Invitrogen™
life technologies

Instruction Manual

ChargeSwitch® gDNA 50 µl Sheep Blood Kits

For purification of genomic DNA from from sheep blood

Catalog nos. CS11300 and CS11300-10

Version A
12 January 2005
25-0816

Table of Contents

Kit Contents and Storage

Shipping and Storage

All components of the ChargeSwitch® gDNA 50 µl Sheep Blood Kits are shipped at room temperature.

Upon receipt, store components as follows:

- Store Proteinase K at 4°C
- Store the remaining kit components at room temperature

All components are guaranteed stable for 6 months when stored properly.

Kit Contents

The components supplied in the ChargeSwitch® gDNA 50 µl Sheep Blood Kits are listed below.

Sufficient reagents are provided in the kits to perform 50 (catalog no. CS11300) or 960 (catalog no. CS11300-10) purifications.

Note: Some reagents in the kit may be provided in excess of the amount needed.

Component	Amount	
	CS11300	**CS11300-10**
ChargeSwitch® Lysis Buffer (L10)	50 ml	1000 ml
ChargeSwitch® Lysis Buffer (L11)	50 ml	1000 ml
ChargeSwitch® Magnetic Beads (25 mg/ml in 10 mM MES, pH 5.0, 10 mM NaCl, 0.1% Tween 20)	1 ml	20 ml
ChargeSwitch® Purification Buffer (N5)	10 ml	100 ml
ChargeSwitch® Wash Buffer (W12)	100 ml	1950 ml
Proteinase K (20 mg/ml in 50 mM Tris-HCl, pH 8.5, 5 mM $CaCl_2$, 50% glycerol)	0.5 ml	5 ml
ChargeSwitch® Elution Buffer (E5; 10 mM Tris-HCl, pH 8.5)	10 ml	100 ml

Accessory Products

Additional Products

The table below lists additional products available from Invitrogen that may be used with the ChargeSwitch® gDNA 50 µl Sheep Blood Kits.

In addition, the table lists other ChargeSwitch® gDNA Kits that are available for purification of genomic DNA from other sources. For more information about these and other ChargeSwitch® gDNA Kits, refer to our website at www.invitrogen.com or call Technical Service (see page 18).

Product	Quantity	Catalog no.
MagnaRack™ Magnetic Rack	1 rack	CS15000
96-Well Magnetic Separator	1 rack	CS15096
ChargeSwitch® gDNA 10-20 µl Blood Kit	96 purifications	CS11010
ChargeSwitch® gDNA 50-100 µl Blood Kit	50 purifications	CS11000
ChargeSwitch® gDNA 1 ml Blood Kit	20 purifications	CS11001
ChargeSwitch® gDNA 1 ml Serum Kit	50 purifications	CS11040
ChargeSwitch® gDNA Mini Tissue Kit	25 purifications	CS11204
ChargeSwitch® gDNA Micro Tissue Kit	50 purifications	CS11203
ChargeSwitch® gDNA Normalized Buccal Cell Kit	50 purifications	CS11020
ChargeSwitch® gDNA Buccal Cell Kit	50 purifications	CS11021
ChargeSwitch® Forensic DNA Purification Kit	100 purifications	CS11200
Quant-iT™ DNA Assay Kit, High Sensitivity	1000 assays	Q33120
Quant-iT™ PicoGreen® dsDNA Assay	1 kit	P7589

E-Gel® Agarose Gels and DNA Ladders

E-Gel® Agarose Gels are bufferless pre-cast agarose gels designed for fast, convenient electrophoresis of DNA samples. E-Gel® agarose gels are available in different agarose percentages and well formats for your convenience.

A large variety of DNA ladders are available from Invitrogen for sizing DNA.

For more details on these products, visit www.invitrogen.com or call Technical Service (page 18).

