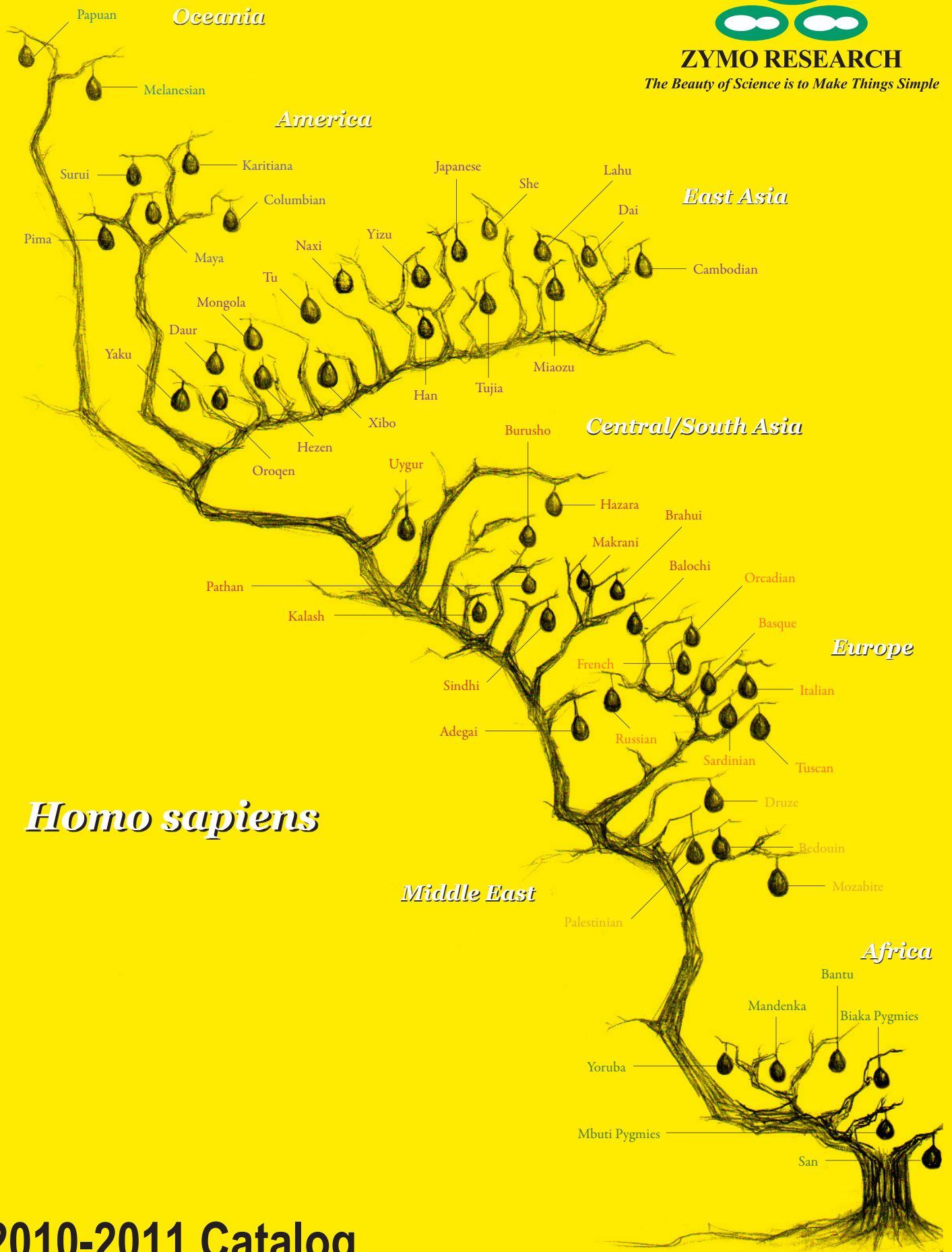




ZYMO RESEARCH
The Beauty of Science is to Make Things Simple



Homo sapiens

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1

Epigenetics

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Introduction

Epigenetic mechanisms are inheritable factors that regulate genetic expression without changing DNA sequence. These factors are manifest as DNA methylation, histone modification, and small regulatory RNAs. In recent years the field of epigenetics has grown into one of the most exciting and dynamic fields of biological research, and Zymo Research has grown with it, branding ourselves *The Epigenetics Company*[™].

DNA methylation studies have dominated the epigenetics field, and Zymo Research is an industry leader in providing DNA methylation research products. The EZ DNA Methylation[™] family of bisulfite treatment (conversion) kits (pp. 8-13) provides complete C to U conversion in DNA for rapid and precise methylation detection by a host of downstream procedures (see figure on following page). Many downstream applications involve PCR, quantitative real time PCR, or high resolution melt (HRM) analysis. Also, Zymo Research has developed the unique hot start ZymoTaq[™] DNA polymerase (p. 18), which is optimized for difficult-to-amplify templates such as bisulfite-converted DNA.

Zymo Research offers DNA standards for use in assessing DNA methylation status. The methylated and non-methylated DNA standards (pp. 15-16) provide the epigenetics research scientist samples of defined methylation signatures with uniform, predictable bisulfite conversion results. These controls are compatible with the EZ DNA Methylation[™] product line and any other commercially available or “homebrew” bisulfite conversion procedures. Also, they can be used for the quantitation of DNA methylation.

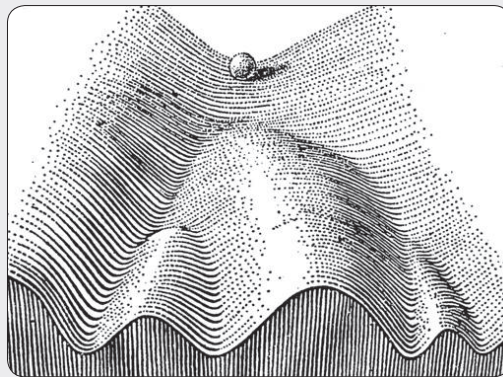
Two highly efficient DNA methyltransferases are ideal for *in vitro* DNA methylation. The CpG Methylase (M.SssI) methylates cytosine bases in the dinucleotide context 5'...CpG...3' (p. 19), and the GpC Methylase (M.CviPI) methylates cytosine bases in the dinucleotide context 5'...GpC...3' (p. 20). Both enzymes have been specifically engineered to ensure rapid, complete, and reproducible methylation of DNA for subsequent analysis.

Many researchers take advantage of immunoprecipitation to study DNA methylation. Zymo Research offers a specific Anti-5-Methylcytosine Monoclonal Antibody available individually (p. 21) or as part of a Methylated-DNA IP Kit (p. 22). Also, the ChIP DNA Clean & Concentrator[™] (p. 23) provides a two-minute method for purification of high quality DNA from any step in a standard ChIP procedure regardless of the antibody(ies) used.

Researchers who study RNA-mediated epigenetic mechanisms will be interested in the ZR RNA MicroPrep[™] and ZR RNA MiniPrep[™] kits (p. 97), which provide quick methods for the isolation of high quality total RNA from small amounts of cells and tissue. Finally, the ZR small-RNA[™] PAGE Recovery Kit (p. 93) is available for high-resolution extraction and purification of small RNAs (e.g., miRNA) from polyacrylamide gel slices.

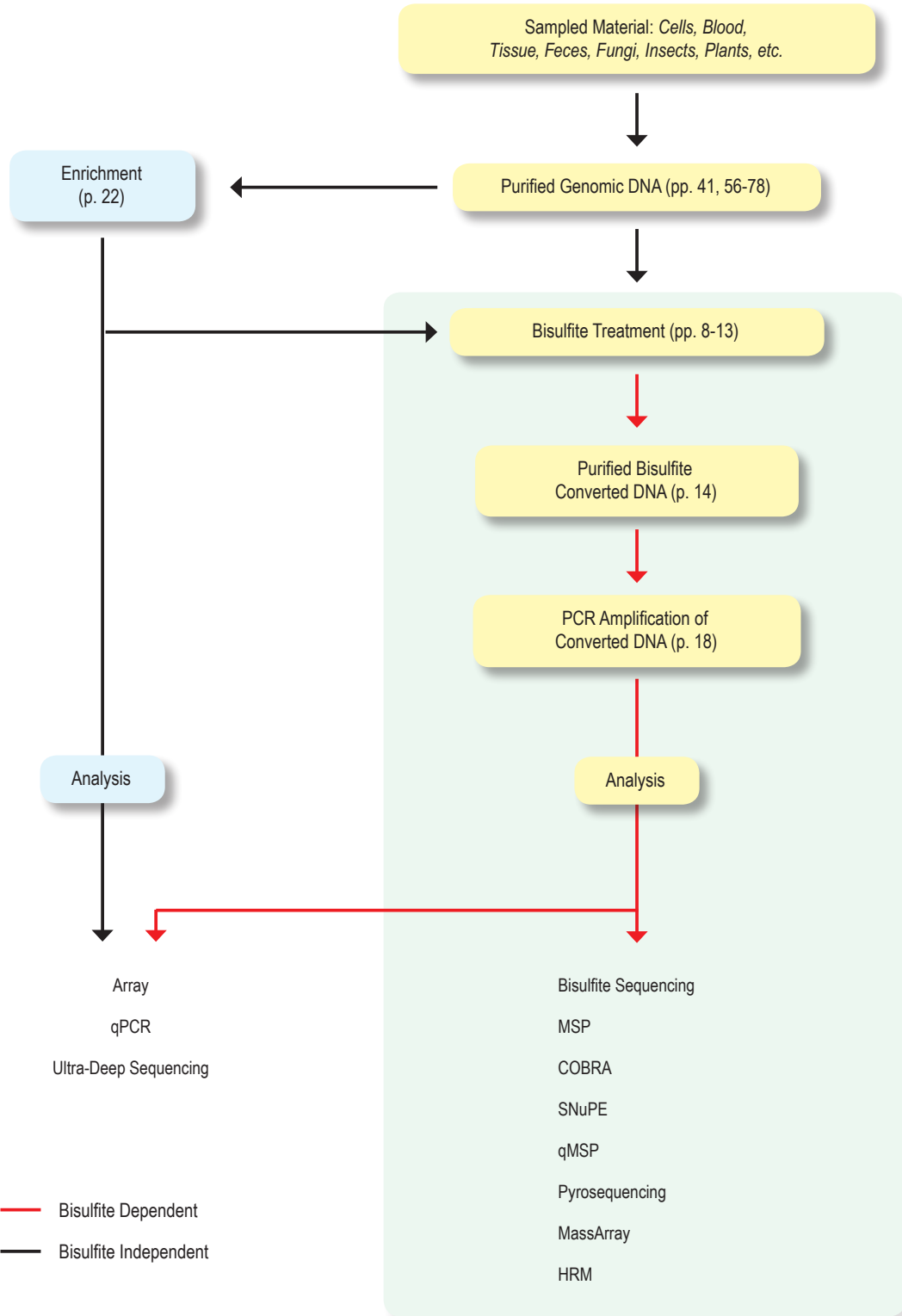
In addition to providing high-quality reagents to researchers, Zymo Research provides other resources for the epigenetics researcher. This section includes FAQs (p. 28), tips (p. 29), and selected citations of papers from leading journals featuring Zymo Research products (p. 30). Other resources, such as our Epigenetics Special Edition newsletter (Vol. 9, Issue 1) features reviews written by experts in the field of epigenetics and is available at www.zymoresearch.com.

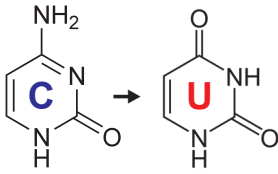
Cell fate switching in an epigenetic landscape, as portrayed by Waddington in 1956. In this view of embryonic regulation, cell fate determination is based on selection between pre-existing, intrinsically robust fates. The dynamics of this developmental selection is depicted as a “landscape” with hills and valleys. The phenotypic state of a cell at any time in its development is indicated by the position of a marble on that landscape. The marble will spontaneously roll down the valleys (stable developmental paths) leading to a distinct phenotype. The lowest points in the valleys correspond to the distinct, stable phenotypes within a given set of fates the cell may experience. However, recent research involving nuclear transfer and reprogramming of embryonic stem cells indicate that the marble can be rolled back to the top of the hill and that lateral movement across the landscape (over peaks) may also be possible in effecting the ultimate fate of the cell.



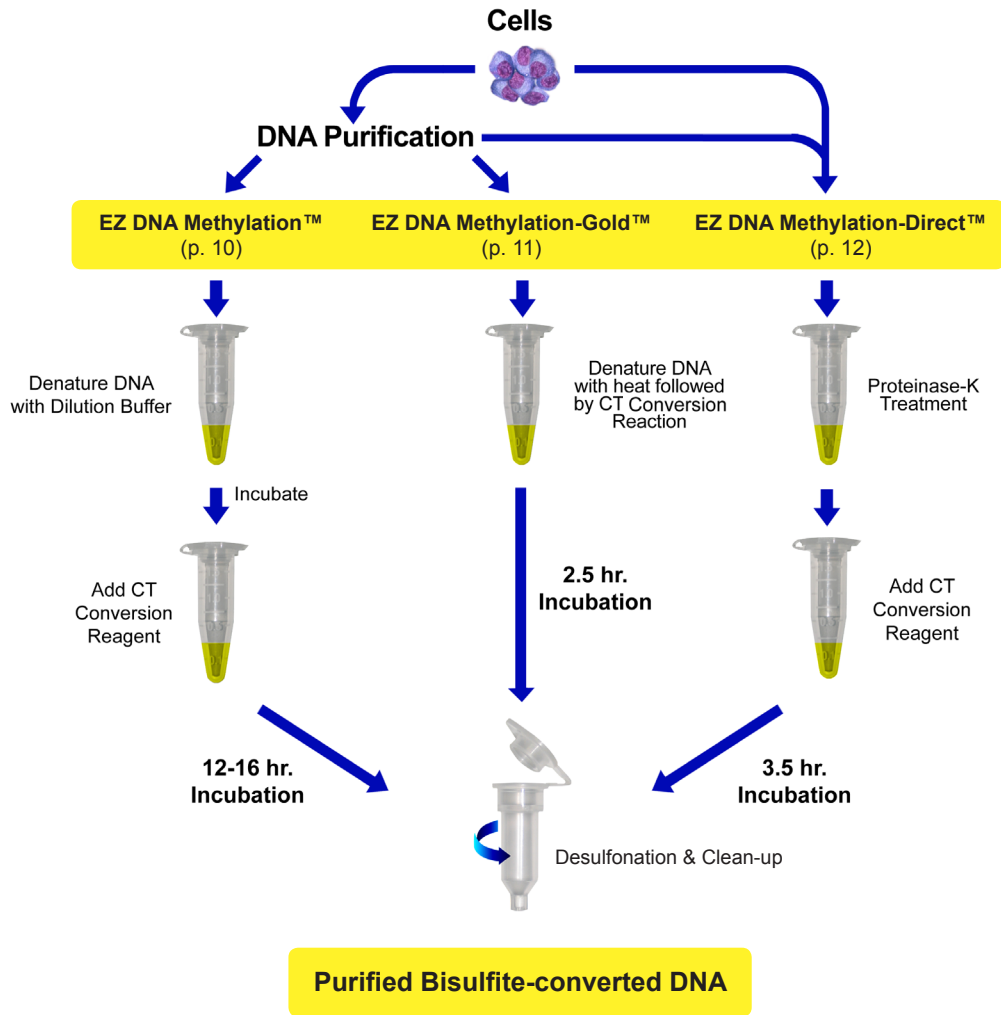
Technology Overview: DNA Methylation Analysis

Bisulfite treatment (conversion) for the deamination of (C)ytosine to (U)racil in DNA has remained the “gold standard” for a number of downstream applications developed over recent years to assess DNA methylation status. Most commonly used methods for locus- and multi-locus specific methylation rely on pretreatment of DNA with bisulfite, since bisulfite conversion and DNA sequencing remain the only means to accurately quantitate methylation at the level of the individual nucleotide.





The EZ DNA Methylation™ family of kits from Zymo Research remains the most popular and cited technologies available for bisulfite conversion and DNA methylation detection today (see page 30 for selected citations). They have been validated by countless researchers at academic institutions as well as biotechnology companies. The EZ DNA Methylation™ kits featured on pages 10-13 have been specifically engineered for complete conversion of as little as 50 pg DNA in as fast as 3 hours reliably with DNA recoveries > 80% (figure below). Kits are available in single column and 96-well plate formats.



Innovators of the Low Elution Desulfonation Column

A core technology of Zymo Research's bisulfite DNA conversion kits is the *Fast-Spin Zymo-Spin™ IC* column. Developed and manufactured by Zymo Research, its innovative design makes it perfect for rapid in-column desulfonation and high-yield elution of bisulfite-treated DNA. These unique columns allow purification of up to 5 µg of DNA in ≥ 6 µl eluate with no buffer retention or carryover.

	<i>EZ DNA Methylation™ Kit</i>	<i>EZ-96 DNA Methylation™ Kit</i>	<i>EZ DNA Methylation-Gold™ Kit</i>	<i>EZ-96 DNA Methylation-Gold™ Kit</i>	<i>EZ DNA Methylation-Direct™ Kit</i>	<i>EZ-96 DNA Methylation-Direct™ Kit</i>
Specifications						
Format	Spin Column	96-Well ¹	Spin Column	96-Well ¹	Spin Column	96-Well ¹
Binding Capacity	5 µg/prep.	5 µg/well	5 µg/prep.	5 µg/well	5 µg/prep.	5 µg/well
Elution Volume	≥ 10 µl	≥ 15 µl	≥ 10 µl	≥ 15 µl	≥ 10 µl	≥ 15 µl
Conversion Efficiency	> 99%	> 99%	> 99%	> 99%	> 99.5%	> 99.5%
DNA Recovery	> 80%	> 80%	> 75%	> 75%	> 80%	> 80%
Processing Time ²	12 - 16 hr.	12 - 16 hr.	3 hr.	3 hr.	4 hr.	4 hr.
Application						
Bisulfite Treatment	✓	✓	✓	✓	✓	✓
Input	DNA ³	DNA ³	DNA ³	DNA ³	DNA ⁴ , cells ⁵ , blood, tissue, FFPE	DNA ⁴ , cells ⁵ , blood, tissue, FFPE
Rapid Column/Plate Desulfonation	✓	✓	✓	✓	✓	✓
Bisulfite Clean-up	✓	✓	✓	✓	✓	✓
Includes Methylated Control DNA w/ Primers						
Includes ZymoTaq™ DNA Polymerase						
Page Number	10	10	11	11	12	12

¹ Available in deep-well format (see Zymo-Spin™ I-96 Plate, p. 150) and shallow-well format (see Silicon-A™ Plate, p. 149).

² Processing time is for bisulfite treatment and/or cleanup where applicable.

³ 500 pg - 2 µg of DNA. For optimal results, the amount of input DNA should be from 200 to 500 ng.

⁴ 50 pg - 2 µg of DNA. For optimal results, the amount of input DNA should be from 200 to 500 ng.

⁵ Cellular input: ≥ 10 cells.

EZ DNA Methylation-Startup™ Kit

EZ Bisulfite DNA Clean-up Kit™

EZ-96 Bisulfite DNA Clean-up Kit™

Specifications			
Format	Spin Column	Spin Column	96-Well [†]
Binding Capacity	5 µg/prep.	5 µg/prep.	5 µg/well
Elution Volume	≥ 10 µl	≥ 10 µl	≥ 15 µl
Conversion Efficiency	> 99.5%		
DNA Recovery	> 80%	> 80%	> 80%
Processing Time ²	4 hr.	25 min.	40 min.
Application			
Bisulfite Treatment	✓		
Input	DNA ⁴ , cells ⁵ , blood, tissue, FFPE	Bisulfite-converted DNA	Bisulfite-converted DNA
Rapid Column/Plate Desulfonation	✓	✓	✓
Bisulfite Clean-up	✓	✓	✓
Includes Methylated Control DNA w/ Primers	✓		
Includes ZymoTaq™ DNA Polymerase	✓		
Page Number	13	14	14

EZ DNA Methylation™ Kit / EZ-96 DNA Methylation™ Kit

Application

Bisulfite Treatment.....	✓
Input.....	DNA
Rapid Column/Plate Desulfonation.....	✓
Bisulfite Clean-up.....	✓

Specifications

Conversion Efficiency.....	> 99%
DNA Recovery.....	> 80%
Processing Time.....	12 - 16 hr.

EZ DNA Methylation™ Kit

Format.....	Spin Column
Binding Capacity.....	5 µg/prep.
Elution Volume.....	≥ 10 µl

EZ-96 DNA Methylation™ Kit

Format.....	96-Well
Binding Capacity.....	5 µg/well
Elution Volume.....	≥ 15 µl

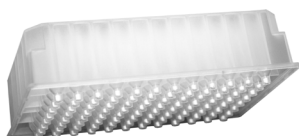
Featured Technologies



Zymo-Spin™ IC (p. 145)
Kits D5001, D5002



Silicon-A™ Plate (p. 149)
Kit D5003



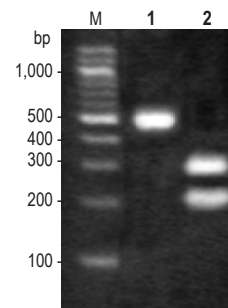
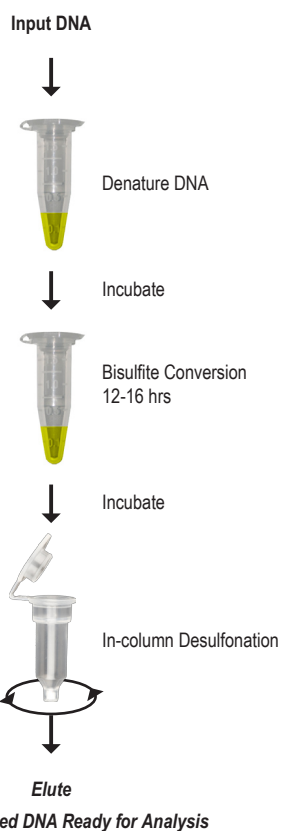
Zymo-Spin™ I-96 Plate (p. 150)
Kit D5004

Highlights

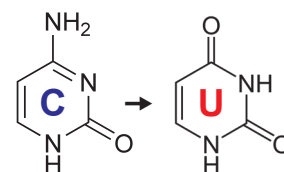
- Desulfonation and recovery of bisulfite-treated DNA with a spin column or 96-well plate.
- Recovered DNA is ideal for downstream analyses including PCR, endonuclease digestion, sequencing, microarrays, etc.

Description

The EZ DNA Methylation™ Kit and EZ-96 DNA Methylation™ Kit feature simplified procedures that streamline bisulfite treatment of DNA. The kits are based on the three-step reaction that takes place between cytosine and sodium bisulfite where cytosine is converted into uracil. The products' innovative in-column and in-plate desulfonation technologies eliminate otherwise cumbersome precipitations. The kits are designed to reduce template degradation, minimize DNA loss during treatment and cleanup, while ensuring complete conversion of the DNA. Purified, converted DNA is ideal for PCR amplification for downstream analyses including endonuclease digestion, sequencing, microarrays, etc. These kits are validated for use with Illumina's *GoldenGate*® and *Infinium*® Assays.



Conversion of non-methylated cytosine.
A 459 bp PCR product amplified from either DNA converted with the EZ DNA Methylation™ Kit (lane 1) or from untreated DNA (lane 2) was digested with EcoR I. The cytosine at the EcoR I site was converted to uracil during treatment, preventing cleavage of the DNA by the endonuclease.



Ordering Information

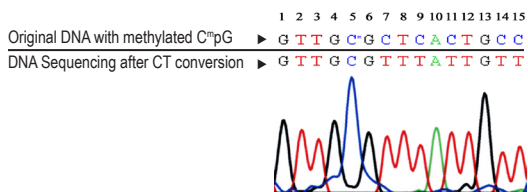
Cat. No.	Product	Size	Price
D5001	EZ DNA Methylation™ Kit	50 rxns.	\$112.00
D5002	EZ DNA Methylation™ Kit	200 rxns.	\$390.00
D5003	EZ-96 DNA Methylation™ Kit (shallow-well)	2 x 96 rxns.	\$310.00
D5004	EZ-96 DNA Methylation™ Kit (deep-well)	2 x 96 rxns.	\$310.00

Highlights

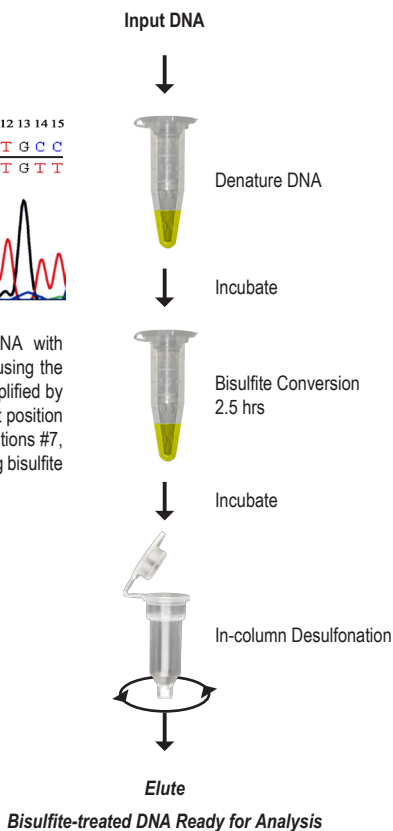
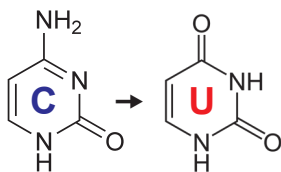
- A coupled heat denaturation/conversion reaction step streamlines the conversion of non-methylated cytosines into uracil.
- Desulfonation and recovery of bisulfite-treated DNA with a spin column or 96-well plate.
- Recovered DNA is ideal for downstream analyses including PCR, endonuclease digestion, sequencing, microarrays, etc.

Description

The EZ DNA Methylation-Gold™ and EZ-96 EZ DNA Methylation-Gold™ kits are refinements of our popular EZ DNA Methylation™ kits (see previous page). These products consolidate DNA denaturation and bisulfite conversion processes into one step, leading to a much faster bisulfite conversion. This is accomplished using temperature denaturation to complement chemical denaturation in the previous protocol. Also, the kits have been streamlined for high yield recovery of DNA following bisulfite treatment. Recovered bisulfite-converted DNA is ideal for PCR amplification for downstream analyses including endonuclease digestion, sequencing, microarrays, etc.



DNA sequencing results after bisulfite treatment. DNA with methylated C^mpG (at nucleotide position #5) was processed using the EZ DNA Methylation-Gold™ Kit. The recovered DNA was amplified by PCR and then sequenced directly. The methylated cytosine at position #5 remained intact while the unmethylated cytosines (i.e., positions #7, 9, 11, 14 and 15) were completely converted into uracil following bisulfite treatment and detected as thymine following PCR.



Application

- Bisulfite Treatment..... ✓
- Input..... DNA
- Rapid Column/Plate Desulfonation..... ✓
- Bisulfite Clean-up..... ✓

Specifications

- Conversion Efficiency..... > 99%
- DNA Recovery..... > 75%
- Processing Time..... 3 hr.

EZ DNA Methylation-Gold™ Kit

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 10 µl

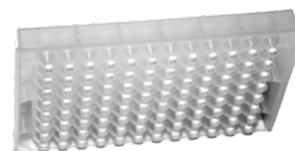
EZ-96 DNA Methylation-Gold™ Kit

- Format..... 96-Well
- Binding Capacity..... 5 µg/well
- Elution Volume..... ≥ 15 µl

Featured Technologies



Zymo-Spin™ IC (p. 145)
Kits D5005, D5006



Silicon-A™ Plate (p. 149)
Kit D5007



Zymo-Spin™ I-96 (p. 150)
Kit D5008

Ordering Information

Cat. No.	Product	Size	Price
D5005	EZ DNA Methylation-Gold™ Kit	50 rxns.	\$ 121.00
D5006	EZ DNA Methylation-Gold™ Kit	200 rxns.	\$ 410.00
D5007	EZ-96 DNA Methylation-Gold™ Kit (shallow-well)	2 x 96 rxns.	\$ 320.00
D5008	EZ-96 DNA Methylation-Gold™ Kit (deep-well)	2 x 96 rxns.	\$ 320.00

Application

- Bisulfite Treatment..... ✓
- Input..... DNA, Cells, Blood, Tissue, FFPE
- Rapid Column/Plate Desulfonation..... ✓
- Bisulfite Clean-up..... ✓

Specifications

- Conversion Efficiency..... > 99.5%
- DNA Recovery..... > 80%
- Processing Time..... 4 hr.

EZ DNA Methylation-Direct™ Kit

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 10 µl

EZ-96 DNA Methylation-Direct™ Kit

- Format..... 96-Well
- Binding Capacity..... 5 µg/well
- Elution Volume..... ≥ 15 µl

Featured Technologies



Zymo-Spin™ IC (p. 145)
Kits D5020, D5021



Silicon-A™ Plate (p. 149)
Kit D5022



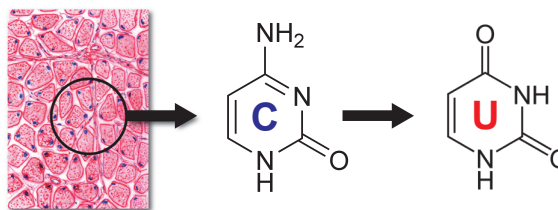
Zymo-Spin™ I-96 Plate (p. 150)
Kit D5023

Highlights

- Complete bisulfite conversion of DNA directly from blood, soft tissue, cells, FFPE samples, and LCM samples.
- Compatible with small sample inputs - as few as 10 cells or 50 pg DNA.
- Desulfonation and recovery of bisulfite-treated DNA with a spin column or 96-well plate.

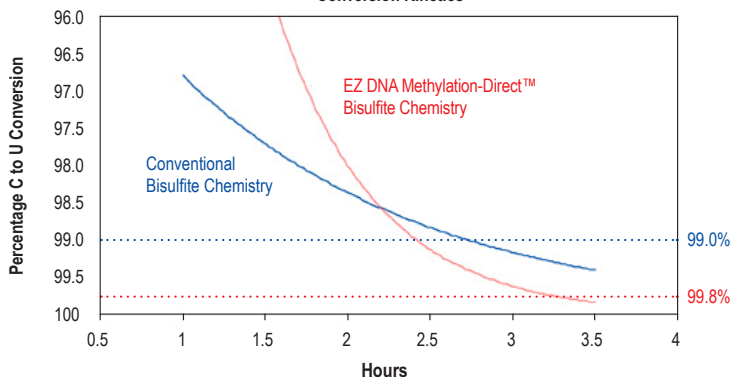
Description

The EZ DNA Methylation-Direct™ and EZ-96 DNA Methylation-Direct™ kits are a further refinement of our popular EZ DNA Methylation™ and EZ DNA Methylation-Gold™ kits (see previous page). These products feature reliable and complete DNA bisulfite conversion directly from blood, tissue, and cells without the prerequisite for DNA purification. The increased sensitivity of these kits make it possible to amplify bisulfite-converted DNA from as few as 10 cells or 50 pg DNA. Like the EZ DNA Methylation-Gold™ kits, DNA denaturation and bisulfite conversion processes are combined into a single step. Recovered bisulfite-converted DNA is ideal for PCR amplification for downstream analyses including restriction endonuclease digestion, sequencing, microarrays, etc.



EZ DNA Methylation-Direct™ Kit can be used for DNA Methylation detection *directly* from blood, cells, and tissue.

EZ DNA Methylation-Direct™ Bisulfite Chemistry Significantly Improves C to U Conversion Kinetics



EZ DNA Methylation-Direct™ Kit bisulfite chemistry significantly improves C to U conversion kinetics. DNA was converted using either EZ DNA Methylation-Direct™ or conventional bisulfite chemistries. Recovered DNA was amplified by PCR, then cloned. Sequences from individual clones were analyzed and quantitated. These data show that EZ DNA Methylation-Direct™ bisulfite chemistry improves the rate and extent (> 99.8%) of C to U conversion of DNA as compared to conventional bisulfite chemistry.

Ordering Information

Cat. No.	Product	Size	Price
D5020	EZ DNA Methylation-Direct™ Kit	50 rxns.	\$161.00
D5021	EZ DNA Methylation-Direct™ Kit	200 rxns.	\$452.00
D5022	EZ-96 DNA Methylation-Direct™ Kit (shallow-well)	2 x 96 rxns.	\$362.00
D5023	EZ-96 DNA Methylation-Direct™ Kit (deep-well)	2 x 96 rxns.	\$362.00

Highlights

- A *complete* system for DNA methylation detection: DNA bisulfite treatment, robust hot-start PCR, and a universally methylated human control DNA standard with primers.
- Designed for the first time user requiring a consolidated product to perform DNA methylation analysis.

Description

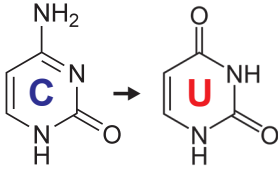
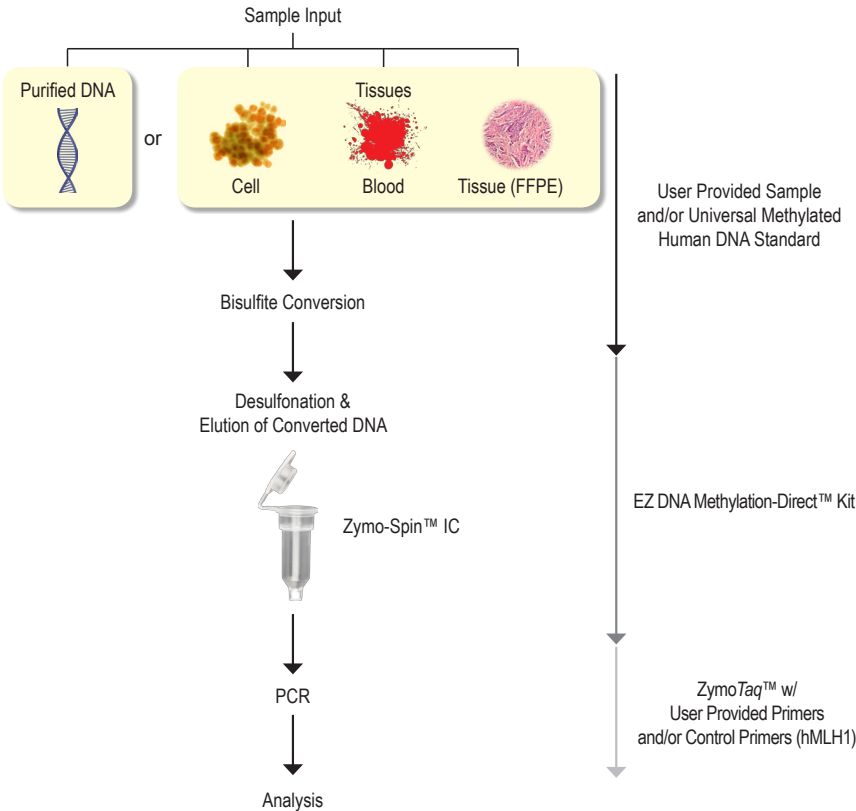
The EZ DNA Methylation-Startup™ Kit provides the necessary technologies required for *complete* bisulfite conversion of DNA for PCR and methylation analysis. This kit includes bisulfite conversion reagents that allow for direct sampling of blood, cells, and fresh or FFPE tissues without the prerequisite for upstream DNA purification (see EZ DNA Methylation-Direct™ Kit, previous page). A fully methylated Universal Methylated Human DNA Standard (p. 15) is provided together with a special primer set for PCR to control for and assess conversion efficiency. Finally, a unique ZymoTaq™ DNA Polymerase (p. 18) is included for robust amplification of bisulfite-treated DNA.

Application

- Bisulfite Treatment..... ✓
- Input..... DNA, Cells, Blood, Tissue, FFPE
- Rapid Column/Plate Desulfonation..... ✓
- Bisulfite Clean-up..... ✓
- Amplification of Bisulfite-converted DNA..... ✓



Workflow of the EZ DNA Methylation-Startup™ Kit



Ordering Information

Cat. No.	Product	Size	Price
D5024	EZ DNA Methylation-Startup™ Kit	50 rxns.	\$381.00

Specifications

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 10 µl
- Conversion Efficiency..... > 99.5%
- DNA Recovery..... > 80%
- Bisulfite Conversion Time..... 4 hr.

- Includes Methylated Control DNA (Human) w/ Primers..... ✓
- Includes ZymoTaq™ DNA Polymerase..... ✓

Featured Technology



Zymo-Spin™ IC (p. 145) Kit D5024

Application

Input..... Bisulfite-converted DNA
 Rapid Column/Plate Desulfonation..... ✓
 Bisulfite Clean-up..... ✓

Specifications

DNA Recovery..... > 80%

EZ Bisulfite DNA Clean-up Kit™

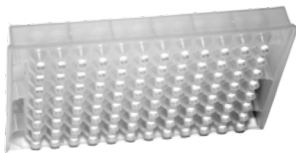
Format..... Spin Column
 Binding Capacity..... 5 µg/prep.
 Elution Volume..... ≥ 10 µl
 Processing Time..... 25 min.

EZ-96 Bisulfite DNA Clean-up Kit™

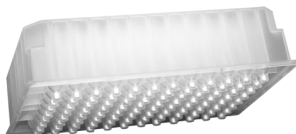
Format..... 96-Well
 Binding Capacity..... 5 µg/well
 Elution Volume..... ≥ 15 µl
 Processing Time..... 40 min.

Featured Technologies

Zymo-Spin™ IC (p. 145)
Kits D5025, D5026



Silicon-A™ Plate (p. 149)
Kit D5027



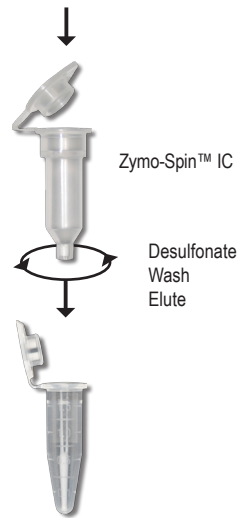
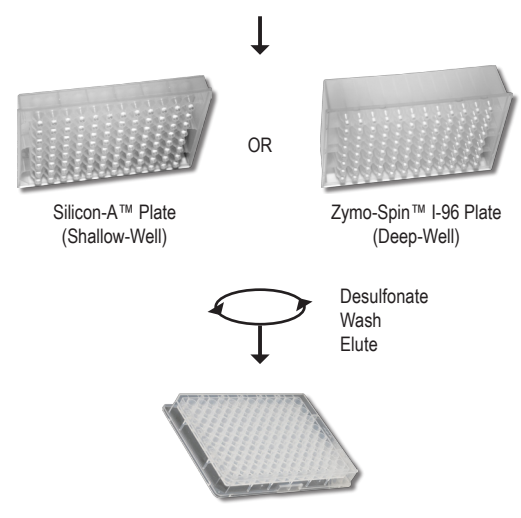
Zymo-Spin™ I-96 Plate (p. 150)
Kit D5028

Highlights

- Consistent, high yield recovery of bisulfite-treated DNA from any “homebrew” or commercial reaction mixture containing bisulfite.
- Simple spin column procedure with small elution volumes (≥ 6 µl) for concentrated DNA.

Description

The EZ Bisulfite DNA Clean-up Kit™ and EZ-96 Bisulfite DNA Clean-up Kit™ have been specifically designed for the purification of bisulfite-treated DNA from any “homebrew” or commercial reaction mixture containing bisulfite. These products feature innovative *Fast-Spin*, in-column and in-plate desulfonation and wash technologies that eliminate DNA loss, buffer carryover, and the need for ethanol/isopropanol precipitations. The procedures are easy and DNA clean-up can be completed in just minutes. Bisulfite-treated DNA purified with these products is ideal for PCR amplification for downstream DNA methylation analyses including restriction endonuclease digestion, sequencing, microarrays, etc.

Spin Column Format
Bisulfite-treated DNA**96-Well Format**
Bisulfite-treated DNA**Ultra-pure DNA for...**

- ✓ PCR
- ✓ Endonuclease Digestion
- ✓ Arrays
- ✓ Sequencing

Ordering Information

Cat. No.	Product	Size	Price
D5025	EZ Bisulfite DNA Clean-up Kit™	50 preps.	\$81.00
D5026	EZ Bisulfite DNA Clean-up Kit™	200 preps.	\$274.00
D5027	EZ-96 Bisulfite DNA Clean-up Kit™ (shallow-well)	2 x 96 preps.	\$214.00
D5028	EZ-96 Bisulfite DNA Clean-up Kit™ (deep-well)	2 x 96 preps.	\$214.00

Highlights

- DNA completely methylated at CpG dinucleotides by CpG Methylase.
- Compatible with the EZ DNA Methylation™ family of products and other bisulfite conversion protocols.
- Each standard is provided with primer set to amplify a fragment of DNA after bisulfite conversion.

Description

The Universal Methylated DNA Standard, Universal Methylated Human DNA Standard, and Universal Methylated Mouse DNA Standard are designed for use as controls to assess the efficiency of bisulfite-mediated conversion of DNA in combination with the EZ DNA Methylation™, EZ DNA Methylation-Gold™, or EZ DNA Methylation-Direct™ kits (pp. 10-12).

The control DNAs have been enzymatically modified *in vitro* with CpG Methylase, resulting in methylation at all cytosines in the dinucleotide sequence 5'...CpG...3'. The methylated cytosines remain unconverted following bisulfite treatment, whereas non-methylated cytosines are converted into uracils and detected as thymines following PCR. Each primer set has been specifically designed to amplify a fragment of the supplied DNA following bisulfite treatment.

The Bisulfite-converted Universal Methylated Human DNA Standard is designed for use as a control for bisulfite mediated conversion of DNA and especially the downstream analyses including PCR, MSP, and other amplification based assays. This DNA is identical to our Universal Methylated Human DNA Standard, but has been bisulfite-converted using Zymo Research's advanced conversion technologies. This product is provided as 20 ng/μl solution, enough for 50 reactions. The primer set included with the standard has been designed and validated to amplify a segment of the bisulfite-converted DNA.

Ordering Information

Cat. No.	Product	Size	Price
D5010	Universal Methylated DNA Standard	1 set (20 rxns.)	\$122.00
D5011	Universal Methylated Human DNA Standard	1 set (20 rxns.)	\$182.00
D5012	Universal Methylated Mouse DNA Standard	1 set (20 rxns.)	\$182.00
D5015	Bisulfite-converted Universal Methylated Human DNA Standard	1 set (50 rxns.)	\$122.00

Application

- Control for Bisulfite Conversion..... ✓
- DNA Methylation Quantitation..... ✓



Specifications

Universal Methylated DNA Standard

- Format..... Linearized Plasmid
- Concentration..... 5 pg/μl

Universal Methylated Human DNA Standard

- Format..... Male Genomic DNA
- Concentration..... 250 ng/μl

Universal Methylated Mouse DNA Standard

- Format..... Male Genomic DNA
- Concentration..... 250 ng/μl

Bisulfite-converted Universal Methylated Human DNA Standard

- Format..... Bisulfite-converted Male gDNA
- Concentration..... 20 ng/μl

Methylated & Non-methylated pUC19 DNA Set

Description

The Methylated & Non-methylated pUC19 DNA Set consists of two control DNAs (methylated and non-methylated) along with a set of specifically designed primers that can be used in conjunction with the EZ DNA Methylation™, EZ DNA Methylation-Gold™, and EZ DNA Methylation-Direct™ kits (pp. 10-12) from Zymo Research to assess the efficiency of bisulfite-mediated conversion of DNA. These plasmids can be used in conjunction with genomic DNAs to provide internal controls to assess bisulfite conversion efficiency or to produce known mixtures of methylated and non-methylated DNA for assay calibration.

The Non-Methylated pUC19 DNA is pUC19 that was isolated from a methylation-negative strain of bacteria (Dam⁻, Dcm⁻) and can be used as a negative control for DNA methylation analysis. The Methylated pUC19 DNA is pUC19 that has been isolated from the same strain and has been enzymatically methylated at all cytosine positions comprising CG dinucleotides by M.SssI methyltransferase (EC 2.1.1.37) and can be used as a positive control for DNA methylation analysis.

Ordering Information

Cat. No.	Product	Size	Price
D5017	Methylated & Non-methylated pUC19 DNA Set	1 set	\$ 142.00

Application

- Control for Bisulfite Conversion..... ✓
- DNA Methylation Quantitation..... ✓

Specifications

- Format..... Linearized Plasmid
- Concentration..... 1 ng/μl

Human Methylated & Non-methylated DNA Set

Application

- Control for Bisulfite Conversion..... ✓
- DNA Methylation Quantitation..... ✓



Specifications

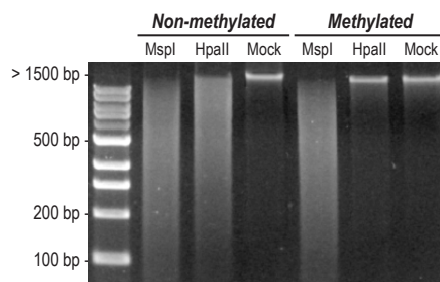
- Format..... Human Male Genomic DNA
- Concentration..... 250 ng/μl



Description

The Human Methylated & Non-methylated DNA Set consists of two control DNAs (a methylated human DNA standard and a non-methylated human DNA standard) together with a set of specifically designed primers that can be used in conjunction with the EZ DNA Methylation™, EZ DNA Methylation-Gold™, and EZ DNA Methylation-Direct™ kits (pp. 10-12) from Zymo Research to assess the efficiency of bisulfite-mediated conversion of DNA.

The non-methylated human DNA is purified from the HCT116 DKO (double knock-out) cell line, which contains genetic knockouts of both DNA methyltransferases DNMT1 (-/-) and DNMT3b (-/-). The DNA derived from HCT116 DKO cells has a low level of DNA methylation (< 5%) and therefore can be used as a negative control for DNA methylation analysis (see below). The methylated human DNA standard is purified HCT116 DKO DNA that has been enzymatically methylated at all cytosine positions comprising CG dinucleotides by CpG Methylase and can be used as a positive control for DNA methylation analysis.



An assay for complete methylation by M.SssI methylase. Non-methylated and methylated DNA from HCT116 DKO cells was digested with restriction enzymes MspI and HpaII. MspI digests both non-methylated and methylated DNA. HpaII is sensitive to CpG methylation.

Ordering Information

Cat. No.	Product	Size	Price
D5014	Human Methylated & Non-methylated DNA Set (DNA w/ primers)	1 set	\$382.00
D5014-1	Human HCT116 DKO Non-methylated DNA (DNA only)	5 μg / 20 μl	\$212.00
D5014-2	Human HCT116 DKO Methylated DNA (DNA only)	5 μg / 20 μl	\$212.00

E. coli Non-methylated Genomic DNA

Application

- Control for Bisulfite Conversion..... ✓
- DNA Methylation Quantitation..... ✓

Specifications

- Format..... *E. coli* Genomic DNA
- Concentration..... 250 ng/μl

Description

This non-methylated genomic DNA is from a Dam⁻ and Dcm⁻ strain (ER2925) of *E. coli*. It is useful for DNA methylation analyses requiring DNA with absolutely no methylation.

ER2925 Genotype: *ara-14 leuB6 fhuA31 lacY1 tsx78 glnV44 galK2 galT22 mcrA dcm-6 hisG4 rfbD1 R(zgb210::Tn10)TetS endA1 rpsL136 dam13::Tn9 xylA-5 mtl-1 thi-1 mcrB1 hsdR2*.

Ordering Information

Cat. No.	Product	Size	Price
D5016	<i>E. coli</i> Non-methylated Genomic DNA	5 μg / 20 μl	\$98.00

Highlights

- Control DNA for 5-methylcytosine and 5-hydroxymethylcytosine quantitation applications (i.e. - mass spectrometry, HPLC, TLC, etc.).
- Substrate for studies involving 5-hydroxymethylcytosine interacting proteins.

Description

The 5-Methylcytosine & 5-Hydroxymethylcytosine DNA Standard Set is a set of three DNA standards that are linear dsDNA, 897 bp, and have the same sequence. The only difference is that each contains either 100% unmodified cytosines, 5-methylcytosines, or 5-hydroxymethylcytosines (see figure). Since the sequence and extent of cytosine modification is known, this DNA standard set is ideal for use in calibration of various applications intended for quantitation of cytosine modifications.

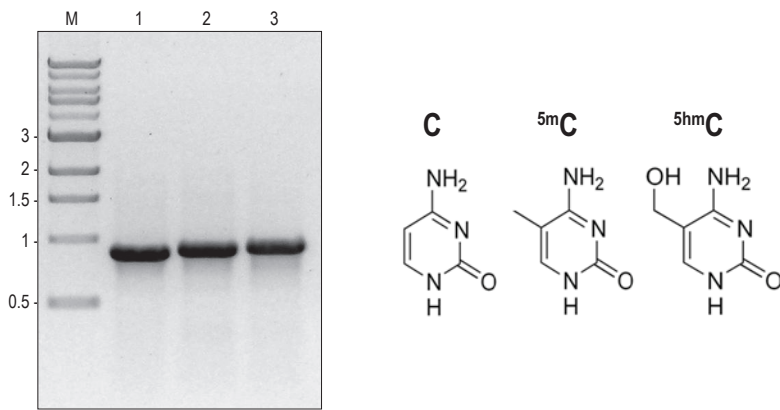
Application

For use in cytosine modification studies (i.e., methylcytosine & hydroxymethylcytosine).

Specifications

Amount of Each DNA..... 2 µg

Concentration of Each DNA..... 50 ng/µl



5-Methylcytosine & 5-Hydroxymethylcytosine DNA Standard Set. All three standards are 897 bp with all cytosines either unmodified (lane 1, C), 5-methylcytosine (lane 2, 5mC), or 5-hydroxymethylcytosine (lane 3, 5hmC). M is a 1 kb DNA ladder (Zymo Research).

Ordering Information

Cat. No.	Product	Size	Price
D5405	5-Methylcytosine & 5-Hydroxymethylcytosine DNA Standard Set	1 set	\$320.00

ZymoTaq™ DNA Polymerase

Application

- Amplification of Bisulfite-converted DNA..... ✓
- Amplification of DNA..... ✓
- TA cloning..... ✓

Specifications

Provided as a PreMix or as Part of a Set



Enzyme Concentration

ZymoTaq™ DNA Polymerase..... 5 U/μl
 ZymoTaq™ PreMix (2X)..... 4 U/50 μl

Unit Definition

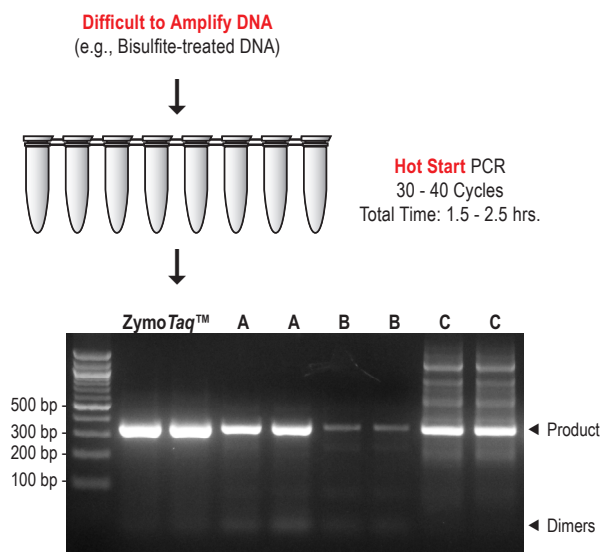
One unit enzyme is defined as the amount of enzyme required for the incorporation of 10 nM dNTPs into an acid-insoluble form in 30 minutes at 72°C.

Highlights

- Hot-start DNA polymerase for robust product formation.
- Reduces nonspecific PCR product formation from difficult templates (e.g., bisulfite-converted DNA).
- Compatible with real-time, quantitative PCR, and suitable for TA-cloning.

Description

ZymoTaq™ DNA Polymerase is a hot-start polymerase that is ideal for amplification of bisulfite-converted DNA. Because it is a heat-activated, thermostable DNA polymerase, ZymoTaq™ reduces primer dimer and nonspecific product formation, whereas conventional polymerases typically exhibit these problems with bisulfite-converted DNA templates. In addition to the amplification of bisulfite-treated DNA for methylation detection, ZymoTaq™ DNA polymerase can also be used for conventional PCR, and real time PCR. The enzyme also has 3'-terminal transferase activity, making it ideal for use in TA-cloning by the addition of "A" overhangs to amplified DNA.



PCR products of immunoprecipitated, methylated DNA vary depending on the hot-start polymerase used. Methylated DNA was immunoprecipitated using the Methylated-DNA IP Kit. DNA (post-IP) was used in a PCR assay comparing Zymo Research's hot-start ZymoTaq™ polymerase vs. that of three other suppliers (A, B, and C). Expected amplicon size is 350 bp. PCR products (in duplicate) were separated in a 2.0% (w/v) agarose TAE/EtBr gel. The use of ZymoTaq™ generated specific, robust products with minimal non-specific banding compared to others.

Ordering Information

Cat. No.	Product	Size	Price
E2001	ZymoTaq™ DNA Polymerase	50 rxns.	\$62.00
E2002	ZymoTaq™ DNA Polymerase	200 rxns.	\$198.00
E2003	ZymoTaq™ PreMix	50 rxns.	\$62.00
E2004	ZymoTaq™ PreMix	200 rxns.	\$198.00

Highlights

- For *complete, in vitro* methylation of DNA for methylation analysis.
- Methylation of chromatin DNA for DNA accessibility studies.
- Inhibition of endonucleases with overlapping CpG sequence recognition.
- [³H]-labeling of DNA.

Description

The CpG Methylase from Zymo Research *completely* methylates all cytosines (C⁵) in double-stranded, non-methylated and hemimethylated DNA having the dinucleotide sequence 5'...CpG...3'. The recombinant methylase is isolated from an *E. coli* strain that expresses the methyltransferase gene from *Spiroplasma* sp. strain MQ1. Reaction conditions have been optimized to maximize the processivity of the enzyme to ensure rapid, complete, and reproducible methylation of DNA for accurate DNA methylation analysis. This product is supplied with 10X Reaction Buffer and S-adenosylmethionine cofactor.

Application

In vitro Methylation of DNA..... ✓

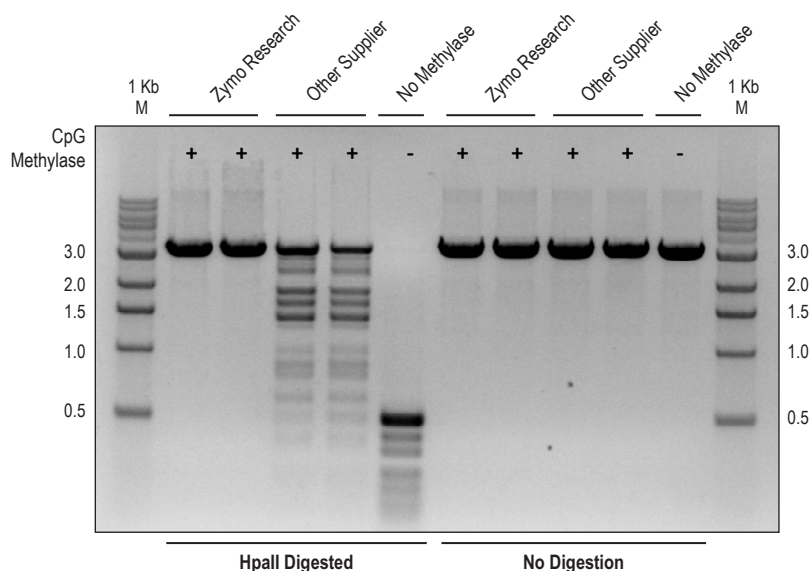
**Specifications**

Enzyme Concentration..... 4 U/μl
 Storage..... -20°C for 12 mo.
 Inactivation..... 65°C for 20 min.
 Standard Reaction Time..... 2 hr.

Unit Definition

One unit is defined as the amount of enzyme required to protect 1 μg of λ DNA against cleavage by BstUI restriction endonuclease in a total reaction volume of 20 μl for 1 hour at 37°C

CpGpCpG



The CpG Methylase from Zymo Research catalyzes complete methylation of the CpG sites in DNA. Methylase activities of CpG Methylase from Zymo Research versus that of another supplier were tested for complete methylation of equivalent amounts of a linearized plasmid DNA using reaction conditions recommended by the supplier. Completion of CpG methylation was assessed by resistance to digestion with a methylation-specific endonuclease (HpaII) and subsequently analyzed in an agarose gel. As shown in the figure above, the CpG Methylase from Zymo Research completely methylated the CpG sites in the DNA whereas that of the other supplier did not. Samples were assayed in duplicate.

Ordering Information

Cat. No.	Product	Size	Price
E2010	CpG Methylase (M. Sssl)	200 U	\$147.00
E2011	CpG Methylase (M. Sssl)	400 U	\$243.00

GpC Methylase (M.CviPI)

Application

In vitro Methylation of DNA..... ✓



Specifications

Enzyme Concentration..... 4 U/μl
 Storage..... -20°C for 12 mo.
 Inactivation..... 65°C for 20 min.
 Standard Reaction Time..... 2 hr.

Unit Definition

One unit is defined as the amount of enzyme required to protect 1 μg of λ DNA against cleavage by HaeIII restriction endonuclease in a total reaction volume of 20 μl for 1 hour at 37°C.

CpGpCpG

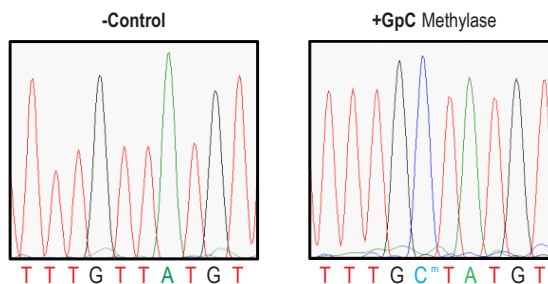
Highlights

- For *complete, in vitro* methylation of DNA for methylation analysis.
- Methylation of chromatin DNA for DNA accessibility studies.
- Inhibition of endonucleases with overlapping GpC sequence recognition.
- [³H]-labeling of DNA.

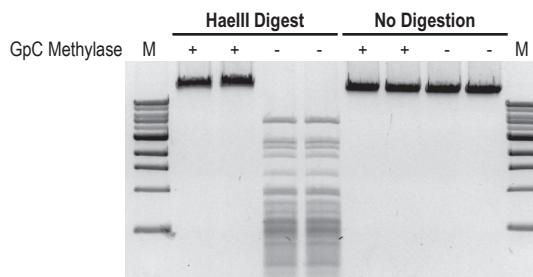
Description

Zymo Research's GpC Methylase *completely* methylates all cytosines (C⁵) within a 5'...GpC...3' context in double-stranded DNA. The enzyme is specific for both non-methylated and hemimethylated DNA. The recombinant GpC Methylase is isolated from an *E. coli* strain that expresses the methyltransferase gene from *Chlorella* virus. The reaction conditions are optimized to maximize the processivity of the enzyme to ensure rapid, complete, and reproducible methylation of DNA for accurate DNA methylation analysis. This product is supplied with 10X Reaction Buffer and S-adenosylmethionine cofactor.

	Original Sequence	+GpC Methylase
Non-converted	→ CTCGCCATGT	CTCGC ^m CATGT
Bisulfite-converted	→ TTTGTTATGT	TTTGC ^m TATGT



DNA sequence after bisulfite treatment. Bisulfite treatment converts non-methylated cytosine to uracil in DNA, which is detected as thymine upon sequencing. Methylated cytosines remain unconverted during treatment. As shown above, treatment of DNA with GpC Methylase methylates cytosines in a GpC context.



The GpC Methylase from Zymo Research catalyzes complete methylation of the GpC sites in DNA. Methylase activity of GpC Methylase was tested for complete methylation of λ DNA using recommended reaction conditions. Completion of GpC methylation was assessed by resistance to digestion with a methylation-sensitive endonuclease (HaeIII) and subsequently analyzed in an agarose gel. "M" is a 1 kb DNA ladder (Zymo Research).

Ordering Information

Cat. No.	Product	Size	Price
E2014	GpC Methylase (M. CviPI)	200 U	\$60.00
E2015	GpC Methylase (M. CviPI)	1,000 U	\$240.00

Highlights

- Specifically binds to 5-methylcytosine in ssDNA context.
- No detectable cross reactivity with non-methylated cytosine.

Description

The mouse Anti-5-Methylcytosine Monoclonal Antibody (Clone 10G4) has been developed to facilitate differentiation between methylated and non-methylated cytosines in DNA. Specificity of this clone is to 5-methylcytosines in single-stranded DNA with no detectable cross-reactivity to non-methylated cytosines. The antibody has proven to be a valuable tool in the characterization of DNA methylation and has been successfully used for immunoprecipitation-based assays such as Methylated DNA Immunoprecipitation (MeDIP), see the following page.

Application

- Immunoprecipitation of Methylated DNA..... ✓
- ELISA..... ✓
- Immunoblotting..... ✓
- Immunofluorescence..... ✓

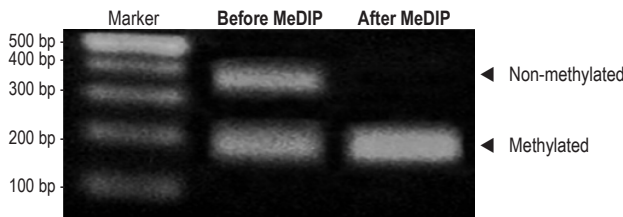


Specifications

- Isotype..... IgG1
- Concentration..... 1 mg/ml
- Buffer..... PBS (pH7.4), 0.01% Thimerosal
- Short Term Storage..... 4°C
- Long Term Storage..... -80°C

Application		Recommended Dilution
ELISA	Yes	1:500 to 1:1,000
Immunoblotting	Yes	N/A*
Immunofluorescence	Yes	N/A*
Immunoprecipitation (IP) of Methylated DNA	Yes	2 - 4 µg per IP

*N/A = Data Not Available



Methylated DNA is efficiently enriched using the 5-Methylcytosine Monoclonal Antibody. DNA was immunoprecipitated using the mouse Anti-5-Methylcytosine 10G4 Antibody from a mixed methylated/non-methylated DNA population. Methylated DNA can be cut with NcoI whereas non-methylated DNA is resistant to NcoI digestion. The DNA (post-IP) was subsequently amplified by PCR and digested with NcoI. Products were then separated in a 2.0% (w/v) agarose/TAE/EtBr gel. The image above demonstrates specific enrichment of methylated versus non-methylated DNA by the Anti-5-Methylcytosine 10G4 Antibody.

