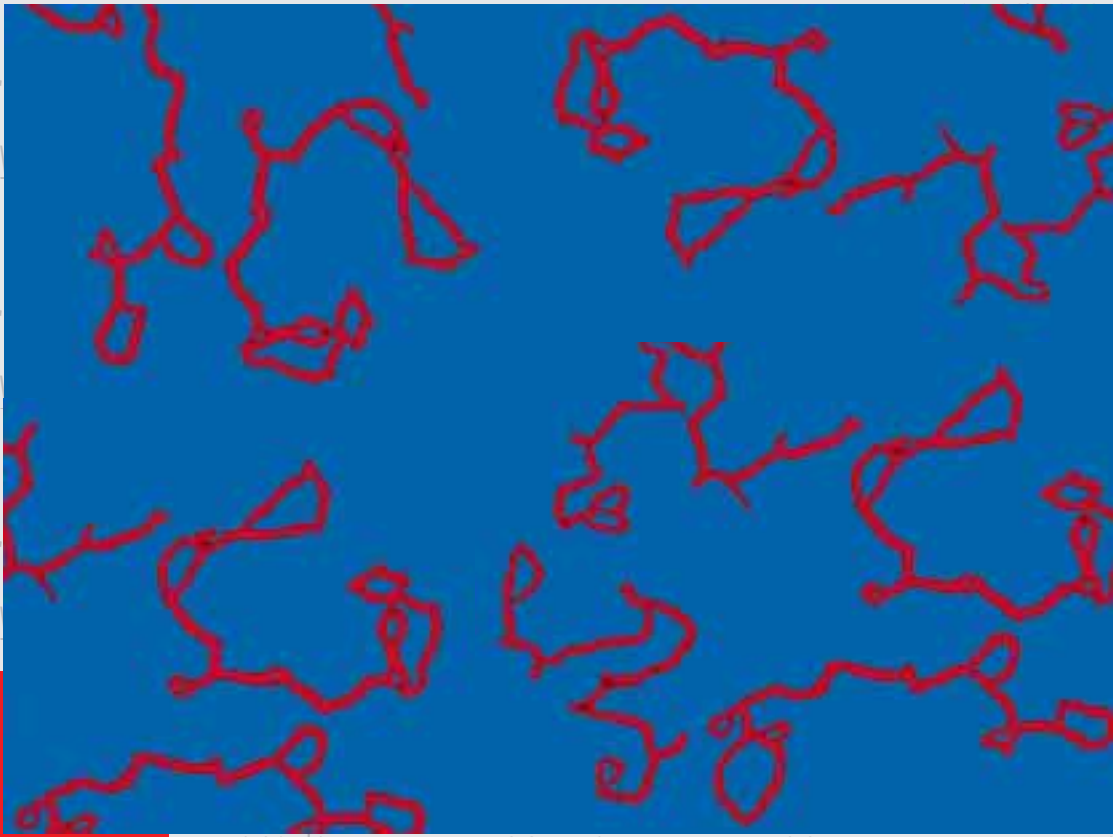




The Art of Plasmid Purification



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The QIAGEN Plasmid Purification System ...

QIAGEN® plasmid purification kits have set the standard in plasmid purification for more than a decade. Our strong research and development team continually strives to streamline and improve nucleic acid purification with new and innovative technologies. QIAGEN now offers a complete system of plasmid purification kits designed to fulfill all research needs.

QIAGEN Plasmid Kits — the standard in ultrapure plasmid preparation

Ultrapure QIAGEN plasmid DNA is ideal for all applications from cloning to transfection. QIAGEN Plasmid Kits contain ready-to-use gravity-flow QIAGEN-tips for purification of 20 µg to 10 mg of plasmid DNA. QIAGEN Plasmid Kits mean:

- ◆ purity equivalent to 2x CsCl gradient centrifugation
- ◆ reproducibility and speed
- ◆ no EtBr, phenol, chloroform, or CsCl

QIAfilter Plasmid Kits — the faster alternative

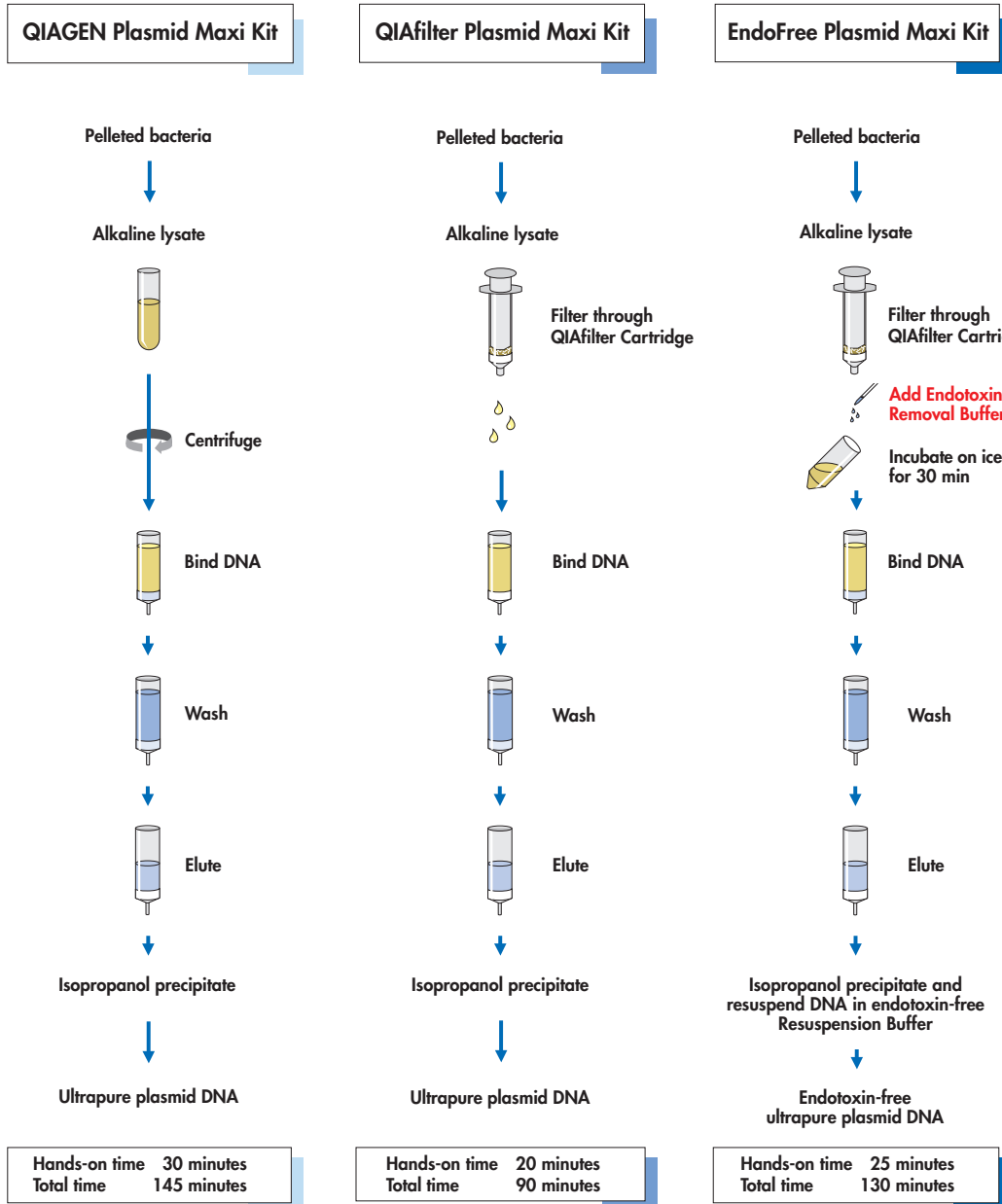
QIAfilter™ Plasmid Kits combine QIAGEN-tips with QIAfilter Cartridges for rapid clearing of bacterial lysates by filtration instead of centrifugation, saving up to 1 hour of purification time. In addition to the advantages offered by QIAGEN-tips, QIAfilter Cartridges:

