May 2026

QIAsprint® DNA Plant Application Guide

For automated purification of genomic DNA from plant samples

Sample to Insight

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Required Kits and Components

Required kit/component name	Cat. no.
QIAsprint DNA/RNA Plant PrepSet (384)	580669
QIAsprint Essential Kit A (384)	585009
QIAsprint Prep Cover (8)	582103
QIAsprint Prep Plate Insert (32)	582226
QIAsprint Elution Plate (10)	583204

Optional kit/component name	Cat. no.
RNase A	19101
Proteinase K	19134
Buffer ATL	19076 or 939011
Reagent DX (antifoaming reagent for use with Buffer ATL)	19088

Kit Contents

The QIAsprint Connect offers the possibility of a modular kit concept, and the following combination is recommended for purification of genomic DNA (gDNA) from plant's tissue samples.

QIAsprint DNA/RNA Plant PrepSet **Catalog no.** **Number of preps**	**(384)** **580669** **384**
Buffer RLT*	4 × 45 mL

* Contains a chaotropic salt. Take appropriate laboratory safety measures and wear gloves when handling. Not compatible with disinfectants containing bleach. See page 8 for Safety Information.

QIAsprint Essential Kit A **Catalog no.** **Number of preps**	**(384)** **585009** **384**
Buffer AW1* (concentrate)	95 mL
Buffer AW1* (concentrate)	27 mL
Buffer AW2 (concentrate)	2 × 68 mL
RNase-free water	50 mL
RNase-free water	30 mL
MagG Bead Suspension	12 mL

* Contains a chaotropic salt. Take appropriate laboratory safety measures and wear gloves when handling. Not compatible with disinfectants containing bleach. See page 8 for Safety Information.

Shipping and Storage

The QIAsprint DNA/RNA Plant PrepSet, Buffer ATL, and QIAsprint Essential Kit A are shipped at ambient temperature.

All buffers and reagents should be stored at room temperature (15–25°C) until the expiration date printed on the box label.

Intended Use

The QIAsprint DNA/RNA Plant PrepSet is intended for molecular biology applications. This product is not intended for the diagnosis, prevention, or treatment of a disease.

All due care and attention should be exercised in the handling of the products. We recommend all users of QIAGEN® products to adhere to the NIH guidelines that have been developed for recombinant DNA experiments, or to other applicable guidelines.

Safety Information

When working with chemicals, always wear a suitable lab coat, disposable gloves, and protective goggles. For more information, please consult the appropriate safety data sheets (SDSs). These are available online in convenient and compact PDF format at **www.qiagen.com/safety**, where you can find, view, and print the SDS for each QIAGEN kit and components.

CAUTION DO NOT add bleach or acidic solutions directly to the sample preparation waste.

Buffers RLT and AW1 contain chaotropic salts, which can form highly reactive compounds when combined with bleach. If liquid containing these buffers is spilled, clean with a suitable laboratory detergent and water. If the spilled liquid contains potentially infectious agents, clean the affected area first with laboratory detergent and water, and then with 1% (v/v) sodium hypochlorite.

Quality Control

In accordance with QIAGEN's ISO-certified Quality Management System, each lot of QIAsprint DNA/RNA Plant PrepSet is tested against predetermined specifications to ensure consistent product quality.

Introduction

The application guide describes processing of the QIAsprint DNA/RNA Plant PrepSet with the QIAsprint Connect instrument. For a detailed description of the QIAsprint Connect instrument, refer to the respective user manual (**www.qiagen.com/HB-3708**) and quick-start guide (**www.qiagen.com/HB-3709**). The QIAsprint DNA Plant application enables automated high-throughput purification of total DNA (i.e., genomic, chloroplast, and mitochondrial DNA) from plant material, such as leaves and seeds, using the QIAsprint Connect instrument.

The kit is suitable for DNA purification from various plant species. Its effectiveness may vary depending on the species. This should be validated by the user. Magnetic-particle technology enables purification of high-quality nucleic acids that are free of proteins, nucleases, and other impurities. The purified nucleic acids are ready to use for highly sensitive detection in downstream assays, such as amplification, or other enzymatic reactions. For the purification of DNA from inhibitor-rich plants or plant-associated bacteria and fungi, QIAsprint PowerExtract IRT PrepSet has been developed to be used on QIAsprint Connect instrument. For more details, refer to the *QIAsprint PowerExtract IRT Application Guide* (**www.qiagen.com/HB-3724**). The QIAsprint Connect can process up to 96 samples per run, and subsequent runs allow handling of up to 192 samples in a single session.