Ordering Information

Cat. No.	Product	Size	Price
A3001-50	Anti-5-Methylcytosine Antibody (clone 10G4)	50 µg/µl	\$152.00
A3001-200	Anti-5-Methylcytosine Antibody (clone 10G4)	200 µg/µl	\$442.00

Methylated-DNA IP Kit

Application

- Immunoprecipitation of Methylated DNA..... ✓
- Purification of Methylated DNA..... ✓



Specifications

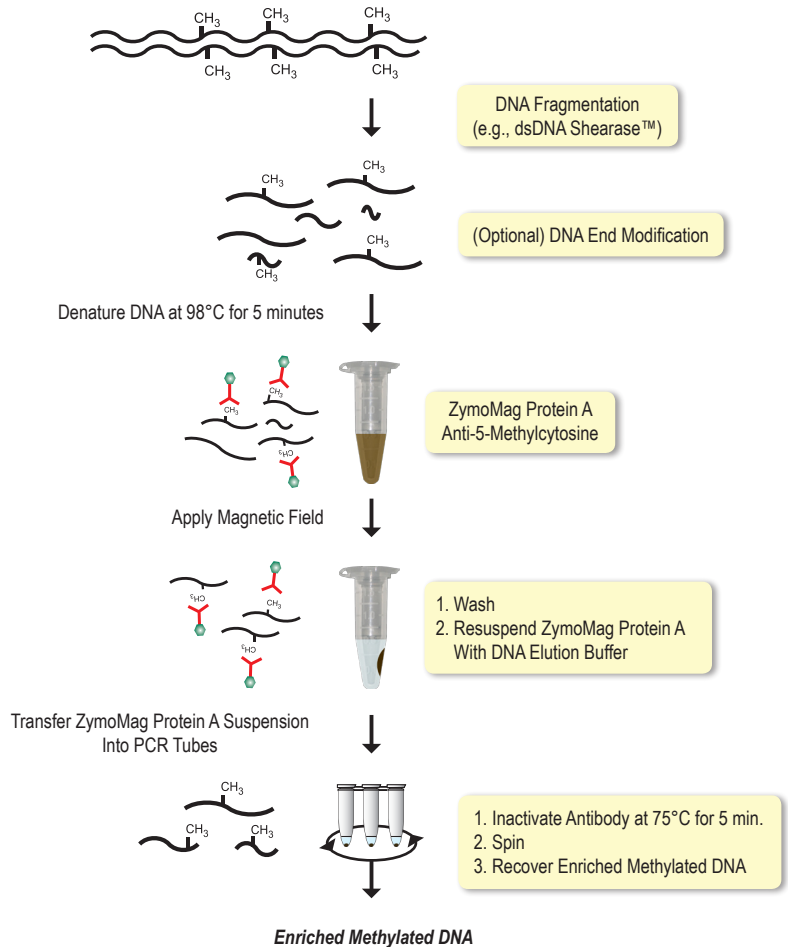
- Format..... Spin Column
- Optimal DNA Input..... 50 - 500 ng
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... 10 µl
- Enrichment Factor..... > 100 fold
- Processing Time..... 4 hr.

Highlights

- Methylated DNA enrichment for large-scale DNA methylation analysis.
- Includes a highly specific anti-5-methylcytosine monoclonal antibody for defined, reproducible results.
- Eluted, ultra-pure DNA is ideal for use in subsequent molecular based analyses (e.g., assembling genomic libraries and determining genome-wide methylation status).

Description

The Methylated-DNA IP Kit utilizes immunoprecipitation technology for the enrichment of 5-methylcytosine-containing DNA from any pool of fragmented genomic DNA for use in genome-wide methylation analysis. The kit features a highly specific Anti-5-Methylcytosine Monoclonal Antibody (p. 21) for the capture and separation of methylated DNA from non-methylated DNA in only a few hours (see figure below). Typically, over a hundred-fold enrichment of methylated DNA vs. non-methylated DNA can be achieved with the use of this kit. Recovered DNA is suitable for many downstream applications to analyze genome-wide DNA methylation including PCR, bisulfite treatment, whole-genome amplification, ultra-deep sequencing, and microarray. The product is provided with control DNA and primers for use as a control.



Ordering Information

Cat. No.	Product	Size	Price
D5101	Methylated-DNA IP Kit	10 preps.	\$420.00

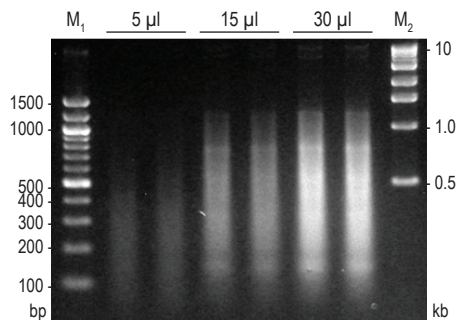
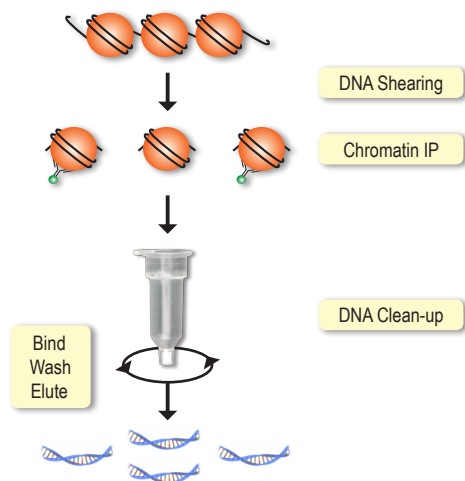
Highlights

- Two (2) minute DNA clean-up from any step in a standard ChIP protocol.
- DNA is ideal for PCR, arrays, DNA quantification, Southern blot analysis, sequencing, and other molecular applications.

Description

The Chromatin Immunoprecipitation (ChIP) DNA Clean & Concentrator™ provides a hassle-free method for the rapid purification and concentration of high quality DNA from any step in a standard ChIP protocol. This includes samples that have undergone reverse cross-linking, Proteinase K or RNase A digestion, mechanical or nuclease-mediated DNA shearing, and samples eluted from chromatin-antibody-bead complexes. The specially formulated ChIP DNA Binding Buffer promotes DNA adsorption to the column in the presence of detergents, antibodies, and proteinases that are often used for ChIP. This kit may be applied to any routine ChIP procedure to determine DNA concentration of samples that have undergone reverse cross-linking following DNA shearing. It can also be used for the removal of TES, 0.1M NaHCO₃ and 1% SDS from DNA eluted from chromatin-antibody-bead complexes and can be used to purify DNA from buffers containing up to 1% SDS or 5% NP-40, Tween-20, Triton X-100 or Sarkosyl.

Overview of ChIP DNA Clean & Concentrator™ Procedure



Agarose gel electrophoresis of DNA isolated from cell lysates. High quality DNA can be efficiently recovered from *Saccharomyces cerevisiae* cell lysates using the ChIP DNA Clean & Concentrator™. Duplicate purifications were performed with 5, 15, and 30 µl cell lysate and an equal volume of eluted DNA was loaded into each lane. The size marker M1 and M2 are 100 bp and 1 kb ladders, respectively (Zymo Research).

Ordering Information

Cat. No.	Product	Size	Price
D5201	ChIP DNA Clean & Concentrator™ (uncapped)	50 preps.	\$82.00
D5205	ChIP DNA Clean & Concentrator™ (capped)	50 preps.	\$86.00

Application

- ChIP DNA Purification..... ✓
- Protein, Salt, and Detergent Removal..... ✓



Specifications

- Spin Column..... ✓
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 6 µl
- DNA Size Limits..... 50 bp - 23 kb
- Processing Time..... 2 min.
- DNA Recovery
 - 50 bp - 10 kb..... 70 - 90%
 - > 10 kb..... 70%
- Detergent Tolerance
 - ≤ 5% Triton X-100, ≤ 5% Tween-20,
 - ≤ 5% Sarkosyl, ≤ 1% SDS, and others.

Featured Technologies



Zymo-Spin™ I (p. 145)
Kit D5201



Zymo-Spin™ IC (p. 145)
Kit D5205

Application

Complete digestion of DNA into individual *nucleotides* components.

Specifications

Enzyme Concentration..... 10 U/μl
 Storage..... -20°C for 12 mo.
 Inactivation..... 70°C for 20 min.
 Standard Reaction Time..... 1 hr.

Unit Definition

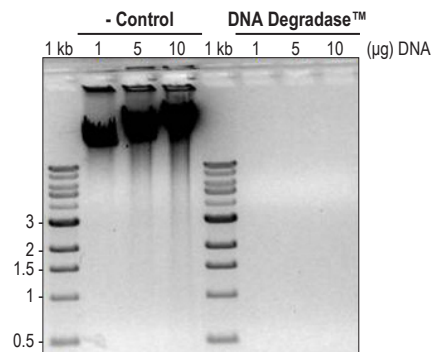
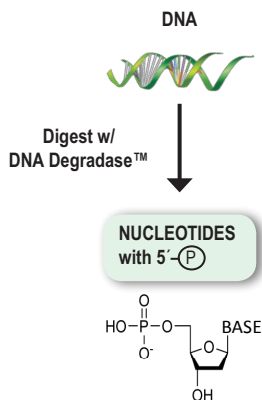
One unit (U) is defined as the amount of enzyme required to degrade 1 μg of λ DNA in a total reaction volume of 25 μl for 1 hour at 37°C.

Highlights

- Quick and simple procedure for completely degrading DNA into its individual *nucleotide* component for quantitative analysis (e.g., whole-genome methylation analysis by HPLC, TLC, etc.).
- 1 hour, single-enzyme digest vs. conventional 6 - 16 hour multi-step enzyme digestion protocols.

Description

DNA Degradase™ from Zymo Research is a nuclease mix that quickly and efficiently degrades DNA to its individual nucleotide components. DNA Degradase™ is ideal for whole-genome DNA methylation analysis by a number of downstream applications (i.e., HPLC, TLC, etc.). Digestion with the enzyme is performed via a one-step procedure that is faster and simpler than other available methods.



DNA Degradase™ efficiently degrades DNA: 1 μg, 5 μg, and 10 μg of λ DNA incubated with 1 μl (10 U) of DNA Degradase™ in 25 μl reaction volume and incubated at 37°C for 1 hour.

Ordering Information

Cat. No.	Product	Size	Price
E2016	DNA Degradase™	500 U	\$120.00
E2017	DNA Degradase™	2,000 U	\$382.00

Highlights

- Quick and simple procedure for completely degrading DNA into its individual *nucleoside* component for quantitative analysis via LC/MS.
- 1 hour, single-enzyme digest vs. conventional 6 - 16 hour multi-step enzyme digestion protocols.

Description

DNA Degradase Plus™ from Zymo Research is a nuclease mix that quickly and efficiently degrades DNA to its individual nucleoside components. Since nucleosides lack negatively charged phosphate, DNA Degradase Plus™ is ideal for whole-genome DNA methylation analysis by LC/MS. Digestion with the enzyme is performed via a one-step procedure that is faster and simpler than other available methods.

Application

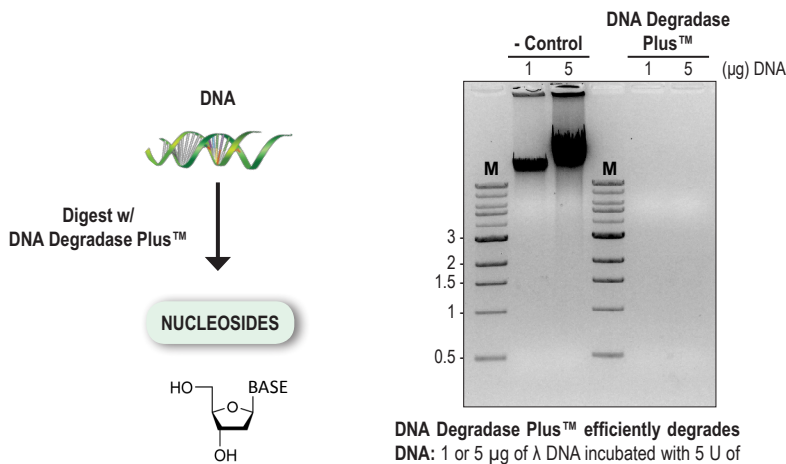
Complete digestion of DNA into individual *nucleosides* components.

Specifications

Enzyme Concentration..... 5 U/μl
 Storage..... -20°C for 12 mo.
 Inactivation..... 70°C for 20 min.
 Standard Reaction Time..... 1 hr.

Unit Definition

One unit (U) is defined as the amount of enzyme required to degrade 1 μg of λ DNA in a total reaction volume of 25 μl for 1 hour at 37°C.



DNA Degradase Plus™ efficiently degrades DNA: 1 or 5 μg of λ DNA incubated with 5 U of DNA Degradase Plus™ in 25 μl reaction volume at 37°C for 1 hour. "M" is a 1 kb DNA ladder (Zymo Research).

Ordering Information

Cat. No.	Product	Size	Price
E2020	DNA Degradase Plus™	250 U	\$120.00
E2021	DNA Degradase Plus™	1,000 U	\$382.00

Application

Blunt-end Digestion of DNA..... ✓

Specifications

Enzyme Concentration..... 1 U/μl
 Storage..... -20°C for 12 mo.
 Inactivation..... 20 mM EDTA

Unit Definition

One unit (U) is defined as the amount of enzyme required to convert 0.5 μg of DNA into fragments averaging ~ 500 bp in a total reaction volume of 25 μl in 20 minutes at 42°C.

Highlights

- The simplest method for generating perfectly blunt-ended dsDNA fragments.
- Fragment size is conveniently controlled by adjusting the incubation time.
- Blunt-ended fragments are ideal for end modification prior to Next-Gen sequencing and for methylated DNA immunoprecipitation (MeDIP), chromatin immunoprecipitation (ChIP), and library construction.

Description

Digestion with dsDNA Shearase™ is the simplest method for DNA fragmentation that circumvents the use of otherwise costly and cumbersome mechanical shearing devices. The enzyme generates blunt-ended DNA fragments of the desired size in a single step. Unlike conventional nebulization procedures, the enzyme is compatible with low volume inputs thus minimizing sample loss. Digested blunt-ended DNA is easily purified in ≥ 10 μl with available DNA Clean & Concentrator™ technology (pp. 37-40) making it ideal for direct use in end modification (linker and adapter) procedures and other manipulations.

Recognition Sites:

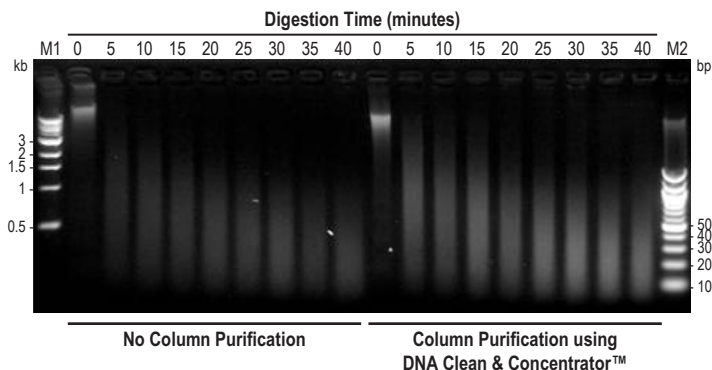
dsDNA Shearase™ recognizes highly degenerate sequences:

(Where N = A or C or G or T, D = A or G or T, and H = A or C or T)



End Product:

DNA fragments generated by dsDNA Shearase™ are blunt-ended and contain a 5'-phosphate and 3'-hydroxyl group at each end.



Time-dependent fragmentation of human genomic DNA by dsDNA Shearase™. Enzymatic activity was assessed by mixing 500 ng of human liver DNA in a 25 μl final reaction volume and incubating at 42°C. The reaction was stopped at time points from 0 to 40 minutes with EDTA or DNA Binding Buffer addition. Fragmented DNA was either analyzed directly or following purification with the DNA Clean & Concentrator™. Analysis was via agarose gel electrophoresis. M1 and M2 are 1 kb and 100 bp markers, respectively (Zymo Research).

Ordering Information

Cat. No.	Product	Size	Price
E2018-50	dsDNA Shearase™	50 U	\$92.00
E2018-200	dsDNA Shearase™	200 U	\$310.00
E2019-50	dsDNA Shearase™ w/ DNA Clean & Concentrator™	50 U + 50 preps.	\$148.00
E2019-200	dsDNA Shearase™ w/ DNA Clean & Concentrator™	200 U + 200 preps.	\$532.00

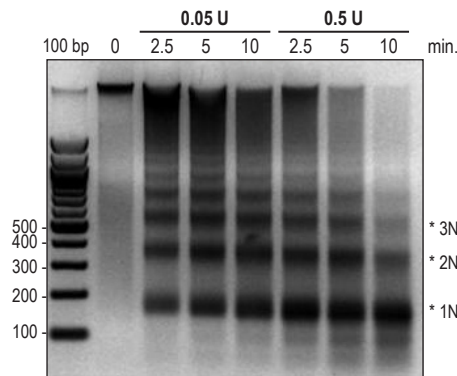
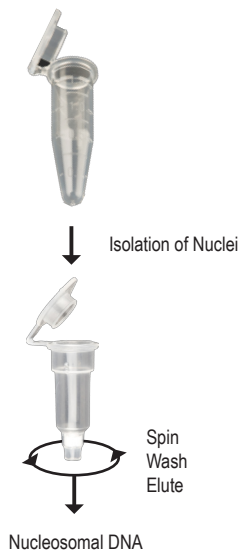
Highlights

- For the isolation of nucleosome-associated DNA from mammalian and yeast cells.
- Ideal for use in nucleosome mapping studies.

Description

The EZ Nucleosomal DNA Prep Kit is a streamlined procedure for the isolation of mammalian and yeast nucleosome-associated DNA. The kit includes procedures and reagents for: cell nuclei isolation, intact nuclei micrococcal nuclease digestion, and nucleosomal DNA purification.

Non-nucleosomal DNA is specifically degraded using micrococcal nuclease and an optimized reaction buffer; while purification of "protected" nucleosome-associated DNA is performed using Zymo Research's proven *Fast-Spin* column technology. The result is pure nucleosomal DNA ready for analysis in less than 30 minutes!



Mammalian Nucleosomal DNA Preparation: Mammalian nuclei prepared as indicated by the Mammalian Nuclei Prep Protocol (see opposing column) was treated with 0.05 and 0.5 U (unit) micrococcal nuclease for the indicated times (min) at 25°C. DNA was subsequently resolved in a 2% agarose gel. 100 bp DNA ladder (Zymo Research). Asterisks (1N, 2N, 3N) represent mono-, di-, and tri-nucleosomal DNAs, respectively.

Application

- Mammalian Cells..... ✓
- Yeast..... ✓
- Nuclei..... ✓

**Specifications**

- Enzyme Concentration..... 0.1 U/μl
- Storage..... -20°C for 12 mo.
- Enzyme Inactivation..... 70°C for 20 min.
- Standard Reaction Time..... 30 min.

Featured Technology

Zymo-Spin™ IIC (p. 145)
Kit D5220

Ordering Information

Cat. No.	Product	Size	Price
D5220	EZ Nucleosomal DNA Prep Kit	20 preps.	\$121.00

FAQs

Q: Should the input DNA be dissolved in TE, water, or some other buffer prior to treatment with Zymo Research's bisulfite kits?

A: Water, TE, or modified TE buffers can be used to dissolve DNA and do not interfere with the conversion process.

Q: At what temperature and for how long can DNA be stored following bisulfite treatment?

A: The sample should be stored at $\leq -20^{\circ}\text{C}$ whenever possible. The quality of the DNA should remain relatively unchanged for up to three months.

Q: Why am I not getting complete conversion of DNA using the EZ DNA Methylation-Direct™ Kit?

A: 1) If sampling solid tissue, then it is most likely that too much sample was processed, resulting in incomplete DNA conversion. 2) If sampling FFPE tissue, then it is probable that the DNA was extensively damaged and/or cross-linked resulting in incomplete DNA conversion. 3) If debris is not removed by centrifugation from the Proteinase K digestion, it may interfere with the bisulfite conversion process resulting in incomplete conversion of the DNA.

Q: Which Taq polymerase(s) do you recommend for PCR amplification of bisulfite-converted DNA?

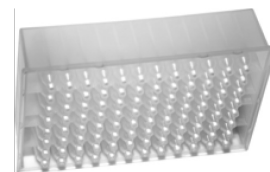
A: We recommend a "hot-start" DNA polymerase (e.g., ZymoTaq™ DNA Polymerase, p. 18).

Q: Why are there two different catalog numbers for the EZ-96 DNA Methylation™ product line?

A: The two different catalog numbers are used to differentiate between the binding plates that are included in the kits. Deep and shallow-well binding plates are available to accommodate most rotors and microplate carriers. The table below shows a comparison of the two binding plates.



Silicon-A™



Zymo-Spin™ I-96

Style	Shallow-well	Deep-well
Dimensions of Binding Plate (H x W x L)	19 mm x 83 mm x 125 mm	35 mm x 83 mm x 125 mm
Height of Binding / Collection Plate Assembly	43 mm	60 mm
Binding Capacity / Minimum Elution Volume	5 μg / 30 μl per well	5 μg / 15 μl per well
Cat. No.	D5003, D5007, D5022, D5027	D5004, D5008, D5023, D5028

Q: Are your bisulfite kits compatible with technologies from Illumina?

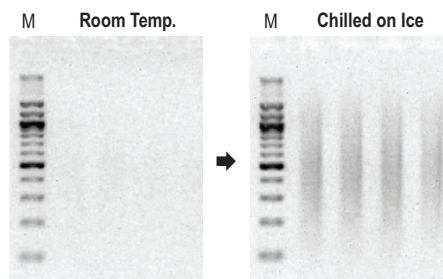
A: Yes. The EZ DNA Methylation™ Kit technologies from Zymo Research are ideal for Illumina's GoldenGate® and Infinium® Assays.

Q: What downstream analytical procedures can be used for DNA bisulfite-converted with the EZ DNA Methylation Kits?

A: DNA converted using any of our EZ DNA Methylation™ kits is ideal for subsequent analysis by canonical sequencing methods, Ms-SNuPE, COBRA, Bisulfite-PCR, MSP, Bisulfite-sequencing, mass spectroscopy (e.g., EpiTYPER® from Sequenom), as well as other methods for analysis.

Visualizing Bisulfite-treated DNA

Bisulfite-treated DNA can be visualized in agarose/EtBr gels following electrophoresis using a standard UV-light source. However, cooling the gel on ice for 10-15 minutes prior to visualization will greatly enhance the resolution and apparent banding of the DNA.



Visualizing bisulfite-treated DNA in agarose/EtBr gels is best done after chilling the gels on ice. In the figures above, bisulfite-treated salmon sperm DNA was desulfonated then purified using the EZ Bisulfite DNA Clean-up Kit™. The DNA, mostly single stranded, was then separated in a 0.8 % (w/v) agarose/TAE/EtBr gel and visualized with a UV-light source immediately following electrophoresis (room temp) and after chilling the gel on ice for 15 minutes. M is a 100 bp DNA ladder (Zymo Research).

Quantifying Bisulfite-treated DNA

Following bisulfite-treatment of genomic DNA, non-methylated cytosine residues are converted into uracil. The recovered DNA is typically A, U, and T-rich. The original base-pairing no longer exists. Instead, it is single stranded with limited non-specific base-pairing at room temperature. The absorption coefficient at 260 nm resembles that of RNA. Use a value of 40 µg/ml for $A_{260} = 1.0$ when determining the concentration of the recovered bisulfite-treated DNA.



PCR of Bisulfite Converted DNA

PCR Primer Design: Generally, primers of 24 to 32 bases are required for amplification of bisulfite-converted DNA. For most eukaryotes, all non-methylated cytosine residues will be converted into uracil during the bisulfite treatment. These Cs should be treated as Ts for primer design purposes. For example, for the sequence 5'-AACCTTACAGGCAC-3', the corresponding primer after bisulfite treatment should be 5'-AATTTTATAGGTAT-3'. MethPrimerDB (<http://medgen.ugent.be/methprimerdb>) and MethPrimer (<http://www.urogene.org/methprimer/index1.html>) are useful resources when designing primers for bisulfite PCR.

If the primer contains CpG dinucleotides with uncertain methylation status, then mixed bases with C and T can be used. Usually, there should be no more than three mixed positions per primer and they should be located toward the 5' end of the primer. It is not recommended to have mixed bases located at the 3' end of the primer.

PCR Conditions: Usually, 35 to 40 cycles are required for successful PCR amplification of bisulfite-converted DNA. Optimal amplicon size is between 150 - 300 bp; however larger amplicons (up to 1 kb) can be generated with optimization of the bisulfite reaction and PCR conditions. We have found that annealing temperatures between 55 - 60°C typically work well. As most non-methylated cytosine residues are converted into uracil, the bisulfite-treated DNA is usually AT-rich and has low GC composition. Thus, it may be necessary to reduce the annealing temperature accordingly.

Non-specific PCR amplification is relatively common with bisulfite-treated DNA due to its AT-rich nature. PCR using hot start polymerases (e.g., Zymo *Taq*™ DNA Polymerase, p. 18) is strongly recommended for the amplification of bisulfite-treated DNA.

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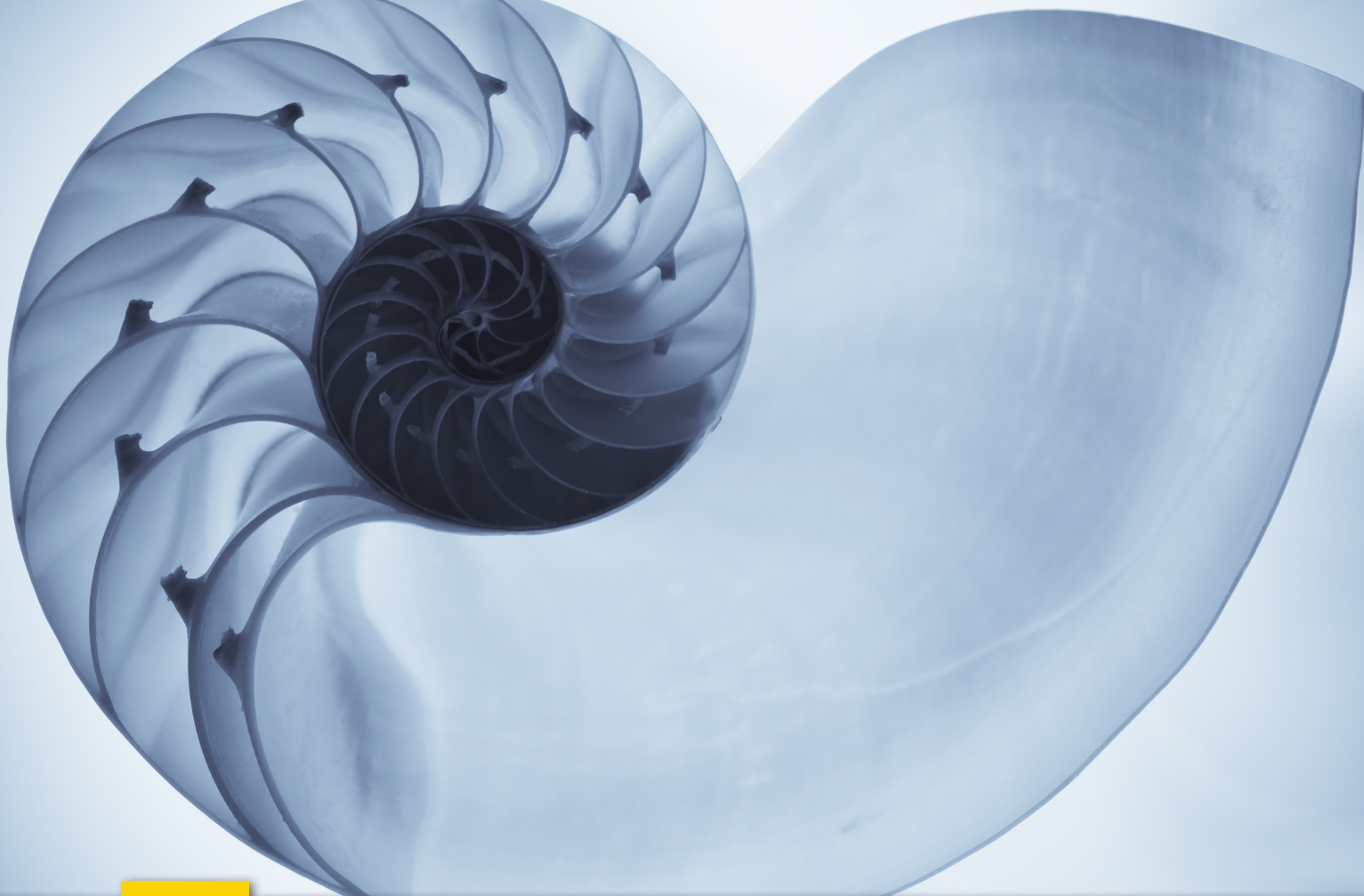
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DNA Purification

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ZR 1 kb DNA Marker™	84

Introduction

Considering DNA Isolation

The fidelity of the method used for the isolation/purification of DNA from biological samples or from reaction mixtures is of critical importance when considering the success of subsequent downstream molecular applications. Many molecular-based applications including PCR, Southern blotting, automated DNA sequencing, microarray, etc., require that the DNA purification procedure result in high yields of high quality DNA. With this considered, the scientists at Zymo Research have developed a range of DNA isolation kits designed for the simple and rapid recovery of high yield, high quality DNA from a diversity of sample sources (see DNA Purification & Isolation Product Guides on following pages).

DNA Fragment Clean-up & Concentration

A variety of DNA kits are available for the rapid desalting, purification, and concentration of DNA from *in vitro* reaction mixtures and cell-free lysates (DNA Clean & Concentrator™ [DCC™] product line, pp. 36-40) or from TAE/TBE buffered agarose gels (Zymoclean™ product line, pp. 45-46). Our scientists pioneered rapid and efficient DNA clean-up and concentration with the development of the DCC™. This family of products presents one of the most efficient and versatile methods for concentrating DNA from a range of sample sources into minimal elution volumes (i.e., ≥ 6 µl). The DCC™ facilitates the removal of DNA polymerases, modifying enzymes, RNA polymerases, ligases, kinases, nucleases, phosphatases, restriction endonucleases, etc., as well as free dNTPs and radiolabeled and fluorescent derivatives. DNA recovered and concentrated using the DCC™ is ideal for use in subsequent sequencing, cloning, ligation, microarray, and endonuclease digestion procedures. Likewise, DNA recovered from agarose gel slices by the Zymoclean™ product line (pp. 45-46) enables the size selection of DNA for subsequent use in sequencing, cloning, PCR, and DNA labeling reactions.

Plasmid DNA Purification

The Zyppy™ plasmid DNA purification kits (pp. 48-51) allow the user to separate plasmid DNA efficiently from chromosomal DNA and cellular RNA in bacterial host cell lysates using procedures that are fast, user-friendly, and reliable when compared to those offered by other suppliers. All of our Zyppy™ kits include color-coded reagents that allow for easy visualization and assessment of bacterial cell lysis and buffer neutralization steps. Also available is the Zymoprep™ line of miniprep kits (p. 55) that allow the user to isolate plasmid DNA from yeast.

Genomic DNA Isolation

Zymo Research offers a range of genomic DNA isolation kits (pp. 41, 56-69) that are suitable for extracting high molecular weight DNA from a wide variety of sample types including tissue, fresh and paraffin-embedded tissue sections, cultured cells, saliva, buccal cells, whole blood, plasma, serum, urine, bacteria, fungi, yeast, algae, viruses, and mitochondria. Our genomic DNA isolation kits yield high quality dsDNA that is ideal for use in downstream applications such as PCR, Southern blotting, endonuclease digestion, and methylation detection. Like our DNA clean-up kits, most of our genomic DNA isolation kits feature *Fast-Spin* column technology which allows for minimal elution volumes and high DNA concentrations.

Environmental DNA Purification

Bead bashing is often required for the efficient processing of tough-to-lyse organisms and environmental samples. Our environmental purification kits feature unique BashingBead™ technology (p. 70-78), which allows isolation of DNA from samples refractory to conventional lysis procedures including tough-to-lyse tissues, soil samples, feces, plants, seeds, food, arthropods, Gram positive and Gram negative bacteria, yeast, filamentous fungi, unicellular and filamentous algae, and protozoa. These products lead to high yield and high quality DNA suitable for downstream applications such as PCR, sequencing, hybridization, restriction digestion, and other enzymatic processes.

DNA/RNA Co-purification

To meet the needs of scientists who wish to extract DNA and RNA from the same source simultaneously, Zymo Research developed a line of DNA/RNA co-purification kits. A scientist can process cells or tissues with the ZR-*Duet*™ DNA/RNA MiniPrep (p. 81) to purify DNA and RNA from the same sample into separate products. The ZR Viral DNA/RNA Kit™ and ZR-96 Viral DNA/RNA Kit™ (p. 83) are for the purification of viral and host DNA and RNA together using blood or cell culture as input. Finally, the ssDNA/RNA Clean & Concentrator™ (p. 82) is an adaptation of our DCC™ product line for cleaning and concentrating mixed ssDNA/RNA samples.

DNA Molecular Weight Markers

The ZR DNA Markers™ (p. 84) are created as defined size fragments that encompass a range of sizes from 50 bp up to 10 kb. This makes DNA size approximation easy for both PCR products as well as plasmid DNAs. The ZR 50 bp DNA Marker™, ranging from 50 bp to 1200 bp, is well within the common range of PCR generated DNA fragments. For larger DNAs, the ZR 100 bp DNA Marker™ and ZR 1 kb DNA Marker™ are appropriate.

	<i>DNA Clean & Concentrator™-5</i>	<i>ZR-96 DNA Clean & Concentrator™-5</i>	<i>DNA Clean & Concentrator™-25</i>	<i>DNA Clean & Concentrator™-100</i>	<i>DNA Clean & Concentrator™-500</i>	<i>Genomic DNA Clean & Concentrator™</i>	<i>ZR-96 DNA Clean-up Kit™</i>
Specifications							
Format	Spin Column	96-Well ⁶	Spin Column	Spin Column	Spin Column	Spin Column	96-Well ⁷
Binding Capacity	5 µg/prep.	5 µg/well	25 µg/prep.	100 µg/prep.	500 µg/prep.	10 µg/prep.	5 µg/well
Elution Volume	≥ 6 µl	≥ 10 µl/well	≥ 25 µl	≥ 150 µl	≥ 2 ml	≥ 10 µl	≥ 30 µl
Processing Time	2 min.	15 min.	2 min.	15 min.	25 min.	5 min.	10 min.
Application							
PCR Clean-up	✓	✓	✓	✓	✓	✓	✓
Large-sized DNA Clean-up						✓	
Sequencing DNA Clean-up							
Dye Terminator Removal ¹							
Enzyme Removal ²	✓	✓	✓	✓	✓	✓	✓
Nucleotide/Dye Removal ³	✓	✓	✓	✓	✓	✓	✓
cDNA/ssDNA Purification ⁴	✓	✓	✓	✓	✓	✓	✓
Probe Purification ⁵	✓	✓	✓	✓	✓	✓	✓
Lysate DNA Clean-up	✓	✓	✓	✓	✓	✓	✓
M13 Phage	✓	✓	✓	✓	✓	✓	✓
DNA From Agarose Gel Slices							
Large-Sized DNA from Agarose Gel Slices							
PCR Inhibitor Removal ⁸							
Page Number	37	37	38	39	40	41	42

¹ Compatible with BigDye® Terminator chemistries (v.1.1, v.3.1) from Applied Biosystems and similar dye terminator sequencing chemistries.

² Efficient removal of: DNA polymerases, modifying enzymes, RNA polymerases, ligases, kinases, nucleases, phosphatases, restriction endonucleases, etc.

³ Efficient removal of free dNTPs and their analogs including fluorescent and radiolabelled derivatives. These include AMCA, FITC, BIO, DIG, DNP, Alexa, Cy-dyes, etc.

⁴ cDNA/ssDNA purification with modification (see protocol for specifications). cDNA preparation for microarray (e.g., Cy-dye and Cy-dNTP removal).

⁵ Probe purification of dsDNA ≥ 50 bp.

⁶ Deep-well Plate (Zymo-Spin™ I-96 plate, see page 150)

⁷ Shallow-well Plate (Silicon-A™ plate; see page 149)

⁸ Removal of polyphenolic substances that can inhibit PCR, including: humic and fulvic acids, tannins, melanin, bilirubin, etc.

	<i>ZR DNA Sequencing Clean-up Kit™</i>	<i>ZR-96 DNA Sequencing Clean-up Kit™</i>	<i>OneStep™ PCR Inhibitor Removal Kit</i>	<i>OneStep-96™ PCR Inhibitor Removal Kit</i>	<i>ZymoClean™ Gel DNA Recovery Kit</i>	<i>ZR-96 ZymoClean™ Gel DNA Recovery Kit</i>	<i>ZymoClean™ Large Fragment DNA Recovery Kit</i>
Specifications							
Format	Spin Column	96-Well ⁷	Spin Column	96-Well ⁷	Spin Column	96-Well ⁶	Spin Column
Binding Capacity	5 µg/prep.	5 µg/well			5 µg/prep.	5 µg/well	10 µg/prep.
Elution Volume	≥ 6 µl	≥ 15 µl	50 - 200 µl	50 - 100 µl	≥ 6 µl	≥ 15 µl	≥ 10 µl
Processing Time	2 min.	10 min.	5 min.	10 min.	15 min.	20 min.	15 min.
Application							
PCR Clean-up							
Large-sized DNA Clean-up							
Sequencing DNA Clean-up	✓	✓					
Dye Terminator Removal ¹	✓	✓					
Enzyme Removal ²	✓	✓					
Nucleotide/Dye Removal ³	✓	✓					
cDNA/ssDNA Purification ⁴							
Probe Purification ⁵							
Lysate DNA Clean-up							
M13 Phage							
DNA From Agarose Gel Slices					✓	✓	
Large-Sized DNA from Agarose Gel Slices							✓
PCR Inhibitor Removal ⁶			✓	✓			
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Technology Overview: DNA Clean & Concentrator™

Zymo Research pioneered rapid, efficient DNA clean-up and concentration with the introduction of its DNA Clean & Concentrator™ (DCC™) product line. Since its inception, the DCC™ family of products has evolved into one of the most efficient and versatile methods for concentrating DNA from a range of sample sources into minimal elution volumes (i.e., ≥ 6 µl). DNA is effectively desalted and concentrated from PCR, endonuclease digestions, DNA modification reactions, isotope/fluorescence labeling reactions, etc. The DCC™ kits facilitate the removal of DNA polymerases, modifying enzymes, RNA polymerases, ligases, kinases, nucleases, phosphatases, and restriction endonucleases. Also removed are free dNTPs and their analogs including radiolabeled and fluorescent derivatives. DNA recovered and concentrated using the DCC™ kits are ideal for use in subsequent sequencing, cloning, ligation, microarray, and endonuclease digestion procedures. The DCC™ kits are available as DCC™-5, DCC™-25, DCC™-100, and DCC™-500 formats that are based on the maximal DNA binding capacities (in micrograms) per column treatment. The DCC™-5 is available in both capped and uncapped column formats as well as in a high output 96-well filtration plate format. Also, the Genomic DNA Clean & Concentrator™ is available for rapid clean-up of large-sized DNA (≤ 200 kb) making it ideal for genomic DNA clean-up (post-Proteinase K digestion).

6 µl elution volume, 2 minute procedure, 0 µl retention volume

For DCC™-5 Kit

Single Column Format

DCC™-5



DCC™-5



DCC™-25



DCC™-25



DCC™-100



DCC™-500



Genomic DCC™



Name	Zymo-Spin™ I	Zymo-Spin™ IC	Zymo-Spin™ II	Zymo-Spin™ IIC	Zymo-Spin™ V	Zymo-Spin™ VI	Zymo-Spin™ IC-XL
Binding Cap.	5 µg / prep.	5 µg / prep.	25 µg / prep.	25 µg / prep.	100 µg / prep.	500 µg / prep.	10 µg / prep.
Elution Vol.	≥ 6 µl	≥ 6 µl	≥ 25 µl	≥ 25 µl	≥ 150 µl	≥ 2 ml	≥ 10 µl
Kits	D4003, D4004	D4013, D4014	D4005, D4006	D4033, D4034	D4029, D4030	D4031, D4032	D4010, D4011

96-well Format

ZR-96 DCC™-5



ZR-96 DNA Clean-up Kit™



Name	Zymo-Spin™ I-96 Plate	Silicon-A™ Plate
Binding Cap.	5 µg/well	5 µg/well
Elution Vol.	10 µl	30 µl
Dimensions (H x W x L)	35 mm x 83 mm x 125 mm	19 mm x 83 mm x 125 mm
Binding + Collection Plate Height	60 mm	43 mm
Kits	D4023, D4024	D4017, D4018

Highlights

- Clean and concentrate up to 5 µg DNA with ≥ 6 µl elution volume in as little as two minutes with 0 µl wash residue carryover.
- Column and deep-well filtration plate designs allow DNA to be eluted at high concentrations into minimal volumes of water or TE buffer.

Description

The DNA Clean & Concentrator™-5 and ZR-96 DNA Clean & Concentrator™-5 products provide purification of up to 5 µg DNA from PCR, endonuclease digestions, DNA modification reactions, isotope/fluorescence labeling reactions, etc. The products facilitate the removal of DNA polymerases, modifying enzymes, RNA polymerases, ligases, kinases, nucleases, phosphatases, and restriction endonucleases, as well as free dNTPs and their analogs including radiolabeled and fluorescent derivatives. Eluted DNA is suitable for PCR, arrays, ligation, sequencing, etc.

Up to 5 µg DNA + Binding Buffer

OR

Spin Wash Elute

Ultra-pure DNA for...

- ✓ Sequencing
- ✓ DNA Ligation
- ✓ Endonuclease Digestion, etc.

Clean & Concentrated DNA. DNA samples, such as the PCR products shown here, can be efficiently purified and concentrated using the DNA Clean & Concentrator™-5.

Application

- PCR Clean-up..... ✓
- Enzyme Removal..... ✓
- Nucleotide/Dye Removal..... ✓
- cDNA/ssDNA Purification..... ✓
- Probe Purification..... ✓
- Lysate DNA Clean-up..... ✓
- M13 Phage..... ✓

Specifications

Binding Capacity..... 5 µg/prep.
 DNA Size Limits..... 50 bp - 23 kb

DNA Clean & Concentrator™-5

Format..... Spin Column
 Elution Volume..... ≥ 6 µl
 Processing Time..... 2 min.

ZR-96 DNA Clean & Concentrator™-5

Format..... 96-Well
 Elution Volume..... ≥ 10 µl
 Processing Time..... 15 min.

Featured Technologies



Zymo-Spin™ I (p. 145)
 Kits D4003, D4004



Zymo-Spin™ IC (p. 145)
 Kits D4013, D4014



Zymo-Spin™ I-96 Plate (p. 150)
 Kits D4023, D4024

Ordering Information

Cat. No.	Product	Size	Price
D4003	DNA Clean & Concentrator™-5 (uncapped)	50 preps.	\$65.00
D4004	DNA Clean & Concentrator™-5 (uncapped)	200 preps.	\$231.00
D4013	DNA Clean & Concentrator™-5 (capped)	50 preps.	\$65.00
D4014	DNA Clean & Concentrator™-5 (capped)	200 preps.	\$231.00
D4023	ZR-96 DNA Clean & Concentrator™-5	2 x 96 preps.	\$189.00
D4024	ZR-96 DNA Clean & Concentrator™-5	4 x 96 preps.	\$368.00

Application

- PCR Clean-up ✓
- Enzyme Removal..... ✓
- Nucleotide/Dye Removal..... ✓
- cDNA/ssDNA Purification..... ✓
- Probe Purification..... ✓
- Lysate DNA Clean-up..... ✓
- M13 Phage..... ✓



Specifications

- Format..... Spin Column
- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 25 µl
- DNA Size Limits..... 50 bp - 23 kb
- Processing Time..... 2 min.

Featured Technologies



Zymo-Spin™ II (p. 145)
Kits D4005, D4006



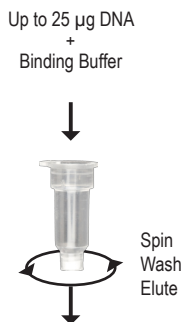
Zymo-Spin™ IIC (p. 145)
Kits D4033, D4034

Highlights

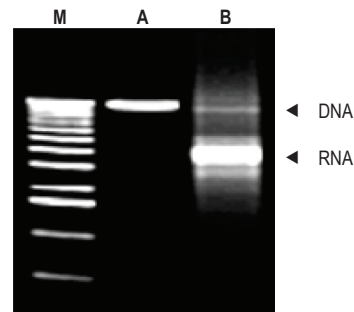
- Quick (2 minute) desalting and recovery of ultra-pure DNA from enzymatic reactions (e.g., PCR and endonuclease digestions), cell-free lysates, etc.
- Column design allows DNA to be eluted at high concentrations into minimal volumes.

Description

The DNA Clean & Concentrator™-25 (DCC™-25) is designed for rapid desalting and purification of up to 25 µg DNA from enzymatic reactions (e.g., PCR), endonuclease digestions, or cell-free lysates. Simply add the specially formulated DNA Binding Buffer to your sample and transfer to the supplied Zymo-Spin™ column. The product features *Fast-Spin* column technology to yield high-quality, purified DNA in just minutes, and it is compatible with cDNA and ssDNA. Eluted DNA is suitable for sequencing, microarray analysis, PCR, nucleotide blotting, and restriction endonuclease digestion procedures.



- Ultra-pure DNA for...**
- ✓ Sequencing
 - ✓ DNA Ligation
 - ✓ Endonuclease Digestion, etc.



The DNA Clean & Concentrator™ yields high quality DNA for efficient transcription reactions. Lanes: M: 1 kb Marker; A: DNA template purified using the DNA Clean & Concentrator™; B: a 7 kb RNA transcript generated *in vitro* from A.

Ordering Information

Cat. No.	Product	Size	Price
D4005	DNA Clean & Concentrator™-25 (uncapped)	50 preps.	\$65.00
D4006	DNA Clean & Concentrator™-25 (uncapped)	200 preps.	\$231.00
D4033	DNA Clean & Concentrator™-25 (capped)	50 preps.	\$65.00
D4034	DNA Clean & Concentrator™-25 (capped)	200 preps.	\$231.00

Highlights

- Simple, rapid recovery of ultra-pure DNA from PCR, endonuclease digestions, and cell-free DNA preps., etc.
- Unique column construction allows sample loading and washing to be performed using a centrifuge, microcentrifuge, vacuum source, or syringe.

Description

The DNA Clean & Concentrator™-100 (DCC™-100) is designed for the rapid desalting and purification of up to 100 µg of high quality DNA from PCR, large format restriction endonuclease digestions, or cell-free lysates. Eluted DNA is suitable for nucleotide sequencing, array analysis, PCR, nucleotide blotting, restriction endonuclease digestion procedures, as well as many other downstream applications requiring high quality DNA. The entire DNA purification/concentration procedure typically takes less than 20 minutes and can be performed using a syringe, centrifuge or vacuum source together with a microcentrifuge.

Loading and washing the Zymo-Spin™ V Column can be performed using any combination of the following:



Syringe



Centrifuge



Vacuum

Elute DNA Using a Microcentrifuge



- Ultra-pure DNA for...**
- ✓ Sequencing
 - ✓ DNA Ligation
 - ✓ Endonuclease Digestion, etc.

Application

- PCR Clean-up..... ✓
- Enzyme Removal..... ✓
- Nucleotide/Dye Removal..... ✓
- cDNA/ssDNA Purification..... ✓
- Probe Purification..... ✓
- Lysate DNA Clean-up..... ✓
- M13 Phage..... ✓



Specifications

- Format..... Spin Column
- Binding Capacity..... 100 µg/prep.
- Elution Volume..... ≥ 150 µl
- DNA Size Limits..... 50 bp - 23 kb
- Processing Time..... 15 min.

Featured Technology



Zymo-Spin™ V (p.147)
Kits D4029, D4030

Ordering Information

Cat. No.	Product	Size	Price
D4029	DNA Clean & Concentrator™-100	25 preps.	\$86.00
D4030	DNA Clean & Concentrator™-100	50 preps.	\$149.00

Application

- PCR Clean-up..... ✓
- Enzyme Removal..... ✓
- Nucleotide/Dye Removal..... ✓
- cDNA/ssDNA Purification..... ✓
- Probe Purification..... ✓
- Lysate DNA Clean-up..... ✓
- M13 Phage..... ✓



Specifications

- Format..... Spin Column
- Binding Capacity..... 500 µg/prep.
- Elution Volume..... ≥ 2 ml
- DNA Size Limits..... 50 bp - 23 kb
- Processing Time..... 25 min.

Featured Technology



Zymo-Spin™ VI (p. 147)
Kits D4031, D4032

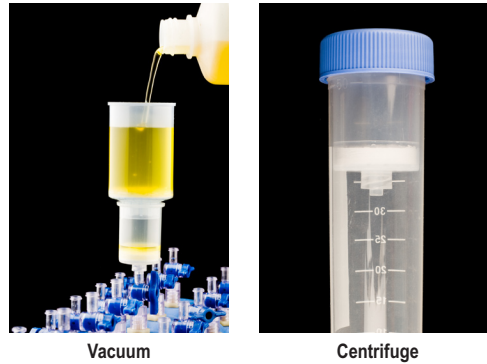
Highlights

- Simple, rapid recovery of ultra-pure DNA from large-scale sample sources.
- Unique column construction allows sample washing to be performed using a centrifuge or vacuum source.
- Column design allows DNA to be eluted at high concentrations into minimal volumes.

Description

The DNA Clean & Concentrator™-500 (DCC™-500) is our highest capacity DNA Clean & Concentrator™ product. It is designed for the rapid, large format purification and concentration of up to 500 µg of high quality DNA from samples such as large-scale restriction endonuclease digestions and crude DNA preparations. Eluted DNA is well suited for use in PCR, DNA sequencing, DNA transfection, DNA ligation, endonuclease digestion, RNA transcription, radiolabeling, etc. The entire DNA purification/concentration procedure typically takes less than 20 minutes.

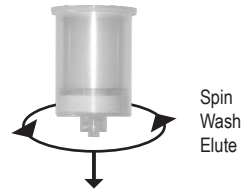
Loading and washing the Zymo-Spin VI™ Column can be performed using any combination of the following methods.



Vacuum

Centrifuge

Elute DNA
Using a Centrifuge



Ultra-pure DNA for...

- ✓ Sequencing
- ✓ Transfection
- ✓ Endonuclease Digestion
- ✓ Cloning, etc.

Ordering Information

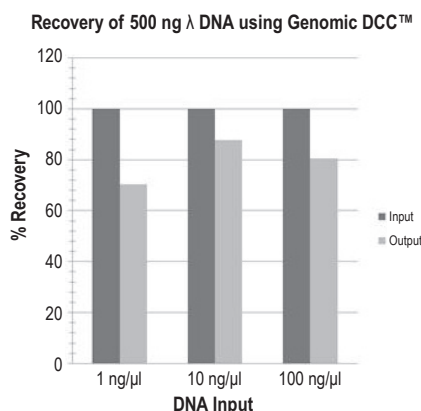
Cat. No.	Product	Size	Price
D4031	DNA Clean & Concentrator™-500	10 preps.	\$65.00
D4032	DNA Clean & Concentrator™-500	20 preps.	\$116.00

Highlights

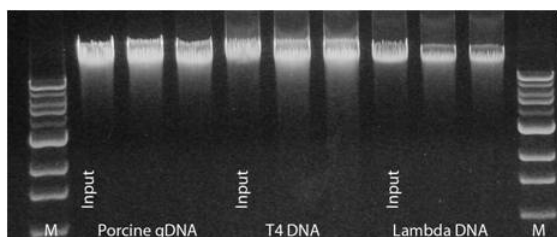
- Quick (5 minute) clean-up of large-sized DNA from any enzymatic reaction or impure preparation without messy precipitations.
- Unique spin column for low volume (≥ 10 µl) elution of ultra-pure, high-yield DNA.
- Eluted DNA is ideal for PCR, endonuclease digestion, sequencing, etc.

Description

The Genomic DNA Clean & Concentrator™ (Genomic DCC™) is for the quick (5 minute) recovery of ultra-pure, large-sized DNA from any enzymatic reaction or impure preparation (e.g., Proteinase K digestion). This includes genomic, mitochondrial, BAC/PAC, viral, phage, (wga)DNA, etc. There is no need for organic denaturants, chloroform, or messy precipitations: simply add the specially formulated ChIP DNA Binding Buffer to a sample and then transfer the mixture to the supplied Zymo-Spin™ Column. Eluted DNA is suitable for sequencing, PCR, endonuclease digestion, and other enzymatic procedures. The product is also compatible with smaller DNAs (50 bp to 10 kb) from PCR, digestions, crude plasmid preparations, cDNA synthesis, etc.



Phage DNA Recovery. λ DNA (48.5 kb) is effectively recovered from 10-fold concentrations of starting material using the Genomic DCC™.



High molecular weight DNA is efficiently purified using the Genomic DCC™. Porcine gDNA (~35-50 kb), T4 phage DNA (170 kb), and λ DNA (48.5 kb) were purified (in duplicate) from input material using the Genomic DCC™. Eluted DNAs were analyzed in a 0.8% (w/v) TAE/agarose/EtBr gel (shown above). The size marker "M" is a 1 kb ladder (Zymo Research).

Application

- Large-sized DNA Clean-up..... ✓
- PCR Clean-up..... ✓
- Enzyme Removal..... ✓
- Nucleotide/Dye Removal..... ✓
- cDNA/ssDNA Purification..... ✓
- Probe Purification..... ✓
- Lysate DNA Clean-up..... ✓
- M13 Phage..... ✓

Specifications

- Format..... Spin Column
- Binding Capacity..... 10 µg/prep.
- Elution Volume..... ≥ 10 µl
- DNA Size Limits..... ≥ 50 bp to > 200 kb
- Processing Time..... 5 min.

Featured Technology



Zymo-Spin™ IC-XL Kits D4010, D4011

Ordering Information

Cat. No.	Product	Size	Price
D4010	Genomic DNA Clean & Concentrator™	25 preps.	\$72.00
D4011	Genomic DNA Clean & Concentrator™	100 preps.	\$251.00

ZR-96 DNA Clean-up Kit™

Application

PCR Clean-up.....	✓
Enzyme Removal.....	✓
Nucleotide/Dye Removal.....	✓
cDNA/ssDNA Purification.....	✓
Probe Purification.....	✓
Lysate DNA Clean-up.....	✓
M13 Phage.....	✓



Specifications

Format.....	96-Well
Binding Capacity.....	5 µg/well
Elution Volume.....	≥ 30 µl
DNA Size Limits.....	50 bp - 23 kb
Processing Time.....	10 min.

Featured Technology



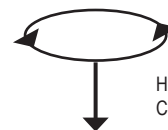
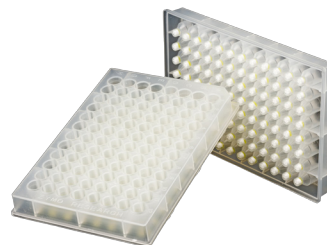
Silicon-A™ Plate (p. 149)
Kits D4017, D4018

Highlights

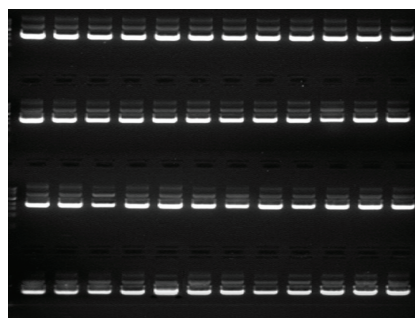
- Quick (20 minute), large-scale recovery of ultra-pure DNA from PCR, endonuclease digestions, cell-free lysates, etc.
- Eluted DNA is well suited for use in PCR, DNA sequencing, DNA ligation, endonuclease digestion, RNA transcription, radiolabeling, etc.

Description

The ZR-96 DNA Clean-up Kit™ provides for rapid, large-scale (96-well) purification and concentration of high-quality DNA from PCR samples, endonuclease digestions, or crude plasmid preparations. Simply add the specially formulated DNA Binding Buffer to your samples and transfer to the wells of the supplied Silicon-A™ Plate. There is no need for organic denaturants or chloroform. Instead, the product features *Fast-Spin* plate technology to yield high-quality, purified DNA in just minutes.



High-Throughput DNA
Clean-up and Concentration



High-throughput DNA processing. Crude preparations of a 3 kb plasmid DNA from bacterial lysates were processed using the ZR-96 DNA Clean-up Kit™. Following elution from the plate, 48 samples were then separated in a 0.8% (w/v) agarose gel.

Ordering Information

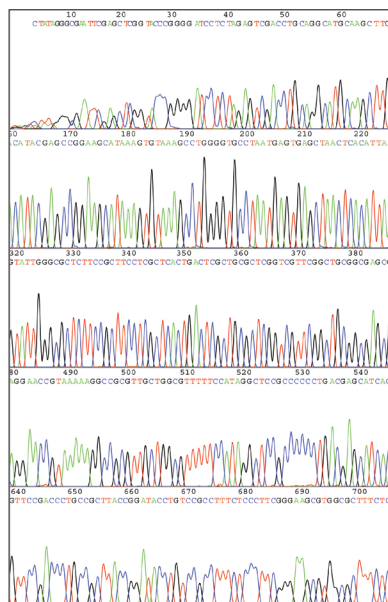
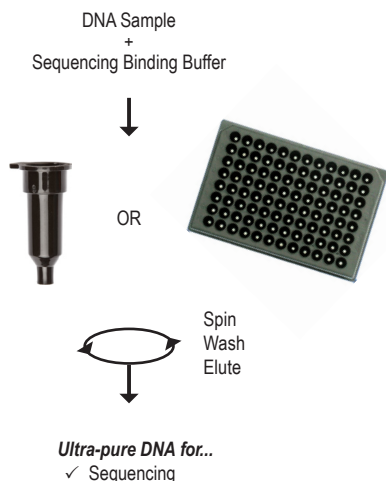
Cat. No.	Product	Size	Price
D4017	ZR-96 DNA Clean-up Kit™	2 x 96 preps.	\$189.00
D4018	ZR-96 DNA Clean-up Kit™	4 x 96 preps.	\$368.00

Highlights

- Complete elimination of “Dye Blobs” for high quality Phred scores and long read lengths.
- Flexible 6 - 20 µl elution volumes allow for direct loading of samples with no precipitation or drying steps.
- *Reusable!*

Description

The ZR DNA Sequencing Clean-up Kit™ and ZR-96 DNA Sequencing Clean-up Kit™ provide simple methods for the rapid removal of post-cycle sequencing reaction contaminants (i.e., unincorporated fluorescent dyes, residual salts, dNTPs, primers, and enzymes) from DNA extension products. These contaminants can often interfere with the quality and signal strength of sequencing data. In particular, unincorporated dyes can result in dye peaks (“dye blobs”) which may obscure portions of the sequencing chromatogram and interfere with base-calling accuracy of sequencing analysis software. DNA is eluted with a small volume of water or loading dye containing formamide. The entire DNA purification procedure typically takes about 2 minutes.



Sequencing chromatogram of pGEM® DNA generated using an ABI 3730xl DNA analyzer. DNA was labeled with ABI BigDye v3.1 Terminators and cleaned using the ZR DNA Sequencing Clean-up Kit™.

Application

- Sequencing DNA Clean-up..... ✓
- Dye Terminator Removal..... ✓
- Enzyme Removal..... ✓
- Nucleotide/Dye Removal..... ✓



Specifications

ZR DNA Sequencing Clean-up Kit™

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 6 µl
- Processing Time..... 2 min.

ZR-96 DNA Sequencing Clean-up Kit™

- Format..... 96-Well
- Binding Capacity..... 5 µg/well
- Elution Volume..... ≥ 15 µl
- Processing Time..... 10 min.

Featured Technologies



Zymo-Spin™ IB (p. 145)
Kits D4050, D4051



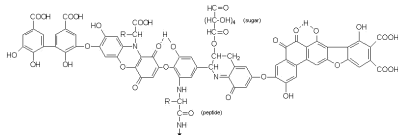
Zymo-Spin™ IB-96 Plate (p. 150)
Kits D4052, D4053

Ordering Information

Cat. No.	Product	Size	Price
D4050	ZR DNA Sequencing Clean-up Kit™	50 preps.	\$82.00
D4051	ZR DNA Sequencing Clean-up Kit™	200 preps.	\$241.00
D4052	ZR-96 DNA Sequencing Clean-up Kit™	2 x 96 preps.	\$132.00
D4053	ZR-96 DNA Sequencing Clean-up Kit™	4 x 96 preps.	\$272.00

Application

- Polyphenolic PCR Inhibitor Removal from DNA ✓
- Polyphenolic RT Inhibitor Removal from RNA ✓



Chemical Structure of Humic Acid

Specifications

Binding Capacity..... Variable
 DNA (RNA) Recovery..... 50 - 90%

OneStep™ PCR Inhibitor Removal Kit

Format..... Spin Column
 Elution Volume..... 50 - 200 µl
 Processing Time..... 5 min.

OneStep-96™ PCR Inhibitor Removal Kit

Format..... 96-Well
 Elution Volume..... 50 - 100 µl
 Processing Time..... 10 min.

