15	9.49	17.41
Life Technologies - Automate Express Forensic DNA Extraction System	●	87.25	65.81	9.94	11.51
AutoGen, Inc. - QuickGene Mini-80	■	85.51	59.18	10.61	15.72
AutoGen, Inc. - QuickGene 810	■	85.23	59.18	10.33	15.72
STRATEC Molecular GmbH - InviGenius	■	84.78	58.17	9.21	17.41
Roche Diagnostics Corporation - MagNA Pure Compact	■	84.62	58.84	9.21	16.56
MP Biomedicals - RapidGene12	■	83.89	57.83	9.49	16.56
Life Technologies - iPrep Purification System	●	83.72	58.51	9.21	16.00
Precision System Science USA, Inc. - Magtration 12GC Plus	●	83.10	58.17	9.21	15.72
Aurora Biomed - VERSA Gene Nucleic Acid Preparation Workstation	●	82.93	56.60	8.93	17.41
AutoGen, Inc. - GENE PREP	●	82.54	55.92	10.05	16.56
Life Technologies - 6700 Automated Nucleic Acid Workstation	●	80.35	59.07	8.93	12.35
Claremont BioSolutions, LLC. - PureLyse	▲	78.94	50.42	9.99	18.53
CUBRC, Inc. - DNAPro Extraction Pipette	▲	78.10	50.08	9.49	18.53
bioMérieux, Inc. - NucliSENS easyMAG	■	77.99	53.90	8.93	15.16
AutoGen, Inc. - QuickGene 610L	▲	76.64	49.75	9.49	17.41

COMPLETE PRODUCT SCORES BASED ON ANALYTICAL LABORATORY USE

Company - Product Name	Tier*	Overall	Effectiveness	System Characteristics	Operations
Claremont BioSolutions, LLC. - Automated Sample Prep Module	▲	75.24	54.91	9.10	11.23
STRATEC Molecular GmbH - InviMag Rack plus InviMag Kits	▲	73.95	46.72	9.83	17.41
Tecan US, Inc. - Freedom EVO Nucleic Acid Purification Workstation	●	71.59	50.87	8.93	11.79
AutoGen, Inc. - AutoGenPrep 965	■	69.96	50.08	6.68	13.19
Boreal Genomics - Aurora Nucleic Acid Purification System	▲	68.00	43.91	9.21	14.88
Akonni Biosystems - TruTip	▲	67.38	37.62	12.35	17.41
bioMérieux, Inc. - NucliSENS miniMAG	▲	64.63	39.98	9.49	15.16
Life Technologies - AB Library Builder System	●	60.58	43.01	6.63	10.95
QuickSilver Analytics, Inc. - LiNKs 2.1	▲	51.32	19.88	13.48	17.97
QIAGEN, Inc. - EZ-1 Advanced	■	47.33	25.15	5.61	16.56
Life Technologies - BenchPro 2100 Plasmid Purification Station	■	41.61	22.01	3.59	16.00

APPENDIX C

Index of Products by Name

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KingFisher Flex	Thermo FisherScientific, Inc.	100
LiNKs 2.1	Quicksilver Analytics, Inc.	84
MagMAX Express 24 Magnetic Particle Processor	Life Technologies	60
MagMAX Express 96 Magnetic Particle Processor	Life Technologies	62
MagNA Pure 96	Roche Diagnostics Corporation	86
MagNA Pure Compact	Roche Diagnostics Corporation	88
MagNA Pure LC 2.0	Roche Diagnostics Corporation	90
Magtration 12GC Plus	Precision System Science USA, Inc.	68
Magtration 6Mx	Precision System Science USA, Inc.	64
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APPENDIX D

Additional Comments Received with Survey Responses

INSTRUMENTS (Nucleic Acid Purification)		
Advanced Liquid Logic-R110		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 32-95 samples/batch	Depends on type of analysis. For example: our Newborn Screening product analyzes 48 samples/cartridge, our Sample-to-Sequence human/microbial ID cartridge accepts one sample and our NGS library prep cartridge accepts 8 samples.
(1.2) Speed	20 minutes or less for sample prep	Depends on workflow and type of analysis. We hold the world speed record for qPCR (40 cycles in under 3 minutes). More complex workflows take more time.
(1.3) Manual Steps Required	1-2 steps required for prep	Depends on type of analysis. In the simplest case with on-cartridge reagents the user needs to put the sample into the cartridge and then push "GO". Our research-oriented products require the user to put both the sample and the reagents into the cartridge.
(2.2) Electrical Requirements	System has 110V electrical requirement	A battery powered version was built and demonstrated in 2006.
(3.1) Sample Preparation	2 solutions, buffers, and/or reagents	Depends on which workflow. Sample-to-sequence requires a completely different set of reagents from multiplex immunoassays.
(3.5) System Single-Use	System is designed for a single use	The cartridge is single-use.