Automated purification on QIAsprint Connect

Nucleic acid purification is fully automated on the QIAsprint Connect platform. The advanced technology integrated into QIAsprint Connect ensures efficient purification of nucleic acids for a wide range of applications while offering exceptional flexibility to allow customers to customize their purification protocols according to specific requirements.

QIAsprint Connect provides comprehensive protocols and purification guides for plasmid DNA, gDNA, RNA, and viral/bacterial nucleic acids.

Figure 1. The QIAsprint Connect instrument.

Principle and procedure

QIAsprint uses MagG magnetic-particle technology for DNA purification from plants. It combines the speed and efficiency of silica-based DNA purification with the convenient handling of magnetic particles (see Figure 2). Fresh, frozen, or lyophilized starting material is mechanically disrupted to give a fine powder. The powder is resuspended in lysis buffer, carefully mixed, and then sedimented by a short centrifugation step. The cleared lysates are transferred to QIAsprint Prep Plate Insert (32) (cat. no. 582226).

DNA binds to the silica surface of MagAttract® magnetic particles in the presence of a chaotropic salt. DNA bound to the magnetic particles is then efficiently washed with alcohol-containing buffers, followed by an air drying step. High-quality DNA is eluted in water or low-salt buffer.

Binding to magnetic particles

The QIAsprint DNA/RNA Plant PrepSet provides a fully automated protocol after the mechanical disruption of plant material. Mixing the lysate with the beads and alcohol ensures optimal adsorption of the plant DNA to the silica surface.

Washing of bound nucleic acids

While plant nucleic acids remain bound to the magnetic particles, contaminants are efficiently washed away during a sequence of wash steps using first Buffer AW1, then Buffer AW2 twice.

Elution of purified nucleic acids

In a single step, purified DNA is eluted in RNase-free water. The purified nucleic acid can be either used immediately in downstream applications or stored for future use.

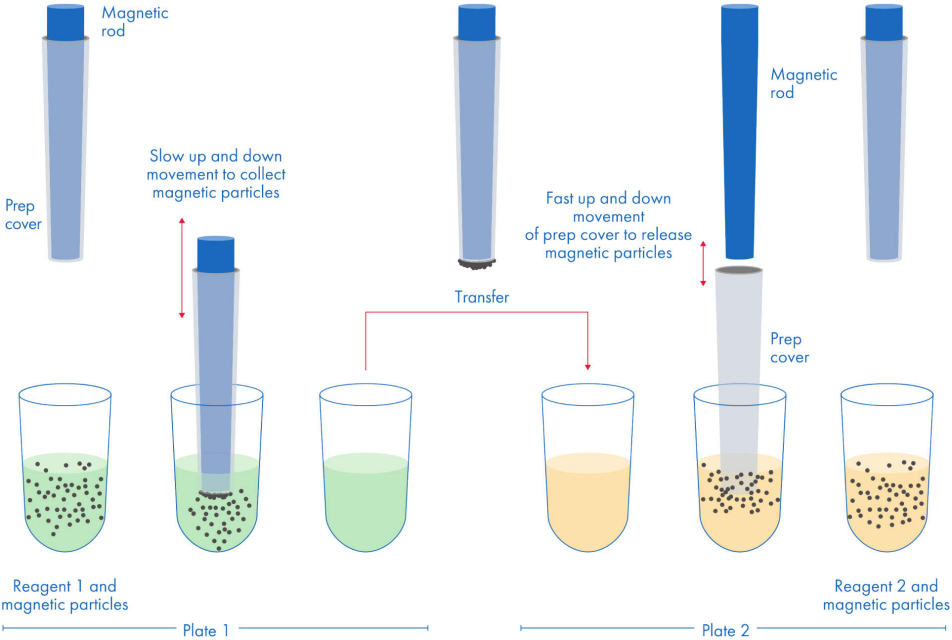


Figure 2. Handling of magnetic particles by the QIAsprint Connect instrument.

Equipment and Reagents to Be Supplied by User

When working with chemicals, always wear a suitable lab coat, disposable gloves, and protective goggles. For more information, consult the appropriate safety data sheets (SDSs) available from the product supplier.

