Instructions for Use
Life Science Kits & Assays

innuPREP AniPath DNA/RNA Kit – IPC16

analytikjena
An Endress+Hauser Company

Order No.:

845-IPS-8016016 16 reactions
845-IPS-8016096 96 reactions
845-IPP-8016016 16 reactions
845-IPP-8016096 96 reactions
845-IPP-8016480 480 reactions

IPS = Kit contains prefilled reagent strips for processing individual samples
IPP = Kit contains prefilled reagent plates for running 8 samples in parallel
Note: Prefilled reagent strips and reagent plates can be used in parallel in the InnuPure C16.

Publication No.: HB_IP_8016_e_190808

Manufacturer:

AJ Innuscreen GmbH
Robert-Rössle-Straße 10
13125 Berlin
Made in Germany!

Phone +49 30 948933 80
Fax +49 30 948933 81
www.analytik-jena.com
info@aj-innuscreen.com

Contents

1 Introduction

1.1 Intended use

The innuPREP AniPath DNA/RNA Kit – IPC16 has been designed for automated isolation of bacterial DNA and viral DNA and RNA from different kinds of starting material like cell-free body fluids, cell culture supernatants or whole blood. Furthermore, fecal samples, swabs and other relevant starting materials can be used for isolation. The extraction procedure is based on a new patented chemistry. The kit is designed to be handled by educated personnel in a laboratory environment.

For the liquid samples, all steps of the extraction process are fully automated and run completely on the InnuPure C16 *touch*. The samples are transferred into the Reagent Strips or Reagent Plates of the kit, which are already prefilled with all extraction reagents needed for the extraction process. The following extraction process runs automatically on the InnuPure C16 *touch*. The extraction process is based on binding of the DNA and/or RNA to surface-modified magnetic particles. After washing steps, the nucleic acid is eluted from the magnetic particles with RNase-free water and is now ready to use for downstream applications. The extraction chemistry in combination with the InnuPure C16 *touch* protocol are optimized to get maximum yield and quality.

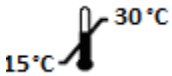
To verify the extraction process the kit contains a Carrier Mix with a carrier RNA and internal control DNA (IC DNA) and RNA (IC RNA). The IC DNA and IC RNA can be detected by Real-time PCR with a corresponding Real-time PCR detection kit.

CONSULT INSTRUCTION FOR USE

This package insert must be read carefully prior to use. Package insert instructions must be followed accordingly. Reliability of results cannot be guaranteed if there are any deviations from the instructions in this package insert.

1.2 Notes on the use of this manual

For easy reference and orientation, the manual uses the following warning and information symbols as well as the shown methodology:

Symbol	Information
	**REF** Catalogue number.
 N	**Content** Contains sufficient reagents for <N> tests.
	**Storage conditions** Store at room temperature, unless otherwise specified.
	**Consult instructions for use** This information must be observed to avoid improper use of the kit and the kit components.
	**Expiry date**
	**Lot number** The number of the kit charge.
	**Manufactured by** Contact information of manufacturer.
	**For single use only** Do not use components for a second time.
	Note / Attention Observe the notes marked in this way to ensure correct function of the device and to avoid operating errors for obtaining correct results.

The following systematic approach is introduced in the manual:

- The chapters and figures are numbered consecutively.
- A cross reference is indicated with an arrow (e.g. → Notes on the use of this manual" p. 4).
- Working steps are numbered

2 Safety precautions

NOTE
Read through this chapter carefully prior to use to guarantee your own safety and a trouble-free operation.
Follow all the safety instructions explained in the manual, as well as all messages and information, which are shown.

All due care and attention should be exercised in handling the materials and reagents contained in the kit. Always wear gloves while handling these reagents and avoid any skin contact! In case of contact, flush eyes or skin with a large amount of water immediately.

FOR SINGLE USE ONLY!
This kit is made for single use only!

ATTENTION!
Don't eat or drink components of the kit!
The kit is designed to be handled by educated personnel in a laboratory environment!

If the buffer bottles are damaged or leaking, wear gloves and protective goggles when discarding the bottles in order to avoid any injuries. This kit is to be used with potentially infectious samples. Therefore, all liquid waste must be considered as potentially infectious and must be handled and discarded according to local safety regulation.

Please observe the federal, state and local safety and environmental regulations. Follow the usual precautions for applications using extracted nucleic acids. All materials and reagents used for DNA or RNA isolation should be free of DNases or RNases.

ATTENTION!
Do not add bleach or acidic components to the waste after sample preparation!

NOTE

Emergency medical information in English and German can be obtained 24 hours a day from:

Poison Information Center, Freiburg / Germany

Phone: +49 (0)761 19 240.

For more information on GHS classification please download the Safety Data Sheet (SDS) from our website (www.analytik-jena.com). Find the SDS of each product and its components in the “downloads”-folder.

