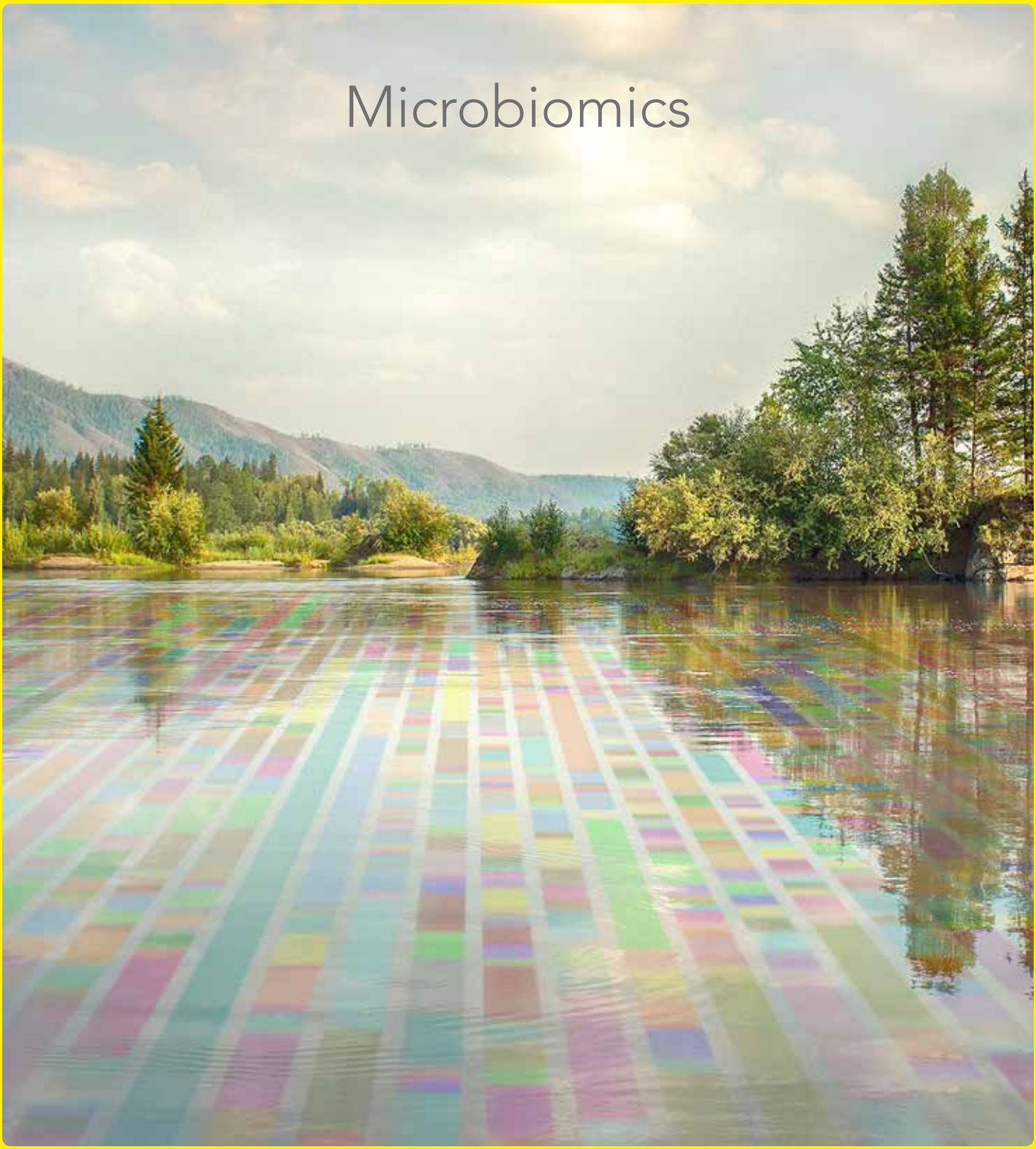
ZYMO RESEARCH

The Beauty of Science is to Make Things Simple®

2019 - 2020 Catalog



About the Cover

by Christopher E. Mason, Ph.D.

In the past two years, extraordinary new research in the microbiome and metagenome fields have shown a wide range of functions, plasticity, and novel applications. From sequencing DNA on the International Space Station in the Biomolecular Sequencer (BSeq) Mission[1], to sequencing thousands of subway stations in the Metagenomics of Subways and Urban Biomes (MetaSUB) project[2], to discovering completely novel genera that drive the risks of diabetes in The Environmental Determinants of Diabetes in the Young (TEDDY) project[3], many new breakthroughs are constantly being made. These breakthroughs include new metrics and risk factors for diabetes from early childhood onward, new risk stratification criteria for adult diabetes patients, and new deployment of NGS methods in microbiome research for clinicians.

Notably, the ZymoBIOMICS® microbial reference materials (see pages 150-153) have been used for more and more studies as critical positive controls. Several groups have now established both the genetic and epigenetic landscapes of these microbial standards. These landscapes reflect work from the Loman and Mason Labs, which are freely and publicly available for use by other groups. Based on Oxford Nanopore Technologies, PacBio, and Illumina sequencing, these genome assembly metrics and specific sites of base modifications can ensure robust data interpretation for limits of detection. In addition, titrated abundance can be estimated from the release of the new, log-titrated ZymoBIOMICS® Standards. These data can help in many areas, including rapid iteration for technology development in Next-Gen Sequencing for genomics and epigenomics, process controls for large-scale data projects, and variant-calling and assembly algorithm development.

Notably, some genomes in the ZymoBIOMICS® standards have scant or undetectable levels of modifications like methyl-6-adenine (m^6A), whereas others have high or wide-ranging levels of m^6A and 5-methylcytosine (5mC). Since new strains can show distinct and different levels of these epigenetic marks, the ZymoBIOMICS® standards are all the more important as reference materials. This work is similar to the "meter stick of the genome" efforts of the Genome in a Bottle Consortium[4] and the Global Alliance for Genomics and Health (GA4GH)[5], who are helping to adjudicate the metrics and parameters needed for accurate genetic variant calls in human genome sequencing. Going forward, these "metagenomes in a bottle" represent well-curated and validated metagenome standards that set the stage for in-depth and accurate studies of the microbiome, help improve genome assembly tools, and ensure greater reproducibility and interpretability for scientists and clinicians alike.

About Christopher E. Mason, Ph.D.
Dr. Christopher Mason is currently an Associate Professor at Weill Cornell Medicine, with appointments at the Tri-Institutional Program in Computational Biology and Medicine between Cornell, Memorial Sloan-Kettering Cancer Center and Rockefeller University, the Sandra and Edward Meyer Cancer Center, and the Feil Family Brain and Mind Research Institute. The Mason laboratory is working on a ten-phase, 500-year plan for the survival of the human species on Earth, in space, and on other planets.

Excitingly, all the details, methods, and data are available for immediate use:

- https://www.biorxiv.org/content/early/2017/04/13/127100
- https://www.biorxiv.org/content/early/2018/12/10/487033
- https://www.ncbi.nlm.nih.gov/biosample?Db=biosample&DbFrom=bioproject&Cmd=Link&LinkName=bioproject_biosample&LinkReadableName=BioSample&ordinalpos=1&IdsFromResult=477598
- https://www.fda.gov/medicaldevices/scienceandresearch/databaseforreferencegrademicrobialsequences/default.htm

References:

1. Castro-Wallace, S.L., et al. "Nanopore DNA Sequencing and Genome Assembly on the International Space Station." Scientific Data. 2017 Dec 21;7(1):18022.
2. The MetaSUB International Consortium. The Metagenomics and Metadesign of the Subways and Urban Biomes (MetaSUB) International Consortium inaugural meeting report. Microbiome. 2016 Jun 3;4(1):24.
3. Vatanen, T., et al. The human gut microbiome in early-onset type 1 diabetes from the TEDDY study. Nature. 2018 Oct;562(7728):589-594.
4. Genome in a Bottle Consortium: http://jimb.stanford.edu/giab/
5. Global Alliance for Genomics and Health (GA4GH): https://www.ga4gh.org

Artistic Rendition by Jay Chen and Casey Cruz

Who We Are

Since its inception in 1994, Zymo Research has been proudly serving the scientific community by providing innovative, reliable, and high quality research tools at affordable prices. Our vision "The Beauty of Science is to Make Things Simple" is now truer than ever. Whether it's epigenetics, DNA, RNA, *E. coli*, or yeast based research, our philosophy remains the same: To provide the highest quality products in the industry while ensuring they are both simple to use and reliable in their performance.

Zymo Research stands on three pillars which form the foundation of our company: Innovation, Quality, and Customer Service. These pillars are fundamental to our culture and ensure our products meet your needs.

Innovation

Zymo Research is historically recognized for its innovation of high quality nucleic acid purification technologies. Under the branding DNA Purification Made Simple® and RNA Purification Made Simple®, our technologies are pushing the limits of what is possible with nucleic acid isolation. As The Epigenetics Company™, Zymo Research has also received much attention for its rapidly expanding portfolio of epigenetics products and services. It is our objective to develop and provide the most comprehensive set of tools for DNA, RNA, and epigenetic research and analysis available today. Thousands of peer-reviewed scientific publications from researchers around the world feature our technologies. Through innovation, our scientists have made streamlined DNA methylation detection possible, pioneered the micro-elution column for DNA and RNA purification, developed the simplest and the most sophisticated methods for high-quality plasmid DNA purification, and patented the first RNA purification directly from Trizol® without phase separation among many other leading technologies in the industry.

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Sample kits are available for the evaluation of selected products (see specific product pages on our website: www.zymoresearch.com). Sample kits must be shipped to a valid business or institution address (no P.O. Boxes). Limit one sample kit of each type. Samples take 1-2 weeks for delivery.

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100% Satisfaction Guaranteed

Zymo Research is committed to the highest standard of quality and assures your satisfaction with its products.

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Contents

1 Epigenetics

So, what is epigenetics?
The Greek prefix "epi" means "on top of" or "over", so the term "Epigenetics" literally describes regulation at a level above, or in addition to, those of genetic mechanisms. The field of epigenetics was given its name and a vague definition only 50 years ago, but is now a dynamic and rapidly expanding discipline. Through epigenetics, the classic works of Charles Darwin, Gregor Mendel, Jean-Baptiste Lamarck, and others are now seen in a different light. Today, scientists are using epigenetics to investigate the roles of DNA, RNA, proteins, and environment in inheritance.

Epigenetic modifications can result in changes to the structure of chromatin, which is a complex of DNA and proteins, such as histones, that compact and organize DNA in cells. These changes can be as stable and heritable as classical genetic mechanisms, and their regulation is very complicated and essential for many biological processes, including regulation of gene expression, development, and cellular differentiation. Epigenetic regulation can be mediated by DNA methylation and hydroxymethylation, and small and large non-coding RNAs.

DNA methylation is one of the most studied epigenetic modifications, both in terms of basic biology and biomarker discovery. Zymo Research is the industry leader in providing DNA methylation research products, including bisulfite conversion kits, which are considered the industry "gold standard" for the study of DNA methylation. Zymo Research's suite of EZ DNA Methylation™ products are the highest quality, most trusted, and most cited technologies. Furthermore, these innovative products feature the fastest methods available for complete bisulfite conversion of DNA. Zymo Research has also pioneered the use of bisulfite-free methods and locus-specific analysis procedures for the study of DNA methylation.

Zymo Research also offers the most comprehensive products and services to investigate other areas of epigenetics, including DNA hydroxymethylation, chromatin immunoprecipitation, and chromatin remodeling, as well as small and large non-coding RNAs. We now offer genome-wide and whole-genome epigenetic services for DNA methylation and hydroxymethylation, targeted methylation analysis, ChIP-Seq, and RNA-Seq – simply send in your samples, and you will receive publication-ready data! Zymo Research is committed to enhancing the study of epigenetics by providing researchers of every discipline with the tools and knowledge needed to help unravel the complexities of genetic regulation, cellular differentiation, embryology, aging, cancer, and other diseases.

THE Epigenetics COMPANY™

Epigenetics

DNA Methylation

Bisulfite Methods

EZ DNA Methylation™ Kits

Streamlined procedure for bisulfite conversion of DNA using specialized kits designed for different samples types.

Page 12-15

Format:
Spin-Column
96-Well Plate

Pico Methyl-Seq™ Library Prep Kit

Post-bisulfite library preparation for Whole Genome Bisulfite Sequencing.

Page 29

Non-Bisulfite Methods

***OneStep* qMethyl™ Kits**

Real-time PCR procedure for bisulfite-free determination of methylation status at specific loci.

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Format:
96-Well Plate

Antibody Methods

5-mC DNA ELISA Kit

High-throughput method for accurate 5-mC detection in genomic DNA.

Page 25

Format:
96-Well Plate

Methylated-DNA IP Kit

Highly specific enrichment of 5-mC in DNA by immunoprecipitation.

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Quick Product Guide

1 Epigenetics

Epigenetics

DNA Hydroxymethylation

Quest 5-hmC™ DNA ELISA Kit

High-throughput method for specific 5-hmC detection in genomic DNA.

Page 32

Format:
96-Well Plate

DNA Degradase Plus™

Generate single nucleosides for global 5-hmC quantification by LC/MS.

Page 40

Chromatin Analysis

Zymo-Spin™ ChIP Kit

Protein-DNA interaction analysis.

Page 36

Format:
Spin-Column

ChIP DNA Clean & Concentrator®

Two minute DNA clean-up procedure for ChIP DNA.

Page 36

Format:
Spin-Column
96-Well Plate

RNA Methylation

EZ RNA Methylation™ Kit

Fast and reliable bisulfite conversion of RNA for methylation analysis.

Page 16

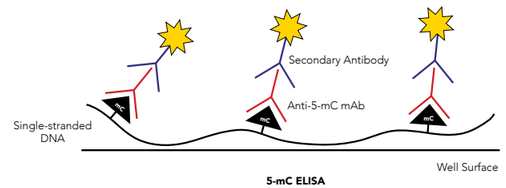
Format:
Spin-Column

A Roadmap for Navigating the Epigenetic Landscape

Epigenetic analyses do not have to be complicated. The scientists at Zymo Research have created this navigation tool to help new and experienced researchers alike tackle epigenetic analysis with ease. Below you will find an overview of some of the most common techniques used for studying DNA methylation with product and service references from Zymo Research to help you along the way.

Global Quantification:

For understanding complicated changes in the epigenome, the simplest place to start is to determine global changes in DNA methylation. ELISAs are a great way to determine overall levels of 5-mC and 5-hmC in DNA samples. Enzymatic methods breaking down DNA to individual nucleosides are also available for analysis of DNA methylation using mass spectrometry or HPLC.



5-mC ELISA

Chromatin Analysis:

Chromatin immunoprecipitation (ChIP) is the prevailing method to investigate protein-DNA interactions on gene expression, such as histone modifications and transcription factors.

Bisulfite Treatment:

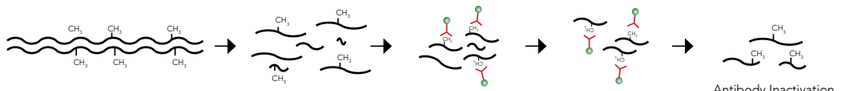
Bisulfite treatment is considered the "gold standard" for the analysis of DNA methylation. Bisulfite treatment converts unmodified cytosine to uracil while methylated cytosines are protected from this conversion. Downstream analyses include methyl-specific PCR (MSP), Bisulfite PCR and Sequencing (BSP), hybridization, pyrosequencing and Next-Generation sequencing.

Bisulfite-Free Methods for Locus Specific Analysis:

Simple bisulfite-free methods for investigation of 5-mC and 5-hmC levels can also be used for rapid screening of DNA methylation. Through the use of Methylation-Sensitive-Restriction-Enzymes (MSRE), differentially modified loci can be quickly and easily distinguished. These methods interrogate a gene's methylation.

Enrichment-Based Methods:

Specific enrichment of methylated DNA and hydroxymethylated DNA is critical for the accuracy of enrichment-based sequencing analysis. This is facilitated by the use of sensitive and specific antibodies or proteins engineered to target DNA with these modifications.



Genome-Wide Analysis:

Assessment of changes in methylation across the genome offers new ways to identify DNA methylation interactions in mechanisms of development, environmental responses, aging, stress, addiction, cancer and various other diseases. Next-Generation sequencing technologies allow high-throughput data analysis and insight into these variations.

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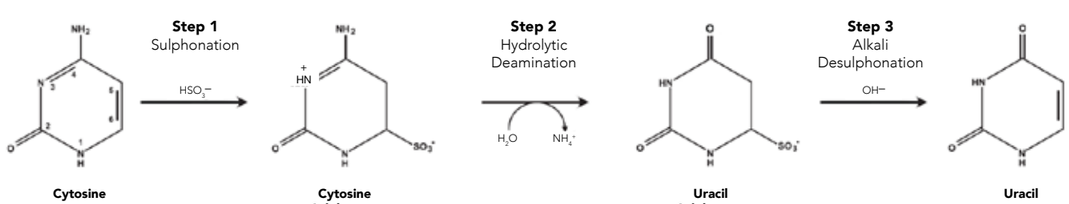
1 Epigenetics

Technology Overview: EZ DNA Methylation™

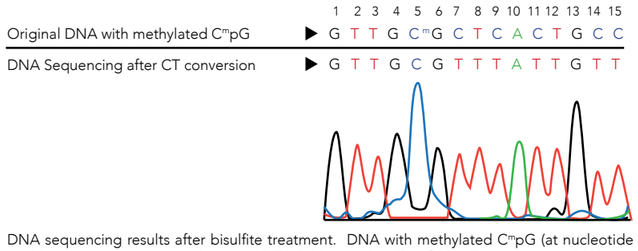
- *Conversion efficiency > 99%.*
- *On-column desulphonation and recovery of bisulfite-treated DNA.*
- *Conversion workflows in as little as 1 hour.*
- *Products available for many sample types, including purified DNA, tissue, cells, FFPE, blood, etc.*
- *Recommended as part of Illumina's workflow.*

The gold standard for the analysis of DNA methylation, bisulfite treatment converts unmodified cytosine to uracil while methylated cytosines are protected from this conversion. Sequence analysis post-treatment provides site-specific information on DNA across the genome. This can be accomplished by PCR, hybridization, MSP, and Next-Generation sequencing.

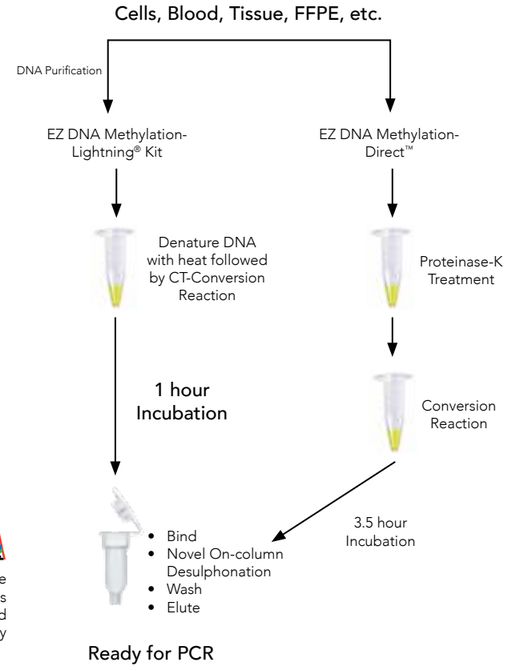


Bisulfite Technology from Zymo Research

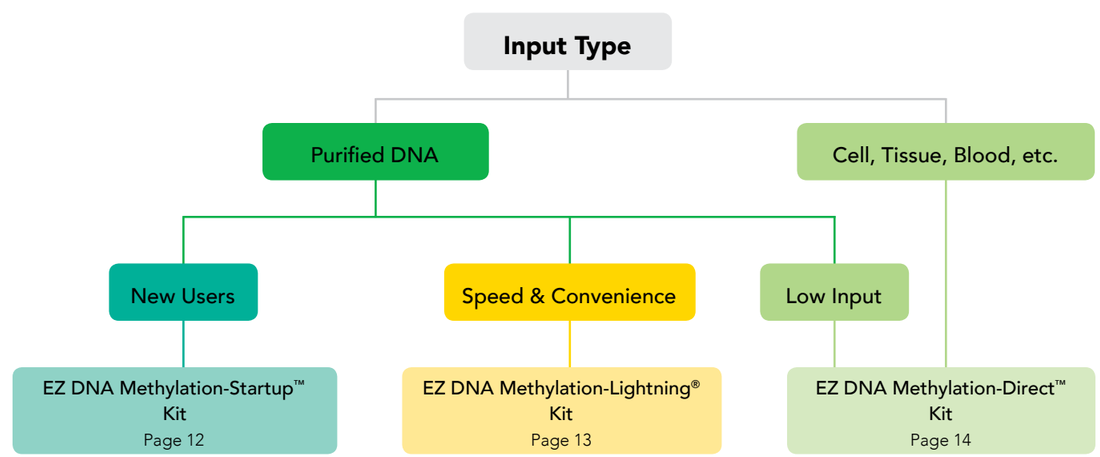
The EZ DNA Methylation™ family of kits from Zymo Research remain the most trusted as well as the most cited technologies available for bisulfite conversion and DNA methylation analysis. These kits have always pushed the limits of epigenetic innovation, from being the first methylation kit to offer on-column desulphonation to reducing conversion time to only 1.5 hours. The EZ DNA Methylation™ kits have been specifically engineered for complete conversion of as little as 50 pg of DNA. Kits are available in single column, 96-well plate and magnetic bead formats.