- ◆ clear neutralized bacterial lysates in seconds
- ◆ remove SDS precipitates completely
- ◆ reduce plasmid prep time

EndoFree Plasmid Kits — for endotoxin-free plasmid DNA

EndoFree™ Plasmid Kits integrate endotoxin removal into the standard QIAGEN procedure to provide endotoxin-free, ultrapure plasmid DNA. Eliminating endotoxins in plasmid preparations improves transfection into sensitive or immunologically active cells and is essential for gene therapy research. EndoFree Plasmid Kits:

- ◆ reduce endotoxins to less than 0.1 endotoxin units per µg of plasmid DNA
- ◆ recover more than 90% of plasmid DNA
- ◆ provide easy and convenient handling



The QIAGEN Advantage

Unique Anion-Exchange Resin

The QIAGEN plasmid purification system uses a unique anion-exchange resin developed exclusively for the purification of nucleic acids. Plasmid purification on QIAGEN Resin is based on the interaction between negatively charged phosphates of the DNA backbone and positively charged DEAE groups on the surface of the resin (Figure 1). The salt concentration and pH conditions of the buffers used determine whether DNA is bound or eluted from the column.

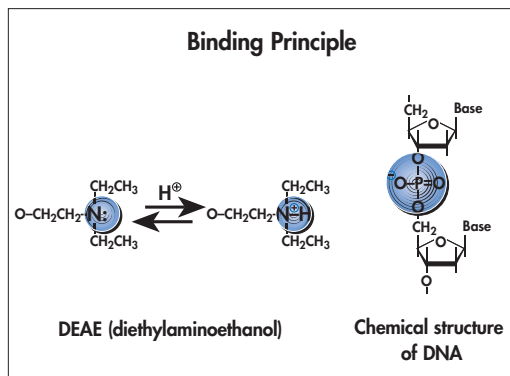


Figure 1. Chemical structure of positively charged DEAE groups of QIAGEN Resin, and negatively charged phosphate groups of the DNA backbone which interact with the resin.

Broad Separation Range

The key advantage of QIAGEN Anion-Exchange Resin arises from its exceptionally high charge density. The resin consists of defined silica beads with a particle size of 100 μm , a large pore size, and a hydrophilic surface coating. The large surface area allows dense coupling of the DEAE groups.

Plasmid DNA remains tightly bound to the DEAE groups over a wide range of salt concentrations (Figure 2). Impurities such as RNA, protein, carbohydrates, and small metabolites are washed from QIAGEN Resin with medium-salt buffers, while plasmid DNA remains bound until eluted with a high-salt buffer. No expensive equipment such as ultracentrifuges and HPLC, or toxic reagents such as phenol and ethidium bromide, are required.

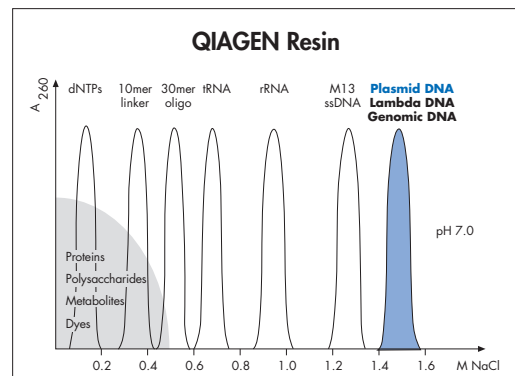


Figure 2. Separation of nucleic acids at neutral pH on QIAGEN Anion-Exchange Resin.

Easy-to-Use Gravity-Flow Columns

QIAGEN Resin is provided in ready-to-use QIAGEN-tips. A variety of tip sizes is available, with capacities for plasmid DNA from 20 μg to 10 mg. All QIAGEN-tips operate by gravity flow, for maximum handling convenience. The columns never run dry, can be left unattended, and are ideal for rapid and simple preparation of multiple samples.

QIAGEN Plasmid Kits

QIAGEN Plasmid Kits are designed for purification of high- and low-copy-number plasmid DNA and cosmid DNA. The purity obtained is greater than or equal to that achieved by 2x CsCl gradient centrifugation (1,2) (Figure 3), making the DNA perfect for use in demanding applications such as transfection, microinjection, fluorescent and radioactive sequencing, *in vitro* transcription, and enzymatic reactions (see page 9–11).