3 General notes and safety recommendations on handling RNA

RNA is far less stable than DNA. It is very sensitive to degradation by endogenous RNases in the biological material and exogenous RNases which are permanently present everywhere in the lab. To achieve satisfactory qualitative and quantitative results in RNA preparations, contaminations with exogenous RNases have to be reduced to a minimum in accordance with the following recommendations:

- Always wear latex or vinyl gloves while handling reagents and RNA samples to prevent RNase contaminations from surface of the skin or from dusty laboratory equipment.
- Change gloves frequently and keep tubes closed.
- Keep isolated RNA on ice.
- Reduce preparation time as much as possible.
- Use only sterile, disposable polypropylene tubes throughout the procedure (these tubes are generally RNase-free.)
- Non-disposable plastic ware should be treated before use to ensure that it is RNase-free. Plastic ware should be thoroughly rinsed with 0.1 M NaOH, 1 mM EDTA followed by RNase-free water. You can also take chloroform-resistant plastic ware rinsed with chloroform to inactivate RNases.

- All glassware should be treated before use to ensure that it is RNase-free. Glassware should be cleaned with detergent, thoroughly rinsed and oven baked at 240 °C for four hours or more before use. Autoclaving will not inactivate RNase activity completely. Oven baking inactivates RNases and ensures that no other nucleic acids (such as plasmid DNA) are present on the surface of the glassware. You can also clean glassware with 0.1 % DEPC (diethyl pyrocarbonate). The glassware has to be immersed in 0.1 % DEPC solution for 12 hours at 37 °C followed by autoclaving or heating to 100 °C for 15 minutes to remove residual DEPC.
- Electrophoresis tanks should be cleaned with detergent solution (e.g. 0.5 % SDS), thoroughly rinsed with RNase-free water, rinsed with ethanol and finally allowed to dry.
- All buffers have to be prepared with DEPC-treated RNase-free water.
- Avoid handling bacterial cultures, cell cultures or other biological sources of RNases in the same lab where the RNA purification will be performed.
- Do not use equipment, glassware and plastic ware employed for other applications which might introduce RNase contaminations in the RNA isolation.

4 Storage conditions

Store lyophilized **Proteinase K** at 4 °C to 8 °C! Aliquot dissolved **Proteinase K** and store at -22 °C to -18 °C. Repeated freezing and thawing will reduce the activity dramatically!

Store lyophilized and dissolved **Carrier Mix** at -22 °C to -18 °C. Aliquot dissolved **Carrier Mix** do not freeze and thaw it more than 3 times.

Store the **MAG Suspension** at 4 °C to 8 °C.

The set up mixture of **Lysis Solution V** and **Carrier Mix** is stable for a maximum of 7 days if stored at 4 °C to 8 °C.

All other components of the innuPREP AniPath DNA/RNA Kit – IPC16 should be stored dry at room temperature (15 °C to 30 °C). When stored at room temperature, the kit is stable until the expiration date printed on the label on the kit box.

Before every use make sure that all components have room temperature. If there are any precipitates within the provided solutions dissolve these precipitates by careful warming.

5 Functional testing and technical assistance

The Analytik Jena AG guarantees the correct function of the kit for applications as described in the manual. This kit was produced and tested in an ISO 13485 certified facility.

We reserve the right to change or modify our products to enhance their performance and design. If you have any questions or problems regarding any aspects of the innuPREP AniPath DNA/RNA Kit – IPC16 or other Analytik Jena AG products, please do not hesitate to contact us. For technical support or further information in Germany please dial +49 36 41 / 77 94 00. For other countries please contact your local distributor.

6 Product use and warranty

The kit is not designed for the usage of other starting materials or other amounts of starting materials than those, referred to in the manual (→ “Product specifications” p. 11). Since the performance characteristics of Analytik Jena AG kits have just been validated for the application described above, the user is responsible for the validation of the performance of Analytik Jena AG kits using other protocols than those described below. Analytik Jena AG kits may be used in clinical diagnostic laboratory systems after the laboratory has validated the complete diagnostic system as required by CLIA’ 88 regulations in the U.S. or equivalent regulations required in other countries.

All products sold by the Analytik Jena AG are subjected to extensive quality control procedures and are warranted to perform as described when used correctly. Any problems should be reported immediately.

NOTE
The kit is for research use only!

