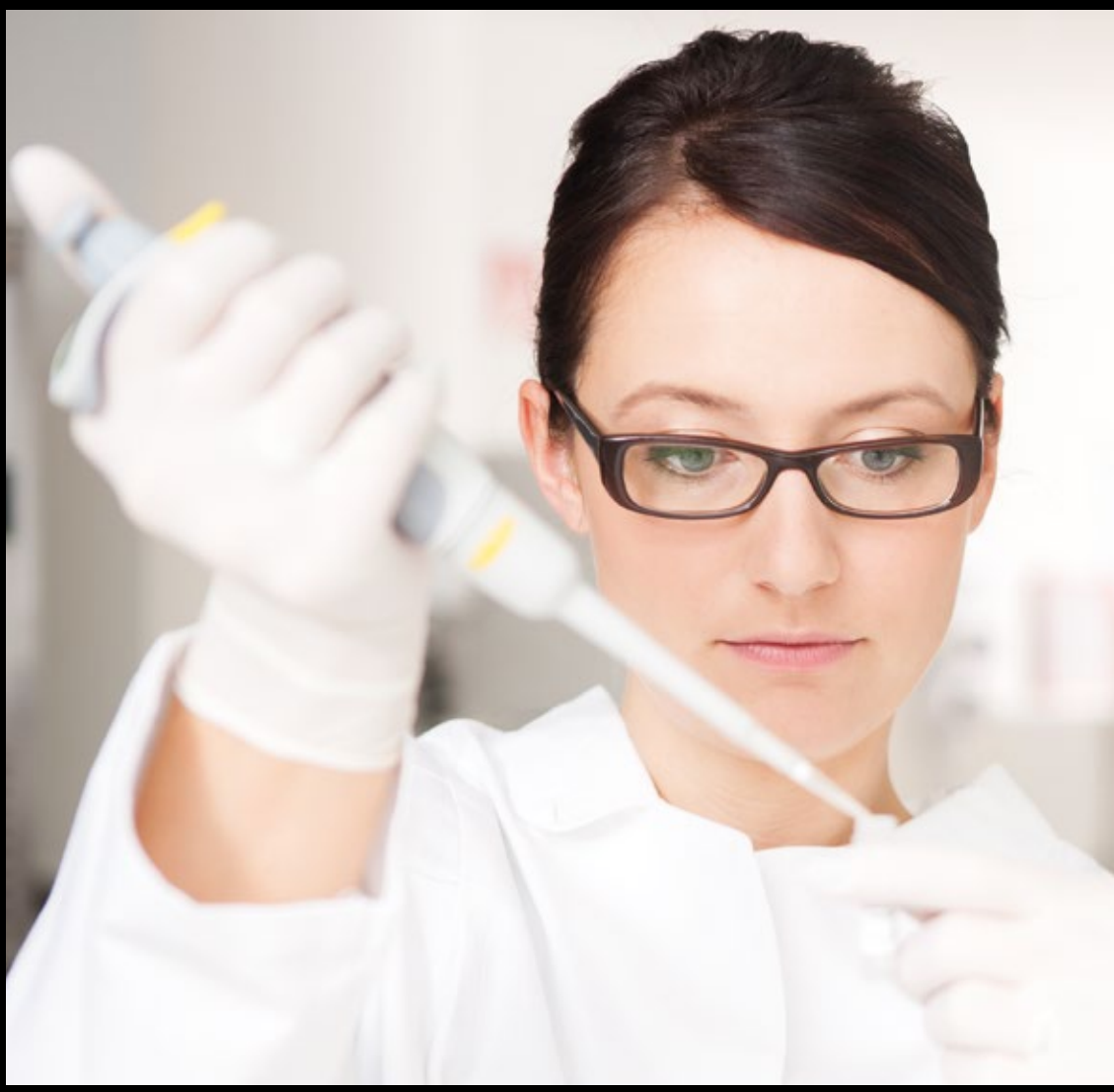
Sample Preparation Made Easy.
Comprehensive Solutions for
Nucleic Acid Extraction

Nucleic Acid Extraction/Enabling Technologies



analytikjena
An Endress+Hauser Company

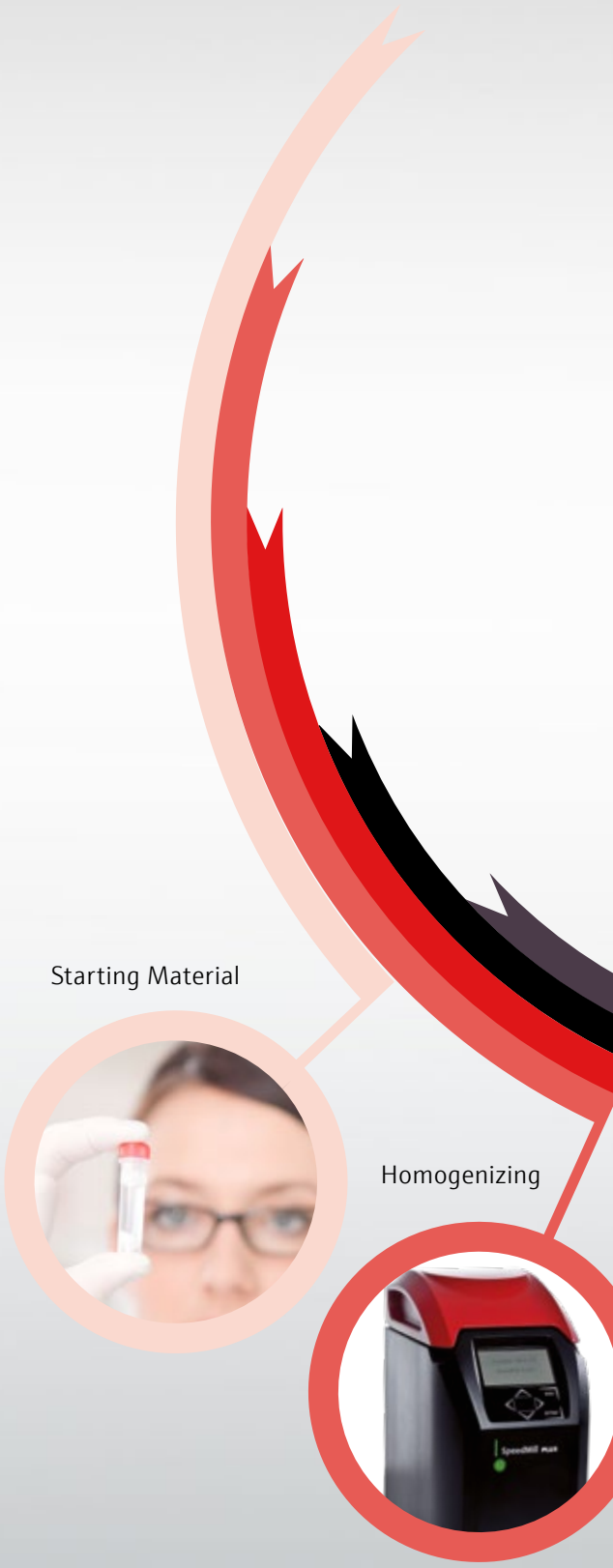
Nucleic Acid Extraction and Enabling Technologies

Analytik Jena stands for unrivaled quality and variety in nucleic acid isolation kits.