Featured Technologies



Zymo-Spin™ IV-HRC (p. 146)
 Kit D6030



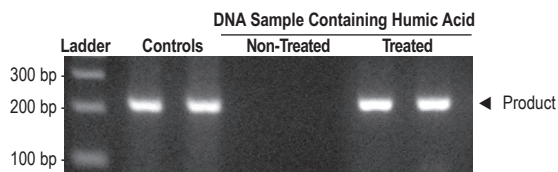
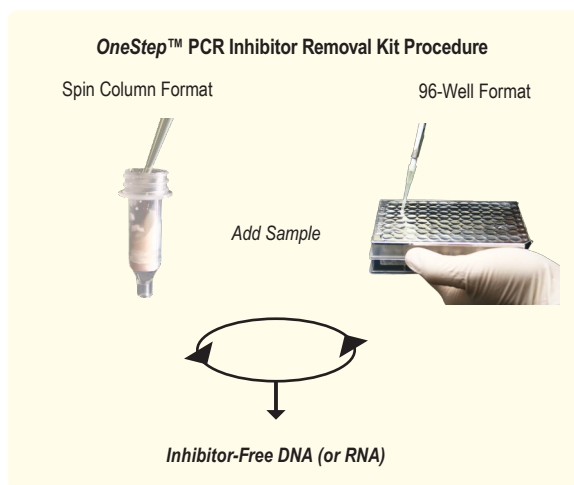
Silicon-A™-HRC Plate (p. 150)
 Kit D6035

Highlights

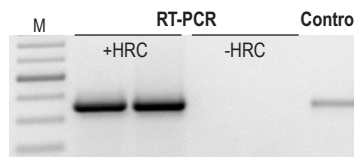
- Removes PCR inhibitors such as polyphenolics, humic/fulvic acids, tannins, melanin, etc. from nucleic acid solutions to yield high quality DNA or RNA.
- Fast, one-step procedure for cleaning impure samples prior to PCR, sequencing, reverse transcription (RT), etc.

Description

The *OneStep™* and *OneStep-96™* PCR Inhibitor Removal Kits contain all the components needed for efficient removal of contaminants that can inhibit downstream enzymatic reactions (e.g. PCR and RT) from DNA and RNA preparations. The column/plate matrices have been specifically designed for the efficient removal of polyphenolic compounds, humic/fulvic acids, tannins, melanin, etc. from the most impure DNA and RNA preparations. Sample clean-up is as simple as applying, spinning, and recovering a sample from the column or plate.



DNA is efficiently amplified by PCR following humic acid removal with the *OneStep™* PCR Inhibitor Removal Kit. The figure shows amplification of a 200 bp product from DNA containing humic acid that was treated with the kit. Alternatively, PCR amplification was completely inhibited in the case of the non-treated sample. In each case, equal amounts of DNA were used for each PCR and equivalent amounts of the reaction were then analyzed in a 2.0% (w/v) agarose/TAE/EtBr gel. The ladder is a 100 bp DNA marker (Zymo Research). Hot start PCR was performed using ZymoTaq™ PreMix (Zymo Research).



PCR amplification of an eukaryotic transcript (post-RT): Total RNA isolated from sludge with or without inclusion of the Zymo-Spin™ IV-HRC Spin Filter. M is a 1 kb DNA Marker (Zymo Research).

Ordering Information

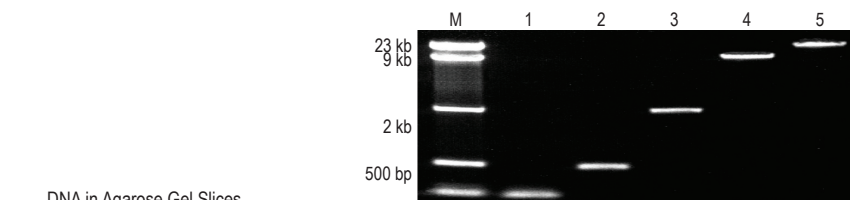
Cat. No.	Product	Size	Price
D6030	OneStep™ PCR Inhibitor Removal Kit	50 preps.	\$97.00
D6035	OneStep-96™ PCR Inhibitor Removal Kit	2 x 96 preps.	\$297.00

Highlights

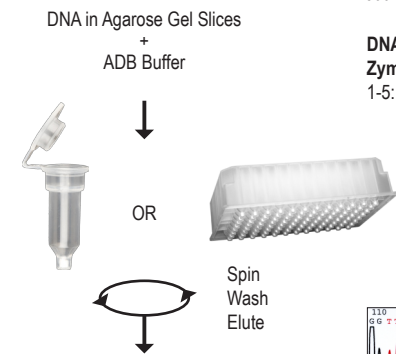
- Quick (15 minute) recovery of ultra-pure DNA from agarose gels.
- Column design permits DNA elution at high concentrations into minimal volumes (≥ 6 µl).
- Eluted DNA is well suited for use in DNA ligation, sequencing, labeling, PCR, etc.

Description

The Zymoclean™ Gel DNA Recovery and ZR-96 Zymoclean™ Gel DNA Recovery Kits provide for the rapid purification of high quality DNA from TAE/TBE-buffered agarose gels. The products feature *Fast-Spin* technology to yield high-quality, purified DNA in just minutes. DNA purified using the Zymoclean™ Gel DNA Recovery kits are perfectly suited for use in DNA ligation reactions, sequencing, DNA labeling reactions, PCR, etc.

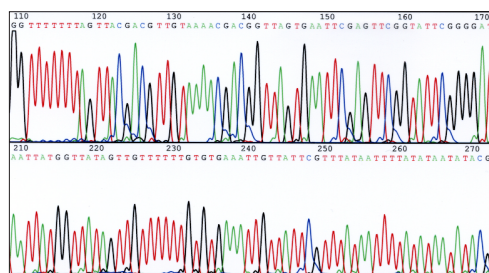


DNA fragments recovered from an agarose gel using the Zymoclean™ Gel DNA Recovery Kit. Lanes: M: DNA Ladder; 1-5: individual ladder DNA fragments.



Ultra-pure DNA for...

- ✓ Sequencing
- ✓ DNA Ligation
- ✓ Endonuclease Digestion, etc.



DNA sequencing chromatogram of a PCR product recovered using the Zymoclean™ Gel DNA Recovery Kit. DNA was recovered from a 2% (w/v) agarose gel and used directly for sequencing.

Ordering Information

Cat. No.	Product	Size	Price
D4001	Zymoclean™ Gel DNA Recovery Kit (uncapped)	50 preps.	\$ 69.00
D4002	Zymoclean™ Gel DNA Recovery Kit (uncapped)	200 preps.	\$ 260.00
D4007	Zymoclean™ Gel DNA Recovery Kit (capped)	50 preps.	\$ 72.00
D4008	Zymoclean™ Gel DNA Recovery Kit (capped)	200 preps.	\$ 272.00
D4021	ZR-96 Zymoclean™ Gel DNA Recovery Kit	2 x 96 preps.	\$ 189.00
D4022	ZR-96 Zymoclean™ Gel DNA Recovery Kit	4 x 96 preps.	\$ 368.00

Application

DNA From Agarose Gel Slices..... ✓



Specifications

Binding Capacity..... 5 µg/prep.
 DNA Size Limits..... 50 bp - 23 kb

Zymoclean™ Gel DNA Recovery

Format..... Spin Column
 Elution Volume..... ≥ 6 µl
 Processing Time..... 15 min.

ZR-96 Zymoclean™ Gel DNA Recovery

Format..... 96-Well
 Elution Volume..... ≥ 15 µl
 Processing Time..... 20 min.

Featured Technologies



Zymo-Spin™ I (p. 145)
 Kits D4001, D4002



Zymo-Spin™ IC (p. 145)
 Kits D4007, D4008



Zymo-Spin™ I-96 Plate (p. 150)
 Kits D4021, D4022

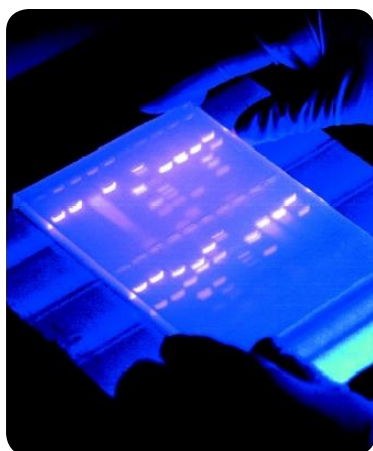
Zymoclean™ Large Fragment DNA Recovery Kit

2

DNA Purification

Application

Large-sized DNA From Agarose Gel Slices.... ✓



Specifications

Format..... Spin Column
Binding Capacity..... 10 µg/prep.
Elution Volume..... ≥ 10 µl
DNA Size Limits..... ≥ 50 bp to > 200 kb
Processing Time..... 15 min.

Featured Technology



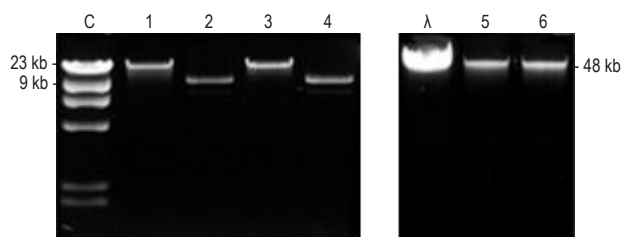
Zymo-Spin™ IC-XL
Kits D4045, D4046

Highlights

- Quick (15 minute) recovery of large-sized DNA (e.g., genomic, plasmid [BAC/PAC], viral, phage, etc.) from agarose gels.
- Unique column design for low volume (≥ 10 µl) elution of ultra-pure, high-yield DNA.
- Eluted DNA is well suited for use in endonuclease digestion, sequencing, labeling, PCR, etc.

Description

The Zymoclean™ Large Fragment DNA Recovery Kit provides a streamlined method for the rapid purification and concentration of high-quality large-sized DNA from agarose gels. Simply add the specially formulated Agarose Dissolving Buffer (ADB) to the gel slice containing a DNA sample, let dissolve, and then transfer to the supplied Zymo-Spin™ IC-XL Column. There is no need for organic denaturants or chloroform. Instead, the product utilizes unique spin column technology to yield high-quality, purified DNA in just minutes. DNA purified using the Zymoclean™ Large Fragment DNA Recovery Kit is ideal for PCR, sequencing, endonuclease digestion, ligation, etc. The entire procedure typically takes about 15 minutes.



Recovery of large DNA fragments. The Zymoclean™ Large Fragment DNA Recovery Kit was used to recover λ DNA digested with HindIII and separated by agarose gel electrophoresis. Lane C: λ-HindIII digest; lanes 1 & 3: recovered 23 kb λ-HindIII fragments; lanes 2 & 4: recovered 9 kb λ-HindIII fragments. Lane λ: intact λ phage DNA; lanes 5, 6: intact λ ~48 kb bands.

Ordering Information

Cat. No.	Product	Size	Price
D4045	Zymoclean™ Large Fragment DNA Recovery Kit	25 preps.	\$72.00
D4046	Zymoclean™ Large Fragment DNA Recovery Kit	100 preps.	\$251.00

Zyppy™ Plasmid Miniprep Kit

Zyppy™ Plasmid Midiprep Kit

Zyppy™ Plasmid Maxiprep Kit

ZR Plasmid Miniprep™_Classic

ZR Plasmid Gigaprep Kit

ZR BAC DNA Miniprep Kit

Zymoprep™ Yeast Plasmid Miniprep I

Zymoprep™ Yeast Plasmid Miniprep II

Specifications								
Format	Spin Column	Spin Column	Spin Column	Spin Column	Affinity Beads, Spin Column	Spin Column	Isopropanol Precipitation	Spin Column
Binding Capacity	25 µg/prep.	125 µg/prep.	500 µg/prep.	25 µg/prep.	Scalable	10 µg/prep.		5 µg/prep.
Elution Volume	≥ 30 µl	≥ 150 µl	≥ 2 ml	≥ 30 µl	≥ 3 ml	≥ 10 µl	≥ 35 µl	≥ 10 µl
Pellet-free ¹ - Direct Culture Input	✓	✓						
Colored Buffers ²	✓	✓	✓	✓	✓	✓		
Culture Input	600 µl - 3 ml	6 - 35 ml	up to 150 ml	500 µl - 5 ml	1,000 ml	500 µl - 5 ml	0.5-1 ml	0.1-1.5 ml
Endotoxin-Free ³	✓	✓	✓	✓	✓	✓		
Typical Yield	2-15 µg	20-100 µg	up to 500 µg	Up to 25 µg	2 - 25 mg	up to 10 µg	Variable	Variable
Product Quality	Cloning, Sequencing, Transfection	Cloning, Sequencing, Transfection	Cloning, Sequencing, Transfection	Cloning, Sequencing, Transfection	Cloning, Sequencing, Transfection	PCR, Sequencing, Transfection	PCR, Transformation, Hybridization	PCR, Transformation, Hybridization
Processing Time	8 min.	15 min.	30 min.	15 min.	60 - 75 min.	15 min.	35 - 90 min.	35 - 90 min.
Application								
Plasmid Recovery From <i>E. coli</i>	✓	✓	✓	✓	✓	✓		
Large Plasmid Recovery From <i>E. coli</i>						✓		
Plasmid Recovery From Yeast							✓	✓
Page No.	49	50	51	52	53	54	55	55

¹ Pellet-free procedure bypasses the requirement for conventional cell pelleting. Instead culture is processed directly.

² Colored buffers allow for visualization of complete cell lysis and neutralization steps.

³ Endotoxin-free as assessed by suitability for cellular transfection.

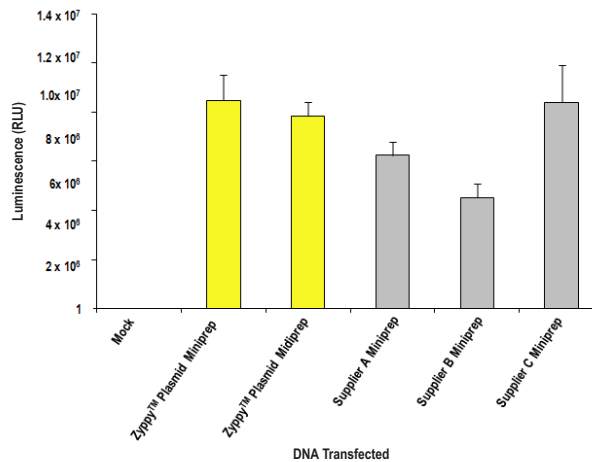
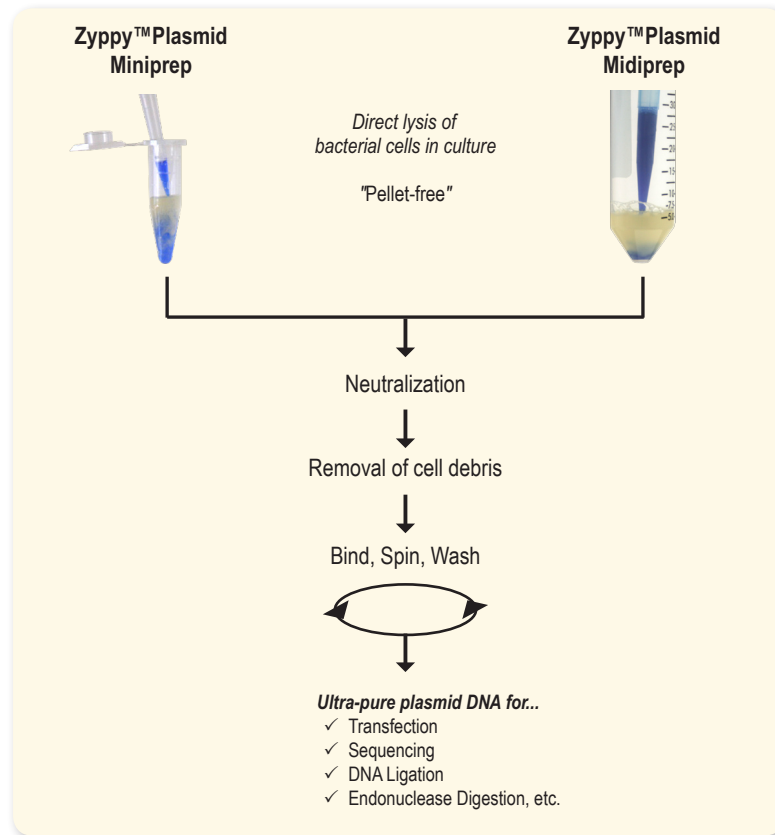
Technology Overview: The Zyppy™ Pellet-free Procedure

2

DNA Purification

The Zyppy™ Plasmid Miniprep and Zyppy™ Plasmid Midiprep kits from Zymo Research feature a pellet-free plasmid DNA purification procedure. Compared with most conventional procedures that involve spinning down the bacteria and lysing with P1, P2, and P3 buffers, the Zyppy™ procedure facilitates direct lysis of bacterial cells in culture and subsequent purification of the plasmid DNA. Bypassing the spin step and consolidating the buffer chemistries as colored lysis and neutralization buffers greatly reduces overall processing time making the Zyppy™ Miniprep and Midiprep procedures the fastest currently available in the market. Additionally, the rapidity of the procedures does not affect the yield or the quality of the DNA. In fact, eluted DNA is high quality and endotoxin-free making it ideal for transfection, sequencing, restriction endonuclease digestion, etc.

An overview of the Zyppy™ Plasmid Miniprep and Midiprep pellet-free procedures is shown below together with transfection data from DNA purified with the Zyppy™ Plasmid kits.



Luciferase activity in transfected cells. Lysates from cells transfected with various DNAs extracted using the pellet-free (Zyppy™ system) and non-pellet-free (suppliers A, B, and C) formats were used to measure luciferase activity. The activity is indicated as relative light units (RLU).



Highlights

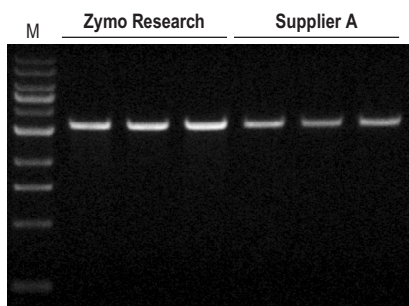
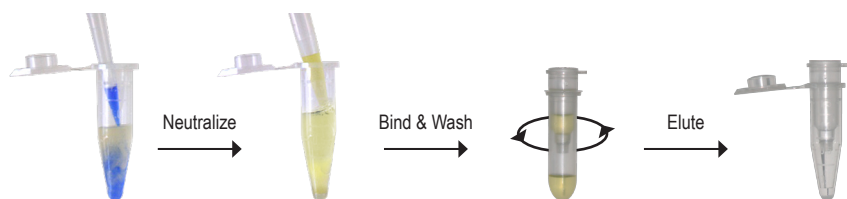
- The fastest, easiest miniprep available for purifying transfection quality plasmid DNA.
- Pellet-free procedure omits conventional cell pelleting and resuspension steps.
- DNA quality appropriate for cloning, sequencing, and transfection.

Description

The Zyppy™ Plasmid Miniprep Kit features a pellet-free modified alkaline lysis method that bypasses bacterial culture centrifugation and resuspension steps common to classical plasmid preparation procedures. Simply add the uniquely formulated 7X Lysis Buffer directly to your bacterial culture, neutralize, and then purify using the provided *Fast-Spin* column technology. Additionally, the innovative colored buffers included in the kit permit error-free visualization and identification of complete bacterial cell lysis and neutralization.

The Zyppy™ Plasmid Miniprep Kit is the fastest and easiest method available to separate plasmid DNA from *E. coli* efficiently. The plasmid DNA is of the highest quality, endotoxin-free, and is well suited for use in transfection, bacterial transformation, restriction endonuclease digestion, DNA ligation, PCR, transcription, sequencing, and other sensitive downstream applications.

Add Lysis Buffer *Directly* to Bacterial Culture



DNA yield from Zyppy™ Plasmid Miniprep Kit and a kit from Supplier A. Plasmid DNA (pGEM®) was digested with EcoRI prior to agarose gel electrophoresis. Performed in triplicate. M, ZR 1 kb DNA Marker (Zymo Research).

Ordering Information

Cat. No.	Product	Size	Price
D4036	Zyppy™ Plasmid Miniprep Kit	50 preps.	\$52.00
D4019	Zyppy™ Plasmid Miniprep Kit	100 preps.	\$95.00
D4020	Zyppy™ Plasmid Miniprep Kit	400 preps.	\$320.00
D4037	Zyppy™ Plasmid Miniprep Kit	800 preps.	\$582.00

Application

Plasmid Recovery From *E. coli*..... ✓



Specifications

Format..... Spin Column
 Binding Capacity..... 25 µg/prep.
 Elution Volume..... ≥ 30 µl
 Pellet-Free, Direct Culture Input..... ✓
 Colored Buffers..... ✓
 Culture Input..... 600 µl - 3 ml
 Endotoxin Free..... ✓
 Typical Yield (high copy plasmid)..... 2 - 15 µg
 DNA Size Limits..... ≤ 25 kb
 Processing Time..... 8 min.



Featured Technology



Zymo-Spin™ IIN (p. 146)
 Kits D4036, D4019, D4020, D4037

Zyppy™ Plasmid Midiprep Kit

Application

Plasmid Recovery From *E. coli*..... ✓



Specifications

Format..... Spin Column
 Binding Capacity..... 50 µg/prep.
 Elution Volume..... ≥ 150 µl
 Pellet-Free - Direct Culture Input..... ✓
 Colored Buffers..... ✓
 Culture Input..... 6 ml - 35 ml
 Endotoxin-Free..... ✓
 Typical Yield (high copy plasmid)..... 20 - 100 µg
 DNA Size Limits..... ≤ 25 kb
 Processing Time..... 15 min.

Featured Technology



Zymo-Spin™ V-E (p. 147)
 Kits D4025, D4026

Highlights

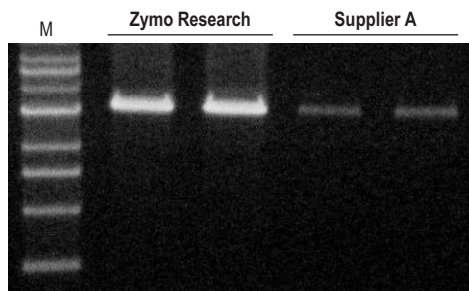
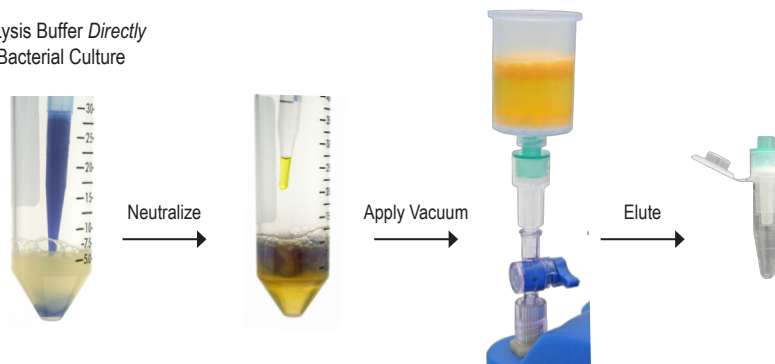
- The fastest, simplest midiprep available for purifying transfection quality plasmid DNA.
- Pellet-free procedure omits conventional cell pelleting and resuspension steps.
- DNA quality appropriate for cloning, sequencing, and transfection.

Description

The Zyppy™ Plasmid Midiprep Kit is a large-scale (up to 100 µg DNA) version of the Zyppy™ Plasmid Miniprep Kit. It features a pellet-free modified alkaline lysis method that bypasses bacterial culture centrifugation and resuspension steps common to classical plasmid preparation procedures. Simply add the uniquely formulated 7X Lysis Buffer directly to your bacterial culture, neutralize, and then purify using our *Fast-Spin* column technology. Additionally, the innovative colored buffers permit error-free visualization and identification of complete bacterial cell lysis and neutralization.

The Zyppy™ Plasmid Midiprep Kit is the fastest and simplest method available to separate plasmid DNA from *E. coli* efficiently. The plasmid DNA is of the highest quality, is endotoxin-free, and is well suited for use in transfection, bacterial transformation, restriction endonuclease digestion, DNA ligation, PCR, transcription, sequencing, and other sensitive downstream applications.

Add Lysis Buffer *Directly*
 to Bacterial Culture



DNA yield from Zyppy™ Plasmid Midiprep Kit and a kit from Supplier A. EcoRI digestion of plasmid DNA (pGEM®) isolated from a 6 ml *E. coli* culture using the Zyppy™ Plasmid Midiprep Kit or a kit from Supplier A. Performed in duplicate. M, ZR 1 kb DNA Marker (Zymo Research).

Ordering Information

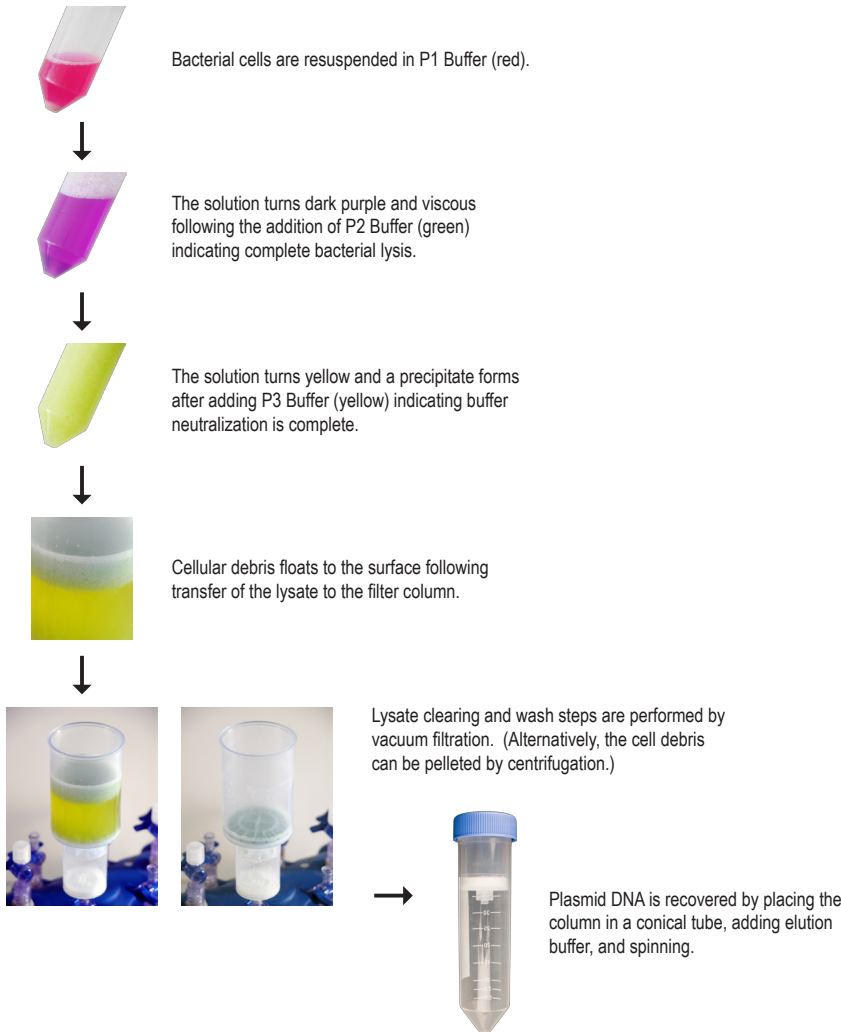
Cat. No.	Product	Size	Price
D4025	Zyppy™ Plasmid Midiprep Kit	25 preps.	\$152.00
D4026	Zyppy™ Plasmid Midiprep Kit	50 preps.	\$280.00

Highlights

- Easy and versatile procedure: lyse cells then centrifuge or vacuum, wash, and elute DNA.
- Innovative colored buffers permit error-free visual identification of complete bacterial cell lysis and neutralization.
- DNA quality appropriate for cloning, sequencing, and transfection.

Description

The Zyppy™ Plasmid Maxiprep Kit employs a modified alkaline lysis method in conjunction with spin-column purification to isolate high quality, endotoxin-free plasmid DNA in minutes. The innovative colored buffers included in the kit permits error-free visualization identification of complete bacterial cell lysis and neutralization. Additionally, the uniquely designed Zymo-Maxi Filter™ column permits lysate clearing without centrifugation while the high capacity DNA-binding Zymo-Spin™ VI column allows for low 2 - 3 ml elution volumes, eliminating the need for DNA precipitation and resuspension steps common to other column-based maxiprep procedures. The purified DNA is suitable for use in transfection, restriction endonuclease digestion, ligation, bacterial transformation, PCR amplification, sequencing, and other sensitive downstream applications.



Ordering Information

Cat. No.	Product	Size	Price
D4027	Zyppy™ Plasmid Maxiprep Kit	10 preps.	\$102.00
D4028	Zyppy™ Plasmid Maxiprep Kit	20 preps.	\$202.00

Application

Plasmid Recovery From *E. coli*..... ✓



Specifications

Format..... Spin Column
 Binding Capacity..... 500 µg/prep.
 Elution Volume..... ≥ 2 ml
 Colored Buffers..... ✓
 Culture Input..... up to 150 ml
 Endotoxin-Free..... ✓
 DNA Size Limits..... ≤ 25 kb
 Processing Time..... 30 min.

Featured Technology



Zymo-Spin™ VI (p. 147)
 Kits D4027, D4028

ZR Plasmid Miniprep™-Classic

2

DNA Purification

Application

Plasmid Recovery From *E. coli*..... ✓



Specifications

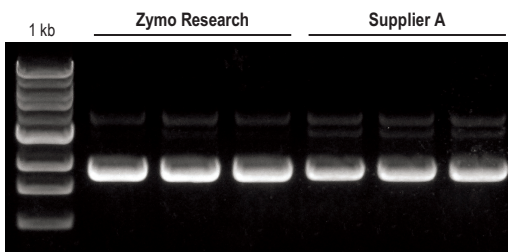
Format..... Spin Column
 Colored Buffers..... ✓
 Culture Input..... 0.5 - 5.0 ml
 Binding Capacity..... 25 µg/prep.
 Processing Time..... 15 min.
 Endotoxin-Free..... ✓
 Elution Volume..... ≥ 30 µl
 DNA Size Limits..... ≤ 25 kb

Highlights

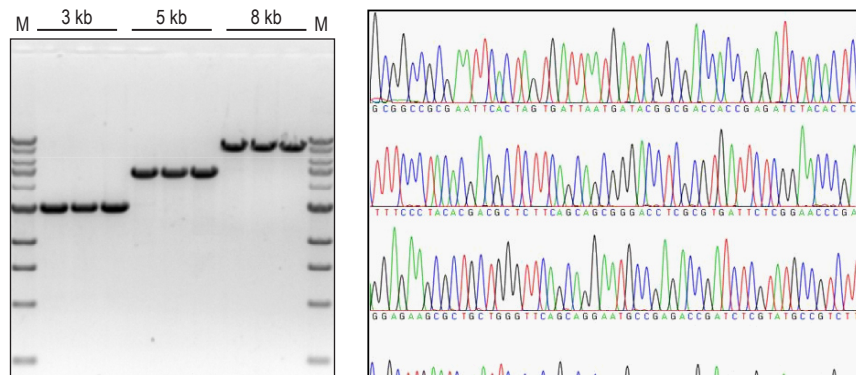
- For purification of high quality, endotoxin-free plasmid DNA for restriction endonuclease digestion, DNA sequencing, transformation, cloning, transfection, *in vitro* transcription reactions, etc.
- Innovative colored P1, P2, and P3 buffers for rapid identification of complete bacterial cell lysis and neutralization steps.
- Unique column design: zero buffer retention and low (30 µl) elution volume.

Description

The ZR Plasmid Miniprep™-Classic is designed for efficient isolation of plasmid DNA from *E. coli* using a traditional 3-buffer (P1, P2, P3) procedure that is simple, rapid, user-friendly, and reliable. It features a modified alkaline lysis protocol together with a unique *Fast-Spin* column to yield high quality plasmid DNA in minutes. The buffers are color-coded (red, green, yellow) for easy determination of complete cell lysis and neutralization. The innovative Zymo-Spin™ IIN columns yield endotoxin-free plasmid DNA. Plasmid DNA purified using the ZR Plasmid Miniprep™-Classic is well suited for use in restriction endonuclease digestion, sequencing, DNA ligation, cloning, PCR, bacterial transformation, transfection, etc.



	ng/µl	A ₂₆₀	A _{260/280}
Zymo Research's Classic	94.0	1.9	1.7
	75.3	1.5	1.9
	66.4	1.3	1.9
Supplier A	72.8	1.5	1.8
	77.5	1.6	1.8
	60.4	1.2	1.9



Plasmid products. Restriction Endonuclease digestion of three different plasmids prepared using the ZR Plasmid Miniprep™-Classic, performed in triplicate. M: ZR 1 kb DNA marker (Zymo Research).

Sequence-quality DNA preparations. DNA sequencing chromatogram of plasmid DNA prepared using the ZR Plasmid Miniprep™-Classic.

Featured Technology



Zymo-Spin™ IIN (p. 146)
 Kits D4015, D4016, D4054

Ordering Information

Cat. No.	Product	Size	Price
D4015	ZR Plasmid Miniprep™-Classic	100 preps.	\$95.00
D4016	ZR Plasmid Miniprep™-Classic	400 preps.	\$320.00
D4054	ZR Plasmid Miniprep™-Classic	800 preps.	\$582.00

Highlights

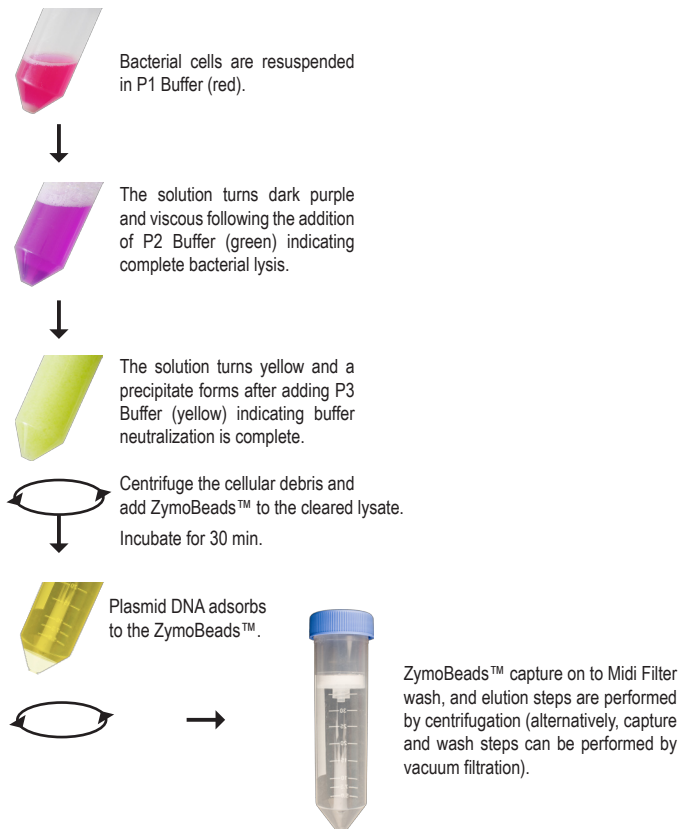
- 2 - 10 mg of high quality, endotoxin free (for transfection) plasmid in less than one hour.
- Innovative chemistry and streamlined procedure for consistent high concentration plasmid recovery directly in water or low salt buffer.
- Colored buffers for visualization of complete bacterial cell lysis and neutralization.

Description

The ZR Plasmid Gigaprep Kit employs a modified alkaline lysis method in conjunction with DNA binding beads (ZymoBeads™) to isolate high quality endotoxin-free (for transfection) plasmid DNA in less than an hour. The purified DNA is suitable for use in transfection, restriction endonuclease digestion, ligation, bacterial transformation, PCR amplification, DNA sequencing and other sensitive molecular biology applications.

The innovative patented colored buffers included in the kit permit error-free visualization of both complete bacterial cell lysis and neutralization. Additionally, the uniquely designed Midi Filter allows the capture of ZymoBeads™ either by centrifugation or vacuum. The unique design of the filter also allows for low elution volumes of 2 - 3 ml directly in supplied Elution buffer or water, thus eliminating the need for plasmid DNA precipitation and resuspension steps common to other column-based gigaprep procedures.

The ZR Plasmid Gigaprep Kit is designed for use with a combination of both centrifuge, and vacuum manifold, or a centrifuge alone, therefore providing flexibility in large scale plasmid DNA purification from *E. coli*. An overview of the purification procedure is shown below.



Ordering Information

Cat. No.	Product	Size	Price
D4056	ZR Plasmid Gigaprep Kit	5 preps.	\$327.00
D4057	ZR Plasmid Gigaprep Kit	10 preps.	\$523.00

Application

Plasmid Recovery From *E. coli*..... ✓



Specifications

Format..... Affinity Bead, Spin Column
 Binding Capacity..... Scalable
 Elution Volume..... ≥ 3 ml
 Colored Buffers..... ✓
 Culture Input..... 1,000 ml
 Endotoxin-Free..... ✓
 Typical Yield (high copy plasmid)..... 2 - 2.5 mg
 Processing Time..... 60 - 75 min.

Featured Technology



ZymoBeads™ (p. 149)
 Kits D4056, D4057

ZR BAC DNA Miniprep Kit

Application

- Large Plasmid Recovery From *E. coli*..... ✓
- Plasmid Recovery From *E. coli*..... ✓



Specifications

- Format..... Spin Column
- Colored Buffers..... ✓
- Culture Input..... 0.5 - 5.0 ml
- Binding Capacity..... 10 µg/prep.
- Elution Volume..... ≥ 10 µl
- Processing Time..... 15 min.
- Endotoxin-Free..... ✓
- DNA Size Limits ≥ 50 bp to ≥ 200 kb

Featured Technology



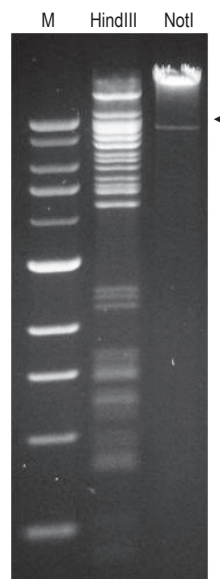
Zymo-Spin™ IC-XL
Kits D4048, D4049

Highlights

- For spin column purification of endotoxin-free BAC/PAC plasmid DNA (up to ~200 kb) for sequencing, PCR, restriction endonuclease digestion, etc.
- Innovative colored buffers for rapid identification of complete bacterial cell lysis and neutralization steps.
- Unique column design: zero buffer retention and low-volume (≥ 10 µl) elution.

Description

The ZR BAC DNA Miniprep Kit is for the efficient isolation of BAC plasmid DNA or other large plasmids (e.g., PAC) from *E. coli* using a procedure that is simple, rapid, user-friendly, and reliable. It features a modified alkaline lysis protocol with color-coded reagents that allow easy visualization and assessment of complete bacterial cell lysis and neutralization. The innovative Zymo-Spin™ IC-XL columns are optimized for high yield endotoxin-free plasmid DNA recovery. BAC DNA purified using the ZR BAC DNA Miniprep Kit is ideal for sequencing, PCR, endonuclease digestion, etc.



HindIII and NotI digestion of BAC DNA.
A BAC (~160 kb) from a RPCI-11 human BAC library (CHORI) was purified from DH10B cells (Invitrogen) using the ZR BAC DNA Miniprep Kit. Digestion with NotI removed the ~148 kb insert from the 11.6 kb pBACe3.6 cloning vector 1 (◄). M: 1 kb DNA ladder (Zymo Research).

Ordering Information

Cat. No.	Product	Size	Price
D4048	ZR BAC DNA Miniprep Kit	25 preps.	\$82.00
D4049	ZR BAC DNA Miniprep Kit	100 preps.	\$271.00

Zymoprep™ Yeast Plasmid Miniprep I / Zymoprep™ Yeast Plasmid Miniprep II

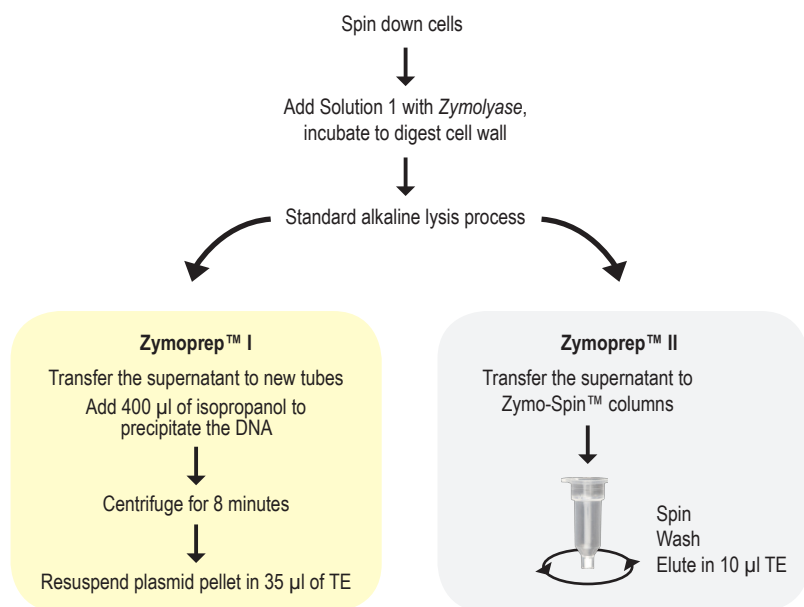
Highlights

- Simple procedures for plasmid rescue from yeast.
- Ideal for low copy and hard-to-isolate plasmids.
- For isolation of plasmid DNA for downstream applications such as PCR, transformation, hybridization, etc.

Description

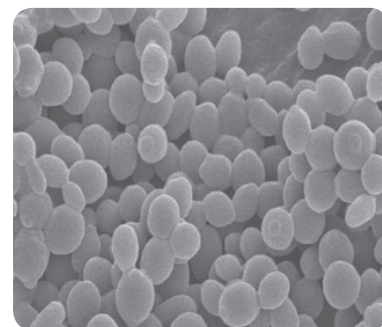
The Zymoprep™ Yeast Plasmid Miniprep provides all the necessary reagents for plasmid isolation from *S. cerevisiae*, *C. albicans* and *S. pombe*, and any fungi whose cell walls are susceptible to yeast lytic enzyme lysis. The procedure is simple and efficient, and there is no need for glass beads or phenol. Reliably recover plasmid DNA from yeast colonies, patches on plates, or as liquid cultures. The system is ideal for low-copy number and hard to isolate plasmids. Eluted plasmid DNA can be used directly for *E. coli* transformation, PCR, and Southern blot analysis.

Procedure for Zymoprep™ Yeast Plasmid Miniprep I & II



Application

Plasmid Recovery From Yeast..... ✓



Specifications

Processing Time..... 35 - 90 min.

DNA Size Limits..... ≤ 23 kb

Zymoprep™ Yeast Plasmid Miniprep Kit I

Format..... Isopropanol Precipitation

Elution Volume..... ≥ 35 µl

Zymoprep™ Yeast Plasmid Miniprep Kit II

Format..... Spin Column

Binding Capacity..... 5 µg/prep.

Elution Volume..... ≥ 10 µl

Ordering Information

Cat. No.	Product	Size	Price
D2001	Zymoprep™ Yeast Plasmid Miniprep I	100 preps.	\$79.00
D2004	Zymoprep™ Yeast Plasmid Miniprep II	50 preps.	\$102.00

Featured Technology



Zymo-Spin™ I (p. 145)
Kit D2004

Quick-gDNA™ MicroPrep

Quick-gDNA™ MiniPrep

Quick-gDNA™ MidiPrep

ZR-96 Quick-gDNA™

ZR Genomic DNA™ -Tissue MicroPrep

ZR Genomic DNA™ -Tissue MiniPrep

ZR Genomic DNA™ -Tissue MidiPrep

ZR-96 Genomic DNA™ -Tissue MiniPrep

Specifications								
Format	Spin Column	Spin Column	Spin Column	96-Well	Spin Column	Spin Column	Spin Column	96-Well
Binding Capacity	5 µg/prep.	25 µg/prep.	125 µg/prep.	5 µg/well	5 µg/prep.	25 µg/prep.	125 µg/prep.	5 µg/well
Elution Volume	≥ 10 µl	≥ 50 µl	≥ 150 µl	≥ 30 µl	≥ 10 µl	≥ 50 µl	≥ 150 µl	≥ 30 µl
Removal of PCR Inhibitors ²	✓	✓	✓	✓	✓	✓	✓	✓
Proteinase K Digestion					✓	✓	✓	✓
Isolation of Large-sized DNA (≤ 200 kb)								
Processing Time	15 min.	15 min.	30 min.	30 min.	25 min. ¹	25 min. ¹	30 min.	45 min.
Application								
Fresh/Frozen Soft Tissue	✓ ³	✓ ³	✓ ³	✓ ³	✓	✓	✓	✓
Fresh/Frozen Solid Tissue					✓	✓	✓	✓
Tail Snips					✓	✓	✓	✓
Ear Punches					✓	✓	✓	✓
FFPE Tissue					✓	✓	✓	✓
Tissue Sections								
FFPE Tissue Sections								
Feathers					✓	✓	✓	✓
Hair					✓	✓	✓	✓
Cultured Cells	✓	✓	✓	✓	✓	✓	✓	✓
Buccal Cells/Swabs	✓	✓		✓	✓	✓	✓	✓
Buffy Coat	✓	✓	✓	✓	✓	✓	✓	✓
Whole Blood	≤ 50 µl	≤ 200 µl	≤ 3 ml	≤ 100 µl	≤ 50 µl	≤ 100 µl	≤ 500 µl	≤ 75 µl
Plasma/Serum	✓	✓	✓	✓	✓	✓	✓	✓
Urine								
Semen	✓	✓	✓	✓	✓	✓	✓	✓
Mitochondria	✓	✓	✓	✓	✓	✓	✓	✓
Yeast								
Virus								
DNA Clean-up of Proteinase K Digested Samples								
Page Number	58	58	59	60	61	61	62	63

¹ For some common applications (e.g., whole blood, biological liquid, etc.).

² PCR inhibitors includes: salts, sugars and starches, lipids, proteins, heme/hemin, bilirubin, and melanin among others.

³ Product is compatible with most soft tissues (brain, spleen, liver, etc.). However, some samples may require additional mechanical or enzymatic processing.

	ZymoBead™ Genomic DNA Kit	Pinpoint™ Slide DNA Isolation System	ZR Serum DNA Kit™	ZR Urine DNA Isolation Kit™	YeaStar™ Genomic DNA Kit	ZR Viral DNA Kit™	ZR-96 Viral DNA Kit™	Genomic DNA Clean & Concentrator™
Specifications								
Format	Affinity Beads	Spin Column	Affinity Beads	Spin Column	Spin Column	Spin Column	96-Well	Spin Column
Binding Capacity	Scalable	5 µg/prep.	Scalable	5 µg/prep.	25 µg/prep.	5 µg/prep.	5 µg/well	10 µg/prep.
Elution Volume	Scalable	≥ 10 µl	Scalable	≥ 6 µl	≥ 60 µl	≥ 6 µl	≥ 10 µl	≥ 10 µl
Removal of PCR Inhibitors ²	✓	✓	✓	✓	✓	✓	✓	✓
Proteinase K Digestion		✓						
Isolation of Large-sized DNA (≤ 200 kb)								✓
Processing Time	20 min. ¹	5 hr.	Variable	10 min.	1.5 hr.	15 min.	25 min.	5 min.
Application								
Fresh/Frozen Soft Tissue	✓ ³					✓ ³	✓ ³	
Fresh/Frozen Solid Tissue								
Tail Snips								
Ear Punches								
FFPE Tissue								
Tissue Sections		✓						
FFPE Tissue Sections		✓						
Feathers								
Hair								
Cultured Cells	✓					✓	✓	
Buccal Cells/Swabs	✓							
Buffy Coat	✓							
Whole Blood	✓					✓	✓	
Plasma/Serum	✓		✓			✓	✓	
Urine				✓				
Semen	✓							
Mitochondria	✓	✓						
Yeast					✓			
Virus						✓	✓	
DNA Clean-up of Proteinase K Digested Samples								✓
Page Number	64	65	66	67	68	69	69	41

Application

- Fresh/Frozen Soft Tissue*..... ✓
- Cultured Cells..... ✓
- Buccal Cells/Swabs..... ✓
- Buffy Coat..... ✓
- Whole Blood..... ✓
- Plasma/Serum..... ✓
- Semen..... ✓
- Mitochondria..... ✓

Specifications

- Format..... Spin Column
- Removal of PCR Inhibitors..... ✓
- Processing Time..... 15 min.

Quick-gDNA™ MicroPrep

- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 10 µl

Quick-gDNA™ MiniPrep

- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 50 µl

* For solid tissues use:
 ZR Genomic DNA™-Tissue MicroPrep (p. 61)
 ZR Genomic DNA™-Tissue MiniPrep (p. 61)
 ZR Genomic DNA™-Tissue MidiPrep (p. 62)
 ZR-96 Genomic DNA™-Tissue MiniPrep (p. 63)

Featured Technologies



Zymo-Spin™ IC (p. 145)
Kits D3020, D3021



Zymo-Spin™ IIN (p. 146)
Kits D3006, D3007



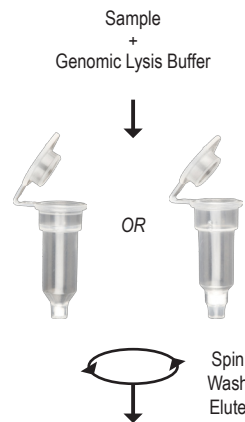
Zymo-Spin™ IIC (p. 145)
Kits D3024, D3025

Highlights

- Easy purification of high quality DNA from whole blood, plasma, serum, body fluids, buffy coat, lymphocytes, tissue, swabs, or cultured cells.
- 15 minute processing time using innovative *Fast-Spin* column technology.
- Protocol excludes the use of Proteinase K and organic denaturants.

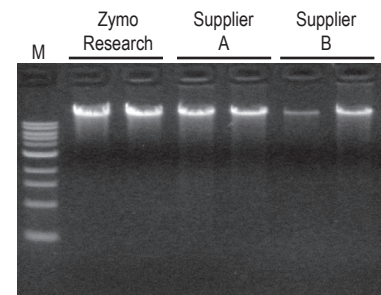
Description

The *Quick-gDNA™* MicroPrep and the *Quick-gDNA™* MiniPrep are for the convenient, rapid isolation of total DNA (e.g., genomic, mitochondrial, viral) from a variety of biological sample sources. Whole blood (fresh or stored), serum, plasma, buffy coat, solid tissue, bone marrow and buccal cells, cells from culture, and many biological liquid samples can be processed with these kits. Both products feature *Fast-Spin* column technology for high-quality DNA purification in minutes. PCR inhibitors are effectively removed, and the eluted DNA is suitable for PCR, nucleotide blotting, DNA sequencing, restriction endonuclease digestion, bisulfite conversion/methylation analysis, and other downstream applications.



Ultra-pure DNA for...

- ✓ PCR
- ✓ Endonuclease Digestion
- ✓ Genotyping
- ✓ Bisulfite Conversion & Methylation Analysis



DNA isolated from porcine whole blood using the *Quick-gDNA™* MiniPrep. Equivalent amounts (100 µl) of blood were processed without Proteinase K using the *Quick-gDNA™* MiniPrep in half the time as compared to the kits from suppliers A and B. Equal volumes of eluted DNA were then analyzed (in duplicate) in a 0.8% (w/v) TAE/agarose/ethidium bromide gel. The size marker "M" is a 1 kb ladder (Zymo Research).

Ordering Information

Cat. No.	Product	Size	Price
D3020	<i>Quick-gDNA™</i> MicroPrep	50 preps.	\$81.00
D3021	<i>Quick-gDNA™</i> MicroPrep	200 preps.	\$263.00
D3006	<i>Quick-gDNA™</i> MiniPrep (uncapped)	50 preps.	\$72.00
D3007	<i>Quick-gDNA™</i> MiniPrep (uncapped)	200 preps.	\$250.00
D3024	<i>Quick-gDNA™</i> MiniPrep (capped)	50 preps.	\$81.00
D3025	<i>Quick-gDNA™</i> MiniPrep (capped)	200 preps.	\$263.00

Highlights

- For the purification of high quality DNA from up to 3 ml whole blood, plasma, serum, body fluids, buffy coat, lymphocytes, cultured cells, and tissues.
- Compatible with commonly used anticoagulants (i.e., EDTA, heparin, citrate).
- Eluted, inhibitor-free DNA is ideal for PCR, endonuclease digestion, bisulfite conversion/ methylation detection, sequencing, genotyping, etc.

Description

The Quick-gDNA™ MidiPrep is a large-scale version of the Quick-gDNA™ MicroPrep and Quick-gDNA™ MiniPrep kits. It provides a simple procedure for the rapid isolation of total DNA (e.g., genomic, mitochondrial, viral) from a variety of biological sample sources, including whole blood (fresh or stored), serum, plasma, buffy coat, solid tissue, bone marrow and cells from culture, and many biological liquid samples. The specially formulated Genomic Lysis Buffer removes the need for organic denaturants or Proteinase K digestion. High quality DNA is purified in just 20 minutes using *Fast-Spin* column technology incorporated into the Zymo-Spin™ V-E Column w/ Zymo-Midi Filter™. DNA purified using the Quick-gDNA™ MidiPrep is suitable for PCR, nucleotide blotting, sequencing, restriction endonuclease digestion, bisulfite conversion/methylation analysis, and other downstream applications.

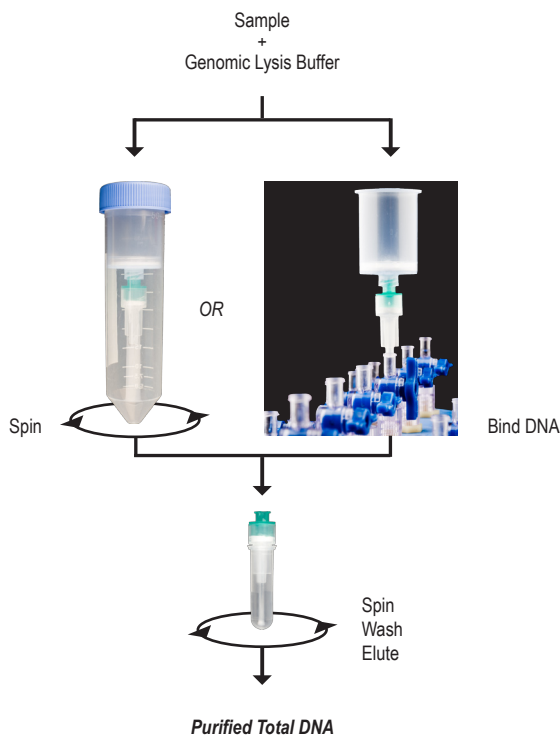
Application

- Fresh/Frozen Soft Tissue* ✓
- Cultured Cells..... ✓
- Buffy Coat..... ✓
- Whole Blood..... ≤ 3 ml
- Plasma/Serum..... ✓
- Semen..... ✓
- Mitochondria..... ✓

Specifications

- Format..... Spin Column
- Binding Capacity..... 125 µg/prep.
- Elution Volume..... ≥ 150 µl
- Removal of PCR Inhibitors..... ✓
- Processing Time..... 30 min.

* For solid tissues use:
 ZR Genomic DNA™-Tissue MicroPrep (p. 61)
 ZR Genomic DNA™-Tissue MiniPrep (p. 61)
 ZR Genomic DNA™-Tissue MidiPrep (p. 62)
 ZR-96 Genomic DNA™-Tissue MiniPrep (p. 63)



Featured Technology



Zymo-Spin™ V-E w/ Zymo-Midi Filter™ (p. 148)
 Kit D3100

Ordering Information

Cat. No.	Product	Size	Price
D3100	Quick-gDNA™ MidiPrep	25 preps.	\$101.00

Application

- Fresh/Frozen Soft Tissue*..... ✓
- Cultured Cells..... ✓
- Buffy Coat..... ✓
- Whole Blood..... ≤ 100 µl
- Plasma/Serum..... ✓
- Semen..... ✓
- Mitochondria..... ✓



Format

- Format..... 96-Well
- Binding Capacity..... 5 µg/well
- Elution Volume..... ≥ 30 µl
- Removal of PCR Inhibitors..... ✓
- Processing Time..... 30 min.

* For solid tissues use:
 ZR Genomic DNA™-Tissue MicroPrep (p. 61)
 ZR Genomic DNA™-Tissue MiniPrep (p. 61)
 ZR Genomic DNA™-Tissue MidiPrep (p. 62)
 ZR-96 Genomic DNA™-Tissue MiniPrep (p. 63)

Featured Technology



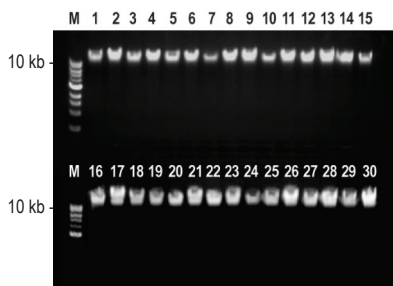
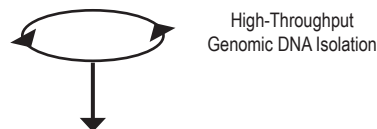
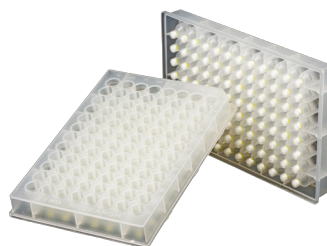
Silicon-A™ Plate (p. 149)
 Kits D3010, D3011, D3012

Highlights

- Simple, high throughput (96-well) purification of DNA from whole blood, plasma, serum, body fluids, buffy coat, lymphocytes, tissue, swabs, or cultured cells in about 30 minutes.
- Isolated DNA is ideal for PCR, endonuclease digestion, bisulfite conversion/methylation detection, sequencing, genotyping, etc.

Description

The ZR-96 Quick-gDNA™ features a simple, high throughput (96-well) procedure for the rapid isolation of total DNA (e.g., genomic, mitochondrial, viral) from a variety of biological sample sources. This product has been optimized for maximal recovery of ultra-pure DNA without RNA contamination and is compatible with whole blood (fresh or stored), serum, plasma, buffy coat, solid tissue, bone marrow and buccal cells, cells from culture, and many biological liquid samples. For processing, simply add the specially formulated Genomic Lysis Buffer to the samples, vortex, and transfer the mixtures to the wells of the supplied Silicon-A™ Plate. The product yields high-quality, purified DNA in just minutes, and PCR inhibitors are effectively removed during the purification process. Eluted DNA is suitable for PCR, nucleotide blotting, DNA sequencing, endonuclease digestion, bisulfite conversion/methylation analysis, and other downstream applications.



Genomic DNA isolated from mouse tail snips using the ZR-96 Quick-gDNA™. A total of 30 mouse tail snips were homogenized with Zymo Research's Squisher-8™ then processed using the ZR-96 Quick-gDNA™. About one third of the number of eluted DNAs was then separated in a 0.8% w/v agarose gel (shown in lanes 1 to 30).

Ordering Information

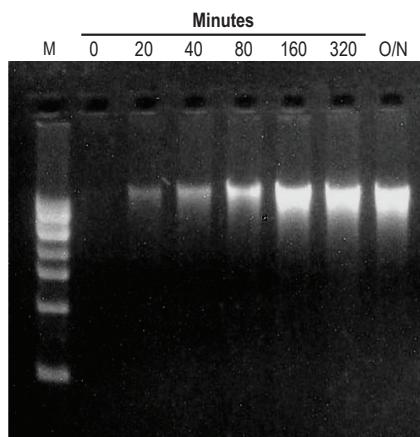
Cat. No.	Product	Size	Price
D3010	ZR-96 Quick-gDNA™	2 x 96 preps.	\$162.00
D3011	ZR-96 Quick-gDNA™	4 x 96 preps.	\$310.00
D3012	ZR-96 Quick-gDNA™	10 x 96 preps.	\$648.00

Highlights

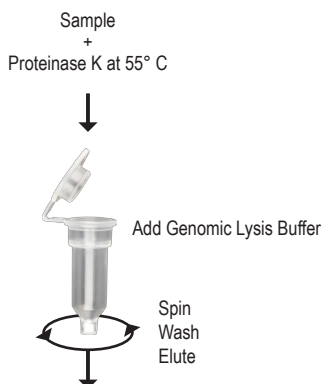
- For high quality DNA purification from solid tissues (e.g., tail snips, ear punches, adipose tissue, etc.), whole blood, plasma, serum, buffy coat, lymphocytes, cultured cells, buccal cells, FFPE tissues, semen, hair, and other biological sources.
- Combines Proteinase K digestion with innovative *Fast-Spin* column technology.

Description

The ZR Genomic DNA™-Tissue MicroPrep and ZR Genomic DNA™-Tissue MiniPrep are simple procedures for the rapid isolation of total DNA (e.g., genomic, mitochondrial, parasitic, microbial, viral) from a variety of solid tissues. The products have been optimized for maximal recovery of ultra-pure DNA without RNA contamination and are also compatible with inputs including: buffy coat, bone marrow, cells from culture, whole blood (fresh or stored), serum, plasma, and many biological liquid samples. For processing, simply digest the sample with the supplied Proteinase K then add the Genomic Lysis Buffer, vortex, and transfer the mixture to the supplied spin column. PCR inhibitors are effectively removed during the purification process and purified DNA is suitable for downstream applications including: PCR, Southern blotting, DNA sequencing, endonuclease digestion, bisulfite conversion/methylation analysis, etc.



High yield/quality DNA is successfully isolated from porcine muscle using the ZR Genomic DNA™-Tissue MiniPrep. Equivalent amounts (25 mg) of muscle tissue were processed using the ZR Genomic DNA™ Tissue MiniPrep after incubation with Proteinase K at 55°C for the indicated times (in minutes) or overnight (O/N). Equal volumes of eluted DNA were analyzed in a 0.8% (w/v) TAE/agarose/ethidium bromide gel. M: 1 kb ladder (Zymo Research).



Ultra-pure DNA for...

- ✓ PCR
- ✓ Endonuclease Digestion
- ✓ Southern Blotting
- ✓ Genotyping
- ✓ Bisulfite Conversion & Methylation Analysis

Application

- Fresh/Frozen Soft & Solid Tissue..... ✓
- Tail Snips..... ✓
- Ear Punches..... ✓
- FFPE Tissue..... ✓
- Feathers..... ✓
- Hair..... ✓
- Cultured Cells..... ✓
- Buccal Cells/Swabs..... ✓
- Buffy Coat..... ✓
- Whole Blood..... ✓
- Plasma/Serum..... ✓
- Semen..... ✓
- Mitochondria..... ✓

Specifications

- Format..... Spin Column
- Removal of PCR Inhibitors..... ✓
- Processing Time..... 25 min.