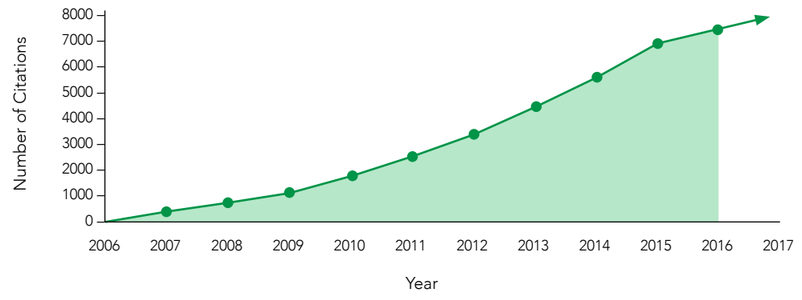
DNA sequencing results after bisulfite treatment. DNA with methylated C^{m}pG (at nucleotide position 5) was processed using the EZ DNA Methylation-Gold® Kit. The recovered DNA was amplified by PCR and then sequenced directly. The methylated cytosine at position #5 remained intact while the unmethylated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

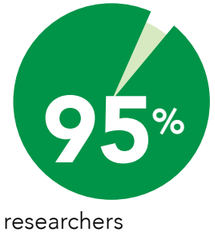


Choosing the right kit is the first step to a successful bisulfite conversion. Zymo Research offers a suite of EZ DNA Methylation™ Kits for a wide variety of sample types and research needs. Check out this quick guide to choose the best kit for your research:



Most-cited Technologies for DNA Methylation Analysis & Detection





of researchers
would recommend our
bisulfite conversion technologies
to a colleague

of researchers
were satisfied with the overall performance
of their EZ DNA Methylation™ Kit

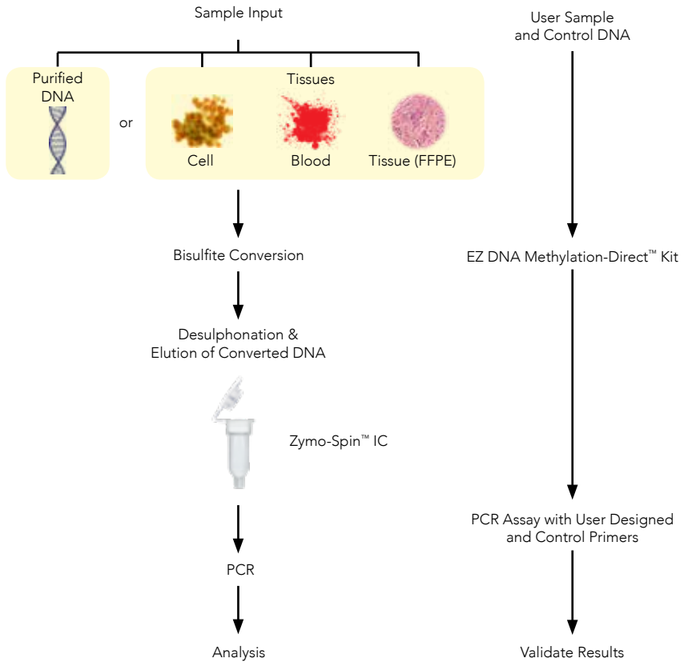
EZ DNA Methylation-Startup™ Kit

- *The complete solution for bisulfite conversion. This all-in-one kit contains: reagents for bisulfite conversion, DNA purification, methylated human DNA with control primers, and a robust hot-start PCR polymerase that is specifically formulated for bisulfite converted DNA.*
- *Designed for the first time user requiring a consolidated product to control for bisulfite conversion.*

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 use with purified DNA or direct sampling of blood, cells, and fresh or FFPE tissues without the prerequisite for upstream DNA purification (see EZ DNA Methylation-Direct™ Kit, p. 14). A fully methylated Universal Methylated Human DNA Standard (p. 24) is provided together with a special primer set for PCR to assess conversion efficiency. Finally, a unique Zymo*Taq*™ DNA Polymerase (p. 38) is included for robust amplification of bisulfite-treated DNA.

Workflow of the EZ DNA Methylation-Startup™ Kit



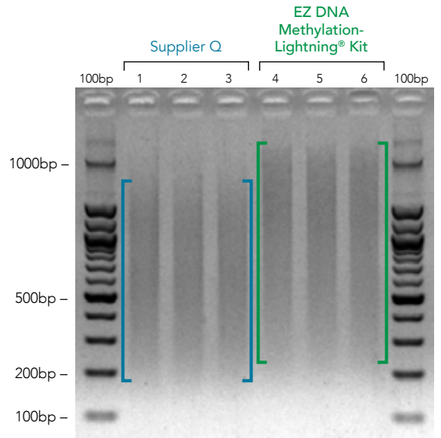
Product	Cat. No.	Size	Specifications	Uses
EZ DNA Methylation-Startup™ Kit	D5024	50 rxns	Input: DNA, Cells, Blood, Tissue, FFPE Conversion Efficiency: > 99.5% Format: Spin-Column Elution Volume: ≥ 10 µl DNA Recovery: > 80% Bisulfite Conversion Time: 4 hours Kit Includes: Conversion kit, primers, and qPCR mix	For first time user. Bisulfite treatment; Rapid column desulphonation; Amplified bisulfite-converted DNA

EZ DNA Methylation-Lightning® Kits

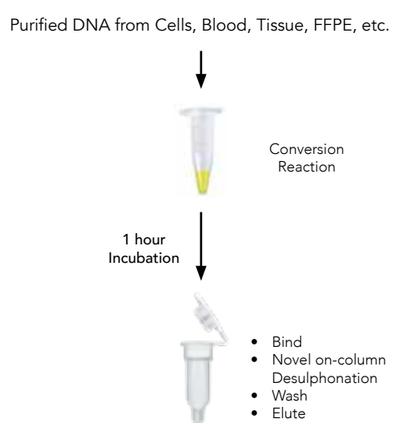
- ***Streamlined Process:*** *Ready-to-use conversion reagent is added directly to DNA. Purified bisulfite converted DNA in < 1.5 hours.*
- ***High-Quality:*** *Bisulfite-converted DNA has > 99.5% conversion efficiency with reduced fragmentation.*
- ***NGS-Ready:*** *Low DNA input requirement makes it ideal for preparing whole genome or targeted enrichment bisulfite libraries for methylation analysis.*

Description

Bisulfite conversion is considered the gold standard in DNA methylation analysis. The only downside is that the bisulfite conversion process is relatively harsh and will innately damage the DNA, leading to DNA fragmentation and low recovery. The EZ DNA Methylation – Lightning® Kit features the fastest bisulfite conversion method resulting in fully converted DNA with reduced fragmentation and more efficient PCR amplification. The bisulfite converted DNA is ideal for downstream DNA methylation analyses such as PCR, MSP, array, bisulfite and Next-Generation sequencing.



The EZ DNA Methylation-Lightning® Kit yields more intact DNA after bisulfite conversion than the comparable kit from Supplier Q.



Ready for PCR or other sensitive downstream applications

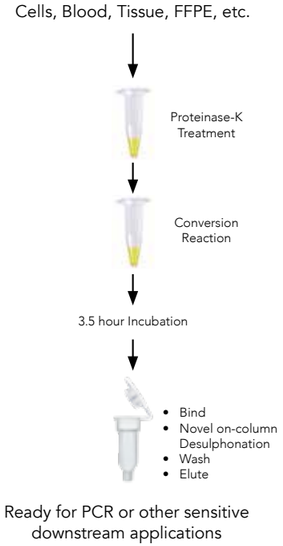
Product	Cat. No.	Size	Specifications	Uses
EZ DNA Methylation-Lightning® Kit	D5030T D5030 D5031	10 rxns 50 rxns 200 rxns	Input: 100 pg to 2 µg of purified DNA Conversion Efficiency: > 99.5% Format: Spin Column Elution Volume: ≥ 10 µl DNA Recovery: > 80% Bisulfite Conversion Time: 1.5 hours	Rapid bisulfite treatment; Rapid column/plate/bead desulphonation
EZ-96 DNA Methylation-Lightning® Kit (shallow-well)	D5032	2 x 96 rxns	Input: 100 pg to 2 µg of purified DNA Conversion Efficiency: > 99.5% Format: 96-Well Elution Volume (shallow-well): ≥ 30 µl Elution Volume (deep-well): ≥ 15 µl DNA Recovery: > 70% Bisulfite Conversion Time: 1.5 hours	
EZ-96 DNA Methylation-Lightning® Kit (deep-well)	D5033	2 x 96 rxns		
EZ-96 DNA Methylation-Lightning® MagPrep Kit	D5046 D5047	4 x 96 rxns 8 x 96 rxns	Input: 100 pg to 2 µg of purified DNA Conversion Efficiency: > 99.5% Format: Magnetic Beads Elution Volume: ≥ 25 µl DNA Recovery: > 70% Bisulfite Conversion Time: 1.5 hours	

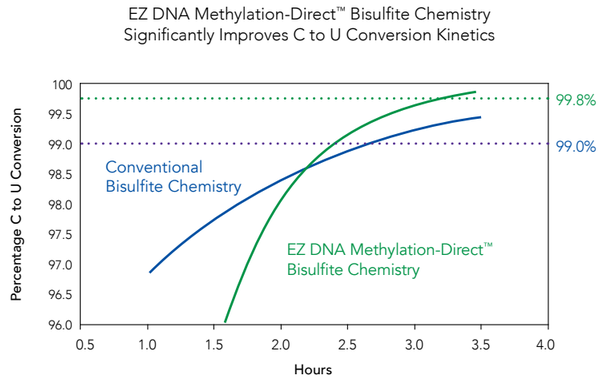
EZ DNA Methylation-Direct™ Kits

- ***No Purification Necessary:*** *Complete bisulfite conversion of DNA directly from blood, soft tissue, cells, FFPE, and LCM samples.*
- ***Low Input:*** *Compatible with small sample inputs, as few as 10 cells or 50 pg DNA.*
- ***High Quality DNA:*** *Converted DNA is ready for PCR, Next-Gen Sequencing, and MSP.*

Description

The EZ DNA Methylation-Direct™ Kit is a further refinement of our popular EZ DNA Methylation™ and EZ DNA Methylation-Gold® kits. The EZ DNA Methylation-Direct™ Kit features reliable and complete bisulfite conversion of DNA 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. Recovered bisulfite-converted DNA is ideal for PCR amplification for downstream analyses including restriction endonuclease digestion, sequencing, microarrays, etc.





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. This data shows that EZ DNA Methylation-Direct™ bisulfite chemistry improves the rate and extent (> 99.8%) of C to U conversion of DNA compared to conventional bisulfite chemistry.

Product	Cat. No.	Size	Specifications	Uses
EZ DNA Methylation-Direct™ Kit	D5020 D5021	50 rxns 200 rxns	Input: DNA, Cells, Blood, Tissue, FFPE (as few as 10 cells or 50 pg) Conversion Efficiency: > 99.5% Format: Spin-Column Elution Volume: ≥ 10 µl DNA Recovery: > 80% Bisulfite Conversion Time: 4 hours	DNA digestion; Bisulfite treatment; Rapid column/plate/bead desulphonation
EZ-96 DNA Methylation-Direct™ Kit (shallow-well)	D5022	2 x 96 rxns	Input: DNA, Cells, Blood, Tissue, FFPE (as few as 10 cells or 50 pg) Conversion Efficiency: > 99.5% Format: 96-Well Elution Volume (shallow-well): ≥ 30 µl Elution Volume (deep-well): ≥ 15 µl DNA Recovery: > 70% Bisulfite Conversion Time: 4 hours	
EZ-96 DNA Methylation-Direct™ Kit (deep-well)	D5023	2 x 96 rxns		
EZ-96 DNA Methylation-Direct™ MagPrep Kit	D5044 D5045	4 x 96 rxns 8 x 96 rxns	Input: DNA, Cells, Blood, Tissue, FFPE (as few as 10 cells or 50 pg) Conversion Efficiency: > 99.5% Format: Magnetic Beads Elution Volume: ≥ 25 µl DNA Recovery: > 70% Bisulfite Conversion Time: 4 hours	

EZ DNA Methylation™ Kits

Description

The EZ DNA Methylation™ Kit features a simplified procedure that streamlines bisulfite treatment of DNA. This kit is the original bisulfite conversion kit from Zymo Research. The EZ DNA Methylation™ Kit is based on the three-step reaction that takes place between cytosine and sodium bisulfite where cytosine is converted into uracil. Innovative desulphonation technologies eliminate otherwise cumbersome precipitations. Designed to reduce template degradation, this kit minimizes 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 recommended with Illumina's GoldenGate® and Infinium® Assays.

Product	Cat. No.	Size	Specifications	Uses
EZ DNA Methylation™ Kit	D5001 D5002	50 rxns 200 rxns	Input: 500 pg - 2 µg of purified DNA Conversion Efficiency: > 99% Format: Spin Column Elution Volume: ≥ 10 µl DNA Recovery: > 80% Bisulfite Conversion Time: 12-16 hours	Bisulfite treatment; Rapid column/plate/bead desulphonation
EZ-96 DNA Methylation™ Kit (shallow-well)	D5003	2 x 96 rxns	Input: 500 pg - 2 µg of purified DNA Conversion Efficiency: > 99% Format: 96-Well Elution Volume (shallow-well): ≥ 30 µl Elution Volume (deep-well): ≥ 15 µl DNA Recovery: > 70% Bisulfite Conversion Time: 12-16 hours	
EZ-96 DNA Methylation™ Kit (deep-well)	D5004	2 x 96 rxns		
EZ-96 DNA Methylation™ MagPrep Kit	D5040 D5041	4 x 96 rxns 8 x 96 rxns	Input: 500 pg - 2 µg of purified DNA Conversion Efficiency: > 99% Format: Magnetic Beads Elution Volume: ≥ 25 µl DNA Recovery: > 70% Bisulfite Conversion Time: 12-16 hours	

EZ DNA Methylation-Gold® Kits

Description

The EZ DNA Methylation-Gold® Kit is a refinement of our popular EZ DNA Methylation™ Kit. The EZ DNA Methylation-Gold® Kit consolidates DNA denaturation and bisulfite conversion processes into one step, resulting in a much faster bisulfite conversion. 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.

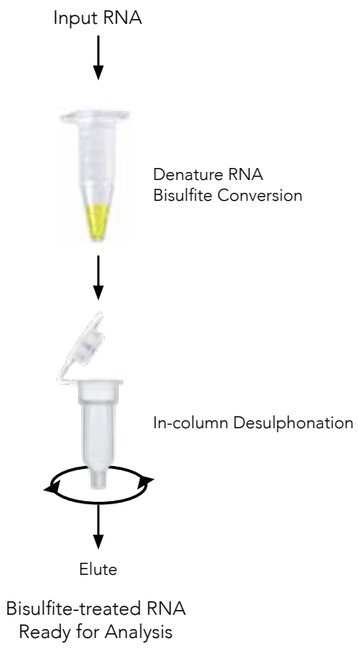
Product	Cat. No.	Size	Specifications	Uses
EZ DNA Methylation-Gold® Kit	D5005 D5006	50 rxns 200 rxns	Input: 500 pg - 2 µg of purified DNA Conversion Efficiency: > 99% Format: Spin Column Elution Volume: ≥ 10 µl DNA Recovery: > 75% Bisulfite Conversion Time: 3 hours	Bisulfite treatment; Rapid column/plate/bead desulphonation
EZ-96 DNA Methylation-Gold® Kit (shallow-well)	D5007	2 x 96 rxns	Input: 500 pg - 2 µg of purified DNA Conversion Efficiency: > 99% Format: 96-Well Elution Volume: ≥ 15 µl DNA Recovery: > 75% Bisulfite Conversion Time: 3 hours	
EZ-96 DNA Methylation-Gold® Kit (deep-well)	D5008	2 x 96 rxns		
EZ-96 DNA Methylation-Gold® MagPrep Kit	D5042 D5043	4 x 96 rxns 8 x 96 rxns	Input: 500 pg - 2 µg of purified DNA Conversion Efficiency: > 99% Format: Magnetic Beads Elution Volume: ≥ 25 µl DNA Recovery: > 75% Bisulfite Conversion Time: 3 hours	

EZ RNA Methylation® Kit

- *Fast and reliable bisulfite conversion of RNA for methylation analysis.*
- *Specifically optimized for complete conversion of non-methylated cytosine in RNA.*
- *Ideal for all RNA inputs.*
- *Complete conversion of RNA in as little as 1 hour.*

Description

The EZ RNA Methylation® Kit features rapid and reliable bisulfite treatment and conversion of cytosines in RNA for methylation analysis. The kit streamlines the three-step process for complete conversion of cytosine into uracil, and includes ready-to-use conversion reagent. RNA denaturation and bisulfite conversion processes are combined into a single step. No buffer preparation is necessary. Innovative in-column desulphonation technology eliminates messy precipitation steps to ensure consistent results. The product has been designed to minimize template degradation, loss of RNA during treatment and clean-up, and to provide complete conversion of cytosine for accurate methylation analysis. Recovered RNA is ideal for RT-PCR, sequencing, library preparation and Next-Generation sequencing.

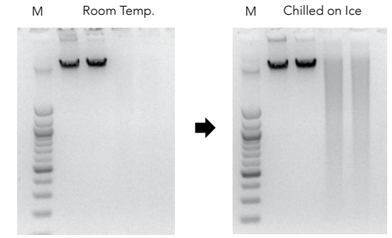


Product	Cat. No.	Size	Specifications	Uses
EZ RNA Methylation® Kit	R5001 R5002	50 preps 200 preps	Input: 32 ng - 3 µg of DNA-free RNA Conversion Efficiency: > 99% RNA Recovery: > 80% Processing Time: 50 minutes	Rapid bisulfite treatment; Rapid column/plate/bead desulphonation

Tips for Bisulfite-treated DNA

Visualizing Bisulfite-Treated DNA
Bisulfite-treated DNA can be visualized in agarose/EtBr gels following electrophoresis using a standard UV-light source. Now that the bisulfite-converted DNA is single-stranded and has limited base-pairing at room temperature, it is necessary to cool the gel on ice for 5-10 minutes prior to visualization. This will drive some base pairing between the single-stranded molecules and allow recovered material to be visible.

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 recovered DNA is now single-stranded and the original base-pairing no longer exists. The absorption coefficient at 260 nm will resemble that of RNA, thus a value of 40 ug/mL for A260 = 1.0 should be used when determining the concentration.



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 desulphonated then purified. 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).

PCR of Bisulfite Converted DNA
Generally, primers of 26 to 32 bases are required for amplification of bisulfite-converted DNA. In general, all Cs should be treated as Ts for primer design purposes, unless they are in a CpG context. See example below.