Whether the starting samples should be treated manually or run in an automated process, here you will find appropriate products for fast and reliable results. It's not for nothing that countless laboratories worldwide trust in our established kits.
The product portfolio is completed by a wide choice of patented extraction chemistry: spin-filter-based isolation of DNA and/or RNA, as well as for use with magnetic particles. Other innovative approaches meet any other needs you have, like SmartExtraction for extra easy automation, Polymer Mediated Enrichment for the efficient recovery of free-circulating DNA, and a lot more enabling technologies.

One purchase decision – plenty of advantages Analytik Jena's kits impress customers:

- Easy isolation of DNA/RNA from all samples
- High yields from different starting materials
- Highest sensitivity and reproducibility
- Time-saving procedures
- Convenient handling
- Minimized use of hazardous chemicals for risk-free working procedures
- Successful downstream applications



All From One Hand

Biotechnological Competence from Analytik Jena

Don’t waste your time and samples – trust in Analytik Jena’s long-term experience.

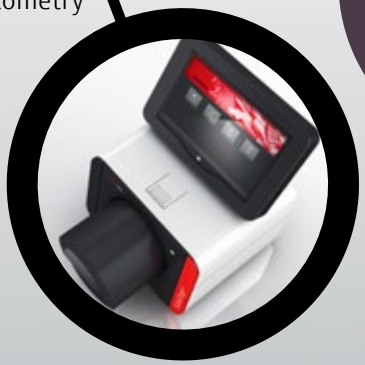
Special extras of each product will ease up your work and guarantee for reliable downstream, applications.

Electrophoresis and BioImaging

Real-Time PCR and Target-Specific Assays

PCR Devices, Reagents and Consumables

Liquid Handling and Automation



UV/Vis Spectro-photometry

Manual or Automated Nucleic Acid Isolation

We Change the Way to Prep
SmartExtraction

More than 35 years after silica-based DNA and RNA isolation was first scientifically documented[1] Analytik Jena is launching a global innovation in nucleic acid extraction. SmartExtraction significantly accelerates and considerably simplifies the entire procedure. Most notably, the technology accommodates the trend towards maximum process automation.
In order to provide users with maximum freedom when selecting materials, SmartExtraction was designed to be platform independent. The technology can be used with all of Analytik Jena's pipetting systems, including InnuPure®, GeneTheatre, and CyBio® FeliX, and is simple to adapt for use with any liquid handling system[2]. The required laboratory equipment is reduced to a thermal shaker and a magnetrack for manual applications.

In addition to simplifying procedures, SmartExtraction is also superior to other technologies in terms of yield, DNA quality, and efficiency criteria: Thanks to high binding capacities, large amounts of high-molecular DNA can be extracted with the appropriate starting materials. Compared with magnetic particle technology used in conjunction with automated pipetting extraction systems, the new technology significantly increases the amount of extracted nucleic acids in many applications, while substantially reducing the processing time required.

That's Not Optimization – That's a Quantum Leap!

DC-Technology® Meets Smart Surfaces
- No phenol/chloroform
- No ion exchanger
- No silica materials or spin filter columns
- No silica or magnetic particle suspensions

[1] Bert Vogelstein, David Gillespie; „Preparative and analytical purification of DNA from agarose" Proc. Natl. Acad. Sci. USA; Vol. 76, No. 2, page 615-619, February 1979; Biochemistry
[2] Pipetting systems with 1 mL pipetting heads

Focused on downstream: extracting high molecular weight DNA

SmartExtraction completely eliminates the need for centrifugation, vortexing, and other stress factors for nucleic acid. With a minimal risk of shearing the DNA, fragments of up to 500 kbp can be isolated.

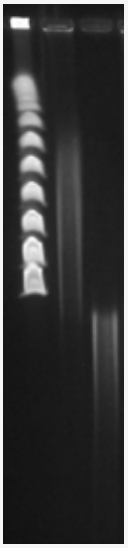


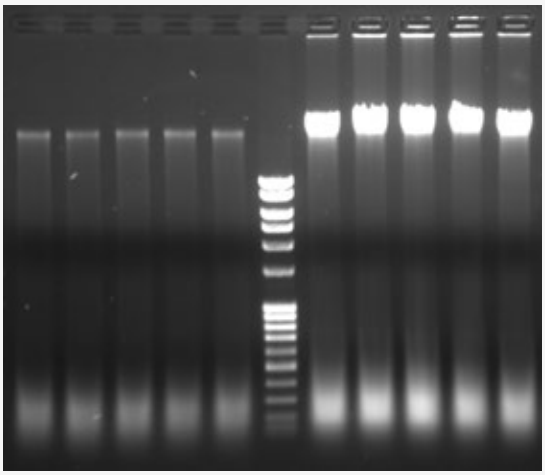
Figure 1: A comparison between manual nucleic acid extraction using an anion exchanger and SmartExtraction with the InnuPure® C16. The Rotaphor system (PFGE – pulsed field gel electrophoresis) was used to determine the molecular weight of isolated DNA.

Lane 1: DNA ladder (48.5 kbp to 727.5 kbp)
Lane 2: *E. coli* DNA after isolation via SmartExtraction with the InnuPure® C16
Lane 3: *E. coli* DNA following anion exchange isolation

Sample	A260:A280	A260:A230	Concentration [ng/µl]
SmartExtraction	1.99	1.77	283.73
Anion exchanger	1.97	2.26	117.00

Without peer: high yield meets ideal quality

The innovatively modified surfaces ("smart modified surfaces") used in SmartExtraction represent a unique solid phase that optimally separates nucleic acids from other cell components. Behavior and conditions during extraction are ideally suited for binding nucleic acids without the clumping that can appear when using magnetic particles. Finally, the highly efficient routine also results in fantastic yields and top quality when eluting nucleic acids.



No.	Method	A260:A280	A260:A230	Conc. [ng/µl]	Yield [µg]
1	MAG beads	1.97	2.30	124	22.8
2	MAG beads	1.98	2.43	124	24.8
3	MAG beads	2.00	2.42	127	24.8
4	MAG beads	2.02	2.42	115	25.4
5	MAG beads	2.00	2.45	132	23.0
7	SmartExtraction	1.97	1.98	258	51.6
8	SmartExtraction	1.97	2.11	298	59.6
9	SmartExtraction	1.96	1.96	321	64.2
10	SmartExtraction	1.96	2.15	350	70.0
11	SmartExtraction	1.95	2.06	321	64.2

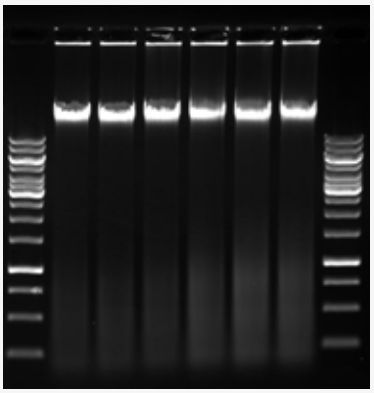
Figure 2: A comparison between DNA isolation based on magnetic particle separation and on SmartExtraction. Tissue samples of 80 mg chicken meat each were used. In contrast to the magnetic particle isolation, the yield of DNA more than doubles when using SmartExtraction while simultaneously cutting prep time in half. Lane 1–5: DNA after isolation from 80 mg chicken meat samples via magnetic particles ; Lane 6: DNA ladder; Lane 7–11: DNA after isolation from 80 mg chicken meat samples via SmartExtraction.

Independent on the used platform - InnuPure® C16 *touch*, GeneTheatre, CyBio® FeliX or CyBio® SELMA - SmartExtraction is ideally suited for easy automation of nucleic acid extraction.