Overview

Introduction

The ChargeSwitch® gDNA 50 µl Sheep Blood Kits allow rapid and efficient purification of genomic DNA (gDNA) from sheep blood. After preparing the lysates, you can purify DNA in less than 15 minutes using the ChargeSwitch® Technology. For more information about the ChargeSwitch® Technology, see below.

The purified DNA is suitable for use in any downstream application of choice such as PCR, restriction enzyme digestion, or Southern blotting.

The ChargeSwitch® Technology

The ChargeSwitch® Technology (CST®) is a novel magnetic bead-based technology that provides a switchable surface charge dependent on the pH of the surrounding buffer to facilitate nucleic acid purification. In low pH conditions, the ChargeSwitch® beads have a positive charge that binds the negatively charged nucleic acid backbone (see figure below). Proteins and other contaminants are not bound and are simply washed away in an aqueous wash buffer. To elute nucleic acids, the charge on the surface of the bead is neutralized by raising the pH to 8.5 using a low salt elution buffer (see figure below). Purified DNA elutes instantly into this elution buffer, and is ready for use in downstream applications.

Overview, Continued

Advantages

The ChargeSwitch® gDNA 50 µl Sheep Blood Kits provide the following advantages:

- A magnetic bead-based technology to isolate genomic DNA without the need for hazardous chemicals, centrifugation, or vacuum manifolds
- Rapid and efficient purification of genomic DNA from 50 µl of sheep blood in less than 15 minutes following sample preparation and lysis
- Simple lysis of cells with Proteinase K without the need for any mechanical lysis
- Minimal contamination with RNA
- Purified genomic DNA demonstrates improved downstream performance in applications including PCR, restriction enzyme digestion, and Southern blotting

System Specifications

Starting Material:	50 µl sheep blood
Bead Binding Capacity:	5-10 µg gDNA per mg beads
Bead Size:	<1 µm
Bead Concentration:	25 mg/ml
Bead Storage Buffer:	10 mM MES, pH 5.0, 10 mM NaCl, 0.1% Tween 20
Elution Volume:	100 µl
DNA Yield:	Up to 2 µg

Automation

Use of the ChargeSwitch® Sheep Blood Kit has been demonstrated on the Tecan Genesis® robotic workstation to purify gDNA in a fully automated system from large numbers of samples in a 96-well format. Other liquid handling robots are suitable provided that each is equipped with a gripper arm, a 96-well magnetic separator, and other additional hardware as described on page 10. This manual provides general guidelines and a protocol that may be used to develop a script for your robot.

General Information

Follow the recommendations below to obtain the best results:

- To minimize DNA degradation, freeze the blood in liquid nitrogen and avoid repeated freezing and thawing of DNA samples
- Maintain a sterile environment when handling DNA to avoid any contamination from DNases
- Ensure that no DNases are introduced into the solutions supplied with the kit
- Make sure all equipment that comes in contact with DNA is sterile including pipette tips and tubes
- Do not vortex the samples for more than 5-10 seconds at each vortexing step to avoid extensive shearing of DNA
- Perform the recommended wash steps during purification to obtain the best results

Safety Information

Follow these safety guidelines when using the ChargeSwitch® Kits.

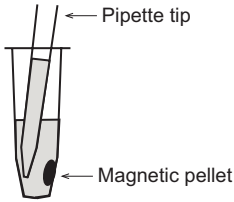
- Treat all reagents supplied in the kit as potential irritants.
- Always wear a suitable lab coat, disposable gloves, and protective goggles.
- Dispose of blood samples and washes during the purification procedure as biohazardous waste.
- If a spill of the buffers occurs, clean with a suitable laboratory detergent and water. If the liquid spill contains potentially infectious agents, clean the affected area first with laboratory detergent and water, then with 1% (v/v) sodium hypochlorite or a suitable laboratory disinfectant.