Akoni Biosystems-TruTip		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 0-1 samples/batch	Adaptable to automation (> 96 samples/batch)
(1.2) Speed	20 minutes or less for sample prep	4 minutes per extraction
(1.9) Nucleic acid fragment size	Nucleic acid fragment size of 10000 bases and 100000 bases or greater	Plasmid extraction currently under development

Aurora Biomed-VERSA 110 NAP-PCR Workstation		
Evaluation Criteria	Response	Additional Comments
(2.2) Electrical Requirements	System has 110V electrical requirement	The system can also run on 220V if required.
(3.1) Sample Preparation	4 solutions, buffers, and/or reagents	The system is complete with 4 ReagentDrop channels as dedicated for individual reagent and for quick dispensing of reagents. The number of reagents required will depend on the number used in the individual's protocol or the commercial kit.
(3.4) Maximum Volume	> 1 mL maximum volume	1 µL to 1000 µL pipetting and more than 1 mL by ReagentDrop channels

Aurora Biomed-VERSA Gene Nucleic Acid Preparation Workstation		
Evaluation Criteria	Response	Additional Comments
(1.2) Speed	40 - 60 minutes for sample prep	Protocol dependent
(3.4) Maximum Volume	> 1 mL maximum volume	Sample volume can range from 1 µL to several mL according to protocol.

AutoGen, Inc.-AutoGenPrep 965		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 96 samples/batch or higher	Run 4 each 96 well plates per run
(1.2) Speed	Greater than 120 minutes for sample prep	Approximately 4 hours for 384 samples
(1.6) Spore Lysis	System does not lyse spores	Machine has not been tested on spores
(2.1) Dimensions	Approximately the size of a home dishwasher	The 965 is an independent floor standing model
(3.1) Sample Preparation	5+ solutions, buffers, and/or reagents	All buffers and disposables come in extraction kit.
(3.5) System Single-Use	System is designed for multiple purifications with little or no cleaning required	About 10 minutes of weekly cleaning

AutoGen, Inc.-FLEX STAR		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	30 x 1-5 mL whole blood per batch, 90 per day
(1.2) Speed	Greater than 120 minutes for sample prep	3 hours for each batch of 30 samples

AutoGen, Inc.-QuickGene 610L		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Up to 2 mL whole blood or saliva per sample / 6 samples per batch
(1.3) Manual Steps Required	3-5 steps are required for prep	Simple procedure to make lysate up front
(2.3) Battery Range	Battery lasts < 1 hour	Systems are often used in the field with external battery

AutoGen, Inc.-QuickGene 810		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	After sample lysis 8 samples can be extracted in 6 minutes
(1.4) Level of Automation	System is currently semi-automated	Once sample lysis is performed and the lysate put into the system the rest of the process is fully automated

AutoGen, Inc.-QuickGene Mini-80		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	After manual sample lysis you can extract 8 samples in 6 minutes
(1.4) Level of Automation	System is currently semi-automated	Operator will pipette buffers

bioMerieux, Inc.-NucliSENS easyMAG		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Run size: 1-24 samples
(1.2) Speed	40 - 60 minutes for sample prep	24 samples in 1 hour
(3.5) System Single-Use	System is designed for multiple purifications with little or no cleaning required	Automated cleaning

bioMerieux, Inc.-NucliSENS miniMAG		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	1-12 samples
(1.2) Speed	40 - 60 minutes for sample prep	12 extractions in 1 hour; 24 extractions in 90 minutes (with 2 miniMAG units)

Boreal Genomics-Aurora Nucleic Acid Purification System		
Evaluation Criteria	Response	Additional Comments
(3.5) System Single-Use	System is designed for a single use	Both single use or multiple use, depending on format of cartridge chosen