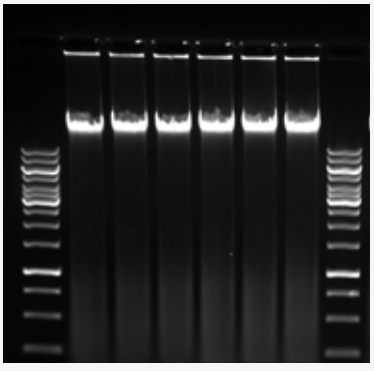
Automation made easy: platform independent technology

The unique SmartExtraction pipette tip with included Smart Modified Surfaces as granulates allows an easy setup of automated nucleic acid extraction on different liquid handling platforms. No additional tools, like centrifuges or magnet adapters are necessary allowing for fast adaption of the whole liquid handling procedure.

Just one single requirement needs to be fulfilled: fit of the 1 ml SmartExtraction tip to the liquid handling system, which perfectly aligns to Analytik Jena's automation portfolio.



A: CyBio® FeliX and CyBio® SELMA



B: GeneTheatre and InnuPure® C16

Lane	Device	A260:A280	A260:A230	Yield [µg]
2	CyBio® FeliX	1.93	1.78	33.79
3		1.93	1.74	30.35
4		1.93	1.66	33.88
5	CyBio® SELMA	1.94	1.79	36.91
6		1.97	2.07	39.40
7		1.95	1.93	39.91
10	GeneTheatre	1.94	1.82	34.08
11		1.94	1.89	35.00
12		1.96	2.00	31.88
13	InnuPure® C16	1.93	2.08	34.58
14		1.93	1.84	32.00
15		1.92	1.90	32.93

Figure 3: Meat of pork muscle each sample with 50 mg was used to extract high molecular weight DNA based on SmartExtraction technology. Independent on the used platform – InnuPure® C16 *touch* as standard isolation system, CyBio® FeliX and GeneTheatre as benchtop liquid handlers or even CyBio® SELMA as semi-automated system – the yield (30 – 39 µg) and quality (1.9) of DNA is equal and comparable.

High performance manual extraction

The unique SmartExtraction pipette tip with included Smart Modified Surfaces as granulates allows an easy setup of automated nucleic acid extraction on different liquid handling platforms. No additional tools, like centrifuges or magnet adapters are necessary allowing for fast adaption of the whole liquid handling procedure.

Just one single requirement needs to be fulfilled: fit of the 1 ml SmartExtraction tip to the liquid handling system, which perfectly aligns to Analytik Jena's automation portfolio.

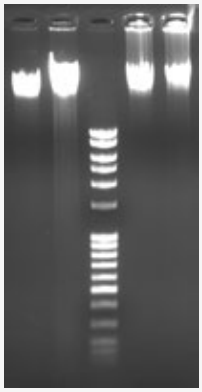


Figure 4: A standard kit based on salt precipitation and manual SmartExtraction were tested in comparison. Each 3 ml and 5 ml of a whole blood sample was used as starting material. Finally the isolated nucleic acids were measured by using a spectrophotometer and visualized on an agarose gel. Especially relating to the size of the extracted DNA, SmartExtraction clearly shows unmatched results. Lane 1: DNA after salt precipitation unsing 3 ml whole blood, Lane 2: DNA after salt precipitation unsing 5 ml whole blood, Lane 3: DNA ladder, Lane 4: DNA after SmartExtraction using 3 ml whole blood, Lane 5: DNA after SmartExtraction using 5 ml whole blood.

Sample	Kit	Volume of whole blood*	Concentration [ng/µl]	Yield [µg]	A_{260}:A_{280}	A_{260}:A_{230}
1	Salt precipitation	3 ml	70.5	52.9	1.763	2.074
2	Salt precipitation	5 ml	207.0	155.3	1.773	2.065
3	SmartExtraction	3 ml	128.0	96.0	1.835	2.217
4	SmartExtraction	5 ml	224.0	168.0	1.836	2.309

* The resulting nucleated cells

It's the Chemistry
DC-Technology®

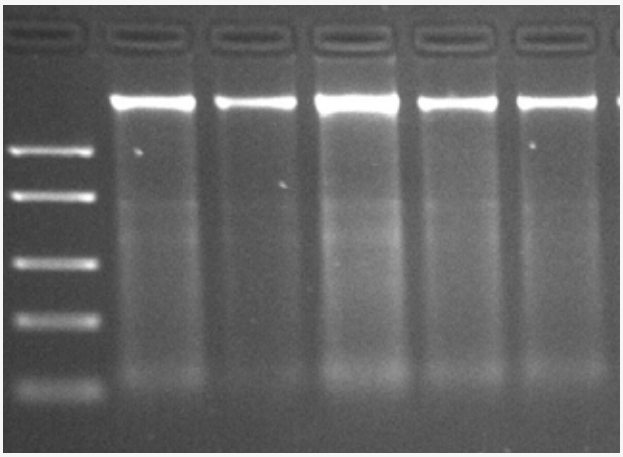
Faster. More efficient. Just Better. The well established platform of Analytik Jena's nucleic acid extraction was and is the the patented Dual-Chemistry-(DC-) Technology®. Means the DNA/RNA isolation kits from Analytik Jena are not just marginally different from competitors' products but differ in substance: sophisticated chemistry!

The heart of DC-Technology® is the highly efficient binding of DNA to a solid phases without a high salt concentration. Instead a combination of chaotropic and non-chaotropic salts with low ionic strenght is used, enabling the development of optimized lysis and new binding buffers.

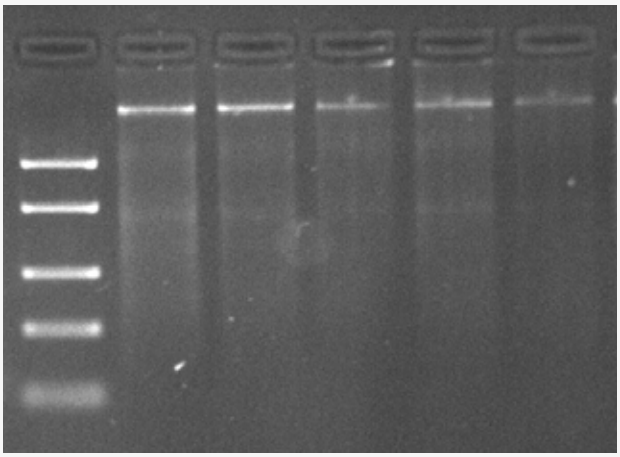
DC-Technology® is not only the basis of SmartExtraction it also allows high performance by using Spin Filters for manual nucleuc acid extraction. Thereby for users nothing changes with regard to hardware and work organization: The routines stay the same. However, the improvements in quality, time of prepration and often referring to the downstream results are satisfying – and this applies even more, as more complex the starting materials are.

Are you frustrated with long lysis times for your DNA extraction?

Discover the capacity of fast lysis powered by Proteinase K. Some things are worth the wait. Fortunately, extraction does not have to be one of those things. Because time to result is crucial in all laboratories.