General Information, Continued

Handling Magnetic Beads

Follow the recommendations below for best results:

- During the mixing and washing steps of the ChargeSwitch® Magnetic Beads, mix beads by pipetting up and down gently to avoid forming bubbles as directed in the protocol.
- Do not allow the beads to dry as drying reduces the bead binding efficiency.
- To aspirate the supernatant after bead washing, place the pipette tip away from the beads by angling the pipette such that the tip is pointed away from the pellet and carefully remove the supernatant without disturbing or removing any beads (see figure below).



- **Do not freeze the magnetic beads** as freezing damages the beads and cannot be used for nucleic acid purifications.

Automation-Important Guidelines

To maximize DNA yield using the automated protocol, follow the recommendations below when processing samples:

- Ensure that the robotic tips enter the wells of the plates without interfering with the pellet of beads.
- When removing supernatant, leave samples on the 96-Well Magnetic Separator and aspirate slowly to ensure that the pellet of beads is not disturbed.
- When resuspending pelleted ChargeSwitch® Magnetic Beads, make sure that all beads are fully resuspended to maximize DNA recovery.
- To maximize DNA yield, make sure that all Wash Buffer is removed before elution and the beads are fully resuspended during the elution step.

Purification Procedure—Manual Protocol

Introduction

This procedure is designed for purifying DNA from sheep blood DNA using microcentrifuge tubes. If you are using a liquid handling system to process the samples, see page 10.

MagnaRack™ Magnetic Rack

The MagnaRack™ Magnetic Rack available from Invitrogen (catalog no. CS15000) is a two-piece magnetic separation rack for use in protocols with magnetic beads. The MagnaRack™ Magnetic Rack consists of a magnetic base station and a removable tube rack. The tube rack can hold up to 24 microcentrifuge tubes. The tube rack fits onto the magnetic base station in two different positions associating the row of 12 neodymium magnets with a single row of 12 tubes for simple 'on the magnet' and 'off the magnet' sample processing (see figure below). For more information, visit www.invitrogen.com or call Technical Service (page 18).

Continued on next page

Purification Procedure—Manual Protocol, Continued

Materials Needed

- MagnaRack™ Magnetic Rack (see previous page)
- Microcentrifuge tubes
- Adjustable pipettes and sterile tips
- Sheep blood

Components supplied with the kit

- ChargeSwitch® Magnetic Beads
- Proteinase K
- ChargeSwitch® Lysis Buffer (L10)
- ChargeSwitch® Lysis Buffer (L11)
- ChargeSwitch® Purification Buffer (N5)
- ChargeSwitch® Wash Buffer (W12)
- ChargeSwitch® Elution Buffer (E5)

Binding DNA

1. Fully resuspend the ChargeSwitch® Magnetic Beads by thorough vortexing.
2. To 50 µl sheep blood (fresh or frozen in EDTA), add 1 ml Lysis Buffer (L10).
3. Add 20 µl ChargeSwitch® Magnetic Beads to the sample.

   For multiple samples, premix Lysis Buffer (L10) and ChargeSwitch® Magnetic Beads and add 1 ml of the mixture to the sample.
4. Pipet up and down gently 5 times using a 1 ml adjustable pipette tip set to 900 µl without forming bubbles.
5. Incubate at room temperature for 1 minute.
6. Place tubes on the MagnaRack™ for 1 minute or until the beads have formed a tight pellet.
7. Without removing the tubes from the magnet, carefully remove the supernatant and discard. Take care not to disturb the pellets by angling the pipette such that the tips are pointed away from the pellets (see figure on page 4).
8. Proceed immediately to **Proteinase K Digestion**, next page.

Continued on next page

Purification Procedure—Manual Protocol, Continued

Proteinase K Digestion

1. Prepare a mixture of 100 µl Purification Buffer (N5), 1 ml Lysis Buffer (L11), and 5 µl Proteinase K for each sample (for multiple samples, scale up the volume of reagents used and prepare a master mix).
2. Remove the tube containing the pelleted magnetic beads from the MagnaRack™.
3. Add 1 ml of the Lysis Buffer (L11)/Proteinase K/Purification Buffer (N5) mixture prepared in Step 1 to the sample.
4. Pipet up and down gently 5 times with a 1 ml adjustable pipette set to 900 µl without forming bubbles.