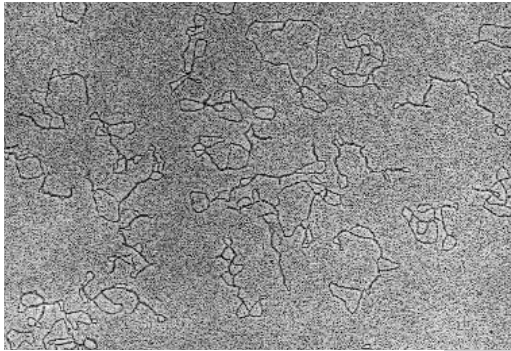


Figure 3. Electron microscopy of pCMVLuc DNA prepared with QIAGEN-tip 2500. Over 90% of the DNA is in the closed circular, supercoiled form. Data kindly provided by E. Spiess, German Cancer Research Center, Heidelberg, Germany.

The QIAGEN Plasmid Procedure

In the QIAGEN Plasmid Kit procedure (see flow chart on page 5), bacterial cells are lysed in NaOH/SDS and neutralized in acidic potassium acetate. After centrifugation, the cleared lysate is loaded onto the QIAGEN-tip where plasmid DNA binds to the QIAGEN Resin. The column is washed,

and ultrapure plasmid DNA is eluted in 1.25 M NaCl-containing buffer, and concentrated and desalted by isopropanol precipitation.

Versatile Kit Range

QIAGEN Plasmid Kits are available in a variety of sizes for preparation of different quantities of plasmid DNA. QIAGEN-tips for plasmid purification come in five sizes with increasing capacities for binding plasmid DNA (Figure 4) — QIAGEN-tip 20 for 20 µg (minipreps), QIAGEN-tip 100 for 100 µg (midipreps), QIAGEN-tip 500 for 500 µg (maxipreps), QIAGEN-tip 2500 for 2.5 mg (megapreps), and QIAGEN-tip 10000 for 10 mg (gigapreps).



Figure 4. QIAGEN-tip 20 to QIAGEN-tip 10000.

QIAfilter Plasmid Kits

QIAfilter Plasmid Midi and Maxi Kits combine QIAfilter Cartridges with QIAGEN-tips for the fastest and most convenient way to isolate ultrapure plasmid and cosmid DNA. QIAfilter Cartridges are special filter units designed to replace the high-speed centrifugation step after alkaline lysis of bacterial cells. They add speed and convenience to the familiar quality, handling, and time-saving aspects of the classic QIAGEN Plasmid Kits.

The QIAfilter Plasmid Procedure

Bacterial cells are pelleted, then lysed in NaOH/SDS, neutralized by addition of acidic potassium acetate, and incubated directly in the QIAfilter Cartridge (see flow chart on page 5). The lysate is cleared in a matter of seconds by pushing the liquid through the filter (Figure 5). Insoluble complexes of chromosomal DNA, salt, detergent, and proteins, which form during the neutralization step, are completely removed at this stage (Figure 6). The cleared filtrate containing plasmid DNA is loaded directly onto a QIAGEN-tip for purification.



Figure 5. The QIAfilter Cartridge in use.



Figure 6. Bacterial lysate before and after clearing using a QIAfilter Cartridge.

Increase Speed without Compromising DNA Quality

The QIAfilter procedure eliminates centrifugation of the cleared lysate — one of the most time-consuming plasmid purification steps — and reduces plasmid preparation time by as much as 1 hour. Moreover, the QIAfilter Cartridge clears bacterial lysates more efficiently than conventional centrifugation. Small SDS precipitates which cannot be separated by conventional centrifugation are completely removed by the QIAfilter process.

Ultrapure DNA prepared with QIAfilter Plasmid Kits is perfect for use in demanding applications such as transfection, microinjection, fluorescent and radioactive sequencing, *in vitro* transcription, and cloning.

Experimental Data for QIAGEN and QIAfilter Plasmid Kits

Ultrapure DNA prepared with QIAGEN Plasmid Kits and QIAfilter Plasmid Kits is ideal for optimal results in any application.

Transfection

Transfection of DNA into eukaryotic cells is a very sensitive application. It is influenced by a variety of parameters including quality of the cell culture,

choice of transfection method, and quality of the plasmid DNA used. The level of DNA purity achieved with QIAGEN-tips is equal to or greater than that obtained after 2x CsCl centrifugation, and no potential contaminants such as ethidium bromide and phenol are used in the QIAGEN procedure. Transfection efficiencies with DNA purified using the two methods are comparably high (Figure 7).

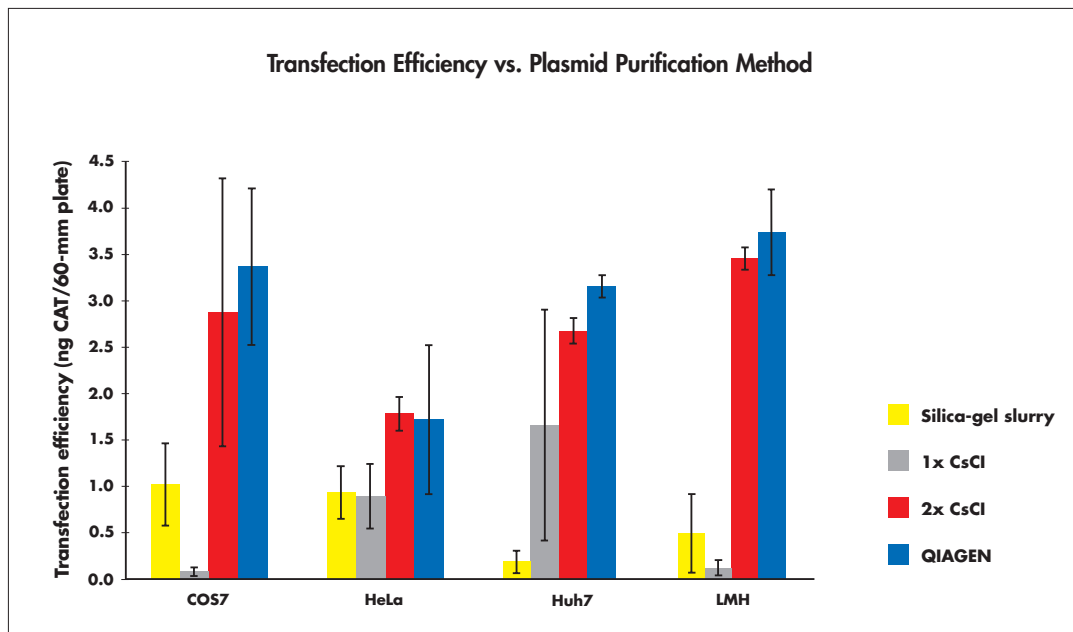


Figure 7. Different pRSVcat DNA preparations using QIAGEN-tip 500 were introduced into the indicated cell lines by liposome-mediated transfection, and the efficiencies determined by measuring CAT protein expressed after 40 h. Each bar represents the mean of 4 independent transfections (2 transfections with each of 2 independent plasmid preparations).