7 Kit components

7.1 Components included in the kit

	Σ 16	Σ 96	Σ 480
REF	845-IPS-8016016*1 845-IPP-8016016*2	845-IPS-8016096*1 845-IPP-8016096*2	845-IPP-8016480*2
Lysis Solution V	15 ml	1 x 60 ml	2 x 140 ml
MAG Suspension	1 ml	5.5 ml	3 x 9 ml
Proteinase K	for 1.5 ml working solution	for 4 x 1.5 ml working solution	for 16 x 1.5 ml working solution
Carrier Mix	for 1 x 1.25 ml working solution	for 1 x 1.25 ml working solution	for 5 x 1.25 ml working solution
RNase-free Water	2 ml	2 ml	5 x 2 ml
Reagent Strip P*1	16 (pre-filled, sealed)	96 (pre-filled, sealed)	--
Reagent Plate P*2	2 (pre-filled, sealed)	12 (pre-filled, sealed)	60 (pre-filled, sealed)
Filter Tips	2 x 16	2 x 96	10 x 96
Elution Tubes (0.65 ml)	16	2 x 48	10 x 48
Elution Caps (Stripes)	2	12	5 x 12
Elution Strips	2	12	5 x 12
Manual	1	1	1

7.2 Components not included in the kit

- 1.5 ml tubes
- ddH_2O for dissolving **Proteinase K**
- 1 x PBS (137 mM NaCl, 2.7 mM KCl, 10 mM Na_2HPO_4, 1.8 mM KH_2PO_4)
- Physiological saline (0.9 % NaCl) for swab samples

8 Initial steps before starting

- Add 1.5 ml ddH_2O to each vial lyophilized **Proteinase K**, mix thoroughly and store as described above.
- Add 1.25 ml RNase-free Water to each vial lyophilized **Carrier Mix,** mix thoroughly and store as described above.
- Invert the Reagent Plate / Reagent Strips for 3–4 times and thump it onto a table to collect the prefilled solutions at the bottom of the wells.
- Prepare **Lysis Solution V / Carrier Mix** according to the table below and store as described above.

Component	16 samples	96 samples	n samples
Lysis Solution V	8 ml	48 ml	500 µl x n samples
Carrier Mix	200 µl	1.2 ml	12.5 µl x n samples
Final volume	8.2 ml	49.2 ml	512.5 µl x n samples

NOTE
If customized extraction controls are used, please add these components to the mixture of **Lysis Solution V** and **Carrier Mix**.

9 Usage of Carrier Mix

Besides carrier RNA, the **Carrier Mix** contains an Internal Control DNA and RNA (IC DNA and IC RNA). Both can be detected by real-time PCR using the corresponding assays.

Name	Amount	Order No.
innuDETECT Internal Control DNA/RNA Assay	100 rxn	845-ID-0008100

If customized extraction controls are used, please add these components to the mixture of **Lysis Solution V / Carrier Mix.** (→ "Initial steps before starting" p. 10)

10 Product specifications

1. Starting material:

- Up to 400 µl cell-free body fluids (e.g. serum, plasma, cerebrospinal fluid, liquor) and cell culture supernatant
- Up to 400 µl whole blood samples
- Swabs from nasopharyngeal samples (e.g. Influenza testing)
- Up to 10 mg tissue samples
- 50 – 100 mg stool samples (e.g. Norovirus extraction)

NOTE

Avoid freezing and thawing of starting material.

2. Time for isolation:

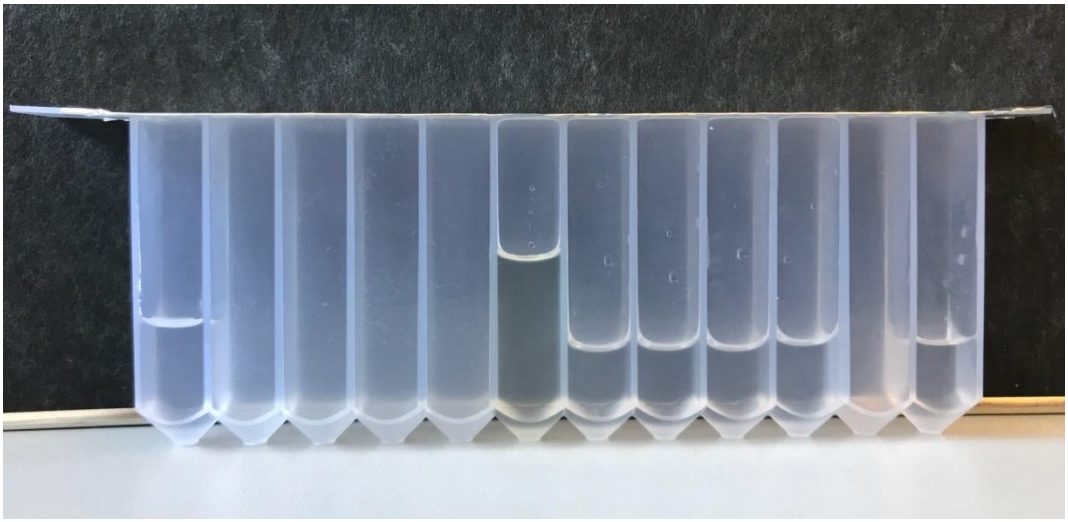
- Time required for external steps depends on the starting material
- Extraction on InnuPure C16 *touch*: 77 min