Claremont BioSolutions, LLC.-Automated Sample Prep Module		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Multiple units would attach to confer multiplex capability.
(1.2) Speed	20 minutes or less for sample prep	5 minutes per sample
(1.3) Manual Steps Required	3-5 steps are required for prep	1) lyse and bind, 2) wash, 3) elute - all automated
(1.4) Level of Automation	System not amenable to full or semi-automation	We have just built the instrument and will deploy the cartridge with a few weeks. The next iteration will be about 1/2 as large as the first.
(1.6) Spore Lysis	Fully automated spore lysis	This method of cell lysis and DNA extraction was developed processing B. subtilis spores.
(1.9) Nucleic Acid Fragment Size	Nucleic acid fragment size of 10000 bases, 100000 bases or greater	We can induce sheering of the DNA or avoid sheering.
(2.1) Dimensions	Approximately the size of a soda can	Two soda cans
(2.2) Electrical Requirements	System uses batteries	1.2 volts
(2.3) Battery Range	Battery lasts 2 - 4 Hours	It is too early to tell. This is only a guess.

Claremont BioSolutions, LLC.-Automated Sample Prep Module, Continued		
Evaluation Criteria	Response	Additional Comments
(2.5) System Evaluation	Third party independent testing and scientific publication	Aspects of this device have experienced third party testing and publication. We are about to start testing this new configuration.
(3.1) Sample Preparation	3 solutions, buffer, and/or reagents	We also have a two-step protocol that eliminates the wash, therefore only two fluids.
(3.4) Maximum Volume	> 1mL maximum volume	The flow through configuration allows for a wide range of sample volumes. 1mL is typical.
(3.5) System Single-Use	System is designed for a single use	The cartridge with the embedded fluids, syringe, valve, and motor are single use. The instrument that operates the valve and syringe pump is permanent.

Claremont BioSolutions, LLC.-PureLyse		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 0-1 samples/batch	We are developing multiplex capability
(1.2) Speed	20 minutes or less for sample prep	3 to 4 minutes per prep
(1.3) Manual Steps Required	1-2 steps required for prep	We are developing an instrument to automate the protocol.
(1.6) Spore Lysis	Semi-automated spore lysis	Can lyse spores in 30 to 60 seconds
(1.9) Nucleic Acid Fragment Size	Nucleic acid fragment size of 100000 bases or greater	It can be used to shear DNA or to not shear DNA.
(2.1) Dimensions	Approximately the size of a soda can	The size of a house key
(2.3) Battery Range	Battery lasts < 1 hour	Each one is used for about 3 to 4 minutes and then discarded.
(2.5) System Evaluation	Third party independent testing and scientific publication	Government test for our related product, the RapidLyser.
(3.1) Sample Preparation	2 solutions, buffers, and/or reagents	We have an alternative protocol that includes and wash step.
(3.4) Maximum Volume	> 1 mL maximum volume	It is flow through, so it can go to even larger volumes.

CUBRC, Inc.-DNAPro Extraction Pipette		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 0-1 samples/batch	The DNAPro is a single-use, disposable extraction device.
(1.3) Manual Steps Required	9-12 steps are required for prep	9-12 steps are required for the extraction of both macromolecule types.
(1.4) Level of Automation	System not amenable to full or semi-automation	This device is intended as a hand-held, electricity-free tool for extraction in austere environments
(1.6) Spore Lysis	Add on capability for spore lysis	The solid phase sorbent can be used to manually grind samples (spores) in the bulb when the DNAPro is inverted
(2.1) Dimensions	Approximately the size of a soda can	The DNAPro extraction pipette weighs approximately 2 grams and is 6.5 inches long. Packaging for the associated chemistries has not been selected yet however 2 mL eppendorf tubes can be used for sample sizes under 1 mL
(3.4) Maximum Volume	500 µL - 1 mL maximum volume	As currently configured, 500 µL is the preferred sample size. The DNAPro is amenable to user defined alterations in sample volume and chemistry volume.

