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

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.

All From One Hand

Biotechnological Competence from Analytik Jena

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 Analytik Jena's pipetting systems InnuPure C16 *touch*, 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 steps 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.

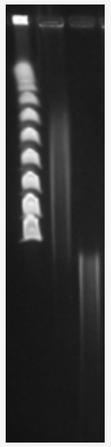


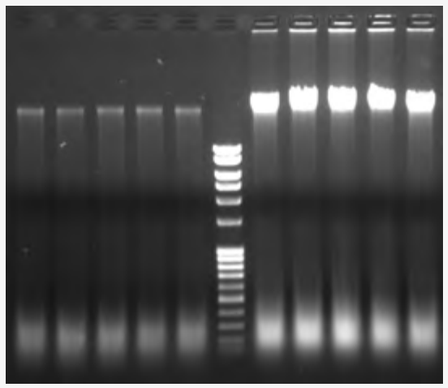
Figure 1: A comparison between manual nucleic acid extraction using an anion exchanger and SmartExtraction with the InnuPure C16. The Rotaphor system (PFGE – pulsed field gel electrophoresis) was used to determine the molecular weight of isolated DNA.

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 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 of the used platform - InnuPure C16 *touch* or CyBio FeliX - 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: compatibility of the 1 mL SmartExtraction tip with the liquid handling system, which perfectly aligns to Analytik Jena's automation portfolio, including the InnuPure C16 *touch* and CyBio FeliX. Just choose a kit according to you specific application and get the automated nucleic acid extraction started on InnuPure C16 *touch* or CyBio FeliX based on pre-defined protocols.

High performance manual extraction

SmartExtraction also simplifies manual isolation of DNA from various starting materials requiring much less equipment than conventional solutions: Instead of an additional centrifuge, a thermal shaker is everything that is needed. Thus, manual nucleic acid extraction protocols based on SmartExtraction are both extremely simple and fast.

At the same time it comprises an exceedingly gentle procedure which affords nucleic acid extracts of minimal fragmentation.

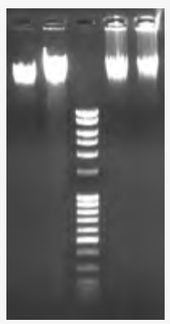
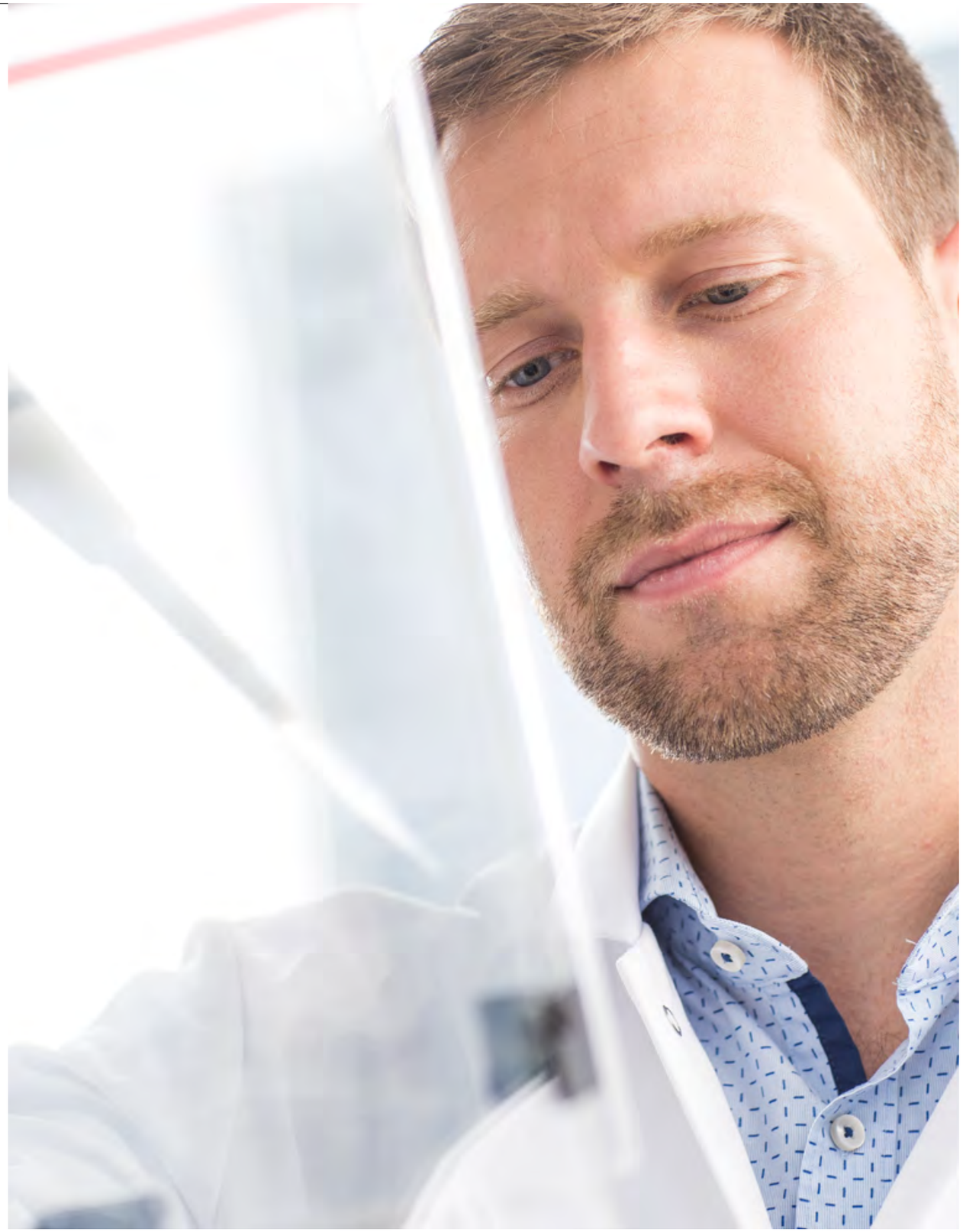