Sequencing

DNA prepared with QIAGEN-tips provides excellent results in radioactive and fluorescent sequencing. The procedure does not use toxic chemicals such as phenol and chloroform which can interfere with sequencing analysis. Other contaminants such as ethanol, salt, and chelating agents are completely removed during purification on QIAGEN-tips.

The resulting sequence data is characterized by its high reproducibility, read-length, and accuracy (Figure 8). Read lengths of 600–700 bp are routinely achieved in fluorescent sequencing.

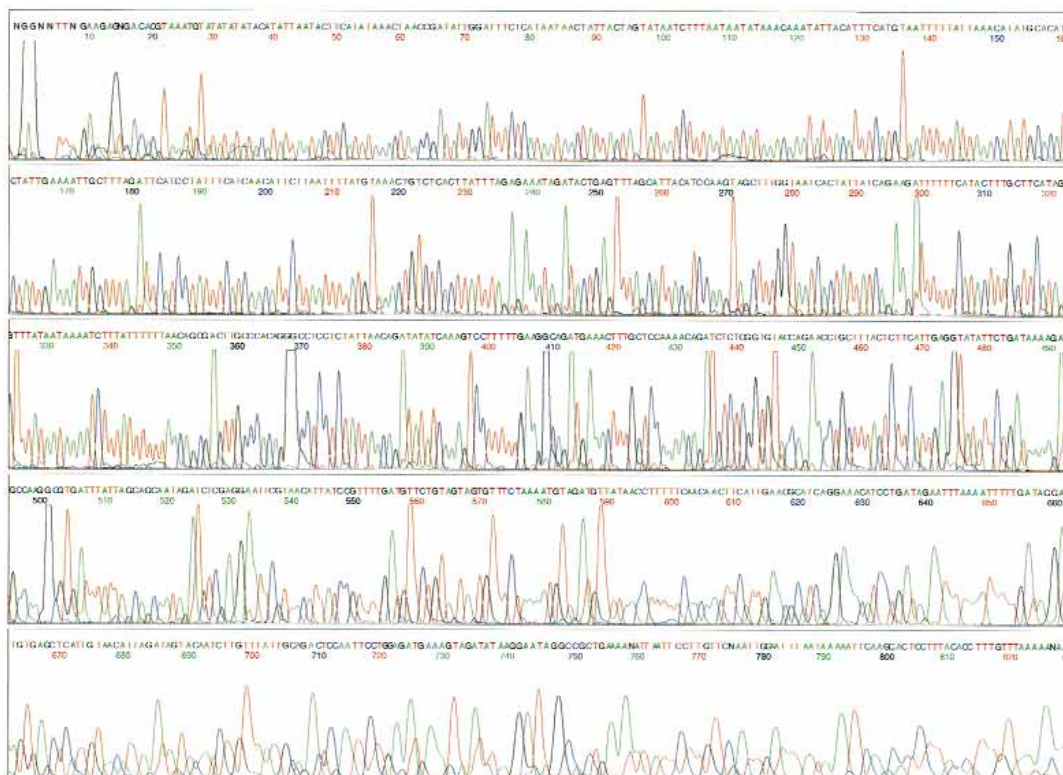


Figure 8. Sequence of cosmid DNA [pWE15 containing 38-kb insert from *S. cerevisiae* chromosome IV] prepared with the QIAfilter Plasmid Midi Kit. Data were generated with 1 µg template using DyeDeoxy™ Terminator cycle sequencing with AmpliTaq® DNA Polymerase, FS on an ABI PRISM™ 377 DNA Sequencer.

***In vitro* Transcription**

Although high levels of RNase A are used in the first step of the QIAGEN plasmid purification procedures, the eluted plasmid DNA is completely free of RNase and can be used directly for *in vitro* transcription (Figure 9).

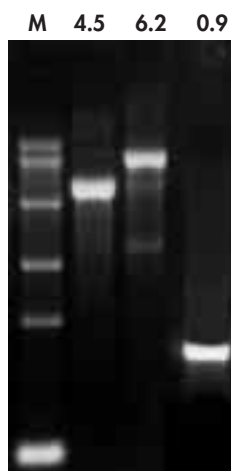


Figure 9. Three pTZ18R constructs containing different mouse homeobox sequences (0.9, 4.5, and 6.2 kb, as indicated) were isolated with QIAGEN-tip 100. Plasmid DNAs were linearized, and 500 ng of each were transcribed *in vitro* using 50 units of T7 polymerase (BRL). M: RNA markers (BRL).

Restriction Analysis

The high purity of QIAGEN plasmid DNA means that enzymatic digestions proceed with higher efficiency, and require less enzyme. Even salt-sensitive and other critical enzymes cut with high efficiency (Figure 10).

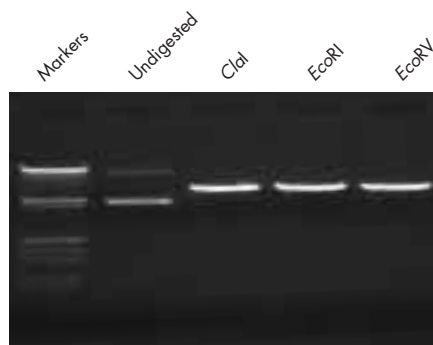


Figure 10. pCMV β plasmid DNA was purified from DH5 α using the QIAfilter Plasmid Maxi Kit, and digested with different enzymes as indicated: Clal (salt-sensitive enzyme), EcoRI, and EcoRV. Digests were performed at 37°C for 1 hour with 2 μ g plasmid DNA and 5 units of enzyme, and 150 ng of each were run on a 0.8% agarose gel. Markers: lambda-HindIII.

