

## DNA purification and analysis

Maximize sample yield, purity, and integrity



# Optimized for maximum yield and purity

From plasmid to genomic DNA and from DNA clean-up to automation, Invitrogen<sup>™</sup> products bring flexible, innovative solutions to meet virtually every researcher's needs.

Explore the Invitrogen™ portfolio of leading solutions, kits, and benchtop devices for reliable results.



Tools for success in your molecular biology research

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# Purification technology overview

# A variety of purification technologies and chemistries to meet your purity needs

We bring a large portfolio of purification kits to suit all your nucleic acid purification needs. From plasmid DNA to genomic DNA, you'll find what you're looking for. Invitrogen<sup>™</sup> nucleic acid purification products are optimized to provide maximum yield, purity, and integrity from virtually any sample type and application. We offer a wide range of

specialized nucleic acid purification products based on three highly developed purification technologies: silica membrane, anion-exchange resin, and switchable surface charge. Let us help you determine which plasmid or genomic DNA (gDNA) purification kit is appropriate for your needs.

#### Genomic DNA product selection guide

| Overview                                    | Low throughput<br>or manual | Medium throughput and spin-column technology | High throughput and 96-well filter plate   | High throughput and<br>magnetic-bead technology |  |
|---|-----------------------------|--|--|---|--|
| Туре  | Organic                     | Spin column                                  | Spin column                                | Magnetic beads                                  |  |
| Product name                                | DNAzol <sup>™</sup> Reagent | PureLink <sup>™</sup> kits                   | PureLink <sup>™</sup> <i>Pro</i> gDNA kits | MagMAX <sup>™</sup> DNA kits                    |  |
| Tissue                                      |                             |  |  | MagMAX DNA Multi Comple                         |  |
| Cells                                       | DNAZOI Reagent              | PureLink gDNA Mini                           |  | Magmax DNA Mulli-Sample                         |  |
| Blood                                       | DNAzol BD Reagent           |  | Dural into Dra 00 aDNA                     | MagMAX DNA Multi-Sample Ultra                   |  |
| Plant                                       | Plant DNAzol Reagent        | PureLink gDNA Plant                          | - Purelink <i>Pro</i> 96 guina<br>-        | MagMAX Plant DNA Isolation                      |  |
| Buccal swabs                                | Not recommended             | Dural interaDNA Mini                         |  | MacMAX DNA Multi Comple Liltro                  |  |
| Bacteria                                    | DNAzol Reagent              | Purelink gona Mini                           |  | MagiMAX DNA Multi-Sample Oltra                  |  |
| Viral                                       | Not recommended             | PureLink Viral RNA/DNA Mini                  | PureLink Pro 96 Viral RNA/DNA              | MagMAX Viral Nucleic Acid                       |  |
| Scalable or automatable                     | No                          | No   | Yes  | Yes   |  |
| Compatible with<br>the KingFisher<br>system | No                          | No   | No   | Yes   |  |
| qPCR  | Yes                         | Yes  | Yes  | Yes   |  |
| NGS   | Yes                         | Yes  | Yes  | Yes   |  |

#### Plasmid DNA product selection guide

| Overview     | Low throughput or manual |  | Low-to-medium throughput<br>and high purity      | High through                                    | out and high purity             |
|--------------|--------------------------|--|--|---|---------------------------------|
| Product name | GeneJET <sup>™</sup> kit | PureLink <sup>™</sup> HiPure<br>and HiPure Filter kits | PureLink <sup>∞</sup> Expi<br>Endotoxin-Free Kit | PureLink <sup>™</sup> <i>Pro</i><br>Quick96 kit | PureLink <sup>∞</sup> 96 HQ kit |
| Purity grade | Molecular                | Transfection   | Advanced transfection                            | Molecular                                       | Transfection                    |

# Plasmid DNA purification kits

### Plasmid DNA that's pure and ready to go

If, during plasmid preparation, your DNA has low recovery, contains impurities, or just doesn't perform in your downstream experiments, you can choose from our wide range of high-performing plasmid purification products. We offer a portfolio of plasmid purification products that support your downstream applications from cloning to transfection of sensitive cell lines. Table 1 shows a variety of formats of the Invitrogen<sup>™</sup> PureLink<sup>™</sup> purification product lines, offering high yields with extremely low endotoxin levels for maximized downstream results. Kits that include these technologies are designed to isolate plasmid DNA at the purity and scale you need.