All protocols

- Pipettes and sterile, RNase-free pipette tips
- Disposable gloves
- 96–100% Ethanol*
- **Optional**: Vortex
- **Optional**: Thermal shaker
- **Optional**: Liquid nitrogen (depends on the homogenization method)
- **Optional**: QIAsprint Frame Shield (100) (cat. no. 580010)

  Note: If desired, use QIAsprint Frame Shield to minimize adhesions of beads to the QIAsprint Prep Cover Frame (cat. no. 582111). For this, place QIAsprint Frame Shield into the QIAsprint Prep Cover Frame before loading the QIAsprint Prep Cover. After the run, discard the QIAsprint Frame Shield.
- Centrifuge capable of handling two 96-well blocks at 6000 × *g*
- QIAsprint Connect consumables (see Table 1)

* Do not use denatured alcohol, which contains other substances such as methanol or methyl ethyl ketone.

Table 1. QIAsprint Connect consumables

Item	Cat. no.	Pieces required for 4 × 96 samples
QIAsprint Prep Cover (8)	582103	4
QIAsprint Prep Plate Insert (32)	582226	16
QIAsprint Elution Plate (10)	583204	4

For disrupting plant tissue (recommended)

- TissueLyser III (cat. no. 9003240)
- TissueLyser Adapter 2 × 96 (cat. no. 69984)
- 1.2 mL Collection Microtubes (racked) (cat. no. 19560) and Collection Microtube Caps (cat. no. 19566)
- 3 mm stainless steel beads

Optional for some starting materials

- Buffer ATL (cat. no. 19076 or 939011)

  Note: Buffer ATL may improve DNA purity in certain plant material such as some roots and leaves (like basil, parsley, or oregano). It also helps reduce viscosity in dense lysates.

Important Notes

Collection and storage of starting material

After harvesting, plant tissue should be processed immediately or frozen in liquid nitrogen and stored at –80°C for future use. Ground tissue powder can also be stored at –80°C. Alternatively, tissue can be freeze-dried/lyophilized after harvesting to allow storage at room temperature (15–25°C).

If possible, it is preferable to collect young materials (e.g., leaves, needles) because they contain more cells per weight and therefore result in higher yields of DNA. In addition, young leaves and needles contain less polysaccharides and polyphenolics and are therefore easier to handle.

Disruption of plant tissue

Complete and quick disruption of starting material is essential to ensure high DNA yields and to avoid DNA degradation. Disruption methods may differ among laboratories, as each laboratory might adapt its own protocol for disrupting and homogenizing plant samples. Our recommended approach leads to optimal results, which involves the TissueLyser III (cat. no. 9003240) together with the TissueLyser Adapter Set 2 × 96 (cat. no. 69984). The TissueLyser III provides rapid and efficient disruption of up to 96 samples in parallel in 2–5 min.

Plant material and a 3 mm stainless bead are added to collection microtubes (when using the TissueLyser Adapter Set 2 × 96) in two racks. The racks are fixed into the clamps on the TissueLyser III using adapter plates and disrupted by 2 min high-speed (30 Hz) shaking steps. Disruption time depends on the plant sample. It is crucial to thoroughly lyse the tissue until no visible tissue fragments remain in the lysis tube. For some samples, such as small seeds, two

3 mm or one 5 mm stainless steel beads should be used for grinding to ensure production of a homogenous plant powder. For other sample, such as large seeds or beans, it is highly recommended to first grind them into fine powder using a powerful grinder. Once ground, proceed with the handling as described using TissueLyser III for complete homogenization.

Fresh, frozen, or lyophilized plant tissue samples can be processed using the TissueLyser III. Fresh or frozen samples can be disrupted after freezing in liquid nitrogen without lysis buffer. Alternatively, fresh material can be directly disrupted in lysis buffer without using liquid nitrogen, but this may cause shearing of high-molecular-weight DNA. Lyophilized material should be disrupted without lysis buffer at room temperature. We do not recommend disrupting frozen material in lysis buffer as this results in low yields and degraded DNA. Disruption of samples in lysis buffer yields DNA that is suitable for PCR, while disruption of samples in liquid nitrogen yields DNA of a higher molecular weight.

