

USER GUIDE

for

**Automated purification of DNA from
Plant leaves, tissues and seeds with**

**KingFisher 96 instrument
and
Invitrogen ChargeSwitch gDNA Plant Kit**

14.3.2007



Description

Purification of DNA from plant samples (e.g. green leaves or seeds) with Invitrogen's ChargeSwitch® gDNA Plant kit can easily be automated using KingFisher® instruments (Thermo Fisher Scientific). The KingFisher platforms utilize patented technology where magnetic rods move particles through the processing steps. KingFisher 96 instrument operates on microplates and can process up to 96 samples per run, where as KingFisher mL can handle 15 samples per run. With both instruments the volumes handled can be up to 1 ml.

Typically, DNA isolation from up to 100 mg of plant material using KingFisher instruments results up to 7 µg DNA. Generally, DNA yields vary according to sample type and storage conditions.

The protocol described here is designed for general use and can be modified according to customer individual needs using KingFisher® Software provided with the instrument.

Important notes

- See ChargeSwitch gDNA Plant Kit user manual for reagent storage, product use limitations, safety information etc.
- Resuspend magnetic beads (DNA Binding Beads) thoroughly before use.

Importing protocols from the web

KingFisher Software protocol for Invitrogen ChargeSwitch gDNA Plant Kit can be downloaded from the www.thermofisher.com/kingfisher website. First you have to **save the file "ChargeSwitch_Plant_KF96" to your computer.**

1. Open KingFisher Software.
2. Select **Protocol** → **Import/Export data**.
3. Click **Read file**.
4. Select the database (*.KF2) by browsing in the **Open** dialog and click **Open**.
5. Select the protocol(s) you wish to import from the *Protocols in file* list. Use the SHIFT key together with the mouse button to select protocols between two clicked protocols and the CTRL key to select only the clicked protocols.

6. Tick **Update existing** if you wish to overwrite the protocols with identical protocol name(s) in the target database.
7. Click **Import**.

If there are protocols with identical names and you have not ticked the **Update existing** tick box, you will be prompted to change the name of the protocol that is being imported:

- Type in a new name and click **OK**.
 - o **Note:** Check that the name of the protocol does not exceed 17 characters.
- You will receive a message stating whether the database updating procedure was successful or not.

Sending or running a protocol

To send a protocol to the instrument memory, or to run the protocol directly without saving it to the instrument memory:

1. Check that the instrument has been configured correctly and that the instrument is connected to the correct COM port.
2. Open the **Transfer protocol to instrument** dialog from **Instrument** → **Send Protocol to Instrument...**
3. Select the target instrument from the *Select instrument* table.
4. Select a protocol from the *Protocols for selected instrument* table. The protocols in that table are the available protocols in the database.
5. Select either of the following:
 - a. Click **Send protocol** to transfer protocols to the instrument memory.
 - You can launch the protocol using the instrument keypad and display.
 - b. Click **Execute protocol** to launch the protocol directly without transferring it to the instrument memory
 - The protocol will launch after validation.

KingFisher 96 protocol

Sample preparation

- KingFisher DNA protocol **ChargeSwitch gDNA Plant** is designed to purify DNA from plant samples, e.g. leaves, tissues and seeds.
- Use KingFisher Microtiter™ deepwell microplate (Catalog No. 95040450), KingFisher deepwell tip comb (Catalog No. 97002534) and KingFisher 96 KF plate (Catalog No. 97002540) with ChargeSwitch gDNA Plant protocol.
- **Prepare Plant Lysate** according to instructions given in ChargeSwitch gDNA Plant Kit User Manual in page 7.
- Add sample (=lysate) and other reagents except Elution Buffer supplied by ChargeSwitch gDNA Plant kit to Microtiter deepwell microplate according to table 1 and instructions below. Add the Elution Buffer to KingFisher KF96 plate and start the ChargeSwitch_Plant_KF96 process.