3. Typical yield:

- Depending on sample and amount of starting material

11 Preparing Reagent Plate / Strip for automated extraction

11.1 General filling scheme of reagent reservoir



Cavity 1:	Water	Cavity 7:	Washing Solution
Cavity 2:	Empty	Cavity 8:	Washing Solution
Cavity 3:	Empty	Cavity 9:	Washing Solution
Cavity 4:	Empty	Cavity 10:	Washing Solution
Cavity 5:	Empty	Cavity 11:	Empty
Cavity 6:	Binding Solution	Cavity 12:	RNase-free water

11.2 Unpacking of Reagent Plate / Reagent Strip

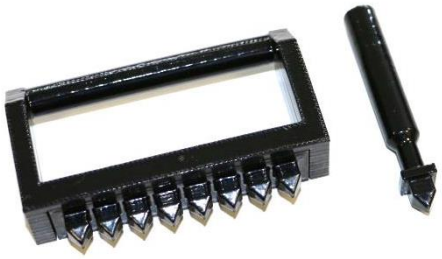
NOTE
According to transport regulations Reagent Reservoirs are wrapped into plastic bags only when transported by airplane.

Reagent Plates or Reagent Strips are delivered wrapped into plastic bags for transport protection.

Carefully open the overpack of Reagent Plates by using scissors.

11.3 Piercing of sealing foil of Reagent Plate / Reagent Strip

NOTE
Before using Reagent Plates or Strips the sealing foil has to be pierced manually. Always wear gloves while piercing of the foil!

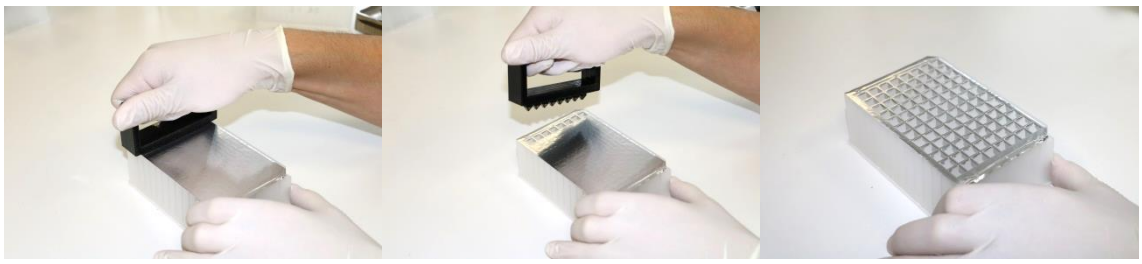


Reagent Plates or Strips are prefilled with extraction reagents and are sealed with a foil. Prior to use this foil has to be pierced manually, by using the piercing tools (single piercer or 8fold piercer).

Keep the Reagent Plates or Strips in a horizontal position to avoid spilling of the reagents while piercing of the foil.

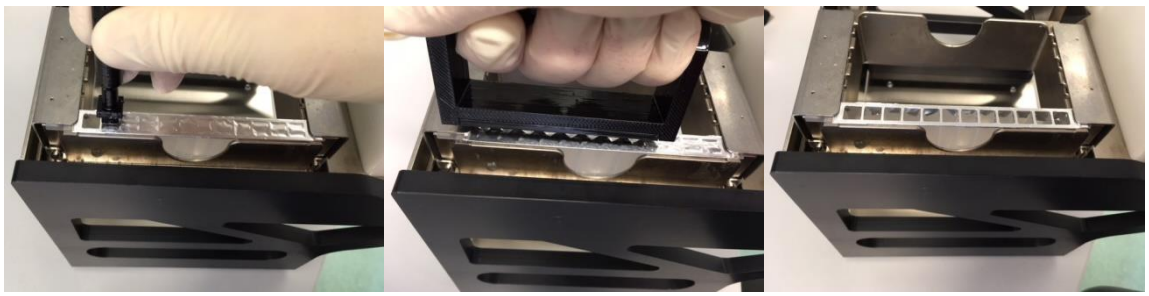
Open all cavities (one row per sample).

Using 8 samples in parallel



Using single sample

Using Reagent Strips



IMPORTANT

Use single or eightfold piercing tool for opening of <u>all</u> cavities of one row per sample!

12 Protocols for isolation of viral and bacterial nucleic acids

NOTE

The lysis of the starting material is done automatically and is included in the InnuPure C16 *touch* extraction protocol.

It is important to mix the **MAG Suspension** by vigorous shaking or vortexing before use (approx. 30 seconds)!

Ensure the foil of Reagent Plate / Strip is pierced (→ „Preparing Reagent Plate / Strip for automated extraction“ p. 12).

12.1 Protocol 1: Isolation from 200 µl cell-free body fluids, cell culture supernatants and whole blood

NOTE
Using cell free body fluids we recommend the addition of Carrier Mix.