Plant tissue can also be manually disrupted by grinding under liquid nitrogen using a mortar and pestle. Optimization of the manual disruption method may be required to ensure maximum DNA yield and quality.

For DNA extraction from plant-associated bacteria or fungi, PowerBead Pro Tubes (cat. no. 19301) or PowerBead Pro Plates (cat. no. 19311) with the TissueLyser Adapter Set 2 × 24 (cat. no. 69982) or Plate Adapter Sets (cat. no. 11990) can be used. In this case, the amount of Buffer RLT may be increased to up to 700 µL.

Additionally, when extracting DNA from plant-associated bacteria or fungi, or from protein-rich plant samples, treatment with Proteinase K can increase DNA yield. Prepare a master mix (*x* + 10% samples) by mixing 75 µL RNase-free water and 25 µL Proteinase K per sample. Add 100 µL of Proteinase K mix to each sample in 300 µL Buffer RLT, mix thoroughly and incubate for 10 min at room temperature.

Centrifugation

The recommended speed for the centrifugation step in the protocol is 6000 × *g*. The Centrifuge 4-16S or Centrifuge 4-16KS equipped with the QIAGEN Plate Rotor 2 × 96 (cat. no. 81031) can be used if processing samples in collection microtubes (see Ordering Information). If these centrifuges are not available or the recommended speed cannot be applied on the given centrifuge, centrifuge the plates at maximum speed. Increase the time of centrifugation if necessary (5–10 min).

Yield and quality of purified DNA

DNA yields depend on the sample type, the sample collection method used, and the method of tissue disruption. The QIAsprint DNA Plant procedure is optimized for 30–50 mg fresh plant material or up to 30 mg lyophilized material. With some plant types, up to 100 mg of fresh plant material can be used. Exceeding the recommended maximum amount of starting material will result in inefficient lysis, resulting in low DNA yield and purity. DNA yields vary depending on genome size, ploidy, and age of sample. Yields typically range from 5 to 20 µg per 30–50 mg of wet-weight sample. We strongly recommend performing a preliminary experiment with different amounts of starting material.

Elution in smaller volumes increases the final DNA concentration in the eluate. We recommend using an elution volume as suggested in our protocols

Preparing lysis buffer

Precipitates may form in Buffer RLT or ATL during storage at room temperature or at 4°C. Dissolve the precipitates by incubating the bottles at 50°C for 15 min and shaking them manually twice within this incubation period.

Preparing MagG Bead Suspension

To ensure that the magnetic silica particles are fully resuspended, MagG Bead suspension must be shaken and vortexed before every use. Before first use, shake the vial or bottle, and vortex for 3 min. Before subsequent uses, shake the bottle and vortex for 1 min.

Quantification of DNA

Carryover of magnetic particles may affect the absorbance reading at 260 nm (A_{260}) of the purified DNA, but should not affect downstream applications. The measured absorbance at 320 nm (A_{320}) should be subtracted from all absorbance readings.

Elution volumes and eluate handling

In the final step of the purification procedure, the DNA is eluted using 100 µL of RNase-free water. To account for eluate loss caused by retention between the beads, it is advisable to add 120 µL RNase-free water to the elution plate. Under these conditions, the resulting eluate volume will be 100 ± 2 µL.

Storing DNA

For short-term storage of up to 24 h, we recommend storing the purified DNA at 2–8°C. For long-term storage of over 24 h, we recommend storage at –90°C to –65°C (preferred) or at –30°C to –15°C.

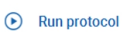
Preparation of Buffer AW1 and Buffer AW2

Add the required volume of ethanol (96–100%) to Buffer AW1* concentrate and Buffer AW2 concentrate, as described on the bottle. Tick the checkbox on the label to indicate that ethanol has been added. Store reconstituted Buffers AW1 and AW2 at room temperature (15–25°C). Reconstituted Buffers AW1 and AW2 are stable for up to 1 year when stored at room temperature, but only until the kit expiration date.

Note: Always mix reconstituted Buffers AW1 and AW2 by shaking before starting the purification procedure.

Working with the QIAsprint Connect

Procedure on the QIAsprint Connect

1. Turn on the QIAsprint Connect instrument and log in.
2. Navigate to the Protocols screen with the tab in the upper part of the home screen.
3. Locate the desired protocol for the DNA plant application, and press and 

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   Optional: Enter run information in the Run details screen. This information will be displayed in the run report.
4. Close the hood and press **Confirm** to get to the loading screen.