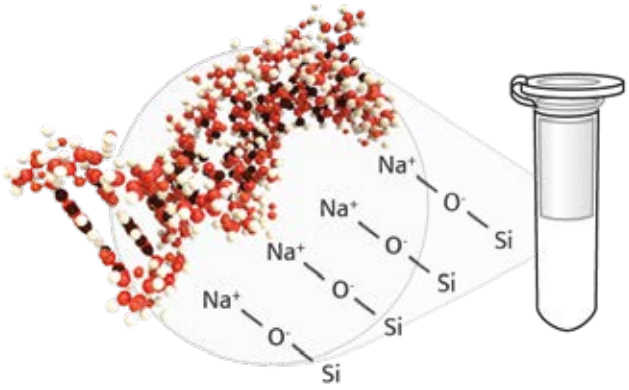
A: Analytik Jena



B: Competition

No.	Kit	A260:280	Conc. [ng/µl]
1	Analytik Jena	1.96	63.55
2	Analytik Jena	1.95	75.86
3	Analytik Jena	1.97	98.11
4	Analytik Jena	1.97	84.11
5	Analytik Jena	1.96	62.67
6	Competition	2.13	32.44
7	Competition	2.01	36.95
8	Competition	2.03	38.81
9	Competition	2.03	33.1
10	Competition	2.05	21.23

Figure 4: A comparison of the innuPREP DNA Mini Kit with a competing spin filter extraction kit from another market leader. Approximately 25 mg of pork tissue was used for DNA isolation. Determination was repeated five times. The starting material was lysed for 30 minutes and then treated in accordance with each kit's user manual.
Figure 4A shows the DNA extracted using the innuPREP DNA Mini Kit, and Figure 4B shows the DNA extracted using the competing product. The yield obtained with Analytik Jena's DC Technology® is more than double the competitor's, while both kits produce equal quality.



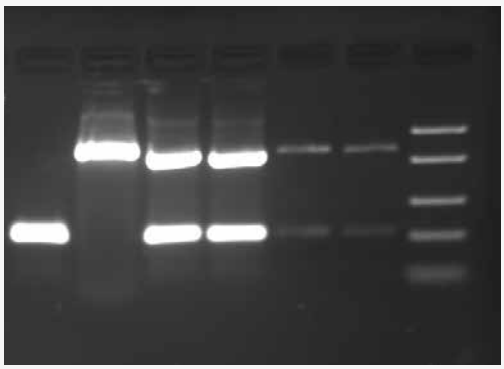
The need of flexible and versatile ready-to-use kits is growing more and more. The fast, easy and secure handling of DC-Technology® perfectly meets those requirements.

For more detailed information about DC-Technology® extraction kits, please refer to the microsite: **www.dual-chemistry.com.**

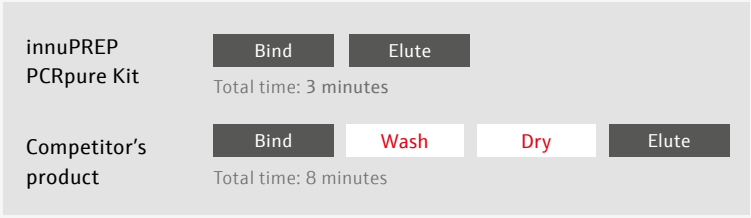
Does your kit require four steps to clean up PCR products?

Discover comprehensive cleanup with minimized handling. Everyone loves a shortcut that doesn't negatively affect the results. If you can reach the same results with half the effort, then why not do so?

Low-salt DC-Technology® puts an end to extensive washing and total washing (e.g., by using innuPREP PCRpure, which can perform PCR purification in 3 minutes).



A: Gel image

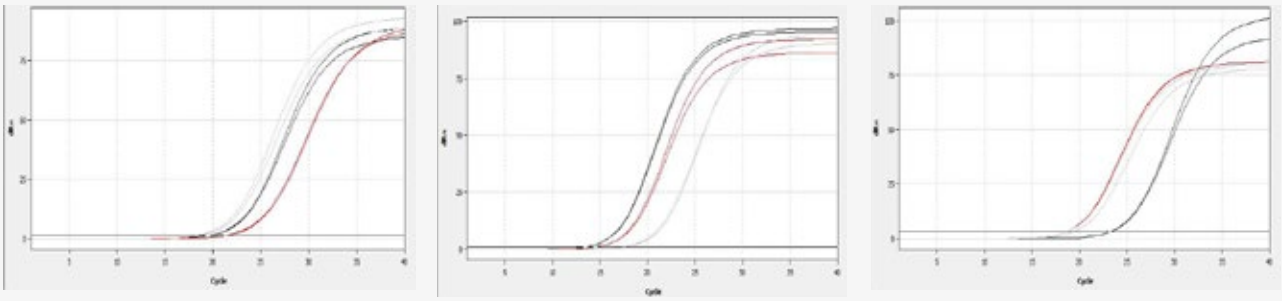


B: Comparison of hands-on time

Figure 5: Two different PCR reaction mixes – one containing a 210 bp fragment and the other a 536 bp fragment – were mixed and used for the purification of PCR products by innuPREP PCRpure Kit. This was compared to a competing, commercially available isolation kit. Both are based on the binding of nucleic acids to spin filter columns.
5A Gel Image with Lane 1: 210 bp fragment before purification
Lane 2: 536 bp fragment before purification
Lane 3–4: PCR fragments after purification using innuPREP PCRpure Kit
Lane 5 to 6: PCR fragments after purification using a competing spin filter isolation kit for PCR products;
Lane 7: DNA ladder
5B compares steps and time needed for purification. The innuPREP PCRpure Kit only needs three minutes and two simple steps to isolate high-quality PCR products from PCR reaction mixes. This saves users time and work!

Do you need to use multiple tools for one task?

Discover the clever setup of Analytik Jena's kits. Thanks to DC-Technology®, processes like plant DNA/RNA isolation can easily be optimized with up to three different lysis buffers.



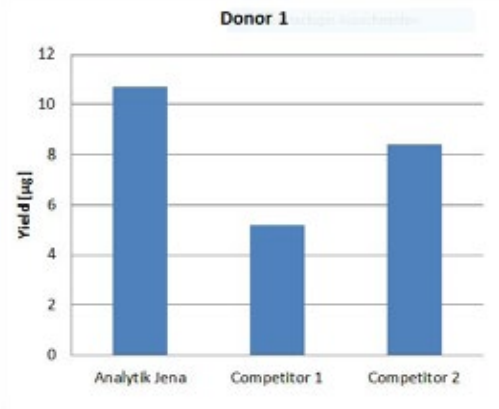
A: Oil palm leaf B: Papaya leaf C: Black bean seed

Figure 6: Depending on the starting material, the three lysis buffer system of the innuPREP Plant DNA Kit simplifies and speeds up the extraction process. The real-time plots show the influence of lysis on the final amplification results. Black: Lysis buffer CBV. Red: Lysis buffer OPT. Gray: Lysis buffer SLS.

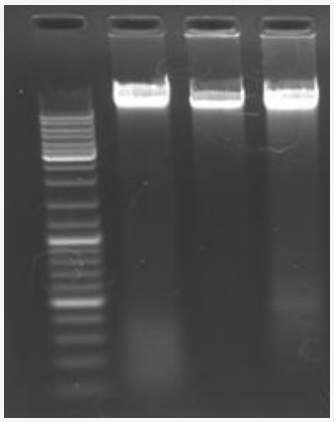
Do you feel helpless when it comes to optimizing downstream cutoffs?

Discover crown sensitivities with a comparatively higher sample input. Because nucleic acid extraction is just a means to an end, the most important asset in this process is a kit users can rely on.

The innuPREP Virus Kits as well as innuPREP Blood DNA Mini Kit allow the input of up to 400 µl of starting material for optimal sample preparation and highly sensitive results.