ZR Genomic DNA™-Tissue MicroPrep

- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 10 µl

ZR Genomic DNA™-Tissue MiniPrep

- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 50 µl

Featured Technology



Zymo-Spin™ IC (p. 145)
Kits D3040, D3041



Zymo-Spin™ IIC (p. 145)
Kits D3050, D3051

Ordering Information

Cat. No.	Product	Size	Price
D3040	ZR Genomic DNA™-Tissue MicroPrep	50 preps.	\$103.00
D3041	ZR Genomic DNA™-Tissue MicroPrep	200 preps.	\$360.00
D3050	ZR Genomic DNA™-Tissue MiniPrep	50 preps.	\$103.00
D3051	ZR Genomic DNA™-Tissue MiniPrep	200 preps.	\$360.00

Application

- Fresh/Frozen Soft & Solid Tissue..... ✓
- Tail Snips..... ✓
- Ear Punches..... ✓
- FFPE Tissue..... ✓
- Feathers..... ✓
- Hair..... ✓
- Cultured Cells..... ✓
- Buccal Cells/Swabs..... ✓
- Buffy Coat..... ✓
- Whole Blood..... ≤ 500 µl
- Plasma/Serum..... ✓
- Semen..... ✓
- Mitochondria..... ✓

Specifications

- Format..... Spin Column
- Binding Capacity..... 125 µg/prep.
- Elution Volume..... ≥ 150 µl
- Removal of PCR Inhibitors..... ✓
- Processing Time..... 30 min.

Featured Technology



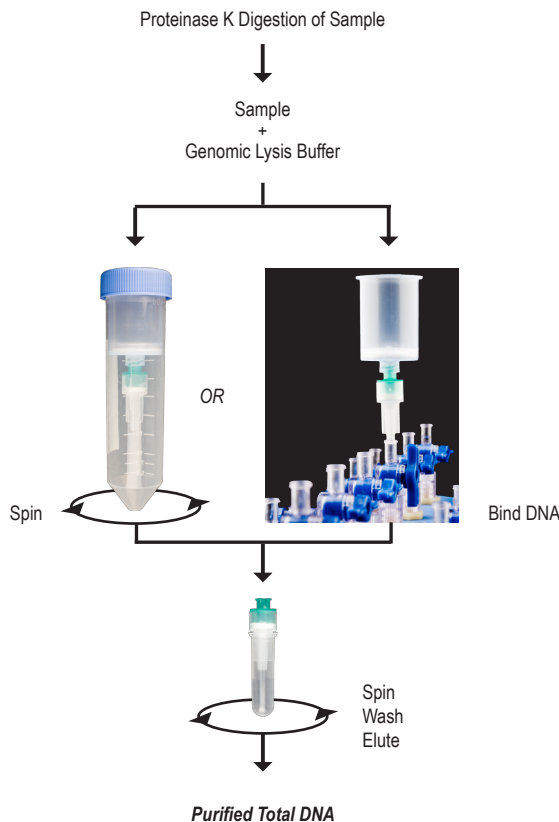
Zymo-Spin™ V-E w/ Zymo-Midi Filter™ (p. 148)
Kit D3110

Highlights

- For high quality DNA purification from solid tissues (e.g., tail snips, ear punches, adipose tissue, etc.), whole blood, plasma, serum, buffy coat, lymphocytes, cultured cells, FFPE tissues, semen, hair, and other biological sources.
- Combines Proteinase K digestion with innovative *Fast-Spin* column purification technology.
- Isolated DNA is ideal for PCR, endonuclease digestion, Southern blotting, bisulfite conversion/methylation detection, sequencing, genotyping, etc.

Description

The ZR Genomic DNA™-Tissue MidiPrep is a large-scale version of the ZR Genomic DNA™-Tissue MicroPrep and the ZR Genomic DNA™-Tissue MiniPrep kits. It provides a straightforward procedure for the rapid isolation of total DNA (e.g., genomic, mitochondrial, parasitic, microbial, viral) from a variety of solid tissues that are either fresh, frozen, or FFPE. This product has been optimized for maximal recovery of ultra-pure DNA without RNA contamination and is compatible with buffy coat, bone marrow, cells from culture, whole blood (fresh or stored), serum, plasma, and many biological liquid samples. For processing, simply digest the sample with the supplied Proteinase K then add the Genomic Lysis Buffer, vortex, and transfer the mixture to the supplied Zymo-Spin™ column/filter assembly. PCR inhibitors are effectively removed during the purification process and purified DNA is suitable for downstream applications including: PCR, Southern blotting, sequencing, endonuclease digestion, bisulfite conversion/methylation analysis, etc.



Ordering Information

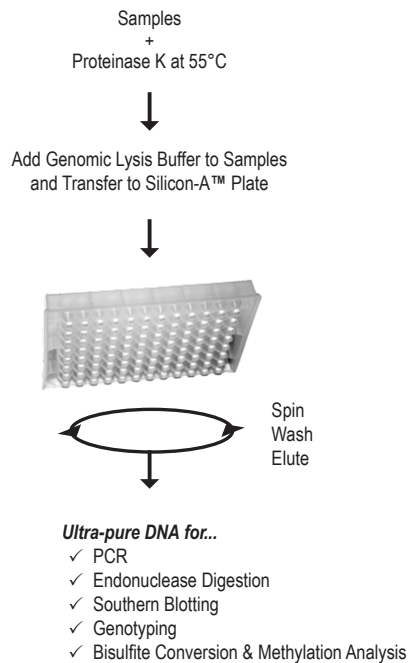
Cat. No.	Product	Size	Price
D3110	ZR Genomic DNA™-Tissue MidiPrep	25 preps.	\$151.00

Highlights

- For high quality DNA purification from solid tissues (e.g., tail snips, ear punches, adipose tissue, etc.), whole blood, plasma, serum, buffy coat, lymphocytes, cultured cells, buccal cells, FFPE tissues, semen, hair, and other biological sources.
- Combines Proteinase K digestion with innovative *Fast-Spin* plate purification technologies.

Description

The ZR-96 Genomic DNA™-Tissue MiniPrep provides a simple, high-throughput procedure for the rapid isolation of total DNA (e.g., genomic, mitochondrial, parasitic, microbial, viral) from a variety of solid tissues. It has been optimized for maximal recovery of ultra-pure DNA without RNA contamination and is also compatible with inputs including buffy coat, bone marrow, cells from culture, whole blood (fresh or stored), serum, plasma, and many biological liquid samples. For processing, simply digest the sample with the supplied Proteinase K then add the Genomic Lysis Buffer, vortex, and transfer the mixture to the supplied Silicon-A™ plate. PCR inhibitors are effectively removed during the purification process and purified DNA is suitable for downstream applications including: PCR, Southern blotting, sequencing, endonuclease digestion, bisulfite conversion/methylation analysis, etc.



Application

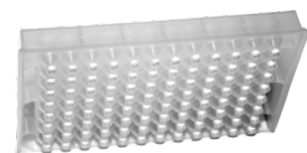
- Fresh/Frozen Soft & Solid Tissue..... ✓
- Tail Snips..... ✓
- Ear Punches..... ✓
- FFPE Tissue..... ✓
- Feathers..... ✓
- Hair..... ✓
- Cultured Cells..... ✓
- Buccal Cells/Swabs..... ✓
- Buffy Coat..... ✓
- Whole Blood..... ≤ 75 µl
- Plasma/Serum..... ✓
- Semen..... ✓
- Mitochondria..... ✓



Specifications

- Format..... 96-Well
- Binding Capacity..... 5 µg/well
- Elution Volume..... ≥ 30 µl
- Removal of PCR Inhibitors..... ✓
- Processing Time..... 45 min.

Featured Technology



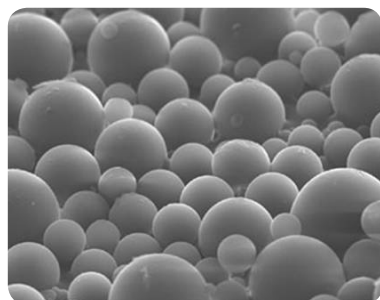
Silicon-A™ Plate (p. 149)
Kits D3055, D3056, D3057

Ordering Information

Cat. No.	Product	Size	Price
D3055	ZR-96 Genomic DNA™-Tissue MiniPrep	2 x 96 preps.	\$395.00
D3056	ZR-96 Genomic DNA™-Tissue MiniPrep	4 x 96 preps.	\$691.00
D3057	ZR-96 Genomic DNA™-Tissue MiniPrep	10 x 96 preps.	\$1,047.00

Application

- Fresh/Frozen Soft Tissue*..... ✓
- Cultured Cells..... ✓
- Buccal Cells/Swabs..... ✓
- Buffy Coat..... ✓
- Whole Blood..... ✓
- Plasma/Serum..... ✓
- Semen..... ✓
- Mitochondria..... ✓



Specifications

- Format..... Affinity Beads
- Binding Capacity..... Scalable
- Elution Volume..... Scalable
- Removal of PCR Inhibitors..... ✓
- Processing Time..... 20 min.

* For solid tissues use:
 ZR Genomic DNA™-Tissue MicroPrep (p. 61)
 ZR Genomic DNA™-Tissue MiniPrep (p. 61)
 ZR Genomic DNA™-Tissue MidiPrep (p. 62)
 ZR-96 Genomic DNA™-Tissue MiniPrep (p. 63)

Featured Technology



ZymoBeads™ (p. 149)
 Kits D3004, D3005

Highlights

- Easy purification of high quality DNA from whole blood, plasma, serum, body fluids, buffy coat, lymphocytes, tissue, swabs or cultured cells in less than 20 minutes using innovative ZymoBead™ silica-bead technology.
- Compatible with commonly used anticoagulants (i.e., EDTA, heparin, citrate).
- Unique extraction technology excludes the use of Proteinase K and organic denaturants.

Description

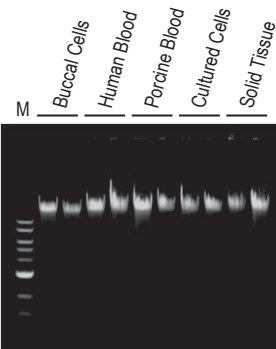
The ZymoBead™ Genomic DNA Kit is a simple procedure for the rapid isolation of total DNA (e.g., genomic, mitochondrial, viral) from a variety of biological sample sources. This product has been optimized for maximal recovery of ultra-pure DNA without RNA contamination and is compatible with whole blood (fresh or stored), serum, plasma, buffy coat, solid tissue, bone marrow and buccal cells, cells from culture, and many biological liquid samples. For processing, simply add the specially formulated Genomic Lysis Buffer to a sample in a 1.5 ml tube, add ZymoBeads™, vortex, then centrifuge. There is no need for organic denaturants or Proteinase K digestion because of the unique chemistries featured in the kit that yield high-quality, purified DNA in just minutes (see below). PCR inhibitors are effectively removed during the purification process. DNA purified using the ZymoBead™ Genomic DNA Kit is suitable for PCR, nucleotide blotting, DNA sequencing, endonuclease digestion, bisulfite conversion/methylation analysis, and other downstream applications.

Sample
 +
 Lysing Buffer with ZymoBeads™

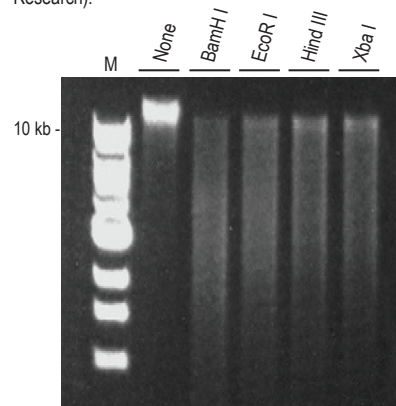


Ultra-pure DNA for...

- ✓ PCR
- ✓ Endonuclease Digestion
- ✓ Genotyping
- ✓ Bisulfite Conversion & Methylation Analysis



DNA isolation using the ZymoBead™ Genomic DNA Kit. Purifications were performed in duplicate for each sample and an equal volume of eluted DNA was loaded into each lane of a 0.8% (w/v) TAE/agarose/ethidium bromide gel. M is a 1 kb DNA ladder (Zymo Research).



Digested genomic DNA. Restriction endonuclease digestion of genomic DNA purified with the ZymoBead™ Genomic DNA Kit.

Ordering Information

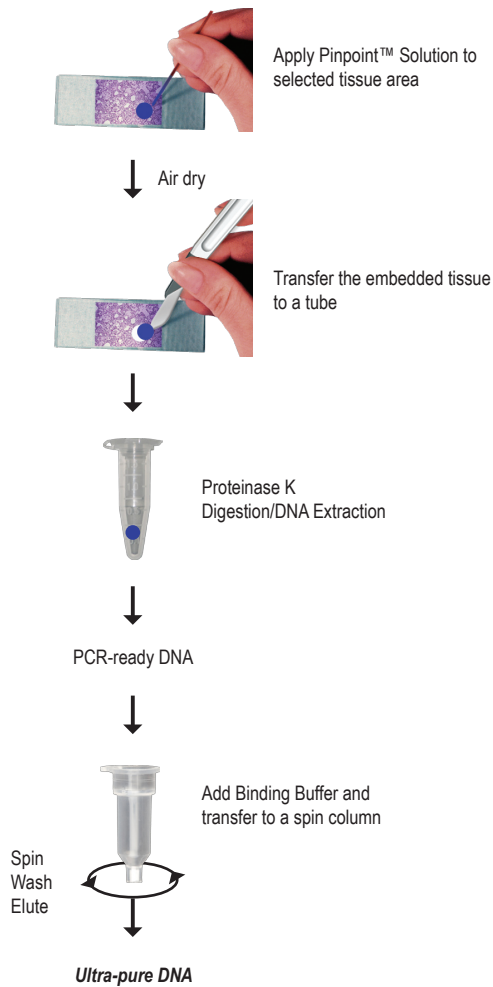
Cat. No.	Product	Size	Price
D3004	ZymoBead™ Genomic DNA Kit	~100 preps.	\$72.00
D3005	ZymoBead™ Genomic DNA Kit	~400 preps.	\$270.00

Highlights

- Convenient and streamlined method for the isolation of genomic DNA from targeted areas of fresh and FFPE tissue sections (slides).
- Features Pinpoint™ tissue sampling technology and a one-step DNA extraction method.

Description

The Pinpoint™ Slide DNA Isolation System is an innovative product for the isolation of total DNA from targeted areas of fresh, frozen, and FFPE tissue sections. There is no need for expensive specialized equipment or computer software. Instead, the system combines innovative Pinpoint™ tissue sampling technology, Proteinase K digestion, and a one-step DNA extraction method for the isolation of DNA that is ideal for PCR, sequencing, etc.



Application

- Tissue Sections..... ✓
- FFPE Tissue Sections..... ✓



Specifications

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 10 µl
- Removal of PCR Inhibitors..... ✓
- Proteinase K Digestion..... ✓
- DNA Size Limits 75 bp - 25 kb
- Processing Time..... 5 hr.

Featured Technology



Zymo-Spin™ I (p. 145)
Kit D3001

Ordering Information

Cat. No.	Product	Size	Price
D3001	Pinpoint™ Slide DNA Isolation System	50 preps.	\$225.00

Application

Plasma/Serum..... ✓



Specifications

Format..... Affinity Beads
 Binding Capacity..... Scalable
 Elution Volume..... Scalable
 Removal of PCR Inhibitors..... ✓
 Processing Time..... Variable

Highlights

- Isolate DNA from up to 250 ml serum or plasma efficiently using innovative ZymoBead™ silica-bead technology.
- Scalability facilitates processing of small (100 µl) or large (10 ml) sample volumes.

Description

The ZR Serum DNA Kit™ is based on a state of the art, single buffer procedure for rapid DNA isolation from large volume serum and plasma samples. The product recovers genomic, mitochondria, and viral DNAs having typical sizes from 25 kb to 50 kb without RNA contamination. The uniquely formulated Genomic Lysis Buffer efficiently lyses cells, virus, and/or cellular particles. DNA/ZymoBead™ complexes are separated by centrifugation, and then washed to remove contaminants. Eluted, purified DNA is ideal for PCR and other sensitive analytical procedures.



Featured Technology



ZymoBeads™ (p. 149)
Kit D3013

Ordering Information

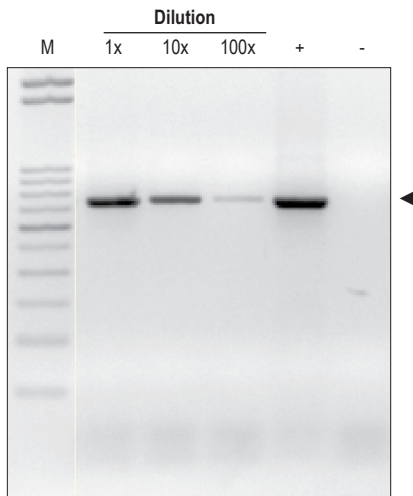
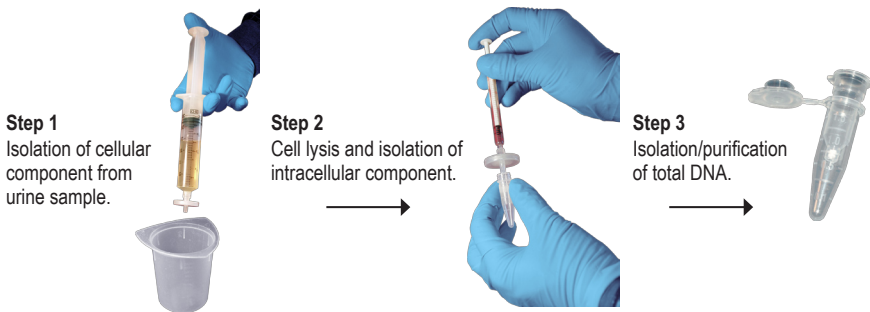
Cat. No.	Product	Size	Price
D3013	ZR Serum DNA Kit™	up to 80 ml serum	\$232.00

Highlights

- Reliable, quick (10 minute) recovery of DNA from urine.
- *Fast-Spin* column design allows DNA to be eluted at high concentrations into minimal volumes ($\geq 6 \mu\text{l}$) elution buffer or water.

Description

The ZR Urine DNA Isolation Kit™ is an innovative product designed for the easy, reliable, and rapid isolation of total DNA from cells and biological sediment in urine samples. The product enables isolation of cells from urine using a syringe fitted with a uniquely-designed syringe filter. Following separation, cells are lysed and the collected lysate can be processed immediately or at a later time following transportation and/or storage. The DNA isolation procedure is simple and can be performed in less than 10 minutes with the technologies featured in this kit. Total DNA isolated with the ZR Urine DNA Isolation Kit™ is ideal for PCR, array, methylation detection, etc.



DNA purified from human urine using the ZR Urine DNA Isolation Kit™ is ideal for use in PCR. The gel image above shows the results of PCR amplification of 15 ng, 1.5 ng, and 0.15 ng total DNA (1x, 10x 100x dilutions, respectively) isolated from human urine using primers specific for the human β -actin gene. (M) is a 50 bp DNA ladder (Zymo Research) and amplicons are indicated (\blacktriangleleft). The (+) and (-) are positive and negative controls, respectively.

Ordering Information

Cat. No.	Product	Size	Price
D3060	ZR Urine DNA Isolation Kit™	20 preps.	\$82.00

Application

Urine..... ✓



Specifications

Format..... Spin Column
 Binding Capacity..... 5 μg /prep.
 Elution Volume..... $\geq 6 \mu\text{l}$
 Removal of PCR Inhibitors..... ✓
 Processing Time..... 10 min.

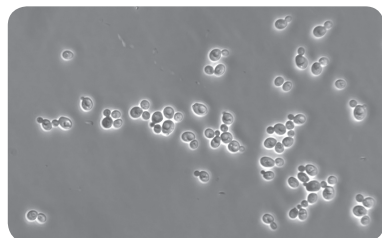
Featured Technology



Zymo-Spin™ IC (p. 145)
 Kit D3060

Application

- Yeast..... ✓
- Zymolyase-sensitive Fungi..... ✓



Specifications

- Format..... Spin Column
- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 60 µl
- Removal of PCR Inhibitors..... ✓
- Processing Time..... 1.5 hr.

Featured Technology



Zymo-Spin™ III (p. 146)
Kit D2002

Highlights

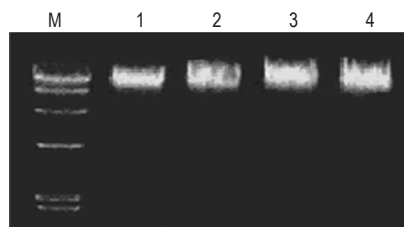
- Efficient DNA isolation from a broad spectrum of fungal species susceptible to yeast lytic enzyme (i.e., Zymolyase) lysis.
- Genomic DNA can be used for Southern blotting, PCR, restriction enzyme digestion, etc.

Description

The YeaStar™ Genomic DNA Kit is designed for reliable and efficient isolation of genomic DNA from a broad spectrum of fungal species, including *Aspergillus fumigatus*, *Aspergillus nidulans*, *Aspergillus nivos* var. *aureus*, *Candida albicans*, *Pichia pastoris*, *Saccharomyces cerevisiae*, *Schizosaccharomyces pombe*, and any fungi whose cell walls are susceptible to yeast lytic enzyme lysis. The kit is based on highly efficient enzyme lysis and *Fast-Spin* column technology. Each standard prep yields about 7 - 20 µg of DNA with a size distribution of 35 - 60 kb. The resulting genomic DNA can be used direct analysis including Southern blotting, PCR, restriction endonuclease digestion, etc.



- Ultra-pure DNA for...**
- ✓ PCR
 - ✓ Southern Blotting
 - ✓ Endonuclease Digestion



Agarose gel electrophoresis of DNA prepared using the YeaStar™ Genomic DNA Kit. Lanes: M: λ-DNA Hind III marker; 1: *S. cerevisiae*; 2: *P. pastoris*; 3: *C. albicans*; 4: *S. pombe*.

Ordering Information

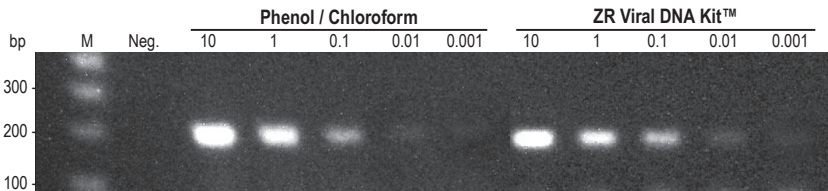
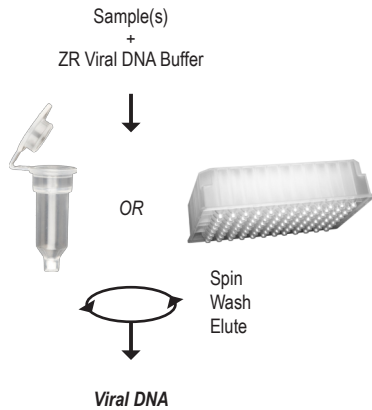
Cat. No.	Product	Size	Price
D2002	YeaStar™ Genomic DNA Kit	40 preps.	\$102.00

Highlights

- Quick recovery of viral DNA from a wide range of sources using *Fast-Spin* column and plate technologies.
- Column and plate designs allow DNA to be eluted at high concentrations into minimal volumes.
- Eluted DNA is suitable for PCR, Southern blotting, and restriction endonuclease digestion.

Description

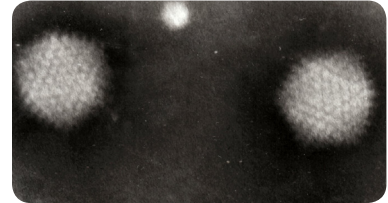
The ZR Viral DNA Kit™ and ZR-96 Viral DNA Kit™ provide for the rapid isolation of high-quality viral DNA from a wide range of biological sources. A uniquely designed buffer is included for the efficient denaturation of viral particles in whole blood (fresh and stored), plasma, serum, tissue, ascites, cultured cells, and from liquid samples. DNA can be eluted with elution buffer or water and is suitable for subsequent PCR, nucleotide blotting, and restriction endonuclease digestion procedures.



Viral DNA purification. Human HBV DNA was isolated from 10 to 0.001 µl of human serum using phenol/chloroform or ZR Viral DNA Kit™. The presence of HBV DNA is evidenced by a ~200 bp PCR amplicon. Lane M is a 100 bp DNA Ladder and "Neg." is the negative control for PCR.

Application

- Fresh/Frozen Soft Tissue..... ✓
- Cultured Cells..... ✓
- Whole Blood..... ✓
- Plasma/Serum..... ✓
- Virus..... ✓



Specifications

- Binding Capacity..... 5 µg/prep.
- Removal of PCR Inhibitors..... ✓
- DNA Size Limits..... 100 bp - 50 kb

ZR Viral DNA Kit™

- Format..... Spin Column
- Elution Volume..... ≥ 6 µl
- Processing Time..... 15 min.

ZR-96 Viral DNA Kit™

- Format..... 96-Well
- Elution Volume..... ≥ 10 µl
- Processing Time..... 25 min.

Featured Technologies



Zymo-Spin™ IC (p. 145)
Kits D3015, D3016



Zymo-Spin™ I-96 Plate (p. 150)
Kits D3017, D3018

Ordering Information

Cat. No.	Product	Size	Price
D3015	ZR Viral DNA Kit™	50 preps.	\$122.00
D3016	ZR Viral DNA Kit™	200 preps.	\$420.00
D3017	ZR-96 Viral DNA Kit™	2 x 96 preps.	\$341.00
D3018	ZR-96 Viral DNA Kit™	4 x 96 preps.	\$613.00

Product Guide: Environmental DNA Purification

2

DNA Purification

ZR Soil Microbe DNA MicroPrep™

ZR Soil Microbe DNA MiniPrep™

ZR Soil Microbe DNA MidiPrep™

ZR-96 Soil Microbe DNA Kit™

ZR Fungal/Bacterial DNA MicroPrep™

ZR Fungal/Bacterial DNA MiniPrep™

ZR Fungal/Bacterial DNA MidiPrep™

ZR-96 Fungal/Bacterial DNA Kit™

ZR Fecal DNA MicroPrep™

ZR Fecal DNA MiniPrep™

Specifications										
ZR BashingBead™ Lysis	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Format	Spin Column	Spin Column	Spin Column	96-Well	Spin Column	Spin Column	Spin Column	96-Well	Spin Column	Spin Column
Binding Capacity	5 µg/prep.	25 µg/prep.	125 µg/prep.	5 µg/well	5 µg/prep.	25 µg/prep.	125 µg/prep.	5 µg/well	5 µg/prep.	25 µg/prep.
Elution Volume	≥ 10 µl	≥ 25 µl	≥ 150 µl	≥ 25 µl	≥ 10 µl	≥ 25 µl	≥ 150 µl	≥ 25 µl	≥ 10 µl	≥ 25 µl
Removal of PCR Inhibitors	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Removal of Humic, Fulvic, Polyphenolic Substances	✓	✓	✓	✓					✓	✓
Processing Time	15 min.	15 min.	25 min.	50 min.	10 min.	10 min.	20 min.	40 min.	15 min.	15 min.
Application										
Environmental Sources										
Soil	✓	✓	✓	✓						
Sediment	✓	✓	✓	✓						
Sludge	✓	✓	✓	✓						
Feces									✓	✓
Microorganisms										
Bacteria	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gram (+)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gram (-)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fungi	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Unicellular (Yeast)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Filamentous	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Algae	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Unicellular	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Filamentous	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Protists	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Tough-to-Lyse Tissues, Organisms, Insects, & Plants										
Soft Tissues	Some	Some	Some	Some	Some	Some	Some	Some	Some	Some
Solid Tissues (Food)										
Tough-to-Lyse Tissues										
Tough-to-Lyse Organisms										
Insects/Arthropods										
Plant Material										
Seeds										
Fruit										
Page Number	74	74	74	74	75	75	75	75	76	76

	ZR Fecal DNA Midiprep™	ZR-96 Fecal DNA Kit™	ZR Tissue & Insect DNA MicroPrep™	ZR Tissue & Insect DNA MiniPrep™	ZR Tissue & Insect DNA Midiprep™	ZR-96 Tissue & Insect DNA Kit™	ZR Plant/Seed DNA MicroPrep™	ZR Plant/Seed DNA MiniPrep™	ZR Plant/Seed DNA Midiprep™	ZR-96 Plant/Seed DNA Kit™
Specifications										
BashingBead™ Lysis	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Format	Spin Column	96-Well	Spin Column	Spin Column	Spin Column	96-Well	Spin Column	Spin Column	Spin Column	96-Well
Binding Capacity	125 µg/prep.	5 µg/well	5 µg/prep.	25 µg/prep.	125 µg/prep.	5 µg/well	5 µg/prep.	25 µg/prep.	125 µg/prep.	5 µg/well
Elution Volume	≥ 150 µl	≥ 25 µl	≥ 10 µl	≥ 25 µl	≥ 150 µl	≥ 25 µl	≥ 10 µl	≥ 25 µl	≥ 150 µl	≥ 25 µl
Removal of PCR Inhibitors	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Removal of Humic, Fulvic, Polyphenolic Substances	✓	✓					✓	✓	✓	✓
Processing Time	25 min.	50 min.	10 min.	10 min.	20 min.	40 min.	15 min.	15 min.	25 min.	50 min.
Application										
Environmental Sources										
Soil										
Sediment										
Sludge										
Feces	✓	✓								
Microorganisms										
Bacteria	✓	✓								
Gram (+)	✓	✓								
Gram (-)	✓	✓								
Fungi	✓	✓								
Unicellular (Yeast)	✓	✓								
Filamentous	✓	✓								
Algae	✓	✓								
Unicellular	✓	✓								
Filamentous	✓	✓								
Protists	✓	✓								
Tough-to-Lyse Tissues, Organisms, Insects, & Plants										
Soft Tissues	Some	Some	✓	✓	✓	✓				
Solid Tissues (Food)			✓	✓	✓	✓				
Tough-to-Lyse Tissues			✓	✓	✓	✓				
Tough-to-Lyse Organisms			✓	✓	✓	✓				
Insects/Arthropods			✓	✓	✓	✓				
Plant Material							✓	✓	✓	✓
Seeds							✓	✓	✓	✓
Fruit							✓	✓	✓	✓
Page Number	76	76	77	77	77	77	78	78	78	78

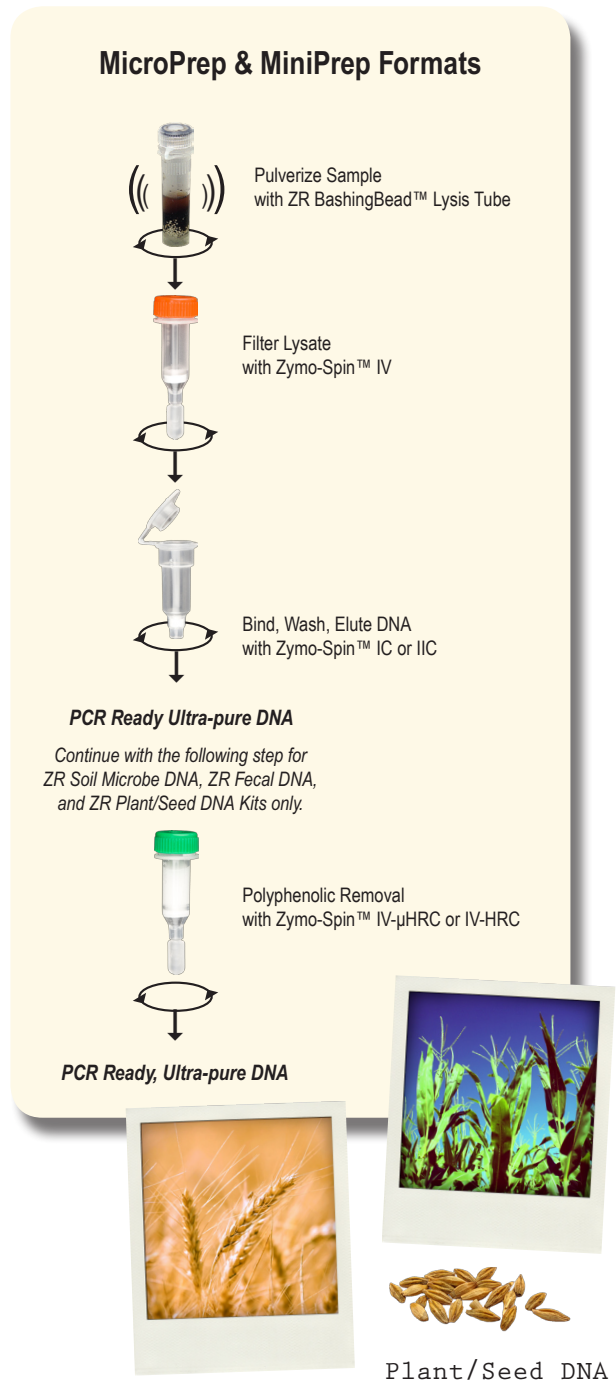
Technology Overview: BashingBead™ Lysis & Environmental DNA Purification

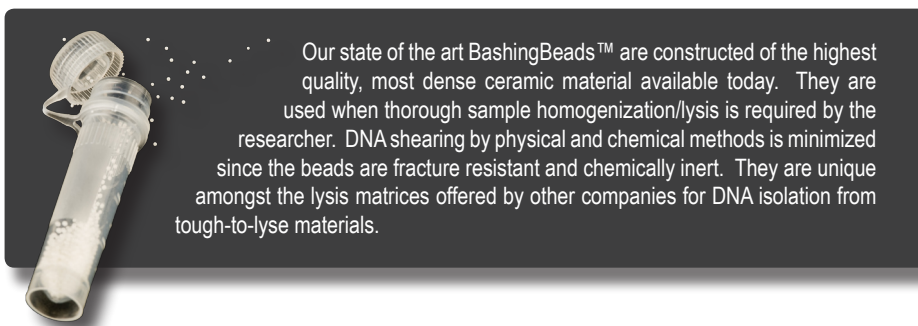
2

DNA Purification

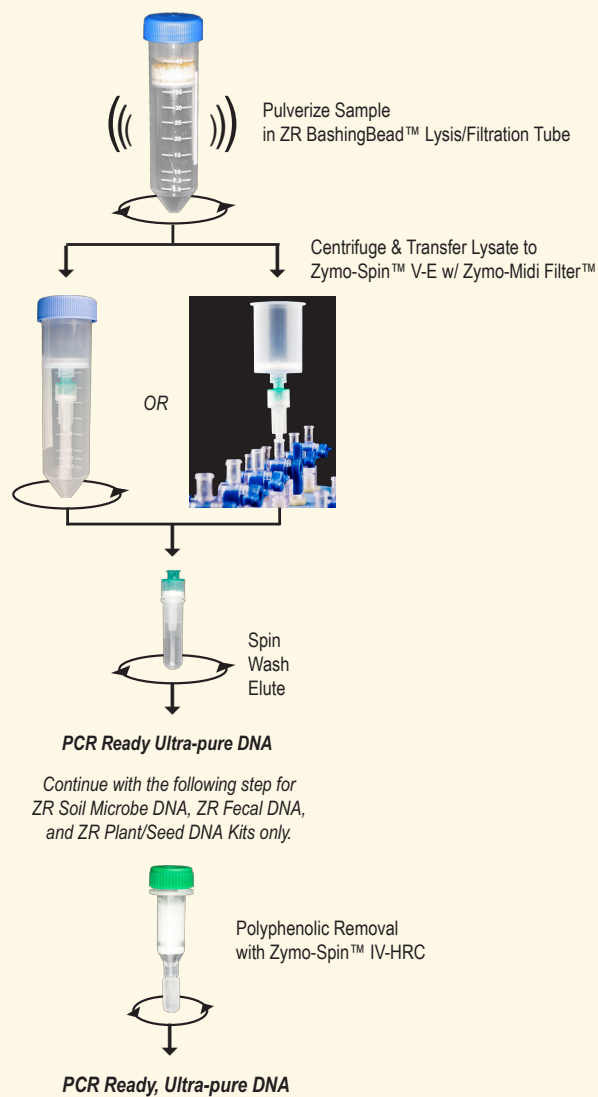
The BashingBead™ DNA purification kits from Zymo Research are for rapid recovery of PCR-ready DNA from a broad range of tough-to-lyse organisms and environmental samples. Kits have been specifically designed for the efficient recovery of inhibitor-free DNA from plants, seeds, tissues, insects, and microorganisms that inhabit soil, sludge, sediment, or fecal samples. Products are available in spin column Micro- (5 µg/prep), Mini- (25 µg/prep), Midi- (125 µg/prep) and 96-well (5 µg/well) formats – these formats are diagramed below and on the following page.

For processing, samples are simply transferred to the provided ZR BashingBead™ Lysis Tubes where samples are rapidly and efficiently lysed by bead beating in uniquely designed lysis buffers. Processing the samples can be performed using any bead mill, pulverizer, or vortex that can accommodate standard 2.0 ml, 50 ml tubes, or 96-well blocks depending on the format of the kit. Following lysis, DNA is isolated using innovative *Fast-Spin* column and plate technologies, and in cases where plant, feces, or soil samples are processed, the DNA is subsequently filtered to remove humic/fulvic acids or polyphenols that can inhibit PCR. The isolation of inhibitor-free DNA typically takes about 15 minutes.

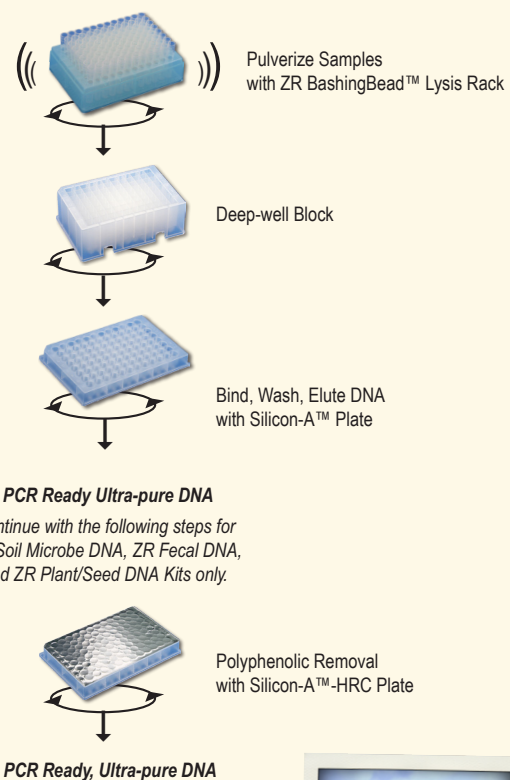




MidiPrep Format



96-Well Format



Fecal DNA

Application

- Soil..... ✓
- Sediment..... ✓
- Sludge..... ✓
- Gram (+) Bacteria..... ✓
- Gram (-) Bacteria..... ✓
- Yeast..... ✓
- Filamentous Fungi..... ✓
- Unicellular Algae..... ✓
- Filamentous Algae..... ✓
- Protist..... ✓



Specifications

- ZR BashingBead™ Lysis..... ✓
- Removal of PCR Inhibitors..... ✓
- Removal of Polyphenolic PCR Inhibitors..... ✓

ZR Soil Microbe DNA MicroPrep™

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 10 µl
- Processing Time..... 15 min.

ZR Soil Microbe DNA MiniPrep™

- Format..... Spin Column
- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 25 µl
- Processing Time..... 15 min.

ZR Soil Microbe DNA MidiPrep™

- Format..... Spin Column
- Binding Capacity..... 125 µg/prep.
- Elution Volume..... ≥ 150 µl
- Processing Time..... 20 min.

ZR-96 Soil Microbe DNA Kit™

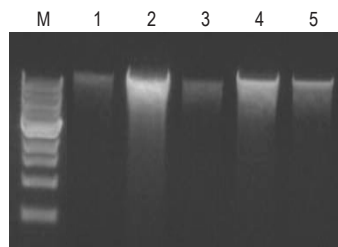
- Format..... 96-Well
- Binding Capacity..... 5 µg/well
- Elution Volume..... ≥ 25 µl
- Processing Time..... 50 min.

Highlights

- Simple, efficient isolation of humic-free DNA from microbes in soil, sludge, sediment, and sand in minutes including tough-to-lyse bacteria, fungi, algae, and protozoa.
- Ultra-high density BashingBeads™ are fracture resistant and chemically inert.

Description

The ZR Soil Microbe DNA MicroPrep™, ZR Soil Microbe DNA MiniPrep™, ZR Soil Microbe DNA MidiPrep™, and ZR-96 Soil Microbe DNA Kit™ are designed for the simple and rapid isolation of humic-free, PCR-quality DNA from microbes in soil. These products can be used to isolate DNA from tough-to-lyse bacteria, fungi, protozoa, and algae that inhabit a variety of samples including clay, sandy, silty, peaty, chalky, and loamy soils. Soil microbes are rapidly and efficiently lysed by bead beating with our state of the art, ultra-high density BashingBeads™. *Fast-Spin* column or plate technology is then used to isolate the DNA, which is subsequently filtered to remove humic acids/polyphenols that can inhibit PCR. The procedures can be performed in minutes, and there is no need for organic denaturants or proteinases.



Metagenomic DNA isolated from 5 soil samples. M: 1 kb marker (NEB); 1-5: soil samples (sand, sandy clay loam, hydrophobic sandy loam, course sandy loam, fine gravel).

Featured Technologies



Ordering Information

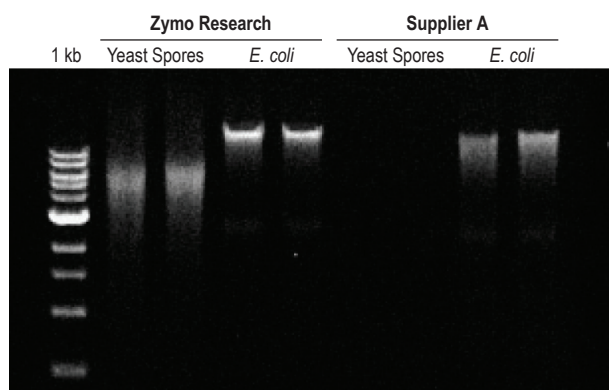
Cat. No.	Product	Size	Price
D6003	ZR Soil Microbe DNA MicroPrep™	50 preps.	\$182.00
D6001	ZR Soil Microbe DNA MiniPrep™	50 preps.	\$182.00
D6101	ZR Soil Microbe DNA MidiPrep™	25 preps.	\$396.00
D6002	ZR-96 Soil Microbe DNA Kit™	2 x 96 preps.	\$559.00

Highlights

- Simple, efficient isolation of DNA from all types of tough-to-lyse fungi and bacteria in minutes.
- Ultra-high density BashingBeads™ are fracture resistant and chemically inert.

Description

The ZR Fungal/Bacterial DNA MicroPrep™, ZR Fungal/Bacterial DNA MiniPrep™, ZR Fungal/Bacterial DNA MidiPrep™, and ZR-96 Fungal/Bacterial DNA Kit™ are designed for the simple and rapid isolation of DNA from tough-to-lyse fungi, including *A. fumigatus*, *C. albicans*, *N. crassa*, *S. cerevisiae*, *S. pombe*, as well as Gram (+/-) bacteria, algae, and protozoa. The procedures are easy and can be completed in minutes: fungal and/or bacterial samples are rapidly and efficiently lysed with our state of the art, ultra-high density BashingBeads™. *Fast-Spin* column or plate technology is then used to isolate the DNA that is ideal for downstream molecular-based applications including PCR, array, etc.



Fungal and bacterial DNA purification. DNA isolated from *Saccharomyces cerevisiae* (spores) and *E. coli* using the ZR Fungal/Bacterial DNA MiniPrep™ is high quality and structurally intact. Equivalent amounts of yeast and bacteria were processed using the ZR Fungal/Bacterial DNA MiniPrep™ or the kit from supplier A. Equal volumes of eluted DNA were then analyzed in a 0.8% (w/v) agarose/ethidium bromide gel. The size marker is a 1 kb ladder (Zymo Research).

Application

- Gram (+) Bacteria..... ✓
- Gram (-) Bacteria..... ✓
- Yeast..... ✓
- Filamentous Fungi..... ✓
- Unicellular Algae..... ✓
- Filamentous Algae..... ✓
- Protist..... ✓



Specifications

- ZR BashingBead™ Lysis..... ✓
- Removal of PCR Inhibitors..... ✓

ZR Fungal/Bacterial DNA MicroPrep™

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 10 µl
- Processing Time..... 10 min.

ZR Fungal/Bacterial DNA MiniPrep™

- Format..... Spin Column
- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 25 µl
- Processing Time..... 10 min.

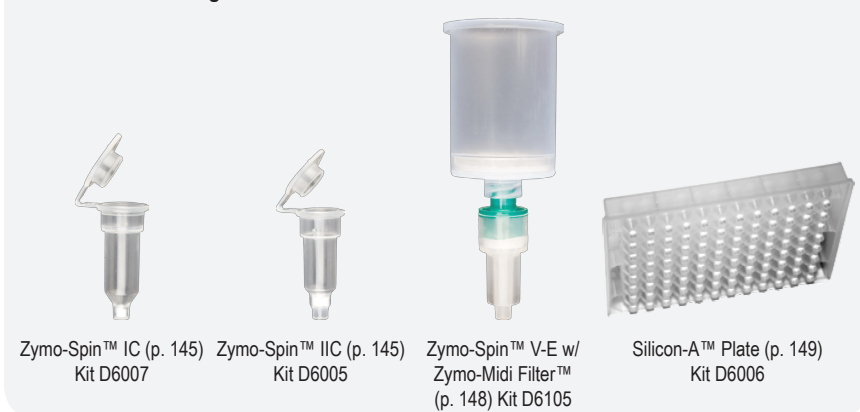
ZR Fungal/Bacterial DNA MidiPrep™

- Format..... Spin Column
- Binding Capacity..... 125 µg/prep.
- Elution Volume..... ≥ 150 µl
- Processing Time..... 20 min.

ZR-96 Fungal/Bacterial DNA Kit™

- Format..... 96-Well
- Binding Capacity..... 5 µg/well
- Elution Volume..... ≥ 25 µl
- Processing Time..... 40 min.

Featured Technologies



Ordering Information

Cat. No.	Product	Size	Price
D6007	ZR Fungal/Bacterial DNA MicroPrep™	50 preps.	\$132.00
D6005	ZR Fungal/Bacterial DNA MiniPrep™	50 preps.	\$132.00
D6105	ZR Fungal/Bacterial DNA MidiPrep™	25 preps.	\$327.00
D6006	ZR-96 Fungal/Bacterial DNA Kit™	2 x 96 preps.	\$482.00

Application

- Feces..... ✓
- Bacteria Gram (+)..... ✓
- Bacteria Gram (-)..... ✓
- Yeast..... ✓
- Filamentous Fungi..... ✓
- Unicellular Algae..... ✓
- Filamentous Algae..... ✓
- Protist..... ✓



Specifications

- ZR BashingBead™ Lysis..... ✓
- Removal of PCR Inhibitors..... ✓
- Removal of Polyphenolic PCR Inhibitors..... ✓

ZR Fecal DNA MicroPrep™

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 10 µl
- Processing Time..... 15 min.

ZR Fecal DNA MiniPrep™

- Format..... Spin Column
- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 25 µl
- Processing Time..... 15 min.

ZR Fecal DNA MidiPrep™

- Format..... Spin Column
- Binding Capacity..... 125 µg/prep.
- Elution Volume..... ≥ 150 µl
- Processing Time..... 25 min.

ZR-96 Fecal DNA Kit™

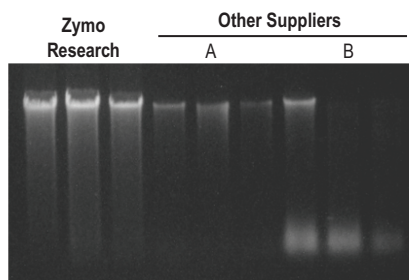
- Format..... 96-Well
- Binding Capacity..... 5 µg/well
- Elution Volume..... ≥ 25 µl
- Processing Time..... 50 min.

Highlights

- Rapid methods for the isolation of inhibitor-free, PCR-quality DNA from fecal samples in minutes including those from humans, birds, rats, mice, cattle, etc.
- Ultra-high density BashingBeads™ are fracture resistant and chemically inert.
- *Fast-Spin* column and unique filtration technologies effectively removes PCR inhibitors from the DNA product.

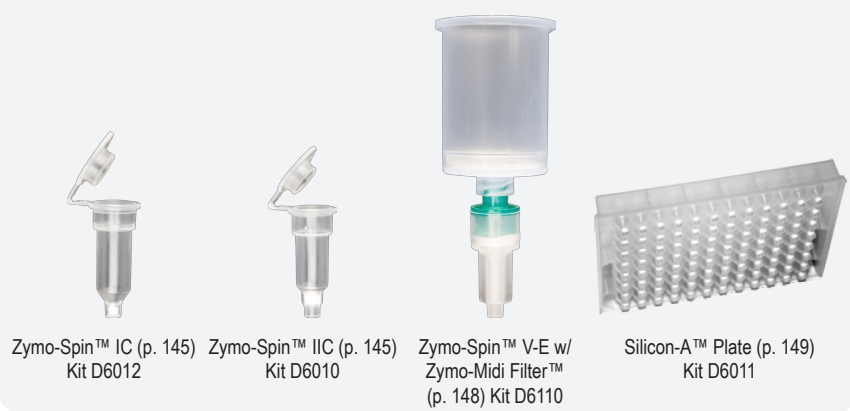
Description

The ZR Fecal DNA MicroPrep™, ZR Fecal DNA MiniPrep™, ZR Fecal DNA MidiPrep™, and the ZR-96 Fecal DNA Kit™ are designed for the simple and rapid isolation of inhibitor-free, PCR-quality host cell and microbial DNA from a variety of sample sources including humans, birds, rats, mice, cattle, etc. The procedures are easy and can be completed in minutes: fecal samples are rapidly and efficiently lysed by bead beating with our state of the art, ultra-high density BashingBeads™. *Fast-Spin* column or plate technology is then used to isolate the DNA which is subsequently filtered to remove humic acids/polyphenols that can inhibit PCR. Eluted DNA is ideal for downstream molecular-based applications including PCR, arrays, genotyping, methylation detection, etc.



Comparison of DNA yields from rat feces using the ZR Fecal DNA MiniPrep™ and kits from suppliers A and B. Equivalent amounts of feces were processed using each kit and then equal volumes of eluted DNA were analyzed in a 0.8% (w/v) agarose/ethidium bromide gel. Samples were processed in triplicate.

Featured Technologies



Ordering Information

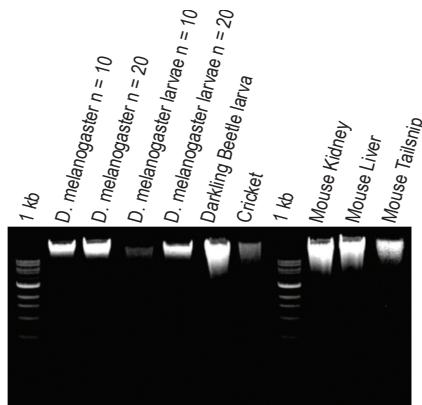
Cat. No.	Product	Size	Price
D6012	ZR Fecal DNA MicroPrep™	50 preps.	\$182.00
D6010	ZR Fecal DNA MiniPrep™	50 preps.	\$182.00
D6110	ZR Fecal DNA MidiPrep™	25 preps.	\$396.00
D6011	ZR-96 Fecal DNA Kit™	2 x 96 preps.	\$559.00

Highlights

- Simple and efficient isolation of DNA from insects, including mosquitoes, bees, lice, ticks, and *D. melanogaster*. Also compatible with tough-to-lyse tissues from other organisms.
- Ultra-high density BashingBeads™ are fracture resistant and chemically inert.

Description

The ZR Tissue & Insect DNA MicroPrep™, ZR Tissue & Insect DNA MiniPrep™, ZR Tissue & Insect DNA MidiPrep™, and ZR-96 Tissue & Insect DNA Kit™ are designed for the simple and rapid isolation of DNA (e.g., genomic, viral, mitochondrial) from fresh, frozen, or stored insect specimens including mosquitoes, bees, lice, ticks, and *D. melanogaster*. The procedures are easy and can be completed in minutes: samples are rapidly and efficiently lysed by bead beating with our state of the art, ultra-high density BashingBeads™. The DNA is then isolated and purified using our *Fast-Spin* column and plate technologies and is ideal for downstream molecular-based applications including PCR, array, genotyping, etc. The procedures are compatible with mammalian tissues, whole blood, and cultured cells.



DNA yields from various insect and mouse samples using the ZR Insect & Tissue DNA MiniPrep™. Various amounts of sample were processed with equal volumes of eluted DNA analyzed in a 0.8% (w/v) agarose/ethidium bromide gel. The 1 kb DNA size marker is from Zymo Research.

Featured Technologies



Ordering Information

Cat. No.	Product	Size	Price
D6015	ZR Tissue & Insect DNA MicroPrep™	50 preps.	\$132.00
D6016	ZR Tissue & Insect DNA MiniPrep™	50 preps.	\$132.00
D6115	ZR Tissue & Insect DNA MidiPrep™	25 preps.	\$327.00
D6017	ZR-96 Tissue & Insect DNA Kit™	2 x 96 preps.	\$482.00

Application

- Soft & Solid Tissues (Food)..... ✓
- Tough-to-Lyse Tissues..... ✓
- Tough-to-Lyse Organisms..... ✓
- Insects/Arthropods..... ✓

Specifications

- ZR BashingBead™ Lysis..... ✓
- Removal of PCR Inhibitors..... ✓



ZR Tissue & Insect DNA MicroPrep™

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 10 µl
- Processing Time..... 15 min.



ZR Tissue & Insect DNA MiniPrep™

- Format..... Spin Column
- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 25 µl
- Processing Time..... 15 min.



ZR Tissue & Insect DNA MidiPrep™

- Format..... Spin Column
- Binding Capacity..... 125 µg/prep.
- Elution Volume..... ≥ 150 µl
- Processing Time..... 20 min.

ZR-96 Tissue & Insect Kit™

- Format..... 96-Well
- Binding Capacity..... 5 µg/well
- Elution Volume..... ≥ 25 µl
- Processing Time..... 40 min.

Application

- Plant Material..... ✓
- Seeds..... ✓
- Fruit..... ✓



Specifications

- ZR BashingBead™ Lysis..... ✓
- Removal of PCR Inhibitors..... ✓
- Removal of Polyphenolic PCR Inhibitors..... ✓

ZR Plant/Seed DNA MicroPrep™

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 10 µl
- Processing Time..... 15 min.

ZR Plant/Seed DNA MiniPrep™

- Format..... Spin Column
- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 25 µl
- Processing Time..... 15 min.

ZR Plant/Seed DNA MidiPrep™

- Format..... Spin Column
- Binding Capacity..... 125 µg/prep.
- Elution Volume..... ≥ 150 µl
- Processing Time..... 25 min.

ZR-96 Plant/Seed DNA Kit™

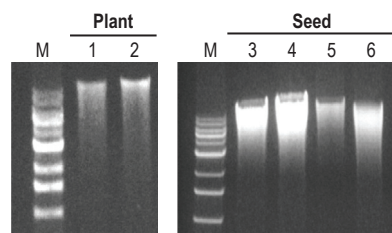
- Format..... 96-Well
- Binding Capacity..... 5 µg/well
- Elution Volume..... ≥ 25 µl
- Processing Time..... 50 min.

Highlights

- Simple methods for the isolation of DNA from tough-to-lyse plant and seed samples in minutes.
- Ultra-high density BashingBeads™ are fracture resistant and chemically inert.
- *Fast-Spin* column technology coupled with filtration removes polyphenolic PCR inhibitors from the DNA product.

Description

The ZR Plant/Seed DNA MicroPrep™, ZR Plant/Seed DNA MiniPrep™, ZR Plant/Seed DNA MidiPrep™, and the ZR-96 Plant/Seed DNA Kit™ are designed for the simple, rapid isolation of inhibitor-free, PCR-quality DNA from a variety of plant sample sources including leaves, stems, buds, flowers, fruit, seeds, etc. The procedures are easy and can be completed in minutes: plant samples are rapidly and efficiently lysed by bead beating with our state of the art, ultra-high density BashingBeads™. Polysaccharides, lipids, and polyphenols/tannins are removed from the DNA using our *Fast-Spin* column or plate technology. The eluted DNA is filtered to remove polyphenolics making it ideal for downstream molecular-based applications including PCR, arrays, etc.



Comparison of DNA yields from various plant and seed samples using the ZR Plant/Seed DNA MiniPrep™. Equivalent amounts of plant materials were processed with equal volumes of eluted DNA analyzed in a 0.8% (w/v) agarose/ethidium bromide gel. M is a 1 kb DNA size marker (Zymo Research). *Arabidopsis thaliana* (1), juniper (2), corn kernel (3, 4), sunflower seed (5, 6).

Featured Technologies



Zymo-Spin™ IC (p. 145) Kit D6022

Zymo-Spin™ IIC (p. 145) Kit D6020

Zymo-Spin™ V-E w/ Zymo-Midi Filter™ (p. 148) Kit D6120

Silicon-A™ Plate (p. 149) Kit D6021

Ordering Information

Cat. No.	Product	Size	Price
D6022	ZR Plant/Seed DNA MicroPrep™	50 preps.	\$182.00
D6020	ZR Plant/Seed DNA MiniPrep™	50 preps.	\$182.00
D6120	ZR Plant/Seed DNA MidiPrep™	25 preps.	\$396.00
D6021	ZR-96 Plant/Seed DNA Kit™	2 x 96 preps.	\$559.00

	ZR-Duet™ DNA/RNA MiniPrep	ssDNA/RNA Clean & Concentrator™	ZR Viral DNA/RNA Kit™	ZR-96 Viral DNA/RNA Kit™
	Parallel Purification	Co-purification		
Specifications				
Format	Spin Column	Spin Column	Spin Column	96-well
DNA Binding Capacity	25 µg/prep.			
RNA Binding Capacity	25 µg/prep.			
DNA & RNA Binding Capacity		5 µg/prep.	5 µg/prep.	5 µg/prep.
Elution Volume	≥ 50 µl DNA / ≥ 25 µl RNA	≥ 6 µl	≥ 6 µl	≥ 10 µl
DNA Separation Column	✓			
In-column DNase Digestion	✓			
RNA/ater® Compatible	✓			
Processing Time	15 ¹ min.	10 min.	5 min.	15 min.
Application				
Small-RNA ²	✓	✓		
Probe Purification		✓		
Fresh/Frozen Soft Tissue	✓			
Fresh/Frozen Solid Tissue	limited ³			
Cultured Cells	✓		✓	✓
Buccal Cells/Swabs	✓			
Buffy Coat	✓			
Whole-blood			≤ 50 µl	≤ 50 µl
Plasma/Serum			✓	✓
Bacteria	limited ³			
Yeast	limited ³			
Virus			✓	✓
Page Number	81	82	83	83

1 Time does not account for in-column DNase I treatment (~20 min.).

2 Can isolate RNAs ≥ 17 nucleotides.

3 Some tissue samples may require mechanical and/or enzymatic pre-treatment for efficient processing.

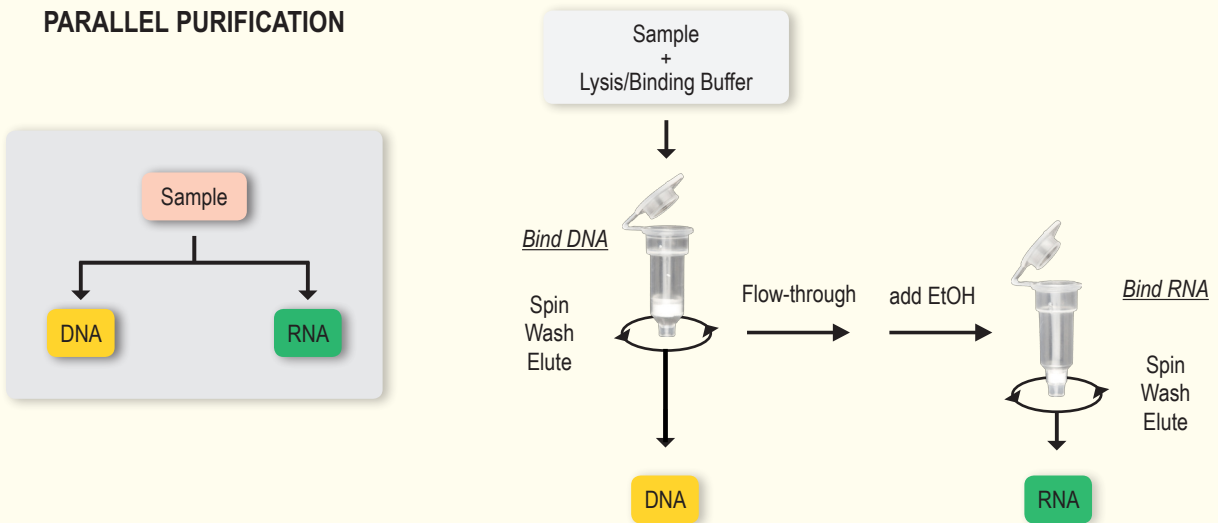
Technology Overview: Parallel Purification and Co-purification of DNA & RNA

Zymo Research features a series of products for simultaneous purification of DNA and RNA from variety of samples. Both parallel purification or co-purification products provide high quality DNA and RNA while the procedures are fast and simple to perform. *The overview of parallel purification and co-purification procedures is illustrated below.*

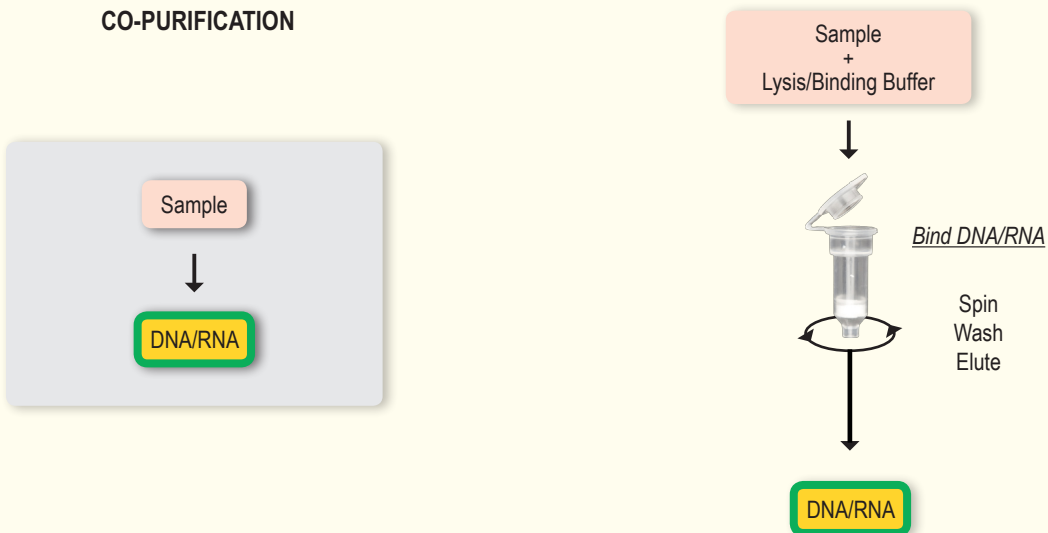
The ZR-Duet™ DNA/RNA MiniPrep is designed for parallel purification of DNA and RNA from the same sample. Without sacrificing DNA yield, this kit also allows for recovery of a broad range of RNA including small RNA molecules (≥ 17 nt).