* Contains a chaotropic salt. Take appropriate laboratory safety measures and wear gloves when handling. Not compatible with disinfectants containing bleach. See page 8 for Safety Information.

5. With the plate hotels located on the lab bench, insert the plates according to the screen instructions into the hotels.
    - The QIAsprint Prep Cover must be located in the metal prep cover frame.

      Note: If desired, use the QIAsprint Frame Shield to minimize adhesions of beads to the QIAsprint Prep Cover Frame. For this, place QIAsprint Frame Shield into the QIAsprint Prep Cover Frame before loading the QIAsprint Prep Cover. After the run, discard the QIAsprint Frame Shield.
    - All QIAsprint Prep Plates need to sit firmly in their metal frames.
    - The QR codes need to face the user.
6. Open the hood and place the hotels on their platforms, taking care not to mix up the left and right hotels.
7. **Optional**: If you have heating or cooling steps during your protocol run and the thermal adapter is not already located on the heater–cooler, place the thermal adapter in one of the slots of the thermal adapter platform with the QR code facing the user. The instrument will install it automatically during the run.
8. Press **Start run** to start the run.
9. After the end of the run, remove the plate hotels from the instrument. Store the elution plate safely or use it directly in your downstream applications.

Protocol: Disruption of Plant Tissue in Liquid Nitrogen using TissueLyser III

This protocol provides guidelines for disruption of 192 (2 × 96) plant tissue samples using the TissueLyser III (see “Disruption of plant tissue”, page 16). After addition of lysis buffer, cleared lysates are prepared by centrifugation.

Important: The optimal amount of starting material depends on the plant type and its state (fresh or lyophilized). We recommend using up to 50 mg fresh plant material or up to 30 mg lyophilized material. Performing a preliminary experiment with different amounts of starting material is very helpful.

Procedure

1. Place a plant tissue sample into each well of two collection microtube racks (cat. no. 19560).

   Keep the clear covers from the collection microtube racks for use in step 4. Normally, 30 mg of starting material is sufficient. Do not use more than 50 mg (wet weight) unless preliminary experiments suggest that the optimal amount is higher.

2. Add one or two stainless steel beads to each collection microtube and seal the tubes with the caps.

3. Ensure that the microtubes are tightly closed and cool them in liquid nitrogen for 30 s.

4. Place a clear cover (saved from step 1) over each rack of collection microtubes and knock the racks upside down against the bench five times to ensure that all stainless steel beads can move freely within the collection microtubes. Ensure that no liquid nitrogen remains but do not allow the plant material to thaw. Remove the clear cover.

5. Place each rack of collection microtubes between adapter plates and fix into the TissueLyser III clamps as described in the *TissueLyser III User Manual* (**www.qiagen.com/HB-3241**). Ensure that the microtubes are properly sealed with caps.

   Important: It is necessary to secure two plate sandwiches to the TissueLyser III to maintain balance. When processing 96 samples or fewer, a second plate sandwich should be assembled using a rack of collection microtubes filled with steel beads but without any samples or buffers, and positioned into the empty clamp.

6. Shake the samples for 1 min at 30 Hz.

7. Remove and dismantle the plate sandwiches. Ensure that the collection microtubes are tightly closed. Cool the collection microtube racks again in liquid nitrogen and then knock the racks against the bench five times to ensure that no tissue powder remains in the caps.

8. Reassemble the plate sandwiches so that the collection microtubes nearest the TissueLyser III in steps 5 and 6 are now outermost. Reinsert the plate sandwiches into the TissueLyser III.

   Rotating the racks of collection microtubes in this way ensures that all samples are thoroughly disrupted.

9. Shake the samples for 1 min at 30 Hz.

10. Carefully remove the caps from the collection microtubes and immediately pipet 400 µL Buffer RLT into each collection microtube.

11. Reseal the tubes with the caps and shake the entire rack in an upright position 20 times back and forth. Vortex the rack of collection microtubes upside down at full speed for 20 s.

12. Centrifuge the rack at 6000 × *g* for 5 min at room temperature (15–25°C).

13. Transfer the recommended amount of the supernatant (Table 2) and proceed with the relevant purification protocol on the QIAsprint Connect.