Figure 3: A standard kit based on salt precipitation and manual SmartExtraction were tested in comparison. Each 3 mL and 5 mL of a whole blood sample was used as starting material. Finally the isolated nucleic acids were measured by using a spectrophotometer and visualized on an agarose gel. Especially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

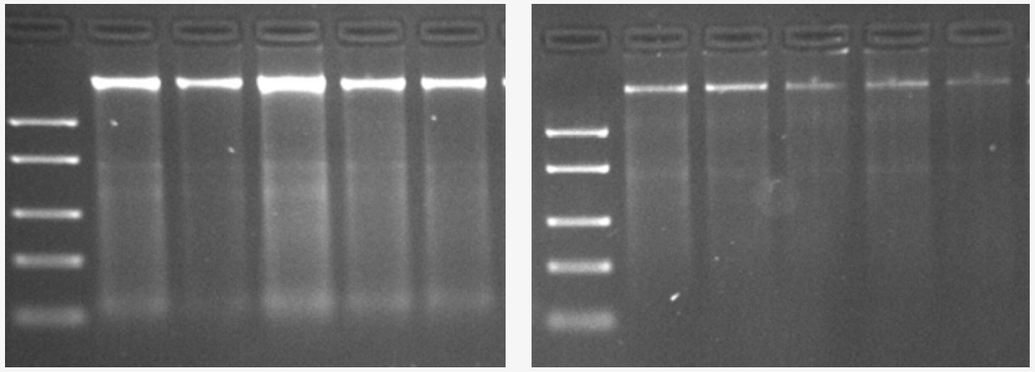
Faster. More efficient. Just Better. The well established platform of Analytik Jena's nucleic acid extraction was and is the patented Dual-Chemistry-(DC-) Technology. Means that the DNA/RNA isolation kits from Analytik Jena are not just marginally different from competitors' products but differ in substance: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

The heart of DC-Technology is the highly efficient binding of DNA to 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 nucleic acid extraction. Therefore, nothing changes for users with regard to hardware and work organization: The routines stay the same. However, the improvements in quality, time of prepration and downstream results are significant – and this applies even more, the 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.