Viral nucleic acids can be readily extracted and co-purified from cells or body fluids with a single column format using the ZR Viral DNA/RNA Kit™. For high-throughput (96-well) sample processing, the ZR-96 Viral DNA/RNA Kit™ is available. The ssDNA/RNA Clean & Concentrator™ streamlines the separation of single stranded DNA and RNA probes and transcripts from double stranded nucleic acid species and provides a convenient method for the removal of enzymes, dNTPs etc. The spin column facilitates concentration of single stranded nucleotide moieties ≥ 17 nt into as little as 6 μ l.

PARALLEL PURIFICATION



CO-PURIFICATION

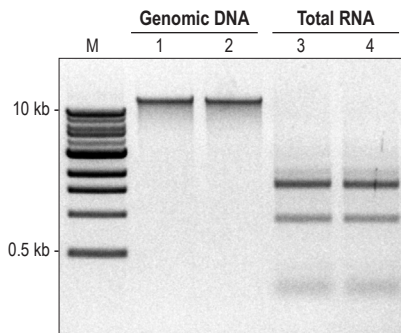


Highlights

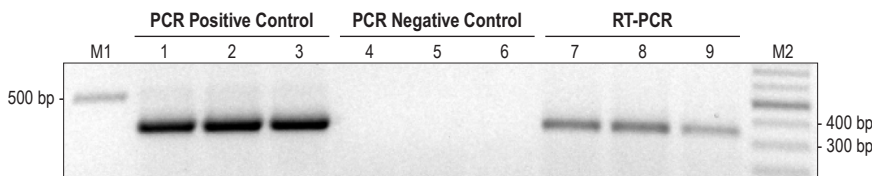
- Quick isolation and separation of genomic DNA and total RNA (up to ~25 µg each) from a wide range of sources using *Fast-Spin* column technology.
- DNA/RNA products are suitable for use in PCR, RT-PCR, and other procedures.
- Omits the use of organic denaturants and proteases.

Description

The ZR-Duet™ DNA/RNA MiniPrep provides a quick method for parallel purification of high quality genomic DNA and total RNA from small amounts of cells and tissue. The kit isolates both genomic DNA and large and small RNA species without the use of phenol or reducing agents. Small RNAs (e.g., tRNAs, microRNAs) can be recovered following a simple adjustment of the RNA isolation protocol – *no extra steps are required!* Both DNA and RNA (up to ~25 µg each) from 5 x 10⁶ cells can be isolated in less than 15 minutes.



DNA and RNA purified using the ZR-Duet™ DNA/RNA MiniPrep. Genomic DNA (lane 1, 2) and total RNA (lane 3, 4) isolated from human epithelial cells (HCT 116) with the ZR-Duet™ DNA/RNA MiniPrep. M is a 1 kb DNA Marker (Zymo Research).



PCR amplification of β-actin transcript (353 bp fragment shown) following DNA and RNA isolation from human epithelial cells (HCT 116) with the ZR-Duet™ DNA/RNA MiniPrep: PCR positive control (DNA template; lane 1, 2, 3), PCR negative control (RNA template; lane 4, 5, 6), RT-PCR (lane 7, 8, 9). M1 and M2 are 1 kb and 100 bp DNA Markers, respectively (Zymo Research).

Application

- Fresh/Frozen Soft Tissue..... ✓
- Cultured Cells..... ✓
- Buccal Cells/Swabs..... ✓
- Buffy Coat..... ✓



Specifications

- Format..... Spin Column
- DNA Binding Capacity..... 25 µg/prep.
- RNA Binding Capacity..... 25 µg/prep.
- DNA Elution Volume..... ≥ 50 µl
- RNA Elution Volume..... ≥ 25 µl
- In-column DNase Digestion..... ✓
- RNAlater Compatible..... ✓
- Processing Time..... 15 min.

Featured Technologies



Zymo-Spin™ IIC (p. 145)
Kit D7001



Zymo-Spin™ IIIC (p. 146)
Kit D7001

Ordering Information

Cat. No.	Product	Size	Price
D7001	ZR-Duet™ DNA/RNA MiniPrep	50 preps.	\$282.00

Application

- Cell Lysates..... ✓
- Enzyme Removal..... ✓
- Nucleotide/Dye Removal..... ✓
- cDNA/ssDNA Purification..... ✓
- Probe Purification..... ✓
- M13 Phage..... ✓



Specifications

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 6 µl
- Size Limits..... ≥ 17 nt
- Processing Time..... 10 min.

Featured Technologies



Zymo-Spin™ IC (p. 145)
Kit D7010, D7011



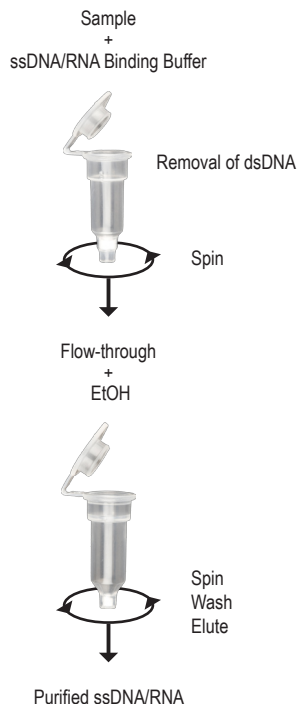
Zymo-Spin™ IIC (p. 145)
Kit D7010, D7011

Highlights

- Quick (10 minute) method for separating, cleaning, and concentrating ssDNA or RNA.
- Ideal for non-enzymatic elimination of genomic DNA from transcripts, probes, primers, etc.
- *Fast-Spin* column technology allows for elution into minimal volumes (≥ 6 µl).

Description

The ssDNA/RNA Clean & Concentrator™ provides a simple and reliable method for the rapid separation, clean-up, and concentration of up to ~5 µg (per prep.) of single stranded DNA and/or RNA from double stranded species (e.g., genomic DNA). This simple 10 minutes procedure is based on the use of a unique single-buffer system and *Fast-Spin* column technology. Single stranded DNA or RNA ≥ 17 nucleotides (e.g., transcripts, probes, primers) can be safely treated and co-purified using this kit. The result is highly concentrated, purified DNA/RNA that is suitable for subsequent molecular methods including PCR, RT-PCR, hybridization, etc.



Ordering Information

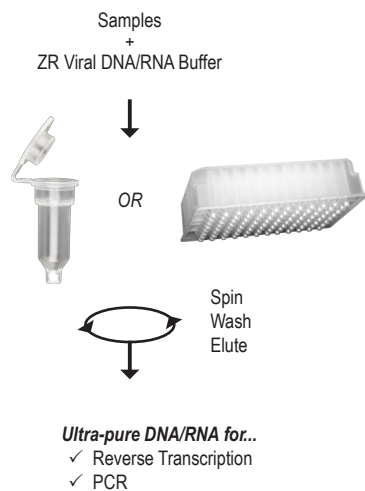
Cat. No.	Product	Size	Price
D7010	ssDNA/RNA Clean & Concentrator™	20 preps.	\$76.00
D7011	ssDNA/RNA Clean & Concentrator™	50 preps.	\$152.00

Highlights

- Quick co-purification of viral DNA/RNA from a wide range of sources.
- *Fast-Spin* column and plate technologies allow ultra-clean DNA and RNA to be eluted into minimal volumes.
- Omits the use of organic denaturants and proteases.

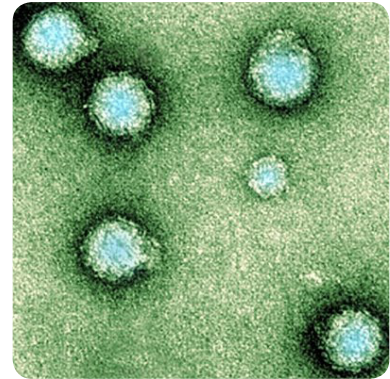
Description

The ZR Viral DNA/RNA Kit™ and ZR-96 Viral DNA/RNA Kit™ provide for rapid, single column or high-throughput (96-well) isolation of high-quality viral nucleic acids from a wide range of biological sources. The kit can be used to successfully isolate viral DNA and RNA from cell-free body fluids as well as cellular suspensions at concentrations $\leq 1 \times 10^5$ cells/ml. The procedure employs a single buffer system that facilitates viral particle lysis and allows for the subsequent DNA/RNA binding onto the matrix of the Zymo-Spin™ IC Column or Zymo-Spin™ I-96 Plate. The nucleic acids are washed then eluted with DNase/RNase-free Water. The eluted DNA and RNA are suitable for use in various subsequent procedures including RT/PCR.



Application

- Cultured Cells..... ✓
- Plasma/Serum..... ✓
- Virus..... ✓



Specifications

- Binding Capacity..... 5 µg/prep.
- RNA Size limits..... ≥ 200 nt

ZR Viral DNA/RNA Kit™

- Format..... Spin Column
- Elution Volume..... ≥ 6 µl
- Processing Time..... 5 min.

ZR-96 Viral DNA/RNA Kit™

- Format..... 96-Well
- Elution Volume..... ≥ 10 µl
- Processing Time..... 15 min.

Featured Technologies



Zymo-Spin™ IC (p. 145)
Kits D7020, D7021



Zymo-Spin™ I-96 (p. 150)
Kits D7022, D7023

Ordering Information

Cat. No.	Product	Size	Price
D7020	ZR Viral DNA/RNA Kit™	50 preps.	\$122.00
D7021	ZR Viral DNA/RNA Kit™	200 preps.	\$420.00
D7022	ZR-96 Viral DNA/RNA Kit™	2 x 96 preps.	\$341.00
D7023	ZR-96 Viral DNA/RNA Kit™	4 x 96 preps.	\$613.00

DNA Molecular Weight Markers

Application

DNA Size Standard for Gel Electrophoresis..... ✓



Specifications

Provided lyophilized nucleic acid or as a ready-to-load liquid*.

Ranges available:

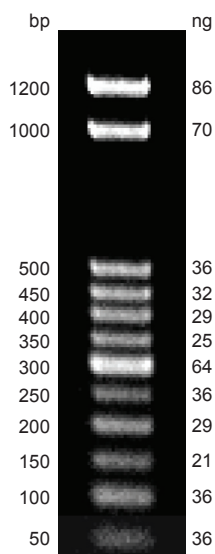
ZR 50 bp DNA Marker™	50-1200 bp
ZR 100 bp DNA Marker™	100-1500 bp
ZR 1 kb DNA Marker™	0.5-10 kb

Inclusion of an intensified band is provided in each marker for easy identification.

*All ready-to-load markers contain Xylene-Cyanol FF and Orange G dyes.

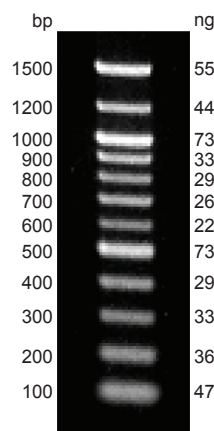
Description

The ZR DNA Markers™ are defined DNA size fragments that encompass a range of sizes from 50 bp up to 10 kb. This makes DNA size approximation easy for both PCR products as well as plasmid DNAs. The ZR 50 bp DNA Marker™, ranging from 50 bp to 1200 bp, is well within the common range of PCR generated DNA fragments. For larger DNAs, the ZR 100 bp DNA Marker™ and ZR 1 kb DNA Marker™ are appropriate. Each marker comes with product information detailing the product and its application.



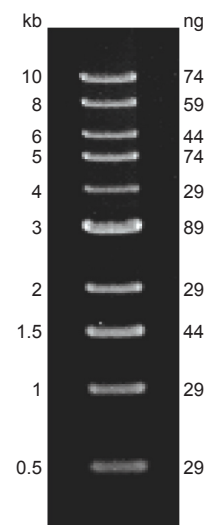
ZR 50 bp DNA Marker™

500 ng of the ZR 50 bp DNA Marker™ was separated in a 1.8% w/v agarose/EtBr/TAE gel.



ZR 100 bp DNA Marker™

500 ng of the ZR 100 bp DNA Marker™ was separated in a 1.5% w/v agarose/EtBr/TAE gel.



ZR 1 kb DNA Marker™

500 ng of the ZR 1 kb DNA Marker™ was separated in a 0.8% w/v agarose/EtBr/TAE gel.

Ordering Information

Cat. No.	Product	Amount	Price
M5001-50	ZR 50 bp DNA Marker™	50 µg / 100 µl	\$50.00
M5001-200	ZR 50 bp DNA Marker™	200 µg / 400 µl	\$150.00
M5004-50	ZR 50 bp DNA Marker™ (ready-to-load*)	50 µg / 600 µl	\$55.00
M5002-50	ZR 100 bp DNA Marker™	50 µg / 100 µl	\$50.00
M5002-200	ZR 100 bp DNA Marker™	200 µg / 400 µl	\$150.00
M5005-50	ZR 100 bp DNA Marker™ (ready-to-load*)	50 µg / 600 µl	\$55.00
M5003-50	ZR 1 kb DNA Marker™	50 µg / 100 µl	\$50.00
M5003-200	ZR 1 kb DNA Marker™	200 µg / 400 µl	\$150.00
M5006-50	ZR 1 kb DNA Marker™ (ready-to-load*)	50 µg / 600 µl	\$55.00



3

RNA Purification

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DNA-Free RNA Kit™ 91

Zymoclean™ Gel RNA Recovery Kit 92

ZR small-RNA™ PAGE Recovery Kit 93

OneStep™ PCR Inhibitor Removal Kit 44

OneStep-96™ PCR Inhibitor Removal Kit 44

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Introduction

Considering RNA Isolation

The quality of RNA obtained from biological samples or reaction mixtures is of critical importance to the success of downstream applications including real-time quantitative PCR, reverse transcription PCR, microarrays, Northern blot analysis, nuclease protection assays, RNA mapping, *in vitro* translation, cDNA library construction, etc. Thus, it is essential that the methods of purifying or isolating RNA from different types of cells and tissues produce RNA of sufficient yield and structural integrity. With this in mind, the scientists at Zymo Research have developed a range of RNA isolation kits designed for the efficient recovery of high quality RNA from a diversity of sources (see RNA Purification & Isolation Product Guides on the following pages).

RNA Clean-up & Concentration

The RNA Clean & Concentrator™ kits (pp. 89-90) and the DNA-Free RNA Kit™ (p. 91) facilitate the efficient removal of RNA polymerases, ligases, and RNA modifying enzymes as well as free NTPs and their analogs including fluorescent and radio-labeled derivatives. Zymo Research developed the Zymoclean™ Gel RNA Recovery Kit (p. 92) and the ZR small-RNA™ PAGE Recovery Kit (p. 93) for recovery of RNA from agarose and polyacrylamide gel matrices. All clean-up kits feature our state of the art *Fast-Spin* column technology so that RNA can be eluted with minimal volumes (i.e., $\geq 6 \mu\text{l}$) of water. This allows for highly concentrated RNA that is well suited for applications like microarrays, RNA transfection, denaturing-gel electrophoresis, Northern blotting, and RT-PCR.

Total RNA Isolation

Zymo Research offers an assortment of products that allow for the simple, rapid, and efficient isolation of total RNA from a variety of biological sources including fresh, frozen, or paraffin-embedded tissues, cultured cells, buccal cells, whole blood, plasma, serum, urine, yeast, or RNA viruses. Like our RNA clean-up kits, all of the RNA isolation kits feature *Fast-Spin* column technology for highly concentrated RNA that is well suited for applications like microarrays, denaturing-gel electrophoresis, Northern blotting, and RT-PCR. Additionally, the ZR RNA MicroPrep™ and ZR RNA MiniPrep™ kits (p. 97), are capable of isolating RNA species as small as 17 nt. Each kit has been optimized for a particular application with specialized, nuclease-free components that ensure: 1) maximum levels of membrane solubilization and cellular disruption, 2) total inhibition of nuclease activity, 3) complete deproteinization of the sample, 4) efficient isolation and concentration of the RNA, 5) stabilization and safe storage of the RNA.

Environmental RNA Purification

For isolating RNA from tough-to-lyse and environmental samples, Zymo Research provides several products featuring unique BashingBead™ lysis technology (pp. 103-109). With these kits, RNA can be isolated from samples otherwise resistant to conventional lysis procedures. These include many solid tissues, plants, seeds, food, arthropods, Gram positive and Gram negative bacteria, yeast, filamentous fungi, unicellular and filamentous algae, and protozoa. The result is high yield, high quality RNA that is suitable for downstream applications such as RT-PCR, etc.

DNA/RNA Co-purification

To meet the needs of scientists who wish to extract DNA and RNA from the same source simultaneously, Zymo Research developed a line of DNA/RNA co-purification kits. A scientist can process cells or tissues with the ZR-*Duet*™ DNA/RNA MiniPrep (p. 81) to purify DNA and RNA from the same sample into separate products. The ZR Viral DNA/RNA Kit™ and ZR-96 Viral DNA/RNA Kit™ (p. 83) are for the purification of viral and host DNA and RNA together using blood or cell culture as input. Finally, the ssDNA/RNA Clean & Concentrator™ (p. 82) is an adaptation of our DCC™ product line for cleaning and concentrating mixed ssDNA/RNA samples.

RNA Molecular Weight Marker

Agarose and polyacrylamide gel electrophoresis are two common techniques for determining the size, purity, and sequence identity (e.g., Northern and Southern blotting procedures) of nucleic acids. Nucleic acids can be visualized in gels using fluorescent stains (e.g. ethidium bromide) or by silver staining. RNA size markers (or ladders) are necessary to help identify the identity of unknown nucleic acids in such gel-based procedures. The ZR small-RNA™ Ladder (p. 110) is ideal for identifying small RNAs (i.e., siRNAs and miRNAs) from 17 - 29 bases in size.

RNA Clean & Concentrator™-5

RNA Clean & Concentrator™-25

RNA Clean & Concentrator™-100

ZR-96 RNA Clean & Concentrator™

DNA-Free RNA Kit™

ZymoClean™ Gel RNA Recovery Kit

ZR small-RNA™ PAGE Recovery Kit

OneStep™ PCR Inhibitor Removal Kit

OneStep™-96 PCR Inhibitor Removal Kit

Specifications									
Format	Spin Column	Spin Column	Spin Column	96-Well	Spin Column	Spin Column	Spin Column	Spin Column	96-Well
Binding Capacity	5 µg/prep.	25 µg/prep.	125 µg/prep.	25 µg/well	5 µg/prep.	5 µg/prep.	5 µg/prep.		
Elution Volume	≥ 6 µl	≥ 25 µl	≥ 100 µl	≥ 10 µl	≥ 6 µl	≥ 6 µl	≥ 6 µl	50-200 µl	50-100 µl
Processing Time	5 min.	5 min.	10 min.	20 min.	20 min.	30 min.	45 min.	5 min.	10 min.
Application									
RNA Clean-up	✓	✓	✓	✓	✓			✓	✓
DNA-free RNA	✓	✓	✓	✓	✓				
Enzyme Removal ¹	✓	✓	✓	✓	✓				
Nucleotide/Dye Removal ²	✓	✓	✓	✓	✓				
Small-RNA/Probe Purification ³	✓	✓	✓	✓	✓				
RNA From Agarose Gel Slices						✓			
RNA From Polyacrylamide Gel Slices							✓		
Removal of Polyphenolic RT Inhibitors ⁴								✓	✓
Page Number	89	89	89	90	91	92	93	44	44

¹ Efficient removal of RNA polymerases, ligases, and RNA modifying enzymes.

² Efficient removal of free NTPs and their analogs including fluorescent and radiolabeled derivatives.

³ Can isolate RNAs ≥ 17 nucleotides.

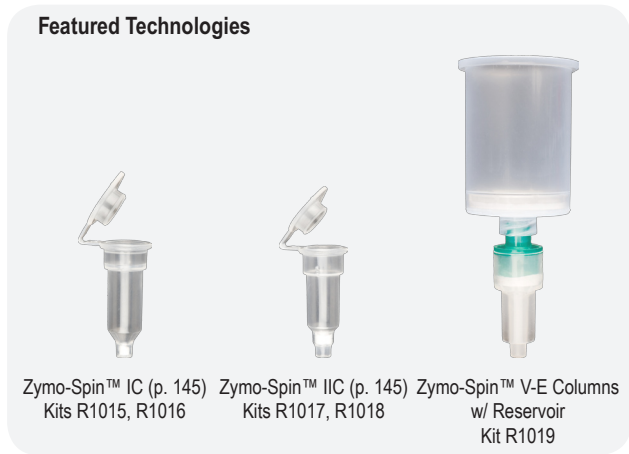
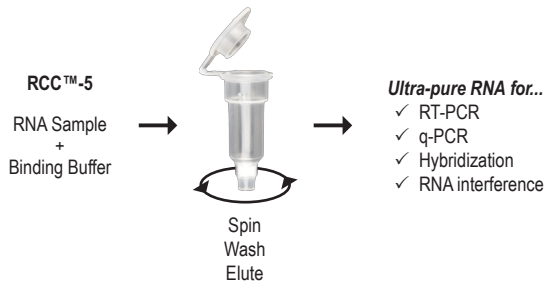
⁴ Polyphenolic RT inhibitors include humic and fulvic compounds from soil, sludge, etc., tannins from plants, and melanin from tissue, among others.

Highlights

- Quick methods for cleaning and concentrating RNA.
- *Fast-Spin* column technology allows RNA to be eluted into minimal volumes (≥ 6 µl).
- Ideal for purification of RNA from aqueous phase following acid phenol extraction.

Description

The RNA Clean & Concentrator™-5, RNA Clean & Concentrator™-25, and RNA Clean & Concentrator™-100 provide simple and reliable methods for the rapid preparation of high-quality RNA. These simple procedures are based on the use of a unique single-buffer system and *Fast-Spin* column technologies. The procedures are easy: just add the binding buffer to your sample, adjust the conditions for binding by adding ethanol, wash, and elute the concentrated RNA. RNA ≥ 17 bases can be safely treated and recovered using these kits. The result is highly-concentrated, purified RNA that is suitable for subsequent RNA-based methods including RT-PCR, hybridization, etc.



Ordering Information

Cat. No.	Product	Size	Price
R1015	RNA Clean & Concentrator™-5	50 preps.	\$122.00
R1016	RNA Clean & Concentrator™-5	200 preps.	\$420.00
R1017	RNA Clean & Concentrator™-25	50 preps.	\$122.00
R1018	RNA Clean & Concentrator™-25	100 preps.	\$220.00
R1019	RNA Clean & Concentrator™-100	25 preps.	\$162.00

Application

- RNA Clean-up..... ✓
- DNA-free RNA..... ✓
- Enzyme Removal..... ✓
- Nucleotide/Dye Removal..... ✓
- Small-RNA/Probe Purification..... ✓



Specifications

Format..... Spin Column
 RNA Size Limits..... ≥ 17 nt

RNA Clean & Concentrator™-5

Binding Capacity..... 5 µg/prep.
 Elution Volume..... ≥ 6 µl
 Processing Time..... 5 min.

RNA Clean & Concentrator™-25

Binding Capacity..... 25 µg/prep.
 Elution Volume..... ≥ 25 µl
 Processing Time..... 5 min.

RNA Clean & Concentrator™-100

Binding Capacity..... 125 µg/prep.
 Elution Volume..... ≥ 100 µl
 Processing Time..... 10 min.

ZR-96 RNA Clean & Concentrator™

Application

- RNA Clean-up..... ✓
- DNA-free RNA..... ✓
- Enzyme Removal..... ✓
- Nucleotide/Dye Removal..... ✓
- Small-RNA/Probe Purification..... ✓



Specifications

- Format..... 96-Well
- Binding Capacity..... 25 µg/well
- Elution Volume..... ≥ 10 µl
- RNA Size Limits..... ≥ 17 nt
- Processing Time..... 20 min.

Featured Technology



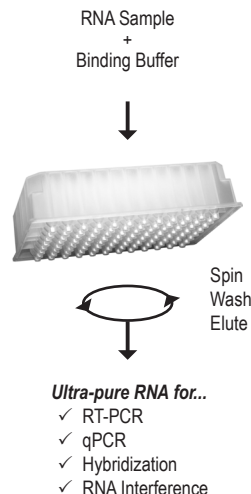
Zymo-Spin™ I-96 (p. 150)
Kit R1080

Highlights

- Quick method for cleaning and concentrating RNA samples.
- *Fast-Spin* plate technology facilitates low volume elution of RNA.
- Ideal for purification of RNA from aqueous phase following acid phenol extraction.

Description

The ZR-96 RNA Clean & Concentrator™ is a 96-well version of the RNA Clean & Concentrator™. It provides a simple and reliable method for high-throughput RNA purification. Simply add the binding buffer to your sample, adjust the conditions for binding by adding ethanol, wash, and elute the concentrated RNA from the wells of the provided *Fast-Spin* plate. RNA fragments (≥ 17 bases) can be safely treated and recovered using this kit. The result is highly-concentrated, purified RNA that is suitable for subsequent RNA-based methods including RT-PCR, hybridization, etc.



Ordering Information

Cat. No.	Product	Size	Price
R1080	ZR-96 RNA Clean & Concentrator™	2 x 96 preps	\$372.00

Highlights

- Quick (20 minute) method for DNA-free RNA preparation.
- Fast-Spin column technology allows RNA to be eluted into minimal volumes (≥ 6 µl).
- DNase I is provided.

Description

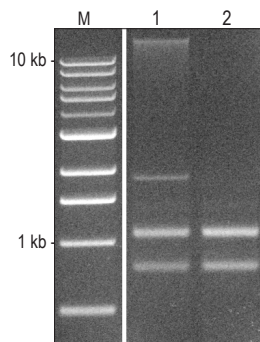
The DNA-Free RNA Kit™ provides a simple and reliable method for the rapid preparation of up to ~5 µg (per prep.) of high-quality RT-PCR-ready, DNA-free RNA. The kit is provided with high fidelity DNase I for complete DNA removal. Purification of the RNA is easy: simply treat your RNA sample with DNase I, add the binding buffer, adjust the conditions by adding ethanol, and then bind, wash, and elute the pure RNA from the provided Zymo-Spin™ IC Column. RNA ≥ 17 bases can be safely treated and recovered using this kit. The result is highly-concentrated, purified RNA that is suitable for subsequent RNA-based methods including RT-PCR, hybridization, etc.

Application

- RNA Clean-up..... ✓
- DNA-Free RNA..... ✓
- Enzyme Removal..... ✓
- Nucleotide/Dye Removal..... ✓
- Small-RNA/Probe Purification..... ✓

Specifications

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 6 µl
- RNA Size Limits..... ≥ 17 nt
- Processing Time..... 20 min.



Purification of RNA samples containing genomic and plasmid DNA treated with the DNA-Free RNA Kit™. (1) RNA/DNA sample purified without prior DNase treatment. (2) DNase treated, purified RNA sample. M is a 1 kb DNA Marker (Zymo Research).



- Ultra-pure RNA for..**
- ✓ RT-PCR
 - ✓ q-PCR
 - ✓ Hybridization
 - ✓ RNA Interference

Ordering Information

Cat. No.	Product	Size	Price
R1013	DNA-Free RNA Kit™	50 preps.	\$142.00
R1014	DNA-Free RNA Kit™	200 preps.	\$510.00

Featured Technology



Zymo-Spin™ IC (p. 145)
Kits R1013, R1014

Zymoclean™ Gel RNA Recovery Kit

Application

RNA From Agarose Gel Slices..... ✓



Specifications

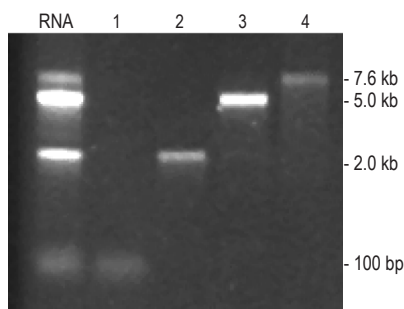
Format..... Spin Column
 Binding Capacity..... 5 µg/prep.
 Elution Volume..... ≥ 6 µl
 RNA Size Limits..... ≥ 200 nt
 Processing Time..... 30 min.

Highlights

- Quick (30 minute) recovery of purified RNA fragments from agarose gels.
- *Fast-Spin* column technology allows RNA to be eluted into minimal volumes (≥ 6 µl).
- Recovery ≥ 80% for RNA > 500 nt.

Description

The Zymoclean™ Gel RNA Recovery Kit provides a quick and efficient purification method for recovery of RNA fragments from agarose gels. The procedure combines a unique, single-step agarose dissolving/RNA binding buffer with *Fast-Spin* column technology to yield high quality, purified RNA in just minutes. The purified RNA is eluted into small volumes of DNase/RNase-free water for highly concentrated samples suitable for subsequent RNA-based manipulations. Compatible with MOPS, TAE, and TBE buffered agarose gels (formaldehyde up to 2.0%).



The recovery of RNA from an agarose gel. Different sized RNAs on the left were excised from the gel and recovered using the Zymoclean™ Gel RNA Recovery Kit (lanes 1-4).



Ultra-pure RNA for..
 ✓ Reverse Transcription
 ✓ Northern Blotting, etc.

Featured Technology



Zymo-Spin™ IC (p. 145)
 Kit R1011

Ordering Information

Cat. No.	Product	Size	Price
R1011	Zymoclean™ Gel RNA Recovery Kit	50 preps.	\$110.00

Highlights

- For efficient recovery of small RNA fragments from polyacrylamide gels.
- *Fast-Spin* column technology allows RNA to be eluted into minimal volumes ($\geq 6 \mu\text{l}$).
- Compatible with up to 25% (w/v) polyacrylamide.

Description

The ZR small-RNA™ PAGE Recovery Kit provides an easy and efficient method for the extraction of high quality small RNAs from polyacrylamide gels (native and/or denatured). The ZR small-RNA™ PAGE Recovery Kit is a refinement of the "crush and soak" method that incorporates a unique buffer system together with *Fast-Spin* column technologies for improved recovery and added convenience. The recovered RNA can be concentrated into volumes as small as 6 μl , making it ideal for many downstream enzymatic reactions and manipulations.

Can be used for extraction/isolation of DNA fragments with equal efficiency.

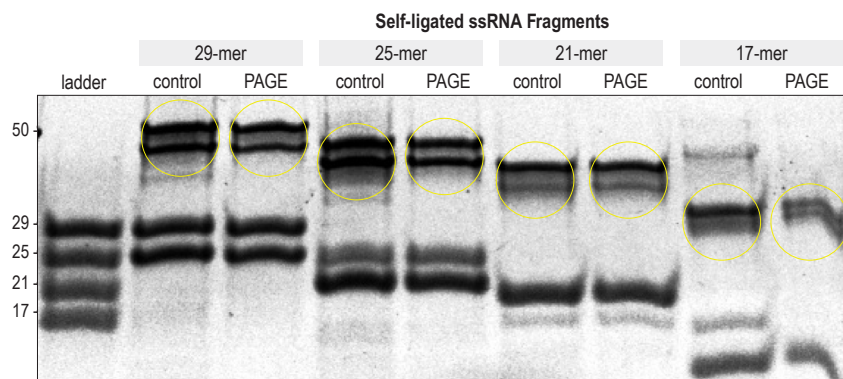
Application

RNA From Polyacrylamide Gel Slices..... ✓



Specifications

Format..... Spin Column
 Binding Capacity..... 5 $\mu\text{g}/\text{prep}$.
 Elution Volume..... $\geq 6 \mu\text{l}$
 RNA Size Limits..... 17 - 200 nt
 Processing Time..... 45 min.



ladder = ZR small RNA ladder
 control = ssRNA oligo ligation control
 PAGE = recovered ssRNA oligo self-ligated

Recovery and ligation of single-stranded RNA oligonucleotides. In the image above, the RNA fragments were recovered from a 17.5% (w/v) native polyacrylamide gel using the ZR small-RNA™ PAGE Recovery Kit. All fragments shown were resolved in a native PAGE gel following ligation. T4 polynucleotide kinase and T4 RNA ligase I (New England Biolabs) were used for the phosphorylation and subsequent ligation of the ssRNA samples. Ligated RNAs are circled in yellow. RNA in the gel was visualized with GelStar® Stain (Lonza).

Featured Technologies



Zymo-Spin™ IC (p. 145)
 Kit R1070



Zymo-Spin™ IIIC (p. 146)
 Kit R1070

Ordering Information

Cat. No.	Product	Size	Price
R1070	ZR small-RNA™ PAGE Recovery Kit	20 preps.	\$121.00

Quick-RNA™ MicroPrep

Quick-RNA™ MiniPrep

Quick-RNA™ MidPrep

ZR-96 Quick-RNA™

ZR RNA MicroPrep™

ZR RNA MiniPrep™

ZR Viral RNA Kit™

ZR-96 Viral RNA Kit™

Specifications								
Format	Spin Column	Spin Column	Spin Column	96-Well	Spin Column	Spin Column	Spin Column	96-Well
Binding Capacity	5 µg/prep.	25 µg/prep.	125 µg/prep.	5 µg/well	5 µg/prep.	25 µg/prep.	5 µg/prep.	5 µg/well
Elution Volume	≥ 6 µl	≥ 35 µl	≥ 100 µl	≥ 25 µl	≥ 6 µl	≥ 25 µl	≥ 6 µl	≥ 10 µl
DNA Removal Column					✓	✓		
In-Column DNase Digestion ¹					✓	✓		
Small-RNA Purification ²					✓	✓		
RNAlater™ Compatible					✓	✓		
Processing Time	10 min.	10 min.	15 min.	30 min.	15 min. ¹	15 min. ¹	5 min.	15 min.
Application								
Fresh/Frozen Soft Tissue	✓	✓	✓	✓	✓	✓		
Fresh/Frozen Solid Tissue	limited ³	limited ³	limited ³	limited ³	limited ³	limited ³		
Tissue Sections								
FFPE Tissue Sections								
Cultured Cells	✓	✓	✓	✓	✓	✓	✓	✓
Buccal Cells/Swabs	✓	✓	✓	✓	✓	✓		
Buffy Coat	✓	✓	✓	✓	✓	✓		
Whole Blood								
Plasma/Serum							✓	✓
Urine								
Bacteria					limited ³	limited ³		
Yeast						limited ³		
Virus							✓	✓
Page Number	96	96	96	96	97	97	98	98

¹ Protocol provided. Time does not account for in-column DNase I treatment (~20 min).

² RNAs ≥ 17 bases can be isolated with modification to the procedure.

³ Some tissue samples may require mechanical and/or enzymatic pre-treatment for efficient processing.

	ZR Whole-Blood RNA MiniPrep™	ZR-96 Whole-Blood RNA™	ZR Urine RNA Isolation Kit™	YeaStar™ RNA Kit	Pinpoint™ Slide RNA Isolation System I	Pinpoint™ Slide RNA Isolation System II
Specifications						
Format	Spin Column	96-Well	Spin Column	Spin Column	Spin Column	Spin Column
Binding Capacity	5 µg/prep.	5 µg/well	5 µg/prep.	25 µg/prep.	5 µg/prep.	5 µg/prep.
Elution Volume	≥ 6 µl	≥ 10 µl	≥ 10 µl	≥ 60 µl	≥ 8 µl	≥ 8 µl
DNA Removal Column						
In-Column DNase Digestion						
Small-RNA Purification ²						
RNAlater™ Compatible						
Processing Time	10 min.	45 min.	5 min.	30 min.	1.5 hr.	5 hr.
Application						
Fresh/Frozen Soft Tissue						
Fresh/Frozen Solid Tissue						
Tissue Sections					✓	✓
FFPE Tissue Sections						✓
Cultured Cells						
Buccal Cells/Swabs						
Buffy Coat	✓	✓				
Whole Blood	≤ 200 µl	≤ 200 µl				
Plasma/Serum	≤ 200 µl	≤ 200 µl				
Urine			✓			
Bacteria						
Yeast				✓		
Virus						
Page Number	99	99	100	101	102	102

Application

- Fresh/Frozen Soft Tissue*..... ✓
- Cultured Cells..... ✓
- Buccal Cells/Swabs..... ✓
- Buffy Coat..... ✓

* For solid tissue or tough-to-lyse samples use: ZR Tissue & Insect RNA MicroPrep™ (p. 108)



Specifications

Quick-RNA™ MicroPrep

- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 6 µl
- Sample Size..... ≤ 10⁵ cells
- Processing Time..... 10 min.

Quick-RNA™ MiniPrep

- Format..... Spin Column
- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 35 µl
- Sample Size..... ≤ 5 x 10⁶ cells
- Processing Time..... 10 min.

Quick-RNA™ MidiPrep

- Format..... Spin Column
- Binding Capacity..... 125 µg/prep.
- Elution Volume..... 100 µl
- Sample Size..... 10³ - 10⁷ cells
- Processing Time..... 15 min.

ZR-96 Quick-RNA™

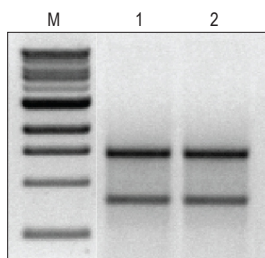
- Format..... 96-Well
- Binding Capacity..... 5 µg/well
- Elution Volume..... ≥ 25 µl
- Sample Size..... ≤ 10⁵ cells
- Processing Time..... 30 min.

Highlights

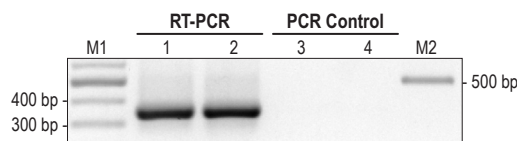
- Quick recovery of RNA from a wide range of cell types and tissue using *Fast-Spin* column and plate technologies.
- Column and plate designs allow for elution of highly concentrated RNA.
- Omits the use of organic denaturants and proteases.

Description

The *Quick-RNA™* MicroPrep, *Quick-RNA™* MiniPrep, *Quick-RNA™* MidiPrep, and ZR-96 *Quick-RNA™* are innovative products designed for the easy, reliable, and rapid isolation of total RNA from cultured cells or solid tissue samples. The procedures combine a unique, single-step RNA extraction/binding buffer with *Fast-Spin* column and plate technologies to yield high quality RNA in minutes. The methods are easy: simply add the provided ZR RNA Buffer to extract total RNA from the cells of interest and then purify the RNA using the provided spin columns or plate. The result is highly-concentrated, purified RNA that is suitable for subsequent RNA-based methods including RT-PCR, hybridization, etc.



Human RNA isolated from cell culture with the *Quick-RNA™* MiniPrep Kit. M: 1 kb DNA marker (Zymo Research); 1, 2: duplicate RNA preparations.



PCR amplification of a β -actin transcript (353 bp fragment shown) following RNA isolation from human epithelial cells (HCT 116) with the *Quick-RNA™* MidiPrep: RT-PCR (lanes 1, 2), PCR negative control (RNA template; lanes 3, 4). M1 and M2 are 100 bp and 1 kb DNA Markers, respectively (Zymo Research).

Featured Technologies



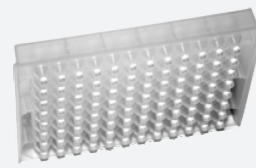
Zymo-Spin™ IC (p. 145) Kit R1050



Zymo-Spin™ IIC (p. 146) Kits R1054, R1055



Zymo-Spin™ V-E (p. 147) Kit R1056



Silicon-A™ Plate (p. 149) Kit R1052, R1053

Ordering Information

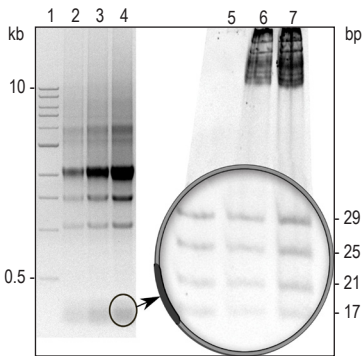
Cat. No.	Product	Size	Price
R1050	<i>Quick-RNA™</i> MicroPrep	50 preps.	\$ 142.00
R1054	<i>Quick-RNA™</i> MiniPrep	50 preps.	\$ 142.00
R1055	<i>Quick-RNA™</i> MiniPrep	200 preps.	\$ 454.00
R1056	<i>Quick-RNA™</i> MidiPrep	25 preps.	\$240.00
R1052	ZR-96 <i>Quick-RNA™</i>	2 x 96 preps.	\$ 354.00
R1053	ZR-96 <i>Quick-RNA™</i>	4 x 96 preps.	\$ 682.00

Highlights

- Quick (15 minute) RNA isolation from a variety of sources using *Fast-Spin* column technology.
- RNAlater™ compatible.
- Omits the use of organic denaturants and proteases.

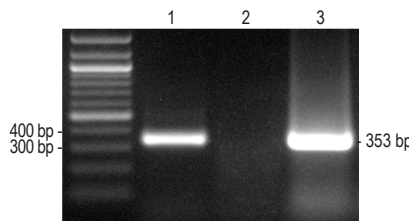
Description

The ZR RNA MicroPrep™ and ZR RNA MiniPrep™ provide quick methods for high quality total RNA isolation from cells, needle biopsies, and tissue. The products isolate both large and small RNA species without the use of reducing agents or phenol. Small RNAs (e.g., tRNAs, microRNAs) can be recovered with a simple adjustment of the RNA isolation protocol. Eluted RNA is suitable for use in RT-PCR and other RNA-based procedures.



Recovery of small RNA. Total RNA isolated using the ZR RNA MicroPrep™ was resolved in an agarose gel (2-4) and small RNAs from the same sample were also resolved in a native polyacrylamide gel (6-7). Input = 10⁸ yeast cells spiked with 1 µg ZR small-RNA™ Ladder (Zymo Research)

- 1 ZR 1 kb DNA Marker [agarose gel]
- 2-4 2, 4, or 9 µg total RNA (yeast) + ZR small-RNA™ Ladder mix [agarose gel]
- 5 ZR small-RNA™ Ladder (17-29 bp ssRNA oligos) [PAGE]
- 6-7 300, 600 ng ZR small-RNA™ Ladder isolated with ZR RNA MicroPrep™ [PAGE]



PCR amplification of β-actin transcript post-RT (353 bp fragment shown): Total RNA from human epithelial cells (HCT 116) was isolated using the ZR RNA MicroPrep™.

- 1) RT-PCR
- 2) PCR negative control (RNA template)
- 3) PCR positive control (DNA template)

Ordering Information

Cat. No.	Product	Size	Price
R1060	ZR RNA MicroPrep™	50 preps.	\$181.00
R1061	ZR RNA MicroPrep™	200 preps.	\$581.00
R1064	ZR RNA MiniPrep™	50 preps.	\$181.00
R1065	ZR RNA MiniPrep™	200 preps.	\$581.00

Application

- Fresh/Frozen Soft Tissue* ✓
- Cultured Cells..... ✓
- Buccal Cells/Swabs..... ✓
- Buffy Coat..... ✓
- Bacteria..... limited

* For solid tissue or tough-to-lyse samples use: ZR Tissue & Insect RNA MicroPrep™ (p. 108)

Specifications

- Format..... Spin Column
- RNA Size Limits..... ≥ 17 nt
- Processing Time..... 15 min.

ZR RNA MicroPrep™

- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 6 µl
- Sample Size..... < 10⁵ cells

ZR RNA MiniPrep™

- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 25 µl
- Sample Size..... 10² – 10⁷ cells

Featured Technologies



Zymo-Spin™ IC (p. 145)
Kits R1060, R1061



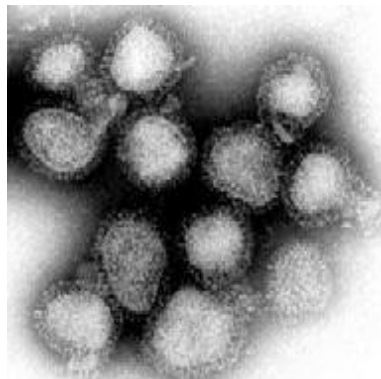
Zymo-Spin™ IIIC (p. 146)
Kits R1060, R1061, R1064, R1065



Zymo-Spin™ IIC (p. 145)
Kits R1064, R1065

Application

- Cultured Cells..... ✓
- Plasma/Serum..... ✓
- Virus..... ✓



Specifications

- Binding Capacity..... 5 µg/prep.
- RNA Size limits..... ≥ 200 nt

ZR Viral RNA Kit™

- Format..... Spin Column
- Elution Volume..... ≥ 6 µl
- Processing Time..... 5 min.

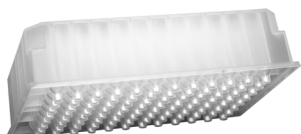
ZR-96 Viral RNA Kit™

- Format..... 96-Well
- Elution Volume..... ≥ 10 µl
- Processing Time..... 15 min.

Featured Technologies



Zymo-Spin™ IC (p. 145)
Kits R1034, R1035



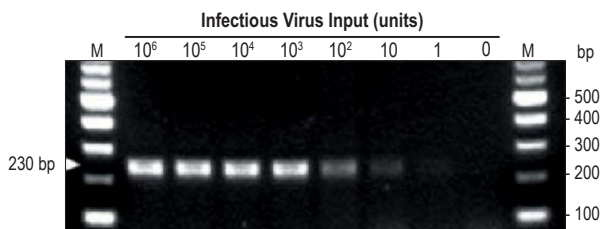
Zymo-Spin™ I-96 (p. 150)
Kits R1040, R1041

Highlights

- Quick recovery of viral RNA from a wide range of sources using *Fast-Spin* column and plate technologies.
- Column and plate designs allow RNA to be eluted at high concentrations into minimal volumes of RNase-free water.
- Omits the use of organic denaturants and proteases.

Description

The ZR Viral RNA Kit™ and ZR-96 Viral RNA Kit™ are designed for the rapid isolation of high-quality viral RNA from a wide range of biological sources. The kits can be used to isolate viral RNA from cell-free body fluids and cellular suspensions at concentrations ≤ 10⁵ cells/ml. The products have been rigorously tested and used to isolate viral RNA from samples containing enteroviruses, rhinoviruses, coronaviruses, HIV, HCV, influenza A virus, flaviviruses, measles virus, parainfluenza virus, and parvovirus (a ssDNA virus). Eluted RNA is suitable for use in subsequent procedures, including RT-PCR.



RT-PCR amplification of enterovirus cDNA. Human serum was spiked with different amounts of infectious enterovirus, then viral RNA was extracted using the ZR Viral RNA Kit™. The eluted RNA was used for one-tube RT-PCR amplification of a 230 bp amplicon. M is a 100 bp DNA Marker (Zymo Research).

Ordering Information

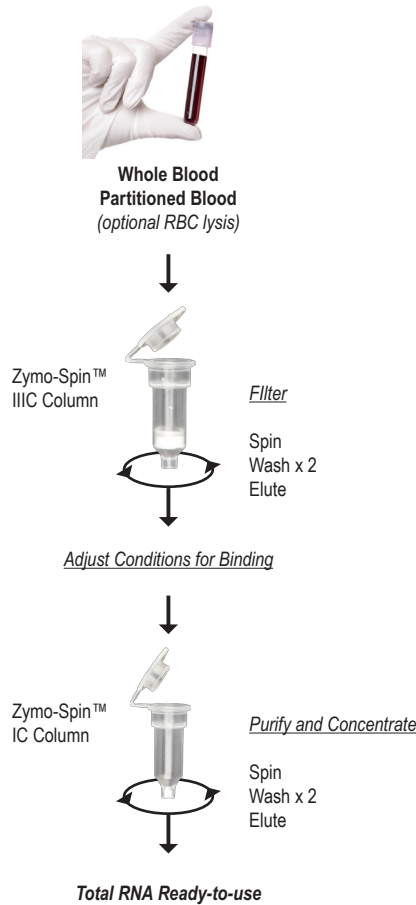
Cat. No.	Product	Size	Price
R1034	ZR Viral RNA Kit™	50 preps.	\$122.00
R1035	ZR Viral RNA Kit™	200 preps.	\$420.00
R1040	ZR-96 Viral RNA Kit™	2 x 96 preps.	\$341.00
R1041	ZR-96 Viral RNA Kit™	4 x 96 preps.	\$613.00

Highlights

- Convenient, fast method for purifying total RNA from whole blood samples.
- Compatible with EDTA, heparin, and citrate anti-coagulants.
- Allows RNA to be eluted at high concentrations into minimal volumes of RNase-free water.

Description

The ZR Whole-Blood RNA MiniPrep™ and ZR-96 Whole-Blood RNA Kit™ provide streamlined methods for the rapid isolation of total RNA from whole and partitioned blood. The procedures are based on the use of a unique buffer system with *Fast-Spin* column and plate technologies. The procedure is easy: just add the Blood RNA Buffer to a blood sample or cell pellet (post RBC lysis), filter the mixture, and then purify and concentrate the RNA using the provided column or plate. If required, the RNA can be DNase treated during the purification procedure. RNA can be isolated immediately from fresh samples or at a later time from blood stored (stabilized) in Blood RNA Buffer. These products are designed for the isolation of blood RNA for subsequent RNA-based methods including RT-PCR, hybridization, etc. A diagram of the ZR Whole-Blood RNA MiniPrep™ (i.e., spin column format) procedure is illustrated below.



Ordering Information

Cat. No.	Product	Size	Price
R1020	ZR Whole-Blood RNA MiniPrep™	50 preps.	\$198.00
R1021	ZR Whole-Blood RNA MiniPrep™	100 preps.	\$355.00
R1022	ZR-96 Whole-Blood RNA™	2 x 96 preps.	\$452.00

Application

Whole Blood.....	≤ 200 μl
Buffy Coat.....	✓
Plasma/Serum.....	≤ 200 μl

Specifications

Binding Capacity.....	5 μg/prep.
RNA Size Limits.....	≥ 200 nt

ZR Whole-Blood RNA MiniPrep™

Format.....	Spin Column
Elution Volume.....	≥ 6 μl
Processing Time.....	10 min.

ZR-96 Whole-Blood RNA™

Format.....	96-Well
Elution Volume.....	≥ 10 μl
Processing Time.....	45 min.

Featured Technologies



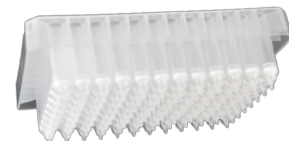
Zymo-Spin™ IC (p. 145)
Kits R1020, R1021



Zymo-Spin™ IIIIC (p. 146)
Kits R1020, R1021



Zymo-Spin™ I-96 (p. 150)
Kit R1022



Zymo-Spin™ III-96 (p. 150)
Kit R1022

ZR Urine RNA Isolation Kit™

Application

Urine..... ✓



Specifications

Format..... Spin Column
 Binding Capacity..... 5 µg/prep.
 Elution Volume..... ≥ 10 µl
 RNA Size Limits..... ≥ 17 nt
 Processing Time..... 10 min.

Highlights

- Quick, simple, and reliable recovery of RNA from cells and biological sediment in urine.
- Ideal for recovering total RNA from large volume liquid samples that contain a low concentration of cells.
- Column design allows RNA to be eluted at high concentration into minimal volume.

Description

The ZR Urine RNA Isolation Kit™ is an innovative product designed for the easy, reliable, and rapid isolation of total RNA from cells and biological sediment in urine. The product enables isolation of cells from urine using a syringe fitted with a uniquely-designed syringe filter. Following separation, cells are lysed and the collected lysate may be processed immediately or at a later time following transportation and/or storage. The RNA isolation procedure is simple and can be performed in less than 10 minutes with the technologies featured in the kit. Total RNA isolated with the ZR Urine RNA Isolation Kit™ is ideal for RT-PCR, etc.

Step 1
Isolation of cellular component from urine sample.



Step 2
Cell lysis and isolation of intracellular component.



Collected lysate can be stored then shipped for lab testing.

Step 3
Isolation/purification of total RNA.



Featured Technology



Zymo-Spin™ IC (p. 145)
Kits R1038, R1039

Ordering Information

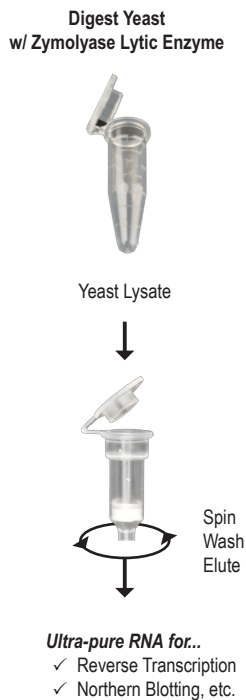
Cat. No.	Product	Size	Price
R1038	ZR Urine RNA Isolation Kit™	20 preps.	\$105.00
R1039	ZR Urine RNA Isolation Kit™	50 preps.	\$241.00

Highlights

- Recovery of purified RNA from a wide range of fungus species using *Fast-Spin* column technology.
- Omits the use of glass beads and organic denaturants.
- Eluted RNA is suitable for use in RT-PCR or other RNA-based procedures.

Description

The YeaStar™ RNA Kit provides all the necessary reagents for RNA isolation from a broad spectrum of fungi including: *Aspergillus fumigatus*, *Aspergillus nidulans*, *Aspergillus nivosus* var. *aureus*, *Candida albicans*, *Pichia pastoris*, *Saccharomyces cerevisiae*, *Schizosaccharomyces pombe*. Generally, the kit can be used for the purification of high-quality, total RNA from any fungus that can be lysed by yeast lytic enzyme. The kit facilitates the purification of 10-25 µg of total RNA from 1-1.5 ml of cultured cells using innovative *Fast-Spin* column technology.



Application

- Yeast..... ✓
- Fungi sensitive to lysis with yeast lytic enzyme (i.e., Zymolyase).



Specifications

- Format..... Spin Column
- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 60 µl
- RNA Size Limits..... ≥ 200 nt
- Processing Time..... 30 min.

Featured Technology



Zymo-Spin™ IIC (p. 146)
Kit R1002

Ordering Information

Cat. No.	Product	Size	Price
R1002	YeaStar™ RNA Kit	40 preps.	\$112.00

Pinpoint™ Slide RNA Isolation Systems I & II

Application

Tissue Sections..... Systems I & II
 FFPE Tissue Sections..... System II



Specifications

Format..... Spin Column
 Binding Capacity..... 5 µg/prep.
 Elution Volume..... ≥ 8 µl
 RNA Size Limit..... ≥ 200 nt

Pinpoint™ Slide RNA Isolation System I

Processing Time..... 1.5 hr.

Pinpoint™ Slide RNA Isolation System II

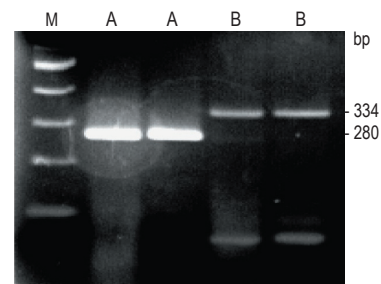
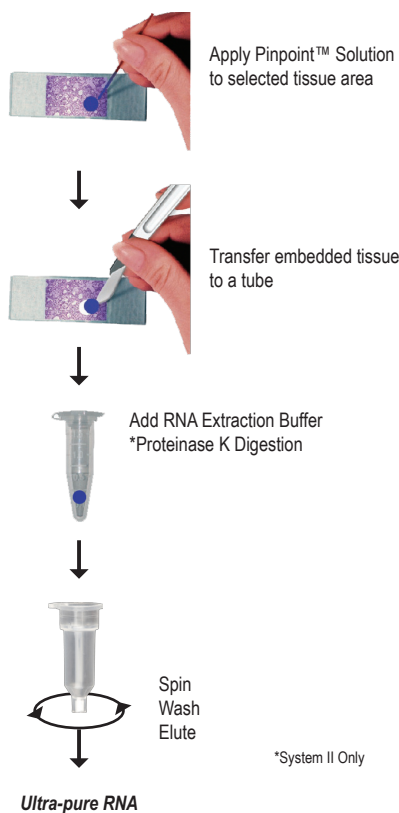
Processing Time..... 5 hr.

Highlights

- Allows for the isolation of total RNA from fresh and/or FFPE tissue sections.
- Simple procedure combines Pinpoint™ tissue sampling technology with a one-step RNA extraction/purification method.
- Omits the use of organic denaturants.

Description

The Pinpoint™ Slide RNA Isolation Systems I and II are innovative products for the isolation of RNA from any targeted area of fresh (Systems I and II) or paraffin-embedded (System II) tissue sectioned onto a glass slide. The systems combine powerful Pinpoint™ tissue sampling methodology, a unique single-step RNA extraction/binding buffer, and *Fast-Spin* column purification technology to yield high quality RNA. Unlike current UV-based methods, these products make isolation of tissue RNA simple and quick. No expensive specialized equipment is needed. Eluted RNA is well suited for subsequent RNA analyses including RT-PCR.



RT-PCR of RNA recovered from human tissue using the Pinpoint™ RNA Isolation System. Amplicons (in duplicate) are from A) a human β -actin transcript; B) an arbitrary human transcript from Chromosome 3. M is 100 bp DNA Marker (Zymo Research).

Featured Technology



Zymo-Spin™ IC (p. 145)
 Kits R1003, R1007

Ordering Information

Cat. No.	Product	Size	Price
R1003	Pinpoint™ Slide RNA Isolation System I	50 preps.	\$141.00
R1007	Pinpoint™ Slide RNA Isolation System II	50 preps.	\$225.00

Product Guide: Environmental RNA Purification

	ZR Soil/Fecal RNA MicroPrep™	ZR Fungal/Bacterial RNA MicroPrep™	ZR Fungal/Bacterial RNA MiniPrep™	ZR Tissue & Insect RNA MicroPrep™	ZR Plant RNA MiniPrep™
Specifications					
BashingBead™ Lysis	✓	✓	✓	✓	✓
Format	Spin Column	Spin Column	Spin Column	Spin Column	Spin Column
Binding Capacity	5 µg/prep.	5 µg/prep.	25 µg/prep.	5 µg/prep.	25 µg/prep.
Elution Volume	≥ 6 µl	≥ 6 µl	≥ 25 µl	≥ 6 µl	≥ 25 µl
Removal of RT Inhibitors ¹	✓	✓	✓	✓	✓
Removal of Polyphenolic RT Inhibitors ²	✓				✓
Processing Time	20 min.	15 min.	15 min.	15 min.	15 min.
Application					
Environmental Sources					
Soil	✓				
Sediment	✓				
Sludge	✓				
Feces	✓				
Microorganisms					
Bacteria	✓	✓	✓		
Gram (+)	✓	✓	✓		
Gram (-)	✓	✓	✓		
Fungi	✓	✓	✓		
Unicellular (Yeast)	✓	✓	✓		
Filamentous	✓	✓	✓		
Algae	✓	✓	✓		
Unicellular	✓	✓	✓		
Filamentous	✓	✓	✓		
Protists	✓	✓	✓		
Solid Tissue and Tough-to-Lyse Samples					
Soft Tissues	some ³	some ³	some ³	✓	
Solid Tissues				✓	
Tough-to-Lyse Tissues				✓	
Tough-to-Lyse Organisms				✓	
Insects/Arthropods				✓	
Plant Material					✓
Seeds					✓
Fruit					✓
Food		✓	✓	✓	
Page Number	106	107	107	108	109

¹ RT inhibitors include: salts, sugars and starches, lipids, proteins, heme/hemin, bilirubin, and melanin among others.

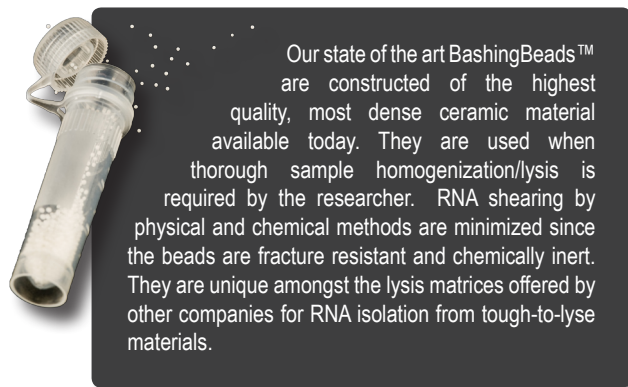
² Polyphenolic RT inhibitors include: humic and fulvic compounds from soil, sludge, etc., tannins from plants, and melanin from mammalian sources, among others.