EndoFree Plasmid Maxi Kit

The efficiency of transfection into sensitive cell lines is reduced by endotoxin contamination of plasmid DNA. Endotoxins can also nonspecifically stimulate immunologically active cells. We recommend purifying plasmid DNA for these critical applications with the EndoFree Plasmid Maxi Kit. This kit integrates endotoxin removal into the standard QIAGEN plasmid purification procedure, to yield ultrapure endotoxin-free DNA.

The EndoFree Plasmid Procedure

After alkaline lysis of bacterial cells, the neutralized lysate is filtered over a QIAfilter Maxi Cartridge and incubated on ice with Endotoxin Removal Buffer (see flow chart on page 5). The addition of this special buffer prevents endotoxin molecules from binding to QIAGEN Resin or complexing with plasmid DNA. This reduces endotoxin levels to less than 0.1 endotoxin units per μg plasmid DNA.

It is important to avoid recontaminating purified endotoxin-free DNA with impure water or reagents. Buffers supplied with the EndoFree Plasmid Maxi Kit are tested and certified endotoxin-free. Endotoxin-free water for preparation of 70% EtOH and endotoxin-free TE buffer for plasmid DNA storage are also provided.

What Are Endotoxins?

Endotoxins, also known as lipopolysaccharides or LPS, are cell-membrane components of Gram-negative bacteria, e.g., *E. coli*. The lipid portion of the outer layer of the outer membrane is completely composed of LPS molecules (Figure 11) — approximately 2 million per cell (3,4). The LPS molecules

are released from the outer membrane during alkaline lysis of bacterial cells for plasmid preparation, and spread through the lysate.

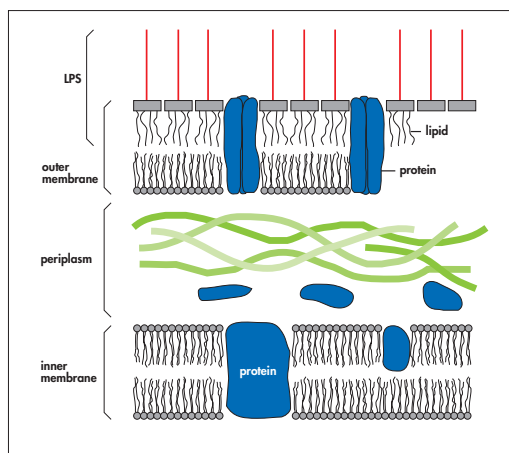


Figure 11. Schematic diagram of the envelope of *E. coli*.

Each LPS molecule consists of a hydrophobic lipid A moiety, a complex array of sugar residues, and negatively charged phosphate groups (Figure 12). This combination of hydrophobic, hydrophilic, and charged regions in LPS molecules and their tendency to form micellar structures makes it very difficult to separate LPS from plasmid DNA. The QIAGEN EndoFree procedure efficiently removes these LPS molecules from the DNA during plasmid preparation — no additional extractions or affinity columns are required.

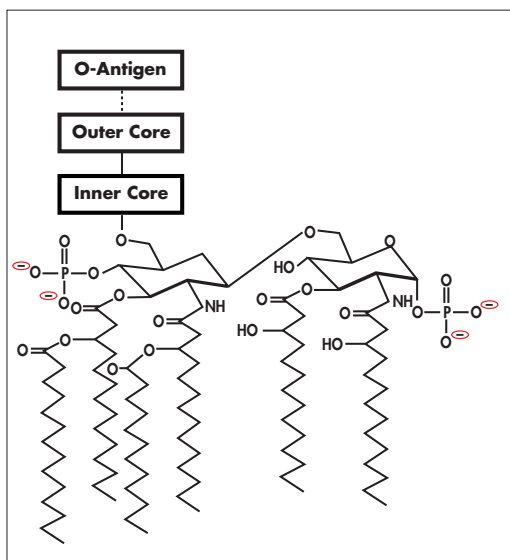


Figure 12. Schematic diagram of the LPS molecule.

Endotoxin Levels from Various Plasmid Preparation Methods

Endotoxins are measured using sensitive photometric tests which are available commercially (e.g., Kinetic-QCL Test from BioWhittaker, Inc.). These tests are based on a Limulus Amoebocyte Lysate (LAL) and a synthetic chromogenic substrate. Lipopolysaccharide contamination is usually expressed in endotoxin units (EU), and typically 1 ng LPS corresponds to 1–10 EU.

The level of endotoxin contamination in plasmid DNA preparations is dependent on the purification method used (5, 6) (Table 1). QIAGEN Plasmid Kits and 2x CsCl gradient centrifugation both yield ultra-pure DNA with relatively low levels of endotoxin. Silica-slurry purified DNA contains significantly higher levels of endotoxin contamination. DNA purified with the EndoFree Plasmid Maxi Kit contains only negligible amounts of LPS (<0.1 EU/ μ g plasmid DNA).

Table 1. Endotoxin contamination and transfection efficiency using various plasmid preparation methods*

Plasmid preparation method	Endotoxin (EU [†] / μ g DNA)	Average transfection efficiency (Figure 13)
EndoFree Plasmid Maxi Kit	0.1	154%
QIAGEN Plasmid Kits	9.3	100%
2x CsCl	2.6	99%
Silica slurry	1230.0	24%

* Host strain used: DH5 α [™], plasmid used: pRSVcat.

[†] 1 ng LPS=1.8 EU.

Influence of Endotoxins on Transfection and Gene Therapy Research

All gene therapy research applications require that plasmid DNA is free of endotoxins. Endotoxins cause fever, endotoxic shock syndrome, and activation of the complement cascade in animals and humans (7). Furthermore, endotoxins strongly influence transfection of DNA into sensitive cultured cells (6). Increased endotoxin levels lead to sharply reduced transfection efficiencies with both liposome-mediated and calcium phosphate transfection methods (6) (Figures 13 & 14).