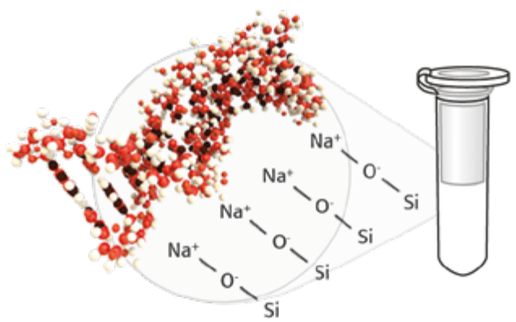


A: Analytik Jena

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 of the competitor's, while both kits produce equal quality.



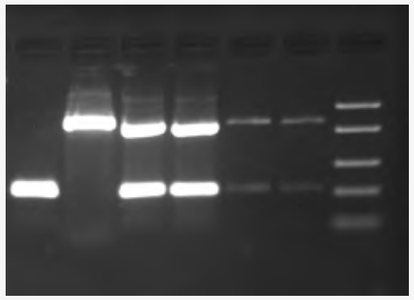
The need of flexible and versatile ready-to-use kits is growing more and more. The fast, easy and secure handling of DC-Technology perfectly meets those requirements.

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

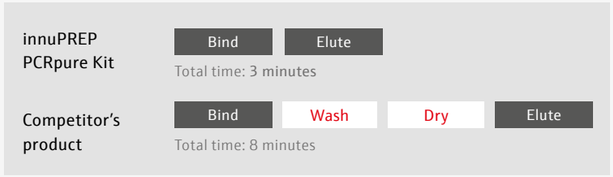
Does your kit require four steps to clean up PCR products?

Discover comprehensive cleanup with minimized handling. Everyone loves a shortcut that does not 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

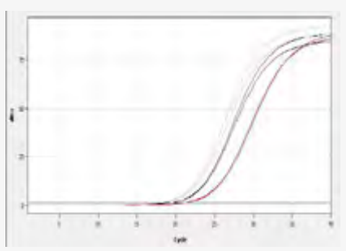


B: Comparison of hands-on time

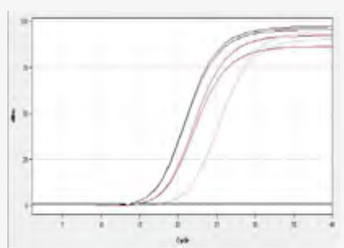
Figure 5: Two different PCR reaction mixes – one containing a 210 bp fragment and the other a 536 bp fragment – were mixed and used for the purification of PCR products by innuPREP PCRpure Kit. This was compared to a competing, commercially available isolation kit. Both are based on the binding of nucleic 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?

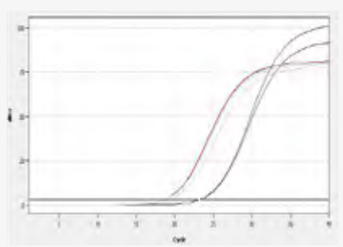
Discover the clever setup of Analytik Jena's kits. Thanks to DC-Technology, processes like plant DNA/RNA isolation can easily be optimized with up to three different lysis buffers.



A: Oil palm leaf



B: Papaya leaf



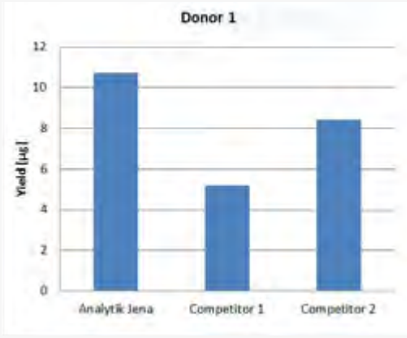
C: Black bean seed

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.

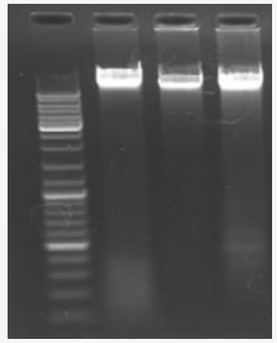
Do you feel helpless when it comes to optimizing downstream cutoffs?

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.