Template: 5′ - GACCGTTCCAGGTCCAGCAGTGCGCT - 3′
Bisulfite Converted: 5′ - GATCGTTTTAGGTTTAGTAGTGCGTT - 3′
Primers Reverse: 3′ - ATCATCACRCAA - 5′
Forward: 5′ - GATYGTTTTAGGT - 3′

R = G/A
Y = C/T

Only the reverse primer binds to the converted DNA, the forward primer will bind to the strand generated by the reverse primer. If the primer contains CpG dinucleotides with uncertain methylation status, then mixed bases with C and T can be used (see above). Usually, there should be no more than one mixed position per primer and it 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. Zymo Research's Bisulfite Primer Seeker (http://www.zymoresearch.com/bisulfite-primer-seeker) is a useful resource when designing primers for bisulfite PCR.

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 optimized PCR conditions. Annealing temperatures between 55 - 60°C typically work well. As most non-methylated cytosine residues are converted to uracil, the bisulfite-treated DNA is usually AT-rich and has low GC composition. 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. 38) is strongly recommended for the amplification of bisulfite-treated DNA.

Primer Design for Bisulfite and Methylation Specific PCR

Bisulfite-converted DNA can be analyzed by a variety of methods: Bisulfite Sequencing PCR, Methylation Specific PCR, Pyrosequencing, Next-Generation sequencing platforms and many others. The two most common techniques for locus-specific determination of methylation are Bisulfite Sequencing PCR and Methylation Specific PCR. Below is a guide to help you choose the best workflow for your needs:

Purify DNA or use EZ DNA Methylation-Direct™ Kits (p. 14)

Bisulfite convert DNA using our EZ DNA Methylation™ Kits and purify bisulfite DNA

Quantify DNA and assess DNA quality
- UV/Vis Spectroscopy
- Agarose Gel

Bisulfite Sequencing PCR (BSP)
Quantitative single-base resolution of methylated cytosines within your region of interest.

Design Bisulfite PCR Primers
- Bisulfite PCR primers need to be long, usually between 26-30 bases.
- Amplicon size 150-300 bp.
- Primer can contain a mixed base at the cytosine position.
- 35 to 40 cycles are required for successful amplification.
- Annealing temperatures between 55-60°C typically work well.
- Annealing temperature gradient should be run with every new primer set to ensure optimal amplification of the specific target.

Conduct PCR using a hot start polymerase

Visualize PCR products on agarose gel

Use Zymoclean™ (p. 94) to extract amplicon from gel

Insert PCR product into vector

Clone into *E. coli* and grow (*Mix & Go!*™ Cells, p. 165)

Sequencing with vector-specific primers by Sanger Sequencing

Methylation Specific PCR (MSP)
Qualitative identification of a few methylated cytosines within your primer binding regions.

Design Methylation Specific Primer Sets
- Need to design methylated and non-methylated primer sets.
- Place 2 to 4 CpG sites in each primer set with the CpG sites located as close as possible to the 3' end of each of the primers.
- An optimal primer will have at least 4 non CpG cytosines to distinguish between converted and non-converted templates.
- An ideal melting temperature is 55 - 62°C for both primer sets. Melt temperatures between each primer set must not be bigger than a 1 - 2°C difference. It is okay if the non-methylated primer set is longer to help increase the melting temperature so it is similar to the methylated set.
- Amplicon length should be a max of 300 bp.
- Check your primers for hairpins and dimers. Also be sure to BLAST® your primers.

Validate your primer sets with the proper controls and proper conditions. Check out our MSP Guide!

Conduct PCR with a hot start polymerase like Zymo*Taq*™ (p. 38)

Visualize PCR products on agarose gel

BLAST® is a registered trademark of the National Library of Medicine.

Frequently Asked Questions

Should the input DNA be dissolved in TE, water, or some other buffer prior to treatment with Zymo Research's bisulfite kits?
Water, TE, or modified TE buffers can be used to dissolve DNA and do not interfere with the conversion process.

Why am I not getting complete conversion of DNA using the EZ DNA Methylation-Direct™ Kit?
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 following the Proteinase K digestion, it may interfere with the bisulfite conversion process resulting in incomplete conversion of the DNA.

Which Taq polymerase(s) do you recommend for PCR amplification of bisulfite-converted DNA?
We recommend a "hot-start" DNA polymerase (e.g., Zymo*Taq*™ DNA Polymerase, p.38).

Why are there two different catalog numbers for the EZ-96 DNA Methylation™ product lines?
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. It is recommended to use the deep-well binding plates if possible.

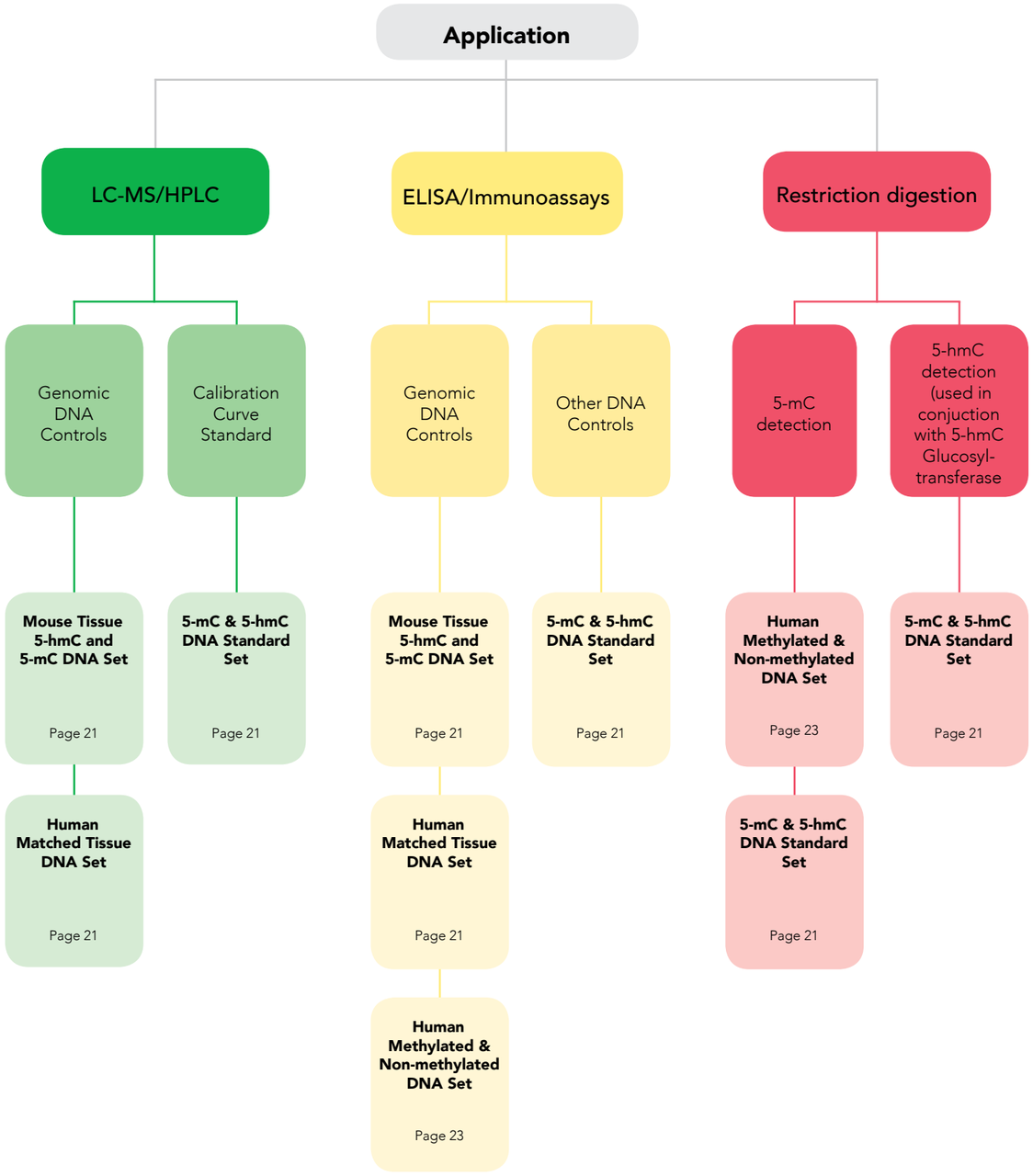
	Silicon-A™	Zymo-Spin™ I-96
Style	Shallow-well	Deep-well
Dimensions of Binding Plate (H x W x L)	19 mm x 83 mm x 125 mm	35 mm x 83 mm x 125 mm
Height of Binding / Collection Plate Assembly	43 mm	60 mm
Binding Capacity / Minimum Elution Volume	5 µg / 30 µl per well	5 µg / 15 µl per well
EZ DNA Methylation™ Kits' Cat. No.	D5003, D5007, D5022, D5032	D5004, D5008, D5023, D5033

Are your bisulfite kits compatible with technologies from Illumina®?
Yes. The EZ DNA Methylation™ Kit technologies from Zymo Research are recommended by Illumina® for GoldenGate® and Infinium® Assays.

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

EpiTYPER® is a registered trademark of Sequenom, Inc. GoldenGate® and Infinium® are registered trademarks of Illumina, Inc.

Choose Your Epigenetic Standards



Matched DNA Sets

- ***High Quality:*** *Set of organ-specific human genomic DNA originating from a single individual.*
- ***Accurate:*** *Precisely quantified levels of 5-methylcytosine & 5-hydroxymethylcytosine via LC/MS.*
- ***Versatile:*** *Useful control for detection methods of 5-methylcytosine or 5-hydroxymethylcytosine.*

Description

Matched DNA Sets are an ideal control for detection and/or quantification methods against 5-mC and 5-hmC as both modified cytosines are present at physiologically relevant levels and loci.

The Human Matched Tissue DNA Set is a set of organ-specific human genomic DNAs, originating from a single individual. The Mouse Tissue 5-hmC & 5-mC DNA Set contains organ-specific mouse genomic DNAs, isolated from a pool of 8-10 week old Swiss Webster mice. The levels of 5-mC and 5-hmC have been precisely quantified by mass spectrometry (LC/MS).

5-mC & 5-hmC DNA Standard Set

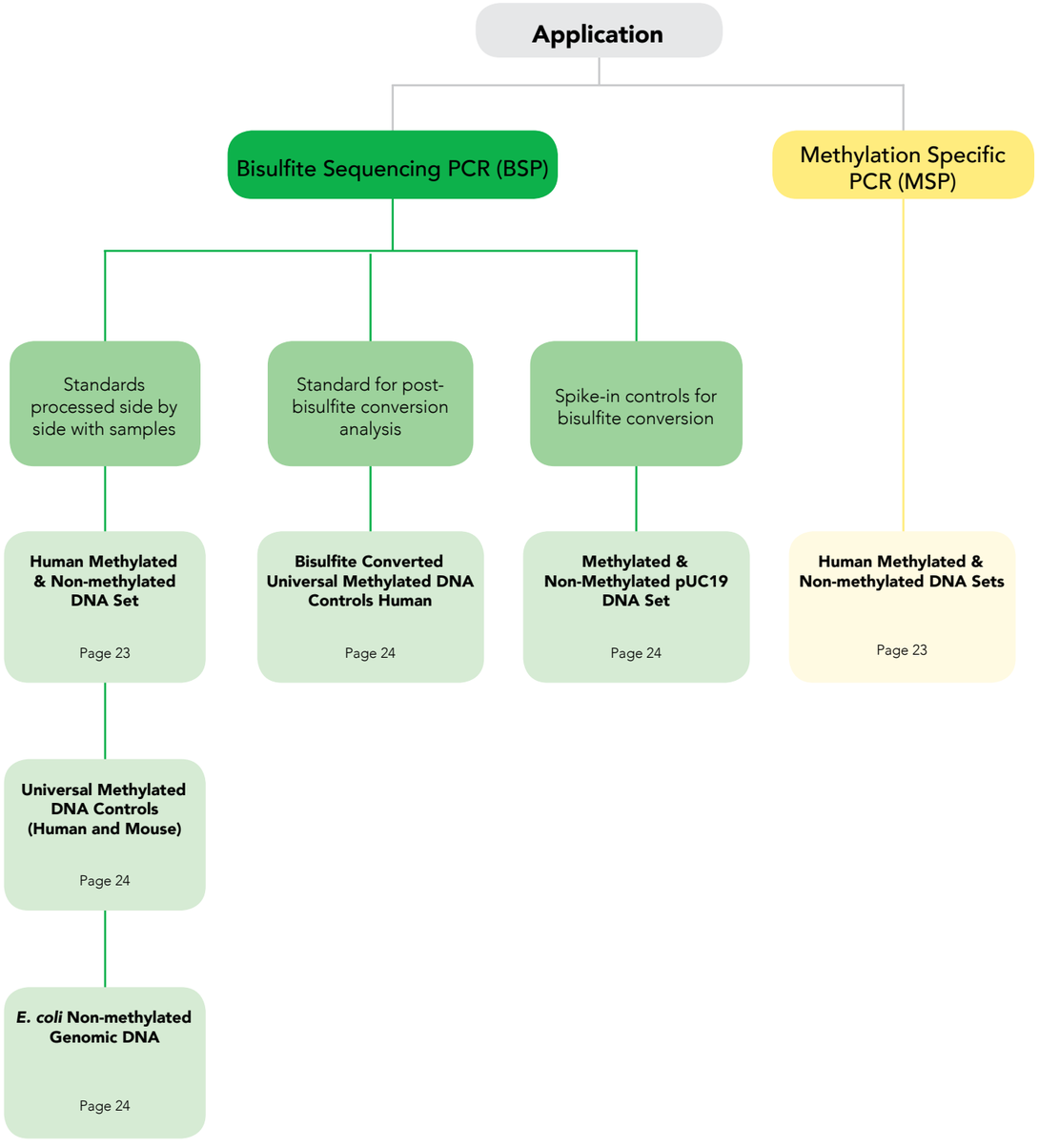
- *Control DNA for 5-methylcytosine (5-mC) and 5-hydroxymethylcytosine (5-hmC) quantitation applications (i.e. - mass spectrometry, HPLC, TLC, etc.).*
- *Substrate for studies involving 5-hmC interacting proteins.*

Description

The 5-mC & 5-hmC DNA Standard Set features three DNA standards, which contain linear dsDNA, which have the same sequence. Each of the three standards are identical except in cytosine modification: 1) 100% unmodified cytosines 2) 5-mC 3) 5-hmC. 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.

Product	Cat. No.	Size	Specifications	Uses
Human Matched DNA Set	D5018	1 set	Source: Human Male Concentration: 250 ng/µl	Control for bisulfite conversion; DNA methylation quantitation
Mouse 5-hmC & 5-mC DNA Set	D5019	1 set	Source: Swiss Webster Mice Concentration: 250 ng/µl	
5-mC & 5-hmC DNA Standard Set	D5405	1 set	DNA Amount: 2 µg each DNA Concentrations: 50 ng/µl each	Cytosine modification studies (i.e 5-mC & 5-hmC); HPLC; Mass Spec; TLC

Choose Your Epigenetic Standards (continued)



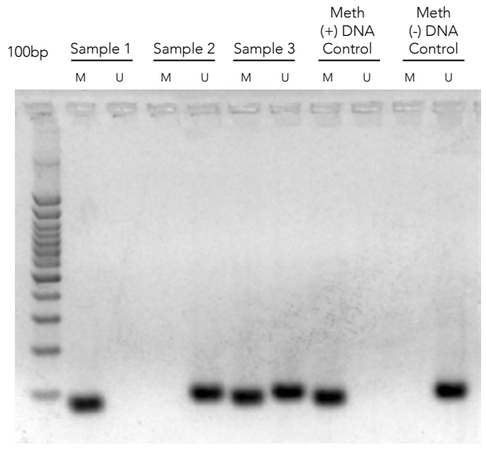
Human Methylated & Non-Methylated DNA Set

- ***Ideal Positive and Negative Controls:*** *DNA standards, purified from HCT116 DKO cell line, for use as positive and negative controls in methylation-detection applications including bisulfite PCR (BSP) and methylation-specific PCR (MSP) experiments.*
- ***Standard Curve Generation:*** *Completely methylated and non-methylated DNA can be mixed together in various proportions to generate a standard curve for suitable quantitation of DNA methylation in experimental samples.*
- ***Convenient:*** *Provided with control primers to amplify a fragment of DNA after bisulfite conversion.*

Description

The Human Methylated & Non-methylated DNA Set consists of two control DNAs (a CpG methylated human DNA standard and a non-methylated human DNA standard), with a set of specifically designed primers that can be used in conjunction with the EZ DNA Methylation™ family of products (p. 12-15). These DNA sets can be included as a positive and negative control 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 methylated DNA standard is purified HCT116 DKO DNA that has been enzymatically methylated at CpG sites.



Example MSP experiment using MSP designed primers for RASSF1. Sample 1 is positive for a Methylated Template. Sample 2 is positive for a Non-Methylated Template and Sample 3 contains Methylated and Non-Methylated Templates. MSP experiment also shows proper controls: Meth (+) DNA Control D5014-2 Human Methylated DNA, Meth (-) DNA Control D5014-1 Human Non-methylated DNA. 2% Agarose Gel, 130V for 35 mins. M = Methylated specific primers, U = Non-Methylated specific primers

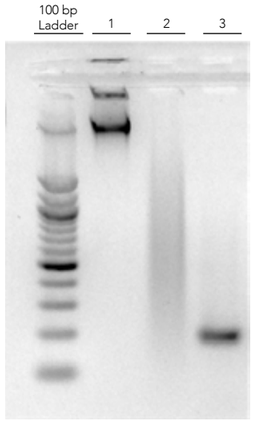
Product	Cat. No.	Size	Specifications	Uses
Human WGA Methylated & Non-methylated DNA Set	D5013	1 set	Format: HCT116 DKO Genomic DNA Concentration: 250 ng/µl	Control for bisulfite conversion; DNA methylation quantitation
Human Methylated & Non-methylated DNA Set	D5014	1 set	Format: HCT116 DKO Genomic DNA Concentration: 250 ng/µl	

Universal Methylated DNA Standards

- ***Ideal Highly-Methylated Controls:*** *Purified DNA from normal human or mouse tissue that is enzymatically methylated at all CpG sites for use as a positive control.*
- ***Side-by-Side Processing:*** *Standards can be processed in parallel with experimental samples to monitor bisulfite conversion efficiency.*
- ***Convenient:*** *Provided with control primers to amplify a fragment of DNA after bisulfite conversion.*

Description

The Universal Methylated DNA Standards are designed for use as positive controls to assess the efficiency of bisulfite-mediated conversion of DNA in combination with the EZ DNA Methylation™ family of products (p. 12-15). The control DNAs can be assayed in parallel with samples to monitor the bisulfite conversion reaction. Each primer set has been designed to amplify a fragment of the supplied DNA following bisulfite treatment.



Gel electrophoresis depicting genomic DNA, bisulfite-converted genomic DNA, and genomic DNA amplified with bisulfite-specific primers. Lane 1 – Input DNA: Universal Methylated Human DNA Standard (D5011). Lane 2 – Bisulfite-converted Universal Methylated Human DNA (D5011) using EZ DNA Methylation-Direct™ Kit (D5020). Lane 3 – Universal Methylated Human DNA (D5011) bisulfite converted and amplified with supplied hMLH1 control primers.

Additional Bisulfite Conversion Controls

Description

The Methylated & Non-methylated pUC19 DNA Set consists of control DNAs and a set of specifically designed primers. The set is ideal as a "spike-in" control to assess bisulfite conversion efficiency within the same reaction as the sample, or to produce known mixtures of methylated and non-methylated DNA for assay calibration. The non-methylated pUC19 DNA is pUC19 isolated from a methylation-negative strain of bacteria (Dam–, Dcm–), and the methylated pUC19 DNA is pUC19 enzymatically methylated at all cytosines in the dinucleotide sequence 5'...CpG...3' by CpG Methylase (p. 41).

E. coli non-methylated genomic DNA is from a Dam– and Dcm– strain (ER2925) of *E. coli*. It works perfectly as a negative control 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.