   Clumping of the beads may occur at this stage and may remain throughout the protocol up to the elution stage. This does not adversely affect the yield though the clump should be broken up as much as possible at the elution step (page 9).
5. Incubate at room temperature for 5 minutes.
6. Place tube on the MagnaRack™ for 1 minute or until the beads have formed a tight pellet.
7. Without removing the tubes from the magnet, carefully remove the supernatant and discard. Take care not to disturb the pellets by angling the pipette such that the tips are pointed away from the pellets.
8. Proceed immediately to **Washing DNA**, next page.

Continued on next page

Purification Procedure—Manual Protocol, Continued

Washing DNA

1. Remove tubes from the magnet.
2. Add 1 ml Wash Buffer (W12). Pipet up and down gently 5 times with a 1 ml adjustable pipette set to 900 µl without forming bubbles.
3. Place tubes on the MagnaRack™ for 1 minute or until the beads have formed a tight pellet.
4. Without removing the tubes from the magnet, carefully remove the supernatant and discard. Take care not to disturb the pellets by angling the pipette such that the tips are pointed away from the pellets.
5. While the tube is still on the magnet, add 1 ml Wash Buffer (W12).
6. Incubate at room temperature for 1 minute.
7. Without removing the tubes from the magnet, carefully remove the supernatant and discard. Take care not to disturb the pellets by angling the pipette such that the tips are pointed away from the pellets.
8. Proceed immediately to **Eluting DNA**, next page.

Purification Procedure—Manual Protocol, Continued

Eluting DNA

1. Remove the tubes from the magnet.
2. Add 100 µl Elution Buffer (E5). Pipet up and down gently 15-30 times using an adjustable pipette set to 70 µl without forming bubbles to allow efficient mixing of beads.

   Any bead clumps should be broken up, but if there are some grainy clumps this will not adversely affect the result. Do not use water for elution.
3. Incubate at room temperature for 10 minutes.

   Tip: For maximum yield, mix the suspension of beads (by pipetting up and down gently) half way through the incubation.
4. Place tubes on the MagnaRack™ for 2 minutes or until the beads have formed a tight pellet.
5. Without removing the tubes from the magnet, carefully transfer the **supernatant containing the DNA** to a sterile tube. Take care not to disturb the pellets by angling the pipette such that the tips are pointed away from the pellets.

   If the supernatant containing the DNA is discolored, repeat Steps 4-5.
6. Discard the used magnetic beads. **Do not** re-use the magnetic beads.

Storing DNA

- Store the purified DNA at –20°C, or use DNA for the desired downstream application.
- To avoid repeated freezing and thawing of DNA, store the purified DNA at 4°C for immediate use, or aliquot the DNA and store at –20°C for long-term storage.

Purification Procedure—Automated Protocol

Introduction

This section provides general information for using the ChargeSwitch® gDNA 50 µl Sheep Blood Kit (catalog no. CS11300-10) to process large numbers of samples in 96-well format using an automated liquid handling robot and magnetic separator. If you wish to process small numbers of samples individually, see Purification Procedure—Manual Protocol (page 3).

Hardware Requirements

The ChargeSwitch® chemistry is ideal for purification of DNA using liquid handling robots, avoiding the need for centrifugation steps or the use of ethanol or chaotropic salts. You will need the following hardware to perform automated processing of samples using the ChargeSwitch® gDNA 50 µl Sheep Blood Kit (catalog no. CS11300-10):

- Any liquid handling robotic workstation with a gripper arm
- Appropriate tips for liquid dispensing and aspiration (see below for factors to consider)
- 96-Well Magnetic Separator (see next page)
- Plate shaker capable of 1500-1800 rpm (optional—for use with deep well plates, if desired)
- 96 x 2 ml deep well plate(s) (U-bottom plates rather than V-bottom plates recommended, *e.g*. Greiner, catalog no. 780270 or Abgene, catalog no. AB-0932)
- 96 x 300 µl U-bottom microtiter plate (Greiner, catalog no. 650201)

Tip Selection

You may use any tips of choice to dispense and aspirate liquid during the purification procedure. Consider the following factors when choosing an appropriate tip to use.