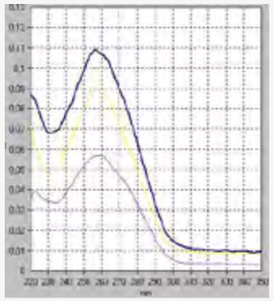
A: Yield of DNA



B: Gel image

Figure 7: 400 µL of whole blood (EDTA) were 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

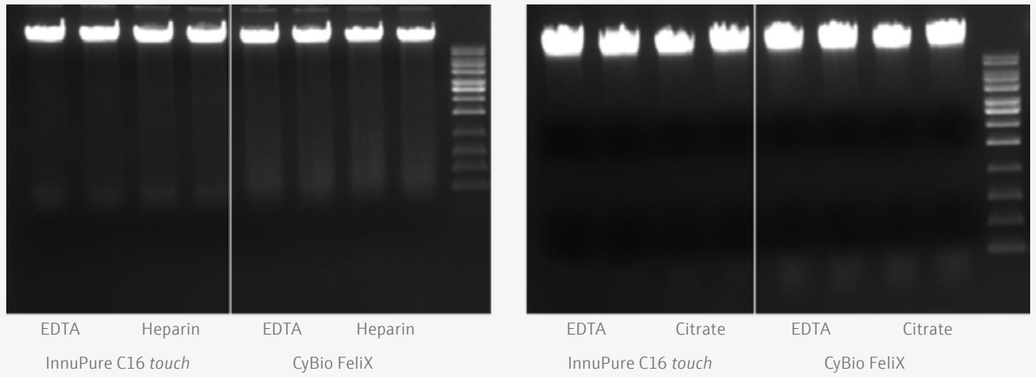
DC-Technology is also suitable for proven magnetic particle separation, with the same outstanding advantages as described for manual Spin Filter nucleic acid extraction. Especially for the InnuPure C16 *touch* and CyBio FeliX, but also for King Fisher® devices a variety of different nucleic acid extraction 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 included 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 CyBio FeliX as well as the InnuPure C16 *touch* are high-grade pipetting systems optimized to efficiently isolate DNA from whole blood samples of up to 400 µL.

Both, pre-filled, sealed reagent plastics in case of InnuPure C16 *touch* and pre-filling routines by CyBio FeliX reduce manual steps to a minimum. After sample loading the routine for automated nucleic acid extraction can be started via pre-defined protocols.

Figure 8: Genomic DNA from 200 µL blood stabilized with EDTA, heparin or citrate were extracted automatically. Independent of the used platform – innuPREP Blood DNA Mini Kit-IPC16 on InnuPure C16 *touch* for medium throughput or innuPREP Blood DNA mini Kit-FX on CyBio FeliX for high throughput applications – the yield and quality of DNA eluates are equal.

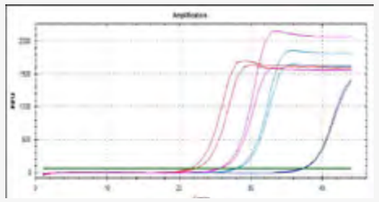


Device	Sample type	Sample volume	260/280	260/230	Yield [µg]
InnuPure C16 *touch*	EDTA	200 µL	1.82	2.20	8.1
	Heparin	200 µL	1.82	2.41	7.7
CyBio FeliX	EDTA	200 µL	1.82	2.15	7.9
	Heparin	200 µL	1.81	2.19	7.5
InnuPure C16 *touch*	EDTA	200 µL	1.78	2.20	5.2
	Citrate	200 µL	1.80	2.42	4.6
CyBio FeliX	EDTA	200 µL	1.78	2.06	6.0
	Citrate	200 µL	1.80	2.12	5.7

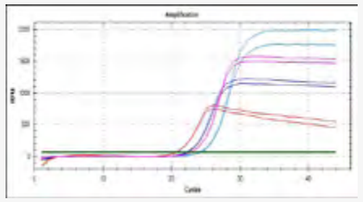
Reduce contamination: easy handling of even the most complex matrices

Due to spices and preservative treatments processed foods represent a particular challenge when it comes to isolating nucleic acids. Additionally, nucleic acids in those sample materials are often of low concentration and highly degraded.

The combination of InnuPure C16 *touch* 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 from potato chips and 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.