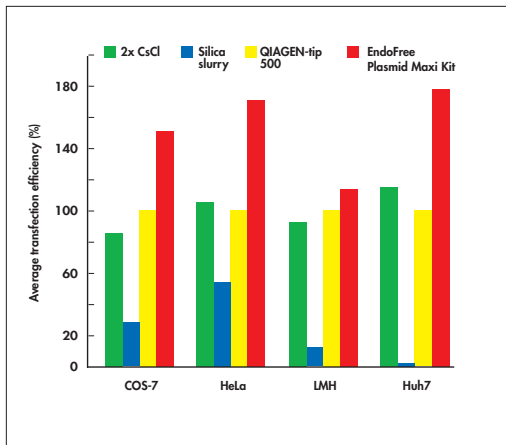


Figure 13. Two independent pRSVcat preparations obtained with each method shown were each transfected twice into COS-7, HeLa, and LMH cells using a liposome-mediated method and into Huh7 cells using calcium phosphate. Average transfection efficiencies are expressed as percentages relative to the efficiency obtained with DNA prepared using QIAGEN-tips (100%).

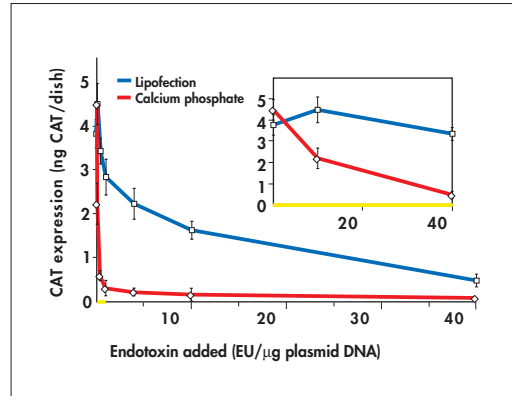


Figure 14. Increasing amounts of endotoxin from *E. coli* 055:B5 were added to pRSVcat DNA which contained <0.05 EU per μg DNA. Dishes of approximately 3×10^6 Huh7 cells were transfected by either the liposome-mediated or calcium phosphate method and the efficiency of transfection determined by analysis of CAT expression. Each point represents the mean of 4 experiments.

Endotoxins and Immunologically Active Cells

Endotoxins also interfere with *in vitro* transfection into immune cells such as macrophages and B cells by causing non-specific activation of immune responses (Figures 15 & 16). These responses include the induced synthesis of immune mediators such as IL-1 and prostaglandin (8, 9). The stimulatory effects of endotoxins on immune cells may obscure factors under investigation.

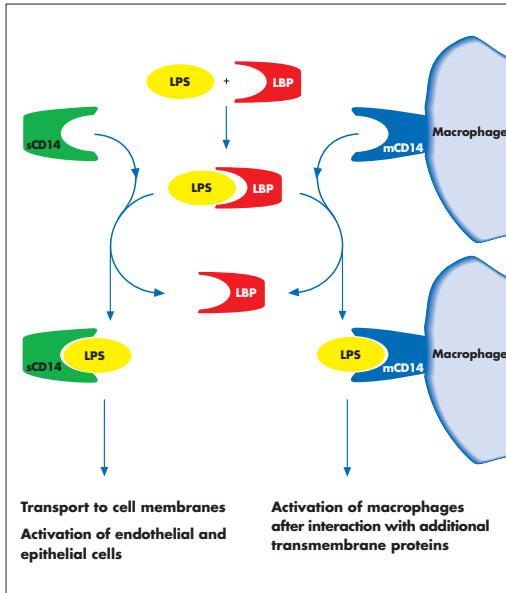


Figure 15. LPS interaction with CD14 receptors.

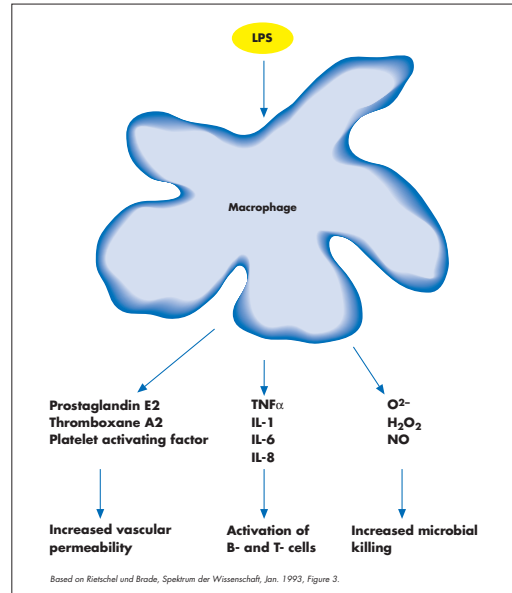


Figure 16. LPS activation of macrophages.

cGMP Contract Production of Plasmid DNA

QIAGEN offers scale-up purification of ultrapure endotoxin-free plasmid DNA. For in-house purification of up to 100 mg of plasmid DNA the Ultrapure 100 column is available. QIAGEN also provides cGMP contract production for plasmid DNA preparations of up to several grams. The cGMP process uses the same basic principles of DNA purification as the EndoFree Plasmid Maxi Kit — just on a larger scale. The cGMP process and the EndoFree Plasmid Maxi Kit offer the highest DNA quality, ideal for gene therapy research applications or genetic vaccination. Scale-up is achieved without changes in the purification principles, leading to consistency in

experimental results. This is particularly advantageous when semi-preparative amounts of plasmid DNA are required for animal studies, and large amounts of cGMP-quality DNA are subsequently necessary for clinical trials in humans. A drug master file for the cGMP production process is available (MF 6224).

For more information about the Ultrapure 100 column and cGMP production, call QIAGEN Technical Services at 49-2103-892-240 in Germany or 800-362-7737 in the USA, and ask for the Contract DNA Production Manager.

Special Applications

The QIAGEN plasmid purification system is suitable for the purification of large DNA constructs such as P1 and BAC DNA, and can be used to isolate plasmid DNA from a wide range of different bacteria. Many of our customers have successfully adapted QIAGEN procedures for their specialized needs, and detailed protocols are available on request.

Purification of P1 and BAC DNA from *E. coli*

Large DNA constructs such as P1s and BACs can be purified with just a few modifications to the standard QIAGEN plasmid protocol. Large culture volumes are often required to obtain good yields of DNA, and volumes of alkaline lysis buffers should be increased to ensure complete lysis. In addition, pre-warming the elution buffer may help to increase yields of large DNA constructs.