1. Transfer **50 µl of MAG Suspension** directly into the liquid of the **first cavity** of Reagent Plate / Strip.
2. Transfer **400 µl Lysis Solution V / Carrier Mix** directly into the **third cavity** of the Reagent Strip / Plate.
3. Add **200 µl PBS** to **third cavity** of the Reagent Strip / Plate.
4. Add **200 µl** sample to the **third cavity** of the Reagent Strip / Plate.

NOTE
If the volume of the blood sample is less than 200 µl fill it up with PBS.

5. Add **50 µl Proteinase K** to the **third cavity** of the Reagent Strip or Reagent Plate.
6. Follow the instructions of chapter 13 p. 19. The sample will be processed using the InnuPure C16 *touch*.

12.2 Protocol 2: Isolation from 400 µl cell-free body fluids, cell culture supernatants and whole blood

NOTE
Using cell free body fluids we recommend the addition of Carrier Mix.

1. Transfer **50 µl of MAG Suspension** directly into the liquid of the **first cavity** of Reagent Plate / Strip.
2. Transfer **400 µl Lysis Solution V / Carrier Mix** directly into the **third cavity** of the Reagent Strip or Reagent Plate.
3. Add 400 µl of the sample to the third cavity of the Reagent Strip or Reagent Plate.

NOTE
If the volume of the blood sample is less than 400 µl fill it up with PBS.

4. Add **50 µl Proteinase K** to the **third cavity** of the Reagent Strip or Reagent Plate.
5. Follow the instructions of chapter 13 p. 19. The sample will be processed using the InnuPure C16 *touch*.

12.3 Protocol 3: Isolation from swabs

NOTE
We recommend the addition of Carrier Mix.

1. Transfer **50 µl of MAG Suspension** directly into the liquid of the **first cavity** of Reagent Plate or Reagent Strip.
2. Transfer **400 µl Lysis Solution V / Carrier Mix** directly into the **third cavity** of the Reagent Strip or Reagent Plate.
3. Place the swabs into 1.5 ml reaction tubes containing **500 µl physiological saline** ("Components not included in the kit" p. 10) and incubate continuously shaking for 20 minutes.
4. Squeeze and remove the swab.
5. Add **400 µl** of the liquid sample into the **third cavity** of the Reagent Strip or Reagent Plate.
6. Add **50 µl Proteinase K** to the **third cavity** of the Reagent Strip or Reagent Plate.
7. Follow the instructions of chapter 13 p. 19. The sample will be processed using the InnuPure C16 *touch*.

12.4 Protocol 4: Isolation from tissue samples

NOTE
Co-extraction of genomic nucleic acids can inhibit downstream PCR or Real-time PCR applications!

1. Homogenize the tissue samples using bead based homogenizers (e.g. SpeedMill Analytik Jena AG). Therefore, weight 5 – 10 mg tissue sample, transfer into a homogenization tube and add **600 µl** RNase free water or PBS. After homogenization centrifuge the sample at 10,000 x g for 2 minutes.
2. Transfer **50 µl of MAG Suspension** directly into the liquid of the **first cavity** of Reagent Plate / Strip.
3. Transfer **400 µl Lysis Solution V** into the **third cavity** of the Reagent Strip / Plate.
4. Add **400 µl** of the homogenized tissue sample into the **third cavity** of the Reagent Strip / Plate.
5. Add **50 µl Proteinase K** to the **third cavity** of the Reagent Strip / Plate.
6. Follow the instructions of chapter 13 p. 19. The sample will be processed using the InnuPure C16 *touch*.

12.5 Protocol 5: Isolation from stool samples

NOTE
Sometimes, the initial fecal sample is mixed with special ELISA Buffer for subsequent ELISA detection of different viruses. In this case use Option 2.

12.5.1 Option 1: Standard procedure

1. Transfer 50–100 mg stool sample into a 1.5 ml reaction tube.
2. Add **250 µl PBS** (“Components not included in the kit” p. 10). Vortex the tube for 10 seconds.