| Purity grade              | Molecular  | Transfection  | Advanced transfection  |
|---------------------------|--|---|--|
| Kits                      | GeneJET  | PureLink HiPure   | PureLink Expi Endotoxin-Free   |
| Endotoxin level           | Standard (1–10 EU/µg)  | Low endotoxin (0.1–1 EU/µg)   | Endotoxin-free (<0.1 EU/µg)  |
| Yield up to               | 20 µg–1 mg   | 20 µg–15 mg   | 1.5–15 mg  |
| Downstream<br>application | <ul> <li>Not sensitive</li> <li>PCR</li> <li>Cloning (digestion, ligation)</li> <li>Sequencing</li> <li>Nucleic acid labeling</li> </ul> | <ul> <li>Sensitive</li> <li>Standard transfections</li> <li>All molecular biology<br/>applications</li> <li>In vitro transcription</li> </ul> | <ul> <li>Very sensitive</li> <li>Primary and stem cell transfection</li> <li>Gene therapy and vaccine (<i>in vivo</i>) research</li> <li>Microinjection</li> <li>All molecular biology applications</li> </ul> |
| Technology                | Silica membrane  | Anion exchange (resin)  | Anion exchange (membrane)  |
| Total protocol time       | 15–60 min  | 30–120 min  | 90–120 min   |
| Prep size                 | Mini-maxi  | Mini-giga   | Maxi, mega, and giga   |

#### Which plasmid DNA isolation technology is right for you?





### Table 1. Plasmid DNA purification products, prep sizes, and approximate yields.

| Prep size | Overnight bacterial culture volume | Approximate yield |
|-----------|------------------------------------|-------------------|
| Miniprep  | 1–5 mL                             | Up to 40 µg       |
| Midiprep  | 10–50 mL                           | Up to 300 µg      |
| Maxiprep  | 100–200 mL                         | Up to 1 mg        |
| Megaprep  | 500 mL-2.5 L                       | Up to 5 mg        |
| Gigaprep  | 2.5–5 L                            | Up to 15 mg       |

For our complete portfolio of plasmid DNA purification products, go to thermofisher.com/plasmidprep

# Plasmid DNA purification kits

### Fast, easy to use, and cost-effective

The PureLink plasmid purification products have been developed to provide the greatest value for your money. With performance meeting or exceeding competitive offerings (Figure 1), and fair pricing, PureLink technology is the clear choice for plasmid purification in research laboratories.

### Invitrogen<sup>™</sup> PureLink<sup>™</sup> HiPure Expi low-endotoxin plasmid purification kits

Fast, easy-to-use protocols, and an anion-exchange resin allow you to purify plasmid DNA at a quality equivalent to that obtained from purifying plasmid DNA by passing it through a cesium chloride gradient twice—one of the most rigorous methods for plasmid purification. In less than 2 hours, plasmid is pure enough for transfections with no need for additional steps to remove contaminants like RNA, proteins, and endotoxins. Additionally, the use of phenol, chloroform, ethidium bromide, and cesium chloride are eliminated, minimizing exposure to and disposal of hazardous materials.



Figure 1. Invitrogen<sup>™</sup> PureLink<sup>™</sup> HiPure Expi kits, with advanced anion exchange technology, produce superior yields of transfection-quality DNA. Comparison of the total yields of Invitrogen<sup>™</sup> pcDNA<sup>™</sup> 3.3 plasmid purified using PureLink HiPure Expi technology versus megapreps from another supplier, with increasing bacterial culture volumes.

#### **High yield**

Isolate up to 5 mg (megaprep) and up to 15 mg (gigaprep) of high-quality plasmid DNA from a single purification using 0.5–5 L of bacterial culture.

#### Purity

Achieve inherently low endotoxin levels (typically 0.1–1.0 EU/µg), and  $A_{260}/A_{280}$  >1.8, making it ideal for mammalian cell transfection.

#### Simplicity and speed

With the vacuum-assisted protocol, plasmid isolation typically takes only 90 minutes to complete (Figure 2).



Figure 2. PureLink HiPure Expi kits offer superior yields of ultrapure, transfection-quality plasmid DNA with an accelerated protocol time. The combination of advanced anion exchange technology and vacuum assistance used with PureLink HiPure Expi kits dramatically reduces overall protocol time.

Comparisons on this page based on internal data.



# Plasmid DNA purification kits

### High throughput, reliable, and reproducible

Our mini-scale portfolio of high-throughput plasmid purification products for molecular- and transfectiongrade applications provides high-quality plasmid DNA. Technologies include silica membrane columns and 96-well plates, anion exchange columns, and magnetic beads. With the PureLink *Pro* Quick96 Plasmid Kit, the resulting plasmid DNA is >90% supercoiled, with no detectable genomic DNA or RNA (Figure 3).