Integrated Nano-Technologies, LLC.-Palladium		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 0-1 samples/batch	The portable unit runs one sample at a time. The multichannel system will run 10 samples at once.
(1.2) Speed	20 minutes or less for sample prep	To isolate nucleic acids from a sample is under 20 minutes. However, other programs designed by the user may take longer.
(2.2) Electrical Requirements	System uses batteries	Field unit is battery powered, multi-channel system uses 110V with a battery backup
(3.1) Sample Preparation	1 solution, buffer, and/or reagent	The system uses a single disposable cartridge which is preloaded with all of the necessary reagents.

Life Technologies-6700 Automated Nucleic Acid Workstation		
Evaluation Criteria	Response	Additional Comments
(1.2) Speed	60 to 120 minutes for sample prep	96 purified RNA samples in < 90 minutes

Life Technologies-AB Library Builder System		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Up to 13 samples/batch
(1.9) Nucleic Acid Fragment Size	Nucleic acid fragment size of 200 bases	200-300bp (DNA fragment library construction)
(3.4) Maximum Volume	100-500 µL maximum volume	120 µL

Life Technologies-Automate Express Forensic DNA Extraction System		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	1-13 samples per run
(1.3) Manual Steps Required	1-2 steps required for prep	Only lysis step is performed manually
(1.4) Level of Automation	System is currently semi-automated	Only lysis step is performed manually
Life Technologies-BenchPro 2100 Plasmid Purification Station		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	1-2 preps per run
(1.2) Speed	60 - 120 minutes for sample prep	About 90 minutes
(1.9) Nucleic Acid Fragment Size		
Fragment Size	Nucleic acid fragment size of 1000 bases, and 10000 bases	2.7 kb - 20 kb
(3.1) Sample Preparation	1 solution, buffer, and/or reagent	Reagent tray is pre-packaged and sealed with multiple sub-compartments
(3.4) Maximum Volume	> 1 mL maximum volume	Input volume is 125 mL of bacterial cell culture

Life Technologies-iPrep Purification System		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Up to 12 purifications per batch
(1.2) Speed	20 - 40 minutes for sample prep	Kit dependent

Life Technologies-MagMAX Express 24 Magnetic Particle Processor		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Up to 24 samples/batch
(1.2) Speed	60 - 120 minutes for sample prep	Depending on sample type and target nucleic acid
(1.9) Nucleic Acid Fragment Size	Nucleic acid fragment size of 200 bases, 1000 bases, 10000 bases, and 100000 bases or greater	Depending on sample condition
(2.2) Electrical Requirements	System has 110V electrical requirement	220V is also available
(2.5) System Evaluation	Government testing, third party testing and scientific publication	Used around the globe by academia and industry
(3.1) Sample Preparation	5+ solutions, buffers, and/or reagents	Kit dependent
(3.4) Maximum Volume	> 1 mL maximum volume	Depending on the protocol

Life Technologies-MagMAX Express 96 Magnetic Particle Processor		
Evaluation Criteria	Response	Additional Comments
(1.2) Speed	60 - 120 minutes for sample prep	Time varies depending on the type of sample and target nucleic acid
(1.3) Manual Steps Required	0 steps required/automatic prep	This is an automatic system that needs loading of samples and reagents prior starting the automatic process
(1.9) Nucleic Acid Fragment Size	Nucleic acid fragment size of 200 bases, 1000 bases, 10000 bases, and 100000 bases or greater	Depending on the sample condition
(2.2) Electrical Requirements	System has 110V electrical requirement	220 V are available too for our markets in EU
(2.5) System Evaluation	Government testing, third party testing and scientific publication	Used in academia and industry around the globe
(3.1) Sample Preparation	3 solutions, buffers, and/or reagents	Solutions and buffers vary depending on the sample type and the target nucleic acid
(3.4) Maximum Volume	> 1 mL maximum volume	This varies depending of the sample type

Precision System Science USA, Inc.-Magtration 12GC Plus		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	1-12 samples/batch
(1.2) Speed	20 - 40 minutes for sample prep	Protocol dependent

Precision System Science USA, Inc.-Magtration 6Mx		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 32-95 samples/batch	Up to 48 samples/batch

Pressure Biosciences, Inc.-PBI Barocycler NEP2320		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Depending of the volume to be extracted 1 sample or up to 12 samples.
(3.1) Sample Preparation	3 solutions, buffers, and/or reagents	Only one reagent is needed for the initial extraction.
(3.4) Maximum Volume	> 1 mL maximum volume	Large volume samples can be between 300 µL and 1400 µL. Small volume samples can be 150 µL or down to 50 µL.