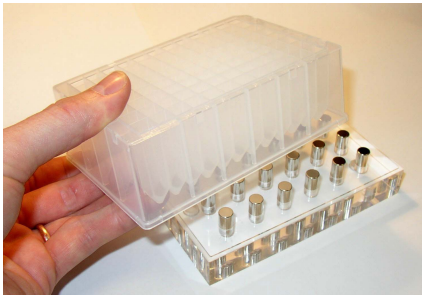
- Fixed vs. disposable tips
- Tip size vs. head size
- Conductive vs. non-conductive
- Sterile vs. non-sterile
- Filtered vs. non-filtered

Continued on next page

Purification Procedure—Automated Protocol, Continued

96-Well Magnetic Separator

The 96-Well Magnetic Separator available from Invitrogen (catalog no. CS15096) is a magnetic base station suitable for use in protocols with magnetic beads. A 96-well plate fits onto the magnetic separator, associating the array of 24 neodymium magnets with the samples for sample processing (see figures below). For more information, see www.invitrogen.com or call Technical Service (page 18).



Materials Needed

- Sheep blood
- Liquid handling robot configured to process samples in 96-well plate
- 96 x 2 ml deep well plate(s) (U-bottom plates)
- 96 x 300 µl U-bottom microtiter plate

Components supplied with the kit

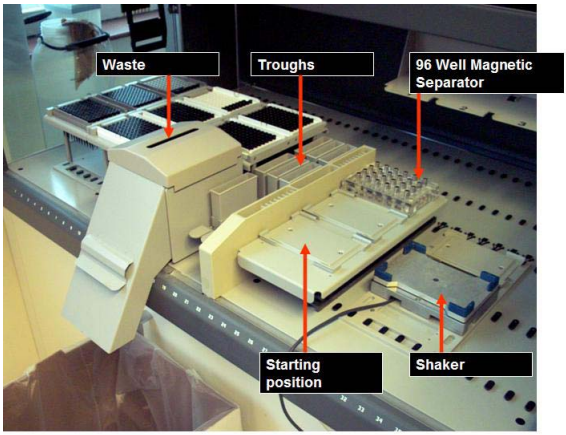
- ChargeSwitch® Magnetic Beads
- Proteinase K
- ChargeSwitch® Lysis Buffer (L10)
- ChargeSwitch® Lysis Buffer (L11)
- ChargeSwitch® Purification Buffer (N5)
- ChargeSwitch® Wash Buffer (W12)
- ChargeSwitch® Elution Buffer (E5)

Purification Procedure—Automated Protocol, Continued

Deck Set Up

Once you have the required hardware, you will need to configure the deck of your liquid handling robot appropriately to process samples. You may use any suitable configuration of your choice. An example is provided below.

Location	Trough Contents	Plate
1		96 well sample tray start position
2	Lysis buffer (L10)	
3	ChargeSwitch® Magnetic Beads	
4	Lysis buffer (L11)	
5	Proteinase K	
6	Purification Buffer (N5)	
7	Wash Buffer (W12)	
8	Waste	
9		96-Well Magnetic Separator
10		Shaker
11		96-well sample tray
12	Elution Buffer (E5)	
13		96-well U-bottom microtiter plate (for final elution)



Continued on next page

Purification Procedure—Automated Protocol, Continued

Primary Liquid Handling Parameters

The table below lists the primary liquid handling parameters required to isolate DNA using the automated protocol. Use the parameters and guidelines provided, as well as the protocol on the next page to program your robot.