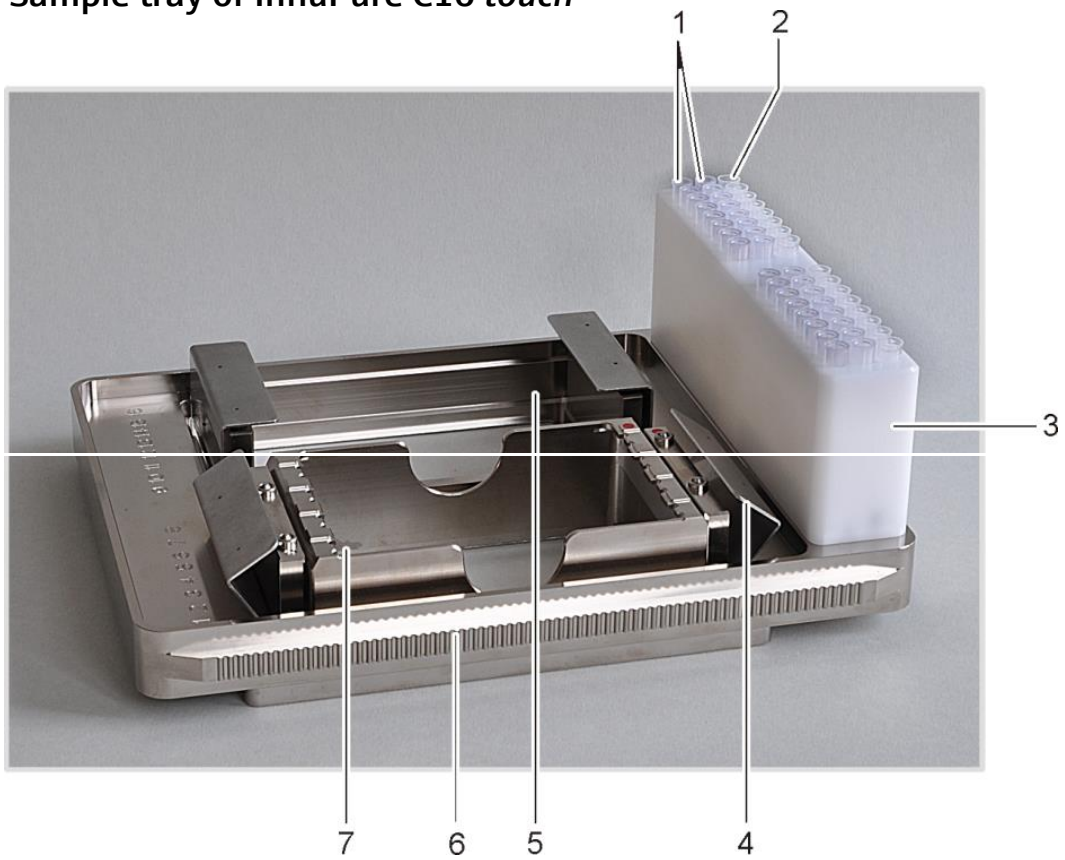
3. Centrifuge the tube at maximum speed for 3 minutes.
4. Transfer **50 µl of MAG Suspension** directly into the liquid of the **first cavity** of Reagent Plate or Reagent Strip.
5. Transfer **400 µl Lysis Solution V** into the **third cavity** of the Reagent Strip or Reagent Plate.
6. Add **200 µl PBS** into the **third cavity** of the Reagent Strip or Reagent Plate.
7. Add **200 µl** of the clear supernatant into the **third cavity** of the Reagent Strip or Reagent Plate.
8. Add **50 µl Proteinase K** to the **third cavity** of the Reagent Strip or Reagent Plate.
9. Follow the instructions of chapter 13 p. 19. The sample will be processed using the InnuPure C16 *touch*.

12.5.2 Option 2: Fecal sample mixed with ELISA Buffer

1. Transfer **250** µl sample into a 1.5 ml reaction tube and centrifuge the tube at maximum speed for 3 minutes.
2. Transfer **50 µl of MAG Suspension** directly into the liquid of the **first cavity** of Reagent Plate or Reagent Strip.
3. Transfer **400 µl Lysis Solution V** into the **third cavity** of the Reagent Strip / Plate.
4. Add **200 µl** of the clear supernatant to the **third cavity** containing Lysis Solution V.
5. Add **200 µl PBS** into the **third cavity** of the Reagent Strip / Plate.
6. Add **50 µl Proteinase K** to the **third cavity** of the Reagent Strip / Plate.
7. Follow the instructions of chapter 13 p. 19. The sample will be processed using the InnuPure C16 *touch*.

13 Automated extraction using InnuPure C16 *touch*

13.1 Sample tray of InnuPure C16 *touch*



No. 1:	Filter tips
No. 2:	Elution vessels for purified samples
No. 3:	Tip block
No. 4:	Holding-down clamp
No. 5:	Sample block for Reagent Plates or adapter for Reagent Strips
No. 6:	Serrated guide rail (C16 *touch*: non-serrated)
No. 7:	Adapter for Reagent Strips

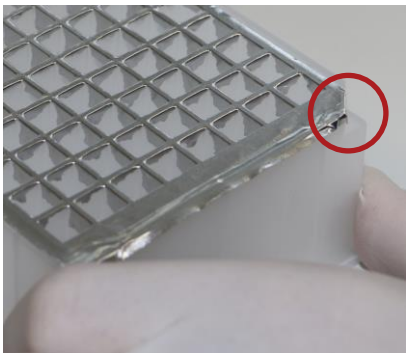
13.2 Preparing sample tray of InnuPure C16 *touch*