#### Which high-throughput PureLink plasmid purification kit is right for you?

|                                   | MagJET <sup>™</sup> Plasmid<br>DNA Kit | PureLink <sup>™</sup> HiPure<br>Plasmid Miniprep Kit | PureLink <i>Pro</i> Quick96<br>Plasmid Kit | PureLink <sup>™</sup> 96 HQ<br>Mini Plasmid DNA<br>Purification Kit |
|-----------------------------------|--|--|--|---|
| Protocol time                     | Variable                               | <90 minutes  | 45 minutes                                 | Variable  |
| Purity grade                      | Molecular                              | Transfection   | Molecular                                  | Transfection  |
| Yield of plasmid DNA              | Up to 25 µg                            | Up to 40 µg  | Up to 15 µg                                | Up to 60 µg   |
| High<br>throughput–<br>compatible | Yes                                    | No   | Yes  | Yes   |
| Technology                        | Magnetic beads                         | Anion-exchange resin                                 | Silica-based spin/<br>vacuum plates        | Silica-based spin/<br>vacuum plates                                 |
| Product size                      | 96 preps, 4 x 96 preps                 | 25 preps, 100 preps                                  | 4 x 96 preps                               | 4 x 96 preps  |



**Figure 3. High purity of plasmid DNA isolated using the PureLink** *Pro* **Quick96 Plasmid Kit.** Invitrogen<sup>™</sup> pcDNA<sup>™</sup> 3.1/His/*lacZ* plasmid DNA (5 μg), purified using a liquid-handling robot and the PureLink *Pro* Quick96 Plasmid Kit, shows high yields of supercoiled plasmid DNA with no detectable genomic DNA or RNA contamination.



# Genomic DNA purification kits

### Maximize process efficiency and downstream performance

We offer a range of Invitrogen<sup>™</sup> genomic DNA purification kits for sensitive, scalable purification from an expansive set of starting materials to maximize process efficiency and downstream performance. This includes a broad range of kits for purifying genomic DNA from a wide variety of samples, including tissues, cells, blood, serum, plants, and forensic samples.

Purel ink Pro 96 Genomic DNA Purification Kit MagMAX FFPE DNA/RNA Ultra Kit Plate Magnetic beads High throughput-compatible High throughput-compatible Low throughput RecoverAll Total Nucleic Acid Isolation Kit for FFPF PureLink Genomic Plant DNAzol Plant DNA Reagent Purification Kit High throughput-compatible

Magnetic beads

MagMAX DNA

Multi-Sample Ultra Kit

PureLink Pro 96 Genomic DNA Purification Kit

Purel ink Microbiome DNA Purification Kit

MagMAX DNA Multi-Sample Ultra Kit

Magnetic beads

Low throughput

Purel ink Pro 96

Genomic DNA Mini Kit

Plate

Find the complete portfolio of genomic DNA purification products at thermofisher.com/gdnaprep

MagMAX Plant

DNA Isolation Kit



### Genomic DNA purification kits tissue and cell samples

### High-yield genomic DNA from tissues and cells

We offer several different kits for purifying genomic DNA from a variety of tissue and cell sample types. We offer a range of genomic DNA extraction kits for sensitive, scalable purification from an expansive set of starting materials to maximize process efficiency and downstream performance. This includes a broad range of kits for purifying genomic DNA from a variety of samples, including tissue and cells, to meet your research needs. The Invitrogen™ PureLink™ Genomic DNA Mini Kit enables high-yield, high-purity genomic DNA (gDNA) extractions from a wide variety of sample types (Figure 4). Use of this kit enables genomic DNA purification from blood, tissues, cells, bacteria, swabs, and blood spots, with a familiar silica-based, microcentrifuge spin-column format.



Figure 4. Higher, more concentrated yields achieved with the PureLink Genomic DNA Mini Kit compared to that obtained with another supplier's kit. E1 is referring to the first elution.

|                                   | DNAzol Reagent                       | PureLink Genomic<br>DNA Mini                           | PureLink <i>Pro</i> 96<br>Genomic DNA             | MagMAX <sup>™</sup> -96 DNA<br>Multi-Sample    |
|-----------------------------------|--------------------------------------|--|---|--|
|                                   | Process the largest amount of tissue | Fast isolation of gDNA<br>from a variety of<br>samples | High-yield, high-purity<br>gDNA in a plate format | Rapid and automated extraction of DNA          |
| Tissue<br>starting<br>material    | Up to 50 mg                          | Up to 25 mg  | Up to 25 mg                                       | Up to 25–50 mg,<br>depending on<br>tissue type |
| Yield                             | Up to 250 µg from tissue             | 5–10 µg from tissue                                    | 5–10 µg from tissue                               | 10–80 µg from tissue                           |
| Isolation<br>method               | Organic extraction                   | Silica spin column                                     | Silica filter plate                               | Scalable, flexible format with magnetic beads  |
| High<br>throughput–<br>compatible | No                                   | No   | Yes   | Yes  |
| Compatible applications           | Cloning, qPCR,<br>sequencing         | Cloning, qPCR,<br>sequencing, genotyping               | Cloning, qPCR,<br>sequencing, genotyping          | Cloning, qPCR,<br>sequencing, genotyping       |
| Prep time                         | 10–30 min                            | 15 min   | 35 min  | 45 min   |
| Prep size                         | 100                                  | 50, 250  | 4 x 96  | 50, 96, 500, 2,500                             |