Product	Cat. No.	Size	Specifications	Uses
Universal Methylated Human DNA Standard	D5011	1 set	Format: Male Genomic DNA Concentration: 250 ng/µl	Control for bisulfite conversion; DNA methylation quantitation
Universal Methylated Mouse DNA Standard	D5012	1 set		
Bisulfite-converted Universal Methylated Human DNA Standard	D5015	1 set	Format: Bisulfite-converted Male Genomic DNA Concentration: 20 ng/µl	
E. coli Non-methylated Genomic DNA	D5016	5 µg	Format: *E. coli* Genomic DNA Concentration: 250 ng/µl	
Methylated & Non-methylated pUC19 DNA Set	D5017	20 ng	Format: Linearized Plasmid Concentration: 1 ng/µl	

5-mC DNA ELISA Kit

- ***Accurate Quantification:*** *Sensitive and specific quantification of 5-methylcytosine (5-mC) DNA from a variety of samples.*
- ***High-Throughput:*** *96-well format is ideal for processing just a few samples to a large number of samples.*
- ***Simple:*** *The streamlined workflows can be completed in 4 hours or less.*

Description

The 5-mC DNA ELISA Kit empowers researchers to accurately quantitate 5-mC for any DNA sample in less than 3 hours. The kit features an Anti-5-mC Monoclonal Antibody (p. 26) that is both sensitive and specific for 5-mC. The assay is compatible with a wide range of input DNA from vertebrate, plant, and microbial sources as well as fragmented DNA. All samples can be accurately quantified from a standard curve generated with specially designed controls included with the kit.

The 5-mC DNA ELISA Kit can quantify 5-mC in numerous DNA samples with close correlation to LC-MS. 100 ng of genomic DNA from mouse brain (MB), mouse kidney (MK), mouse thymus (MT), human brain (HB), human spleen (HS), and *E. coli* ER2925 were used to coat wells, in triplicate. Percent 5-mC was calculated using the logarithmic equation of the line from the standard curve that was constructed with the Negative Control and the Positive Control. The percent 5-mC calculated in DNA samples using the 5-mC DNA ELISA Kit (ELISA) strongly correlates to mass spectrometry (MS) data of 5-mC found in the respective gDNA sample.

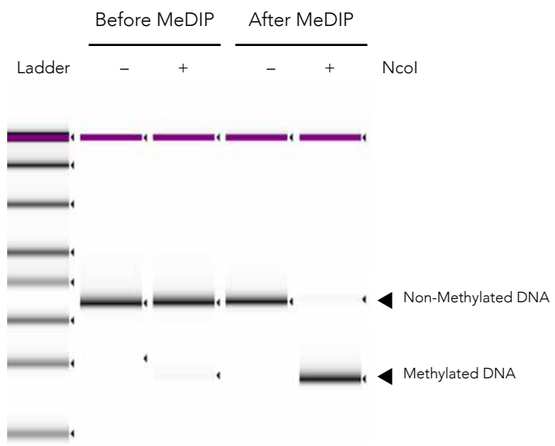
Product	Cat. No.	Size	Specifications	Uses
5-mC DNA ELISA Kit	D5325 D5326	1 x 96 rxns 2 x 96 rxns	DNA Input: 10 - 200 ng Detection: ≥ 0.5% 5-mC per 100 ng Assay Time: 3 - 4 hours	Global 5-mC detection and quantitation

Anti-5-Methylcytosine Monoclonal Antibody (Clone 7D21)

- ***Sensitive:*** *Specifically binds to 5-methylcytosine in ssDNA context.*
- ***Specific:*** *No detectable cross reactivity with non-methylated cytosine.*
- ***Versatile:*** *Can be used in ELISA, IP, and IF applications.*

Description

The mouse Anti-5-Methylcytosine Monoclonal Antibody (Clone 7D21) is exceptional at differentiating between methylated and non-methylated cytosines in DNA. The antibody binds to 5-mC in single-stranded DNA, with no detectable cross reactivity to non-methylated cytosines. This product is ideal for immuno-based assays such as methylated DNA Immunoprecipitation (MeDIP), ELISA and dot blot.



Efficient enrichment of methylated DNA using Methylated-DNA IP Kit. DNA comprised of a mixture of methylated/non-methylated DNA (1:4 ratio) and immunoprecipitated following the Cat. No. D5101 protocol. Digestion of amplicons with NcoI produced two 175 bp fragments for methylated DNA control or one 350 bp fragment for non-methylated control. The results show an efficient enrichment of methylated DNA vs. non-methylated DNA in immunoprecipitated DNA (After MeDIP) compared to non-precipitated (Before MeDIP) samples. The products were visualized using D1000 Tape on TapeStation 2200 (Agilent, Santa Clara, CA).

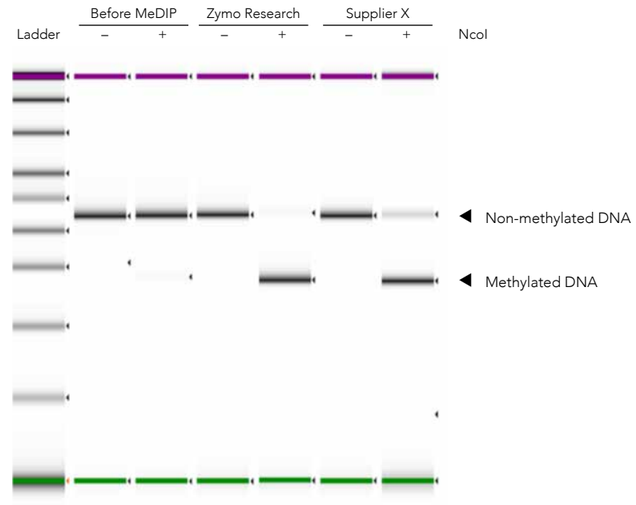
Product	Cat. No.	Size	Specifications	Uses
Anti-5-Methylcytosine Monoclonal Antibody (Clone 7D21)	A3002-15 A3002-30 A3002-50 A3002-200	15 µl 30 µl 50 µl 200 µl	Isotype: IgG1 Concentration: 5 µg/µl Buffer: PBS (pH 7.4) 0.05% Sodium Azide Short Term Storage: 4°C Longe Term Storage: -80°C	Immunoprecipitation of methylated DNA; ELISA; Immunoblotting; Immunofluorescence

Methylated-DNA IP Kit

- ***Robust:*** *Enrichment & immunoprecipitation of 5-mC containing DNA.*
- ***Streamlined:*** *Includes a highly specific anti-5-methylcytosine monoclonal antibody for defined, reproducible results.*
- ***High-Quality:*** *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 is designed for enrichment of 5-mC-containing DNA from any pool of fragmented genomic DNA for use in genome-wide methylation analysis. It features a highly specific Anti-5-Methylcytosine Monoclonal Antibody for the immunoprecipitation of methylated DNA in only a few hours. This kit is capable of achieving over one hundred-fold enrichment of methylated DNA vs. non-methylated DNA. 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. Control DNA and primers are included to monitor the success of the assay.



Methylated DNA is efficiently enriched using the 5-Methylcytosine antibody. Control DNA comprised of a mixture of methylated/non-methylated was immunoprecipitated using mouse Anti-5-Methylcytosine antibody from Zymo or Supplier X. The methylated DNA contains point a mutation that introduces an NcoI restriction site. After immunoprecipitation of the mixture, the region of DNA containing the restriction site was amplified by PCR, digested with NcoI, and visualized using the Agilent 2200 Tapestation®. Non-methylated DNA remains un-cut, whereas the methylated DNA is cut by NcoI. The image above demonstrates specific enrichment of methylated versus non-methylated DNA by the Anti-5-Methylcytosine from Zymo compared to Supplier X.

Product	Cat. No.	Size	Specifications	Uses
Methylated-DNA IP Kit	D5101	10 rxns	Format: Magnetic Beads Optimal DNA Input: 50 - 500 ng Elution Volume: 10 µl Enrichment Factor: > 100 fold Processing Time: 4 hours	Immunoprecipitation of methylated DNA; PCR; Sequencing

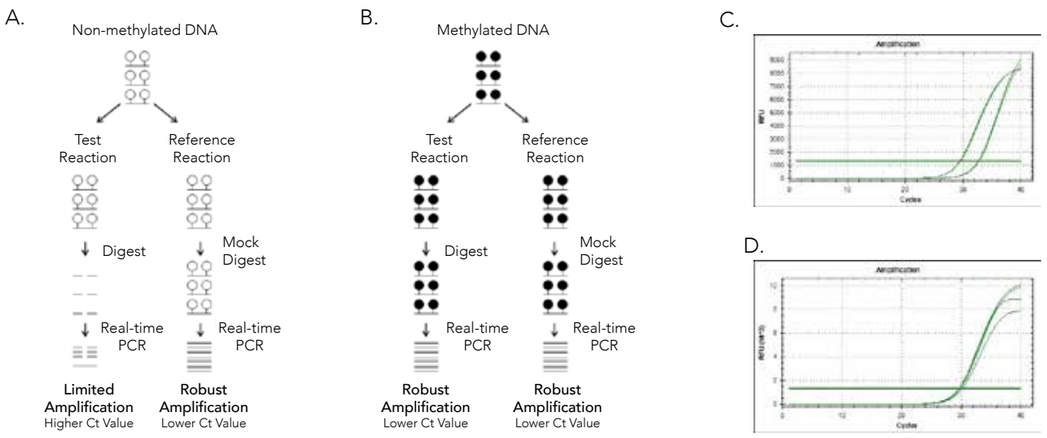
OneStep qMethyl™ Kits

- *Single step, bisulfite-free DNA methylation analysis.*
- *Includes reagents and controls for quantitative detection and reliable performance.*
- *Ideal for rapid screening of single and multi-locus DNA methylation.*

Description

The *OneStep* qMethyl™ Kit provides a simple, bisulfite-free procedure for rapid, locus-specific DNA methylation assessment via the selective amplification of a methylated region of DNA.

This is accomplished by splitting any DNA to be tested into two parts: a "Test Reaction" and a "Reference Reaction" (see figure below). DNA in the Test Reaction is digested with Methylation Sensitive Restriction Enzymes (MSREs) while DNA in the Reference Reaction is not. The DNA from both samples is then amplified using real-time PCR in the presence of SYTO®9 fluorescent dye and then quantitated. The "Lite" version allows real-time PCR to be performed with other fluorescent dyes or molecular probes of the researcher's choosing.



Rapid bisulfite-free methylation analysis is efficiently performed using the *OneStep* qMethyl™ Kit. Schematics A and B (above) illustrate the sample workflow of Non-methylated DNA and Methylated DNAs. Test Reaction samples are MSRE digested while the Reference Reaction samples are not (mock digested). Following digestion, DNA from both samples is used for real-time PCR. The white lollipops in the image represent unmethylated cytosines and black lollipops methylated cytosines in CpG dinucleotide context. Following real-time PCR, amplification plots (C and D) demonstrate non-methylated DNA exhibits large differences in the Ct values for Test and Reference Reactions (C) while highly methylated DNA samples exhibit little difference (D).

Product	Cat. No.	Size	Specifications	Uses
OneStep qMethyl™ Kit	D5310	1 x 96 well	Format: 96-Well Plate Detection Dye: SYTO® 9 DNA Input: 20 ng in 5 µl Thermocycler Compatibility: Roche LightCycler 480®, Bio-Rad CFX96™, ABI 7500 or similar Processing Time: ~4 hours	Bisulfite-free DNA methylation analysis; Rapid screening of multiple loci or single locus across multiple samples
OneStep qMethyl™-Lite	D5311	1 x 96 well		

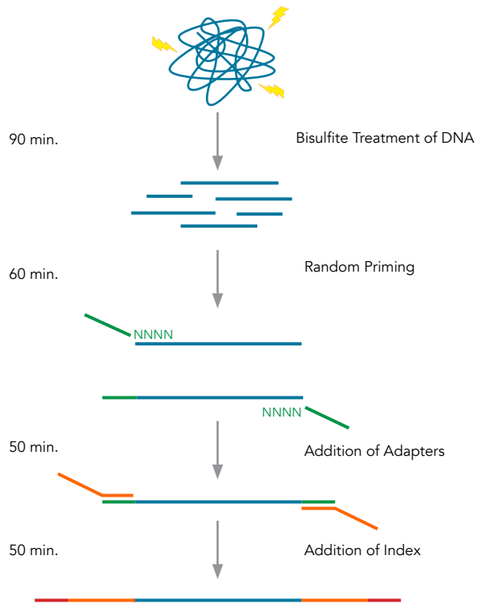
SYTO® is a registered trademark of Molecular Probes, Inc.

Pico Methyl-Seq™ Library Prep Kit

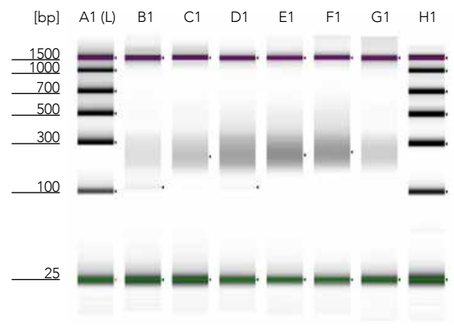
- ***All-inclusive:*** *Complete solution for bisulfite conversion followed by Whole Genome Bisulfite Sequencing (WGBS) library preparation.*
- ***Low input:*** *Accommodates ultra-low DNA input (down to 10 pg) and is compatible with FFPE samples.*
- ***Simple:*** *Ligation- and gel-free workflow can be completed in a few hours.*

Description

The Pico Methyl-Seq™ Library Prep Kit provides a streamlined workflow for making WGBS libraries. Britely, input DNA is randomly fragmented during the initial bisulfite treatment step followed by three rounds of amplification with uniquely designed primers. The procedure can accommodate as little as 10 pg input DNA (including that derived from FFPE samples), making it ideal for methylation analysis of precious, limited, and target-enriched samples.



Pico Methyl-Seq™ libraries ready for sequencing.



Agilent 2200 TapeStation® D1K gel of libraries prepared (from B1-G1) using 10 pg, 20 pg, 100 pg, 1 ng, 10 ng, and 100 ng, respectively.

Product	Cat. No.	Size	Specifications	Uses
Pico Methyl-Seq™ Library Prep Kit	D5455 D5456	10 preps 25 preps	DNA Input: 10 pg - 100 ng DNA Samples: Genomic DNA, FFPE DNA Sequencing Platform Compatibility: Illumina TruSeq chemistries for Hi-Seq® and MiSeq® sequencing platforms	DNA methylation library preparation for WGBS

The Double Helix Epigenetic Switch™:

5-methylcytosine and 5-hydroxymethylcytosine Exert Opposite Forces on Base Pairing of DNA Double Helix

Ron Leavitt, James Yen, Xi-Yu Jia
Zymo Research Corporation

Abstract

DNA base pairing governs the fundamental function of DNA in life. Importantly, annealing and unwinding of base-paired double helical DNA strands are essential for DNA replication and transcription processes. Moreover, epigenetic DNA base modifications are thought to be involved in regulation of DNA at all levels in higher organisms. Our recent research into DNA base modifications has shown that 5-methylcytosine (5-mC) and 5-hydroxymethylcytosine (5-hmC) modifications dramatically change the properties of C:G base pairing. In contrast to the 5-mC:G pairing, which increases the base pairing stability relative to normal C:G pairing, we find that 5-hmC:G base pairing greatly decreases stability relative to both C:G and 5-mC:G base pairing. It is evident that cytosine epigenetic modifications provide another layer of hidden codes, which serve as a "lock", neutral and "unlock" mechanism on DNA beyond the canonical genetic codes. We call this the Double Helix Epigenetic Switch™.

Introduction

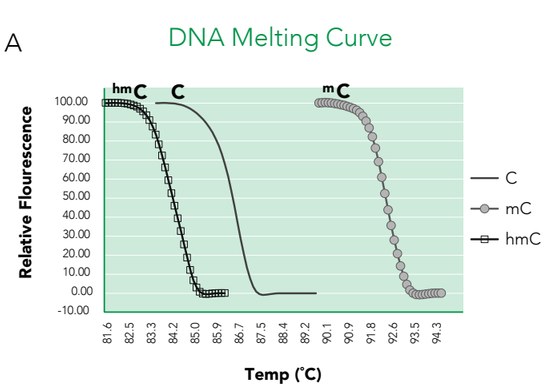
DNA is the blueprint for life, coding all of the genes needed in each cell within each tissue in all organisms on Earth. It has been over half a century since the discovery of the DNA double helix and uncovering of genetic codes. In the last decade, the development of epigenetic understanding has further elucidated some fundamental mechanisms of how genes are organized, regulated and inherited through elaborated epigenetic regulation mechanisms. In addition, the century old debate on nature versus nurture has finally begun to converge into a more complete picture of biology, where genetics and epigenetics are both considered. It is now clear that both nature and nurture are important.

Cytosine modifications in both 5-mC and 5-hmC are two important epigenetic markers and their involvement in gene regulation has been intensively studied in the last decade. Although fundamental A:T and C:G base pairings are well known for the DNA double helix structure, the direct biochemical effects of epigenetically modified bases of 5-mC and 5-hmC on DNA has not been thoroughly investigated. Here we report the 5-mC and 5-hmC base modification effects on C:G base pairing and the overall effects on dsDNA stability.

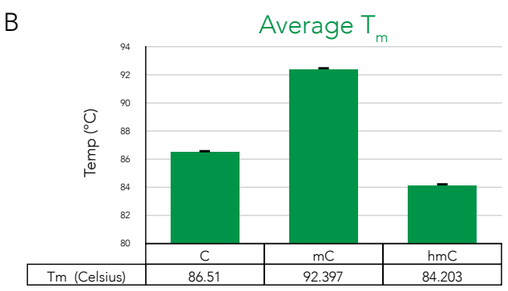
Results and Discussion

5-mC and 5-hmC exert opposite forces on DNA stability. High resolution melting (HRM) analysis was used to measure the dsDNA stability. This analysis directly measures DNA as either dsDNA (base-paired) or single stranded (denatured) status. This was used as a measurement of DNA stability for different cytosine modifications in a 897bp DNA fragment (5-methylcytosine & 5-hydroxymethylcytosine DNA Standard Set, D5405, Zymo Research) with relative evenly distributed G, A, T and C. The C was either 100% native C, or 100% 5-mC or 5-hmC.

A



B



	C	mC	hmC
Tm (Celsius)	86.51	92.397	84.203

Figure 1. 5-Hydroxymethylcytosine decreases thermodynamic stability of DNA. Procedure: (A) Melting curves of DNA standards containing 100% of their cytosine as either unmodified cytosine (C), 5-methylcytosine (5-mC), or 5-hydroxymethylcytosine (5-hmC) were analyzed by high resolution melting (HRM). Samples were done in triplicate and averages were plotted. (B) Tm's were calculated by finding the 50% relative fluorescence levels.

The 5-mC containing DNA showed a dramatic increase in DNA melting temperature, on the other hand, the 5-hmC showed a dramatic decrease in DNA melting temperature (Fig 1A). When the 50% DNA melting point was used for measurement, 5-mC could increase the effective DNA denaturation temperature by 6°C while 5-hmC decreased the effective DNA denaturation temperature by over 2°C in relation to native C. When measuring 5-hmC vs 5-mC, the melting temperature difference was shown to be over 8°C for the same DNA (Figure 1B).

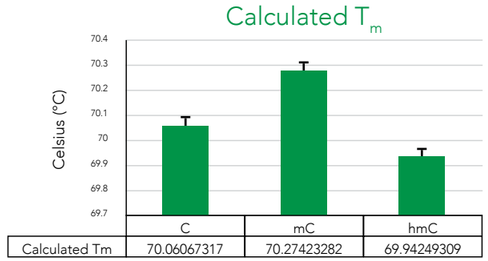
The above observed results were demonstrated using a relatively large DNA fragment (897bp) and represented the collective effect of the whole fragment.