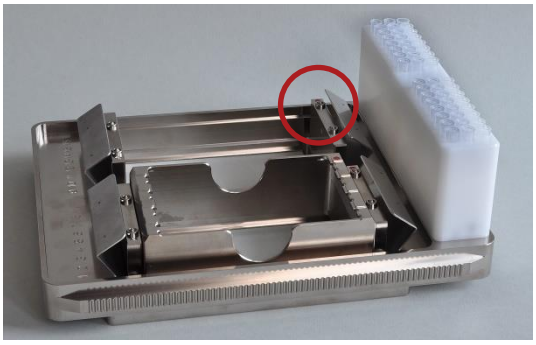
NOTE
The required number of Reagent Strips or Reagent Plates is depending on the number of samples, which have to be processed. Don't use more strips as number of samples!

1. Place the InnuPure C16 *touch* sample tray into the priming station and fold the holding-down clamp at the sample tray upwards!
2. Place the Reagent Plate or an adapter with Reagent Strips into the holder of the sample tray. Using Reagent Plates, the notched corner of the Reagent Plate has to align with the colored dot at the holder. Using adapters and Reagent Strips, the colored dot of the adapter has to align with the colored dot at the holder and Reagent Strips have to be inserted in a way that the “AJ” labels are arranged at the side of the adapter which is more distant from the tip block.

Reagent Plate

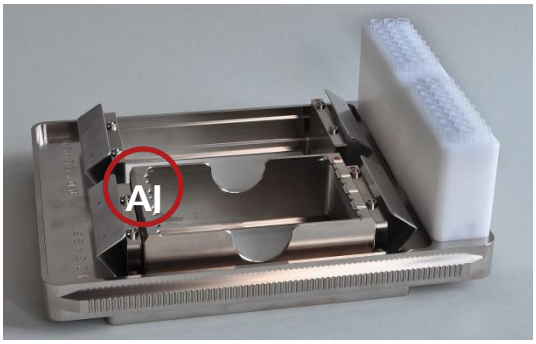
The notched corners of the Reagent Plate must point to the colored dot on the holder.





Reagent Strips

Place the Reagent Strips into the adapter. The long tab marked with the label "AJ" must point to the side of the adapter which is more distant from the tip block.



IMPORTANT NOTE
Both holders have to be equipped with a Reagent Plate or Reagent Strips. If applicable use an empty or dummy plate for the respective holder.

3. Fold down the holding-down clamp to prevent the Reagent Plates and Reagent Strips to be pulled out of the holder during the extraction process.
4. For each extracted sample place two filter tips in the smaller drill holes of the tip block.
5. Place the Elution Tubes into the wider drill hole at the edge of the tip block. Empty sample positions do not need to be filled.

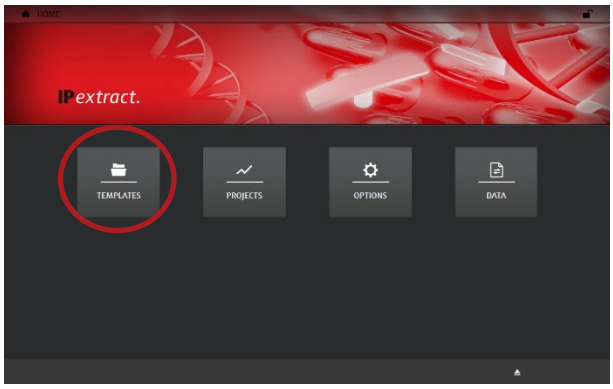
NOTE
Especially with the Reagent Strips make sure that for every Reagent Strip the tips and the elution vessel are in the corresponding positions in the tip block!

IMPORTANT NOTE
It is possible to select between two different elution vessels! For small elution volumes up to 200 µl use Elution Strips (0.2 ml). For high elution volumes up to 500 µl use Elution Tubes (0.65 ml) with corresponding Elution Caps (Strips).

13.3 Starting the InnuPure C16 *touch*

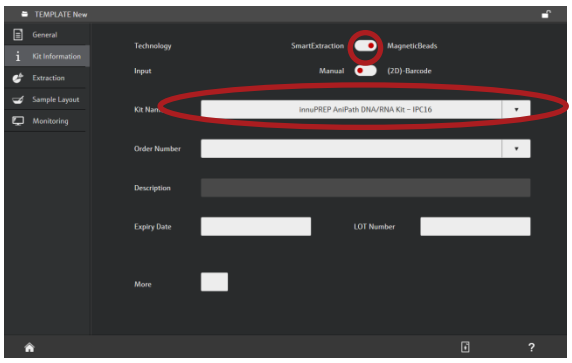
NOTE
The following instructions describe the necessary steps for the start of the InnuPure C16 *touch*. For further features and data entry (e.g. opening templates, entering sample setups, saving projects) refer to the manual of the InnuPure C16 *touch*.