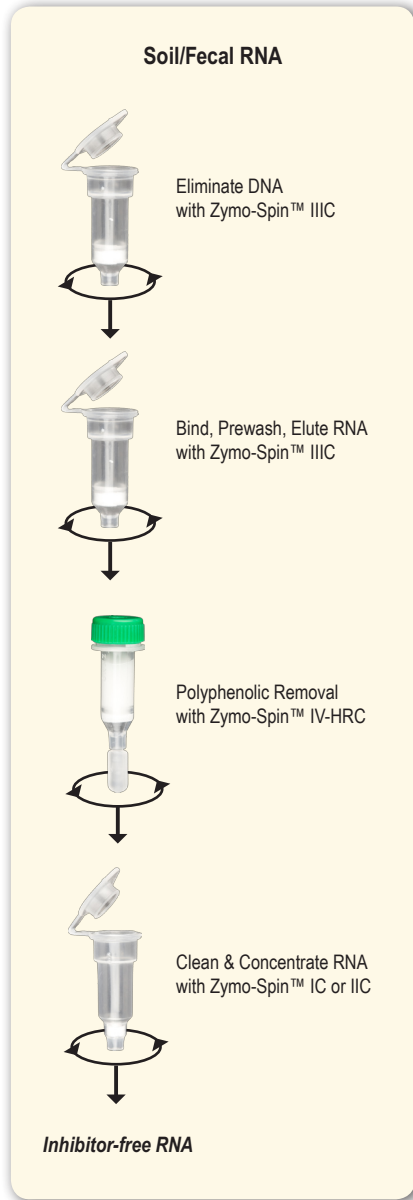
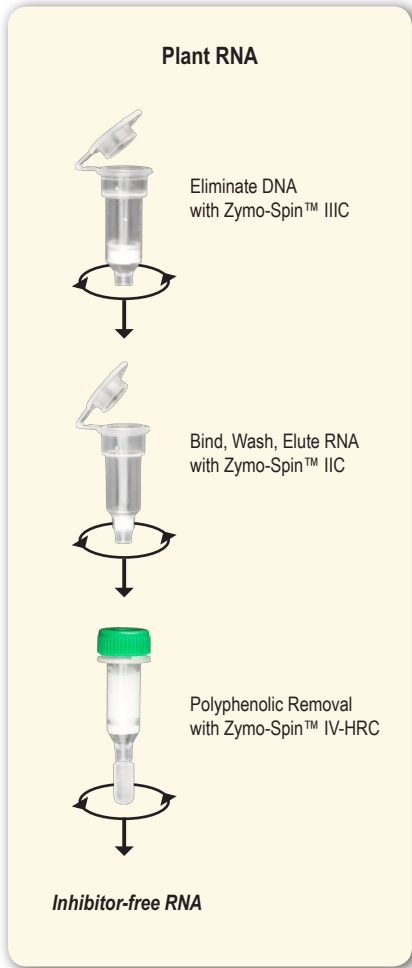
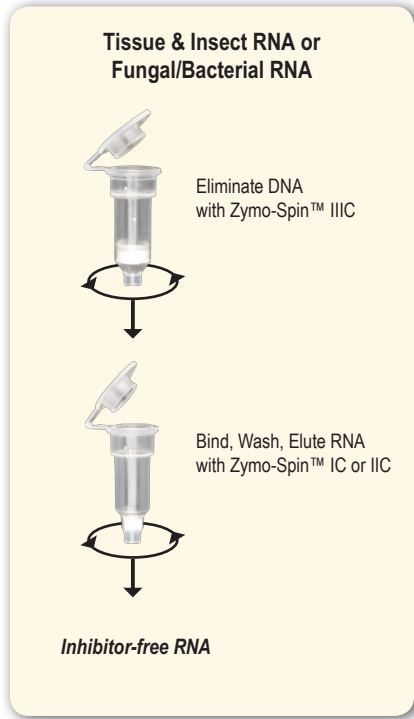
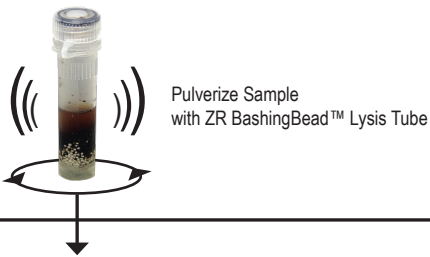
³ Product is limited to most soft tissues (brain, spleen, liver, etc.). Solid tissues (tail snips, ear punches, insects, plant material, etc.) will require additional procedures for sample lysis and efficient processing.

Technology Overview: BashingBead™ Lysis & Environmental RNA Purification

The BashingBead™ RNA purification kits from Zymo Research are designed for quick recovery of RT-ready total RNA from tough-to-lyse environmental samples. RNA can be isolated from a broad range of samples including plants, seeds, insects and microorganisms in soil, sludge, sediment, or fecal samples. Kits are available in MicroPrep (5 µg/prep) and MiniPrep (25 µg/prep) spin column formats (see illustrations below).

For processing, samples are simply transferred to the provided ZR BashingBead™ Lysis Tubes and then rapidly and efficiently processed by bead beating in specially formulated lysis buffers. Bead beating can be performed in any bead mill, pulverizer, or vortex that can accommodate standard 2.0 ml tubes. Following lysis, RNA is purified using innovative *Fast-Spin* column technology. Special filtration technologies are implemented for plant, fecal, and soil samples to remove polyphenolic inhibitors that can inhibit reverse transcriptase (RT). The isolation of inhibitor free RNA typically takes about 15 minutes.



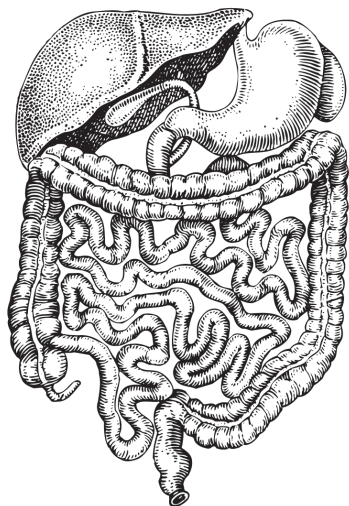


Soil/Fecal RNA



Application

- Soil..... ✓
- Sediment..... ✓
- Sludge..... ✓
- Feces..... ✓



Specifications

- ZR BashingBead™ Lysis..... ✓
- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 6 µl
- Removal of RT Inhibitors..... ✓
- Removal of Polyphenolic RT Inhibitors..... ✓
- Processing Time..... 20 min.

Featured Technologies



Zymo-Spin™ IC (p. 145)
Kit R2040



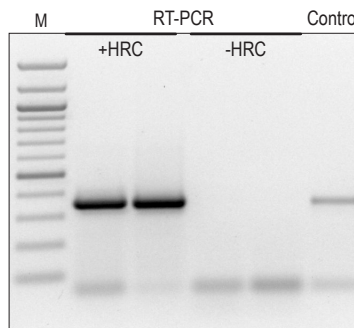
Zymo-Spin™ IIC (p. 146)
Kit R2040

Highlights

- Simple and efficient method for the isolation of inhibitor-free RNA from soil and fecal samples.
- Ultra-high density BashingBeads™ can be used with any bead mill, disrupter, or vortex.
- *Fast-Spin* column technology allows ultra-clean RNA to be eluted into minimal volumes.

Description

The ZR Soil/Fecal RNA MicroPrep™ is an innovative product designed for the simple, reliable, and rapid isolation of total RNA including small RNAs (≥ 17 nt) from various soil types, sludge, sediment, and/or fecal samples. The kit can be used to isolate RNA from tough-to-lyse bacteria, fungi, protozoa, algae, etc. in soil and in fecal samples. Samples are added to the ZR BashingBead™ Lysis Tubes with a uniquely formulated RNA extraction buffer where microbes are efficiently lysed by bead beating to extract total RNA. The included *Fast-Spin* column purification technologies allow for quick removal of genomic DNA and subsequent purification of RNA. Polyphenolic RT/PCR inhibitors (e.g., humic acids, polyphenols, tannins) are removed during the purification process. The result is highly-concentrated, purified RNA that is suitable for subsequent RNA-based methods including RT-PCR, hybridization, etc.



PCR amplification of a eukaryotic transcript post-RT: Total RNA isolated from sludge with or without inclusion of the Zymo-Spin™ IV-HRC spin filter during the ZR Soil/Fecal RNA MicroPrep™ protocol. M is a ZR 1 kb DNA Marker (Zymo Research).

Ordering Information

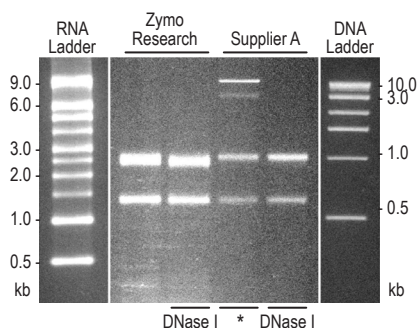
Cat. No.	Product	Size	Price
R2040	ZR Soil/Fecal RNA MicroPrep™	50 preps.	\$292.00

Highlights

- Quick (15 minute) isolation of total RNA from tough-to-lyse bacteria, yeast, and fungi .
- Omits the use of organic denaturants and proteases.
- *Fast-Spin* column technology allows RNA to be eluted into minimal volumes (≥ 6 µl).

Description

The ZR Fungal/Bacterial RNA MicroPrep™ and MiniPrep™ provide for rapid isolation of total RNA from pelleted tough-to-lyse bacterial (e.g., Gram-positive), yeast, and/or fungal cells. Both kits employ ultra-high density BashingBeads™ for sample homogenization and a robust buffer system for total RNA purification (small RNAs included). Using *Fast-Spin* column technology, the RNA is eluted into volumes as little as 6 µl and suitable for subsequent procedures including RT-PCR. The entire RNA isolation procedure typically takes less than 15 minutes.



Total RNA was isolated from equal amounts of pelleted *E. coli* cells containing plasmid DNA (pGEM®) using the ZR Fungal/Bacterial RNA MicroPrep™ or kit from Supplier A. The samples were resolved in a 2% (w/v) agarose gel. RNA Millenium Markers (Ambion) and ZR 1 kb DNA Marker (Zymo Research) were used.

* = genomic (> 10 kb) and plasmid (> 3 kb) DNA contamination; DNase I = samples treated with DNase I.

Application

- Gram (+) Bacteria..... ✓
- Gram (-) Bacteria..... ✓
- Yeast..... ✓
- Filamentous Fungi..... ✓
- Unicellular Algae..... ✓
- Filamentous Algae..... ✓
- Protists..... ✓
- Soft Tissues..... limited
- Food..... ✓

Specifications

- ZR BashingBead™ Lysis..... ✓
- Format..... Spin Column
- Removal of RT Inhibitors..... ✓
- Processing Time..... 15 min.

ZR Fungal/Bacterial RNA MicroPrep™

- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 6 µl

ZR Fungal/Bacterial RNA MiniPrep™

- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 25 µl

Featured Technologies



Zymo-Spin™ IC (p. 145)
Kit R2010



Zymo-Spin™ IIC (p. 146)
Kits R2010, R2014



Zymo-Spin™ IIC (p. 145)
Kits R2014

Ordering Information

Cat. No.	Product	Size	Price
R2010	ZR Fungal/Bacterial RNA MicroPrep™	50 preps.	\$211.00
R2014	ZR Fungal/Bacterial RNA MiniPrep™	50 preps.	\$211.00

ZR Tissue & Insect RNA MicroPrep™

Application

- Soft Tissues..... ✓
- Solid Tissues..... ✓
- Tough-to-Lyse Tissues..... ✓
- Tough-to-Lyse Organisms..... ✓
- Insects/Arthropods..... ✓
- Food..... ✓



Specifications

- ZR BashingBead™ Lysis..... ✓
- Format..... Spin Column
- Binding Capacity..... 5 µg/prep.
- Elution Volume..... ≥ 6 µl
- Removal of RT Inhibitors..... ✓
- Processing Time..... 15 min.

Featured Technologies



Zymo-Spin™ IC (p. 145)
Kit R2030



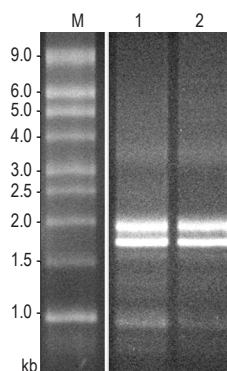
Zymo-Spin™ IIC (p. 146)
Kit R2030

Highlights

- Quick (15 minute) isolation of RNA from insects and tough-to-lyse tissues.
- Efficient processing with ultra-high density BashingBeads™.
- Omits the use of organic denaturants and proteases.

Description

The ZR Tissue & Insect RNA MicroPrep™ provides for rapid isolation of total RNA from various tissue samples, insect, and arthropod specimens (e.g., mosquitoes, bees, lice, ticks, *Drosophila melanogaster*). Soft and solid mammalian tissues can also be processed with this kit. The product employs ultra-high density BashingBeads™ for sample homogenization and a robust buffer system delivering total RNA purification (small RNAs included). The Zymo-Spin™ IIC Column allows for high-capacity DNA elimination and the Zymo-Spin™ IC Column is used for purifying the total RNA. RNA eluted in DNase/RNase-free water is suitable for subsequent procedures including RT-PCR.



Analysis of ZR Tissue & Insect RNA MicroPrep™.
Isolation of total RNA from n=2 *Drosophila* sp. individuals was performed in duplicate (lanes 1 and 2). Samples were processed (2 x 30 sec at 6 m/s) using a FastPrep®-24 Instrument (MP Biomedicals) and resolved alongside (lane M) RNA Millenium™ Markers (Ambion) in a 1% (w/v) non-denaturing agarose gel.

Ordering Information

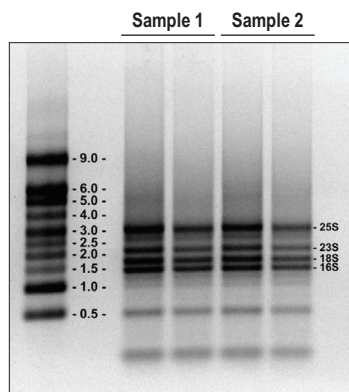
Cat. No.	Product	Size	Price
R2030	ZR Tissue & Insect RNA MicroPrep™	50 preps.	\$211.00

Highlights

- Quick (15 minute) isolation of inhibitor-free total RNA from a variety of plant tissues.
- Efficient processing with ultra-high density BashingBeads™.
- Omits the use of organic denaturants and proteases.

Description

The ZR Plant RNA MiniPrep™ provides for rapid isolation of total RNA from various plant samples (e.g., leaves, stems, buds, flowers, fruit, seeds, etc.). The kit allows for high-capacity DNA elimination and efficient purification of total RNA. The RNA is eluted into volumes as little as 25 µl. For polyphenolic inhibitor removal, the eluted RNA is filtered using Zymo-Spin™ IV-HRC spin devices. The RNA is suitable for use in various downstream procedures including RT-PCR. The entire RNA isolation procedure typically takes about 15 minutes.



Isolation of total RNA from 10 mg of a fresh leaf material (*Nicotiana* sp.) using the ZR Plant RNA MiniPrep™. Leaves were minced then processed using a FastPrep®-24 instrument (MP Biomedicals). Samples 1 and 2 were loaded in 2x and 1x volume aliquots, respectively, and resolved in a 1% (w/v) nondenaturing agarose gel. RNA Millenium™ Markers (Ambion) were used as size standards.

Application

- Plant Material..... ✓
- Seeds..... ✓
- Fruit..... ✓



Specifications

- ZR BashingBead™ Lysis..... ✓
- Format..... Spin Column
- Binding Capacity..... 25 µg/prep.
- Elution Volume..... ≥ 25 µl
- Removal of RT Inhibitors..... ✓
- Removal of Polyphenolic RT Inhibitors..... ✓
- Processing Time..... 15 min.

Featured Technologies



Zymo-Spin™ IIC (p. 145)
Kit R2024



Zymo-Spin™ IIIC (p. 146)
Kit R2024

Ordering Information

Cat. No.	Product	Size	Price
R2024	ZR Plant RNA MiniPrep™	50 preps.	\$241.00

ZR small-RNA™ Ladder

Application

MicroRNA sized standard for size estimation of small RNAs in PAGE gels.

Specifications

Ladder of four microRNAs (17, 21, 25, 29 nt)

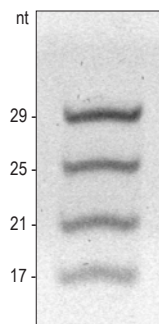
Concentration..... 20 ng/μl

Amount..... 10 μg

Storage..... -20° C

Description

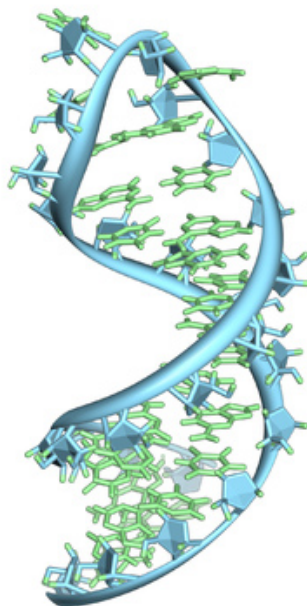
The ZR small-RNA™ Ladder is a microRNA size marker for use in polyacrylamide gel separation methods and small RNA size approximation. The ladder consists of four single-stranded RNA oligonucleotides 17, 21, 25, and 29 bases in length. The marker is supplied in water and can be stained with dyes specific for single-stranded nucleic acid species e.g, GelStar®.



ZR small-RNA™ Ladder. ZR small-RNA™ Ladder (350 ng) was resolved in a 25% (w/v) non-denaturing PAGE gel and visualized after staining with GelStar® for 5 minutes.

Ordering Information

Cat. No.	Product	Size	Price
R1090	ZR small-RNA™ Ladder	10 μg	\$79.00





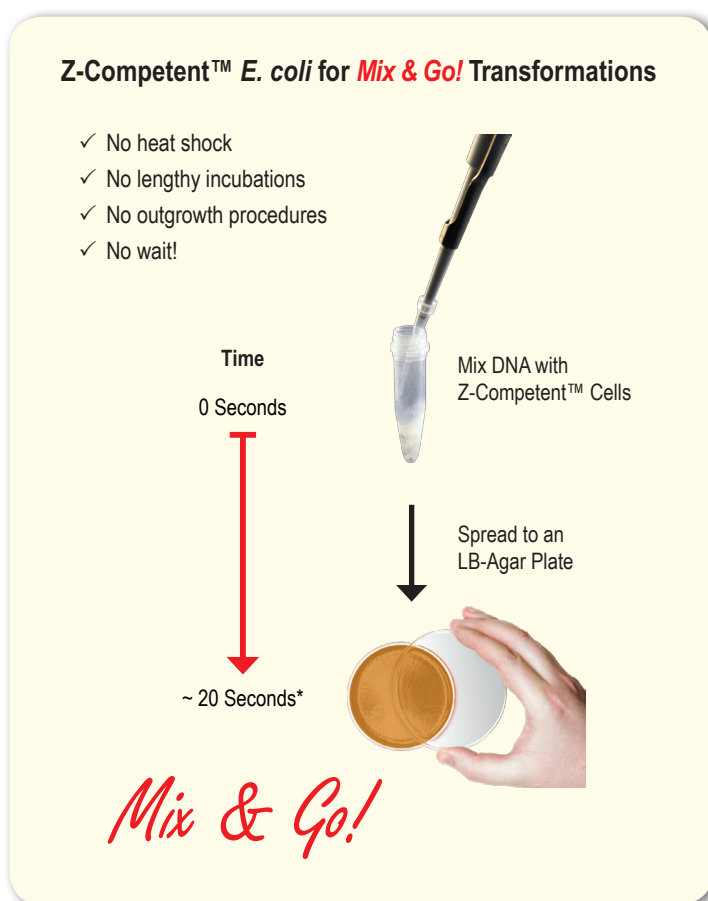
4

Competent *E. coli* & Transformation

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Introduction

Despite the remarkable diversity of research interests in labs throughout the world, most labs have the need to transform *E. coli* for cloning or protein purification. With the needs of the researcher in mind, Zymo Research offers a range of premade chemically competent *E. coli* strains having transformation efficiencies $> 10^8$ transformants / μg pUC19 DNA. Zymo Research's innovative *Mix & Go!* transformation procedure streamlines the process, eliminating long outgrowth times and the need for electroporation. Using premade Z-Competent™ *E. coli* cells from Zymo Research, a scientist can transform cells in less than 20 seconds (see following page). Zymo Research also provides reagents that enable researchers to make their own homemade Z-Competent™ *E. coli*. We have developed a specially formulated medium, ZymoBroth™ (p. 117), that when used to generate chemically competent cells, enhances the transformation efficiency of many K- and B-strains of *E. coli*. With the *Mix & Go!* system you will increase transformation efficiency and decrease transformation time.



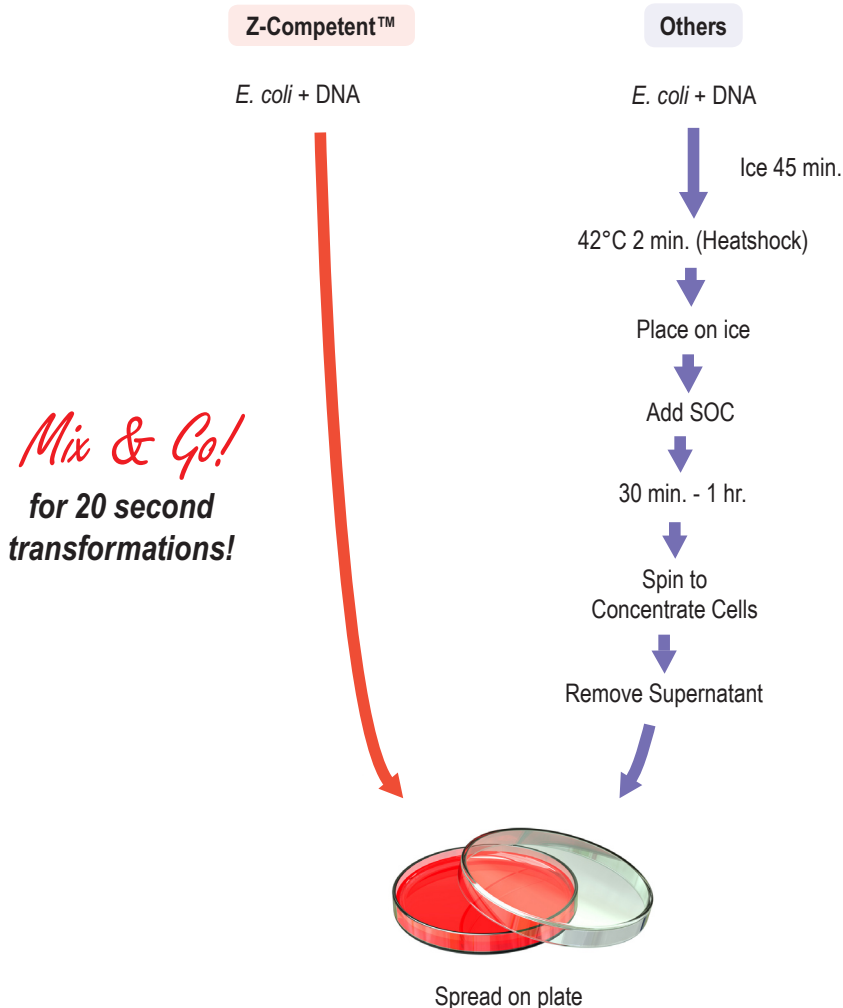
* For ampicillin selection only.

Q: What are Z-Competent™ *E. coli*?

A: Z-Competent™ *E. coli* are chemically competent cells used for simple and highly efficient DNA transformations. They are made chemically competent by a unique method that completely eliminates the requirement for heat-shocking and related procedures. For *Mix & Go!* transformation, simply mix the DNA with Z-Competent™ cells, then spread onto a plate. The entire procedure takes about 20 seconds!

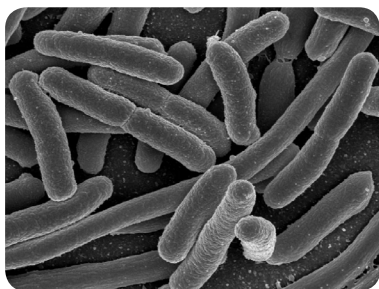
Q: How can I generate my own Z-Competent™ *E. coli*?

A: You can make your own Z-Competent™ cells using our Z-Competent™ *E. coli* Transformation Kit (p. 116) or Z-Competent™ *E. coli* Buffer Set (p. 116). Simply grow the preferred strain of *E. coli*, wash, and resuspend with the supplied buffer. The cells are now ready for transformation or can be frozen at -70°C for future use. Alternatively, you may wish to use our premade, ready to use Z-Competent™ cells. Our premade Z-Competent™ cells are highly efficient (> 10⁸ transformants / μg pUC19) and can be used for cloning, subcloning, PCR cloning, library construction, or other uses. The premade Z-Competent™ cells include *E. coli* strains C600, DH5a, HB101, JM109, and TG1.



Application

Recombinant Protein Expression..... ✓



Specifications

Glycerol Stock..... ✓

10 x 100 µl Aliquots of Frozen Competent Cells ✓



Highlights

- Straightforward transformation procedure with up to 10⁸ - 10⁹ transformants/µg plasmid.
- Simple, fast, and controlled autolysis of *E. coli*.
- Available with DE3 lysogen for T7 promoter transcription.

Description

XJ Autolysis™ *E. coli* strains are a new alternative for bacterial transformation and lysis. These strains are efficiently lysed following arabinose-induced expression of the bacteriophage λ endolysin protein, coupled to a single freeze-thaw cycle. The strains simplify protein expression and purification, and are also applicable for nucleic acid purification. They are also available with a DE3 lysogen encoding the T7 polymerase for expressing recombinant proteins driven by the T7 promoter.

	XJa Autolysis™ (<i>E. coli</i> , K-strain JM109)	XJb Autolysis™ (<i>E. coli</i> , B-strain BL21)
Cell Growth	Grows well, especially when medium is supplemented with 1 mM Mg ²⁺ .	A very robust strain, reaching higher OD's than <i>E. coli</i> K-strains.
Autolysis	This strain lyses easily. Actually, the parent strain JM109 itself will release about 20% of cellular protein after one freeze-thaw cycle. This strain will lyse in a wide range of buffer conditions.	XJb lysis efficiency is 10-20 % lower than XJa. For optimal lysis, more care needs to be taken when selecting the lysis buffer. However, even very low concentrations of a detergent may improve lysis significantly.
Protein Expression	Suitable for general screening, but proteases may degrade small or otherwise unstable recombinant proteins.	XJb is ideal for recombinant protein expression. It lacks Lon and OmpT proteases, leading to higher protein yields.
DNA Extraction	This strain is EndA ⁻ and yields high quality DNA preparations.	XJb is not optimal for DNA extraction.
DNA Stability	The RecA ⁻ mutation in XJa stabilizes repetitive DNA sequences.	This strain is RecA positive.
Genotype	F ⁻ [traD36 proA ⁺ B ⁺ lac ^R Δ(lacZ)M15] Δ(lac-proAB) glnV44 (supE44) e14 ⁻ (McrA ⁻) thi gyrA96 (Nal ^R) endA1 hsdR17(r _K ⁻ m _K ⁻) relA1 recA1 ΔaraB::λR, cat (Cm ^R)	F ⁻ ompT hsdS _B (r _B ⁻ m _B ⁻) gal dcm ΔaraB::λR, cat (Cm ^R)

Ordering Information

Cat. No.	Product	Size	Price
T5021	XJa Autolysis™	1 glycerol stock, 1 ml 500X L-Arabinose	\$92.00
T3021	XJa Autolysis™	10 x 100 µl Z-competent cells, 1 ml 500X L-Arabinose	\$184.00
T5031	XJa(DE3) Autolysis™	1 glycerol stock, 1 ml 500X L-Arabinose	\$92.00
T3031	XJa(DE3) Autolysis™	10 x 100 µl Z-competent cells, 1 ml 500X L-Arabinose	\$184.00
T5041	XJb Autolysis™	1 glycerol stock, 1 ml 500X L-Arabinose	\$92.00
T3041	XJb Autolysis™	10 x 100 µl Z-competent cells, 1 ml 500X L-Arabinose	\$184.00
T5051	XJb(DE3) Autolysis™	1 glycerol stock, 1 ml 500X L-Arabinose	\$92.00
T3051	XJb(DE3) Autolysis™	10 x 100 µl Z-competent cells, 1 ml 500X L-Arabinose	\$184.00

Highlights

- *Mix & Go!* transformation procedure with transformation efficiencies of 10^8 - 10^9 transformants/ μg of plasmid DNA.
- Simple procedure: add DNA and then spread. DNA transformation in as little as 20 seconds!

Description

The Z-Competent™ *E. coli* strains are premade, chemically competent cells for simple and highly efficient DNA transformation. Z-Competent™ *E. coli* cells are made chemically competent by a method that completely eliminates the need for heat shocking and related procedures. For transformation, simply mix DNA with cells and then spread onto solid medium – *Mix & Go!* The premade Z-Competent™ cells are highly efficient ($> 10^8$ transformants / μg pUC19) and can be used for cloning, sub-cloning, PCR fragment cloning, library construction, etc. Premade Z-Competent™ cells are supplied as a pack of 10 convenient 100 μl /tube single use aliquots or in a 96-tube format with removable 8-tube strips for your high-throughput transformation needs.



Single Tube Format



96-Tube Format

**Application**

- Bacterial Transformations..... ✓
- DNA Cloning..... ✓
- Blue-white Screening..... ✓

Specifications

- 10 x 100 μl aliquots..... 10 Tubes
- 96 x 50 μl aliquots..... 96-Tube Plates

C600

Genotype	Cat. No.	Size	Price
<i>F</i> [e14 (McrA ⁻) or e14* (McrA ⁺)] thr-1 leuB6 thi-1 lacY1 glnV44 (supE44) rfbD1 fhuA21	T3015	10 x 100 μl aliquots (10 tubes)	\$110.00

DH5a

Genotype	Cat. No.	Size	Price
<i>F</i> ϕ 80lacZ Δ M15 Δ (lacZYA-argF)U169 deoR nupG recA1 endA1 hsdR17(<i>r_k⁻ m_k⁺</i>) phoA glnV44 (supE44) thi-1 gyrA96 relA1, λ -	T3007	10 x 100 μl aliquots (10 tubes)	\$110.00
	T3009	96 x 50 μl aliquots (96-well plate)	\$420.00

HB101

Genotype	Cat. No.	Size	Price
<i>F</i> Δ (gpt-proA)62 leuB6 glnV44 (supE44) ara-14 galK2 lacY1 Δ (mcrC-mrr) xyl-5 mtl-1 recA13 thi-1 rpsL20 (Sm ^R)	T3011	10 x 100 μl aliquots (10 tubes)	\$110.00
	T3013	96 x 50 μl aliquots (96-well plate)	\$420.00

JM109

Genotype	Cat. No.	Size	Price
<i>F</i> [traD36 proA ⁺ B ⁺ lac ^R Δ (lacZ)M15] Δ (lac-proAB) glnV44 (supE44) e14 ⁻ (McrA ⁻) thi gyrA96 (Na ^R) endA1 hsdR17(<i>r_k⁻ m_k⁺</i>) relA1 recA1	T3003	10 x 100 μl aliquots (10 tubes)	\$110.00
	T3005	96 x 50 μl aliquots (96-well plate)	\$420.00

TG1

Genotype	Cat. No.	Size	Price
<i>F</i> [traD36 lac ^R Δ (lacZ) M15 proA ⁺ B ⁺] glnV (supE) thi-1 Δ (mcrB-hsdSM)5 (<i>r_k⁻ m_k⁺</i> McrB) thi Δ (lac-proAB)	T3017	10 x 100 μl aliquots (10 tubes)	\$110.00

Application

Preparation of Competent *E. coli*..... ✓



Specifications

Reagents for Competent Cell Preparation..... ✓

ZymoBroth™ Growth Medium*..... ✓

*Not included in Z-Competent™ *E. coli* Transformation Buffer Set

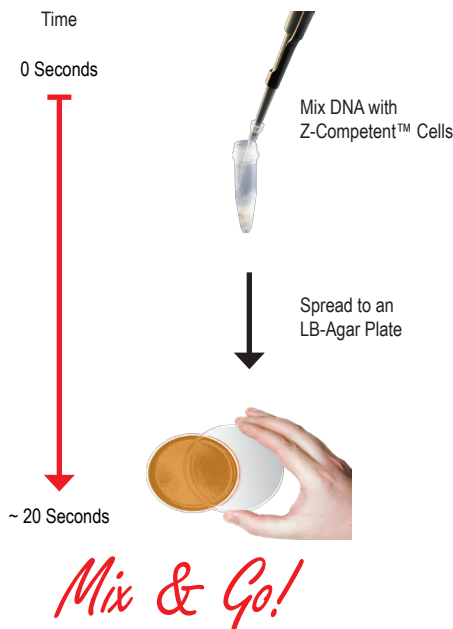
Highlights

- Make your own highly efficient chemically competent cells: 10⁸-10⁹ transformants/μg of plasmid DNA for most common lab strains.
- No heat shock or related procedures: simply add DNA and spread onto a plate - *Mix & Go!*

Description

The Z-Competent™ *E. coli* Transformation Kit and Z-Competent™ *E. coli* Buffer Set are convenient methods for the preparation of competent *E. coli* cells for simple and highly efficient DNA transformation. The Z-Competent™ method completely eliminates the requirement for heat shocking and related procedures. Instead, *Mix & Go!* bacterial transformation can be performed by adding DNA to Z-Competent™ cells and spreading onto a plate. Transformation efficiencies are typically on the order of 10⁸-10⁹ transformants/μg plasmid DNA with most *E. coli* strains.

Uniquely formulated reagents make it easy to generate Z-Competent™ cells from current *E. coli* strains that are available in the laboratory. Simply grow the *E. coli* strain of your choice, wash, then resuspend the cells in the provided buffers. The cells are now transformation ready! The Z-Competent™ *E. coli* Transformation Kit includes all buffers and ZymoBroth™ medium to generate 20 ml of Z-Competent™ cells. The Z-Competent™ *E. coli* Transformation Buffer Set includes all buffers that are required to generate 60 ml of Z-Competent™ cells, and the medium (broth) is supplied by the user.



Ordering Information

Cat. No.	Product	Size	Price
T3001	Z-Competent™ <i>E. coli</i> Transformation Kit	up to 20 ml	\$99.00
T3002	Z-Competent™ <i>E. coli</i> Transformation Buffer Set	up to 60 ml	\$102.00

Highlights

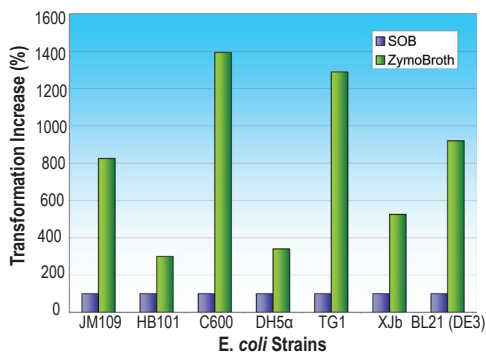
- Uniquely formulated growth medium for making highly competent *E. coli* for DNA transformation.
- Choice growth medium for difficult-to-transform *E. coli* strains.

Description

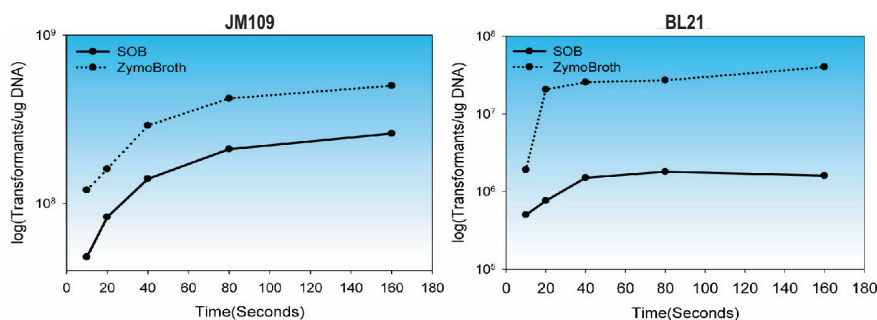
ZymoBroth™ (ZB) is a specially formulated growth medium used for the preparation of highly competent *E. coli* cells for DNA transformation. When compared to classic SOB growth medium, ZymoBroth™ dramatically increases transformation efficiency, typically on the order of 5 - 100 fold (depending on the *E. coli* strain). As part of our popular Z-Competent™ *E. coli* Transformation Kit (see previous page), ZB enables researchers to generate their own homemade Z-Competent™ *E. coli* for DNA transformation. ZB medium has been tested on a wide range of *E. coli* strains. Our data indicate that ZB medium stimulates the transformation efficiency of all *E. coli* strains tested, including K12 derivatives (Such as JM109, HB101, etc.) and B strain derivatives (such as BL21, etc.).

Application

Chemically Competent *E. coli* Preparation..... ✓



Transformation efficiencies of strains generated with ZymoBroth™ and SOB media. ZymoBroth™ dramatically increases the transformation efficiencies of a broad range of *E. coli* strains. Generally, ZymoBroth™ enhances transformation efficiencies better for difficult-to-transform strains.



Transformation kinetics. Z-Competent™ *E. coli* prepared with ZymoBroth™ display fast transformation kinetics and high transformation efficiencies.

Ordering Information

Cat. No.	Product	Size	Price
M3015-100	ZymoBroth™	100 ml	\$23.00
M3015-500	ZymoBroth™	500 ml	\$72.00

Rattler™ Plating Beads

Application

Spreading Inocula on Solid Media (plates)..... ✓



Specifications

Material: Solid, glass 4.5 mm beads can be washed, autoclaved, and reused.

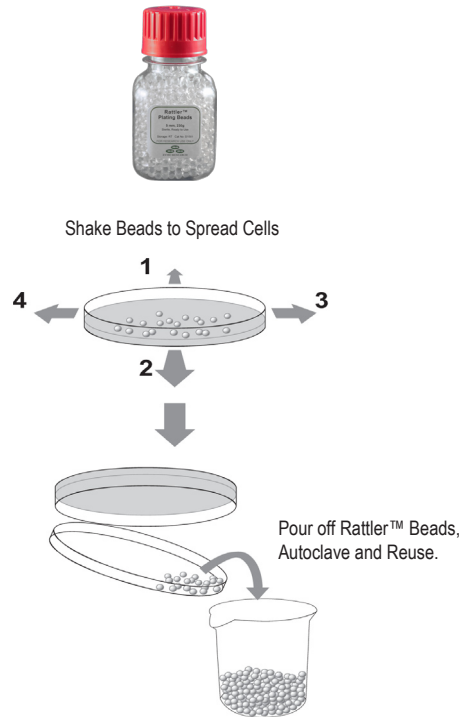
Packaging: Polycarbonate, autoclavable wide mouth bottle. For bulk format, supplied non-sterile as a 25 kg bag.

Highlights

- Sterile 4.5 mm glass plating beads that are convenient and easy to use.
- No flaming required.
- Quickly spread cells evenly over the entire growth surface of a plate.
- Ideal when plating yeast for two-hybrid screens.

Description

Zymo Research offers Rattler™ Plating Beads to save the researcher time and effort when plating bacteria or yeast. The sterile glass beads are simply poured onto solid plated medium together with a liquid cell suspension, and the mixture is shaken to distribute the cells evenly over the medium's surface. This allows for numerous plates to be processed quickly and efficiently. Pour the Rattler™ beads onto a series of plates, stack, and shake simultaneously in a side to side motion. The beads can be easily removed following inversion of the plates and pouring off from the plate lids. Using the Rattler™ Plating Beads is simple, easy, and saves you time. The beads come sterile in polycarbonate bottles and can be reused following cleaning and washing.



Ordering Information

Cat. No.	Product	Size	Price
S1001	Rattler™ Plating Beads	1 bottle (230 g/bottle)	\$15.00
S1001-5	Rattler™ Plating Beads	5 bottles (230 g/bottle)	\$70.00
S1001-B	Rattler™ Plating Beads - bulk format (non-sterile)	25 kg bag	\$346.00



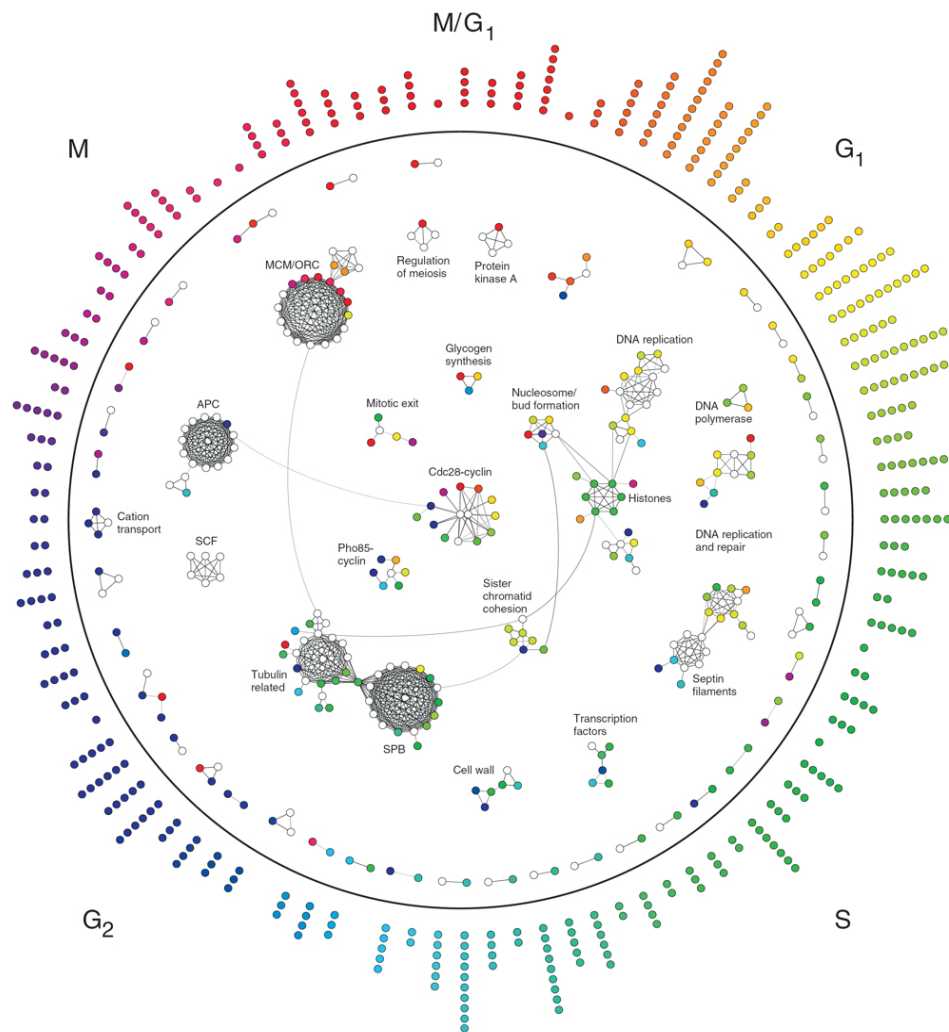
5

Yeast Research

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Introduction

At Zymo Research, our first products were those for yeast. This inspired the three "budding yeast" that are part of our company's logo today. In addition to those technologies described in previous chapters for yeast DNA and RNA purification, we also provide yeast growth and transformation products. For transformation of yeast and fungus, a uniquely formulated YPD medium (YPD Plus™) increases the transformation efficiencies for most yeast strains by $\geq 50\%$. Also, our Frozen EZ Yeast Transformation II Kit™ has been designed to make yeast transformation easier and more efficient compared to conventional methods. We also provide several specialty products for yeast researchers that include α -Factor Mating Pheromone and 5-fluoroorotic acid. Our Zymolyase and Yeast Protein Kit remain important reagents for yeast lysis and protein purification, respectively.

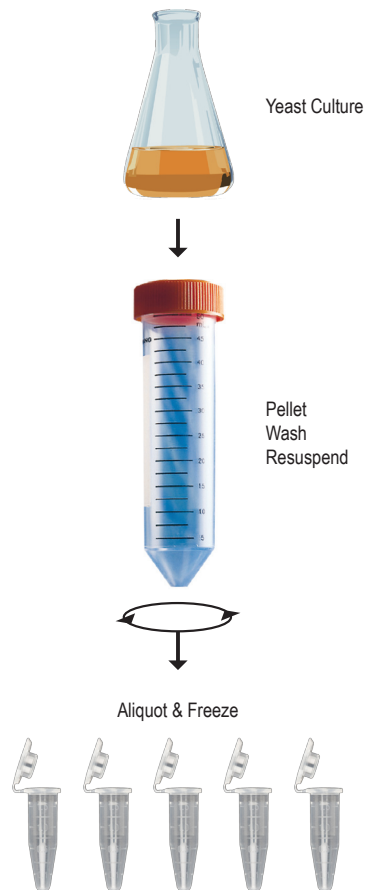


Highlights

- Yeast cells with high transformation efficiencies can be prepared in under 10 minutes.
- Simple method for transforming yeast with single or multiple plasmids in less than 1 hour.
- No carrier DNA required.

Description

The Frozen-EZ Yeast Transformation II Kit™ is designed to make yeast transformations and library screening easier and more efficient than currently available methods. The yeast cells prepared with the Frozen-EZ Yeast Transformation II Kit™ can be used immediately for transformation or can be stored (i.e., ≤ -70°C) for use at a later time. Yeast prepared with this kit can be transformed with both circular and linear DNAs. Also, the Frozen-EZ Yeast Transformation II Kit™ can be used with other fungi including *C. albicans*, *S. pombe*, and *P. pastoris*.



Application

- Competent Yeast Cell Preparation..... ✓
- Compatibility:
- S. cerevisiae*..... ✓
 - S. pombe*..... ✓
 - C. albicans*..... ✓
 - P. pastoris*..... ✓



Specifications

- Transformation Efficiency..... 10⁵ - 10⁶ CFU/μg
- Transformation DNA Input..... 0.2 - 1.0 μg
- Competent Cell Stability..... ≥ 1 year -70°C

Ordering Information

Cat. No.	Product	Size	Price
T2001	Frozen-EZ Yeast Transformation II Kit™	120 rxns.	\$92.00

Application

Yeast Transformation and Outgrowth..... ✓

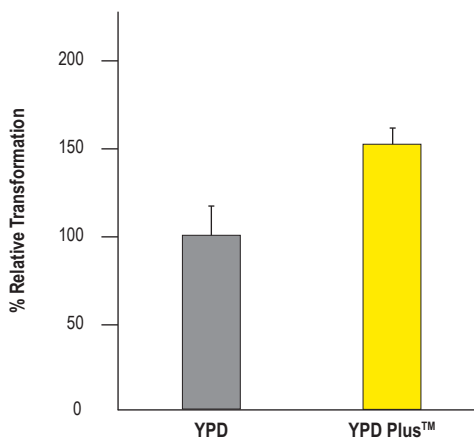


Highlights

- Specialized medium used for yeast outgrowth that increases transformation efficiency > 50% when compared to conventional YPD medium.
- Ideal for yeast strains exhibiting poor growth characteristics.
- Useful when attempting to maximize transformation efficiencies for library screening purposes.

Description

The outgrowth step in yeast transformation protocols is often critical for increasing overall yeast transformation efficiencies. Following treatment of yeast with lithium acetate and polyethylene glycol solutions, it is often necessary to add medium to allow for a period of outgrowth, which normally results in increased cell survival. This is useful when attempting to maximize transformation efficiencies for library screening or transforming yeast with multiple plasmids. YPD Plus™ is a special formulation of conventional YPD outgrowth medium that increases yeast transformation efficiencies by > 50%. YPD Plus™ is recommended for mutant yeast strains exhibiting poor growth characteristics that are not amenable to transformation. Simply supplement a yeast transformation reaction mixture with YPD Plus™ to achieve consistent increases in yeast transformation efficiencies.



Comparison of YPD vs. Zymo Research's YPD Plus™ medium. Yeast transformations were performed with outgrowth performed in either standard YPD or YPD Plus™ medium. The relative percentage of transformants is shown in the graph to the left. Each plot represents the relative transformation efficiency averaged from six individual transformations.

Ordering Information

Cat. No.	Product	Size	Price
Y1003-50	YPD Plus™	50 ml	\$15.00
Y1003-100	YPD Plus™	100 ml	\$22.00

Highlights

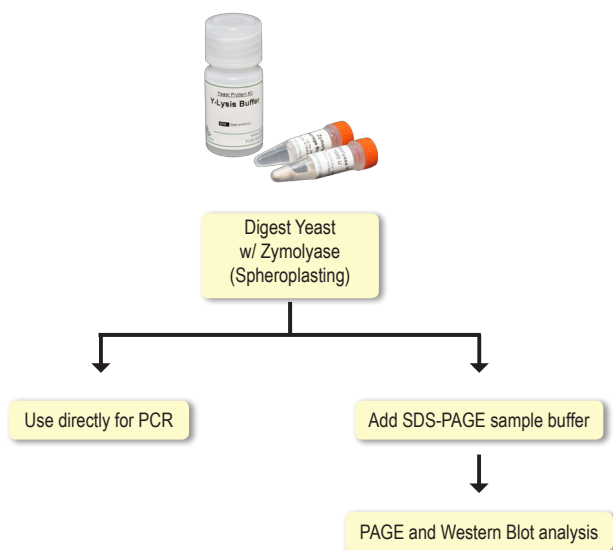
- Convenient, rapid method for efficient lysis of yeast for downstream protein and DNA analyses.
- Alternative protocols for use in conjunction with PCR and Western blotting.
- The procedure can be used for any fungal species susceptible to yeast lytic enzyme (Zymolyase) digestion.

Description

The Yeast Protein Kit is a simple and convenient method for the rapid, thorough lysis of yeast cells. The kit has been optimized for use with *S. cerevisiae* and *C. albicans* but can be used for any fungal species that is susceptible to yeast lytic enzyme (Zymolyase) digestion. The digestion procedure effectively generates spheroplasts of yeast cells, making them ideal for both protein and DNA analyses including Western blotting and PCR, respectively.

Application

- Yeast Cell Lysis..... ✓
- Protein Analysis..... ✓
- DNA Analysis..... ✓



Ordering Information

Cat. No.	Product	Size	Price
Y1002	Yeast Protein Kit	200 preps.	\$58.00

5-Fluoroorotic Acid (5-FOA)

Application

- Yeast Counter-selection..... ✓
- Yeast Two-hybrid Screen..... ✓
- Plasmid Curing..... ✓
- Plasmid Shuffling..... ✓
- Allelic Replacement..... ✓

Specifications

Appearance: White crystalline powder.

Molecular Weight: 174.0

Method for Determining Identity: TLC, melting point and lot comparison.

Purity: Estimated to be greater than 98% by TLC, melting point, and lot comparison.

Solubility: 50 mg in 1 ml (1:1 NH₄OH: H₂O) with gentle heating, > 100 mg/ml DMSO.

Storage: Store in freezer (powder, 100X 5-FOA). Store at 4°C (2X SC/5-FOA).

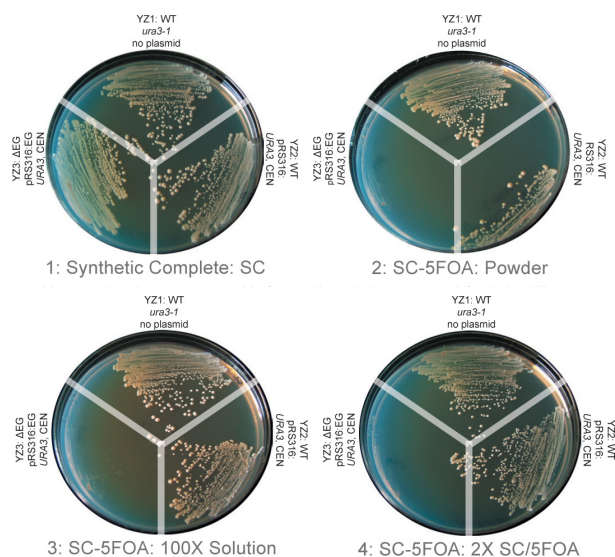
Highlights

- Yeast genetic counter-selection agent.
- Available as an ultra-pure powder (> 98% purity) or as a solution in DMSO.

Description

Using 5-Fluoroorotic Acid (5-FOA) for the counter-selection of yeast is a common genetic screening method. Curing yeast strains of plasmids, plasmid shuffling, allelic replacement, and two-hybrid screens are methods that can employ the use of 5-FOA. Otherwise nontoxic to yeast, 5-FOA is converted to the toxic form (i.e., 5-fluorouracil) in strains expressing the functional *URA3* gene coding for orotidine-5'-monophosphate decarboxylase that is involved in the synthesis of uracil. Yeast strains that are phenotypically Ura⁺ become Ura⁻ and 5-FOA(R) (resistant) after selection.

The question of 5-FOA solubility is often raised by customers using ultra-pure (> 98%) 5-FOA powder because of its insolubility in water. Thus, we provide a 100X concentrated (100 mg/ml) 5-FOA solution in DMSO and a 2X concentrated (2 mg/ml) synthetic complete 5-FOA (i.e., 2X SC/5-FOA) in liquid medium containing yeast nitrogen base, ammonium sulfate, complete amino acids, and glucose. Both have been tested and validated on the basis of counter selection activity (see below).



Counter selection of yeast using 5-FOA. Yeast strains that are auxotrophic for uracil (*ura3-1*) were tested for their ability to grow on 5-FOA containing media. Three strains were tested: wt alone (YZ1), wt with a URA3 marked low copy plasmid (YZ2), and a mutant strain with a deletion of an essential gene (Δ EG) that could not lose a complementing URA3 plasmid (YZ3).

From left to right, top to bottom are synthetic complete glucose medium (SC): 1. SC, synthetic complete no 5FOA; 2. Standard - SC-5FOA (SC-5FOA made from ultra-pure 5-FOA powder, 1 g/liter) 3. SC-5FOA made from 100X 5-FOA solution; 4. SC-5FOA made from 2X SC/5-FOA.

For each plate, Top: Yeast strain: YZ1 wild-type, Ura- (wt, *ura3-1*), Right: Yeast strain: YZ2, wt carrying a low copy, URA3 plasmid alone, and Left: Yeast strain: YZ3: Δ EG, containing the complementing plasmid (pRS316: EG, URA3, CEN). The counter selection against strain YZ3 was evident for all media containing 5-FOA with no 5-FOAR colonies evident (see left panels, YZ3: in plates 2, 3, and 4). Cells from control strains YZ1 and YZ2 were able to grow on 5-FOA media.

Ordering Information

Cat. No.	Product	Size	Price
F9001-1	5-FOA (powder)	1 g	\$41.00
F9001-5	5-FOA (powder)	5 g	\$181.00
F9002	2X SC / 5-FOA (liquid)	250 ml	\$86.00
F9003	100X 5-FOA (liquid)	10 ml	\$59.00

Highlights

- Aqueous solution of yeast α-factor mating pheromone.

Description

When yeast “a” and “α” cells encounter mating pheromones of the opposite cell type they induce genes necessary for mating, arrest the cell cycle in G1, alter cell surface and nuclear determinants, and also undergo dramatic morphological elongation into pear shapes, affectionately termed “schmooing”. These alterations prepare the yeast cells for mating and fusion to form stable diploids. The a/α diploids are not responsive to mating pheromone of either type, but can be induced to undergo meiosis via nutrient deprivation. The use of yeast mating pheromones has pioneered the study of the cell cycle, cellular morphology, transcriptional induction, as well as signal transduction pathways.

Zymo Research provides the α-factor peptide mating pheromone as a ready to use liquid that has been optimized for both activity and stability and is guaranteed to retain biological function through multiple freeze-thaw cycles.

Application

- Yeast Mating Induction..... ✓
- G1 Phase Arrest..... ✓

Specifications

Concentration: 10 mM in 0.1 M sodium acetate, pH 5.2, (i.e., 4 mg/240 µl).

Recommended Usage Concentration:
~5 µM (*bar1* Δ) to 100 µM (*BAR1*).

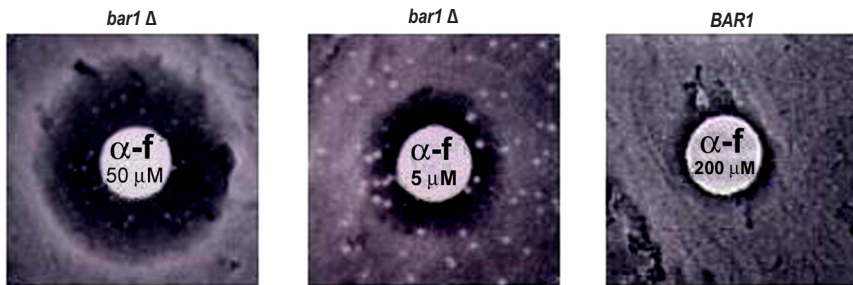
Peptide Sequence: TRP-LEU-GLN-LEU-LYS-PRO-GLY-GLN-PRO-MET-TYR.

Molecular Weight: 1684.0

Activity Test: G1 arrest.

Purity: > 98% by HPLC.

Storage: -20°C.



Activity test of α-Factor. α-Factor peptide pheromone (10 µl) was applied to sterile filters on a lawn of MATa cells, which were either wild-type for the *BAR1* (200 µM, right) protease or *bar1* Δ (50 µM, left; 5 µM, center). Sensitivity to the α-factor is evident as the zone of clearing (G₁ arrested cells). Cells that have the *BAR1* protease deletion are more sensitive to α-Factor than *BAR-1*-protease-positive wild strain which require ~20 - 50X more pheromone to arrest the cells.

Ordering Information

Cat. No.	Product	Size	Price
Y1001	α-Factor Mating Pheromone	240 µl	\$128.00

Zymolyase – Yeast Lytic Enzyme

Application

Spheroplast/Protoplast Formation.....	✓
Yeast Cell Fusion.....	✓
Yeast Transformation.....	✓
Other Fungi.....	✓

Specifications

Enzyme Concentration.....	5 U/μl
Total Protein Concentration.....	~10 - 15 mg/ml
Storage.....	-70° C
Inactivation.....	60°C for 5 min.

Unit Definition

One lytic unit (U) is defined as a 10% decrease in O.D. at 800 nm for 30 min.

Highlights

- Zymolyase (100T equivalent) prepared from *Arthrobacter luteus* (essential enzyme activities: β-1,3-glucan laminaripentaohydrolase and β-1,3-glucanase).
- Provided lyophilized together with a buffer for reconstitution.
- Also available combined with RNase A (R-Zymolyase).

Description

Digestion of yeast and fungal cell walls is necessary for many experimental procedures including spheroplasting, immunofluorescence, transformation, protein purification, and others. The use of lytic enzymes like Zymolyase is routinely used for digestion. The Zymolyase from Zymo Research is prepared from *Arthrobacter luteus*, lyophilized, and packaged with a resuspension buffer. The buffer has been optimized to confer maximal levels of enzymatic activity. The main activities of the enzyme are β-1,3 glucanase and β-1,3-glucan laminaripentaohydrolase, which hydrolyze glucose polymers at the β-1,3-glucan linkages releasing laminaripentaose as the principal product. Optimal Zymolyase activity is at 30° - 37°C; lytic activity ceases at higher temperatures.

R-Zymolyase includes 0.5 U/μl RNase A when reconstituted.

Susceptible fungal genera: *Asbya*, *Candida*, *Debaryomyces*, *Eremothecium*, *Endomyces*, *Hansenula*, *Hanseniaspora*, *Kloekera*, *Kluyveromyces*, *Lipomyces*, *Metschikowia*, *Pichia*, *Pullularia*, *Saccharomyces*, *Saccharomycodes*, *Saccharomycopsis*, *Schizosaccharomyces*, *Torulopsis*.

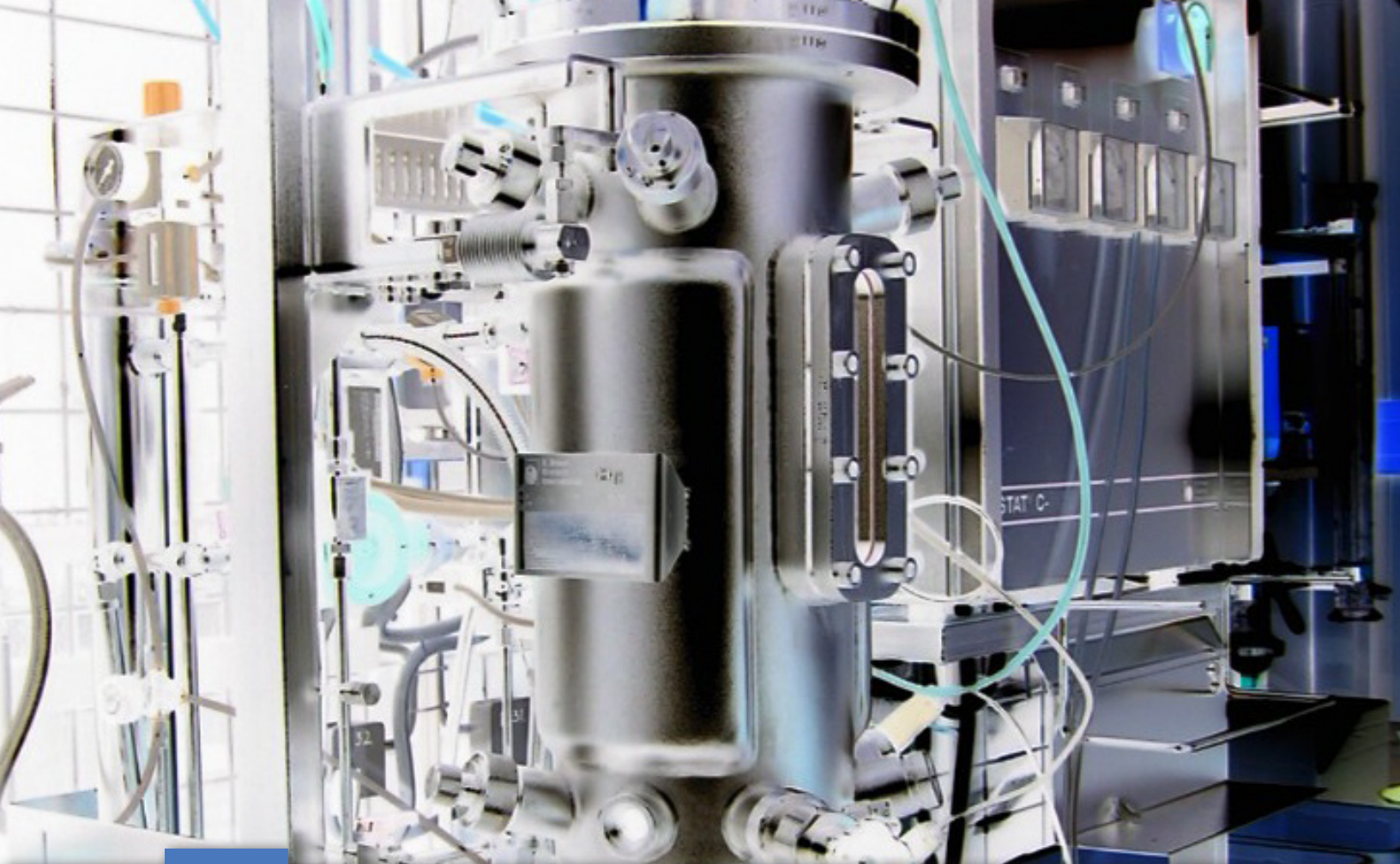


Zymolyase can be used for enzymatic digestion of yeast glycan coats and for spheroplast formation. The arrow indicates the nucleus and intracellular components of a spheroplast through a partially digested plasma membrane.*

*Source: A protocol for isolation and visualization of yeast nuclei by scanning electron microscopy (SEM). Elena Kiseleva, Terry D Allen, Sandra A Rutherford, Steve Murray, Ksenia Morozova, Fiona Gardiner, Martin W Goldberg & Sheona P Drummond. Nature Protocols 2, 1943 - 1953 (2007) Published online: 9 August 2007 doi:10.1038/nprot.2007.251

Ordering Information

Cat. No.	Product	Size	Price
E1004	Zymolyase	1,000 U	\$54.00
E1005	Zymolyase	2,000 U	\$92.00
E1006	R-Zymolyase	1,000 U	\$68.00



6

Protein Expression, Purification & Enzymes

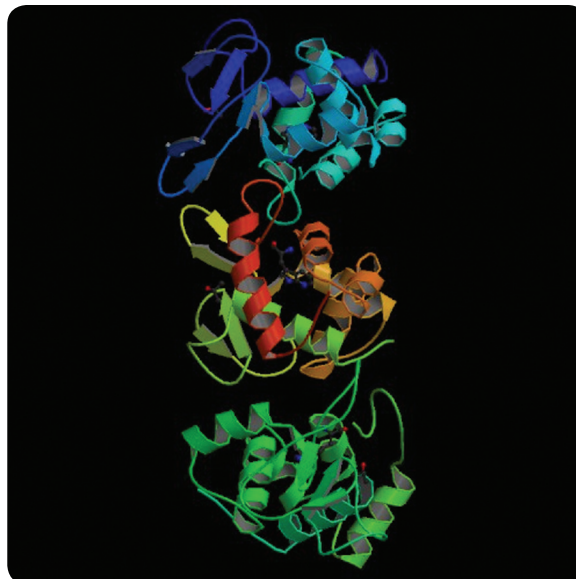
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Introduction

Although the expression of recombinant proteins in *E. coli* is now a routine procedure, high level expression or overexpression is not always attainable. However, those at Zymo Research have designed products to exploit the fact that high levels of protein expression can be consistently obtained when the processes of cell expansion and protein expression are kept separate. This is easily achieved with the use of the Dual Media Set™ where the over-expression of many proteins can be reliably controlled. In conjunction with the Dual Media Set™, our XJ Autolysis™ expression strains (see Chapter 4) are ideal hosts for recombinant protein expression. With these strains, bacterial cell lysis is complete after a single freeze/thaw cycle. Researchers will find the single step lysis procedure simple, reproducible, and faster than conventional methods.