### Which genomic DNA purification kit is right for your tissue or cell samples?

### Genomic DNA purification kits blood and serum samples

Rapid and efficient extraction of genomic DNA from human blood and serum

The emergence of pharmacogenomic centers of excellence has resulted in increasing needs for purification of high-quality genomic DNA from a large of volume of blood. Since samples are collected and shipped worldwide, every sample may differ with regard to storage and shipping conditions. Choosing the right genomic DNA purification kit is important based on your needs and expected end results. We offer a wide range of kits designed to isolate genomic DNA from your blood or serum samples at the purity and scale you need. Figure 5 shows gel image of gDNA purified from whole blood samples using the Invitrogen<sup>™</sup> GeneCatcher<sup>™</sup> gDNA Blood Kit.



Figure 5. Purification of gDNA from archived whole blood samples using the GeneCatcher gDNA Blood Kit. An 0.8% agarose gel was used to evaluate gDNA extractions from archived whole blood samples (blood samples frozen for >8 years). Blood samples were split into 2 equal aliquots, and gDNA was extracted using the GeneCatcher gDNA Blood Kit and a kit from another supplier G. The GeneCatcher kit extractions employ magnetic beads, while supplier G's kit uses a traditional lysis and DNA precipitation method that has been shown to co-purify agents that are inhibitory to downstream applications. I = GeneCatcher extractions; G = supplier G extractions; L = Invitrogen<sup>%</sup> 1 Kb DNA Extension Ladder, largest band 40 kb.



### Which genomic DNA purification kit is right for your blood or serum samples?

|                                | DNAzol <sup>™</sup> BD              | PureLink Genomic<br>DNA Mini             | PureLink <i>Pro</i> 96<br>Genomic DNA             | MagMAX-96 DNA<br>Multi-Sample                 |
|--------------------------------|-------------------------------------|--|---|---|
|                                | Process the largest amount of blood | Fast isolation of gDNA from blood        | High-yield, high-purity<br>gDNA in a plate format | Rapid and automated extraction of DNA         |
| Blood input                    | 500 µL                              | 200 µL                                   | 200 µL  | 50 μL–1 mL                                    |
| Yield                          | 10–20 µg                            | 3–10 µg                                  | 3–10 µg   | 1.5–66 µg                                     |
| Isolation method               | Organic extraction                  | Silica spin column                       | Silica filter plate                               | Scalable, flexible format with magnetic beads |
| High throughput-<br>compatible | No                                  | No                                       | Yes   | Yes   |
| Compatible applications        | Cloning, qPCR,<br>sequencing        | Cloning, qPCR,<br>sequencing, genotyping | Cloning, qPCR,<br>sequencing, genotyping          | Cloning, qPCR,<br>sequencing, genotyping      |
| Prep time                      | 10–30 min                           | 15 min                                   | 35 min  | 45 min  |
| Prep size                      | 100                                 | 50, 250                                  | 4 x 96  | 50, 96, 500, 2,500                            |

### Plant genomic DNA isolation kits

### Successful plant DNA extraction that's easy on you

Plant tissue is difficult enough to work with due to the high levels of polysaccharides and polyphenols present. Therefore, compounding the complexity with tedious, inefficient methods will only prolong the process of isolation. Cetyl trimethyl ammonium bromide (CTAB) methods require excessive time and handling, limiting your throughput. Some silica membrane– and magnetic bead–based protocols don't remove inhibitors inherent in plant samples that can carry over into the final product and interfere with downstream applications. This leads to frequent sample processing failure, necessitating that you repeat the purification—if you have the time and sample to spare. Now we offer you products specifically designed for easy, high-yield, and high-purity DNA purification from plant samples. Inhibitors are removed for reliable downstream results. Make your DNA isolation from plant samples easier on you and easier on your samples, while achieving high-yield, high-purity results with Invitrogen<sup>™</sup> and Applied Biosystems<sup>™</sup> plant molecular biology reagents.