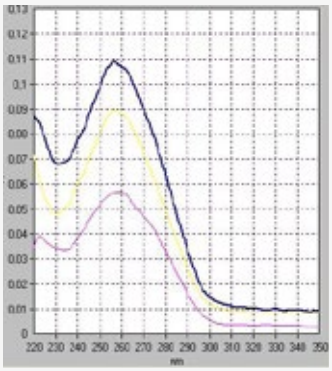
A: Yield of DNA



B: Gel image

Figure 7: 400 µl of whole blood (EDTA) was used for isolating human genomic DNA based on spin filter extraction kits from different suppliers.

7A: Extracted amount of DNA
7B: Gel Image
Lane 1: DNA ladder; Lane 2: Analytik Jena;
Lane 3: Competitor 1;
Lane 4: Competitor 2



C: UV/Vis spectra

	260/280	260/230	Conc. [ng/µl]
Blue (Analytik Jena)	1.81	1.66	53.38
Pink (Comp. 1)	1.79	1.71	28.32
Yellow (Comp. 2)	1.96	2.02	44.01

7C: UV/Vis spectra of eluted DNA and the corresponding determination of yield and quality

The Optimal Solution for Each Application

State-of-the-Art Automation: Magnetic Particle Based Extraction

Perfect fit: Automated nucleic acid extraction basd on magnetic beads

DC-Technology® is also suitable for proven magnetic particle separation, with the same outstanding advantages as described for manual Spin Filter nucleic acid extraction. Especially for the InnuPure® systems and CyBio® FeliX, but also for King Fisher® devices a variety of different nucleic acid extraction kits are available. Excellent results with high purity and yield are guaranteed. This ensures the final product to be free of proteins, nucleases and other contaminants and to be used immediately for subsequent applications. All instruments make sure that time is saved significantly and manual interventions are reduced to an absolute minimum. The extraction automats operate all pipetting and mixing steps including in the routine.

Best functionality: minimal hands-on time for full automation

No two whole blood samples are the same. This makes nucleic acid isolation quite a challenge, especially when it comes to automated solutions. Cell numbers and conditions such as coagulation will vary dramatically. The InnuPure® C16 and C16 *touch* are high-grade pipetting systems optimized toefficiently isolate DNA from whole blood samples of up to 400 µl.

Just load the sample to the prefilled, sealed reagent plastics and start the routine. The extraction process will now run completely automatically. No further manual steps are necessary.

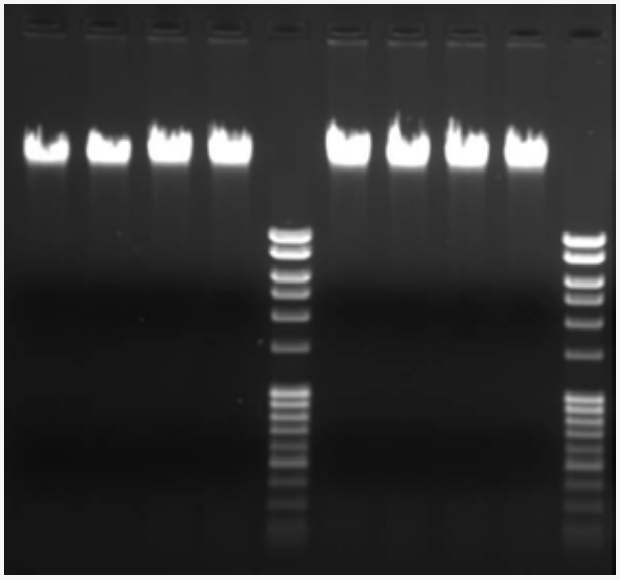


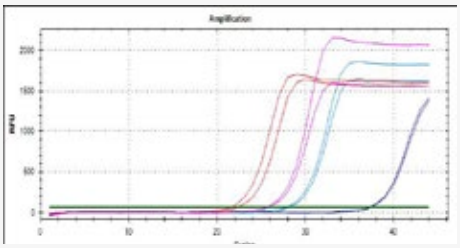
Figure 8: In combination with innuPREP Blood DNA Mini Kit – IPC16 different whole blood samples of 400 µl each were used for automated DNA isolation with InnuPure® C16 and InnuPure® C16 *touch*.
Lane 1–4: DNA from whole blood processed with InnuPure® C16;
Lane 5 and 10: DNA ladder;
Lane 6–9: DNA from whole blood processed with InnuPure® C16 *touch*

Lane	Device	A_{260}:A_{280}	A_{260}:A_{230}	Concentration [ng/µl]	Yield [ng/µl]
1	InnuPure® C16	1.81	2.14	30.0	4.5
2	InnuPure® C16	1.85	2.17	32.5	4.9
3	InnuPure® C16	1.82	2.07	40.5	6.1
4	InnuPure® C16	1.81	1.95	40.0	6.0
5	DNA Ladder				
6	InnuPure® C16 *touch*	1.80	2.19	46.0	6.9
7	InnuPure® C16 *touch*	1.82	2.10	41.0	6.2
8	InnuPure® C16 *touch*	1.84	2.44	41.5	6.2
9	InnuPure® C16 *touch*	1.81	2.30	38.0	5.7
10	DNA Ladder				

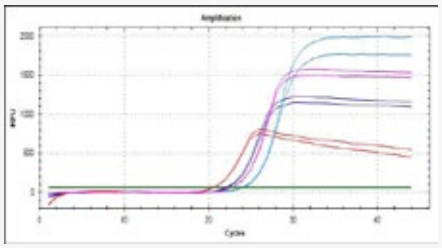
Reduce contamination: easy handling of even the most complex matrices

Processed food represents a particular challenge when it comes to isolating nucleic acids. This is down to spices and treatments needed for stabilizing. Additionally nucleic acids in those sample materials are often of low concentration and highly degraded.

The combination of InnuPure® C16 and innuPREP Food DNA Kit – IPC16 utilizes high-quality magnetic particle–based DNA extraction from any number of different food samples, ranging from sausages and chocolate bars to potato chips and instant soups.



A: Spicy potato chips



B: Instant soup

Figure 9: A comparison between DNA that was isolated automatically using InnuPure® C16 and DNA isolated using a competing machine and its magnetic particle extraction kits. DNA was isolated in potato chips and an instant soup. Finally, a target-specific amplification in real-time was carried out with double determination of the undiluted and 1:10 diluted sample.

Sample	Kit	Ct value (undiluted)	Ct value (1:10 dilution)
Spicy potato chips	Analytik Jena	21.9	25.7
	Competitor	37.4	28.1
Instant soup	Analytik Jena	20.6	22.8
	Competitor	22.2	24.1

In alignment with the starting material: three lysis buffer system

Nucleic acid extraction is just a means to an end. Nevertheless, it's a crucial step for all downstream applications. To simplify things, Analytik Jena's innuPREP Plant DNA Kit – IPC16 contains three different lysis buffers, which enable it to adapt perfectly and simply to any plant material. The result? Ideal DNA yields and quality.