Purification of Plasmids from Other Bacteria

Although QIAGEN plasmid purification kits are optimized for preparation of plasmids from *E. coli*, they can be successfully used to isolate plasmids from many other bacteria. Modifications to the bacterial lysis procedure are necessary in most cases in order to optimize conditions for the particular species. Subsequent plasmid purification on QIAGEN-tips requires no major changes to the standard protocol.

Detailed protocols are available for plasmid isolation from the following bacteria:

- ◆ *Bacillus subtilis*
- ◆ *Borrelia**
- ◆ *Citrobacter freundii*
- ◆ *Corynebacterium glutamicum*
- ◆ *Lactobacillus**
- ◆ *Oligotropha carboxydovorans*
- ◆ *Proteus**
- ◆ *Staphylococcus**

* several species included

Contact Us for Detailed Protocols!

Detailed protocols for all of these special applications are available on request — just call the appropriate Technical Service Department:

In Germany: 02103-892-240
 In the UK: 01293-422-999
 In France: 01-60-920-930

In the USA: 800-DNA-PREP (800-362-7737)
 In Switzerland: 061-319 30 30
 In Australia: 03-9489-3666

or contact your local distributor.

If you have used QIAGEN Plasmid Kits for an unusual application, we would be delighted to share your results with other researchers.

Guide to the Perfect Plasmid Prep

To help you gain maximal benefit from QIAGEN Plasmid Kits, QIAfilter Plasmid Kits, and EndoFree Plasmid Kits, we have developed the following guide to ensure optimal plasmid propagation and a perfect DNA prep. Parameters to be taken into consideration include plasmid copy number, host strain, culture volume, culture density, antibiotics, and culture media.



Do you have your plasmid's number?

Typically, a high-copy-number plasmid (e.g., pBluescript[®], the pUC series and its derivatives, pGEM[®], and pTZ) yields 300–500 µg DNA from 100 ml LB culture and a low-copy-number plasmid (e.g., pBR322 and its derivatives) yields 20–100 µg DNA from 100 ml LB culture. The binding capacity of the QIAGEN-tip and the copy number of the plasmid determine the volume of culture used for purification. Manipulating the properties of the plasmid (e.g., plasmid size, insert size, origin of replication, stringency of growth control) can influence DNA yield and quality.

Please note that the number of the QIAGEN-tips, e.g., QIAGEN-tip 100, QIAGEN-tip 500 etc., indicates the binding capacity for plasmid DNA in µg and NOT the culture volume that can be used.



Is your bacteria the perfect host?

The *E. coli* host strain used to propagate a plasmid has a large effect on the quantity and quality of the plasmid DNA. Highly reproducible and reliable results have been observed with DH1, DH5α, XL1-Blue and C600. High levels of endonuclease activity and large amounts of carbohydrate are released from HB101, TG1, and the JM100 series during lysis, which can result in lower-quality DNA.



Do you know how to make your first billion?

A bacterial culture should always be grown from a single colony picked from a selective plate. Never subculture directly from glycerol stocks or liquid cultures, since plasmids may mutate or be lost. Inoculate a single colony into 2–5 ml of media (preferably LB) containing the appropriate antibiotic, and grow for 8 hours (late logarithmic phase). Dilute the miniculture 1:100 into a larger volume of selective media, and grow to early stationary phase (12–16 hours), to give a cell density of $1-4 \times 10^9$ per ml.



Does your bacteria come from a select background?

Antibiotic selection should be applied at all stages of growth. This ensures that cells which do not receive plasmids fail to grow under the selective pressure of the antibiotic. Some antibiotics, e.g., ampicillin, are metabolized by plasmid-encoded enzymes and thus are continuously depleted during growth of the culture. Temperature sensitivity of antibiotics should also be taken into account.



Is the media giving your bacteria a hard time?

We generally recommend LB-Miller media* for use with QIAGEN-tips. While rich broths such as TB or 2x YT produce more bacteria

*Composition of LB-Miller media: 10 g tryptone, 5 g yeast extract, and 10 g NaCl per liter.

(2–5 times) in a shorter time than LB, this does not necessarily lead to more or higher-quality DNA. In TB, selective pressure is lost earlier (Figure 17, dotted lines), and the stationary phase of growth is reached after approximately 8 hours (4 hours sooner than with LB) (Figure 17, solid lines). The stationary phase also ends earlier. Consequently, a 16-hour (overnight) culture in TB will not only have a higher cell density but will also contain a higher proportion of lysed cells and cells which no longer contain plasmid DNA. If TB must be used, special attention should be given to the culture time and the cell density in order to avoid genomic DNA contamination, degraded plasmid DNA, and overloading of the QIAGEN-tip.

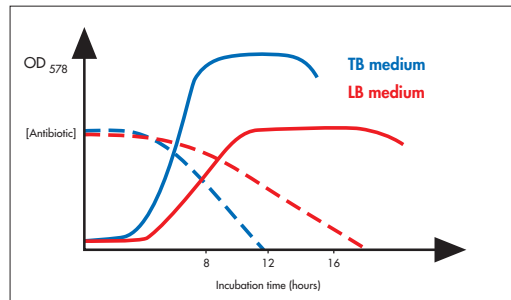


Figure 17. Culture-medium dependent growth of *E. coli* cultures.

! Your ultrapure DNA is guaranteed!

The time you have spent going through this guide will ensure the best results possible with your plasmid/host system, and guarantee you ultrapure DNA.

Products for Plasmid Minipreps

QIAGEN offers a variety of additional products for small-scale plasmid purification that use either QIAGEN Anion-Exchange Resin or silica-gel membranes.

The QIAwell Plasmid Purification System

The QIAwell® Plasmid Purification System uses QIAGEN Anion-Exchange Resin in a membrane format for rapid processing by vacuum filtration. The system is available in 8- and 96-well format for medium- to high-throughput DNA minipreparation. Additional modules are available for in-line lysate clearing, and desalting and concentration of the purified DNA directly on the QIAvac 6S or QIAvac 96 vacuum manifold. The QIAwell System provides the same ultrapure DNA quality as QIAGEN Plasmid Mini Kits, with greater convenience for larger sample numbers. The anion-exchange-purified DNA is ideal for use in demanding applications such as long-read fluorescent sequencing and transfection.