Next, we measured the single cytosine base modification effect on dsDNA stability. To do this, a synthetic 52bp template was designed with a modified C in the middle (Figure 2A). In this set up, the DNA melting temperature changes will result from the effect of the single modified base. As shown in Figure 2B, the effect of the DNA melting temperature could be observed reproducibly, even on a single base modification. This demonstrates that the modifications are affecting the strength of the C:G base pairing. Clearly the 5-hmC:G bond is noticeably weaker than the 5-mC:G bond and the normal C:G bond strength is somewhere in between. This and several other experiments (data not shown here) showed similar results, all of which concluded that the 5-mC increases the dsDNA stability.

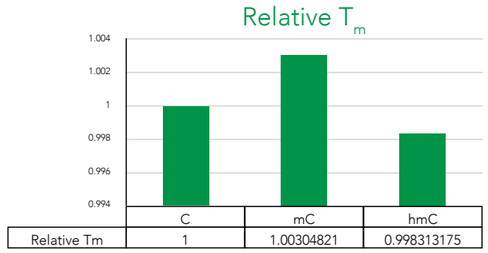
A Template

CACTATCATAAATAAATATTATAA →
GTGATAGTATTTATTTATAATATTTCGACTCTACAACTCTATTCACCAAACA

B



	C	mC	hmC
Calculated Tm	70.06067317	70.27423282	69.94249309



	C	mC	hmC
Relative Tm	1	1.00304821	0.998313175

Figure 2. 5-Hydroxymethylcytosine decreases thermodynamic stability of DNA Procedure: Template was created by primer extension with a dNTP mix containing either cytosine, 5-methylcytosine, or 5-hydroxymethylcytosine. (A) Templates were designed to incorporate either cytosine on the extended strand. Template strand (bottom strand 52mer) and elongation primer (italicized bold 24mer). (B) Melting curves were analyzed by high resolution melting (HRM). Tm's were calculated by finding the 50% relative fluorescence levels.

Conclusions

Taken together, these results present a unique view of the dynamics of epigenetic modifications. The cytosine modifications not only cause structural changes on the DNA backbone, which may affect the protein binding directly due to the changed chemical structure, but these modifications can also affect the stability of the double helix directly. It is well known that DNA unwinding is an essential step in transcription initiation and DNA replication. It is conceivable that the cytosine mC and hmC modifications also serve as a DNA intrinsic "molecular switch." We call this the Double Helix Epigenetic Switch™ for its potential to be in a locked, neutral and unlocked status. Thus, cytosine epigenetic modifications give dsDNA another coding dimension beyond the primary code. Together, genetic and epigenetic information render dsDNA into life's blueprint.

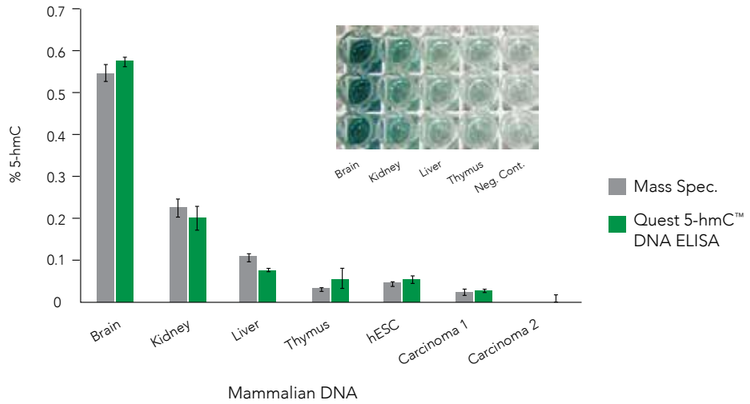
Like the lights on a traffic signal, 5-mC is generally associated with gene silencing whereas 5-hmC often acts as the green light for gene transcription. The Double Helix Epigenetic Switch™ serves as a lock, neutral and unlock mechanism giving dsDNA another coding dimension beyond the canonical genetic codes.

Quest 5-hmC™ DNA ELISA Kit

- ***Accurate Quantification:*** *Sensitive and specific quantification of 5-hydroxymethylcytosine (5-hmC) DNA from a variety of samples.*
- ***High-Throughput:*** *96-well format is ideal for processing just a few samples to a large number of samples.*
- ***Simple:*** *The streamlined workflows can be completed in 4 hours or less.*

Description

Ideal for sensitive and specific quantitation, the Quest 5-hmC™ DNA ELISA Kit is and can be used to accurately detect 5-hmC DNA in a variety of samples. The kit is compatible with a wide range of input DNA, including intact genomic DNA as well as enzyme-digested and mechanically sheared fragments. The control DNA set included with this kit has been calibrated to accurately quantify the percent 5-hmC in sample DNA by use of a standard curve. The fast, streamlined workflow is ideal when analyzing and screening large numbers of samples.



The Quest 5-hmC™ DNA ELISA Kit can be used to detect 5-hmC in numerous DNA samples with high specificity as evidenced by comparison with LC-MS. 5-hmC pAb (100 ng/well) was used to quantitate the amount 5-hmC in 100 ng of single-stranded DNA. % 5-hmC was calculated from a standard curve generated using the Control DNA Set. The figure shows a correlation between the % 5-hmC in DNA samples calculated using the Quest 5-hmC™ DNA ELISA Kit and mass spectrometry.

Product	Cat. No.	Size	Specifications	Uses
Quest 5-hmC™ DNA ELISA Kit	D5425 D5426	1 x 96 rxns 2 x 96 rxns	DNA Input: 25 - 200 ng Detection: ≥ 0.02% 5-hmC per 100 ng Assay Time: 3 - 4 hours	Global 5-mC detection and quantitation

Anti-5-hmC Polyclonal Antibody

- *High sensitivity to low levels of 5-hydroxymethylcytosine DNA.*
- *No detectable cross reactivity with cytosine and 5-methylcytosine.*

Description

The rabbit Anti-5-hmC Polyclonal Antibody can robustly distinguish between hydroxymethylated DNA and methylated or unmodified DNA with limited to no cross-reactivity. The antibody has been validated in ELISA and immunoprecipitation-based enrichment assays, and is suitable for use in other applications including immunohistochemical labeling and chromatographic blotting.

Quest 5-hmC™ Detection Kit

- *Method to distinguish 5-hydroxymethylcytosine (5-hmC) within a specific locus.*
- *Convenient and reliable single tube reaction format.*
- *Compatible with various downstream applications (e.g. end-point PCR, qPCR, Next-Generation sequencing, etc.) for complete analysis and quantification of 5-hmC.*

Description

The Quest 5-hmC™ Detection Kit allows for locus-specific detection of 5-hydroxymethylcytosine (5-hmC) using a simple and efficient reaction setup. This kit features a robust and highly specific 5-hmC glucosyltransferase enzyme to specifically tag 5-hmC sites, yielding the modified base, glucosyl-5-hydroxymethylcytosine (g-5-hmC).

After glucosylation of 5-hmC, digestion of DNA with g-5-hmC sensitive restriction endonucleases (GSREs) allow 5-hmC to be differentiated from 5-mC. GSREs can efficiently digest DNA when a cytosine, 5-mC, or 5-hmC is present in their recognition site, but it is sensitive to the presence of g-5-hmC. By exploiting this sensitivity, the 5-hmC level of a specific locus can be interrogated by utilizing various downstream applications (e.g. end-point PCR, qPCR, Next-Generation sequencing, etc.).

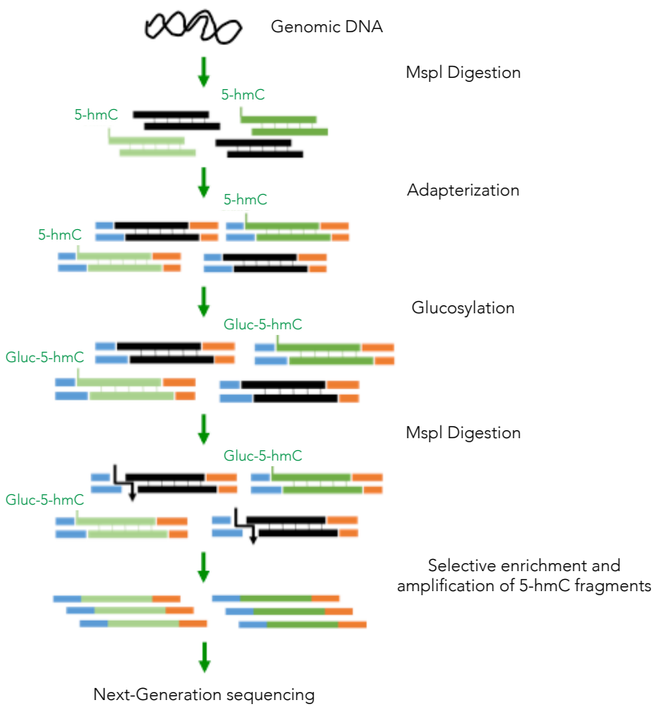
Product	Cat. No.	Size	Specifications	Uses
Anti-5-Hydroxymethylcytosine Polyclonal Antibody	A4001-25 A4001-50 A4001-200	25 µg/25 µl 50 µg/50 µl 200 µg/200 µl	Source: Rabbit Isotype: IgG1 Concentration: 1 mg/ml Buffer: PBS at pH 7.5 Storage: -20°C	Immunoprecipitation for 5-hmC DNA; ELISA; Immunoblotting; Immunoflourescence
Quest 5-hmC™ DNA Detection Kit (includes MspI GSRE)	D5410 D5411	25 preps 50 preps	DNA Input: 100 ng - 1 µg	5-hmC DNA detection
Quest 5-hmC™ DNA Detection Kit -Lite (GSRE not included)	D5415 D5416	25 preps 50 preps		

RRHP™ 5-hmC Library Prep Kit

- *Innovative library preparation for strand-specific mapping of 5-hmC in DNA.*
- *Streamlined workflow accommodates low (≥100ng) DNA inputs.*
- *Libraries are ready for Next-Generation sequencing (Illumina-compatible).*

Description

The RRHP™ 5-hmC Library Prep Kit is an all-inclusive solution for analysis of genome-wide 5-hydroxymethylcytosine (5-hmC) positions at single-base resolution. The Reduced Representation Hydroxymethylation Profiling (RRHP) method is based on blocking MspI digestion by glucosylating 5-hmC within MspI recognition sites. Fragments lacking glucosylated 5-hmC at the adapter-ligation junction will be cleaved and not amplified by PCR. Therefore, only fragments containing 5-hmC will be successfully amplified and analyzed by Next-Generation Sequencing. Fragments with higher 5-hmC levels will be correlated with higher frequency of sequencing reads. RRHP™ bypasses the need for bisulfite conversion, which allow for DNA inputs as low as 100 ng, lower sequencing depth, and straight-forward bioinformatics processing.

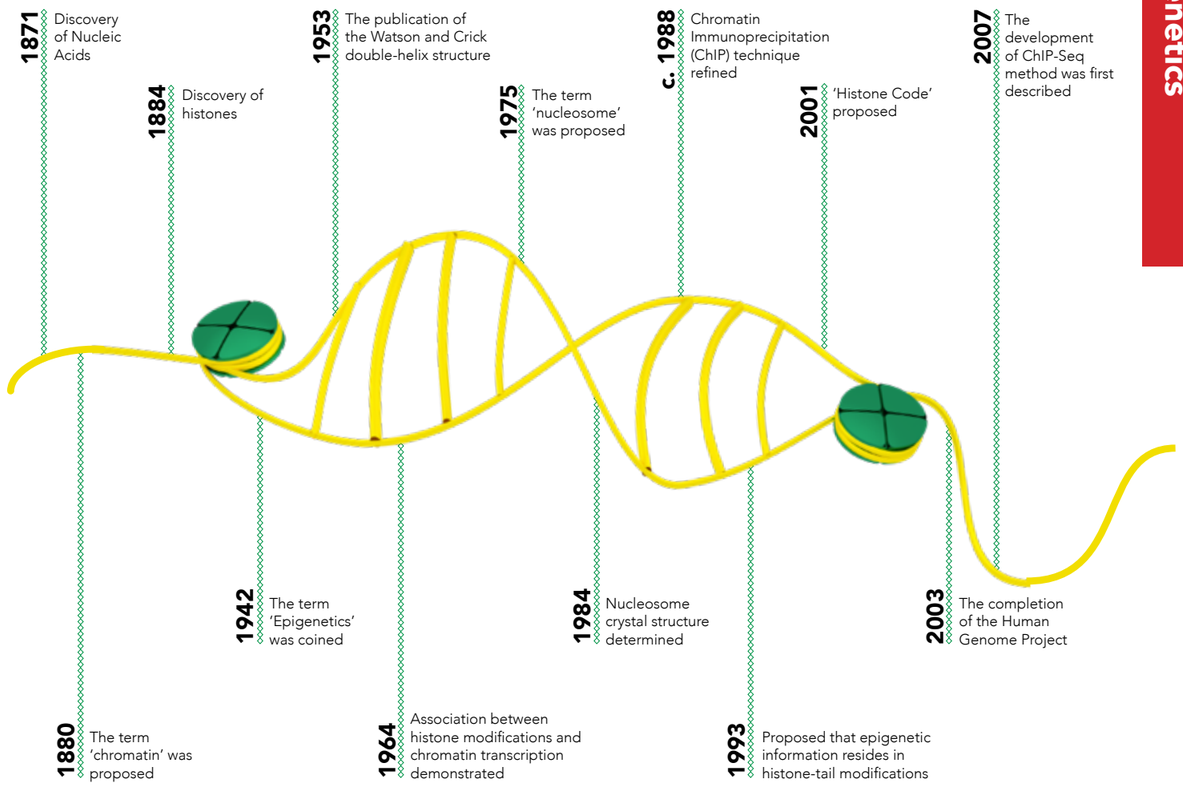


Product	Cat. No.	Size	Specifications	Uses
RRHP™ 5-hmC Library Prep Kit	D5450 D5451	12 preps 25 preps	DNA Input: 100 ng - 1 µg Sequencing Platform Compatibility: Illumina® TruSeq® Chemistries, HiSeq® and MiSeq® platforms	5-hmC DNA detection

Chromatin Overview

The field of epigenetics has grown tremendously over the past several decades. Chromatin analysis has been a staple in the field for studying protein-DNA interactions and continue to be at the forefront of understanding cellular processes and disease.

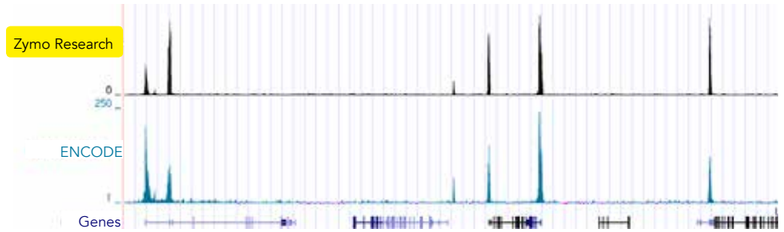
Chromatin analyses use a wide-range of techniques to study nucleosome positions, histone modifications, transcription factors, DNA regulatory proteins, and chromatin structure. These tools are essential for studying everything from development, neurological disorders, and even cancer. While chromatin immunoprecipitation (ChIP) remains the prevailing method used for studying protein-DNA interactions and the dynamics of epigenetic modifications, other techniques such as nucleosomal mapping and chromosome conformation capture are proving to be extremely useful.



Chromatin history: Our View from the Bridge
Donald E. Olins & Ada L. Olins Nature Reviews Molecular Cell Biology 4, 809-814 (October 2003)
doi:10.1038/nrm1225

Zymo-Spin™ ChIP Kit

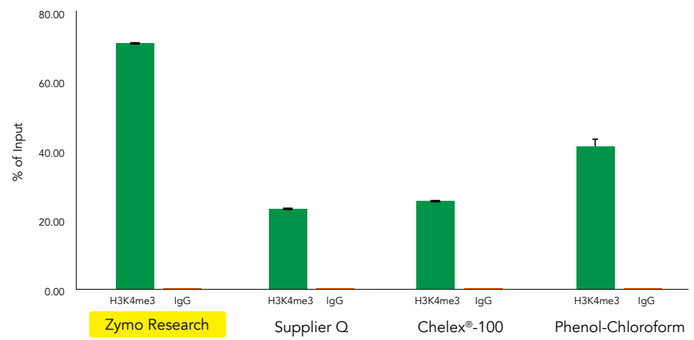
- ***Simplified Workflow:*** *Streamlined protocol for chromatin immunoprecipitation and purification of ChIP DNA.*
- ***High-Quality:*** *Ultra-pure, concentrated ChIP DNA can be eluted in as little as 6 µl.*
- ***NGS-Ready:*** *ChIP DNA is suitable for ChIP-Seq, ChIP-qPCR, and other sensitive molecular applications.*



ENCODE Quality ChIP Workflow: Browser tracks depicting H3K4me3 ChIP-Seq assay using the Zymo-Spin™ ChIP Kit. Peaks overlap the same sites identified at the Broad Institute of MIT and Harvard as part of the ENCODE project.

ChIP DNA Clean & Concentrator® Kit

- ***Fast:*** *Two-minute DNA clean-up from any step in a standard ChIP protocol.*
- ***High-Quality:*** *Ultra-pure, concentrated ChIP DNA can be eluted in as little as 6 µl.*
- ***Ready to Use:*** *DNA is ideal for PCR, arrays, DNA quantification, Southern blot analysis, sequencing, and other molecular applications.*



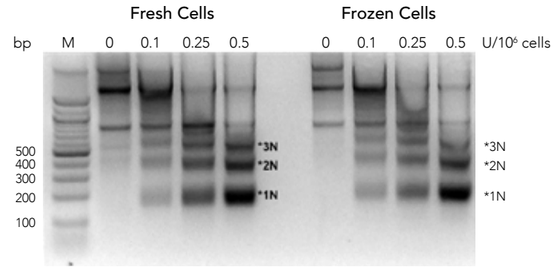
ChIP DNA Purification Comparison: ChIP assays were performed with HeLa cells using ChIP-grade anti-H3K4me3 and rabbit IgG antibodies. Both total and immunoprecipitated chromatin were reverse cross-linked and recovered using either the ChIP DNA Clean & Concentrator® (included in the Zymo-Spin™ ChIP Kit), DNA recovery kit from Supplier Q, Chelex®-100 protocol or phenol-chloroform extraction. The amount of ChIP DNA was determined using qPCR with primers specific to the GAPDH promoter. ChIP DNA enrichment is graphed as % input.

EZ Nucleosomal DNA Prep Kit

- *For the isolation of nucleosome-associated DNA from fresh or frozen cells.*
- *Ideal for use in nucleosome mapping studies.*
- *Pure nucleosomal DNA ready for analysis in less than 45 minutes.*

Description

The EZ Nucleosomal DNA Prep Kit is a streamlined procedure for the isolation of nucleosome-associated DNA. The kit includes reagents/procedures for: cell nuclei isolation, intact nuclei enzymatic digestion, and nucleosomal DNA purification. This kit includes two different enzymes for nucleosomal DNA preparation: Atlantis dsDNase and Micrococcal Nuclease. Enzymatic digestion yields very homogeneous populations of core nucleosomes and purification of the nucleosome-associated DNA is performed using Zymo Research's proven spin column technology.



Mammalian Nucleosomal DNA Preparation: Mammalian nuclei prepared as indicated by the Mammalian Nuclei Prep Protocol was treated with 0.1 U, 0.25 U, and 0.5 U (unit) Atlantis dsDNase for 20 min at 42°C. DNA was subsequently resolved in a 2% agarose gel. M is a 100 bp DNA ladder (Zymo Research). Asterisks (1N, 2N, 3N) represent mono-, di-, and tri-nucleosomal DNAs, respectively.