Protocol: Disruption of Plant Tissue in Lysis Buffer using TissueLyser III

This protocol provides guidelines for disruption of 192 (2 × 96) plant tissue samples using the TissueLyser III (see “Disruption of plant tissue”, page 16). After addition of lysis buffer, cleared lysates are prepared by centrifugation.

Important: The optimal amount of starting material depends on the plant type and its state (fresh or lyophilized). We recommend using up to 50 mg fresh plant material or up to 30 mg lyophilized material. Performing a preliminary experiment with different amounts of starting material is very helpful.

Procedure

1. Place a plant tissue sample into each of two collection microtube racks (cat. no. 19560).

   Keep the clear covers from the collection microtube racks for use in step 4. Normally, 30 mg of starting material is sufficient. Do not use more than 50 mg (wet weight) unless preliminary experiments suggest that the optimal amount is higher.

2. Add one or two stainless steel beads to each collection microtube and seal the tubes with the caps.

3. Pipet 400 µL Buffer RLT into each collection microtube and seal the tubes with the caps.

   Important: For challenging materials like roots and certain leaves (such as basil, parsley, oregano, or similar plants), add Buffer ATL (cat. no. 19076 or 939011) to the lysate. For this, use 300 µL Buffer RLT, 100 µL Buffer ATL, and 1 µL Reagent DX (antifoaming, cat. no. 19088), then follow steps 4 to 11 to disrupt and homogenize the sample.

4. Place a clear cover (saved from step 1) over each rack of collection microtubes and knock the racks upside down against the bench five times to ensure that all stainless steel beads

can move freely within the collection microtubes. Remove the clear cover.

5. Place each rack of collection microtubes between adapter plates and fix into the TissueLyser III clamps as described in the *TissueLyser III User Manual* (**www.qiagen.com/HB-3241**). Ensure that the microtubes are properly sealed with caps.

   Important: It is necessary to secure two plate sandwiches to the TissueLyser III to maintain balance. When processing 96 samples or fewer, a second plate sandwich should be assembled using a rack of collection microtubes filled with steel beads but without any samples or buffers, and positioned into the empty clamp.

6. Shake the samples for 1 min at 30 Hz.

7. Remove and dismantle the plate sandwiches. Ensure that the collection microtubes are tightly closed. Place a clear cover and then knock the racks against the bench five times to ensure that the beads can move freely within the collection microtubes.

8. Reassemble the plate sandwiches so that the collection microtubes nearest the TissueLyser III in steps 4 and 5 are now outermost. Reinsert the plate sandwiches into the TissueLyser III.

   Rotating the racks of collection microtubes in this way ensures that all samples are thoroughly disrupted.

9. Shake the samples for 1 min at 30 Hz.

   Steps 6–8 can be repeated if the tissue is still recognized in the lysate.

10. Centrifuge the rack at 6000 × *g* for 5–10 min at room temperature (15–25°C).

11. Transfer the recommended amount of the supernatant (Table 2) and proceed with the relevant purification protocol.

Protocol: Purification of DNA from Plant Using QIAsprint Connect

Important points before starting

- If using the QIAsprint DNA/RNA Plant PrepSet and QIAsprint Essential Kit A for the first time, read "Important Notes".
- After receiving the QIAsprint DNA/RNA Plant PrepSet and QIAsprint Essential Kit A, check the kit and components for damage. If any kit components are damaged, contact QIAGEN Technical Services or your local distributor. In the case of liquid spillage, refer to the Safety Information. Do not use damaged PrepSet and Essential Kit components because their use may lead to poor performance.
- Buffer RLT and Buffer AW1 contain guanidine and salt and are therefore not compatible with disinfecting reagents containing bleach.

Things to do before starting

- If necessary, redissolve any precipitate in Buffer RLT and Buffer AW1 by warming.
- Equilibrate buffers to room temperature.
- All steps should be performed at room temperature. Work quickly.
- Add ethanol (96–100%) to Buffer AW1 and Buffer AW2 concentrates before use (see bottle label for volume).
- **Optional**: Prepare a fresh Buffer AW1/RNase solution (2 µL RNase for each 700 µL Buffer AW1).
- For 100 µL elution, add 120 µL RNase-free Water.

Procedure

Homogenization and lysis of plant samples

For homogenization and lysis of plant samples, follow the steps in “Protocol: Disruption of Plant Tissue in Liquid Nitrogen using TissueLyser III” or “Protocol: Disruption of Plant Tissue in Lysis Buffer using TissueLyser III”.