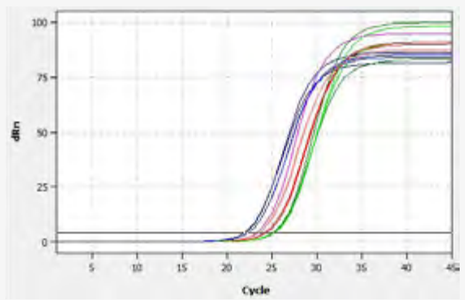
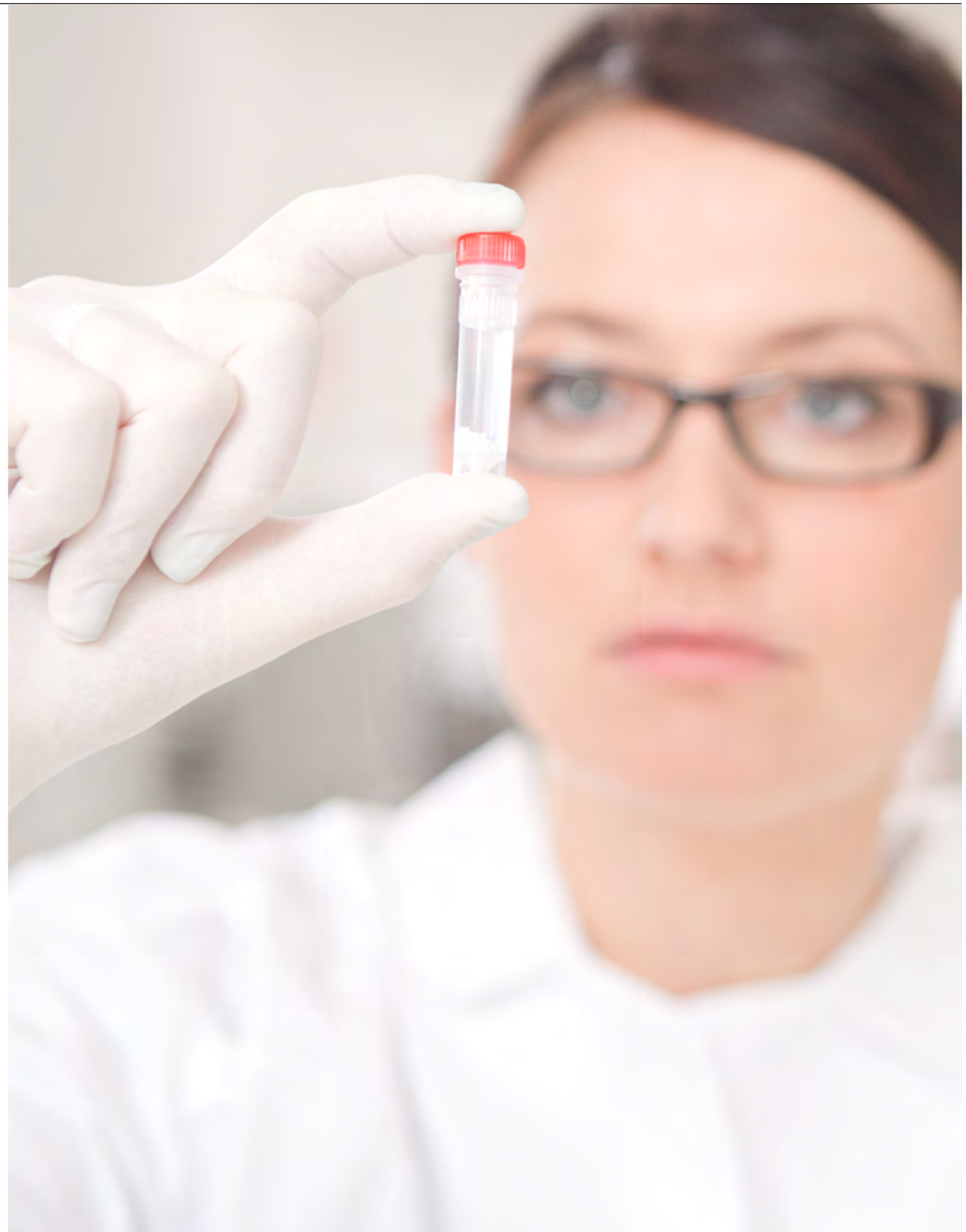