QIAprep Miniprep Kits

QIAprep® Miniprep Kits use a unique silica-gel-based membrane for rapid and economic purification of plasmid DNA without organic extraction. Silica-gel membrane technology yields plasmid DNA of a purity suitable for most molecular biology applications, such as sequencing and clone screening. Since the DNA is bound in high-salt buffer and eluted in low-salt buffer, the eluted DNA is ready for use — no alcohol precipitation is required. QIAprep Miniprep Kits are available in either spin-column format for use in a microfuge or on a vacuum manifold, or 8-well strip format for use on QIAvac 6S.



QIAprep 96-well plate, QIAprep 8-well strip and QIAprep spin columns.

QIAprep Turbo Miniprep Kits

QIAprep Turbo Miniprep Kits accelerate sample processing by combining QIAprep technology with in-line lysate clearing in either 8- or 96-well format on a vacuum manifold. The QIAprep Turbo system provides the same high-quality DNA as standard QIAprep Miniprep Kits.

The QIAGEN BioRobot 9600

The QIAGEN BioRobot™ 9600 offers greatly increased productivity through automated plasmid minipreparation using the QIAwell or QIAprep Turbo systems.

For more information on these and other QIAGEN products and technologies, please contact QIAGEN or your local distributor.

Ordering Information

Product	Contents	Cat. No.
QIAGEN Plasmid Kits		
QIAGEN Plasmid Starter Kit I	10 QIAGEN-tip 20, 3 QIAGEN-tip 100, 1 QIAGEN-tip 500, Reagents, Buffers	12129
QIAGEN Plasmid Combi Kit	4 QIAGEN-tip 100, 4 QIAGEN-tip 500, Reagents, Buffers	12169
QIAGEN Plasmid Mini Kit (25)	25 QIAGEN-tip 20, Reagents, Buffers	12123
QIAGEN Plasmid Mini Kit (100)	100 QIAGEN-tip 20, Reagents, Buffers	12125
QIAGEN Plasmid Midi Kit (25)	25 QIAGEN-tip 100, Reagents, Buffers	12143
QIAGEN Plasmid Midi Kit (50)	50 QIAGEN-tip 100, Reagents, Buffers	12144
QIAGEN Plasmid Midi Kit (100)	100 QIAGEN-tip 100, Reagents, Buffers	12145
QIAGEN Plasmid Maxi Kit (10)	10 QIAGEN-tip 500, Reagents, Buffers	12162
QIAGEN Plasmid Maxi Kit (25)	25 QIAGEN-tip 500, Reagents, Buffers	12163
QIAGEN Plasmid Mega Kit (5)	5 QIAGEN-tip 2500, Reagents, Buffers	12181
QIAGEN Plasmid Mega Kit (25)	25 QIAGEN-tip 2500, Reagents, Buffers	12183
QIAGEN Plasmid Giga Kit (5)	5 QIAGEN-tip 10000, Reagents, Buffers	12191
QIAfilter Plasmid Kits		
QIAfilter Plasmid Midi Kit (25)	25 QIAGEN-tip 100, Reagents, Buffers, 25 QIAfilter Midi Cartridges	12243
QIAfilter Plasmid Midi Kit (100)	100 QIAGEN-tip 100, Reagents, Buffers, 100 QIAfilter Midi Cartridges	12245
QIAfilter Plasmid Maxi Kit (10)	10 QIAGEN-tip 500, Reagents, Buffers, 10 QIAfilter Maxi Cartridges	12262
QIAfilter Plasmid Maxi Kit (25)	25 QIAGEN-tip 500, Reagents, Buffers, 25 QIAfilter Maxi Cartridges	12263
EndoFree Plasmid Products		
EndoFree Plasmid Maxi Kit (10)	10 QIAGEN-tip 500, Reagents, Endotoxin-free Buffers, 10 QIAfilter Maxi Cartridges	12362

Product	Contents	Cat. No.
Related Miniprep Products		
QIAwell Plasmid Kits		
QIAwell 8 Plasmid Kit (10) [†]	For 10 x 8 plasmid minipreps: 10 QIAwell 8 Strips, Reagents, Buffers, Collection Microtubes and Caps	17122
QIAwell 8 Plus Plasmid Kit (10) [†]	For 10 x 8 plasmid minipreps, 10 each: QIAwell 8, and QIAprep 8 Strips; Reagents, Buffers, Collection Microtubes and Caps	16142
QIAwell 8 Ultra Plasmid Kit (10) [†]	For 10 x 8 plasmid minipreps, 10 each: QIAfilter 8, QIAwell 8, and QIAprep 8 Strips; Reagents, Buffers, Collection Microtubes and Caps	16152
QIAwell 96 Ultra Plasmid Kit (1) [†]	For 1 x 96 plasmid minipreps, 1 each: QIAfilter 96, QIAwell 96, and QIAprep 96 Plates; Reagents, Buffers, Collection Microtubes and Caps	16190
QIAprep Plasmid Kits		
QIAprep Spin Miniprep Kit (50)	For 50 plasmid minipreps: 50 QIAprep Spin Columns, Reagents, Buffers, Collection Tubes	27104
QIAprep 8 Miniprep Kit (10) [†]	For 10 x 8 plasmid minipreps: 10 QIAprep 8 Strips, Reagents, Buffers, Collection Microtubes and Caps	27142
QIAprep 8 Turbo Miniprep Kit (10) [†]	For 10 x 8 plasmid minipreps: 10 TurboFilter 8 Strips, 10 QIAprep 8 Strips, Reagents, Buffers, Collection Microtubes and Caps	27152
QIAprep 96 Turbo Miniprep Kit (1) [†]	For 1 x 96 plasmid minipreps: 1 TurboFilter 96 Plate, 1 QIAprep 96 Plate, 1 Flat-Bottom Block, Reagents, Buffers, Collection Microtubes and Caps	27190

**Prices are subject to change without notice.*

[†] Requires use of QIAvac 6S vacuum manifold. [‡] Requires use of QIAvac 96 vacuum manifold. Please call for ordering information.

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