Promega Corporation-Maxwell 16 Instruments (Forensic, Diagnostic, and Research)		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Up to 16 samples per batch
(1.2) Speed	20 - 40 minutes for sample prep	Sample type dependent
(1.3) Manual Steps Required	0 steps required/automatic prep	Sample type dependent. Some samples may require lysis step.
(2.2) Electrical Requirements	System has 110V electrical requirement	System can accommodate 110V or 220V. Power cord is specific to shipping address.
(3.1) Sample Preparation	1 solution, buffer, and/or reagent	Kit dependent (1-4 reagents)

QIAGEN, Inc.-EZ-1 Advanced		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	EZ-1 Advanced: up to 6 samples EZ-1 advanced XL: up to 14 samples
(1.2) Speed	20 minutes or less for sample prep	Most protocols are 17-19 mins
(1.3) Manual Steps Required	1-2 steps required for prep	Manual steps required: load sample tubes, eluate collection tube, pipette tip, and sample cartridge.
(1.6) Spore Lysis	Manual kit handles spore lysis	Spore lysis options: mericon bacteria extraction kit - Thermal lysis mericon bacteria plus kit - Mechanical lysis
(2.2) Electrical Requirements	System has 110V electrical requirement	System can work with supplemental battery (Liquid Cell, NiCa, Li Ion)
(3.1) Sample Preparation	4 solutions, buffers, and/or reagents	Five buffers are required for RNA purification.

QIAGEN, Inc.-QIAcube		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Up to 12 samples per batch
(1.2) Speed	40 - 60 minutes for sample prep	RNA protocols may exceed 60 minutes
(1.3) Manual Steps Required	3-5 steps are required for prep	Manual Steps Include: - loading of spin column/rotor-adaptor complex - loading of buffer bottles - loading of tips - loading of samples
(1.6) Spore Lysis	Add on capability for spore lysis	Optional: mericon bacteria kit (thermal lysis) mericon plus bacteria kit (mechanical lysis)
(3.1) Sample Preparation	3 solutions, buffers, and/or reagents	Can hold up to 6 buffer/reagents for more complex protocols
(3.5) System Single-Use	System is designed for multiple purifications with little or no cleaning required	Cleaning consists of daily wipe down with ethanol

QIAGEN, Inc.-QIASymphony SP/AS		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 96 samples/batch or higher	In batches of 96 or 24. Each batch of 24 can be run as different protocols
(1.2) Speed	Greater than 120 minutes for sample prep	Running multiple batches of 24 can delay the completion of all 96 samples.
(1.3) Manual Steps Required	3-5 steps are required for prep	Manual Steps Include: - Loading of Reagents in drawers underneath deck - Loading of Tips in drawers underneath deck - Loading of Sample racks or plates If Assay Setup module is included: - loading of PCR plates in drawers underneath deck - loading of tips in drawers underneath deck
(1.6) Spore Lysis	Add on capability for spore lysis	Optional Solution: mericon bacteria kit (mechanical lysis) mericon bacteria plus kit (thermal lysis)

QIAGEN, Inc.-QIASymphony SP/AS, Continued		
Evaluation Criteria	Response	Additional Comments
(3.1) Sample Preparation	2 solutions, buffers, and/or reagents	All necessary reagents are self-contained in cartridges that are loaded under the deck
(3.5) System Single-Use	System is designed for multiple purifications with little or no cleaning required	Cleaning consists of wiping deck with ethanol. Contains UV light source for decontamination.

Roche Diagnostics Corporation-MagNA Pure Compact		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	1-8 samples per run
(3.1) Sample Preparation	5+ solutions, buffers, and/or reagents	Reagents supplied in pre-filled cartridges

Roche Diagnostics Corporation-MagNA Pure LC 2.0		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 32-95 samples/batch	1-32 samples/batch
(1.2) Speed	60 - 120 minutes for sample prep	1-3 hours, dependent on protocol

STRATEC Molecular GmbH-InviGenius		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Up to 12 samples per batch
(1.2) Speed	60 - 120 minutes for sample prep	60-180 minutes (protocol-specific)
(3.1) Sample Preparation	4 solutions, buffers, and/or reagents	Average - kit dependent
(3.4) Maximum Volume	> 1 mL maximum volume	200-4000 µL (protocol-specific)