Figure 10: Two different samples of rice grains were lysed using three different lysis buffers for automatic extraction via InnuPure C16 and magnetic particle separation.
9A: Rice-specific amplification plots. Blue: Lysis buffer CBV; Red: Lysis buffer SLS; Green: Lysis puffer OPT

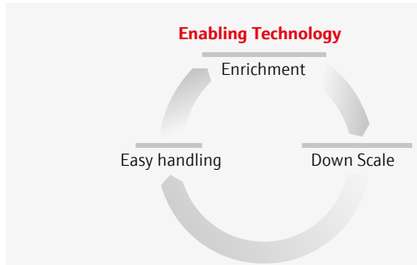
Lysis buffer	Samples	Ct value	Mean Ct	Std. dev. Ct
SLS	Sample 1	24.34	24.25	0.12
	Sample 1	24.16		
	Sample 2	23.53	23.47	0.09
	Sample 2	23.40		
OPT	Sample 1	25.09	25.13	0.05
	Sample 1	25.16		
	Sample 2	25.10	25.17	0.09
	Sample 2	25.23		
CBV	Sample 1	21.86	21.94	0.11
	Sample 1	22.02		
	Sample 2	22.27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



Enrichment

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 contains unique patented methods that serve as a solution to challenging special requirements.



Enrichment
PME – Polymer-Mediated Enrichment

Targeting free-circulating DNA or DNA in elevated sample volumes or complex matrices is a challenging task requiring innovative technology. New approaches for enriching nucleic acids are needed when it comes to ensureing reliable downstream results. Polymer-mediated enrichment (PME) quickly and efficiently captures nucleic acid in a large volume of up to 10 mL starting material. The polymer/DNA complex is then collected through centrifugation and isolated using either spin filters or magnetic particles, depending on whether 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 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*

Efficient DNA extraction from complex starting materials

Extraction of DNA from food samples is extraordinarily challenging due to the complex nature of the starting materials and presence of very low or fragmented DNA content especially in processed food. The PME Food DNA Kit was especially developed to result in high yields from both solid and liquid food samples. In the application example below, DNA was extracted from numerous different food samples including juices, sausages and tofu.

Resulting eluates were evaluated qualitatively by gel electrophoretic separation as well spectroscopic quantification. Both, absorbance data, as well as images obtained from gel electrophoresis confirm that even from highly processed food samples fragmented DNA is isolated reproducibly.

Sample ID	Sample	A260/A280	A260/A230	DNA Concentration [ng/µL]
1	Freshly squeezed orange juice	2.43	1.71	13.2
2	Pressed industrial orange juice	2.11	1.55	28.3
3	Organic juice from juice concentrate	2.22	1.86	48.7
4	Discounter juice from juice concentrate	2.11	1.87	78.1
5	Pork ham	1.99	2.51	19.1
6	Sausage	2.02	2.99	20.1
7	Liverwurst with apple and onion	1.96	2.17	85.4
8	Minced tofu (vegan)	2.16	2.33	73.9

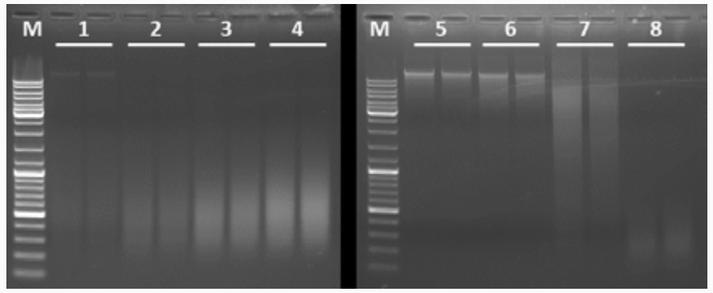


Figure 11: Gel electrophoretic separation of DNA purifed from fluid or solid food samples as indicated in the table above

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.