1. Switch on the InnuPure C16 *touch* and the tablet computer. Wait until the home screen of IP*extract* is displayed on the tablet screen.



NOTE
Home screen of IP*extract*

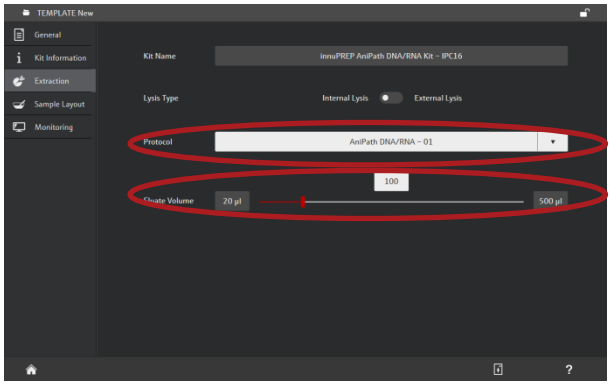
2. Choose [TEMPLATES]→[New Template]→[Kit-based].
3. Enter optional information in the tab “General”.
4. Choose the tab “Kit Information” and switch the “Technology” to “MagneticBeads”!
5. Choose your desired kit from “Kit Name”!



NOTE
“Kit Information” tab

6. Enter optional information in the tab “Kit Information”
7. Choose the tab “Extraction” and choose the desired “Protocol” →“ AniPath DNA/RNA - 01”

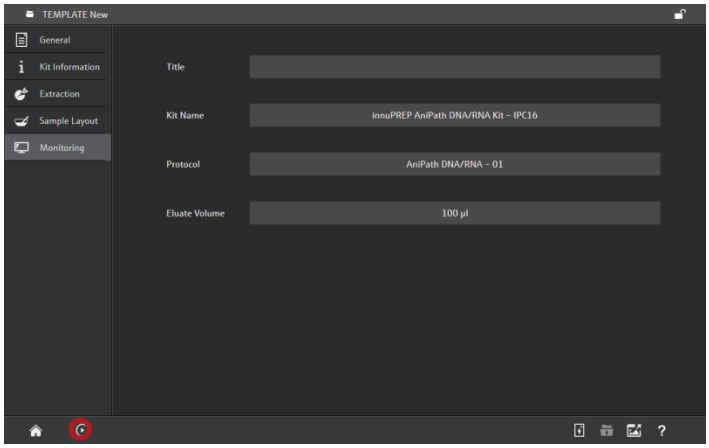
8. Adjust your desired “Eluate Volume“ using the slider or the text field.



NOTE
“Extraction” tab

The recommended elution volume is 100 µl.

9. Choose the tab “Monitoring” and start the protocol by tapping the start button.



NOTE
“Monitoring” tab

10. Follow the instructions displayed on the tablet screen.
11. Completion of the protocol is indicated by a message on the tablet screen. Follow the instructions on the screen to remove the sample tray from the device.
12. The Elution Tubes contain the extracted DNA or RNA. Close the lids and store the DNA or RNA under proper conditions.

NOTE
Store the DNA and RNA under adequate conditions. We recommend storing the extracted DNA at -22 °C to -18 °C!

14 Troubleshooting

Problem / probable cause	Comments and suggestions
No extracted DNA/ RNA	
Insufficient lysis	Ensure that the **Proteinase K** has been prepared according to the instruction.
Insufficient binding	Ensure that the **MAG Suspension** has been added to the Reagent Stripe/ Reagent Plate according to the instruction.
Low amount of extracted RNA/DNA	
Low concentrated starting material	Use more starting material, e.g. use 400 µl instead of 200 µl sample. Ensure to choose the appropriate extraction protocol.
Eluate volume too high.	Decrease the eluate volume. The suggested eluate volume is 100 µl. Please note that lowering the eluate volume will not necessarily increase the yield proportionally!
Poor quality of extracted DNA	Avoid carryover of solid sample material, eg. stool samples, when transferring sample to cavity 3 of Reagent Plate/Strip.
Inadequate extraction.	Inhibiting substances in starting material. Please use the kit only for samples that match the requirements declared in "Product specifications". Use Internal Controls for verification of extraction procedure.
Eluate exert high viscosity	Elution volume to low. Increase the elution volume.
Total RNA degraded	
RNA source inappropriately handled or stored	Ensure that the starting material is fresh! Ensure that the protocol, especially the first steps, has been performed quickly.
RNase contamination of solutions; Receiver Tubes, etc.	Use sterile, RNase-free filter tips. Before every preparation clean the pipette, the devices and the working place. Always wear gloves!

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Headquarters

Analytik Jena AG
Konrad-Zuse-Str. 1
07745 Jena · Germany

Phone +49 3641 77 70
Fax +49 3641 77 9279
info@analytik-jena.com
www.analytik-jena.com

Pictures: Analytik Jena AG
Subjects to changes in design and scope of delivery as well as further technical development!

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