Product	Cat. No.	Size	Specifications	Uses
Zymo-Spin™ ChIP Kit	D5209 D5210	10 preps 25 preps	Sample Source: Mammalian Cells	Chromatin Immunoprecipitation (ChIP)
ChIP DNA Clean & Concentrator® (uncapped columns)	D5201	50 preps	Format: Spin-Column Elution Volume: ≥ 6 µl DNA Size Limit: 50 bp - 23 kb DNA Recovery: 50 bp - 10 kb 70-90%; > 10 kb 70% Binding Capacity: 5 µg Processing Time: 2 minutes	DNA purification from any step in a ChIP assay
ChIP DNA Clean & Concentrator® (capped columns)	D5205	50 preps		
ZR-96 ChIP DNA Clean & Concentrator®	D5206 D5207	2 x 96 preps 4 x 96 preps	Format: 96-Well Elution Volume: ≥ 10 µl DNA Size Limit: 50 bp - 23 kb DNA Recovery: 50 bp - 10 kb 70-90%; > 10 kb 70% Binding Capacity: 5 µg Processing Time:45 minutes	
EZ Nucleosomal DNA Prep Kit	D5220	20 preps	Enzyme Concentration: 0.1 U/µl Storage: -20°C Inactivation: 5X MN Stop Buffer Standard Reaction Time: 45 minutes	Compatible in mammalian cells, yeast, and nuclei

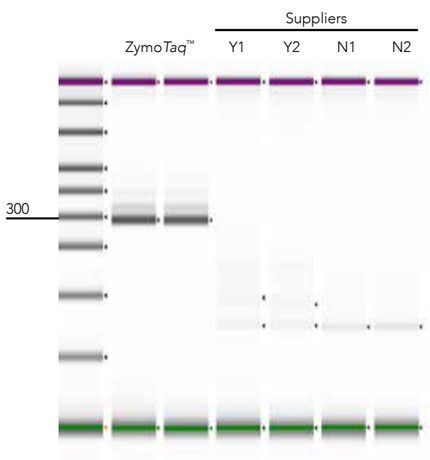
Chelex® is a trademark of BIO-RAD LABORATORIES, INC.

Zymo*Taq*™ DNA Polymerase

- ***Reliable:*** *Hot-start DNA polymerase robustly amplifies DNA, including bisulfite-treated samples.*
- ***Specific:*** *Reduces non-specific PCR product formation from difficult templates.*
- ***Versatile:*** *Compatible with real-time, quantitative PCR and suitable for TA-cloning.*

Description

Zymo*Taq*™ DNA Polymerase is a hot-start polymerase that is ideal for amplification of bisulfite-converted DNA. Since it is a heat-activated, thermostable DNA polymerase, Zymo*Taq*™ reduces primer dimer and non-specific 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, Zymo*Taq*™ DNA polymerase can 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.



Efficient PCR amplification of bisulfite treated DNA for methylation detection. The figure shows a 274 bp product amplified from bisulfite-treated DNA using ZymoTaq™ DNA Polymerase vs. polymerases from Supplier Y and N. In each case, equal amounts of bisulfite-treated DNA (EZ DNA Methylation-Lightning® Kit from Zymo Research) were used for each duplicate PCR reaction and the products visualized using the Agilent 2200 TapeStation®.

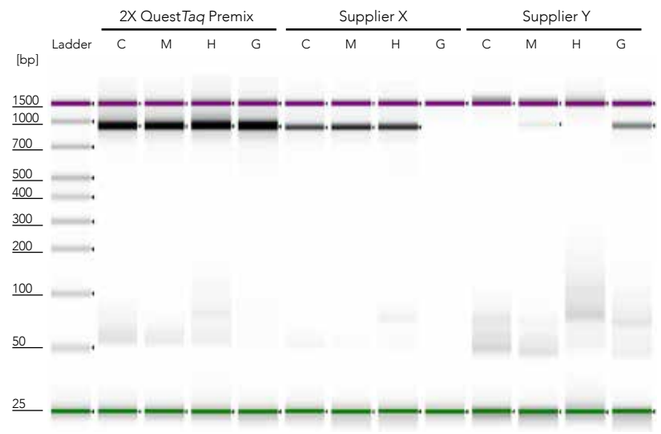
Product	Cat. No.	Size	Specifications	Uses
Zymo*Taq*™ DNA Polymerase	E2001 E2002	50 rxns 200 rxns	Provided as a PreMix or as part of a set Enzyme Concentration: 5 U/µl One unit (U) is defined as the amount of enzyme required for the incorporation of 10nM dNTPs into an acid-insoluble form in 30 minutes at 72°C	Amplification of bisulfite-converted & CpG rich DNA; Amplification of DNA; TA cloning
Zymo*Taq*™ PreMix	E2003 E2004	50 rxns 200 rxns		
Zymo*Taq*™ qPCR PreMix	E2054 E2055	50 rxns 200 rxns		

Quest*Taq*™ PreMix

- ***Convenient Setup:*** *Premixed reagent containing all necessary components.*
- ***Robust Amplification:*** *Ideal for amplification of 5mC, 5hmC, and glucosyl-5hmC modified DNA.*
- ***Versatile:*** *Can be used for end-point analyses or with a range of fluorescent dyes in real-time PCR.*

Description

Quest*Taq*™ PreMix is supplied as a convenient 2X concentrated "master mix" containing all the reagents (i.e., dNTPs, MgCl2, and enhancers) necessary for robust PCR with little or no by-product formation. The Quest*Taq*™ PreMix has been optimized for the non-biased amplification of cystosine, 5-mC, 5-hmC, and glucosyl-5-hydroxymethylcytosine (g-5-hmC) containing DNA, ensuring high yield amplification across a wide range of templates. The Quest*Taq*™ PreMix differs from Quest*Taq*™ qPCR PreMix, in that it excludes SYTO®9 dye from the PreMix solution. It is compatible with real-time and quantitative PCR using fluorescent dyes of the researcher's choosing.



2X QuestTaq Premix unbiasedly amplifies modified DNA. Cytosine (C), methylcytosine (M) hydroxymethylcytosine (H), and glucosylated hydroxymethylated (G) modified DNA templates (900 bp) was amplified with either QuestTaq™ PreMix or premixes from Suppliers X and Y. In each case, PCR products were visualized using the Agilent 2200 TapeStation®.

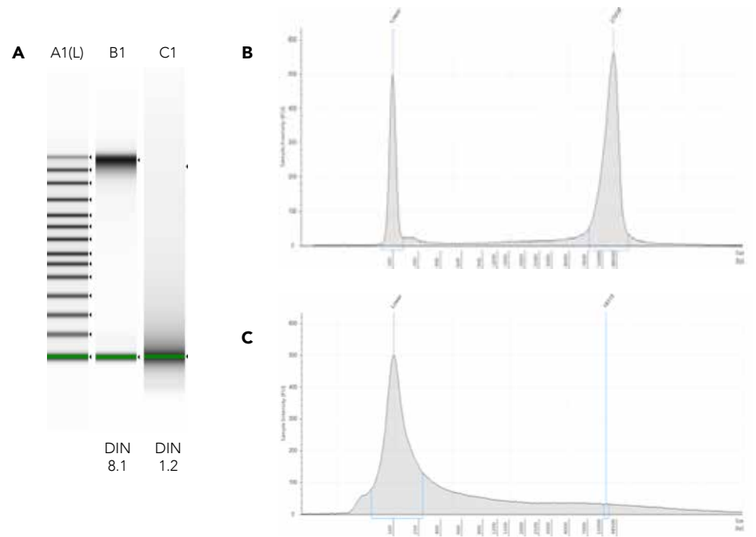
Product	Cat. No.	Size	Specifications	Uses
Quest*Taq*™ PreMix	E2050 E2051	50 rxns 200 rxns	Enzyme Concentration: 2 U/10 µl One unit (U) is defined as the amount of enzyme required for the incorporation of 10nM dNTPs into an acid-insoluble form in 30 minutes at 72°C	Non-biased amplification of 5-mC, 5-hmC, g-5-hmC DNA
Quest*Taq*™ qPCR PreMix	E2052 E2053	50 rxns 200 rxns		

DNA Degradase™ & DNA Degradase Plus™

- ***Fast:*** *One hour, single-enzyme digestion vs. conventional 6–16-hour multi-step enzyme digestion protocols.*
- ***Streamlined Workflow:*** *Quick, simple procedure for completely degrading DNA into individual nucleotides (DNA Degradase™) or nucleosides (DNA Degradase Plus™).*
- ***No Clean-Up Necessary:*** *Digested DNA products are immediately ready for downstream analysis by global quantitative methods including HPLC, TLC, and LC-MS.*

Description

DNA Degradase™ and DNA Degradase Plus™ are nuclease mixes that quickly and efficiently degrade DNA to its individual nucleotide or nucleoside components, respectively. DNA Degradase™ is ideal for global DNA methylation analysis, including hydroxymethylation and other demethylation intermediate products, by a number of downstream applications (i.e., LC-MS, HPLC, TLC, etc.). Digestion with the enzyme is a simple single-step procedure that works faster than other available methods.



DNA Degradase Plus™ efficiently degrades DNA. Mouse brain DNA (1 µg) was digested with 5 U of DNA Degradase Plus for 1 hr at 37°C and analyzed using Agilent 2200TapeStation®. A) TapeStation gel image (A1- genomic ladder, B1- control DNA, C1- DNA Degradase Plus digested DNA). Electropherogram of control DNA (B) and DNA Degradase Plus™ digested DNA (C).

Product	Cat. No.	Size	Specifications	Uses
DNA Degradase™	E2016 E2017	500 U 2,000 U	Enzyme Concentration: 10 U/ µl Storage: -20°C Inactivation: 70°C for 20 minutes Standard Reaction Time: 1 hour 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.	Complete digestion of DNA into individual nucleotide/nucleoside components
DNA Degradase Plus™	E2020 E2021	250 U 1,000 U	Enzyme Concentration: 5 U/ µl Storage: -20°C Inactivation: 70°C for 20 minutes Standard Reaction Time: 1 hour	

CpG Methylase (M.SssI)

- *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

Zymo Research's CpG Methylase completely methylates all cytosines (C5) in double-stranded, non-methylated, and hemimethylated DNA possessing a 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.

GpC Methylase (M.CviPI)

- *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

Our GpC Methylase completely methylates all cytosines 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.

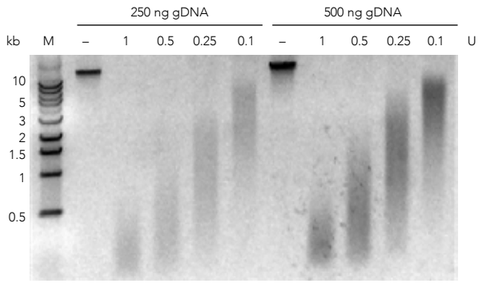
Product	Cat. No.	Size	Specifications	Uses
CpG Methylase (M.SssI)	E2010 E2011	200 U 400 U	Enzyme Concentration: 4 U/ µl Storage: -20°C Inactivation: 65°C for 20 minutes Standard Reaction Time: 2 hours One unit (U) is defined as the amount of enzyme required to protect 1 µg of λ DNA against cleavage by BstUI restriction endonuclease in a total reaction volume of 20 µl for 1 hour at 37°C.	*In vitro* methylation of DNA
GpC Methylase (M.CviPI)	E2014 E2015	200 U 1,000 U	Enzyme Concentration: 4 U/ µl Storage: -20°C Inactivation: 65°C for 5 minutes Standard Reaction Time: 2 hours One unit (U) 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.	*In vitro* methylation of DNA

dsDNA Shearase™ Plus

- ***Simple:*** *The simplest method for generating random-end dsDNA fragments.*
- ***Tunable:*** *Fragment size is easily controlled by adjusting enzyme concentration.*
- ***NGS-Ready:*** *dsDNA Shearase™ Plus-generated fragments are ideal for library construction, Next-Gen Sequencing, and DNA immunoprecipitation (i.e. MeDIP, MeDIP-Seq).*

Description

Digestion with dsDNA Shearase™ Plus is the simplest method for DNA fragmentation, as it circumvents the use of otherwise costly and cumbersome mechanical shearing devices. dsDNA Shearase™ Plus is an endonuclease that cleaves phosphodiester bonds in DNA to yield oligonucleotides with 5′-phosphate and 3′-hydroxyl termini. It has a particularly strong preference for double-stranded DNA (dsDNA) and generates random-ended DNA fragments of the desired size in a single step. Sequencing data demonstrates that this enzyme does not introduce any detectable bias in the sequencing library preparation. It is compatible with low volume inputs, thus minimizing sample loss. Digested DNA is easily purified in ≥ 6 µl with recommended DNA Clean & Concentrator® technology (p. 86) making it ideal for use in end modification (linker & adapter) procedures and other applications.



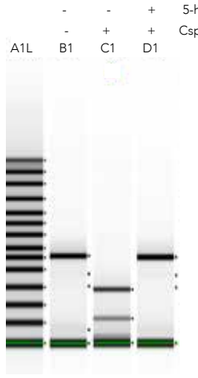
DNA is effectively fragmented using dsDNA Shearase™ Plus. 250 ng or 500 ng of HCT116 cell genomic DNA was incubated with 1, 0.5, 0.25, or 0.1 U dsDNA Shearase™ Plus for 20 min at 42°C. The reaction was stopped by incubating at 65°C for 5 min. Fragmented DNA was purified using the DNA Clean & Concentrator® kit and subsequently resolved in a 1% agarose gel. The amount of DNA fragmentation observed was directly correlated to the amount of enzyme used.

5-hmC Glucosyltransferase

- *Highly processive enzyme for specific modification of 5-hydroxymethylcytosine (5-hmC) with a glucose moiety.*
- *Ideal for locus specific and global quantification of hydroxymethylated DNA.*

Description

The 5-hmC Glucosyltransferase is a highly active enzyme that specifically tags 5-hydroxymethylcytosine in DNA with a glucose moiety yielding glucosyl-5-hydroxymethylcytosine, which in turn can be used for sequence specific, genome-wide, or global 5-hmC detection.



5-hmC Glucosyltransferase demonstrates high activity and specificity. 1 µg of 5-hmC Control DNA (Cat. No. D5405) was incubated with 4 U of 5-hmC Glucosyltransferase (5-hmC GT) for 1 hour at 37°C and digested with 10 U Csp61. Results analyzed using Agilent 2200 TapeStation® show digestion of DNA not treated with 5-hmC Glucosyltransferase (C1) and no digestion of DNA treated with 5-hmC Glucosyltransferase indicating all 5-hmC residues were fully glucosylated (D1).

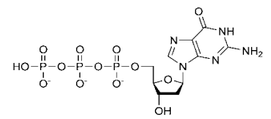
Product	Cat. No.	Size	Specifications	Uses
dsDNA Shearase™ Plus	E2018-50 E2018-200	50 U 200 U	Enzyme Concentration: 1 U/µl Storage: -20°C Inactivation: 65°C for 5 minutes Standard Reaction Time: 20 minutes One unit (1 U) is defined at the amount of enzyme required to convert 250 ng human DNA into DNA fragments in the range of 100-500 bp in 20 minutes at 42°C in total reaction volume in 10 µl.	DNA fragmentation
dsDNA Shearase™ Plus with DNA Clean & Concentrator®-5	E2019-50 E2019-200	50 U + 50 preps 200 U + 200 preps		
5-hmC Glucosyltransferase	E2026 E2027	100U 200U	Enzyme Concentration: 2 U/ µl Storage: -20°C Standard Reaction Time: 2 hours One unit (U) is defined as the amount of enzyme needed to protect 1 µg of 5-hmC DNA Standard (D5405-3, p. 21) from GlaI digestion.	5-hmC detection; 5-hmC enrichment

dNTPs

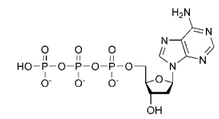
- *Ready to use dNTP Mix (dATP, dTTP, dGTP, dCTP) of ultra high purity; > 99% triphosphate by HPLC.*
- *Readily incorporated into PCR amplicons with ZymoTaq™, QuestTaq™ or other DNA polymerases.*
- *Free of endo-, exodeoxyribonuclease, ribonuclease, phosphatase and nicking activities.*

Description

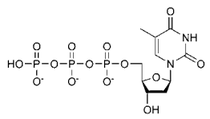
dNTP Mix and dATP, dTTP, dGTP, dCTP from Zymo Research are of ultra-high purity and can be used to generate DNA by PCR using Zymo*Taq*™ or other DNA polymerases.



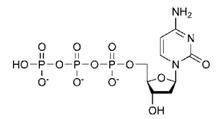
dGTP



dATP



dTTP



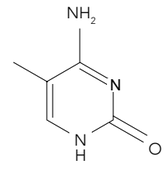
dCTP

Methylated & Hydroxymethylated Nucleotides

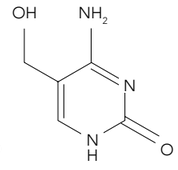
- *Ready to use 5-Hydroxymethylcytosine dNTP mix (dATP, dTTP, dGTP, d5hmCTP) and 5-Methylcytosine dNTP mix (dATP, dTTP, dGTP, d5mCTP) is of ultra-high purity; > 99% triphosphate by HPLC.*
- *Readily incorporated into PCR amplicons with ZymoTaq™, QuestTaq™ or other DNA polymerases.*
- *Free of endo-, exodeoxyribonuclease, ribonuclease, phosphatase and nicking activities.*

Description

Methylated & hydroxymethylated nucleotides are of ultra-high purity and can be used to generate DNA by PCR using Zymo*Taq*™, Quest*Taq*™ or other DNA polymerases.



5-mC



5-hmC

Product	Cat. No.	Size	Uses
dNTP Mix (10 mM)	D1000 D1000-1	500 µl 100 µl	PCR mixes
dATP (100 mM)	D1005	250 µl	
dTTP (100 mM)	D1010	250 µl	
dGTP (100 mM)	D1015	250 µl	
dCTP (100 mM)	D1020	250 µl	
5-Methylcytosine dNTP Mix (10 mM)	D1030	250 µl	
5-Methyl dCTP (10 mM)	D1035	100 µl	
5-Hydroxymethylcytosine dNTP Mix (10 mM)	D1040	250 µl	
5-Hydroxymethyl dCTP (100 mM)	D1045	100 µl	


Apple
(Malus domestica)


Alligator
(Alligator mississippiensis)


Cow
(Bos taurus)


Barrel Clover
(Medicago truncatula)


Chicken
(Gallus gallus domesticus)


Platypus
(Ornithorhynchus anatinus)


Salmon
(Salmo salar)


Rat
(Rattus norvegicus)


Mouse
(Mus musculus)

Explore Epigenomics

with Next-Gen sequencing services

Shown here are some of the diverse species analyzed by our team


Human
(Homo sapien)


Baboon
(Papio anubis)


Dog
(Canis lupus familiaris)


Oppossum
(Didelphimorphia)


Zebra Finch
(Taeniopygia guttata)


Fruit Fly
(Drosophila melanogaster)


Bean
(Phaseolus vulgaris)


Wine Grape
(Vitis vinifera)


Pig
(Sus scrofa domesticus)

Explore Epigenomics with the Most Comprehensive Services for Epigenetic Analysis!

Following the publication of the sequence of the human genome in 2001, and more recently the ENCODE Project in 2012, it has become clear that genes and chromatin are far more complicated than previously anticipated. DNA once believed to be "junk" has been found to code for specific non-coding transcripts and to contain important regulatory elements. It is now apparent that investigating one or a few genes is no longer sufficient to answer the questions currently posed by researchers in the fields of molecular biology, genetics, and systems biology. Genome-wide genetic and epigenetic analyses need to be considered for complete assessment of the regulation of cellular processes.

Zymo Research makes these analyses available to every researcher with a repertoire of genome-wide services. All Next-Gen Epigenetic Services feature state-of-the-art sample prep technologies, Illumina® certified sequencing, cutting-edge bioinformatics, and competitive pricing. All services can be combined for the most comprehensive analysis possible. Zymo Research's Epigenetic Services can be applied to a broad range of sample sources including human, mouse, plant, platypus, and more! Let Zymo Research do the work for you and receive customizable, publication-ready data.

The scientists at Zymo Research have been developing industry leading epigenetic technologies and workflows for more than a decade. Zymo Research remains committed to pioneering new research tools and services to meet the future challenges of the rapidly growing field of epigenetics. Explore epigenomics with Zymo Research today!

Illumina PROPEL certified

All services are customizable and can be combined to suit your needs!
Please contact us at **services@zymoresearch.com** to inquire today.