The His-Spin Protein Miniprep™ provides researchers a simple, fast method for His-tagged protein purification. The procedure is based on innovative protein purification chemistry as well as state of the art *Fast-Spin* column technology. Up to 1 mg of His-tagged protein can be purified per preparation in as little as 5 minutes. The purified protein can be used directly in enzymatic assays, protein biochemical analyses, SDS-PAGE, and other applications. The straightforward spin-wash-elute protocol ensures results are obtained in minutes, not hours.

In addition to those enzymes presented in Chapter 1, Zymo Research offers several others, including DNase I (RNase-free), Proteinase K, RNase A, and Zymolyase that are detailed in this chapter.



Three dimensional model of lysozyme (i.e., endolysin) from Bacteriophage Lambda. Endolysin is a key component in the arabinose induced lysis of Zymo Research's XJ Autolysis™ strains of *E. coli*.

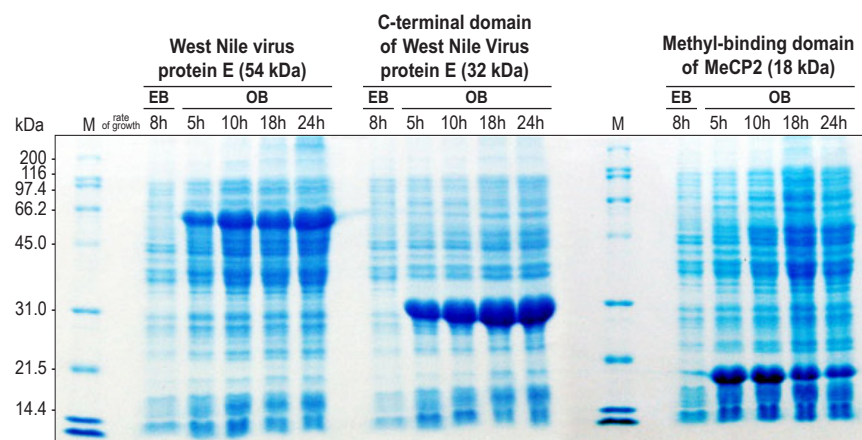
Highlights

- Simple, reliable method for high level recombinant protein expression in *E. coli*.
- Eliminates the need to monitor cell density and the time of inducer addition.
- Synchronizes cultures that express different recombinant proteins.

Description

Although recombinant protein expression in *E. coli* has become routine, high level protein expression or overexpression is not always attainable for every protein. Our research has shown that high level protein expression can be achieved consistently when two processes, cell expansion and protein expression, are kept separate.

The Dual Media Set™, different from commonly used protein expression procedures using Luria-Bertani (LB) medium or other specially prepared medium, contains two specially formulated media: Expansion Broth (EB) and Overexpression Broth (OB). For expansion, *E. coli* cells are grown in EB which keeps the production of recombinant protein repressed. To initiate high level protein expression, OB is simply added to the culture. By using the Dual Media Set™, protein overexpression can be reliably controlled for many recombinant proteins (see figure below). In some circumstances, when the expressed protein is either toxic or insoluble, overexpression may be counter-productive. In such cases, protein production can be kept at a minimum by adding the inducer IPTG (for *lac*-based promoters) to cells growing in EB (see figure to the right).



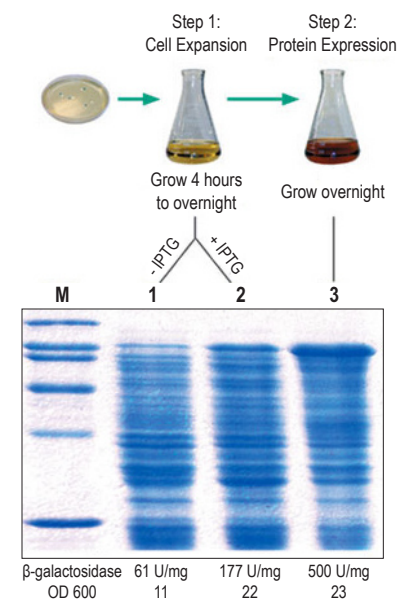
SDS-PAGE of cell proteins after growth using the Dual Media Set™. M – protein markers; 1-5, West Nile virus protein E (54 kDa): 1, repressed expression in EB, 2-5, over-expression in OB for 5, 10, 18, and 24 hours, respectively, after inoculation with uninduced EB culture; 6-10, C-terminal domain of West Nile virus protein E (32 kDa): 6, repressed expression in EB, 7-10, over-expression in OB for 5, 10, 18, and 24 hours, respectively, after inoculation with uninduced EB culture; 11-15, Methyl-binding domain of MeCP2 (18 kDa): 11, repressed expression in EB, 12-15, over-expression in OB for 5, 10, 18, and 24 hours, respectively, after inoculation with uninduced EB culture.

Ordering Information

Cat. No.	Product	Size	Price
M3011	Dual Media Set™ (EB + OB)	100 ml EB + 500 ml OB	\$38.00
M3012-100	Expansion Broth (EB)	100 ml	\$12.00
M3012-500	Expansion Broth (EB)	500 ml	\$28.00
M3013-100	Overexpression Broth (OB)	100 ml	\$12.00
M3013-500	Overexpression Broth (OB)	500 ml	\$28.00

Application

Recombinant Protein Expression..... ✓



Controlled overexpression of β -galactosidase. Cells were grown in EB, where only background levels of the T7-*lac* promoter-controlled product are produced (1). Moderate amounts of the enzyme were produced by incubating overnight in EB with IPTG (2), the highest amounts of protein are produced in OB (3).

His-Spin Protein Miniprep™

Application

His-tagged Protein Purification..... ✓



Specifications

Format..... Spin Column

His-affinity Gel..... ✓

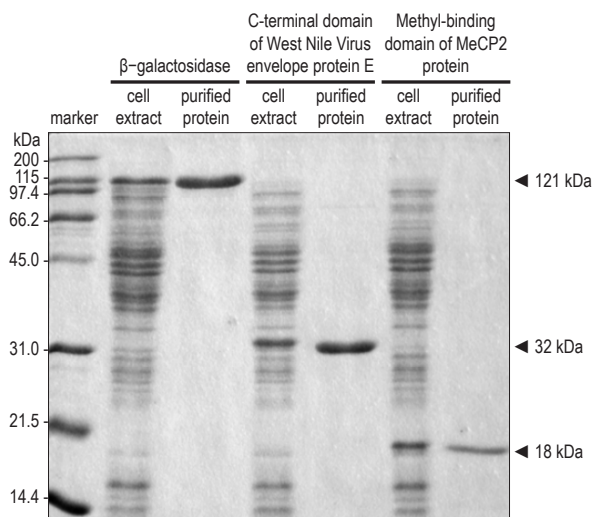
Protein Binding Capacity..... 1 mg/column

Highlights

- Fast (5 minute) method for the purification of His-tagged proteins from cell free extracts.
- Screen bacterial colonies directly on the basis of protein expression vs. plasmid DNA.
- No special instrumentation is required other than a benchtop microcentrifuge.

Description

The His-Spin Protein Miniprep™ provides researchers with a method for fast His-tagged protein purification. The easy-to-follow procedure is based on a nickel-charged His-Affinity Gel (IMAC), innovative protein purification, and unique *Fast-Spin* column technology. Up to 1 mg of His-tagged protein can be purified in as little as 5 minutes and can be eluted into as little as 100 µl of the provided His-Elution Buffer. The purified protein can be used directly for enzymatic assays, protein biochemical analyses, SDS-PAGE, as well as other protein based applications. The His-Spin Protein Miniprep™ has been optimized to yield maximal protein purity indices: a single protein band is often visualized following Coomassie Blue® staining of proteins in SDS-PAGE gel (see figure below). The straightforward spin-wash-elute protocol dramatically simplifies protein purification and results are obtained in minutes, not hours!



Purification of 6X His-fusion proteins. *E. coli* cell extracts, containing indicated proteins (i.e., 112, 32, 18 kDa) expressed as a N-terminal 6X His-fusion, as well as the proteins purified using His-Spin Protein Miniprep™ were analyzed by SDS-PAGE in a 15% (w/v) polyacrylamide gel, and stained with Coomassie Blue®. The recombinant proteins were purposely expressed to a low level to demonstrate the efficiency of the His-Spin Protein Miniprep™.

Featured Technology



Zymo-Spin™ PI (p. 145)
Kits P2001, P2002

Ordering Information

Cat. No.	Product	Size	Price
P2001	His-Spin Protein Miniprep™	10 preps.	\$62.00
P2002	His-Spin Protein Miniprep™	50 preps.	\$245.00
P2003-2	His-Affinity Gel	14 ml	\$168.00

CpG Methylase (M. SssI)

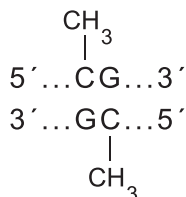
The CpG Methylase from Zymo Research completely methylates all cytosine bases at the C⁵ position in double-stranded, non-methylated and hemi-methylated DNA having the dinucleotide sequence 5'...CpG...3'. The reaction conditions are optimized to maximize the processivity of the enzyme to ensure rapid, complete, and reproducible methylation of DNA for accurate DNA methylation analysis. See page 19 for details.

Specifications: Provided in solution (4 U/μl) w/ 10X Reaction Buffer and 20X SAM (S-adenosylmethionine)

Source: Recombinant methylase is isolated from *E. coli* expressing methyltransferase gene from *Spiroplasma* sp. strain MQ1.

Heat Inactivation: 65°C for 20 min.

Unit Definition: One unit is the amount of enzyme required to protect 1 μg of λ DNA from cleavage by BstUI restriction endonuclease in a total reaction volume of 20 μl for 1 hour at 37°C.



CpG Methylase methylates all cytosine residues in double-stranded, CpG context.

Cat. No.	Size	Price
E2010	200 U	\$147.00
E2011	400 U	\$243.00

DNA Degradase™

DNA Degradase™ from Zymo Research is a nuclease mix that quickly and efficiently degrades DNA into individual *nucleotides*. DNA Degradase™ is ideal for whole-genome DNA methylation analysis by a number of downstream applications (i.e., HPLC, LC/MS, TLC, etc.). Digestion with the enzyme is performed via a simple one hour, one-step procedure. See page 24 for details.

Specifications: Provided with 10X DNA Degradase™ Reaction Buffer

Enzyme Concentration: 10 U/μl

Enzyme Inactivation: 70°C for 20 min.

Optimum Reaction Temperature: 37°C

Unit Definition: One unit (U) is defined as the amount of enzyme required to degrade 1 μg of λ DNA in a total reaction volume of 25 μl for 1 hour at 37°C.

Cat. No.	Size	Price
E2016	500 U	\$120.00
E2017	2,000 U	\$382.00

DNA Degradase Plus™

DNA Degradase Plus™ is a nuclease mix that quickly and efficiently degrades DNA into individual *nucleosides*. It is ideal for whole-genome DNA methylation analysis by LC/MS. Digestion is performed in a simple one hour, one-step procedure. See page 25 for details.

Specifications: Provided with 10X DNA Degradase™ Reaction Buffer

Enzyme Concentration: 10 U/μl

Enzyme Inactivation: 70°C for 20 min.

Optimum Reaction Temperature: 37°C

Unit Definition: One unit (U) is the amount of enzyme required to degrade 1 μg of λ DNA in a total reaction volume of 25 μl for 1 hour at 37°C.

Cat. No.	Size	Price
E2020	250 U	\$ 120.00
E2021	1,000 U	\$ 382.00

DNase I (RNase-Free)

Pancreatic DNase I (RNase-free) cuts both double-stranded and single-stranded DNA, producing 3'-OH oligonucleotides. It is typically used for selectively degrading DNA in the presence of RNA. This DNase is suited for applications such as nick translation, production of random fragments, cleavage of genomic DNA for footprinting, removal of DNA template after *in vitro* transcription, and removal of DNA from RNA samples prior to applications such as RT-PCR. It is compatible with all of our RNA kits featuring in-column DNase digestion.

Specifications: Provided in 10 mM HEPES, pH 7.5, 50 % Glycerol, 10 mM MgCl₂, 10 mM CaCl₂ w/ 10X Reaction Buffer

Source: Bovine Pancreas

Heat Inactivation: 65°C for 10 min.

Unit Definition: One unit is defined as the amount of enzyme required to degrade 1 µg λ DNA completely in 10 minutes at 37°C in a 50 µl reaction volume (40 mM Tris-HCl, pH 8.0, 10 mM NaCl, 6 mM MgCl₂, and 10 mM CaCl₂). One unit of enzyme is equivalent to one Kunitz unit under these assay conditions.

Cat. No.	Size	Price
E1007	100 U / 100 µl	\$27.00

dsDNA Shearase™

Digestion with dsDNA Shearase™ digests dsDNA into blunt-ended fragments. The size of the fragments can be controlled by the reaction time. Unlike conventional nebulization procedures, the enzyme is compatible with low volume inputs, thus minimizing sample loss. See page 26 for details.

Specifications: Provided with 10X dsDNA Shearase™ Reaction Buffer; digests sequences 5'...ND / HN...3' where D = A, G, or T, and H = A, C, or T

Enzyme Concentration: 1 U/µl

Enzyme Inactivation: 1 µL 0.5 M EDTA per 25 µL reaction

Optimum Reaction Temperature: 42°C

Unit Definition: One unit (U) is defined as the amount of enzyme required to convert 0.5 µg of DNA into fragments averaging ~500 bp in a total reaction volume of 25 µl in 20 minutes at 42°C.

Cat. No.	Size	Price
E2018-50	50 U	\$92.00
E2018-200	200 U	\$310.00

GpC Methylase (M. CviPI)

The GpC Methylase from Zymo Research completely methylates all cytosine bases at the C⁵ position in double-stranded, non-methylated and hemi-methylated DNA having the dinucleotide sequence 5'...GpC...3'. The reaction conditions are optimized to maximize the processivity of the enzyme to ensure rapid, complete, and reproducible methylation of DNA for accurate DNA methylation analysis. See page 20 for details.

Specifications: Provided in solution (4 U/µl) w/ 10X Reaction Buffer and 20X SAM (S-adenosylmethionine)

Source: Recombinant GpC Methylase is isolated from *E. coli* expressing the methyltransferase gene from a Chlorella virus.

Heat Inactivation: 65°C for 20 min.

Unit Definition: One unit is defined as the amount of enzyme required to protect 1 µg of λ DNA against cleavage by HaeIII restriction endonuclease in a total reaction volume of 20 µl for 1 hour at 37°C.

Cat. No.	Size	Price
E2014	200 U	\$60.00
E2015	1,000 U	\$240.00

Micrococcal Nuclease

Micrococcal Nuclease cleaves single stranded and double stranded DNA and RNA. Complete digestion with Micrococcal Nuclease yields mono and oligonucleotides with 3' phosphates.

Specifications: Typical buffer consists of 20mM Tris-HCl, (pH 8.8), 1mM CaCl₂. CaCl₂ is essential for activity.

Enzyme Commission Number: (E.C. 3.1.31.1)

Enzyme Concentration: 0.1 U/μl

Enzyme Inactivation: EDTA or EGTA in molar excess of CaCl₂

Optimum Reaction Temperature: 37°C

Unit Definition: One unit will produce 1.0 μmole of acid soluble polynucleotides from native DNA per min at pH 8.8 at 37 °C, based on EM/260 = 10,000 for the mixed nucleotides.

Cat. No.	Size	Price
D5220-1	10 U / 100 μl	\$21.00

Proteinase K

Proteinase K is a stable serine protease with broad substrate specificity and will degrade many proteins in their native conformation even in the presence of detergents (e.g., SDS). The enzyme is frequently used in molecular biology applications to digest unwanted proteins such as nucleases from DNA and/or RNA preparations from microorganisms, cells, and plants.

Specifications: Lyophilized Enzyme Provided w/ Solubilization Buffer

Enzyme Commission Number: (EC 3.4.21.64)

Source: *Engyodontium album*

pH and Temperature Range: 4.0 to 12.0 (8.0 is optimum), 25 to 65°C.

Specific Activity: > 30 units/mg protein

Unit Definition: One unit (U) of enzyme will hydrolyze urea-denatured hemoglobin to produce 1.0 μmole of tyrosine per minute at pH 7.5 at 37°C.

Cat. No.	Size	Price
D3001-2-5	5 mg	\$18.00
D3001-2-20	20 mg	\$38.00

RNase A

Pancreatic RNase A specifically cleaves at the 3'-side of pyrimidine (uracil or cytosine) phosphate bonds. The enzyme does not hydrolyze DNA, because DNA lacks 2'-OH groups essential for the formation of cyclic intermediates. The enzyme can also be used to hydrolyze RNA from protein samples. It is compatible for use in RNase protection assays, to remove unspecifically bound RNA, in the analysis of RNA sequences, to hydrolyze RNA contained in protein samples, and in the purification of DNA.

Specifications: Lyophilized Enzyme Provided w/ Solubilization Buffer

Enzyme Commission Number: (EC 3.1.27.5)

Source: Bovine Pancreas

Enzymatic Activity: 50 - 100 Kunitz units per mg protein

Cat. No.	Size	Price
E1008-2	2 mg	\$20.00
E1008-8	8 mg	\$30.00

Zymolyase

Digestion of yeast and fungal cell walls is necessary for many experimental procedures including spheroplasting, immunofluorescence, transformation, protein purification, and others. The use of lytic enzymes like Zymolyase is routinely used for digestion. The Zymolyase from Zymo Research is prepared from *Arthrobacter luteus* and is 100T equivalent. The storage buffer provided with the lyophilized enzyme has been optimized to confer maximal levels of enzymatic activity. R-Zymolyase also contains RNase A.

Specifications: Lyophilized Enzyme Provided w/ Storage Buffer

Source: *Arthrobacter luteus*

Activity: β -1,3-glucanase

Essential Enzyme: β -1,3-glucan laminaripentaohydrolase

Optimum pH and Temperature: pH 7.5, 35°C (lysis of viable yeast), pH 6.5, 45°C (hydrolysis of yeast glucan)

Unit Definition: One unit (U) of lytic activity is defined as the amount of enzyme that catalyzes a 10% decrease in optical density at 800 nm (OD_{800}) in 30 minutes.

Assay Condition: Yeast (0.8 - 1.0 OD_{800}) in 50 mM potassium phosphate, pH 7.5, 10 mM 2-mercaptoethanol

Cat. No.	Product	Size	Price
E1004	Zymolyase	1,000 U	\$54.00
E1005	Zymolyase	2,000 U	\$92.00
E1006	R-Zymolyase	1,000 U	\$68.00

ZymoTaq™ DNA Polymerase

ZymoTaq™ DNA Polymerase contains all the reagents needed to perform “hot-start” PCR. The inclusion of a heat-activated, thermostable DNA polymerase reduces primer dimer and nonspecific product formation that can occur during PCR. This unique product is specifically designed for the amplification of bisulfite-treated DNA for methylation detection, but is applicable for conventional PCR. The product generates specific amplicons with little or no by-product formation. Simple and easy to use: heat at 95°C for 10 minutes to initiate polymerization. ZymoTaq™ DNA Polymerase is a heat-activated, “hot start” polymerase that has 3'-terminal transferase activity. The addition of “A” overhangs to amplified DNA makes it ideal for use in TA-cloning. See page 18 for details.

Specifications: Provided as a PreMix (E2003, E2004) or as a component of a set (E2001, E2002).

Source: Recombinant enzyme

Activity: 5' - 3' DNA polymerization

Essential Enzyme: DNA polymerase

Optimum pH and Temperature: 72°C

Unit Definition: One unit (U) enzyme is defined as the amount of enzyme required for the incorporation of 10 nM dNTPs into an acid-insoluble form in 30 minutes at 72°C.

Cat. No.	Product	Size	Price
E2001	ZymoTaq™ DNA Polymerase	50 rxns.	\$62.00
E2002	ZymoTaq™ DNA Polymerase	200 rxns.	\$198.00
E2003	ZymoTaq™ PreMix	50 rxns.	\$62.00
E2004	ZymoTaq™ PreMix	200 rxns.	\$198.00



7

Antibiotics & Chemicals

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Introduction

Zymo Research offers a range of premade, ready to use high quality antibiotics and chemicals to satisfy your research needs. Our ready-to-use ampicillin, chloramphenicol, kanamycin, and tetracycline solutions are perfect for use in bacterial selection procedures (see chart below).

Antibiotic (Cat. No.)	Description	Resistance	Working Concentration (For <i>E. coli</i>)	Stock Concentration
Ampicillin (Ap) (A1001)	For Gram (+) and (-) bacteria. Penicillin derivative that prevents bacterial cell wall synthesis.	Resistance to Ampicillin is conferred by the <i>bla</i> gene which encodes β -lactamase that cleaves the β -lactam bond of the antibiotic.	20 - 100 μ g/ml	100 mg/ml
Chloramphenicol (Cm) (A1002)	For Gram (+) and (-) bacteria and some mycobacteria. Chloramphenicol inhibits bacterial protein synthesis by binding the 50S ribosomal subunit.	Resistance to Chloramphenicol is conferred by the <i>cat</i> gene which encodes an acetyltransferase that acetylates and inactivates the antibiotic.	20 μ g/ml	10 mg/ml
Kanamycin (Km) (A1003)	For Gram (+) and (-) bacteria. Kanamycin binds to 70S ribosomes resulting in dysfunctional translation of mRNA.	Resistance to Kanamycin is conferred by an aminoglycoside phosphotransferase that modifies the antibiotic, preventing its interaction with ribosomes.	30 μ g/ml	35 mg/ml
Tetracycline (Tc) (A1004)	For Gram (+) and (-) bacteria. Tetracycline inhibits bacterial protein synthesis by binding the 30S ribosomal subunit.	Resistance to Tetracycline is conferred by the <i>tet</i> gene product that alters the bacterial cell membrane and transport of the antibiotic into the cell.	10 - 20 μ g/ml	10 mg/ml

Ampicillin Sodium

Description Premade ampicillin solution. Ampicillin inhibits bacterial cell wall synthesis. Commonly used to select for ampicillin resistant plasmid bearing strains of bacteria. Effective against both Gram (-) and Gram (+) bacteria.

Purity	≥ 98%	Cat. No.	Size	Price
Concentration	100 mg/ml	A1001-5	5 ml	\$20.00
Storage	-20° C	A1001-25	5 x 5 ml	\$65.00

Chloramphenicol

Description Premade chloramphenicol solution. Chloramphenicol inhibits bacterial protein synthesis by binding 50S ribosomal subunit. Commonly used for the amplification of vectors in Gram (-) bacteria. Effective against both Gram (-) and Gram (+) bacteria and some mycobacteria.

Purity	≥ 97%	Cat. No.	Size	Price
Concentration	10 mg/ml	A1002-5	5 ml	\$20.00
Storage	-20° C	A1002-25	5 x 5 ml	\$65.00

Kanamycin Sulfate

Description Premade kanamycin solution. Kanamycin inhibits bacterial protein synthesis by binding 70S ribosomes resulting in dysfunctional translation of mRNA commonly used to select for cosmid vectors. Effective against both Gram (-) and Gram (+) bacteria.

Purity	≥ 98%	Cat. No.	Size	Price
Concentration	35 mg/ml	A1003-5	5 ml	\$20.00
Storage	-20° C	A1003-25	5 x 5 ml	\$65.00

Tetracycline Hydrochloride - Reagent Grade

Description Premade tetracycline solution. Tetracycline inhibits bacterial protein synthesis by binding the 30S ribosomal subunit. Effective against both Gram (-) and Gram (+) bacteria.

Purity	≥ 98%	Cat. No.	Size	Price
Concentration	10 mg/ml	A1004-5	5 ml	\$20.00
Storage	-20° C	A1004-25	5 x 5 ml	\$65.00

Chemicals

5-FOA (5-Fluoroorotic Acid)

Description Synthetic 5-FOA monohydrate powder. See page 124 for details.

Formula $C_5H_3FN_2O_4 \cdot H_2O$

M.W. 174.0

Purity $\geq 98\%$

Cat. No.	Size	Price
F9001-1	5-FOA 1 g (Powder)	\$41.00
F9001-5	5-FOA 5 g (Powder)	\$181.00
F9002	2X SC/5-FOA 250 ml (liquid)	\$86.00
F9003	100X 5-FOA 10 ml (Liquid)	\$59.00

Arabinose

Description Concentrated arabinose inducer for XJ Autolysis™ strains.

Concentration 500X

Storage $-20^\circ C$

Cat. No.	Size	Price
A2001-1	1 ml	\$8.00
A2001-10	10 x 1 ml	\$52.00

His-Affinity Gel

Description Nickel affinity gel used for the purification of histidine-tagged proteins. 6% beaded agarose. ≥ 15 mg/ml protein binding capacity. See His-Spin Protein Miniprep™, page 130.

Concentration 50% suspension in 30% ethanol.

Storage $4^\circ C$

Cat. No.	Size	Price
P2003-2	14 ml	\$168.00

IPTG (Isopropyl- β -D-thiogalactopyranoside)

Description Premade IPTG in water.

Purity $\geq 98\%$.

Concentration 0.5 M

Storage $-20^\circ C$

Cat. No.	Size	Price
I1001-5	5 ml	\$7.00
I1001-25	5 x 5 ml	\$31.00

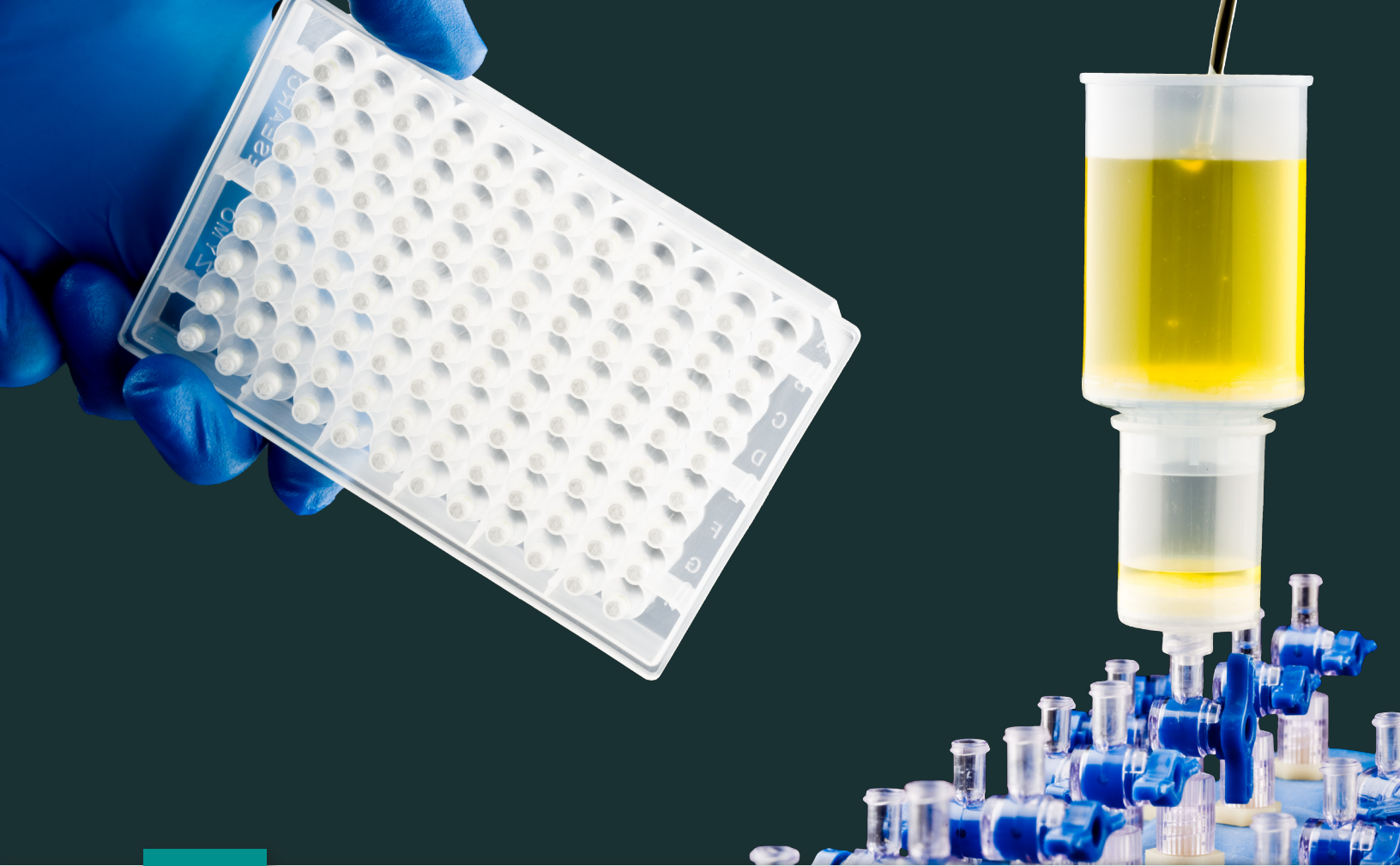
X-GAL (5-bromo-4-chloro-3-indolyl β -D-galactopyranoside)

Description Sterile, ready to use X-Gal solution.

Concentration 2% w/v in DMF

Storage $-20^\circ C$

Cat. No.	Size	Price
X1001-5	5 ml	\$10.00
X1001-25	5 x 5 ml	\$45.00



8

Columns, Plates, Instruments & Accessories

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Introduction

The nucleic acid binding columns are vital components of the kits presented in preceding chapters. Most of these columns, plates, filters, tubes, and other accessories can be purchased separately and they are highlighted in this chapter.

Column design is crucial to the quality of eluted nucleic acid, and Zymo Research's Zymo-Spin™ series of columns and plates are uniquely designed to make high yield recovery of DNA and RNA simple, fast, and reliable. The columns and plates contain silica-based matrices of exclusive chemical composition that are optimized for maximal adsorption of DNA and/or RNA and efficiently removes contaminants during the purification process. Our *Fast-Spin* technology ensures rapid and complete filtration of solutions through the column matrix, eliminating the likelihood of buffer carryover.

For instance, our innovative Zymo-Spin™ I column has a *0 µl retention volume* and an *elution volume as low as 6 µl*, something other suppliers can not claim. Likewise, the Zymo-Spin™ I-96 filtration plate integrates our existing Zymo-Spin™ I column technology into a durable 96-well format that can be used for simple, rapid cleaning and concentration of DNA/RNA in either centrifugation or vacuum based protocols. Other Zymo-Spin™ columns are designed for processing larger samples and binding greater amounts of nucleic acid, but the principle is the same: high quality, high yield DNA and/or RNA.





Products featuring BashingBead™ lysis technology were spotlighted in the chapters on environmental DNA (pp. 70-78) and RNA (pp. 103-109) Purification. ZR BashingBead™ Lysis Tubes and ZR-96 BashingBead™ Lysis Racks may be purchased separately. Additionally, we carry cell disrupters and accessories from several manufacturers. Each of these machines can be used for easy and efficient cell lysis with the ZR BashingBead™ products. For manual homogenization of tissues, Zymo Research offers Squisher™ homogenization devices in single, 8-well, and 96-well formats. These homogenizers can be cleaned and reused for the simple, efficient processing of tissue samples, such as liver, brain, mouse tail snips, *Drosophila*, and other insects, etc.






Zymo-Spin™ Column Versatility

Technology Overview: Fast-Spin Columns


Zymo-Spin™ I Columns





				
Name	Zymo-Spin™ I	Zymo-Spin™ IC	Zymo-Spin™ IB	Zymo-Spin™ PI
Format	DNA/RNA binding	DNA/RNA binding	DNA/RNA binding	His-Spin Column
Binding Capacity / Elution	5 µg / ≥ 6 µl	5 µg / ≥ 6 µl	5 µg / ≥ 6 µl	5 µg / ≥ 6 µl
Compatibility	microcentrifuge, vacuum manifolds	microcentrifuge, vacuum manifolds	microcentrifuge, vacuum manifolds	microcentrifuge, vacuum manifolds
Matrix / Construction	silica-based / polypropylene	silica-based / polypropylene	silica-based / polypropylene	silica-based / polypropylene
Cat. No. / Size	C1003-50 — 50 pack	C1004-50 — 50 pack	C1014-50 — 50 pack	P2003-1 — 50 pack
	C1003-250 — 250 pack	C1004-250 — 250 pack	C1014-250 — 250 pack	



Zymo-Spin™ II Columns


			
Name	Zymo-Spin™ II	Zymo-Spin™ IIC	Zymo-Spin™ IIN
Format	DNA/RNA binding	DNA/RNA binding	DNA/RNA binding
Binding Capacity / Elution	25 µg / ≥ 25 µl	25 µg / ≥ 25 µl	25 µg / ≥ 25 µl
Compatibility	microcentrifuge	microcentrifuge, vacuum manifolds	microcentrifuge, vacuum manifolds
Matrix / Construction	silica-based / polypropylene	silica-based / polypropylene	silica-based / polypropylene
Cat. No. / Size	C1008-50 — 50 pack	C1011-50 — 50 pack	C1019-50 — 50 pack
	C1008-250 — 250 pack	C1011-250 — 250 pack	C1019-250 — 250 pack

Zymo-Spin™ III Columns

		
Name	Zymo-Spin™ III	Zymo-Spin™ IIIC
Format	DNA/RNA binding	DNA/RNA binding
Binding Capacity / Elution	25 µg / ≥ 35 µl	25 µg / ≥ 35 µl
Compatibility	microcentrifuge, vacuum manifolds	microcentrifuge, vacuum manifolds
Matrix / Construction	silica-based / polypropylene	silica-based / polypropylene
Cat. No. / Size	C1005-50 — 50 pack	C1006-50 — 50 pack
	C1005 — 250 pack	C1006-250 — 250 pack

Zymo-Spin™ IV Columns				
	 Orange Cap	 Green Cap	 Yellow Cap	 Red Cap
Name	Zymo-Spin™ IV	Zymo-Spin™ IV-HRC	Zymo-Spin™ IV-μHRC	Zymo-Spin™ IV-M
Format	filtration column	DNA/RNA inhibitor removal filtration column	DNA/RNA inhibitor removal filtration column	filtration column
Volumetric Capacity	700 μl	50 - 200 μl	10 - 50 μl	700 μl
Compatibility	microcentrifuge, vacuum manifolds	microcentrifuge, vacuum manifolds	microcentrifuge, vacuum manifolds	microcentrifuge, vacuum manifolds, mini lab-rollers/rotators
Matrix / Construction	silica-based with 10-20 μm pore size / polypropylene, snap off base, sealable screw cap	silica-based with 10-20 μm pore size, PCR/RT inhibitor removal resin / polypropylene, snap off base, sealable screw cap	silica-based with 10-20 μm pore size, PCR/RT inhibitor removal resin / polypropylene, snap off base, sealable screw cap	filter membrane with 10 μm pore size / polypropylene, snap off base, sealable screw cap
Cat. No. / Size	C1007-50 — 50 pack	C1010-50 — 50 pack	C1022-50 — 50 pack	C1020-10 — 10 pack
	C1007-250 — 250 pack			

Zymo-Spin™ V Columns		
		
Name	Zymo-Spin™ V	Zymo-Spin™ V-E
Format	DNA/RNA binding	DNA/RNA binding
Binding Capacity / Elution	100 μg / ≥ 100 μl	125 μg / ≥ 100 μl
Compatibility	microcentrifuge, centrifuge, vacuum manifolds, syringe (luer-lok top)	microcentrifuge, centrifuge, vacuum manifolds, syringe (luer-lok top)
Matrix / Construction	silica-based / polypropylene	silica-based / polypropylene
Cat. No. / Size	C1012-25 — 25 pack	C1024-25 — 25 pack
	C1012-50 — 50 pack	C1024-50 — 50 pack

Zymo-Spin™ VI Columns	
	
Name	Zymo-Spin™ VI
Format	DNA/RNA binding
Binding Capacity / Elution	500 μg / ≥ 1 ml
Compatibility	centrifuge, vacuum manifolds, luer-lok bottom assembly
Matrix / Construction	silica-based / polypropylene
Cat. No. / Size	C1013-10 — 10 pack
	C1013-20 — 20 pack

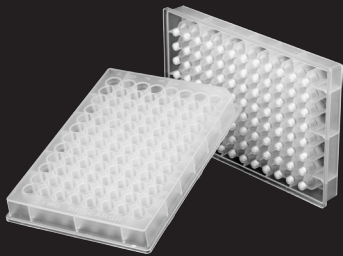

Innovators of the Low Elution Spin Column

A core technology of Zymo Research is the *Fast-Spin* Zymo-Spin™ IC column. Developed and manufactured by Zymo Research, these unique columns allow purification of up to 5 μg of DNA in ≥ 6 μl eluate with *no* buffer retention or carryover.





Technology Overview: Fast-Spin Plates

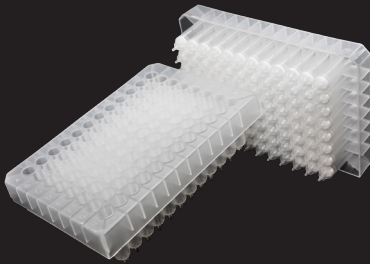
Silicon-A™ Plates

		
Name	Silicon-A™ Plate	Silicon-A™-HRC Plate
Format	DNA/RNA binding - up to 5 µg per well	DNA/RNA inhibitor removal, filtration plate
Capacity / Elution	600 µl per well / ≥ 30 µl	up to 100 µl/well
Dimensions (H x W x L)	19 mm x 83 mm x 125 mm	19 mm x 83 mm x 125 mm
Compatibility	centrifuge, vacuum manifolds	centrifuge
Matrix / Construction	silica-based / polypropylene	polypropylene
Cat. No. / Size	C2001 – 2 plates	C2009 – 2 plates

Zymo-Spin™ I Plates

		
Name	Zymo-Spin™ I-96 Plate	Zymo-Spin™ IB-96 Plate
Format	DNA/RNA binding - up to 5 µg per well	DNA/RNA binding - up to 5 µg per well
Capacity / Elution	1.1 ml per well / ≥ 10 µl	600 µl per well / ≥ 15 µl
Dimensions (H x W x L)	35 mm x 83 mm x 125 mm	19 mm x 83 mm x 125 mm
Compatibility	centrifuge, vacuum manifolds	centrifuge, vacuum manifolds
Matrix / Construction	silica-based / polypropylene	silica-based / polypropylene
Cat. No. / Size	C2004 – 2 plates	C2006 – 2 plates

Zymo-Spin III™ Plates

	
Name	Zymo-Spin™ III-96 Plate
Format	DNA/RNA binding - up to 25 µg per well
Capacity / Elution	1.1 ml per well / ≥ 50 µl
Dimensions (H x W x L)	38 mm x 83 mm x 125 mm
Compatibility	centrifuge, vacuum manifolds
Matrix / Construction	silica-based / polypropylene
Cat. No. / Size	C2010 – 2 plates

Zymo-Spin™ I



The Zymo-Spin™ I *Fast-Spin* column can be used either in microcentrifuges or on vacuum manifolds for the purification of DNA and/or RNA. The Zymo-Spin™ I features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 5 µg DNA or RNA in ≥ 6 µl eluate. Capacity is 800 µl.

Cat. No.	Qty.	Price
C1003-50	50 pack	\$37.00
C1003-250	250 pack	\$160.00

Zymo-Spin™ IC



Capped version of the Zymo-Spin™ I column. The Zymo-Spin™ IC *Fast-Spin* column can be used either in microcentrifuges or on vacuum manifolds for the purification of DNA and/or RNA. The Zymo-Spin™ IC features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 5 µg DNA or RNA in ≥ 6 µl eluate. Capacity is 800 µl.

Cat. No.	Qty.	Price
C1004-50	50 pack	\$48.00
C1004-250	250 pack	\$207.00

Zymo-Spin™ IB



The black, opaque Zymo-Spin™ IB *Fast-Spin* column can be used either in microcentrifuges or on vacuum manifolds for the purification of DNA and/or RNA and fluorescent dye removal. The Zymo-Spin™ IB features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 5 µg DNA or RNA in ≥ 6 µl eluate. Capacity is 800 µl.

Cat. No.	Qty.	Price
C1014-50	50 pack	\$39.00
C1014-250	250 pack	\$170.00

Zymo-Spin™ PI



The Zymo-Spin™ PI *Fast-Spin* column features durable polypropylene construction and is the same column featured in the His-Spin Protein Miniprep™ (p. 130). Capacity is 800 µl. Note: Column only and does not contain His-Affinity gel.

Cat. No.	Qty.	Price
P2003-1	50 pack	\$37.00

Zymo-Spin™ II



The Zymo-Spin™ II *Fast-Spin* column features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 25 µg DNA or RNA in ≥ 25 µl eluate. Capacity is 800 µl.

Cat. No.	Qty.	Price
C1008-50	50 pack	\$37.00
C1008-250	250 pack	\$160.00

Zymo-Spin™ IIC



The Zymo-Spin™ IIC *Fast-Spin* column can be used either in microcentrifuges or on vacuum manifolds for the purification of DNA and/or RNA. The Zymo-Spin™ IIC features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 25 µg DNA or RNA in ≥ 25 µl eluate. Capacity is 900 µl.

Cat. No.	Qty.	Price
C1011-50	50 pack	\$48.00
C1011-250	250 pack	\$170.00

Zymo-Spin™ IIN



The Zymo-Spin™ IIN *Fast-Spin* column can be used either in microcentrifuges or on vacuum manifolds for the purification of DNA and/or RNA. The Zymo-Spin™ IIN features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 25 µg DNA or RNA in ≥ 25 µl eluate. Capacity is 900 µl.

Cat. No.	Qty.	Price
C1019-50	50 pack	\$37.00
C1019-250	250 pack	\$160.00

Zymo-Spin™ III



The Zymo-Spin™ III *Fast-Spin* column can be used either in microcentrifuges or on vacuum manifolds for the purification of DNA and/or RNA. The Zymo-Spin™ III features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 25 µg DNA or RNA in ≥ 35 µl eluate. Capacity is 800 µl.

Cat. No.	Qty.	Price
C1005-50	50 pack	\$42.00
C1005-250	250 pack	\$200.00

Zymo-Spin™ IIIC



Capped version of the Zymo-Spin™ III column. The Zymo-Spin™ IIIC *Fast-Spin* column can be used either in microcentrifuges or on vacuum manifolds for the purification of DNA and/or RNA. The Zymo-Spin™ IIIC features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 25 µg DNA or RNA in ≥ 35 µl eluate. Capacity is 800 µl.

Cat. No.	Qty.	Price
C1006-50	50 pack	\$44.00
C1006-250	250 pack	\$208.00

Zymo-Spin™ IV



The Zymo-Spin™ IV™ is a durable polypropylene *Fast-Spin* filtration column that features a unique snap-off base and sealable orange screw cap. It is ideal for clarifying solutions including crude cell lysates and homogenates. The silica filtration membrane has an approximate 10 - 20 µm pore size and a binding capacity of 5 µg DNA/RNA. Capacity is 700 µl.

Cat. No.	Qty.	Price
C1007-50	50 pack	\$52.00
C1007-250	250 pack	\$250.00

Zymo-Spin™ IV-HRC



The Zymo-Spin™ IV-HRC is a durable polypropylene *Fast-Spin* filtration column filled with a unique matrix that features a unique snap off base and sealable green screw cap. It is ideal for removing PCR/RT inhibitors including polyphenols, humic acids and fulvic acids from DNA/RNA preparations derived from water or soil microbes. The column filtration membrane has an approximate 10 - 20 µm pore size. Capacity is 50 - 200 µl.

Cat. No.	Qty.	Price
C1010-50	50 pack	\$97.00

Zymo-Spin™ IV-µHRC



The Zymo-Spin™ IV-µHRC is a durable polypropylene *Fast-Spin* filtration column filled with a unique matrix that features a unique snap off base and sealable yellow screw cap. It is ideal for removing PCR/RT inhibitors including polyphenols, humic acids, and fulvic acids from DNA/RNA preparations derived from water or soil microbes. The column filtration membrane has an approximate 10 - 20 µm pore size. Capacity is 10 - 50 µl.

Cat. No.	Qty.	Price
C1022-50	50 pack	\$97.00

Zymo-Spin™ IV-M



The Zymo-Spin™ IV-M is a durable polypropylene *Fast-Spin* filtration column that features a unique snap-off base and sealable red screw cap. It is a modified version of the Zymo-Spin™ IV column designed for filtration of DNA immunoprecipitation reactions. The filtration membrane has an approximate 10 µm pore size. The capacity is 700 µl.

Cat. No.	Qty.	Price
C1020-10	10 pack	\$ 21.00

Zymo-Spin™ V



The versatile Zymo-Spin™ V *Fast-Spin* column can be used either in microcentrifuges, centrifuges, or on vacuum manifolds for the purification of DNA and/or RNA. This column features a luer-lok top allowing it to be easily attached to a syringe. The Zymo-Spin™ V features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 100 µg DNA or RNA in ≥ 100 µl eluate. Capacity is 800 µl.

Cat. No.	Qty.	Price
C1012-25	25 pack	\$45.00
C1012-50	50 pack	\$72.00

Zymo-Spin™ V-E



The versatile Zymo-Spin™ V-E *Fast-Spin* column can be used either in microcentrifuges, centrifuges, or on vacuum manifolds for the purification of DNA and/or RNA. This column features a luer-lok top allowing it to be easily attached to a syringe, reservoir, or prefilter. The Zymo-Spin™ V-E features durable polypropylene construction and contains a unique silica-based matrix for the purification of up to 125 µg DNA or RNA in ≥ 100 µl elution buffer or water. The capacity of the spin column is 400 µl.

Cat. No.	Qty.	Price
C1024-25	25 pack	\$45.00
C1024-50	50 pack	\$72.00

Zymo Spin™ VI



The versatile Zymo-Spin™ VI spin column can be used either in centrifuges or on vacuum manifolds for the purification of DNA and/or RNA. Exclusive to this column is a luer-lok bottom assembly. The Zymo-Spin™ VI features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 500 µg DNA or RNA in ≥ 1 ml eluate. Capacity is 15 ml.

Cat. No.	Qty.	Price
C1013-10	10 pack	\$38.00
C1013-20	20 pack	\$60.00

Collection/Filter Assemblies

Zymo-Spin™ V w/ Reservoir



The Zymo-Spin™ V w/ Reservoir assembly can be used in conjunction with centrifuges and on vacuum manifolds for the purification of DNA and/or RNA. The spin column and reservoir feature durable polypropylene construction. The spin column features a unique silica-based matrix for the purification of up to 100 µg DNA or RNA in ≥ 100 µl elution buffer or water. Capacity of the spin column with reservoir is 15 ml.

Cat. No.	Qty.	Price
C1016-25	25 pack	\$58.00
C1016-50	50 pack	\$92.00

Zymo-Spin™ V-E w/ Zymo-Midi Filter™



The Zymo-Spin™ V-E w/ Zymo-Midi Filter™ assembly can be used in conjunction with centrifuges and on vacuum manifolds for the purification of DNA and/or RNA. The spin column and filter feature durable polypropylene construction. The spin column features a unique silica-based matrix for the purification of up to 125 µg DNA or RNA in ≥ 100 µl elution buffer or water. The capacity of the spin column with filter is 15 ml.

Cat. No.	Qty.	Price
C1021-25	25 pack	\$81.00

Zymo-Spin™ VI w/ Reservoir



The Zymo-Spin™ VI w/ Reservoir assembly can be used with vacuum manifolds for the purification of DNA and/or RNA. The spin column and reservoir feature durable polypropylene construction. The spin column features a unique silica-based matrix for the purification of up to 500 µg DNA or RNA in ≥ 1 ml elution buffer or water. The capacity of the spin column with filter is 75 ml.

Cat. No.	Qty.	Price
C1018-10	10 pack	\$46.00
C1018-20	20 pack	\$72.00

Zymo-Spin™ VI w/ Zymo-Maxi Filter™



The Zymo-Spin™ VI w/ Zymo-Maxi Filter™ assembly can be used with vacuum manifolds for the purification of DNA and/or RNA. The spin column and filter feature durable polypropylene construction. The spin column features a unique silica-based matrix for the purification of up to 500 µg DNA or RNA in ≥ 1 ml elution buffer or water. The capacity of the spin column with filter is 75 ml.

Cat. No.	Qty.	Price
C1017-10	10 pack	\$50.00
C1017-20	20 pack	\$80.00

ZRC-GF Filter™



The ZRC-GF Filter™ syringe filter features durable polypropylene construction and contains a 1.6 µm pore size glass fiber filtration membrane. The filter is ideal for separating the cellular component from biological liquids (e.g., urine) and is the same filter featured in the ZR Urine DNA and RNA Isolation kits.

Cat. No.	Qty.	Price
C1009-20	20 pack	\$46.00
C1009-50	50 pack	\$116.00

Tubes

Collection Tube (2.0 ml)



Durable polypropylene collection tube that is used in conjunction with the *Fast-Spin* line of spin columns (i.e., Zymo-Spin™ I through Zymo-Spin™ V). Capacity is 2 ml.

Cat. No.	Qty.	Price
C1001-50	50 tubes	\$5.00
C1001-500	500 tubes	\$45.00
C1001-1000	1,000 tubes	\$80.00

DNase/RNase-free Tubes (1.5 ml)



DNase/RNase-free 1.5 ml microcentrifuge tubes made of durable polypropylene construction.

<i>Cat. No.</i>	<i>Qty.</i>	<i>Price</i>
C2001-50	50 tubes	\$9.00
C2001-100	100 tubes	\$11.00

ZR BashingBead™ Lysis Tubes (0.5 mm)



Each impact resistant 2.0 ml tube contains 0.7 ml (dry volume) of 0.5 mm ZR BashingBead™ lysis matrix. These state of the art, ultra-high density beads are fracture resistant and chemically inert and ideal for disrupting tough-to-lyse bacteria, yeast, fungi, and algae.

<i>Cat. No.</i>	<i>Qty.</i>	<i>Price</i>
S6002-50	50 tubes	\$92.00

ZR BashingBead™ Lysis Tubes (2.0 mm)



Each impact resistant 2 ml tube contains 0.7 ml dry volume 2.0 mm ZR BashingBead™ lysis matrix. The state of the art, ultra-high density beads are fracture resistant, chemically inert, and ideal for disrupting tough-to-lyse biological samples. These beads are ideal for tissues, insects, plant material, etc.

<i>Cat. No.</i>	<i>Qty.</i>	<i>Price</i>
S6003-50	50 tubes	\$92.00

DNA Affinity Beads

ZymoBeads™

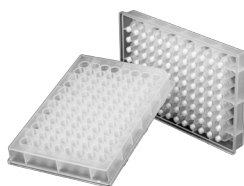


DNA affinity matrix, made of silica beads, featured in ZymoBead™ Genomic DNA Kit (p. 64) and ZR Serum DNA Kit™ (p. 66).

<i>Cat. No.</i>	<i>Qty.</i>	<i>Price</i>
D3004-3-1	1 ml	\$ 20.00
D3004-3-4	4 x 1 ml	\$ 75.00

96-Well Plates, Blocks & Racks

Silicon-A™ Plate



The Silicon-A™ Plate can be used in centrifuges for the large scale (i.e., 96-well) purification of DNA and/or RNA. Its low-profile, durable polypropylene construction and unique silica-based matrix make it perfect for purifying up to 5 µg DNA or RNA in ≥ 30 µl eluate per well. Capacity is 600 µl per well.

<i>Cat. No.</i>	<i>Qty.</i>	<i>Price</i>
C2001	2 plates	\$118.00

Silicon-A™-HRC Plate



The Silicon-A™-HRC Plate can be used in centrifuges for large-scale (i.e., 96-well) purification of DNA and/or RNA. Its low-profile, durable polypropylene construction and unique matrix make it ideal for removing polyphenolic compounds (e.g. melanin, humic acids, tannins, etc.) that can inhibit PCR and RT in non-pure DNA and RNA preparations, respectively. Capacity is 100 µl per well.

Cat. No.	Qty.	Price
C2009	2 plates	\$370.00

Zymo-Spin™ I-96 Plate



The Zymo-Spin I-96™ Plate can be used in centrifuges for the large-scale (i.e., 96-well) purification of DNA and/or RNA. Its deep-well, durable polypropylene construction and unique silica-based matrix make it perfect for purifying up to 5 µg DNA or RNA in ≥ 10 µl eluate per well. Capacity is 1.1 ml per well.

Cat. No.	Qty.	Price
C2004	2 plates	\$130.00

Zymo-Spin™ IB-96 Plate



The Zymo-Spin™ IB-96 Plate can be used in centrifuges for large-scale (i.e., 96-well) purification of DNA and/or RNA. Its low-profile, durable polypropylene construction and unique silica-based matrix make it perfect for purifying up to 5 µg DNA or RNA in ≥ 15 µl/well elution buffer or water. Opaque black in color. Capacity is 600 µl per well.

Cat. No.	Qty.	Price
C2006	2 plates	\$128.00

Zymo-Spin™ III-96 Plate



The versatile Zymo-Spin™ III-96 low skirted plate can be used either in centrifuges or on vacuum manifolds for large scale (i.e., 96-well) purification of DNA and/or RNA. Its low-profile, durable polypropylene construction and unique silica-based matrix make it perfect for purifying up to 25 µg DNA or RNA in ≥ 50 µl eluate per well. Capacity is 1 ml per well.

Cat. No.	Qty.	Price
C2010	2 plates	\$130.00

Collection Plate



The 96-well Collection Plates feature deep-well, durable, clear polypropylene construction. Each has a level footprint and conforms to laboratory standards. Adaptable for use with either Silicon-A™, Zymo-Spin™ I-96, Zymo-Spin™ IB-96, and Zymo-Spin™ III-96 plates. Capacity is 2 ml per round bottom well.

Cat. No.	Qty.	Price
C2002	2 plates	\$19.00

Elution Plate



These clear polypropylene plates have a level footprint and conform to laboratory standards. Adaptable for use with either Silicon-A™ plates or Zymo-Spin™ I-96 filtration plates. Capacity is 350 µl per “V” bottom well.

Cat. No.	Qty.	Price
C2003	2 plates	\$16.00

96-Well PCR/Conversion Plate

96-well, non-skirted PCR plate with easy-to-read alphanumeric labels. Rimmed wells minimize cross contamination. Capacity is 350 µl per well.

<i>Cat. No.</i>	<i>Qty.</i>	<i>Price</i>
C2008	2 plates	\$4.00

96-Well PCR/Conversion Plate w/ Cover Foil

96-well, non-skirted PCR plate with easy-to-read alphanumeric labels. Rimmed wells minimize cross contamination. Provided with adhesive, pierceable foil cover. Capacity is 350 µl per well.

<i>Cat. No.</i>	<i>Qty.</i>	<i>Price</i>
C2005	2 plates/foils	\$6.00

96-Well Block

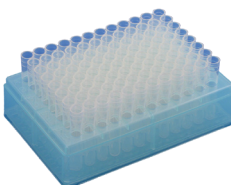
96-Well Block features durable, clear polypropylene construction. Each has a level footprint and conforms to laboratory standards. Capacity is 2 ml per round bottom well.

<i>Cat. No.</i>	<i>Qty.</i>	<i>Price</i>
P1001-2	2 blocks	\$15.00
P1001-10	10 blocks	\$58.00

96-Well Block w/ Cover Foil

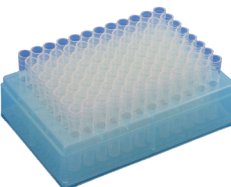
96-Well Block w/ Cover Foil feature durable, clear polypropylene construction. Each has a level footprint and conforms to laboratory standards. Capacity is 2 ml per round bottom well.

<i>Cat. No.</i>	<i>Qty.</i>	<i>Price</i>
P1002-2	2 blocks/foils	\$24.00

ZR-96 BashingBead™ Lysis Rack (0.5 mm)

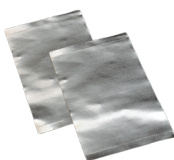
Each impact resistant 1.1 ml tube contains 0.5 ml dry volume 0.5 mm ZR BashingBead™ lysis matrix. Tubes are in a 96-well rack with caps and a cover for high throughput processing. The state of the art, ultra-high density beads are fracture resistant, chemically inert, and ideal for disrupting tough-to-lyse biological samples. These beads are ideal for microbes and fungi in soil, feces, sludge, etc.

<i>Cat. No.</i>	<i>Qty.</i>	<i>Price</i>
S6002-96-1	1 rack	\$176.00

ZR-96 BashingBead™ Lysis Rack (2.0 mm)

Each impact resistant 1.1 ml tube contains 0.5 ml dry volume 2.0 mm ZR BashingBead™ lysis matrix. Tubes are in a 96-well rack with caps and a cover for high throughput processing. The state of the art, ultra-high density beads are fracture resistant, chemically inert, and ideal for disrupting tough-to-lyse biological samples. These beads are ideal for tissues, insects, plant material, etc.

<i>Cat. No.</i>	<i>Qty.</i>	<i>Price</i>
S6002-96-2	1 rack	\$176.00

96-Well Plate Cover Foil

Pierceable aluminum foil with strong adhesive strength for sealing 96-well plates and blocks. Ideal for cold storage. Dimensions are 82.6 x 132.6 mm.

<i>Cat. No.</i>	<i>Qty.</i>	<i>Price</i>
C2007-2	2 foils	\$5.00
C2007-4	4 foils	\$10.00

Cell Disrupters & Accessories

Disruptor Genie®



The Disruptor Genie® is an automated cell disruption device that is commonly used for the disruption and lysis of yeast, bacteria, and plant and animal tissue. Provided with a head assembly to accommodate up to (twelve) 2 ml tubes. Intended for use with ZR BashingBead™ Lysis Tubes.



Description	Cat. No.	Qty.	Price
120V	S6001-2-120	1 unit	\$545.00
230V, European Plug	S6001-2-230	1 unit	\$545.00

Bullet Blender™



Homogenize tissue or disrupt/lyse cells in minutes. The Bullet Blender™ is a vortexer (at a low setting), a cell disrupter, and a tissue homogenizer (at a high setting) all in one unit. No parts contact the samples, eliminating the possibility of cross contamination. Available in 1.5 - 2 ml and 50 ml tube formats.

NEXT >>> ADVANCE

Description	Cat. No.	Qty.	Price
BBX24 Bullet Blender™ (24 x 1.5 - 2.0 ml tubes)	S6007-1	1 unit	\$1,995.00
BBX24B Bullet Blender™ Blue (24 x 1.5 - 2.0 ml tubes) w/ cooling fan	S6007-2	1 unit	\$2,295.00
BBX50B Bullet Blender™ Blue 50 (9 x 50 ml tubes) w/ cooling fan	S6007-3	1 unit	\$2,595.00

FastPrep®-24



The FastPrep®-24 Instrument is a unique, high-speed benchtop homogenizer that employs a powerful, proprietary technology for the rapid lysis of almost any sample in 40 seconds or less. The FastPrep® Instrument makes it possible to isolate DNA, RNA, and protein from sources that are virtually impossible to lyse without the use of its rapid reciprocating motion.



Cat. No.	Qty.	Price
S6005	1 unit	\$9,500.00

FastPrep® Accessories



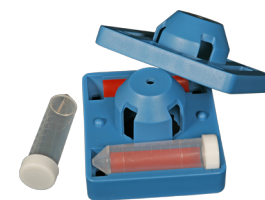
A.



B.



C.



D.