Plate preparation

1. Ensure sufficient resuspension of the MagG Bead Suspension by pipetting or vortexing
2. Prepare the plates as shown in Table 2.

Table 2. QIAsprint Connect Plates preparation

Plate	Content	Volume (µL)
Lysate Plate	Lysate supernatant* Ethanol 100% MagG Bead Suspension	300 300 20
Wash Plate 1	Buffer AW1/RNase	700/2
Wash Plate 2	Buffer AW2	650
Wash Plate 3	Buffer AW2	500
Elution Plate	RNase-free Water	100 (+20 µL to recover a 100 µL elute)

* From step 19.

Note: Residual adhesive can lead to instrument crash. If you cover plates with adhesive foil after plate preparation, ensure that no adhesive remains on the plate surface after removal of the foil.

3. To start the run, follow the instructions stated in “Working with the QIAsprint Connect” on page 20.

   Using the following protocols is recommended: “QIAsprint DNA Plant 100 uL V1” when using the QIAsprint DNA/RNA Plant PrepSet or “QIAsprint DNA Inhibitor Rich Plants 100 uL V1” when using the QIAsprint PowerExtract IRT PrepSet.

Troubleshooting Guide

This troubleshooting guide may be helpful in solving any problems that may arise. For more information, see also the Frequently Asked Questions page at our Technical Support Center: **www.qiagen.com/FAQ/FAQList.aspx** (for contact information, visit **support.qiagen.com**).

	Comments and suggestions
Low DNA yield/recovery	
Insufficient sample disruption	Ensure that the starting material is completely disrupted. See "Disruption of plant tissue", page 16. Some plant tissues may require more or less bead beating than recommended. Requirements can vary substantially between species and between different portions of the plant. Therefore, individual sample types should be assessed to determine optimal conditions.
Insufficient sample lysis	Before the bead-beating step, the yield of DNA from some plant tissues may be improved by heating at 65°C for 10 min in the presence of Buffer RLT. This effect is dramatically changed among species
Oils or other secondary metabolites may interfere with the binding process	Increase the volume of Buffer RLT used for lysis to up to 500–600 µL, but process only the recommended 300 µL of lysate for DNA purification. Polyphenolic compounds may be copurified with some plant materials, and these can inhibit downstream reactions. Polyphenols can be removed by adding 33 mg/mL insoluble polyvinyl polypyrrolidone (PVP) to Buffer RLT before use. PVP forms complex hydrogen bonds with polyphenolic compounds, which are then separated from the DNA during the lysate centrifugation step. Prepare a small aliquot of Buffer RLT containing 33 mg/mL PVP and thoroughly vortex the modified lysis buffer before use.
MagG Bead Suspension were not completely resuspended	Before starting the procedure, ensure that the MagAttract® particles are fully resuspended. Vortex for at least 5 min before first use and for 1 min before subsequent uses.
Contamination of RNA in the eluate	
Buffer AW1 did not contain RNase A	Check that RNase A was added to Buffer AW1. Overestimation of yield can lead to failure of downstream applications.

	Comments and suggestions
Magnetic beads in the eluate	
Too much input material used	When using high amounts of sample material, small bead fragments may appear in the eluate, depending on the plant species. These fragments adhere tightly to the plastic at the bottom of the plate. They do not affect eluate quality or the efficiency of downstream applications. The eluate can be easily transferred to another plate without bead carryover. Adjust the "collect bead" parameters: number of loops, speed, position, and bottom time. Adjust the lysate viscosity; see "Lysate problems" below.
Lysate problems	
Lysate is viscus or turbid	If seeds are used as starting material, the crude lysate may be very viscous and turbid. This may result in low yields of DNA, problems with sample processing, and carryover of inhibitors. Generally, a turbid lysate indicates that too much plant material was used. For optimal results, reduce the amount of starting material. If it is not possible to use less material, we recommend increasing the volume of Buffer RLT used for lysis to up to 500–600 µL, but process only the recommended 300 µL of lysate for DNA purification. Add Buffer ATL (not included; cat. no. 19076 or 939011): For this, reduce Buffer RLT volume to 300 µL, and supplement with 100 µL Buffer ATL. Optionally, add 1 µL Reagent DX (cat. no. 19088) to minimize foaming. It is critical to homogenize the plant sample in Buffer RLT prior to the addition of Buffer ATL. Following the addition of Buffer ATL, centrifugation is required.
Green-, red-, or yellow-colored eluates	
Insufficient washing of the MagG Bead Suspension	Chlorophyll or carotenoids can be efficiently removed by adding one additional wash step using Buffer AW2 or a 100% ethanol in future preparations.
Too much starting material	Reducing the amount of starting material to the recommended amounts. Slight color in the eluate does not necessarily interfere with downstream applications. Add Buffer ATL (not included; cat. no. 19076 or 939011), reduce Buffer RLT volume to 300 µL, and supplement with 100 µL Buffer ATL. Optionally, add 1 µL Reagent DX (cat. no. 19088) to minimize foaming. Disrupt and homogenize the plant material then centrifuge the lysate as describe.