KingFisher 96 process

Table 1 Pipetting instructions for KingFisher 96 and ChargeSwitch gDNA Plant protocol.

Plate *	Plate	Content	Sample/ Reagent volume
A	1	Lysate (see ChargeSwitch gDNA Plant Kit User Manual page 7)	800 µl
		ChargeSwitch Magnetic Beads	40 µl
		ChargeSwitch 10% Detergent (D1)	80 µl
A	2	ChargeSwitch Wash Buffer (W12)	750 µl
A	3	ChargeSwitch Wash Buffer (W12)	750 µl
A	4	ChargeSwitch Wash Buffer (W12)	750 µl
B	5	ChargeSwitch Elution Buffer (E6)	100 µl

* A= Microtiter Deep well plate, B=KingFisher 96 KFplate

1. Combine 800 µl of lysate, 40 µl of resuspended ChargeSwitch Magnetic Beads and 80 µl of Detergent Buffer (D1) to plate **1**
2. Add 750 µl of ChargeSwitch Wash Buffer (W12) to plates **2, 3** and **4**.
3. Add 100 µl of ChargeSwitch Elution Buffer (E6) to plate **5**.
4. Combine the tip comb and The KingFisher plate. See KingFisher 96 User manual.
5. Select the ChargeSwitch gDNA Plant protocol using arrow keys from the instrument and press START button OR execute protocol using KingFisher software.
6. Load the plates according to protocol request and press START after every plate to confirm the action.
7. **Note!** Confirm that the plates are placed in correct orientation: A1 well to be pointed to upper right corner of the plate holder in turntable. A1 row of the plate is then always located in the inner circle of the turntable.
8. The purification protocol will start when the last plate is loaded and START button is pressed.
9. After the purification process is completed the plates are removed according to instructions shown in instrument screen. Press START after each plate removal to confirm the action.
10. When the last plate is removed text End_of_run will appear. Press STOP to complete the run.

Description of ChargeSwitch gDNA Plant protocol with KingFisher 96

1. Samples are lysed according to instructions given in ChargeSwitch gDNA Plant Kit User Manual in page 7.
2. Lysate is incubated first with magnetic beads and detergent in plate 1 for 4 minutes. Magnetic bead/DNA complexes are formed.
3. Magnetic beads are washed with ChargeSwitch Wash Buffer (W12) in plates 2, 3 and 4.
4. DNA is released to ChargeSwitch Elution Buffer in plate 5 for 10 minutes with heating.
5. Beads are discarded into plate 4.

Troubleshooting

1. Magnetic particles are remained in the sample well
 - If starting material is too viscose, the magnetic rods will not be able to collect the particles. Dilute the sample and check that the sample is properly homogenized/lysed.
2. Magnetic particles are attached to the tip combs
 - This will not affect the yield because the sample has been released from the particles.
3. The volumes of the reagent in one well exceeds the limit.
 - It is recommended to keep the given volumes within certain limits to avoid failure in performance of the chemical reactions and the processor.
4. Any steps of the protocol (e.g. sample incubation and elution times) and the reagent volumes can be modified with KingFisher® software.
5. The processor is not working properly
 - Refer to Kingfisher 96 User Manual
6. If you have questions related to ChargeSwitch chemistry see ChargeSwitch gDNA Plant Kit User Manual for detailed troubleshooting instructions.

Ordering Information

Product no.	Product Description
Thermo Fisher Scientific	
540 05 00	KingFisher 96, 110V-240V, Magnetic particle processor
24073430	KingFisher 96 head for Deep Well plate
97002534	KingFisher 96 tip comb for DW magnets (10 x 10 pcs/box)
97002540	KingFisher 96 KF plate (200 µl), 48 plates/box
95040450	Microtiter Deep Well 96 plate, V-bottom, Polypropylene
Invitrogen	
CS18000	ChargeSwitch gDNA Plant kit (1x96 preps)
CS18000-10	ChargeSwitch gDNA Plant kit (10x96 preps)

Contact information

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