|                                | Plant DNAzol <sup>™</sup><br>Reagent | PureLink <sup>™</sup> Genomic<br>DNA Plant Mini | PureLink <sup>™</sup> <i>Pro</i> 96<br>Genomic DNA           | MagMAX <sup>™</sup> Plant DNA                 |
|--------------------------------|--------------------------------------|---|--|---|
|                                | Most cost effective                  | High-quality gDNA<br>at a great value           | Fast isolation of gDNA<br>from a variety of<br>plant samples | Rapid and automated extraction of DNA         |
| Plant tissue input             | 100 mg                               | 100 mg  | Up to 25 mg  | 100 mg  |
| Yield                          | Varies based on starting material    | 1–15 µg   | 5–10 µg from tissue  | Varies based on starting material             |
| Isolation method               | Organic extraction                   | Silica spin column                              | Silica filter plate  | Scalable, flexible format with magnetic beads |
| High throughput-<br>compatible | No                                   | No  | Yes  | Yes   |
| Compatible applications        | Cloning, qPCR,<br>sequencing         | Cloning, qPCR,<br>sequencing, genotyping        | Cloning, qPCR,<br>sequencing, genotyping                     | Cloning, qPCR,<br>sequencing, genotyping      |
| Prep time                      | 60 min                               | 40 min  | 35 min   | 40 min  |
| Prep size                      | ~330                                 | 50  | 4 x 96   | 96  |
| Price per prep                 | \$0.58                               | \$3.60  | \$2.62   | \$2.12  |

### Which genomic DNA purification kit is right for your plant samples?



Empower your plant science research: go to **thermofisher.com/agbio** to learn more and to purchase our products and solutions.

## Viral genomic DNA purification kits

### High-yield genomic DNA from tissue and cells

Purification of viral nucleic acids poses unique challenges for getting good recovery and detection sensitivity. Capture and lysis of virus particles from very dilute solutions or cell-free samples is the first hurdle. We've developed DNA purification products that are optimized to provide maximum viral DNA yield, purity, and integrity from a broad range of sample types in several format options. For example, the Invitrogen<sup>™</sup> PureLInk<sup>™</sup> Quick Gel Extraction Kit allows you to rapidly and efficiently purify DNA fragments (Figure 6) that are high quality and show reliable performance in PCR, restriction enzyme digestion, cloning, and labeling.



|                                | PureLink <sup>™</sup> Viral<br>RNA/DNA Mini | PureLink <sup>™</sup> <i>Pro</i> 96<br>Viral RNA/DNA | MagMAX <sup>™</sup> Pathogen<br>RNA/DNA Kit          |
|--------------------------------|---|--|--|
|                                | Fast isolation of<br>viral nucleic acid     | Easy to use with<br>high sensitivity                 | Rapid and automated extraction of viral nucleic acid |
| Sample input                   | 500 µL cell-free sample                     | 200 $\mu$ L cell-free sample                         | 300 µL cell-free sample                              |
| Compatible samples             | Plasma, serum,<br>cerebrospinal fluid       | Plasma, serum,<br>cerebrospinal fluid                | Plasma, serum, saliva, blood                         |
| Isolation method               | Silica spin column                          | Filter plate   | Scalable, flexible format with magnetic beads        |
| High throughput-<br>compatible | No  | Yes  | Yes  |
| Compatible applications        | Cloning, qPCR,<br>sequencing, genotyping    | Cloning, qPCR,<br>sequencing, genotyping             | Cloning, qPCR,<br>sequencing, genotyping             |
| Prep time                      | 15 min                                      | 35 min   | 45 min   |
| Prep size                      | 50  | 4 x 96   | 480  |

#### Which genomic DNA purification kit is right for your viral samples?

For more information on Invitrogen viral RNA/DNA purification and detection products, go to **thermofisher.com/viral** 

# DNA clean-up solutions for every downstream application

Whether isolating a specific size of DNA from complex PCR mixtures or recovering bands from agarose gels, we have solutions that will meet your needs. Kit formats offer simple and rapid PCR clean-up using spin columns or magnetic beads; 96-well plates, with flexible size selection; and one-tube, 5-minute protocols. Isolated DNA is ready for sequencing, PCR, transcription, cloning, and labeling.





Figure 6. PureLink Quick Gel Extraction Kit protocol. Gel fragments are first solubilized to release the DNA. The sample is then loaded on a PureLink spin column and isolated using a simple "bind, wash, and elute" procedure. DNA fragments are recovered in TE buffer or water in a ready-to-use format.





### Vacuum

### Which DNA clean-up kit is right for you?

| Product   | Cat. No.                      | Quantity                          | Protocol<br>time (min) | DNA clean-up application           | Format                        | Elution<br>volume (µL) |
|---|-------------------------------|-----------------------------------|------------------------|------------------------------------|-------------------------------|------------------------|
| PureLink <sup>™</sup> PCR<br>Purification Kit                                       | K310001<br>K310002            | 50 preps<br>250 preps             | <15                    | PCR clean-up                       | Silica spin/<br>vacuum column | 50                     |
| PureLink <sup>™</sup> <i>Pro</i> 96 PCR<br>Purification Kit                         | K310096A                      | 4 plates<br>(4 x 96 rxns)         | 20                     | PCR clean-up                       | 96-well silica plate          | 50–150                 |
| PureLink <sup>™</sup> PCR<br>Micro Kit  | K210010<br>K310050<br>K310250 | 10 preps<br>50 preps<br>250 preps | ≤10                    | PCR clean-up                       | Silica spin column            | 5–20                   |
| PureLink Quick Gel<br>Extraction Kit  | K210012<br>K210025            | 50 preps<br>250 preps             | <30                    | Gel extraction                     | Silica spin/<br>vacuum column | 30–100                 |
| PureLink <sup>™</sup> Quick Gel<br>Extraction Kit and PCR<br>Purification Combo Kit | K220001                       | 50 preps                          | 10–30                  | PCR clean-up<br>and gel extraction | Silica spin/<br>vacuum column | 30–100                 |