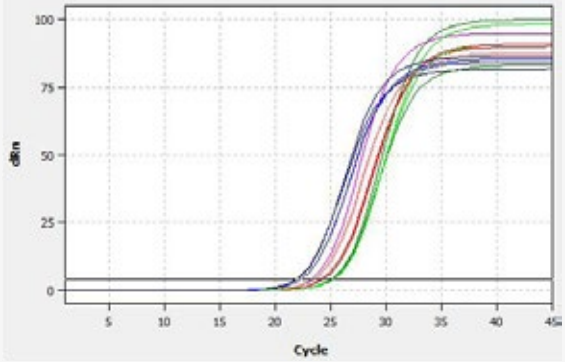


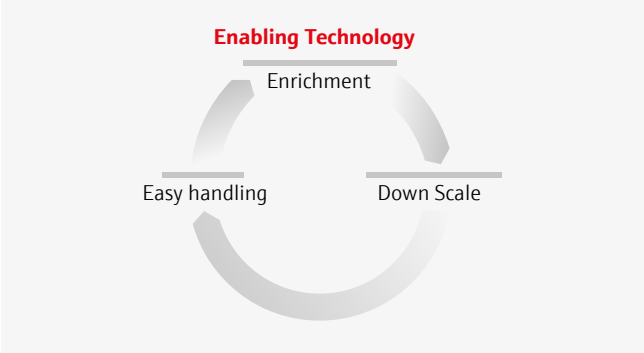
Figure 10: Two different samples of rice grains were lysed using three different lysis buffers for automatic extraction via InnuPure® C16 and magnetic particle separation.
9A: Rice-specific amplification plots. Blue: Lysis buffer CBV; Red: Lysis buffer SLS; Green: Lysis puffer OPT

Lysis buffer	Samples	Ct value	Mean Ct	Std. dev. Ct
SLS	Sample 1	24.34	24.25	0.12
	Sample 1	24.16		
	Sample 2	23.53	23.47	0.09
	Sample 2	23.40		
OPT	Sample 1	25.09	25.13	0.05
	Sample 1	25.16		
	Sample 2	25.10	25.17	0.09
	Sample 2	25.23		
CBV	Sample 1	21.86	21.94	0.11
	Sample 1	22.02		
	Sample 2	22.27	22.27	0.01
	Sample 2	22.27		

Enrichment and Epigenetics

Special-Purpose Solution: Enabling Technologies

New and inventive technologies are needed as additional options to standard methods for isolating nucleic acids. New fields of application are especially in need of innovation. Analytik Jena's product line for enrichment and epigenetics contains a number of unique patented methods that serve as a solution to challenging special requirements.



Enrichment

PME – Polymer-Mediated Enrichment

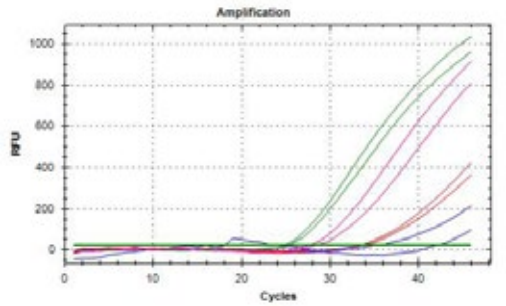
Targeting free-circulating DNA or DNA in a food quality control situation (e.g., halal and vegan testing) are challenging tasks requiring innovative technology. New approaches for enriching nucleic acids are needed when it comes down to ensure reliable downstream results. Polymer-mediated enrichment (PME) quickly and efficiently captures nucleic acid in a large volume of up to 10 ml of starting material. The polymer/DNA complex is then collected through centrifugation and isolated using either spin filters or magnetic particles, depending on if the setup is manual or automated.

- Enriches and extracts free-circulating DNA or small amounts of DNA, e.g., for vegan testing
- Works with up to 10 ml of starting material
- Uses an extremely easy-to-handle and time-saving procedure, ca. 30 min
- Offers both a manual version based on spin filter extraction and automated routines by InnuPure® C16 and C16 *touch*

Ideal preparation of challenging samples

The determination of pork DNA in gelatin is a challenge for any nucleic acid isolation method because industrial gelatin production destroys and removes the majority of the DNA.

The unique PME technology allows a fast and effective enrichment of residual DNA for sensitive downstream applications.



A: Amplification plots

Plot	Extraction	Sample	Kit	Ct value
Green	PME	3 ml	PME Gelatin Kit	25.42
Green	PME	3 ml	PME Gelatin Kit	24.88
Pink	PME	1 ml	PME Gelatin Kit	27.73
Pink	PME	1 ml	PME Gelatin Kit	28.56
Red	MAG beads	400 µl	innuPREP Food DNA Kit – IPC16	33.63
Red	MAG beads	400 µl	innuPREP Food DNA Kit – IPC16	33.70
Blue	Spin filter	200 µl	innuPREP DNA Mini Kit	35.98
Blue	Spin filter	200 µl	innuPREP DNA Mini Kit	42.29

B: Determination of Ct values

Figure 11: One gummy bear was dissolved in 3 ml PBS (1x). Depending on the extraction routine and method, different volumes of the solution were used to isolate the DNA from the gelatin. A pork DNA–specific, real-time amplification was carried out to determine the yield of extracted DNA.

High starting volumes and improved sensitivity

In addition to plasma and serum, urine samples can also be processed using the PME free-circulating DNA Extraction Kit. A starting volume of up to 10 ml is used, ensuring that the final concentration of cell-free DNA will be sufficient for detection carried out in further applications.

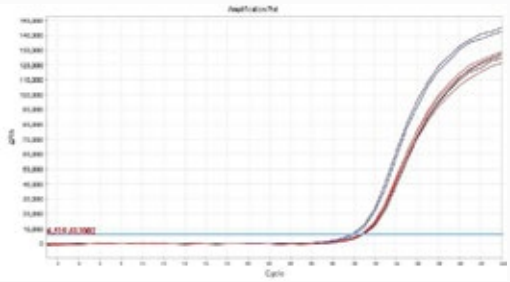
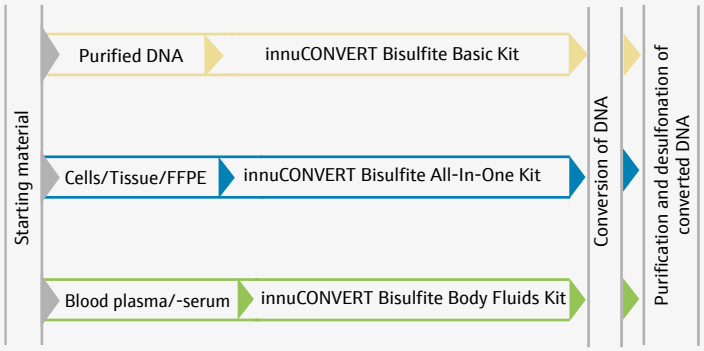


Figure 12: Free-circulating DNA from human urine samples of 5 and 10 ml was extracted using the PME Free-Circulating DNA Extraction Kit. Subsequently, the cell-free DNA was tested and compared with DNA that had been extracted from a 4 ml urine sample subjected to a competing extraction kit for free-circulating nucleic acids (market leader). Real-time PCR was used by amplifying a human-specific coding gene. The blue and black graphs correspond to extraction from the 10 ml sample and from the 5 ml sample with the PME technology. The red graphs correspond to the 4 ml sample applied to the competitor's product.


jena

Bisulfite Conversion
innuCONVERT Kits

The innuCONVERT bisulfite product family lets users completely convert nonmethylated cytosine to uracil in just a few hours. For best functionality, the DNA sample denaturation and bisulfite treatment are combined in the same reaction vessel. After a total reaction time of approximately 2.5 hours, the converted DNA is isolated, desulfonated, and finally eluted. Subsequently, high-purity nucleic acids become available for immediate downstream applications (e.g., PCR, sequencing).