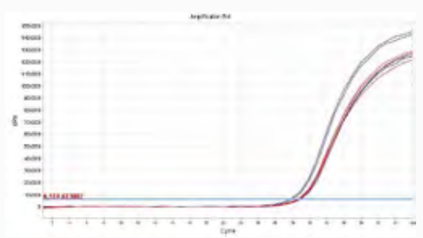


Figure 12: Free-circulating DNA from human urine samples of 5 and 10 mL was extracted using the PME Free-Circulating DNA Extraction Kit. Subsequently, the cell-free DNA was tested and compared with DNA that had been extracted from a 4 mL urine sample subjected to a competing extraction kit for free-circulating nucleic acids (market leader). Real-time PCR was used to amplify 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.

RNA

	Manual	Automated
Bacteria	innuPREP Micro RNA Kit innuPREP DNA/RNA Mini Kit innuPREP RNA Mini Kit 2.0 innuSOLV RNA Reagent	
Blood	innuPREP Blood RNA Kit	innuPREP AniPath DNA/RNA Kit – KFFLX
Cell culture supernatant	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 AniPath DNA/RNA Kit – KFFLX
Cell-free body fluids	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 AniPath DNA/RNA Kit – KFFLX innuPREP Virus DNA/RNA Kit – FX
Cerebrospinal fluid	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 AniPath DNA/RNA Kit – KFFLX

	Manual	Automated
Eukaryotic cells	innuPREP Micro RNA Kit innuPREP DNA/RNA Mini Kit innuPREP RNA Mini Kit 2.0 innuSOLV RNA Reagent	innuPREP RNA Kit – IPC16
FFPE/ Paraffin samples	innuPREP FFPE total RNA Kit innuPREP Virus DNA/RNA Kit	
Plant material	innuPREP Plant RNA Kit	
Saliva	innuPREP MP Basic Kit A	
Stool samples	innuPREP MP Basic Kit A	innuPREP Virus DNA/RNA Kit – IPC16 innuPREP Virus RNA Kit – KFml innuPREP RNA Virus PLUS Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX
Swabs	innuPREP Virus TS 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 AniPath DNA/RNA Kit – KFFLX innuPREP Virus DNA/RNA Kit – FX innuPREP Virus TS RNA Kit 2.0 - FX
Ticks	blackPREP Tick DNA/RNA Kit	

	Manual	Automated
Tissue/ Biopsies	innuPREP Micro RNA Kit innuPREP DNA/RNA Mini Kit innuPREP RNA Mini Kit 2.0 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 AniPath DNA/RNA Kit – KFFLX
Viruses	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 AniPath DNA/RNA Kit - KFFLX innuPREP Virus DNA/RNA Kit – FX
Yeast cells	innuSOLV RNA Reagent	

Plasmid

	Manual	Automated
Bacterial suspension	innuPREP Plamid Mini Kit 2.0	

DNA and fcDNA

	Manual	Automated
Agarose gels	innuPREP DOUBLEpure Kit	
Bacteria	innuPREP Bacteria DNA Kit innuPREP DNA/RNA Mini Kit smart DNA prep (m)	innuPREP Bacteria DNA Kit – IPC16 innuPREP AniPath DNA/RNA Kit – KFFLX smart DNA prep (a) smart DNA prep (a96) - FX
Blood	innuPREP DNA Micro Kit innuPREP Blood DNA Mini Kit innuPREP Forensic Kit smart Blood DNA Midi prep (m)	innuPREP Blood DNA Mini Kit – IPC16 innuPREP Forensic DNA Kit – IPC16 innuPREP Blood DNA Kit – KFFLX innuPREP AniPath DNA/RNA Kit – KFFLX innuPREP Blood DNA Mini Kit – FX smart Blood DNA Midi prep (a) smart Blood DNA Midi direct prep (a) smart Blood DNA Midi prep (a96) - FX smart Blood DNA Midi direct prep (a96) - FX
Cell culture supernatant	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 – KFml innuPREP AniPath DNA/RNA Kit – KFFLX PME free-circulating DNA Extraction Kit – IPC16
Cerebrospinal fluid	innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A	innuPREP Virus DNA/RNA Kit – IPC16 innuPREP Virus DNA/RNA Kit – KFml innuPREP AniPath DNA/RNA Kit – KFFLX