# Complete purification system for nucleic acids, proteins, and cells

Successful downstream analysis depends on high-quality, reproducible purification of nucleic acids, proteins, and cells. Thermo Scientific<sup>™</sup> KingFisher<sup>™</sup> purification systems are designed to deliver high-quality results with minimal hands-on time, automating a significant part of your workflow.

- Choose from five distinct systems to meet your application and throughput needs
- Optimized kits streamline the purification workflow for a wide variety of sample types
- Thermo Scientific<sup>™</sup> BindIt<sup>™</sup> Software enables you to create customized protocols for additional flexibility
- Specially designed consumables allow efficient sample processing

#### Magnetic separation technology

KingFisher systems use permanent magnetic rods and disposable tip combs to collect, transfer, and mix magnetic particles:

- 1. When the magnetic rod—sheathed inside the tip comb is lowered into the solution, magnetic beads collect at the bottom of the tip comb.
- 2. The tip comb is then positioned in a different row or plate, and the beads are released by moving the magnetic rods out of the tip comb.
- 3. The tip comb facilitates the mixing of reagents with the beads as the magnetic head moves up and down.



### Invitrogen automated sample preparation technologies comparison chart

|   | Thermo Scientific <sup>™</sup> KingFisher <sup>™</sup> Duo<br>Prime Purification System  | Thermo Scientific <sup>™</sup><br>KingFisher <sup>™</sup> Flex <sup>™</sup> system   | Thermo Scientific <sup>™</sup> KingFisher <sup>™</sup><br>Presto <sup>™</sup> Purification System  |
|---|--|--|--|
|   |  |  |  |
| Benefits                                | An economical option for automated<br>nucleic acid extraction and protein<br>purification from up to 12 samples at<br>a time and 24 samples per load using<br>magnetic beads                                       | A highly versatile and reproducible purification of 24 or 96 samples per run   | Utilizes magnetic particle–based<br>technology to provide high-quality<br>yields of target nucleic acids and proteins<br>in high-throughput laboratories           |
| Application                             | DNA and RNA isolation from various starting materials; proteomic applications; cell isolation  | DNA and RNA isolation from various starting materials; proteomic applications; cell isolation  | Nucleic acid purification, protein<br>purification, immunoprecipitation,<br>antibody purification, phosphopeptide<br>enrichment, phage display                     |
| Reagents                                | Preloaded and user-editable<br>Applied Biosystems <sup>™</sup> MagMAX <sup>™</sup> kits<br>available to support tissue, cells, blood,<br>FFPE, bacteria, buccal, plant, viral<br>samples, and liquid (e.g., serum) | Preloaded and user-editable MagMAX<br>kits available to support tissue, cells,<br>blood, FFPE, bacteria, buccal, plant, viral<br>samples, and liquid (e.g., serum) | Preloaded and user-editable MagMAX<br>kits available to support tissue, cells,<br>blood, FFPE, bacteria, buccal, plant, viral<br>samples, and liquid (e.g., serum) |
| Protocol                                | Using Bindlt Software or USB memory device   | Using Bindlt Software  | Using Bindlt Software  |
| Plastic<br>consumables                  | 96 deep-well plate<br>24 deep-well plate<br>1 x 12 elution strip   | 96 deep-well plate<br>24 deep-well plate<br>96-well plate  | 96 deep-well plate<br>24 deep-well plate<br>96-well plate  |
| Sample input<br>volume                  | 30–1,000 μL (12-pin magnet head)<br>200–5,000 μL (6-pin magnet head)   | 50–1,000 μL, 96 deep-well plate<br>200–5,000 μL, 24 deep-well plate<br>20–200 μL, 96-well plate  | 50–5,000 µL<br>24- or 96-head magnets  |
| Throughput                              | Up to 12 with 12-pin magnet head<br>Up to 6 with 6-pin magnet head   | 96 or 24 samples   | 96 or 24 samples   |
| Instrument<br>dimensions<br>(W x D x H) | 400 x 460 x 340 mm<br>(15.7 x 18.1 x 13.4 in.)   | 680 x 600 x 380 mm<br>(26.8 x 23.6 x 15 in.)   | 36.0 x 46.5 x 40.0 cm<br>(14.2 x 18.3 x 15.5 in.)  |
| Weight                                  | 17 kg (37.5 lb)  | 28 kg (62 lb)  | 24 kg (53 lb)  |

# Nucleic acid quantitation

# Accurate, sensitive, and specific quantification of DNA and RNA

For nucleic acid quantitation, Invitrogen<sup>™</sup> Qubit<sup>™</sup> technology employs extreme selectivity not possible with absorbance measurements, resulting in accuracy high enough to quantitate even the most dilute or low-abundance samples, while still leaving enough sample for downstream applications (Figure 7).