Epigenetic Analysis

Expression Services

Microbiomic Services

Epigenetic Aging Clock Service

Additional Services

Epigenetic Biomarker Discovery Program

From Collection to Conclusion
Zymo Research offers a new Epigenetic Biomarker Discovery Program for the development of epigenetic lab diagnostic tests. Whether you are interested in developing epigenetic tests for cancer, developmental disorders, autoimmune diseases, obesity and other anomalies, Zymo Research provides a solution for sample collection through to commercial development. The experts at Zymo Research can help you at any step in the development pipeline by offering a portfolio of products and services for sample collection and purification, biomarker discovery, biomarker validation, platform selection, and commercial development.

Sample Collection & Purification
Zymo Research offers specialized collection devices and purification kits for tissues, feces, urine, blood and other biological specimens. Sample collection begins with DNA/RNA Shield™ which is an innovative stabilization reagent that allows samples to be stored and transported at ambient temperatures. DNA/RNA Shield™ does not require the need for refrigeration or specialized equipment and makes shipping your precious specimens to Zymo Research easy.

Biomarker Discovery: Epigenetic NGS Services
With the latest Next-Generation sequencing technologies for DNA methylation analysis, Zymo Research provides comprehensive services and bioinformatics analysis to help discover epigenetic biomarkers in your specific sample set. Zymo Research's Illumina® certified MethylSeq® platforms are each designed to suit your specific coverage need.

Epigenetic Biomarker Validation
Zymo Research offers the simplest way to validate epigenetic biomarkers with our MethylCheck™ sequencing platform. Whether you have genome-wide DNA methylation (450K/850K array or RRBS) data or a particular gene region in mind, our scientists will design, validate, and evaluate site-specific DNA methylation changes.

Platform Selection
Once you have your specific biomarkers narrowed down and validated, Zymo Research will help you select the most sensitive and cost-effective platform for your lab diagnostic test. A wide range of citation-leading bisulfite and bisulfite-free methods are available to implement your test.

Commercial Development
Zymo Research's associates, Pangea™ CLIA-certified lab, will help you to bring your lab diagnostic test to the market.

PANGEA LABORATORY

DNA Methylation

Zymo Research offers four platforms for genome-wide DNA methylation analysis at single-nucleotide resolution, each designed to suit your specific coverage needs. The main difference between the platforms is the percentage of the total genome actually being sequenced. All platforms accommodate a wide range of sample types, including any species with a reference genome, low-input (>10 ng), and FFPE samples.

Classic RRBS (Reduced Representation Bisulfite Sequencing) combines restriction enzyme digestion with bisulfite sequencing to enrich for a CpG-dense fraction of the genome. The Classic RRBS platform allows for a maximum amount of methylation data using a minimal amount of sequencing at a significantly reduced cost. This combination makes Classic RRBS the perfect platform for pilot studies. Classic RRBS covers ≥70% of all CpG islands, >75% of all gene promoters, and detects 1.5-2 million unique CpG sites at 5-10x average minimum coverage*.

Methyl-MiniSeq® is an expanded version of Classic RRBS. The system is extremely robust and the read depth is impressive, making it ideal for biomarker discovery using identification and analysis of differentially methylated regions. The low cost of this platform relative to the sequence data it produces also makes Methyl-MiniSeq® a good platform for pilot studies. Methyl-MiniSeq® covers ≥85% of all CpG islands, >80% of all gene promoters, and captures approximately 4 million unique CpG sites at 5-10x average minimum coverage*.

Methyl-MidiSeq® extends coverage to include a large majority of genetic regulatory elements (enhancers), gene bodies, and repeat DNA sequences that Classic RRBS and Methyl-MiniSeq® do not capture due to low CpG density in those regions. Methyl-MidiSeq® allows for the detection of 8-9 million unique CpG sites at 5-10x coverage.

Methyl-MaxiSeq® is a whole-genome bisulfite sequencing (WGBS) option that provides DNA methylation information at single nucleotide resolution in CpG, as well as in the less common CHG and CHH contexts, across all regions of the genome.

The Basic Service package for each platform includes sample standardization, library construction, sequencing, and raw data alignment. The Full Service package offers additional down-stream bioinformatics processing and statistical analysis.

*Coverage estimates based on the human genome.

Service Option	Classic RRBS	Methyl-MiniSeq®	Methyl-MidiSeq®	Methyl-MaxiSeq®
Capable with low DNA input?	Yes	Yes	Yes	Yes
Single-base Resolution?	Yes	Yes	Yes	Yes
Methylome Coverage*	1.5 - 2 million sites	3 - 4 million sites	8 - 9 million sites	Entire methylome
Quantitative Analysis?	Yes	Yes	Yes	Yes
Genomic Regions covered	Nearly all CpG islands and gene promoters	Twice as many unique CpG sites compared to Classic RRBS	Also includes gene bodies and regulatory regions (90% of enhancers)	Entire methylome
Notes	Efficient genome-wide analysis	Robust biomarker discovery	Expanded methylation analysis	Complete methylation analysis

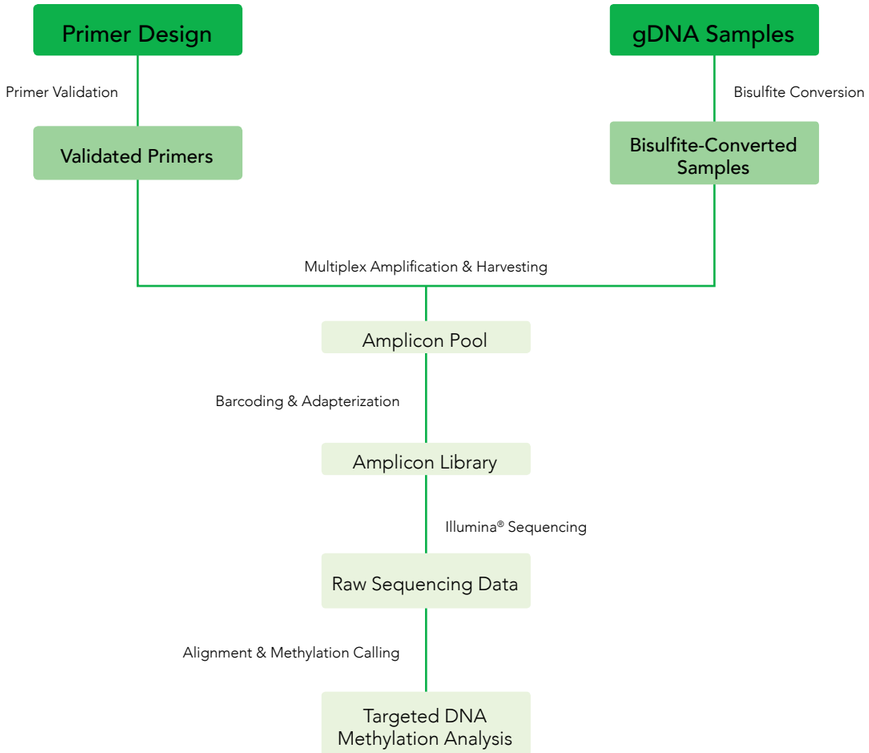
* calculation based on human genome
** depends on capture efficiency and methylation levels

MethylCheck™ Bisulfite Sequencing

Zymo Research makes epigenetic biomarker validation simple with our MethylCheck™ platform. Whether you have methylation array (27K/450K/850K) data that you would like to validate in a large sample cohort or have a specific gene region in mind, our scientists are available to design, validate, and evaluate site-specific DNA methylation changes. Simply send us your samples and regions of interest, and we will perform every step through data analysis, sending you back publication-quality graphs and figures.

The Targeted Bisulfite Sequencing Service Includes:

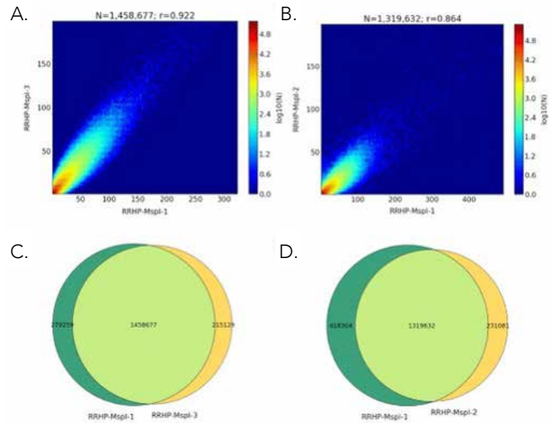
- Primer Design and Validation
- Targeted Amplification
- Adapterization and Barcoding
- Sequencing with Illumina® Technology
- Sequence Alignment to Reference Genome
- DNA Methylation Analysis



DNA Hydroxymethylation

Zymo Research's platform for the analysis of DNA hydroxymethylation has unparalleled sensitivity and coverage of 5-hydroxymethylcytosine (5-hmC). With traditional bisulfite-conversion methods, 5-hmCs cannot be distinguished from 5-mCs. Therefore, Zymo Research has developed Reduced Representation Hydroxymethylcytosine Profiling (RRHP™), compatible with Next-Generation sequencing to ensure high coverage and sensitivity for the detection of 5-hmC at single-base resolution. RRHP® allows genome-wide profiling for 5-hmC with reduced sequencing requirements.

RRHP™
This service is for genome-wide profiling of 5-hydroxymethylcytosine in DNA at single-nucleotide resolution. RRHP™ also allows strand-specific determination of the location of the 5-hmC modification as well as quantification of 5-hmC levels. Data from RRHP™ can be combined with DNA methylation data from Methyl-MiniSeq® (p. 47), allowing for direct comparison of DNA methylation and hydroxymethylation in the same sample. RRHP™ is compatible with low DNA inputs and has the added advantage of providing read data for simultaneous SNP detection.



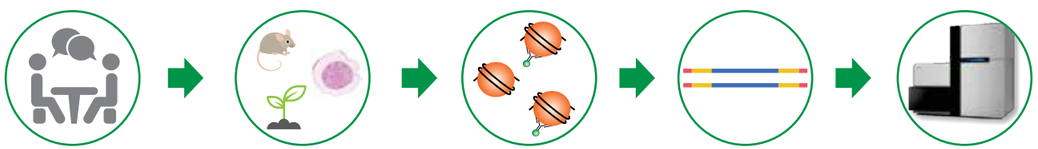
Replicate sample 5-hmC levels show very strong correlation when assessed using the RRHP™ platform.
(Petterson A, Chung TH, Tan D, Sun X, Jia XY. Genome Biol. 2014 Sep 24;15(9):456.)

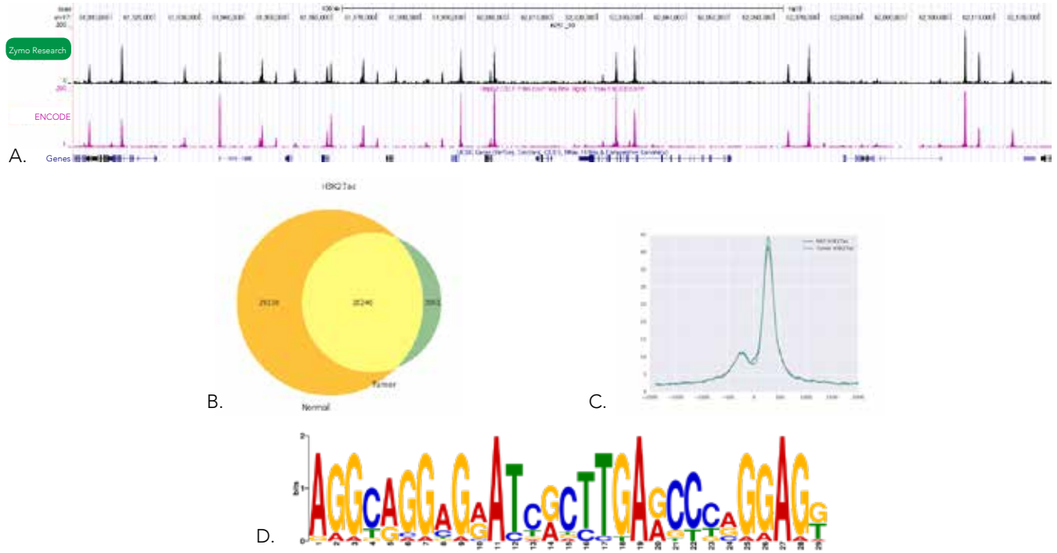
ChIP-Seq

Chromatin Immunoprecipitation Sequencing (ChIP-Seq) is a technique that combines chromatin immunoprecipitation with the quantitative power and genome-wide coverage of Next-Generation sequencing. It is a powerful tool for genome-wide mapping of DNA interactions with transcription factors, histone modifications, and chromatin binding proteins and is essential for understanding the effect of DNA-protein interaction on gene regulation.

With the ChIP-Seq service from Zymo Research, you can either perform the ChIP assay yourself and send us the enriched DNA for library construction and Next-Gen Sequencing, or we can process your samples using our proprietary chromatin shearing and enrichment procedures. We also perform the bioinformatics and statistical analyses, and send you the publication-ready results.

Simply send us your samples and we will handle the rest!





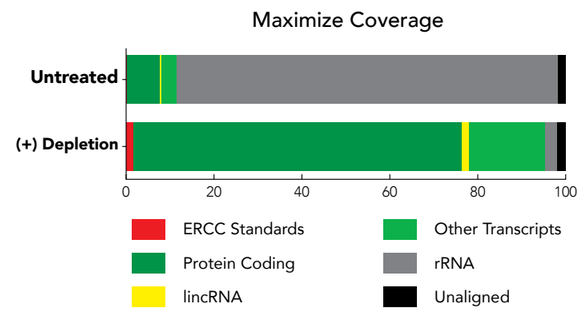
Example of Zymo Research's ChIP-Seq Services Data Output: A. Browser tracks for visualization of peak regions. B. Venn diagram showing sample comparison data. C. Peak density profile to analyze peak locations relative to transcriptional start sites. D. Motif analysis to analyze bound genomic regions.

RNA-Sequencing Services

Zymo Research's RNA-Seq service makes transcriptome analysis available to every researcher, without the need for expensive equipment or bioinformatics expertise. Now you can achieve transcriptome-wide coverage of total RNA, or small RNA with the latest Next-Gen Sequencing technology.

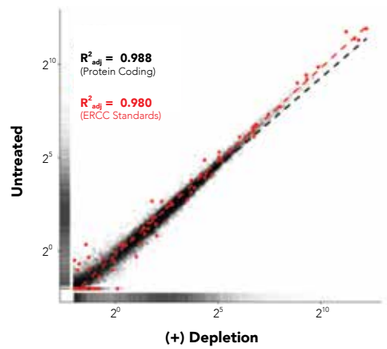
Let Zymo Research do the work for you!

- **Simple and customizable:** All RNA purification, sample prep, sequencing, and bioinformatics analysis is included. Each project is customizable and delivers publication-ready figures.
- **Maximize Coverage:** Proprietary depletion method minimizes bias during rRNA removal, allowing for cost effective sequencing to increase coverage of relevant transcripts, no matter the sample type.
- **Stringent QC:** Each library is assessed using standards to ensure that quality data is generated.
- **Available Services:** Total RNA-Seq and miRNA-Seq.



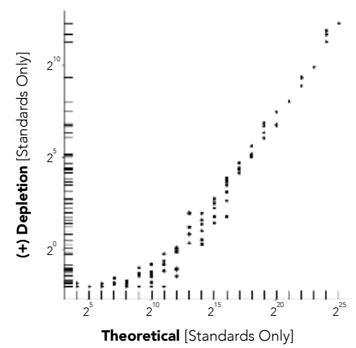
All RNA-Seq services projects use cutting-edge methods to prepare your libraries. Shown here is a proprietary depletion method to eliminate rRNA transcripts from your sample with virtually zero bias. Stacked bar plot representing read classification by gene biotype of Universal Human Reference RNA samples using the Zymo Research RNA-Seq analysis pipeline.

Unbiased Depletion



Have confidence in your data every time with increasing read depth of relevant transcript coverage. Scatterplot demonstrates that rRNA Depletion (Y-axis) vs Untreated (X-axis) RPKM show virtually no bias in both gene expression (black) and spike-in standards (red).

Stringent QC Using Standards



Empirical quality control ensures reliable data generation and interpretation. RNA-seq pipelines are optimized using spike-in standards to deliver data of the highest quality and rigor, with the lowest bias. Scatterplot comparing measured (Y-axis) vs theoretical (X-axis) RPKM for spike-in standards

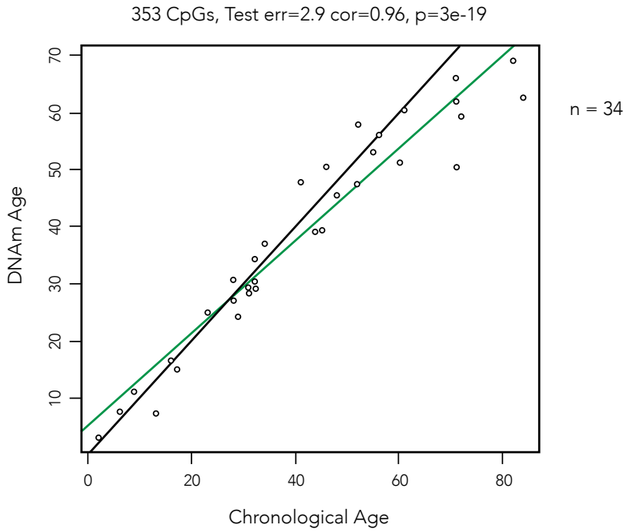
For info, inquire at **services@zymoresearch.com**

Epigenetic Aging Clock

A growing number of studies have highlighted the strong correlation of DNA methylation changes with aging. Additionally, accelerated biological aging, as determined by DNA methylation profiling, has been associated with disease phenotypes including Down Syndrome and HIV-1-infection. DNA methylation-based biological age is a valuable surrogate biomarker of molecular aging.

The Epigenetic Aging Clock Service allows you to effectively gauge the biological age of any human tissue sample. With this easy to use service, the only thing you have to do is provide us with the sample. Starting with DNA purification all the way through bioinformatics analysis, Zymo scientists will do the work for you and provide you with an accurate biological age estimate along with a comprehensive report. Enhance any aging study or satisfy your intellectual curiosity with this multi-tissue age predictor.

- *Reliably determine the true biological age of any human sample.*
- *Quantify changes in biological age following lifestyle interventions or drug treatments.*
- *Identify disease-associated aging alterations.*



Predicted epigenetic age of urine samples from healthy donors.

Additional Services

Mass Spectrometry

Zymo Research offers DNA composition analysis with LC/MS analysis. Please inquire for more information.

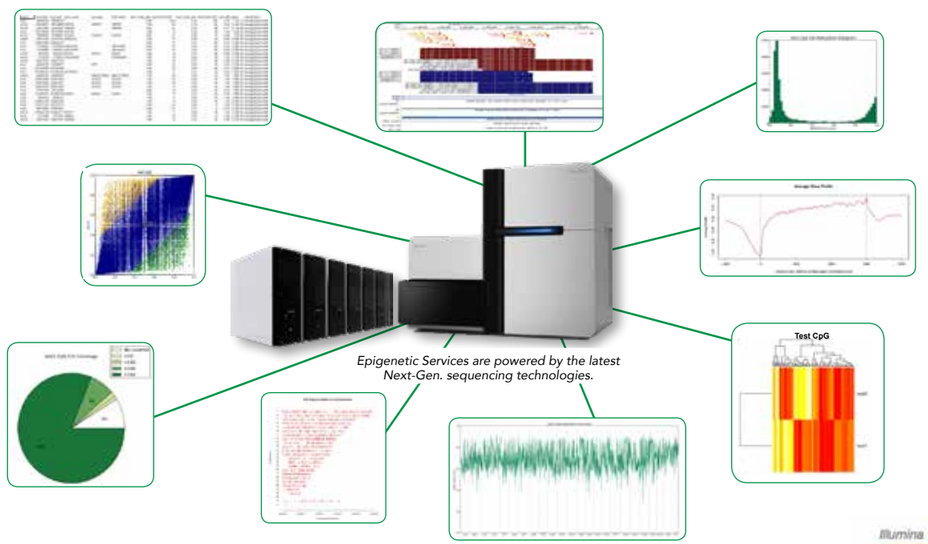
Custom Bioinformatics

Do you have Next-Generation sequencing data that you need analyzed? Zymo Research offers complete bioinformatics solutions to fulfill your needs. Whether it is whole-genome bisulfite sequencing data or ChIP-Seq data, we can help make sense of your overwhelming data sets. We use established as well as customizable bioinformatic pipelines to transform raw sequence data into manageable and interpretable figures and data sets. Simply provide the raw (FASTQ) or aligned (SAM or BAM) data and we will provide you with your desired downstream analyses.