Parameter	Aim	Guidelines
[Magnetic Bead Preparation]	To resuspend beads prior to mixing with solution	• Only required once • Beads stay in suspension for up to 45 minutes
[Mixing #1]	Used to mix beads or bead/DNA pellet with buffer	• Aspirate/dispense at 400-500 µl • Aspirate/dispense position fixed 1-2 mm above the well bottom • Use tips/volume setting at 80 µl volume
[Dispense liquid]	Normal liquid parameters for adding a reagent to each well	• Aspirate/dispense at 300-400 µl • Use multi-dispense if appropriate to save time
[Transfer supernatant to waste]	To remove and discard supernatant	• Aspirate slowly at 50-100 µl/second • Aspirate off the entire liquid volume using liquid detect and tracking or setting fixed height 1 mm above the well bottom • Do not disturb pellet • Dispense to waste
[Transfer supernatant to another plate]	To transfer supernatant to another plate	• Aspirate slowly at 50-100 µl/second • Aspirate off the entire liquid volume using liquid detect and tracking or setting fixed height 1 mm above the well bottom • Do not disturb pellet • Dispense slowly at 50-100 µl/second • Avoid splashing
[Final DNA Elution]	To dispense the eluate containing DNA	• Dispense at 10 µl/second • Aspirate from position fixed 1 mm above the well bottom • Avoid bead carry-over • Dispense into new plate at 2 mm above the well bottom

Purification Procedure—Automated Protocol, Continued

Automated Protocol

1. Dispense 50 µl of sheep blood per well of a 96 x 2 ml deep well plate.
2. To each 50 µl sheep blood, add 1 ml Lysis Buffer (L10).
3. Mix the ChargeSwitch® Magnetic Beads to resuspend the beads by pipetting up and down, then add 20 µl ChargeSwitch® Magnetic Beads to each sample well.
4. Place the plate on the shaker for 1 minute. Shake at medium fast speed (*e.g.* pulse, 10 seconds) to evenly distribute the magnetic beads within the solution.
5. Place the plate on the 96-Well Magnetic Separator for 1 minute.
6. Slowly aspirate the supernatant and discard, leaving behind the bead pellet.
7. Remove the plate from the magnet.
8. Add 1 ml Lysis Buffer (L11) to each sample well.
9. Add 5 µl Proteinase K to each sample well.
10. Place the plate on the shaker (set to medium fast speed) for 1 minute.
11. Incubate at room temperature for 5 minutes.
12. Add 100 µl Purification Buffer (N5) to each sample well.
13. Place the plate on the shaker (set to medium fast speed) for 1 minute.
14. Place the plate on the 96-Well Magnetic Separator for 1 minute.
15. Slowly aspirate the supernatant and discard, leaving behind the bead pellet.
16. Remove the plate from the magnet.
17. Add 1 ml Wash Buffer (W12) to each sample well.
18. Place the plate on the shaker for 1 minute.
19. Place the plate on the 96-Well Magnetic Separator for 1 minute.
20. Slowly aspirate the supernatant and discard, leaving behind the bead pellet.
21. With the plate still on the 96-Well Magnetic Separator, add 1 ml Wash Buffer (W12) to each sample well.

Procedure continued on the next page.

Continued on next page

Purification Procedure—Automated Protocol, Continued

Automated Protocol, continued

Procedure continued from the previous page.

22. Incubate at room temperature for 1 minute.
23. Slowly aspirate the supernatant and discard, leaving behind the bead pellet.
24. Remove the plate from the 96-Well Magnetic Separator.
25. Add 100 µl Elution Buffer (E5) to each sample well.
26. Place the plate on the shaker and shake rapidly for 20 seconds to completely disperse the beads within the solution.
27. Incubate at room temperature for 10 minutes.
28. Pipet up and down gently 30 times.
29. Place the plate on the 96-Well Magnetic Separator for 2 minutes.
30. Transfer the **supernatant containing the DNA** to a sterile 96 x 300 µl U-bottom microtiter plate.