#### **Benefits of using Qubit technology**

- Better selectivity and accuracy than absorbance assays
- Effectively quantitates dilute and low-abundance samples
- Available for DNA and RNA samples

Upon binding to nucleic acid, the fluorescence of the Qubit dyes increases several hundred-fold, giving a very high signal-to-noise ratio for exceedingly high sensitivity—up to 1,000 times more sensitive than absorbance readings.

#### **Qubit 2.0 Fluorometer for accurate, precise benchtop quantitation of DNA and RNA**

Use of the Invitrogen<sup>™</sup> Qubit<sup>™</sup> 2.0 Fluorometer for nucleic acid quantitation is:

- Selective—each Qubit assay kit is highly selective for a single analyte (RNA, DNA, or protein)
- Sensitive—samples with concentrations as low as 10 pg/µL of DNA and 12.5 µg/mL of protein may be accurately and reliably quantified
- Simple and intuitive—the Qubit 2.0 Fluorometer provides the same high accuracy you've come to expect, but now is even faster and requires less effort to use

The Qubit 2.0 Fluorometer utilizes specifically designed fluorometric technology using Invitrogen<sup>™</sup> dyes that only fluoresce when bound to DNA, RNA, or protein. These fluorescent dyes emit signals only when bound to specific target molecules, even in the presence of free nucleotides or degraded nucleic acids. This specificity allows you to get very accurate results because Qubit technology only reports the concentration of the molecule of interest, not contaminants. Qubit fluorometric quantitation provides exceptionally specific and sensitive DNA and RNA quantitation, even at low concentrations (Figure 8).

Qubit assay kits for the Qubit 2.0 Fluorometer contain reagent, premade calibration standards and premade buffer, and are also available in quantities of 500 assays. Please go to **thermofisher.com/qubit** for a full product list.



**Figure 7. Invitrogen**<sup>w</sup> **Qubit**<sup>w</sup> **High-Sensitivity and Broad-Range DNA Assay Kits.** (A) The Qubit High-Sensitivity DNA Assay Kit and (B) the Qubit Broad-Range DNA Assay Kit have linear detection ranges of 0.2–100 ng and 2–1,000 ng, respectively. Each kit is selective for dsDNA, even in the presence of an equal mass of RNA. The x-axis gives the mass of nucleic acid at a given point when DNA or RNA is assayed alone. In the 1:1 mixture, the total mass of nucleic acid at a given point is double what is stated on the x-axis.



#### Qubit dsDNA HS Assay

**Figure 8. Accuracy and precision of the Qubit 2.0 Fluorometer.** Ten replicates of lambda DNA at concentrations of 0.01–10 ng/µL were assayed using the Invitrogen<sup>™</sup> Qubit<sup>™</sup> dsDNA HS Assay on the Qubit 2.0 Fluorometer according to the standard kit protocol. The same concentrations of DNA were measured in ten replicates using a Thermo Scientific<sup>™</sup> NanoDrop<sup>™</sup> ND-1000 Spectrophotometer, and results were compared for both accuracy and precision. Each bar represents the average of 10 replicates. Error bars represent the standard deviations of the 10 replicates. The concentrations indicated are those of DNA in the starting samples, before dilution in the Invitrogen<sup>™</sup> Qubit<sup>™</sup> assay tubes.