STRATEC Molecular GmbH-InviMag Rack plus InviMag Kits		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Up to 12 purifications per batch
(1.2) Speed	20 minutes or less for sample prep	Kit dependent
(1.3) Manual Steps Required	6-8 steps are required for prep	Kit dependent
(3.1) Sample Preparation	3 solutions, buffers, and/or reagents	Average - kit dependent
(3.5) System Single-Use	System is designed for a single use	Kits are single use; rack is multiple use

Tecan US, Inc.-Freedom EVO Nucleic Acid Purification Workstation		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 96 samples/batch or higher	Completely variable
(1.9) Nucleic Acid Fragment Size	0 steps required/automatic prep	For most commercially available kits
(3.1) Sample Preparation	Unknown	Protocol dependent

Thermo Fisher Scientific, Inc.-KingFisher Duo		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Up to 12 (12-pin magnet head) Up to 6 (6-pin magnet head)
(1.2) Speed	20 - 40 minutes for sample prep	Protocol dependent
(1.3) Manual Steps Required	1-2 steps required for prep	Pre-extraction steps depends on sample type
(3.1) Sample Preparation	4 solutions, buffer, and/or reagents	May be kit dependent
(3.4) Maximum Volume	> 1 mL maximum volume	Two volume ranges: 1 mL or 5 mL

Thermo FisherScientific, Inc.-KingFisher Flex		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 96 samples/batch or higher	Up to 96 samples/batch
(1.2) Speed	20 - 40 minutes for sample prep	Protocol dependent
(1.3) Manual Steps Required	1-2 steps required for prep	Pre-extraction preparation depends on sample type
(3.1) Sample Preparation	4 solutions, buffer, and/or reagents	May be kit dependent
(3.4) Maximum Volume	> 1 mL maximum volume	24 samples: 200µL-5mL 96 samples: 20-1000µL

INSTRUMENTS (Sample Preparation)

Fraunhofer USA-CMI-Bacterial Concentrator		
Evaluation Criteria	Response	Additional Comments
(1.3) Manual Steps Required	9-12 steps are required for prep	We are in the process of automating the entire protocol so that only sample introduction will be required.
(3.4) Maximum Volume	> 1 mL maximum volume	Nominal input volume of blood is 10 mL. Less is possible.
(3.5) System Single-Use	System is designed for a single use	Current prototype requires some cleaning, but future prototypes will be fully disposable.

InnovaPrep, LLC.-InnovaPrep Concentrating Pipette		
Evaluation Criteria	Response	Additional Comments
(1.2) Speed	20 minutes or less for sample prep	Capable of up to 100 mL/min. Dependent on sample volume and type.
(1.3) Manual Steps Required	1-2 steps required for prep	Depends on sample type. Some matrices require a pre-step. Watery samples are automatic
(1.4) Level of Automation	System is currently fully automated	Depends on sample matrices.
(1.6) Spore Lysis	System does not lyse spores	The system will concentrate spores but will not lyse them
(2.3) Battery Range	No battery; not intended for portable use	A hand-held version is in our product pipeline
(3.1) Sample Preparation	1 solution, buffer, and/or reagent	Elution fluid comes in aerosol-type cans and contains a buffer, a surfactant, and carbon dioxide.
(3.4) Maximum Volume	> 1 mL maximum volume	Dependent on sample type but capable of up to liters.
(3.5) System Single-Use	System is designed for a single use	The system utilizes single-use concentration tips. The tip-types vary. Based on target organism size. Currently available types are for bacteria size. Tips capable of concentrating viruses and free DNA will be available [summer of 2012].

KITS		
MO BIO Laboratories, Inc. - UltraClean Blood DNA Isolation Kit		
Evaluation Criteria	Response	Additional Comments
(1.9) Nucleic Acid Fragment Size	Nucleic acid fragment size of 1000 bases, 10000 bases, 100000 bases or greater	Over 100 kb with Non-spin kit
(3.4) Maximum Volume	> 1 mL maximum volume	10 mL

MO BIO Laboratories, Inc. - UltraClean Tissue and Cells DNA Isolation Kit		
Evaluation Criteria	Response	Additional Comments
(1.9) Nucleic Acid Fragment Size	Nucleic acid fragment size of 1000 bases and 10000 bases.	50,000 bases or smaller

Molzym GmbH - MoLYsis		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 0-1 samples/batch	Setup is per sample. Multiple samples can be set up at one time.
(1.4) Level of Automation	System adapted to semi-automation with some effort	This has been adapted for semi-automation on the NorDiag ARROW instrument. Customers have integrated the MoLYsis Basic products to a range of automated NA instruments from leading suppliers.