Storing DNA

- Store the purified DNA at –20°C, or use DNA for the desired downstream application.
- To avoid repeated freezing and thawing of DNA, store the purified DNA at 4°C for immediate use, or aliquot the DNA and store at –20°C for long-term storage.

DNA Quantitation

Perform DNA quantitation using Quant-iT™ Kits.

The Quant-iT™ DNA Assay Kits (see page vi for ordering information) provide a rapid, sensitive, and specific fluorescent method for dsDNA quantitation. The kit contains a state-of-the-art quantitation reagent, DNA standards for a standard curve, and a pre-made buffer to allow fluorescent DNA quantitation using standard fluorescence microplate readers or fluorometers.

Troubleshooting

Introduction

Refer to the table below to troubleshoot problems that you may encounter when purifying genomic DNA with the ChargeSwitch gDNA 50 µl Sheep Blood Kits.

Problem	Cause	Solution
Low DNA yield	Poor quality of starting material	Use fresh sample and process immediately after collection, or freeze the sample at –80°C or in liquid nitrogen. The yield and quality of DNA isolated depends on the type and age of the starting material.
	Incorrect handling of ChargeSwitch® Magnetic Beads	Vortex the tube containing the ChargeSwitch® Magnetic Beads to fully suspend the beads before adding them to your sample.
	Pellet of beads disturbed or lost during binding or washing steps	• Keep the samples on the magnetic rack when removing supernatant during the binding or washing steps. • Remove the supernatant without disturbing the pellet of beads by angling the pipette tip away from the pellet.
	Incorrect elution conditions	• After adding ChargeSwitch® Elution Buffer (E5) to the sample, pipet up and down to resuspend the magnetic beads before incubation. • Do not use water to elute DNA. Use ChargeSwitch® Elution Buffer (E5) or TE, pH 8.5.

Continued on next page

Troubleshooting, Continued

Problem	Cause	Solution
No DNA recovered	Water used for elution	Do not use water for elution. The elution buffer must have a pH of 8.5-9.0 or the DNA will remain bound to the ChargeSwitch® Magnetic Beads. Use ChargeSwitch® Elution Buffer (E5) or TE, pH 8.5.
	ChargeSwitch® Magnetic Beads stored or handled improperly	• Store beads at room temperature. **Do not freeze** the beads as they will become irreparably damaged. • Make sure that the beads are submerged in buffer at all times and do not dry. Dried beads are non-functional.
Eluate containing DNA is discolored	Magnetic pellet disturbed during elution	Place the sample on the magnetic separator until the beads form a tight pellet. Remove the eluate to a sterile tube or plate, taking care not to disturb the bead pellet.
DNA is sheared or degraded	Lysate mixed too vigorously or small pipette tips used during mixing	• Use appropriate pipette tip set to a volume, lower than the total volume of the solution to mix the sample. • Pipet up and down gently to mix.
	Bubbles formed during mixing steps	Make sure that the pipette tip is submerged in the solution during mixing.
	DNA repeatedly frozen and thawed	Aliquot DNA and store at 4°C or –20°C. Avoid repeated freezing and thawing.
	DNA contaminated with DNases	Maintain a sterile environment while working *(e.g.* wear gloves and use DNase-free reagents.

Technical Service

World Wide Web

Visit the Invitrogen Web Resource using your World Wide Web browser. At the site, you can:

- Get the scoop on our hot new products and special product offers
- View and download vector maps and sequences
- Download manuals in Adobe® Acrobat® (PDF) format
- Explore our catalog with full color graphics
- Obtain citations for Invitrogen products
- Request catalog and product literature

Once connected to the Internet, launch your Web browser (Internet Explorer 5.0 or newer or Netscape 4.0 or newer), then enter the following location (or URL):

http://www.invitrogen.com

...and the program will connect directly. Click on underlined text or outlined graphics to explore. Don't forget to put a bookmark at our site for easy reference!