### **Ordering information**

| Product   | Quantity                          | Cat. No.                         |
|---|-----------------------------------|----------------------------------|
| Plasmid purification kits   |                                   |                                  |
| PureLink HiPure Plasmid Miniprep Kit                              | 25 preps<br>100 preps             | K210002<br>K210003               |
| PureLink Quick Plasmid Miniprep Kit                               | 50 preps<br>250 preps             | K210010<br>K210011               |
| PureLink Pro Quick 96 Plasmid Purification Kit                    | 4 x 96 rxns                       | K211004A                         |
| PureLink HQ Mini Plasmid DNA Purification Kit                     | 4 x 96 preps                      | K210096                          |
| PureLink HiPure Plasmid Midiprep Kit                              | 25 preps<br>50 preps              | K210004<br>K210015               |
| PureLink HiPure Plasmid Filter Midiprep Kit                       | 25 preps                          | K210014                          |
| PureLink HiPure Plasmid Maxiprep Kit                              | 10 preps<br>25 preps              | K210006<br>K210007               |
| PureLink HiPure Plasmid Filter Maxiprep Kit                       | 10 preps<br>25 preps              | K210016<br>K210017               |
| PureLink HiPure Plasmid FP (Filter and Precipitator) Maxiprep Kit | 10 preps<br>25 preps              | K210026<br>K210027               |
| PureLink HiPure Expi Plasmid Megaprep Kit                         | 4 preps                           | K210008XP                        |
| PureLink HiPure Expi Plasmid Gigaprep Kit                         | 2 preps                           | K210009XP                        |
| PureLink Expi Endotoxin-Free Megaprep                             | 4 preps                           | A31232                           |
| PureLink Expi Endotoxin-Free Megaprep                             | 2 preps                           | A31233                           |
| Genomic DNA purification kits                                     |                                   |                                  |
| PureLink Genomic DNA Mini Kit                                     | 10 preps<br>50 preps<br>250 preps | K1820-00<br>K1820-01<br>K1820-02 |
| PureLink Pro 96 Genomic DNA Mini Kit                              | 4 x 96 preps                      | K182104A                         |
| PureLink Pro 96 Viral RNA/DNA Purification Kit                    | 4 plates<br>(4 x 96 rxns)         | 133800-96A                       |
| PureLink Pro 96 Viral RNA/DNA Mini Kit                            | 50 preps                          | 12280-050                        |
| PureLink Genomic Plant DNA Mini Kit                               | 50 preps                          | K183001                          |
| DNAzol Reagent  | 100 mL                            | 10503027                         |
| PureLink Microbiome DNA Purification Kit                          | 50 preps                          | A29790                           |
| Plasmid clean-up and gel extraction kits                          |                                   |                                  |
| PureLink Quick Gel Extraction and PCR Purification Combo Kit      | 50 preps                          | K220001                          |
| PureLink Quick Gel Extraction Kit                                 | 50 preps<br>250 preps             | K210012<br>K210025               |
| PureLink PCR Purification Kit                                     | 50 preps<br>250 preps             | K310001<br>K310002               |
| PureLink Pro 96 PCR Purification Kit                              | 4 plates<br>(4 x 96 rxns)         | K310096A                         |
| PureLink PCR Micro Kit  | 50 preps                          | K310050                          |

| Product  | Quantity   | Cat. No.         |
|--|--|------------------|
| Automated nucleic acid purification systems                |  |                  |
| Instruments  |  |                  |
| KingFisher Flex Purification System with 24 Deep-Well Head | 1 each   | 5400640          |
| KingFisher Flex Purification System with 96 Deep-Well Head | 1 each   | 5400630          |
| KingFisher Duo Prime Purification System                   | 1 each   | 5400110          |
| Nucleic acid purification products                         |  |                  |
| MagMAX kits  |  |                  |
| MagMAX-96 DNA Multi-Sample Kit                             | 96 preps   | 4413021          |
| MagMAX mirVana Total RNA Isolation Kit                     | 96 preps   | A27828           |
| MagJET Plasmid DNA Kit                                     | 96 preps   | K2791            |
| MagMAX Cell-Free DNA Isolation Kit                         | 50 preps   | A29319           |
| MagMAX Plant DNA Isolation Kit                             | 96 Preps   | A32549           |
| MagMAX mirVana Total RNA Isolation Kit                     | 96 preps   | A27828           |
| MagMAX DNA Multi-Sample Ultra Kit                          | 500 preps  | A25597           |
| MagMAX FFPE DNA/RNA Ultra Kit                              | 1 kit  | A31881           |
| MagMAX Total Nucleic Acid Isolation Kit                    | 100 preps  | AM1840           |
| MagMAX Cell-Free DNA Isolation Kit                         | 1 kit  | A29319           |
| MagMAX Pathogen RNA/DNA Kit                                | 480 preps  | 4462359          |
| Dynabeads mRNA DIRECT Purification Kit                     | 5 mL   | 61011            |
| Nucleic acid quantitation                                  |  |                  |
| Qubit Fluorometer  | 1 each   | Q32866           |
| Qubit Quantitation Starter Kit                             | 1 each   | Q32871           |
| Qubit Quantitation Lab Starter Kit                         | 1 each   | Q32872           |
| Qubit dsDNA BR Assay Kit                                   | 100 assays, 2–1,000 ng<br>500 assays, 2–1,000 ng | Q32850<br>Q32853 |
| Qubit dsDNA HS Assay Kit                                   | 100 assays, 0.2–100 ng<br>500 assays, 0.2–100 ng | Q32851<br>Q32854 |
| Qubit ssDNA HS Assay Kit                                   | 100 assays, 1–200 ng                             | Q10212           |
| Qubit Assay Tubes  | Set of 500                                       | Q32856           |

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