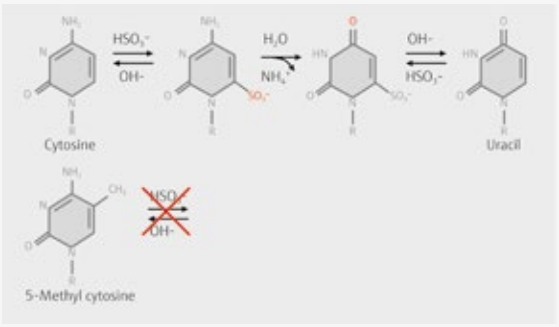


innuCONVERT product family

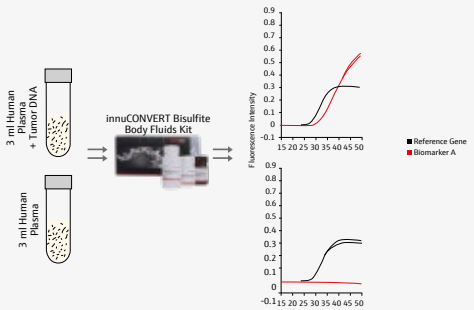
- Completely converts nonmethylated cytosine to uracil in just 45 min
- Enables easy storage of liquid reagents at room temperature
- Combines denaturation and conversion reaction in a single vessel
- Provides multifunctionality with a wide variety of sample types

Save time with fast bisulfite conversion

The only effective way to combat a disease like cancer is to understand it. The analysis of DNA methylation has come to play an increasingly important role by providing more meaningful information on tumorigenesis, tumor progression, and metastasis. Most methods for determining DNA methylation are based on a prior bisulfite DNA conversion step that deaminates nonmethylated cytosine to form uracil and leaves methyl cytosine unchanged. This new process transforms epigenetic information into sequences that can be measured using standard methods such as PCR.



A: How bisulfite conversion works



B: Bisulfite conversion of cell-free DNA from large volumes of human plasma

Figure 14: The innuCONVERT Bisulfite Body Fluids Kit was used for processing human blood plasma and human plasma containing DNA from a colorectal tumor cell line (positive for cancer-specific biomarker 14B). The total yield of cell-free DNA and of tumor-specific biomarker A was determined using qPCR. The kit lets users perform bisulfite conversion on cell-free DNA from large volumes of human plasma. This is followed by a purification step. The bisulfite-converted DNA is suitable for use in sensitive tests for DNA methylation tumor markers.

RNA

	Manual	Automated
Bacteria	innuPREP Micro RNA Kit innuPREP DNA/RNA Mini Kit innuPREP RNA Mini Kit 2.0 innuSPEED Bacteria/Fungi RNA Kit innuSOLV RNA Reagent	
Blood	innuPREP Blood RNA Kit	innuPREP AniPath DNA/RNA Kit – KFFLX
Cell culture supernatant	innuPREP Virus RNA Kit innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A	innuPREP Virus DNA/RNA Kit – IPC16 innuPREP RNA Virus Kit – KFml innuPREP Virus DNA/RNA Kit – KFml innuPREP Virus RNA PLUS Kit – KFFLX innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX
Cell-free body fluids	innuPREP Virus RNA Kit innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A	innuPREP Virus DNA/RNA Kit – IPC16 innuPREP Virus RNA Kit – KFml innuPREP Virus DNA/RNA Kit – KFml innuPREP RNA Virus PLUS Kit – KFFLX innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX
Cerebrospinal fluid	innuPREP Virus RNA Kit innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A	innuPREP Virus DNA/RNA Kit – IPC16 innuPREP Virus RNA Kit – KFml innuPREP Virus DNA/RNA Kit – KFml innuPREP RNA Virus PLUS Kit – KFFLX innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX

	Manual
Eukaryotic cells	innuPREP Micro RNA Kit innuPREP DNA/RNA Mini Kit innuPREP RNA Mini Kit 2.0 innuSOLV RNA Reagent
FFPE/ Paraffin samples	innuPREP FFPE total RNA Kit innuPREP Virus RNA Kit innuPREP Virus DNA/RNA Kit
Fungal spores	innuSPEED Bacteria/Fungi RNA Kit
Plant material	innuPREP Plant RNA Kit innuSPEED Plant RNA Kit
Saliva	innuPREP MP Basic Kit A
Stool samples	innuPREP MP Basic Kit A
Swabs	innuPREP Virus RNA Kit innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A
Ticks	blackPREP Tick DNA/RNA Kit

Automated
innuPREP RNA Kit – IPC16
innuPREP Virus DNA/RNA Kit – IPC16 innuPREP Virus RNA Kit – KFml innuPREP RNA Virus PLUS Kit – KFFLX innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX
innuPREP Virus DNA/RNA Kit – IPC16 innuPREP Virus DNA/RNA Kit – IPC96 innuPREP Virus RNA Kit – KFml innuPREP Virus DNA/RNA Kit – KFml innuPREP RNA Virus PLUS Kit – KFFLX innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX

	Manual	Automated
Tissue/ Biopsies	innuPREP Micro RNA Kit innuPREP DNA/RNA Mini Kit innuPREP RNA Mini Kit 2.0 innuSPEED Tissue RNA Kit innuPREP Virus RNA Kit innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A innuSOLV RNA Reagent	innuPREP RNA Kit – IPC16 innuPREP Virus RNA Kit – KFml innuPREP Virus DNA/RNA Kit – KFml innuPREP RNA Virus PLUS Kit – KFFLX innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX
Viruses	innuPREP Virus RNA Kit innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A	innuPREP Virus DNA/RNA Kit – IPC16 innuPREP Virus RNA Kit – KFml innuPREP Virus DNA/RNA Kit – KFml innuPREP RNA Virus PLUS Kit – KFFLX innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit - KFFLX
Yeast cells	innuSPEED Bacteria/Fungi RNA Kit innuSOLV RNA Reagent	

Plasmid

	Manual	Automated
Bacterial suspension	innuPREP Plamid Mini Kit 2.0	

DNA and fcDNA

	Manual	Automated
Agarose gels	innuPREP DOUBLEpure Kit innuPREP GelExtraction Kit	
Bacteria	innuPREP Bacteria DNA Kit innuPREP DNA/RNA Mini Kit blackPREP Food DNA I Kit innuSPEED Bacteria/Fungi DNA Kit smart DNA prep (m)	innuPREP Bacteria DNA Kit – IPC16 innuPREP AniPath DNA/RNA Kit – KFFLX smart DNA prep (a)
Blood	innuPREP DNA Micro Kit innuPREP Blood DNA Mini Kit innuPREP Blood DNA Midi Kit innuPREP Forensic Kit smart Blood DNA Midi prep (m)	innuPREP Blood DNA Mini Kit – IPC16 innuPREP Blood DNA Midi Kit – IPC16 innuPREP Forensic DNA Kit – IPC16 innuPREP Blood DNA Kit – KFFLX innuPREP Blood DNA Midi Kit – KFFLX innuPREP DNA I Kit – KFml innuPREP AniPath DNA/RNA Kit – KFFLX smart Blood DNA Midi prep (a) smart Blood DNA Midi direct prep (a)
Bronchoalvolar lavage	innuPREP Mycobacteria DNA Kit	innuPREP Mycobacteria DNA Kit – IPC16
Cell culture supernatant	innuPREP Virus DNA Kit innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A PME free-circulating DNA Extraction Kit	innuPREP Virus DNA/RNA Kit – IPC16 innuPREP Virus DNA/RNA Kit – IPC96 innuPREP Virus DNA Kit – KFml innuPREP Virus DNA/RNA Kit – KFml innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX PME free-circulating DNA Extraction Kit – IPC16
Cerebrospinal fluid	innuPREP Virus DNA Kit innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A	innuPREP Virus DNA/RNA Kit – IPC16 innuPREP Virus DNA/RNA Kit – IPC96 innuPREP Virus DNA Kit – KFml innuPREP Virus DNA/RNA Kit – KFml innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX

	Manual
Cell-free body fluids	innuPREP Virus DNA Kit innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A PME free-circulating DNA Extraction Kit innuCONVERT Bisulfite Body Fluids Kit
Epigenetics	innuuCONVERT Bisulfite-All-in-One Kit innuCONVERT Bisulfite Body Fluids Kit innuCONVERT Bisulfite Basic Kit
Eukaryotic cells	innuPREP DNA Micro Kit innuPREP DNA Mini Kit innuPREP DNA/RNA Mini Kit
FFPE/ Paraffin samples	blackPREP FFPE DNA Kit innuPREP DNA Mini Kit innuPREP Virus DNA Kit innuPREP Virus DNA/RNA Kit innuCONVERT Bisulfite All-in-One Kit
Food/ Food after cultivation	blackPREP Food DNA I Kit
Forensic material	innuPREP Forensic Kit
Fruits	innuPREP Plant DNA Kit innuSPEED Plant DNA Kit
Fungal spores	innuSPEED Bacteria/Fungi DNA Kit

Automated
innuPREP Virus DNA/RNA Kit – IPC16 innuPREP Virus DNA Kit – KFml innuPREP Virus DNA/RNA Kit – KFml innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX
PME free-circulating DNA Extraction Kit – IPC16
innuPREP DNA Kit – IPC16
smart DNA prep (a)
innuPREP FFPE DNA Kit – IPC16
innuPREP Food DNA Kit – IPC16
innuPREP Forensic DNA Kit – IPC16
innuPREP Plant DNA I Kit – IPC16

	Manual	Automated
Fungi (fruiting body)	innuPREP Plant DNA Kit innuSPEED Plant DNA Kit	innuPREP Plant DNA I Kit – IPC16
Mycobacteria	innuPREP Mycobacteria DNA Kit	
Mycoplasma	innuPREP DNA Mini Kit innuPREP Bacteria DNA Kit	
PCR reactions	innuPREP DOUBLEpure Kit innuPREP DYEpure Kit innuPREP PCRpure Kit innuPREP PCRpure 96 Kit	
Plant material	innuPREP Plant DNA Kit innuSPEED Plant DNA Kit	innuPREP Plant DNA I Kit – IPC16
Saliva	innuPREP Forensic Kit innuPREP MP Basic Kit A	innuPREP Forensic DNA Kit – IPC16
Seed	innuPREP Plant DNA Kit innuSPEED Plant DNA Kit	innuPREP Plant DNA I Kit – IPC16
Soil samples	innuSPEED Soil DNA Kit	
Sputum	innuPREP Mycobacteria DNA Kit innuCONVERT Bisulfite All-in-One Kit	
Stomacher samples	blackPREP Food DNA I Kit	smart DNA prep (a)

DNA and fcDNA

	Manual	Automated
Stool samples	innuPREP Stool DNA Kit innuPREP MP Basic Kit A	innuPREP Stool DNA Kit – IPC16 innuPREP Virus DNA/RNA Kit – IPC16 innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX innuPREP Stool DNA Kit – KF96 & KFFLX
Swabs	blackPREP Swab DNA Kit innuPREP DNA Mini Kit innuPREP Forensic Kit innuPREP Virus DNA Kit innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A innuCONVERT Bisulfite All-in-One Kit	innuPREP Forensic DNA Kit – IPC16 innuPREP DNA I Kit - KFml innuPREP Virus DNA/RNA Kit – IPC16 innuPREP Virus DNA Kit – KFml innuPREP Virus DNA/RNA Kit – KFml innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX
Ticks	blackPREP Tick DNA Kit blackPREP Tick DNA/RNA Kit	
Tissue/ Biopsies	innuPREP DNA Micro Kit innuPREP DNA Mini Kit innuPREP Forensic Kit innuPREP Rodent Tail DNA Kit innuPREP DNA/RNA Mini Kit innuPREP Virus DNA Kit innuPREP Virus DNA/RNA Kit innuPREP Mycobacteria DNA Kit innuSPEED Tissue DNA Kit innuPREP MP Basic Kit A smart DNA prep (m) innuCONVERT Bisulfite All-in-One Kit	innuPREP DNA Kit – IPC16 innuPREP Forensic DNA Kit – IPC16 innuPREP Virus DNA Kit – KFml innuPREP Virus DNA/RNA Kit – KFml innuPREP Tissue DNA Kit – KF96 & KFFLX innuPREP DNA I Kit – KFml innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX smart DNA prep (a)
Urine/ Urine sediment	PME free-circulating DNA Extraction Kit innuCONVERT Bisulfite All-in-One Kit innuCONVERT Bisulfite Body Fluids Kit	PME free-circulating DNA Extraction Kit – IPC16

	Manual	Automated
Viruses	innuPREP Virus DNA Kit innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A	innuPREP Virus DNA/RNA Kit - IPC16 innuPREP Virus DNA Kit – KFml innuPREP Virus DNA/RNA Kit – KFml innuPREP DNA/RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX
Yeast cells	innuSPEED Bacteria/Fungi DNA Kit smart DNA prep (m)	innuPREP Bacteria DNA Kit – IPC16 smart DNA prep (a)

How to Choose the Right Extraction Method?
A Short Technology Overview

Nucleic acid extraction is not only a question of choosing the right extraction kit, it is more challenging to find the ideal technology or platform first.

All Analytik Jena extraction kits are ready-to-use and based on patented DC-Technology® with all its advantages:

- Based on our own patents
- Combination of chaotropic and antichaotropic chemistry
- Flexible adaptation to different types of starting material
- Low salt and low ionic strength promote activity and the stability of enzymes

- Optimal lysis conditions: fast and powerful, which makes themmild to nucleic acids
- A perfect combination of stringent lysis and unique binding buffer system
- Less extensive washing necessary

	Spin Filter	MAG Beads	SmartExtraction	Enrichment
Brand	innuPREP innuSPEED blackPREP	innuPREP-IPC16 innuPREP-IPC96 innuPREP-KFml innuPREP-KFFLX	smart prep (a) smart prep (m)	PME
Level of automation	Manual Manual with optimization to homogenization	Automated or manual solutions	Automated or manual solutions	Automated or manual solutions
Compatibility	–	InnuPure® systems KingFisher systems	InnuPure® systems CyBio® FeliX GeneTheatre CyBio® SELMA Other 1 ml pipetting robots	InnuPure® C16 and C16 *touch*
Process	Binding of nucleic acids to solid Spin Filter Membranes and processing by centrifugation	Separation of nucleic acids by magnetic particles and processing by pipetting or plungers	Binding of nucleic acids to unique Smart Modified Surfaces and processing by simple pipetting	Efficient recovery of minor DNA components e.g., free-circulating DNA, small DNA fragments or pathogen DNA
Throughput	Low throughput	Medium to high throughput	Medium to high throughput	Low throughput
Time	Ø 20 to 40 min per sample	Ø 40 to 90 min per run (16 – 96 samples)	Ø 20 to 80 min per run (8 – 96 samples)	Ø 40 to 60 min per sample


Spin Filter


Magnetic beads


Smart modified surface


Phenol/ Chlorophorm


Polymer Mediated Enrichment


Prep Tubes

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Subjects to changes in design and scope of delivery as well as further technical development!

en · 08/2018 · 844-MA159-2-B
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