Description	Cat. No.	Qty.	Price
A. HiPrep™ Attachment (48 x 2 ml tubes)	S6005-1	1 unit	\$2,040.00
B. CoolPrep™ Attachment (24 x 2 ml tubes)	S6005-2	1 unit	\$2,640.00
C. TeenPrep™ Attachment (12 x 15 ml tubes)	S6005-3	1 unit	\$1,200.00
D. BigPrep™ Attachment (2 x 50 ml tubes)	S6005-4	1 unit	\$1,344.00
E. FastPrep® European AC Cord	S6005-5	1 unit	\$29.00

2010 Geno/Grinder®

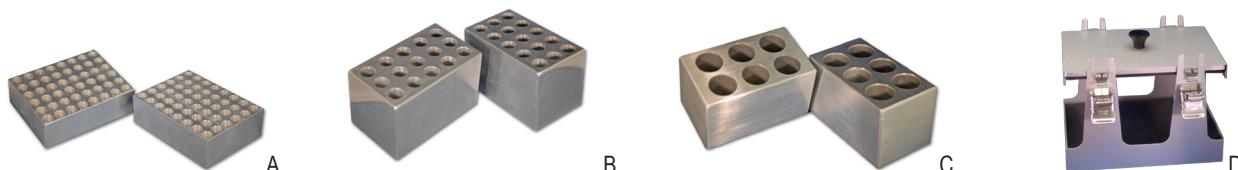


Next generation high throughput tissue homogenizer and cell lyser. Accommodates a variety of formats ranging from deep-well titer plates to centrifuge tubes. Specifically designed for rapid cell disruption, lysis, and tissue homogenization while preserving temperature sensitive samples. Typical samples include plant and animal tissues, cell cultures, seeds, yeast, and bacteria. (For sale to US customers only).



Cat. No.	Qty.	Price
S6006	1 unit	\$12,950.00

2010 Geno/Grinder® Accessories



Description	Cat. No.	Qty.	Price
A. 2 ml Tube Holder/Cryo Block Assembly (48 x 2.0 ml tubes/block)	S6006-1	2 blocks	\$255.00
B. 15 ml Tube Holder/Cryo Block Assembly (15 x 15 ml tubes/block)	S6006-2	2 blocks	\$430.00
C. 50 ml Tube Holder/Cryo Block Assembly (6 x 50 ml tubes/block)	S6006-3	2 blocks	\$420.00
D. Large Capacity Clamp Assembly	S6006-10	1 unit	\$1,000.00

Manual Homogenizers

Squisher™-Single



The Squisher™-Single features durable polypropylene construction and, although disposable, can be cleaned and reused to homogenize small samples of tissue in preparation for DNA, RNA, or protein extraction and purification. Works well with liver and brain tissue as well as mouse tail snips and small insects. Intended for use with conventional style 1.5 ml microcentrifuge tubes.

Cat. No.	Qty.	Price
H1001	10 pack	\$11.00
H1001-50	50 pack	\$35.00

Squisher™-8 w/ 96-Well Block



The Squisher™-8 features durable polypropylene construction and although disposable, can be cleaned and reused to homogenize up to 8 small samples of tissue simultaneously in preparation for DNA, RNA, or protein extraction and purification. Works well with liver and brain tissue as well as mouse tail snips and small insects. Comes with 96-well deep well blocks for efficient sample recovery.

Cat. No.	Qty.	Price
H1002-5	5 pk / 1 block	\$40.00
H1002-20	20 pk / 2 blocks	\$125.00

Squisher™-96 w/ 96-Well Block



The Squisher™-96 features durable polypropylene construction and although disposable, can be cleaned and reused to homogenize up to 96 small samples of tissue simultaneously in preparation for DNA, RNA, or protein extraction and purification. Works well with liver and brain tissue as well as small insects. Comes with 96-well deep-well blocks for efficient processing and sample recovery.

Cat. No.	Qty.	Price
H1004-2	2 pk / 2 blocks	\$110.00
H1004-5	5 pk / 5 blocks	\$220.00

Plating Beads

Rattler™ Plating Beads



Rattler™ Plating Beads saves the researcher time and effort when plating either bacterial or yeast cells. Sterile glass plating beads are convenient and easy to use. 230 g/bottle. See page 118 for more details.

Cat. No.	Qty.	Price
S1001	1 bottle	\$15.00
S1001-5	5 bottles	\$70.00
S1001-B	25 kg bag (bulk)	\$346.00

Other Instruments & Accessories

Vortex-Genie® 2



The Vortex-Genie® 2 offers variable speed for precise mixing from gentle to vigorous, has Hands-free or Touch On control, and may be used in cold rooms or incubators. A broad range of attachments are available for most tubes, plates, and other containers. See next page.



Description	Cat. No.	Qty.	Price
120V	S5001	1 unit	\$336.00
230V, European plug	S5002	1 unit	\$344.00

Digital Vortex-Genie® 2

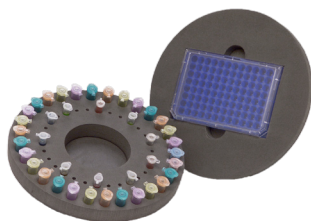


The Digital Vortex-Genie® 2 has the same great features as Vortex-Genie® 2 with digital control and display of time. The digital display provides accuracy, reproducibility, and repeatability. Timer functions include Touch On (1-99 seconds) and Hands-free (1-99 minutes or continuous). May be used in cold rooms and incubators.



Description	Cat. No.	Qty.	Price
120V	S5003	1 unit	\$429.00
230V, European plug	S5004	1 unit	\$429.00

Vortex-Genie® Family Accessories



A. & B.



C.



D.

Description	Cat. No.	Qty.	Price
A. Microtube Foam Inserts: Accommodates up to 60 microtubes. Fits into 6 in. platform.	S5001-1	2 units	\$40.00
B. Microplate Foam Inserts: Accommodates one microplate. Fits into 6 in. platform.	S5001-2	2 units	\$41.00
C. 29-37mm Tube Foam Inserts: Fits into recessed platform.	S5001-3	2 units	\$18.00
D. Pop-off Cup: Mixing and vortexing in single tubes. Use with Vortex-Genie® 1, Disruptor Genie®, and the Vortex-Genie® 2 family.	S5001-4	1 unit	\$24.00



E.



F.



G.

Description

E. Horizontal 50 ml Tube Holder: Holds 6 tubes.

Cat. No.

S5001-5

Qty.

1 unit

Price

\$79.00

F. Horizontal 15 ml Tube Holder: Holds 12 tubes. Use with any Vortex-Genie® 2 product.

S5001-6

1 unit

\$89.00

G. Horizontal Microtube Holder: Holds 24 microtubes. Use with any Vortex-Genie® 2.

S5001-7

1 unit

\$99.00

Disruptor Genie® - TurboMix Attachments, for 1.5 ml and 2.0 ml Tubes

The TurboMix attachment permanently mounts to an existing Vortex-Genie® mixer, converting it into a Disruptor Genie® cell disrupter, page 152.

**Description**

1.5 ml

Cat. No.

S6004-1

Qty.

1 unit

Price

\$183.00

2.0 ml

S6004-2

1 unit

\$210.00

MicroPlate Genie®

The MicroPlate Genie® has a small vortexing orbit of 1.0 mm for thorough mixing regardless of sample viscosity. The high speed and small orbit combine to offer true vortexing action in each well of the microplate. It accepts most microplate types within the recommendations of the Society for Biomolecular Screening (SGBS), even 384-well formats.

**Description**

120V

Cat. No.

S5005

Qty.

1 unit

Price

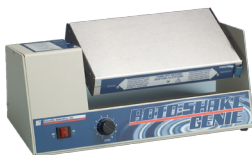
\$470.00

230V, European plug

S5006

1 unit

\$470.00

Roto-Shake Genie®

Roto-Shake Genie® combines rotating and rocking in one compact unit. The magnetic platform and various accessories securely holds almost any sample. A variety of attachments/accessories are available to provide maximum application versatility and it maintains a set speed between 0 - 38°C for use in cold rooms or incubators.

**Description**

120V

Cat. No.

S5007

Qty.

1 unit

Price

\$1,100.00

230V, European plug

S5008

1 unit

\$1,100.00

MagStir Genie®

The MagStir Genie® allows programmable high/low speed stirring. High and low speed range including reverse and interval stirring for applications ranging from gentle stirring for cell culture to aggressive mixing for viscous polymers. There are three power levels for various sample viscosities. The low-profile magnetic stirrers use microprocessor control for precise and reproducible operation without heat build-up from internal friction.

**Description**

120V

Cat. No.

S5009

Qty.

1 unit

Price

\$545.00

230V, European plug

S5010

1 unit

\$545.00

Index by Catalog Number

Cat. No.	Description	Size	Page	Price
A1001-5	Ampicillin	5 ml	137	\$20.00
A1001-25	Ampicillin	5 x 5 ml	137	\$65.00
A1002-5	Chloramphenicol	5 ml	137	\$20.00
A1002-25	Chloramphenicol	5 x 5 ml	137	\$65.00
A1003-5	Kanamycin Sulfate	5 ml	137	\$20.00
A1003-25	Kanamycin Sulfate	5 x 5 ml	137	\$65.00
A1004-5	Tetracycline Hydrochloride	5 ml	137	\$20.00
A1004-25	Tetracycline Hydrochloride	5 x 5 ml	137	\$65.00
A2001-1	Arabinose	1 ml	138	\$8.00
A2001-10	Arabinose	10 x 1 ml	138	\$52.00
A3001-50	Anti-5-Methylcytosine (clone 10G4)	50 µg/µl	21	\$152.00
A3001-200	Anti-5-Methylcytosine (clone 10G4)	200 µg/µl	21	\$442.00
C1001-50	Collection Tubes (2 ml)	50 tubes	148	\$5.00
C1001-500	Collection Tubes (2 ml)	500 tubes	148	\$45.00
C1001-1000	Collection Tubes (2 ml)	1000 tubes	148	\$80.00
C1003-50	Zymo-Spin™ I Columns	50 pack	145	\$37.00
C1003-250	Zymo-Spin™ I Columns	250 pack	145	\$160.00
C1004-50	Zymo-Spin™ IC Columns	50 pack	145	\$48.00
C1004-250	Zymo-Spin™ IC Columns	250 pack	145	\$207.00
C1005-50	Zymo-Spin™ III Columns	50 pack	146	\$42.00
C1005-250	Zymo-Spin™ III Columns	250 pack	146	\$200.00
C1006-50	Zymo-Spin™ IIIC Columns	50 pack	146	\$44.00
C1006-250	Zymo-Spin™ IIIC Columns	250 pack	146	\$208.00
C1007-50	Zymo-Spin™ IV Columns	50 pack	146	\$52.00
C1007-250	Zymo-Spin™ IV Columns	250 pack	146	\$250.00
C1008-50	Zymo-Spin™ II Columns	50 pack	145	\$37.00
C1008-250	Zymo-Spin™ II Columns	250 pack	145	\$160.00
C1009-20	ZRC-GF Filter™	20 pack	148	\$46.00
C1009-50	ZRC-GF Filter™	50 pack	148	\$116.00
C1010-50	Zymo-Spin™ IV-HRC Columns	50 pack	146	\$97.00
C1011-50	Zymo-Spin™ IIC Columns	50 pack	145	\$48.00
C1011-250	Zymo-Spin™ IIC Columns	250 pack	145	\$170.00
C1012-25	Zymo-Spin™ V Columns	25 pack	147	\$45.00
C1012-50	Zymo-Spin™ V Columns	50 pack	147	\$72.00
C1013-10	Zymo-Spin™ VI Columns	10 pack	147	\$38.00
C1013-20	Zymo-Spin™ VI Columns	20 pack	147	\$60.00
C1014-50	Zymo-Spin™ IB Columns	50 pack	145	\$39.00
C1014-250	Zymo-Spin™ IB Columns	250 pack	145	\$170.00
C1016-25	Zymo-Spin™ V Columns w/ Reservoir	25 pack	147	\$58.00
C1016-50	Zymo-Spin™ V Columns w/ Reservoir	50 pack	147	\$92.00
C1017-10	Zymo-Spin™ VI Columns w/ Zymo-Maxi Filter™	10 pack	148	\$50.00
C1017-20	Zymo-Spin™ VI Columns w/ Zymo-Maxi Filter™	20 pack	148	\$80.00
C1018-10	Zymo-Spin™ VI Columns w/ Reservoir	10 pack	148	\$46.00
C1018-20	Zymo-Spin™ VI Columns w/ Reservoir	20 pack	148	\$72.00
C1019-50	Zymo-Spin™ IIN Columns	50 pack	146	\$37.00
C1019-250	Zymo-Spin™ IIN Columns	250 pack	146	\$160.00
C1020-10	Zymo-Spin™ IV-M Columns	10 pack	147	\$21.00
C1021-25	Zymo-Spin™ V-E Columns w/ Zymo-Midi Filter™	25 pack	148	\$81.00
C1022-50	Zymo-Spin™ IV-µHRC	50 pack	146	\$97.00

Cat. No.	Description	Size	Page	Price
C1024-25	Zymo-Spin™ V-E Columns	25 pack	147	\$45.00
C1024-50	Zymo-Spin™ V-E Columns	50 pack	147	\$72.00
C2001	Silicon-A™ Plate	2 plates	149	\$118.00
C2001-50	DNase/RNase-free Tubes (1.5 ml)	50 tubes	149	\$9.00
C2001-100	DNase/RNase-free Tubes (1.5 ml)	100 tubes	149	\$11.00
C2002	Collection Plate	2 plates	150	\$19.00
C2003	Elution Plate	2 plates	150	\$16.00
C2004	Zymo-Spin™ I-96 Plate (deep-well)	2 plates	150	\$130.00
C2005	96-Well PCR/Conversion Plate w/ Cover Foil	2 plates/foils	151	\$6.00
C2006	Zymo-Spin™ IB-96 Plate (shallow-well)	2 plates	150	\$128.00
C2007-2	96-Well Plate Cover Foil	2 foils	151	\$5.00
C2007-4	96-Well Plate Cover Foil	4 foils	151	\$10.00
C2008	96-Well PCR/Conversion Plate	2 plates	151	\$4.00
C2009	Silicon-A™-HRC Plate	2 plates	150	\$370.00
C2010	Zymo-Spin™ III-96 Plate	2 plates	150	\$130.00
D2001	Zymoprep™ Yeast Plasmid Miniprep I	100 preps.	55	\$79.00
D2001-1-15	Solution 1, Digestion Buffer	15 ml		\$15.00
D2001-2-15	Solution 2, Lysis Buffer	15 ml		\$15.00
D2001-3-15	Solution 3, Neutralizing Buffer	15 ml		\$15.00
D2002	YeaStar™ Genomic DNA Kit	40 preps.	68	\$102.00
D2002-1	YD Digestion Buffer	4.8 ml		\$15.00
D2002-2	YD Lysis Buffer	4.8 ml		\$25.00
D2004	Zymoprep™ Yeast Plasmid Miniprep II	50 preps.	55	\$102.00
D2004-1-10	Solution 1, Digestion Buffer	10 ml		\$15.00
D2004-2-10	Solution 2, Lysis Buffer	10 ml		\$15.00
D2004-3-20	Solution 3, Neutralizing Buffer	20 ml		\$15.00
D3001	Pinpoint™ Slide DNA Isolation System	50 preps.	65	\$225.00
D3001-1	Pinpoint™ Solution	1 ml		\$68.00
D3001-2-5	Proteinase K w/ Storage Buffer	5 mg	133	\$18.00
D3001-2-20	Proteinase K w/ Storage Buffer	20 mg	133	\$38.00
D3001-3	Pinpoint™ Extraction Buffer	2.5 ml		\$42.00
D3001-4	Pinpoint™ Binding Buffer	6 ml		\$42.00
D3001-5	Pinpoint™ Wash Buffer	2.4 ml		\$15.00
D3004	ZymoBead™ Genomic DNA Kit	~100 preps.	64	\$72.00
D3004-1-50	Genomic Lysis Buffer	50 ml		\$30.00
D3004-1-100	Genomic Lysis Buffer	100 ml		\$52.00
D3004-1-150	Genomic Lysis Buffer	150 ml		\$62.00
D3004-1-200	Genomic Lysis Buffer	2 x 100 ml		\$98.00
D3004-1-250	Genomic Lysis Buffer	250 ml		\$72.00
D3004-1-1000	Genomic Lysis Buffer	1000 ml		\$330.00
D3004-2-50	g-DNA Wash Buffer	50 ml		\$15.00
D3004-2-100	g-DNA Wash Buffer	100 ml		\$26.00
D3004-2-200	g-DNA Wash Buffer	200 ml		\$47.00
D3004-2-400	g-DNA Wash Buffer	4 x 100 ml		\$86.00
D3004-3-1	ZymoBeads™	1 ml	149	\$20.00
D3004-3-4	ZymoBeads™	4 x 1 ml	149	\$75.00
D3004-4-1	DNA Elution Buffer	1 ml		\$3.00
D3004-4-4	DNA Elution Buffer	4 ml		\$6.00
D3004-4-10	DNA Elution Buffer	10 ml		\$12.00

Cat. No.	Description	Size	Page	Price
D3004-4-16	DNA Elution Buffer	16 ml		\$16.00
D3004-4-50	DNA Elution Buffer	50 ml		\$29.00
D3004-5-15	DNA Pre-wash Buffer	15 ml		\$8.00
D3004-5-30	DNA Pre-wash Buffer	30 ml		\$17.80
D3004-5-50	DNA Pre-wash Buffer	50 ml		\$22.00
D3005	ZymoBead™ Genomic DNA Kit	~400 preps.	64	\$270.00
D3006	Quick-gDNA™ MiniPrep (uncapped)	50 preps.	58	\$72.00
D3007	Quick-gDNA™ MiniPrep (uncapped)	200 preps.	58	\$250.00
D3010	ZR-96 Quick-gDNA™ Kit	2 x 96 preps.	60	\$162.00
D3011	ZR-96 Quick-gDNA™	4 x 96 preps.	60	\$310.00
D3012	ZR-96 Quick-gDNA™	10 x 96 preps.	60	\$648.00
D3013	ZR Serum DNA Kit™	up to 80 ml serum	66	\$232.00
D3015	ZR Viral DNA Kit™	50 preps.	69	\$122.00
D3015-1-50	ZR Viral DNA Buffer	50 ml		\$68.00
D3016	ZR Viral DNA Kit™	200 preps.	69	\$420.00
D3016-1-100	ZR Viral DNA Buffer	100 ml		\$130.00
D3017	ZR-96 Viral DNA Kit™	2 x 96 preps.	69	\$341.00
D3018	ZR-96 Viral DNA Kit™	4 x 96 preps.	69	\$613.00
D3020	Quick-gDNA™ MicroPrep	50 preps.	58	\$81.00
D3021	Quick-gDNA™ MicroPrep	200 preps.	58	\$263.00
D3024	Quick-gDNA™ MiniPrep (capped)	50 preps.	58	\$81.00
D3025	Quick-gDNA™ MiniPrep (capped)	200 preps.	58	\$263.00
D3040	ZR Genomic DNA™-Tissue MicroPrep	50 preps.	61	\$103.00
D3041	ZR Genomic DNA™-Tissue MicroPrep	200 preps.	61	\$360.00
D3050	ZR Genomic DNA™-Tissue MiniPrep	50 preps.	61	\$103.00
D3050-1-5	2X Digestion Buffer	5 ml		\$5.00
D3050-1-20	2X Digestion Buffer	20 ml		\$20.00
D3051	ZR Genomic DNA™-Tissue MiniPrep	200 preps.	61	\$360.00
D3055	ZR-96 Genomic DNA™-Tissue MiniPrep	2 x 96 preps.	63	\$395.00
D3056	ZR-96 Genomic DNA™-Tissue MiniPrep	4 x 96 preps.	63	\$691.00
D3057	ZR-96 Genomic DNA™-Tissue MiniPrep	10 x 96 preps.	63	\$1,047.00
D3060	ZR Urine DNA Isolation Kit™	20 preps.	67	\$82.00
D3100	Quick-gDNA™ MidiPrep	25 preps.	59	\$101.00
D3110	ZR Genomic DNA™-Tissue MidiPrep	25 preps.	62	\$151.00
D4001	Zymoclean™ Gel DNA Recovery Kit (uncapped)	50 preps.	45	\$69.00
D4001-1-50	ADB (Agarose Dissolving Buffer)	50 ml		\$28.00
D4001-1-100	ADB (Agarose Dissolving Buffer)	100 ml		\$56.00
D4002	Zymoclean™ Gel DNA Recovery Kit (uncapped)	200 preps.	45	\$260.00
D4003	DNA Clean & Concentrator™-5 (uncapped)	50 preps.	37	\$65.00
D4003-1-L	DNA Binding Buffer	50 ml		\$28.00
D4003-1-25	DNA Binding Buffer	25 ml		\$18.00
D4003-2-6	DNA Wash Buffer	6 ml		\$7.00
D4003-2-24	DNA Wash Buffer	24 ml		\$28.00
D4003-2-48	DNA Wash Buffer	48 ml		\$52.00
D4004	DNA Clean & Concentrator™-5 (uncapped)	200 preps.	37	\$231.00
D4004-1-L	DNA Binding Buffer	100 ml		\$49.00
D4005	DNA Clean & Concentrator™-25 (uncapped)	50 preps.	38	\$65.00
D4006	DNA Clean & Concentrator™-25 (uncapped)	200 preps.	38	\$231.00
D4007	Zymoclean™ Gel DNA Recovery Kit (capped)	50 preps.	45	\$72.00

Cat. No.	Description	Size	Page	Price
D4008	Zymoclean™ Gel DNA Recovery Kit (capped)	200 preps.	45	\$272.00
D4010	Genomic DNA Clean & Concentrator™	25 preps.	41	\$72.00
D4011	Genomic DNA Clean & Concentrator™	100 preps.	41	\$251.00
D4013	DNA Clean & Concentrator™-5 (capped)	50 preps.	37	\$65.00
D4014	DNA Clean & Concentrator™-5 (capped)	200 preps.	37	\$231.00
D4015	ZR Plasmid MiniPrep™-Classic	100 preps.	52	\$95.00
D4016	ZR Plasmid MiniPrep™-Classic	400 preps.	52	\$320.00
D4017	ZR-96 DNA Clean-up Kit™	2 x 96 preps.	42	\$189.00
D4018	ZR-96 DNA Clean-up Kit™	4 x 96 preps.	42	\$368.00
D4019	Zyppy™ Plasmid MiniPrep Kit	100 preps.	49	\$95.00
D4020	Zyppy™ Plasmid MiniPrep Kit	400 preps.	49	\$320.00
D4021	ZR-96 Zymoclean™ Gel DNA Recovery Kit	2 x 96 preps.	45	\$189.00
D4022	ZR-96 Zymoclean™ Gel DNA Recovery Kit	4 x 96 preps.	45	\$368.00
D4023	ZR-96 DNA Clean & Concentrator™-5	2 x 96 preps.	37	\$189.00
D4024	ZR-96 DNA Clean & Concentrator™-5	4 x 96 preps.	37	\$368.00
D4025	Zyppy™ Plasmid MidiPrep Kit	25 preps.	50	\$152.00
D4026	Zyppy™ Plasmid MidiPrep Kit	50 preps.	50	\$280.00
D4027	Zyppy™ Plasmid MaxiPrep Kit	10 preps.	51	\$102.00
D4027-1-10	Buffer P1	10 ml		\$10.00
D4027-1-20	Buffer P1	20 ml		\$12.00
D4027-1-80	Buffer P1	80 ml		\$18.00
D4027-1-160	Buffer P1	160 ml		\$22.00
D4027-1-320	Buffer P1	320 ml		\$38.00
D4027-2-10	Buffer P2	10 ml		\$10.00
D4027-2-20	Buffer P2	20 ml		\$12.00
D4027-2-80	Buffer P2	80 ml		\$18.00
D4027-2-160	Buffer P2	160 ml		\$22.00
D4027-2-320	Buffer P2	320 ml		\$38.00
D4027-3-12	Buffer P3	12 ml		\$1100
D4027-3-50	Buffer P3	50 ml		\$15.00
D4027-3-220	Buffer P3	220 ml		\$38.00
D4027-3-440	Buffer P3	440 ml		\$70.00
D4027-4-6	Plasmid Wash Buffer (concentrate)	6 ml		\$8.00
D4027-4-12	Plasmid Wash Buffer (concentrate)	12 ml		\$15.00
D4027-4-24	Plasmid Wash Buffer (concentrate)	24 ml		\$30.00
D4027-4-48	Plasmid Wash Buffer (concentrate)	48 ml		\$42.00
D4028	Zyppy™ Plasmid MaxiPrep Kit	20 preps.	51	\$202.00
D4029	DNA Clean & Concentrator™-100	25 preps.	39	\$86.00
D4030	DNA Clean & Concentrator™-100	50 preps.	39	\$149.00
D4031	DNA Clean & Concentrator™-500	10 preps.	40	\$65.00
D4032	DNA Clean & Concentrator™-500	20 preps.	40	\$116.00
D4033	DNA Clean & Concentrator™-25 (capped)	50 preps.	38	\$65.00
D4034	DNA Clean & Concentrator™-25 (capped)	200 preps.	38	\$231.00
D4036	Zyppy™ Plasmid MiniPrep Kit	50 preps.	49	\$52.00
D4036-1-6	7X Lysis Buffer	6 ml		\$12.00
D4036-1-12	7X Lysis Buffer	12 ml		\$32.00
D4036-1-30	7X Lysis Buffer	30 ml		\$40.00
D4036-1-48	7X Lysis Buffer	48 ml		\$60.00
D4036-1-60	7X Lysis Buffer	60 ml		\$70.00
D4036-2-20	Neutralization Buffer	20 ml		\$10.00
D4036-2-40	Neutralization Buffer	40 ml		\$30.00
D4036-2-100	Neutralization Buffer	100 ml		\$70.00

Cat. No.	Description	Size	Page	Price
D4036-2-160	Neutralization Buffer	160 ml		\$110.00
D4036-2-200	Neutralization Buffer	200 ml		\$120.00
D4036-3-6	Endo-Wash Buffer	6 ml		\$6.00
D4036-3-15	Endo-Wash Buffer	15 ml		\$8.00
D4036-3-30	Endo-Wash Buffer	30 ml		\$15.00
D4036-3-60	Endo-Wash Buffer	60 ml		\$30.00
D4036-3-120	Endo-Wash Buffer	120 ml		\$42.00
D4036-3-240	Endo-Wash Buffer	240 ml		\$75.00
D4036-4-6	Zyppy™ Wash Buffer	6 ml		\$8.00
D4036-4-12	Zyppy™ Wash Buffer	12 ml		\$15.00
D4036-4-24	Zyppy™ Wash Buffer	24 ml		\$30.00
D4036-4-48	Zyppy™ Wash Buffer	48 ml		\$42.00
D4036-5-5	Zyppy™ Elution Buffer	5 ml		\$8.00
D4036-5-10	Zyppy™ Elution Buffer	10 ml		\$15.00
D4036-5-20	Zyppy™ Elution Buffer	20 ml		\$22.00
D4036-5-30	Zyppy™ Elution Buffer	30 ml		\$35.00
D4036-5-60	Zyppy™ Elution Buffer	60 ml		\$65.00
D4037	Zyppy™ Plasmid Miniprep Kit	800 preps.	49	\$582.00
D4045	Zymoclean™ Large Fragment DNA Recovery Kit	25 preps.	46	\$72.00
D4046	Zymoclean™ Large Fragment DNA Recovery Kit	100 preps.	46	\$251.00
D4048	ZR BAC DNA Miniprep Kit	25 preps.	54	\$82.00
D4049	ZR BAC DNA Miniprep Kit	100 preps.	54	\$271.00
D4050	ZR DNA Sequencing Clean-up Kit™	50 preps.	43	\$82.00
D4050-1-14	Sequencing Binding Buffer	14 ml		\$32.00
D4050-1-55	Sequencing Binding Buffer	55 ml		\$82.00
D4050-1-500	Sequencing Binding Buffer	500 ml		\$328.00
D4050-2-20	Sequencing Wash Buffer	20 ml		\$28.00
D4050-2-70	Sequencing Wash Buffer	70 ml		\$45.00
D4050-2-500	Sequencing Wash Buffer	500 ml		\$281.00
D4051	ZR DNA Sequencing Clean-up Kit™	200 preps.	43	\$241.00
D4052	ZR-96 DNA Sequencing Clean-up Kit™	2 x 96 preps.	43	\$132.00
D4053	ZR-96 DNA Sequencing Clean-up Kit™	4 x 96 preps.	43	\$272.00
D4054	ZR Plasmid Miniprep™-Classic	800 preps.	52	\$582.00
D4056	ZR Plasmid Gigaprep Kit	5 preps.	53	\$327.00
D4057	ZR Plasmid Gigaprep Kit	10 preps.	53	\$523.00
D5001	EZ DNA Methylation™ Kit	50 rxns.	10	\$112.00
D5001-1	CT Conversion Reagent (10 conversions)	1 tube		\$6.10
D5001-1-50	CT Conversion Reagent (5 x 10 conversions)	5 tubes		\$30.50
D5001-2	M-Dilution Buffer	1.3 ml		\$2.00
D5001-3	M-Binding Buffer	20 ml		\$11.00
D5001-4	M-Wash Buffer	6 ml		\$7.00
D5001-5	M-Desulphonation Buffer	10 ml		\$12.00
D5001-6	M-Elution Buffer	1 ml		\$1.50
D5002	EZ DNA Methylation™ Kit	200 rxns.	10	\$390.00
D5002-2	M-Dilution Buffer	5.2 ml		\$6.00
D5002-3	M-Binding Buffer	80 ml		\$33.00
D5002-4	M-Wash Buffer	24 ml		\$21.00
D5002-5	M-Desulphonation Buffer	40 ml		\$36.00
D5002-6	M-Elution Buffer	4 ml		\$4.50
D5003	EZ-96 DNA Methylation™ Kit (shallow-well)	2 x 96 rxns.	10	\$310.00
D5003-1	CT Conversion Reagent (96 conversions)	1 Bottle		\$55.00
D5004	EZ-96 DNA Methylation™ Kit (deep-well)	2 x 96 rxns.	10	\$310.00

Cat. No.	Description	Size	Page	Price
D5005	EZ DNA Methylation-Gold™ Kit	50 rxns.	11	\$121.00
D5005-2	M-Dilution Buffer-Gold	1.5 ml		\$3.00
D5005-3	M-Binding Buffer-Gold	30 ml		\$17.00
D5005-6	M-Dissolving Buffer	500 µl		\$5.00
D5006	EZ DNA Methylation-Gold™ Kit	200 rxns.	11	\$410.00
D5006-2	M-Dilution Buffer-Gold	7 ml		\$6.50
D5006-3	M-Binding Buffer-Gold	125 ml		\$50.00
D5006-6	M-Dissolving Buffer	1.2 ml		\$12.00
D5007	EZ-96 DNA Methylation-Gold™ Kit (shallow-well)	2 x 96 rxns.	11	\$320.00
D5007-4	M-Wash Buffer	36 ml		\$32.00
D5007-6	M-Elution Buffer	8 ml		\$5.00
D5008	EZ-96 DNA Methylation-Gold™ Kit (deep-well)	2 x 96 rxns.	11	\$320.00
D5010	Universal Methylated DNA Standard	1 set	15	\$122.00
D5011	Universal Methylated Human DNA Standard	1 set	15	\$182.00
D5012	Universal Methylated Mouse DNA Standard	1 set	15	\$182.00
D5014	Human Methylated & Non-methylated DNA Set (DNA w/ primers)	1 set	16	\$382.00
D5014-1	Human HCT116 DKO Non-Methylated DNA	5 µg / 20 µl	16	\$212.00
D5014-2	Human HCT116 DKO Methylated DNA	5 µg / 20 µl	16	\$212.00
D5015	Bisulfite-converted Universal Methylated Human DNA Standard	1 set	15	\$122.00
D5017	Methylated & Non-methylated pUC19 DNA Set	1 set	15	\$142.00
D5016	<i>E. coli</i> Non-methylated Genomic DNA	5 µg / 20 µl	16	\$98.00
D5020	EZ DNA Methylation-Direct™ Kit	50 rxns.	12	\$161.00
D5020-7	M-Solubilization Buffer	4.5 ml		\$16.00
D5020-8	M-Reaction Buffer	1 ml		\$12.00
D5020-9	M-Digestion Buffer (2X)	4 ml		\$5.00
D5021	EZ DNA Methylation-Direct™ Kit	200 rxns.	12	\$452.00
D5021-7	M-Solubilization Buffer	18 ml		\$24.00
D5021-8	M-Reaction Buffer	4 ml		\$18.00
D5021-9	M-Digestion Buffer (2X)	15 ml		\$12.00
D5022	EZ-96 DNA Methylation-Direct™ Kit (shallow-well)	2 x 96 rxns.	12	\$362.00
D5023	EZ-96 DNA Methylation-Direct™ Kit (deep-well)	2 x 96 rxns.	12	\$362.00
D5024	EZ DNA Methylation-Startup™ Kit	50 rxns.	13	\$381.00
D5025	EZ Bisulfite DNA Clean-up Kit™	50 preps.	14	\$81.00
D5026	EZ Bisulfite DNA Clean-up Kit™	200 preps.	14	\$274.00
D5027	EZ-96 Bisulfite DNA Clean-up Kit™ (shallow-well)	2 x 96 preps.	14	\$214.00
D5028	EZ-96 Bisulfite DNA Clean-up Kit™ (deep-well)	2 x 96 preps/	14	\$214.00
D5101	Methylated-DNA IP Kit	10 rxns.	22	\$420.00
D5101-1-500	Protein A-Sepharose Slurry	500 µl		\$52.00
D5101-2	Methylated/Non-methylated Control DNA & Primer Set	1 Set		\$122.00
D5101-3-20	MIP Buffer	20 ml		\$25.00
D5101-4-1	DNA Denaturing Buffer	1 ml		\$15.00
D5101-5-6	IP DNA Binding Buffer	6 ml		\$25.00
D5101-6-1	DNA Elution Buffer	1 ml		\$10.00
D5201	ChIP DNA Clean & Concentrator™ (uncapped)	50 preps.	23	\$82.00
D5201-1-50	ChIP DNA Binding Buffer	50 ml		\$32.00
D5205	ChIP DNA Clean & Concentrator™ (capped)	50 preps.	23	\$86.00
D5220	EZ Nucleosomal DNA Prep Kit	20 preps.	27	\$121.00
D5220-1	Micrococcal Nuclease	10 U / 100 µl	133	\$21.00

Cat. No.	Description	Size	Page	Price
D5405	5-Methylcytosine & 5-Hydroxymethylcytosine DNA Standard Set	1 set	17	\$320.00
D5405-1	Cytosine DNA Standard	2 µg		\$52.00
D5405-2	5-Methylcytosine DNA Standard	2 µg		\$122.00
D5405-3	5-Hydroxymethylcytosine DNA Standard	2 µg		\$152.00
D6001	ZR Soil Microbe DNA MiniPrep™	50 preps.	74	\$182.00
D6001-1-100	Soil DNA Binding Buffer	100 ml		\$102.00
D6001-1-150	Soil DNA Binding Buffer	150 ml		\$132.00
D6001-1-500	Soil DNA Binding Buffer	500 ml		\$162.00
D6001-2-50	Soil DNA Wash Buffer	50 ml		\$15.00
D6001-2-100	Soil DNA Wash Buffer	100 ml		\$25.00
D6001-3-40	Lysis Solution	40 ml		\$25.00
D6001-3-150	Lysis Solution	150 ml		\$75.00
D6002	ZR-96 Soil Microbe DNA Kit™	2 x 96 preps.	74	\$559.00
D6003	ZR Soil Microbe DNA MicroPrep™	50 preps.	74	\$182.00
D6005	ZR Fungal/Bacterial DNA MiniPrep™	50 preps.	75	\$132.00
D6005-1-100	Fungal/Bacterial DNA Binding Buffer	100 ml		\$102.00
D6005-1-150	Fungal/Bacterial DNA Binding Buffer	150 ml		\$132.00
D6005-2-50	Fungal/Bacterial DNA Wash Buffer	50 ml		\$15.00
D6005-2-100	Fungal/Bacterial DNA Wash Buffer	100 ml		\$25.00
D6006	ZR-96 Fungal/Bacterial DNA Kit™	2 x 96 preps.	75	\$482.00
D6007	ZR Fungal/Bacterial DNA MicroPrep™	50 preps.	75	\$132.00
D6010	ZR Fecal DNA MiniPrep™	50 preps.	76	\$182.00
D6010-1-100	Fecal DNA Binding Buffer	100 ml		\$102.00
D6010-1-150	Fecal DNA Binding Buffer	150 ml		\$132.00
D6010-2-50	Fecal DNA Wash Buffer	50 ml		\$15.00
D6010-2-100	Fecal DNA Wash Buffer	100 ml		\$25.00
D6011	ZR-96 Fecal DNA Kit™	2 x 96 preps.	76	\$559.00
D6012	ZR Fecal DNA MicroPrep™	50 preps.	76	\$182.00
D6015	ZR Tissue & Insect DNA MicroPrep™	50 preps.	77	\$132.00
D6016	ZR Tissue & Insect DNA Kit MiniPrep™	50 preps.	77	\$132.00
D6017	ZR-96 Tissue & Insect DNA Kit™	2 x 96 preps.	77	\$482.00
D6020	ZR Plant/Seed DNA MiniPrep™	50 preps.	78	\$182.00
D6020-1-100	Plant/Seed DNA Binding Buffer	100 ml		\$102.00
D6020-1-150	Plant/Seed DNA Binding Buffer	150 ml		\$132.00
D6020-2-50	Plant/Seed DNA Wash Buffer	50 ml		\$15.00
D6020-2-100	Plant/Seed DNA Wash Buffer	100 ml		\$25.00
D6021	ZR-96 Plant/Seed DNA Kit™	2 x 96 preps.	78	\$559.00
D6022	ZR Plant/Seed DNA MicroPrep™	50 preps.	78	\$182.00
D6030	OneStep™ PCR Inhibitor Removal Kit	50 preps.	44	\$97.00
D6035	OneStep-96™ PCR Inhibitor Removal Kit	2 x 96 preps.	44	\$297.00
D6035-1-30	Prep Solution	30 ml		\$15.00
D6101	ZR Soil Microbe DNA MidiPrep™	25 preps.	74	\$396.00
D6105	ZR Fungal/Bacterial DNA MidiPrep™	25 preps.	75	\$327.00
D6110	ZR Fecal DNA MidiPrep™	25 preps.	76	\$396.00
D6115	ZR Tissue & Insect DNA MidiPrep™	25 preps.	77	\$327.00
D6120	ZR Plant/Seed DNA MidiPrep™	25 preps.	78	\$396.00
D7001	ZR-Duet™ DNA/RNA MiniPrep	50 preps.	81	\$282.00
D7001-1-50	Lysis Buffer-Duet	50 ml		\$68.00
D7001-2-25	DNA Prep Buffer	25 ml		\$15.00
D7010	ssDNA/RNA Clean & Concentrator™	20 preps.	82	\$76.00
D7010-1-10	ssDNA/RNA Binding Buffer	10 ml		\$15.00

Cat. No.	Description	Size	Page	Price
D7010-1-25	ssDNA/RNA Binding Buffer	25 ml		\$42.00
D7010-1-50	ssDNA/RNA Binding Buffer	50 ml		\$65.00
D7010-2-10	ssDNA/RNA Prep Buffer	10 ml		\$15.00
D7010-2-25	ssDNA/RNA Prep Buffer	25 ml		\$34.00
D7010-3-6	ssDNA/RNA Wash Buffer (concentrate)	6 ml		\$15.00
D7010-3-12	ssDNA/RNA Wash Buffer (concentrate)	12 ml		\$26.00
D7011	ssDNA/RNA Clean & Concentrator™	50 preps.	82	\$152.00
D7020	ZR Viral DNA/RNA Kit™	50 preps.	83	\$122.00
D7021	ZR Viral DNA/RNA Kit™	200 preps.	83	\$420.00
D7022	ZR-96 Viral DNA/RNA Kit™	2 x 96 preps.	83	\$341.00
D7023	ZR-96 Viral DNA/RNA Kit™	4 x 96 preps.	83	\$613.00
E1004	Zymolyase w/ Storage Buffer	1,000 U	126, 134	\$54.00
E1005	Zymolyase w/ Storage Buffer	2,000 U	126, 134	\$92.00
E1006	R-Zymolyase w/ Storage Buffer	1,000 U	126, 134	\$68.00
E1007	DNase I, RNase-free w/ 10X Reaction Buffer	100 U / 100 µl	132	\$27.00
E1008-2	RNase A	2 mg	133	\$20.00
E1008-8	RNase A	8 mg	133	\$30.00
E2001	ZymoTaq™ DNA Polymerase	50 rxns.	18, 134	\$62.00
E2002	ZymoTaq™ DNA Polymerase	200 rxns.	18, 134	\$198.00
E2003	ZymoTaq™ PreMix	50 rxns.	18, 134	\$62.00
E2004	ZymoTaq™ PreMix	200 rxns.	18, 134	\$198.00
E2010	CpG Methylase (M. Sssl)	200 U	19, 131	\$147.00
E2010-2	10X CpG Reaction Buffer	1 ml		\$10.00
E2010-3	20X SAM (S-adenosylmethionine)	200 µl		\$20.00
E2011	CpG Methylase (M. Sssl)	400 U	19, 131	\$243.00
E2014	GpC Methylase (M. CviPI)	200 U	20, 132	\$60.00
E2014-2	10X GpC Reaction Buffer	1 ml		\$10.00
E2015	GpC Methylase (M. CviPI)	1,000 U	20, 132	\$240.00
E2016	DNA Degradase™	500 U	24, 131	\$120.00
E2017	DNA Degradase™	2,000 U	24, 131	\$382.00
E2018-50	dsDNA Shearase™	50 U	26, 132	\$92.00
E2018-200	dsDNA Shearase™	200 U	26, 132	\$310.00
E2019-50	dsDNA Shearase™ + DCC™-5	50 U + 50 preps.	26	\$148.00
E2019-200	dsDNA Shearase™ + DCC™-5	200 U + 200 preps.	26	\$532.00
E2020	DNA Degradase Plus™	250 U	25, 131	\$120.00
E2021	DNA Degradase Plus™	1,000 U	25, 131	\$382.00
F9001-1	5-Fluoroorotic Acid (powder)	1 g	124, 138	\$41.00
F9001-5	5-Fluoroorotic Acid (powder)	5 g	124, 138	\$181.00
F9002	2X SC / 5-FOA (liquid)	250 ml	124	\$86.00
F9003	100X 5-Fluoroorotic Acid (liquid)	10 ml	124	\$59.00
H1001	Squisher™-Single	10 pack	153	\$11.00
H1001-50	Squisher™-Single	50 pack	153	\$35.00
H1002-5	Squisher-8™ w/ 96-Well Block	5 pack & 1 block	153	\$40.00
H1002-20	Squisher-8™ w/ 96-Well Block	20 pack & 2 blocks	153	\$125.00
H1003-5	Squisher™-8 Panel	5 pack		\$35.00
H1003-20	Squisher™-8 Panel	20 pack		\$120.00
H1004-2	Squisher™-96 w/ 96-Well Block	2 pack & 2 blocks	153	\$110.00
H1004-5	Squisher™-96 w/ 96-Well Block	5 pack & 5 blocks	153	\$220.00

Cat. No.	Description	Size	Page	Price
I1001-5	Isopropyl-β-D-thiogalactopyranoside (IPTG)	5 ml	138	\$7.00
I1001-25	Isopropyl-β-D-thiogalactopyranoside (IPTG)	5 x 5 ml	138	\$31.00
M3011	Dual Media Set™ (100 ml EB & 500 ml OB)	1 Set	129	\$38.00
M3012-100	Expansion Broth (EB)	100 ml	129	\$12.00
M3012-500	Expansion Broth (EB)	500 ml	129	\$28.00
M3013-100	Overexpression Broth (OB)	100 ml	129	\$12.00
M3013-500	Overexpression Broth (OB)	500 ml	129	\$28.00
M3015-100	ZymoBroth™	100 ml	117	\$23.00
M3015-500	ZymoBroth™	500 ml	117	\$72.00
M5001-50	ZR 50 bp DNA Marker™	50 µg / 100 µl	84	\$50.00
M5001-200	ZR 50 bp DNA Marker™	200 µg / 400 µl	84	\$150.00
M5002-50	ZR 100 bp DNA Marker™	50 µg / 100 µl	84	\$50.00
M5002-200	ZR 100 bp DNA Marker™	200 µg / 400 µl	84	\$150.00
M5003-50	ZR 1 kb DNA Marker™	50 µg / 100 µl	84	\$50.00
M5003-200	ZR 1 kb DNA Marker™	200 µg / 400 µl	84	\$150.00
M5004-50	ZR 50 bp DNA Marker™ (ready-to-load)	50 µg / 600 µl	84	\$55.00
M5005-50	ZR 100 bp DNA Marker™ (ready-to-load)	50 µg / 600 µl	84	\$55.00
M5006-50	ZR 1 kb DNA Marker™ (ready-to-load)	50 µg / 600 µl	84	\$55.00
P1001-2	96-Well Block	2 blocks	151	\$15.00
P1001-10	96-Well Block	10 blocks	151	\$58.00
P1002-2	96-Well Block w/ Cover Foil	2 blocks/foils	151	\$24.00
P2001	His-Spin Protein Miniprep™	10 preps.	130	\$62.00
P2002	His-Spin Protein Miniprep™	50 preps.	130	\$245.00
P2003-1	Zymo-Spin™ PI Columns	50 pack	145	\$37.00
P2003-2	His-Affinity Gel	14 ml	130, 138	\$168.00
P2003-3	His-Binding Buffer	50 ml		\$21.00
P2003-4	His-Wash Buffer	50 ml		\$23.00
P2003-5	His-Elution Buffer	25 ml		\$28.00
R1001-1	YR Digestion Buffer	3.2 ml		\$20.00
R1001-2	YR Lysis Buffer	6.4 ml		\$20.00
R1002	YeaStar™ RNA Kit	40 preps.	101	\$112.00
R1003	Pinpoint™ Slide RNA Isolation System I	50 preps.	102	\$141.00
R1003-2-3	RNA Extraction Buffer	3 ml		\$9.00
R1003-2-12	RNA Extraction Buffer	12 ml		\$26.00
R1003-2-50	RNA Extraction Buffer	50 ml		\$77.00
R1003-2-100	RNA Extraction Buffer	100 ml		\$132.00
R1003-3-6	RNA Wash Buffer	6 ml		\$15.00
R1003-3-12	RNA Wash Buffer	12 ml		\$26.00
R1003-3-24	RNA Wash Buffer	24 ml		\$52.00
R1003-3-48	RNA Wash Buffer	48 ml		\$92.00
R1003-4-1	RNA Elution Buffer	1 ml		\$15.00
R1003-4-5	RNA Elution Buffer	5 ml		\$52.00
R1003-4-10	RNA Elution Buffer	10 ml		\$82.00
R1007	Pinpoint™ Slide RNA Isolation System II	50 preps.	102	\$225.00
R1007-1	RNA Digestion Buffer	1.2 ml		\$26.00
R1011	Zymoclean™ Gel RNA Recovery Kit	50 preps.	92	\$110.00

Cat. No.	Description	Size	Page	Price
R1011-1-50	RAD Buffer	50 ml		\$65.00
R1013	DNA-Free RNA Kit™	50 preps.	91	\$142.00
R1013-2-25	RNA Binding Buffer	25 ml		\$42.00
R1013-2-50	RNA Binding Buffer	50 ml		\$65.00
R1013-2-100	RNA Binding Buffer	100 ml		\$112.00
R1013-2-1000	RNA Binding Buffer	1000 ml		\$560.00
R1014	DNA-Free RNA Kit™	200 preps.	91	\$510.00
R1015	RNA Clean & Concentrator™-5	50 preps.	89	\$122.00
R1016	RNA Clean & Concentrator™-5	200 preps.	89	\$420.00
R1017	RNA Clean & Concentrator™-25	50 preps.	89	\$122.00
R1018	RNA Clean & Concentrator™-25	100 preps.	89	\$220.00
R1019	RNA Clean & Concentrator™-100	25 preps.	89	\$162.00
R1020	ZR Whole-Blood RNA MiniPrep™	50 preps.	99	\$198.00
R1020-1-50	ZR RNA Buffer	50 ml		\$68.00
R1020-1-100	ZR RNA Buffer	100 ml		\$122.00
R1020-1-200	ZR RNA Buffer	200 ml		\$198.00
R1020-2-12	RNA Pre-wash Buffer	12 ml		\$18.00
R1020-2-25	RNA Pre-wash Buffer	25 ml		\$20.00
R1020-2-50	RNA Pre-wash Buffer	50 ml		\$30.00
R1020-2-100	RNA Pre-wash Buffer	100 ml		\$50.00
R1021	ZR Whole-Blood RNA MiniPrep™	100 preps.	99	\$355.00
R1022	ZR-96 Whole-Blood RNA™	2 x 96 preps.	99	\$452.00
R1022-1-50	Blood RNA Buffer	50 ml		\$68.00
R1022-1-100	Blood RNA Buffer	100 ml		\$122.00
R1022-2-50	RBC Lysis Buffer	50 ml		\$32.00
R1022-2-100	RBC Lysis Buffer	100 ml		\$58.00
R1034	ZR Viral RNA Kit™	50 preps.	98	\$122.00
R1034-1-50	ZR Viral RNA Buffer	50 ml		\$68.00
R1034-1-100	ZR Viral RNA Buffer	100 ml		\$132.00
R1035	ZR Viral RNA Kit™	200 preps.	98	\$420.00
R1038	ZR Urine RNA Isolation Kit™	20 preps.	100	\$105.00
R1038-1-20	RNA Extraction Buffer Plus	20 ml		\$27.00
R1038-1-50	RNA Extraction Buffer Plus	50 ml		\$69.00
R1039	ZR Urine RNA Isolation Kit™	50 preps.	100	\$241.00
R1040	ZR-96 Viral RNA Kit™	2 x 96 preps.	98	\$341.00
R1041	ZR-96 Viral RNA Kit™	4 x 96 preps.	98	\$613.00
R1050	Quick-RNA™ MicroPrep	50 preps.	96	\$142.00
R1052	ZR-96 Quick-RNA™	2 x 96 preps.	96	\$354.00
R1053	ZR-96 Quick-RNA™	4 x 96 preps.	96	\$682.00
R1054	Quick-RNA™ MiniPrep	50 preps.	96	\$142.00
R1055	Quick-RNA™ MiniPrep	200 preps.	96	\$454.00
R1056	Quick-RNA™ MidiPrep	25 preps.	96	\$240.00
R1060	ZR RNA MicroPrep™	50 preps.	97	\$181.00
R1060-1-50	RNA Lysis Buffer	50 ml		\$68.00
R1060-1-100	RNA Lysis Buffer	100 ml		\$132.00
R1060-2-10	RNA Prep Buffer	10 ml		\$15.00
R1060-2-25	RNA Prep Buffer	25 ml		\$34.00
R1061	ZR RNA MicroPrep™	200 preps.	97	\$581.00
R1064	ZR RNA MiniPrep™	50 preps.	97	\$181.00
R1065	ZR RNA MiniPrep™	200 preps.	97	\$581.00
R1070	ZR small-RNA™ PAGE Recovery Kit	20 preps.	93	\$121.00
R1070-1-10	RNA Recovery Buffer	10 ml		\$15.00

Cat. No.	Description	Size	Page	Price
R1070-2-20	RNA MAX Buffer	20 ml		\$47.00
R1080	ZR-96 RNA Clean & Concentrator™	2 x 96 preps.	90	\$372.00
R1090	ZR small-RNA™ Ladder	10 µg	110	\$79.00
R2010	ZR Fungal/Bacterial RNA MicroPrep™	50 preps.	107	\$211.00
R2014	ZR Fungal/Bacterial RNA MiniPrep™	50 preps.	107	\$211.00
R2024	ZR Plant RNA MiniPrep™	50 preps.	109	\$241.00
R2030	ZR Tissue & Insect RNA MicroPrep™	50 preps.	108	\$211.00
R2040	ZR Soil/Fecal RNA MicroPrep™	50 preps.	106	\$292.00
S1001	Rattler™ Plating Beads, 230 g	1 bottle	118, 154	\$15.00
S1001-5	Rattler™ Plating Beads, 230 g	5 bottles	118, 154	\$70.00
S1001-B	Rattler™ Plating Beads - bulk format (non-sterile)	25 kg bag	118, 154	\$346.00
S5001	Vortex-Genie® 2 (120V)	1 unit	154	\$336.00
S5001-1	Microtube Foam Inserts	2 units	154	\$40.00
S5001-2	Microplate Foam Inserts	2 units	154	\$41.00
S5001-3	29-37 mm Tube Foam Inserts	2 units	154	\$18.00
S5001-4	Pop-off Cup	1 unit	154	\$24.00
S5001-5	Horizontal 50 ml Tube Holder	1 unit	155	\$79.00
S5001-6	Horizontal 15 ml Tube Holder	1 unit	155	\$89.00
S5001-7	Horizontal Microtube Holder	1 unit	155	\$99.00
S5002	Vortex-Genie® 2 (230V, Euro plug)	1 unit	154	\$344.00
S5003	Digital Vortex-Genie® 2 (120V)	1 unit	154	\$429.00
S5004	Digital Vortex-Genie® 2 (230V, Euro plug)	1 unit	154	\$429.00
S5005	MicroPlate Genie® (120V)	1 unit	155	\$470.00
S5006	MicroPlate Genie® (230V, Euro plug)	1 unit	155	\$470.00
S5007	Roto-Shake Genie® (120V)	1 unit	155	\$1,100.00
S5008	Roto-Shake Genie® (230V, Euro plug)	1 unit	155	\$1,100.00
S5009	MagStir Genie® (120V)	1 unit	155	\$545.00
S5010	MagStir Genie® (230V, Euro plug)	1 unit	155	\$545.00
S6001-2-120	Disruptor Genie® (120V)	1 unit	152	\$545.00
S6001-2-230	Disruptor Genie® (230V, Euro plug)	1 unit	152	\$545.00
S6002-50	ZR BashingBead™ Lysis Tubes (0.5 mm)	50 tubes	149	\$92.00
S6002-96-1	ZR-96 BashingBead™ Lysis Rack (0.5 mm)	1 rack	151	\$176.00
S6002-96-2	ZR-96 BashingBead™ Lysis Rack (2 mm)	1 rack	151	\$176.00
S6003-50	ZR BashingBead™ Lysis Tubes (2 mm)	50 tubes	149	\$92.00
S6004-1	Disruptor Genie® TurboMix Attachment (1.5 ml tube)	1 unit	155	\$183.00
S6004-2	Disruptor Genie® TurboMix Attachment (2.0 ml tube)	1 unit	155	\$210.00
S6005	FastPrep®-24	1 unit	152	\$9,500.00
S6005-1	HiPrep™ Attachment (48 x 2 ml tubes)	1 unit	152	\$2,040.00
S6005-2	CoolPrep™ Attachment (24 x 2 ml tubes)	1 unit	152	\$2,640.00
S6005-3	TeenPrep™ Attachment (12 x 15 ml tubes)	1 unit	152	\$1,200.00
S6005-4	BigPrep™ Attachment (2 x 50 ml tubes)	1 unit	152	\$1,344.00
S6005-5	FastPrep® European AC Cord	1 unit	152	\$29.00
S6006	2010 Geno/Grinder®	1 unit	153	\$12,950.00
S6006-1	2 ml Tube Holder/Cryo Block Assembly	2 blocks	153	\$255.00
S6006-2	15 ml Tube Holder/Cryo Block Assembly	2 blocks	153	\$430.00
S6006-3	50 ml Tube Holder/Cryo Assembly	2 blocks	153	\$420.00
S6006-10	Large Capacity Clamp Assembly	1 unit	153	\$1,000.00
S6007-1	BBX24 Bullet Blender™	1 unit	152	\$1,995.00
S6007-2	BBX24B Bullet Blender™ Blue w/ Cooling Fan	1 unit	152	\$2,295.00

Cat. No.	Description	Size	Page	Price
S6007-3	BBX50B Bullet Blender™ Blue 50 w/ Cooling Fan	1 unit	152	\$2,595.00
S6010	ZR BashingBead™ Lysis/Filtration Tubes w/ 0.5 mm Beads (50 ml)	25 pack		\$175.00
S6011	ZR BashingBead™ Lysis/Filtration Tubes w/ 2.0 mm Beads (50 ml)	25 pack		\$175.00
T2001	Frozen-EZ Yeast Transformation II Kit™	120 rxns.	121	\$92.00
T2002	Frozen-EZ Solution 1	60 ml		\$25.00
T2003	Frozen-EZ Solution 2	6 ml		\$35.00
T2004	Frozen-EZ Solution 3	60 ml		\$45.00
T3001	Z-Competent™ <i>E. coli</i> Transformation Kit	up to 20 ml	116	\$99.00
T3001-1-100	SOB Medium	100 ml		\$21.00
T3001-2-10	Z-Competent™ 2X Stock Wash Buffer	10 ml		\$24.00
T3001-2-30	Z-Competent™ 2X Stock Wash Buffer	30 ml		\$45.00
T3001-3-10	Z-Competent™ 2X Stock Competent Buffer	10 ml		\$24.00
T3001-3-30	Z-Competent™ 2X Stock Competent Buffer	30 ml		\$45.00
T3001-4-20	Z-Competent™ Dilution Buffer	20 ml		\$10.00
T3001-4-60	Z-Competent™ Dilution Buffer	60 ml		\$22.00
T3002	Z-Competent™ <i>E. coli</i> Transformation Buffer Set	up to 60 ml	116	\$102.00
T3003	Z-Competent™ <i>E. coli</i> -JM109	10 x 100 µl	115	\$110.00
T3005	Z-Competent™ <i>E. coli</i> -JM109	96 x 50 µl	115	\$420.00
T3007	Z-Competent™ <i>E. coli</i> -DH5a	10 x 100 µl	115	\$110.00
T3009	Z-Competent™ <i>E. coli</i> -DH5a	96 x 50 µl	115	\$420.00
T3011	Z-Competent™ <i>E. coli</i> -HB101	10 x 100 µl	115	\$110.00
T3013	Z-Competent™ <i>E. coli</i> -HB101	96 x 50 µl	115	\$420.00
T3015	Z-Competent™ <i>E. coli</i> -C600	10 x 100 µl	115	\$110.00
T3017	Z-Competent™ <i>E. coli</i> -TG1	10 x 100 µl	115	\$110.00
T3021	Z-Competent™ <i>E. coli</i> -XJa Autolysis™	10 x 100 µl	114	\$184.00
T3031	Z-Competent™ <i>E. coli</i> -XJa (DE3) Autolysis™	10 x 100 µl	114	\$184.00
T3041	Z-Competent™ <i>E. coli</i> -XJb Autolysis™	10 x 100 µl	114	\$184.00
T3051	Z-Competent™ <i>E. coli</i> -XJb (DE3) Autolysis™	10 x 100 µl	114	\$184.00
T5021	XJa Autolysis™, Glycerol Stock	1 tube	114	\$92.00
T5031	XJa(DE3) Autolysis™, Glycerol Stock	1 tube	114	\$92.00
T5041	XJb Autolysis™, Glycerol Stock	1 tube	114	\$92.00
T5051	XJb(DE3) Autolysis™, Glycerol Stock	1 tube	114	\$92.00
W1001-1	DNase/RNase-free Water	1 ml		\$2.00
W1001-4	DNase/RNase-free Water	4 ml		\$3.00
W1001-6	DNase/RNase-free Water	6 ml		\$4.00
W1001-10	DNase/RNase-free Water	10 ml		\$6.00
X1001-5	5-bromo-4-chloro-3-indolyl β-D-galactopyranoside (X-GAL)	5 ml	138	\$10.00
X1001-25	5-bromo-4-chloro-3-indolyl β-D-galactopyranoside (X-GAL)	5 x 5 ml	138	\$45.00
Y1001	α-Factor Mating Pheromone	240 µl	125	\$128.00
Y1002	Yeast Protein Kit	200 preps.	123	\$58.00
Y1002-1-6	Y-Lysis Buffer	6 ml		\$13.00
Y1003-50	YPD Plus™	50 ml	122	\$15.00
Y1003-100	YPD Plus™	100 ml	122	\$22.00

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SAMPLING



Sample-sized kits of some of our DNA / RNA purification and epigenetics technologies are available for your evaluation. Below is a list of our current offerings. Sample kits must be shipped to a valid business or institution address (no P.O. Boxes). Limit one kit of each type per customer. For sample requests outside the US, please contact your nearest distributor.

Cat. No.	Kit	Size
D3024S	Quick-gDNA MiniPrep™	10 preps.
D4001S	Zymoclean™ Gel DNA Recovery Kit	10 preps.
D4003S	DNA Clean & Concentrator™-5	10 preps.
D4015S	ZR Plasmid Miniprep™-Classic	10 preps.
D4036S	Zyppy™ Plasmid Miniprep Kit	10 preps.
D4050S	ZR DNA Sequencing Clean-up Kit™	10 preps.
D5005S	EZ DNA Methylation-Gold™ Kit	10 rxns.
D5020S	EZ DNA Methylation-Direct™ Kit	10 rxns.
D6001S	ZR Soil Microbe DNA MiniPrep™	5 preps.
D6005S	ZR Fungal/Bacterial DNA MiniPrep™	5 preps.
D6010S	ZR Fecal DNA MiniPrep™	5 preps.
D6015S	ZR Tissue & Insect DNA MicroPrep™	5 preps.
D6020S	ZR Plant/Seed DNA MiniPrep™	5 preps.
D6030S	OneStep™ PCR Inhibitor Removal Kit	5 preps.
R1011S	Zymoclean™ Gel RNA Recovery Kit	5 preps.
R1015S	RNA Clean & Concentrator™-5	5 preps.
R1050S	Quick-RNA MicroPrep™	5 preps.
R1054S	Quick-RNA MiniPrep™	5 preps.
R1060S	ZR RNA MicroPrep™	5 preps.
R2010S	ZR Fungal/Bacterial RNA MicroPrep™	5 preps.
R2024S	ZR Plant RNA MiniPrep™	5 preps.
R2030S	ZR Tissue & Insect RNA MicroPrep™	5 preps.



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The dsDNA Shearase™, EZ DNA Methylation-Gold™, EZ DNA Methylation-Direct™, XJ Autolysis™, Zymo-Spin™ V-E, and Zyppy™ plasmid prep technologies are patent pending.

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