	Manual	Automated
Cell-free body fluids	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 – KFml innuPREP AniPath DNA/RNA Kit – KFFLX nnuPREP Virus DNA/RNA Kit – FX PME free-circulating DNA Extraction Kit – IPC16
Eukaryotic cells	innuPREP DNA Micro Kit innuPREP DNA Mini Kit innuPREP DNA/RNA Mini Kit	innuPREP DNA Kit – IPC16 smart DNA prep (a) smart DNA prep (a96) - FX
FFPE/ Paraffin samples	blackPREP FFPE DNA Kit innuPREP DNA Mini Kit innuPREP Virus DNA/RNA Kit	innuPREP FFPE DNA Kit – IPC16
Food/ Food after cultivation		innuPREP Food DNA Kit – IPC16
Forensic material	inuuPREP Forensic Kit	innuPREP Forensic DNA Kit – IPC16
Fruits	innuPREP Plant DNA Kit PME Food DNA Kit	innuPREP Plant DNA I Kit – IPC16

	Manual	Automated
Fungi (fruiting body)	innuPREP Plant DNA Kit	innuPREP Plant DNA I Kit – IPC16
Mycoplasma	innuPREP DNA Mini Kit innuPREP Bacteria DNA Kit	
PCR reactions	innuPREP DOUBLEpure Kit innuPREP PCRpure Kit	
Plant material	innuPREP Plant DNA Kit	innuPREP Plant DNA I Kit – IPC16 smart Plant DNA prep (a96) - FX
Saliva	innuPREP Forensic Kit innuPREP MP Basic Kit A	innuPREP Forensic DNA Kit – IPC16
Seed	innuPREP Plant DNA Kit	innuPREP Plant DNA I Kit – IPC16 smart Plant DNA prep (a96) - FX
Soil samples	innuSPEED Soil DNA Kit	

DNA and fcDNA

	Manual	Automated
Stool samples	innuPREP Stool DNA Kit innuPREP MP Basic Kit A	innuPREP Virus DNA/RNA Kit – IPC16 innuPREP AniPath DNA/RNA Kit – KFFLX
Swabs	innuPREP DNA Mini Kit innuPREP Forensic Kit innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A	innuPREP Forensic DNA Kit – IPC16 innuPREP Virus DNA/RNA Kit – IPC16 innuPREP Virus DNA/RNA Kit – KFml innuPREP AniPath DNA/RNA Kit – KFFLX innuPREP Virus DNA/RNA Kit – FX
Ticks	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/RNA Kit innuPREP MP Basic Kit A smart DNA prep (m)	innuPREP DNA Kit – IPC16 innuPREP Forensic DNA Kit – IPC16 innuPREP Virus DNA/RNA Kit – KFml innuPREP AniPath DNA/RNA Kit – KFFLX smart DNA prep (a) smart DNA prep (a96) - FX
Urine/ Urine sediment	PME free-circulating DNA Extraction Kit	PME free-circulating DNA Extraction Kit – IPC16
Viruses	innuPREP Virus DNA/RNA Kit innuPREP MP Basic Kit A	innuPREP Virus DNA/RNA Kit - IPC16 innuPREP AniPath DNA/RNA Kit – KFFLX innuPREP Virus DNA/RNA Kit – FX
Yeast cells	smart DNA prep (m)	innuPREP Bacteria DNA Kit – IPC16 smart DNA prep (a) smart DNA prep (a96) - FX

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:

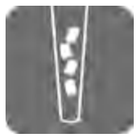
- Based on our own patents
- Combination of chaotropic and antichaotropic chemistry
- Flexible adaptation to different types of starting material
- Low salt concentrations and low ionic strength promote activity and the stability of enzymes

- Optimal lysis conditions: fast and powerful, which makes them mild 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 blackPREP	innuPREP-IPC16 innuPREP-KFml innuPREP-KFFLX innuPREP - FX	smart prep (m) smart prep (a) smart prep (a96) smart prep (a96) - FX	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 CyBio FeliX	InnuPure C16 *touch* CyBio FeliX Other 1 mL pipetting robots	InnuPure 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 to medium 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 (16 – 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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