Contact Us

For more information or technical assistance, please call, write, fax, or email. Additional international offices are listed on our web page (www.invitrogen.com).

Corporate Headquarters:
Invitrogen Corporation
1600 Faraday Avenue
Carlsbad, CA 92008 USA
Tel: 1 760 603 7200
Tel (Toll Free): 1 800 955 6288
Fax: 1 760 602 6500
E-mail: tech_service@invitrogen.com

European Headquarters:
Invitrogen Ltd
Inchinnan Business Park
3 Fountain Drive
Paisley PA4 9RF, UK
Tel: +44 (0) 141 814 6100
Tech Fax: +44 (0) 141 814 6117
E-mail: eurotech@invitrogen.com

MSDS Requests

To request an MSDS, visit our Web site at www.invitrogen.com. On the home page, go to 'Technical Resources', select 'MSDS', and follow instructions on the page.

Product Qualification

Functional Qualification

Each kit is functionally tested to ensure conformance with the most current approved product specifications.

Current specifications consist of tests for:

- Bead size, charge, and binding capacity
- Nucleic acid quality and quantity
- Buffer turbidity, volume, and absence of RNases and DNases
- Kit packaging and labeling accuracy

For individual lot test results and more information, visit www.invitrogen.com to download the Certificate of Analysis.

Purchaser Notification

License

Limited Use Label License No. 265: ChargeSwitch® Technology

The use of this product may be covered by European Patent No. EP1036082B1 and foreign equivalents.

Limited Warranty

Invitrogen is committed to providing our customers with high-quality goods and services. Our goal is to ensure that every customer is 100% satisfied with our products and our service. If you should have any questions or concerns about an Invitrogen product or service, contact our Technical Service Representatives. Invitrogen warrants that all of its products will perform according to specifications stated on the certificate of analysis. The company will replace, free of charge, any product that does not meet those specifications. This warranty limits Invitrogen Corporation's liability only to the cost of the product. No warranty is granted for products beyond their listed expiration date. No warranty is applicable unless all product components are stored in accordance with instructions. Invitrogen reserves the right to select the method(s) used to analyze a product unless Invitrogen agrees to a specified method in writing prior to acceptance of the order. Invitrogen makes every effort to ensure the accuracy of its publications, but realizes that the occasional typographical or other error is inevitable. Therefore Invitrogen makes no warranty of any kind regarding the contents of any publications or documentation. If you discover an error in any of our publications, please report it to our Technical Service Representatives. **Invitrogen assumes no responsibility or liability for any special, incidental, indirect or consequential loss or damage whatsoever. The above limited warranty is sole and exclusive. No other warranty is made, whether expressed or implied, including any warranty of merchantability or fitness for a particular purpose.**

For research use only. Not intended for any animal or human therapeutic or diagnostic use.

Genesis® is a registered trademark of Tecan AG group.

Corporate Headquarters:
Invitrogen Corporation
1600 Faraday Avenue
Carlsbad, California 92008
Tel: 1 760 603 7200
Tel (Toll Free): 1 800 955 6288
Fax: 1 760 602 6500
Email: tech_service@invitrogen.com

European Headquarters:
Invitrogen Ltd
Inchinnan Business Park
3 Fountain Drive
Paisley PA4 9RF, UK
Tel (Free Phone Orders): 0800 269 210
Tel (General Enquiries): +44 (0) 141 814 6100
Fax: +44 (0) 141 814 6260
Email: eurotech@invitrogen.com

International Offices:
Argentina 5411 4556 0844
Australia 1 800 331 627
Brazil 55 11 5051 7422
Canada 800 263 6236
China 10 6849 2578
Hong Kong 2407 8450
Japan 03 3663 7974
New Zealand 0800 600 200
Singapore 65 686 186 38
Taiwan 2 2651 6156

For other countries see our website

www.invitrogen.com