	Comments and suggestions
Challenging starting material	
Ground seeds	Grinding efficiently lyses seeds and beans for DNA extraction. After grinding, thoroughly mix the powder with Buffer RLT and use bead beating with a 3 mm bead for best results.
Oily plants	See the comments and suggestions for "Oils or other secondary metabolites may interfere with the binding process" and "Lysate problems".
Inhibitor-rich plants	Consider using QIAsprint PowerExtract IRT PrepSet (384) (cat. no. 587679), which has been developed to be used on QIAsprint Connect instrument to extract DNA from challenging plant material. For more information, refer to the *QIAsprint RNA Tissue/Cells Application Guide* (**www.qiagen.com/HB-3724**).

Contact Information

For technical assistance and more information, please see our Technical Support Center at **www.qiagen.com/Support** or contact one of the QIAGEN Technical Service Departments or local distributors (visit **support.qiagen.com**).

Ordering Information

Product	Contents	Cat. no.
QIAsprint DNA/RNA Plant PrepSet (384)	For processing 384 standard plant samples: Buffer RLT	580669
QIAsprint PowerExtract IRT PrepSet (384)	For 384 DNA/RNA or total NA preps for inhibitor-rich samples like stool or plant samples: Solutions CD1 and CD2 and Buffer MVL	587679
QIAsprint Essential Kit A (384)	For 384 preps for purification of nucleic acids: MagG Bead Suspension, Buffer AW1, Buffer AW2, and nuclease-free water	585009
QIAsprint Prep Cover (8)	Set of 8 prep covers for use with QIAsprint Connect	582103
QIAsprint Prep Plate Insert (32)	Set of 32 prep plate inserts for use with QIAsprint Connect	582226
QIAsprint Elution Plate (10)	Set of 10 elution plates for use with QIAsprint Connect	583204
Related products		
QIAsprint Connect	Benchtop instrument for automated isolation of nucleic acids; includes 1 year warranty on parts and labor	9001234
QIAsprint Frame Shield (100)	Set of 100 frame shields for use with QIAsprint Connect	580010
QIAsprint Prep Cover Frame (2)	Set of 2 prep cover frames for use with QIAsprint Connect	582111
QIAsprint Prep Plate Frame (2)	Set of 2 prep plate frames for use with QIAsprint Connect	582211
Buffer ATL	200 mL tissue lysis buffer	19076
RNAse A (17,500 U)	2.5 mL solution for removal of RNA	19101
Collection Microtubes (racked, 10 × 96)	Nonsterile polypropylene tubes (1.2 mL), 960 in racks of 96 for mechanical disruption and homogenization of the plant material	19560
Collection Microtube Caps (120 × 8)	Nonsterile polypropylene caps for collection microtubes (1.2 mL, 960 in strips of 8 for sealing the collection microtubes to prevent leakage	19566
TissueLyser III	Bead mill, 100–120/220–240 V, 50/60 Hz; requires TissueLyser Adapters (available separately)	9003240
TissueLyser Adapter Set 2 × 24	Two sets of adapter plates and two racks for use with 2 × 24 samples in 2 mL microcentrifuge tubes on the TissueLyser III	69982

Product	Contents	Cat. no.
TissueLyser Adapter Set 2 × 96	Two sets of adapter plates for use with Collection Microtubes (racked) on the TissueLyser III	69984

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Document Revision History

Date	Description
03/2026	Initial release
05/2026	Updated to match the Essential Kit configuration.

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