Promega Corporation - ReliaPrep Blood gDNA Miniprep System		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 0-1 samples/batch	Scalable
(1.9) Nucleic Acid Fragment Size	Nucleic acid fragment size of 1000 bases, 10000 bases, 100000 bases or greater	Genomic DNA prep (range of lengths)

Promega Corporation - Wizard Genomic DNA Purification Kit		
Evaluation Criteria	Response	Additional Comments
(3.4) Maximum Volume	> 1 mL maximum volume	300 µL - 10 mL

QIAGEN, Inc. - DNeasy and REPLI-g Kits		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 96 samples/batch or higher	DNeasy kits come in single spin column and 96 well plate format
(1.2) Speed	60 - 120 minutes for sample prep	1 hour (DNeasy); 10-16 hours (REPLI-g); 1.5 hours (REPLI-g UltraFast)
(1.3) Manual Steps Required	9-12 steps are required for prep	9-12 steps for DNeasy kit plus REPLI-g kit sample preparation
(1.4) Level of Automation	System easily adapted to full automation	DNeasy Kits are compatible for automation in the QIAcube
(1.9) Nucleic Acid Fragment Size	Nucleic acid fragment size of 1000 bases, 10000 bases, and 100000 bases or greater.	Genomic DNA range of 2-100 kb
(3.1) Sample Preparation	5+ solutions, buffers, and/or reagents	Both kits combined

QIAGEN, Inc. - PAXgene Blood DNA Kit		
Evaluation Criteria	Response	Additional Comments
(1.2) Speed	40 - 60 minutes for sample prep	1 hour for 8 sample preps
(1.9) Nucleic Acid Fragment Size	Nucleic acid fragment size of 10000 bases and 100000 bases or greater	Genomic DNA purification: generally > 20 kb
(3.4) Maximum Volume	> 1 mL maximum volume	8.5 mL of blood collected per sample

ZyGEM -PrepGEM, ForensicGEM, and RNagem Kits		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 96 samples/batch or higher	The kits can be used just as easily for one sample or very high throughput.
(1.6) Spore Lysis	Semi-automated spore lysis	Our enzymes have been used to isolate nucleic acids from spores but we find that upstream disruption increases recovery.
(1.9) Nucleic Acid Fragment Size	Nucleic acid fragment size of 1000 bases, 10000 bases, and 100000 bases or greater	Will give spoolable DNA. Have not looked at largest RNA pieces.
(2.1) Dimensions	Approximately the size of a soda can	Kits are very small.
(2.3) Battery Range	System has no power requirement	There is no power requirement beyond a heating step
(3.4) Maximum Volume	100 - 500 µL maximum volume	We are scalable up or down as we are a liquid based system.
(3.5) System Single-Use	System is designed for a single use	Chemistries are one and done.

REAGENTS		
Bio-Rad Life Science Research-Instagene Matrix		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Up to 12 samples at once

GE Healthcare Biosciences-903 Specimen Collection Paper		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 0-1 samples/batch	Sample transport device only
(1.9) Nucleic Acid Fragment Size	Nucleic acid fragment size of 100 or fewer bases, 200 bases, 1000 bases, 10000 bases, and 100000 bases or greater.	Sample transport only
(3.4) Maximum Volume	< 100 µL maximum volume	75 to 80 µL of sample per half-inch circle

Phenol/Chloroform		
Evaluation Criteria	Response	Additional Comments
(1.1) Throughput of Product	Throughput of 2-31 samples/batch	Typically limited by microfuge rotor capacity to about 24 samples
(1.2) Speed	Greater than 120 minutes for sample prep	Assuming icing steps during ethanol precipitation takes approximately 30 minutes
(2.1) Dimensions	Approximately the size of a toaster	The microfuge is the size of a toaster