Service Packages

Basic Service Packages for all of the platforms include sample standardization, library construction, Next-Generation sequencing, and raw data alignment.

Full Service Packages offer additional down-stream bioinformatic processing and statistical analysis specifically tailored to fit your needs.



Explore Epigenomics with Zymo Research and inquire today at
www.zymoresearch.com/services

2 DNA Purification

The fidelity of the method used for the purification of DNA from biological samples and from reaction mixtures is of critical importance when considering the success of subsequent downstream molecular applications.

Samples can be challenging to process, due to a variety of factors: small sample size, contaminants, degradation, and sample source (i.e. tough-to-lyse or Gram-negative). Extraction methods must also protect DNA from degradation, especially when storing/transporting precious samples. Inadequate preservation can lead to suboptimal analysis. Undesired contaminants necessitate removal to prevent interference with downstream applications. These can include proteins, RNA, chemicals and compounds from the source material which can convolute procedures through nonspecific interactions with the DNA substrate and/or method used for analysis.

It is clear that many molecular-based applications including PCR, DNA sequencing, microarray, Southern blotting, etc., require high-quality DNA. The scientists at Zymo Research have developed a range of DNA purification kits designed for the simple and rapid recovery of high-yield, inhibitor-free DNA from diverse sample sources.

DNA Purification Made Simple®

Quick Product Guide

Plasmid DNA Purification

From *E. coli*

Miniprep Scale

ZymoPURE™ Plasmid Miniprep Kit

≤ 100 µg transfection-grade plasmid DNA.

Page 64

Format:
Spin-Column

Zyppy® Plasmid Miniprep Kits

Pellet-free, high-quality plasmid DNA in only 8 minutes.

Page 66-67

Format:
Spin-Column
96-Well Plate
Magnetic Beads

Midiprep, Maxiprep, and Gigaprep

ZymoPURE™ II Plasmid Prep Kits

Vaccine/transfection grade plasmid DNA in ≤ 20 minutes.

Page 62-63

Format:
Spin-Column

ZymoPURE-Express™ Plasmid Midiprep Kit

Pellet-free isolation of transfection grade plasmid DNA in only 15 minutes.

Page 65

Format:
Spin-Column

BAC, YAC, PAC
Plasmid DNA ~200 kb

ZymoPURE™ Plasmid Miniprep Kit & ZymoPURE™ II Plasmid Midi, Maxi, & Gigaprep Kits

Quickly isolate large constructs (~200 kb) using a spin-column.

Page 62-64

Format:
Spin Column

High-Throughput

Zyppy®-96 Plasmid Magbead Kit

Pellet-free procedure for high-quality plasmid DNA (no centrifugation).

Page 68

Format:
Magnetic Bead

Zyppy®-96 Plasmid Miniprep Kit

Pellet-free procedure for high-quality plasmid DNA.

Page 66-67

Format:
96-Well Plate

From Yeast

Zymoprep™ Yeast Plasmid Miniprep Kits

Simple solution for yeast plasmid DNA isolation using Zymolyase.

Page 177

Format:
Spin-Column
96-Well Plate

Quick Product Guide

DNA Isolation
Biological Fluids, Cells & Solid Tissues

Biological Fluids, Cells & Tissues

Quick-DNA™ Plus Kits

High-quality DNA from any biological fluids, cells, and tissue.
(Proteinase K included)

Page 72-73

Format:
Spin-Column
96-Well Plate

Quick-DNA™ Kits

High-quality DNA from cells and whole blood.

(No Proteinase K)

Page 72-73

Format:
Spin-Column
96-Well Plate

Liquid Biopsy Serum, Plasma, Urine, Cerebrospinal Fluid, Amniotic Fluid, & Saliva
(large volume)

Quick-cfDNA™ Serum & Plasma Kit

Total cell-free DNA from ≤ 10 ml serum, plasma, cerebrospinal fluid, amniotic fluid, and ≤ 5 ml saliva.

Page 77

Format:
Spin-Column

Quick-DNA™ Urine Kit

For total, cellular, or cell-free DNA from 5 - 40 ml of urine.

Page 76

Format:
Spin-Column

Fixed Tissues
(FFPE and glass-slide samples)

Quick-DNA™ FFPE Kit

Rapid, high-quality DNA from FFPE tissue.

Page 74

Format:
Spin-Column

Pinpoint® Slide DNA Isolation System

Convenient DNA isolation from glass-slides.

Page 75

Format:
Spin-Column

DNA Isolation

Tough-to-Lyse Samples

Microbial

Quick-DNA™ Fungal/Bacterial DNA Kits

Simple and robust isolation from cultures.

*BashingBeads™ included

Page 82

Format:
Spin-Column
96-Well Plate

YeaStar™ Genomic DNA Kit

Simple enzymatic procedure utilizing Zymolyase.

Page 178

Format:
Spin-Column

Environmental (Fecal, Soil, and Water Filtrate)

ZymoBIOMICS® DNA Kits

Accurate, inhibitor-free DNA for microbiomics, metagenomics, and other applications.
*BashingBeads™ included

Page 154

Format:
Spin-Column
96-Well Plate
MagBead

Quick-DNA™ Fecal/Soil Microbe DNA Kits

High-quality, inhibitor-free DNA.

*BashingBeads™ included

Page 81

Format:
Spin-Column
96-Well Plate
MagBead

Plant and Seed

Quick-DNA™ Plant/Seed Kits

Inhibitor-free DNA from plant tissues and seeds.

*BashingBeads™ included

Page 84

Format:
Spin-Column
96-Well Plate

DNA Clean-up

Enzymatic Reactions & Impure or Diluted DNA

DNA Clean & Concentrator® Kits

Ultra pure DNA in 2 minutes (50 bp to 23 kb).

Page 86-87

Format:
Spin-Column
96-Well Plate

Genomic DNA Clean & Concentrator® Kits

High molecular weight DNA clean-up (1 kb to > 200 kb).

Page 90-91

Format:
Spin-Column
96-Well Plate

Oligo Clean & Concentrator™ Kits

DNA & RNA oligos and probes (16 to 200 nt).

Page 88

Format:
Spin-Column
96-Well Plate

Select-a-Size DNA Clean & Concentrator®

High quality, size selected DNA in 7 minutes (library preparation and NGS applications).

Page 89

Format:
Spin-Column
MagBead

Sequenced DNA Samples

ZR DNA Sequencing Clean-up Kits™

Rapid clean-up of post-cycle DNA sequencing contaminants.

Page 92

Format:
Spin-Column

Removal of Polyphenolic Inhibitors

OneStep™ PCR Inhibitor Removal Kits

For polyphenolic-inhibitor removal from DNA samples.

Page 93

Format:
Spin-Column
96-Well Plate

Agarose Gel Excisions

Zymoclean™ Gel DNA Recovery Kits

High recovery (>80%) of DNA from agarose gels.

Page 94

Format:
Spin-Column
96-Well Plate

Plasmid DNA Isolation

Innovation. Pure & Simple.™

Plasmid DNA purification has existed for nearly a half-century. Yet, it has remained unwieldy, requiring time-consuming gravity filtration, centrifugation steps, and isopropanol precipitation.

Zymo Research is making history with our plasmid DNA isolation technologiesThis rapid, streamlined purification results in ultra-pure, transfection-grade plasmid at superior speeds. The unique colored buffers allow for visualization of complete bacterial lysis and neutralization.

The ZymoPURE™ plasmid kits feature state-of-the-art technology for simple and robust purification. Streamlined methodology avoids time-consuming steps and enables highly-concentrated plasmid DNA to be eluted directly from a microcentrifuge column in minutes.

Imagine recovering plasmid DNA without large-scale centrifugation cell pelleting directly from culture. The ZymoPURE-Express™ Midiprep Kit allows for direct lysis and the omission of pelleting and re-suspension steps that are common to all other conventional procedures. Plasmid DNA can then be isolated in minutes with our unique Zymo-Spin™ columns.

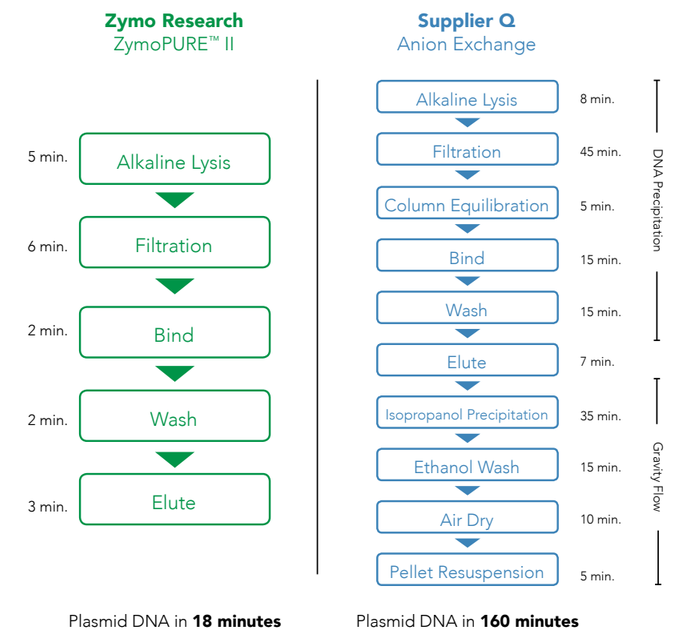
Does your workflow involve highly sensitive applications, which requires ultra-pure plasmid DNA? The ZymoPURE™ II Plasmid Kits enable you to isolate plasmid DNA with endotoxin levels ≤ 0.025 EU/µg. The kits incorporate the novel EndoZero™ spin-column to reduce endotoxin levels of plasmid DNA without lengthy incubations, gravity flow anion-exchange columns, expensive chromatography columns, or time-consuming centrifugation steps. The result is plasmid DNA ideal for transfection, restriction endonuclease digestion, in vivo studies, bacterial transformation, PCR amplification, DNA sequencing, and other sensitive downstream applications.

Simplify your workflow with Zyppy® technology, which drives the fastest molecular biology grade miniprep kits available. It features a pellet-free alkaline lysis procedure which bypasses bacterial culture centrifugation. The Zyppy® 96 Miniprep Kits enable culturing, lysis, and neutralization using the same plate. These kits feature the fastest and simplest high-throughput and automated procedures for purifying high-quality, endotoxin-free plasmid DNA.

Technology Overview: ZymoPURE™

Empower your research with ZymoPURE™ plasmid DNA purification kits. Streamlined methodology and superior technology enables unrivaled speed and performance. At the core of the ZymoPURE™ technology is a novel binding chemistry and membrane that redefines plasmid purity, reduces processing time by 7 fold, and enables > 1 mg of plasmid DNA to be eluted directly from a microcentrifuge column.

EndoZero™ Plasmid DNA in 5 Easy Steps



Plasmid DNA in **18 minutes**

Plasmid DNA in **160 minutes**

Highly Rated

95% of researchers consider ZymoPURE™ easy to use

88% of researchers were satisfied with the overall performance

85% of researchers would recommend ZymoPURE™ to a colleague

based on feedback from 687 researchers

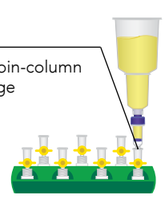
Endless possibilities, **what will you create?**

ZymoPURE™ II Plasmid Kits

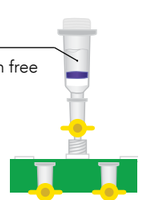
- ***Fastest:*** *Simple 20 minute Midi/Maxi preps.*
- ***Highest Yield:*** *6x more plasmid.*
- ***Ultra-Pure:*** *EndoZero™, vaccine grade*, and transfection ready.*

Simple 20 minute EndoZero™ Midi/Maxi preps

bind
rapid loading onto a spin-column via vacuum or centrifuge

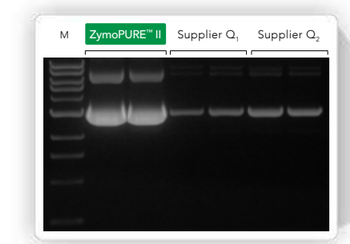


wash
for ultra-pure endotoxin free plasmid DNA



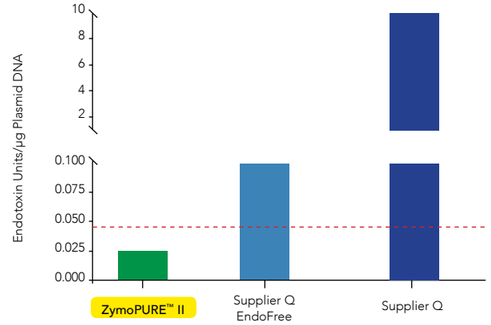
elute
transfection ready from spin-column

Highest Yield & Lowest Elution Volume



ZymoPURE™ II is plasmid purification reimagined. At the core of our ZymoPURE™ II technology is a novel binding chemistry and membrane that redefines plasmid purity, reduces processing time 7 fold, and enables >1 mg of plasmid to be eluted from a microcentrifuge column.

Ultra-Pure Vaccine Grade Plasmid DNA



Stated endotoxin levels for the ZymoPURE™ II Maxiprep kit compared to two separate kits from Supplier Q.

* Endotoxins <0.04 EU/µg of plasmid DNA meets the FDA limit for vaccines.

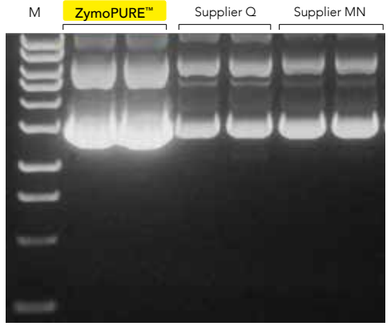
Product	Cat. No.	Size	Processing Time	Culture Volume	Elution Volume	Plasmid Yield	Endotoxins
ZymoPURE™ II Plasmid Midiprep Kit	D4200 D4201	25 preps 50 preps	20 minutes	≤ 50 ml	≥ 100 µl	≤ 400 µg	≤ 0.025 EU/µg
ZymoPURE™ II Plasmid Maxiprep Kit	D4202 D4203	10 preps 20 preps	20 minutes	≤ 150 ml	≥ 200 µl	≤ 1.2 mg	≤ 0.025 EU/µg
ZymoPURE™ II Plasmid Gigaprep Kit	D4204	5 preps	50 minutes	≤ 2.5 L	≥ 2 ml	≤ 10 mg	≤ 0.025 EU/µg

ZymoPURE™ Plasmid Miniprep Kit

- ***Highest Yield:*** *Purify up to 100 µg of plasmid DNA in as little as 25 µl directly from a spin-column.*
- ***Transfection-Grade:*** *50,000 times fewer endotoxins than industry leading minipreps.*
- ***BAC/YAC/PAC Ready:*** *Purify DNA up to ~200 kb.*

Superior Yields

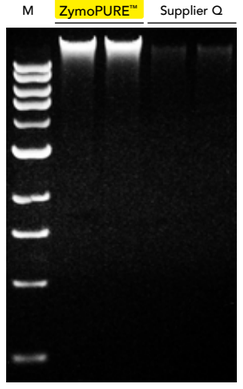
Plasmid DNA yield and concentration from the ZymoPure™ Miniprep Kit compared to other major suppliers. Plasmid DNA (pGL3®) was isolated from 5 ml of JM109 *E. coli* culture grown overnight following the manufacturer's suggested protocol (in duplicate). The size marker "M" is a 1 kb ladder.



Transfection-grade

50,000 times
fewer ENDOTOXINS
than the industry leading miniprep kit

BAC/YAC/PAC Ready



BAC DNA yield and concentration from the ZymoPURE™ Miniprep Kit compared to a Supplier Q kit. A BAC clone (~190 kb) from a RPC1-11 human BAC library (CHORI) was purified from 5 ml of DH10B *E. coli* cultures grown in duplicate overnight following the manufacturer's suggested protocol. The size marker "M" is a 1 kb ladder.

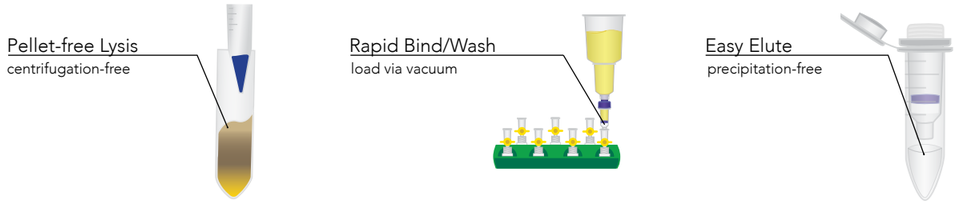
Product	Cat. No.	Size	Processing Time	Culture Volume	Elution Volume	Plasmid Yield	Endotoxins
ZymoPURE™ Plasmid Miniprep Kit	D4208T D4209 D4210 D4211 D4212	10 preps 50 preps 100 preps 400 preps 800 preps	15 minutes	≤ 5 ml	≥ 25 µl	≤ 100 µg	≤ 1 EU/µg DNA

ZymoPURE-Express™ Plasmid Midiprep Kit

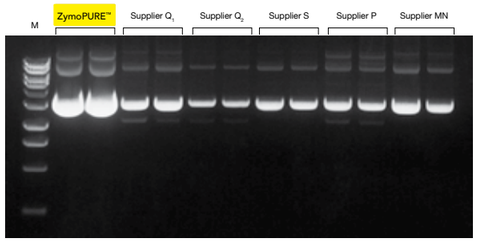
- ***Pellet-Free:*** *Direct lysis procedure omits cell-pelleting, resuspension steps, and large centrifuges.*
- ***Quick & Pure:*** *15 minutes from culture flask to transfection-grade plasmid DNA.*
- ***Highest Yield:*** *Purify up to 1.2 mg of plasmid DNA using a spin-column.*

15 minutes from Culture to Plasmid DNA

(No large-scale centrifugation)

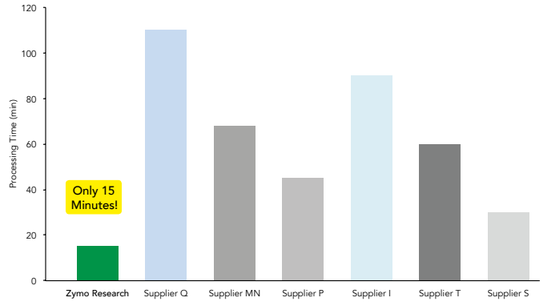


Superior Yield



Plasmid DNA yield and concentration from the ZymoPURE-Express™ Midiprep Kit compared to other major suppliers. Plasmid DNA (pGL3®) was isolated from 25 ml of JM109 *E. coli* culture grown overnight following the manufacturer's suggested protocol in duplicate. The eluted plasmid DNA was visualized post agarose gel electrophoresis. The size marker "M" is a 1 kb ladder.

Fastest Plasmid Midiprep



Save up to 100 minutes with the ZymoPURE-Express™ Midiprep Kit.

Product	Cat. No.	Size	Processing Time	Culture Volume	Elution Volume	Plasmid Yield	Endotoxins
ZymoPURE-Express™ Plasmid Midiprep Kit	D4213	25 preps	15 minutes	25-50 ml	≥ 200 µl	≤ 1.2 mg	≤ 1 EU/µg DNA

Zyppy® Plasmid Purification Kits

1. Add lysis buffer directly to bacterial culture

2. Neutralize

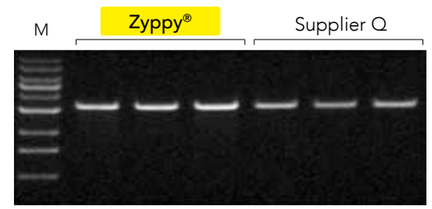
3. Bind, Wash, Elute

Pellet-free, high-quality plasmid DNA in 8 minutes

No Pelleting. No Resuspension.

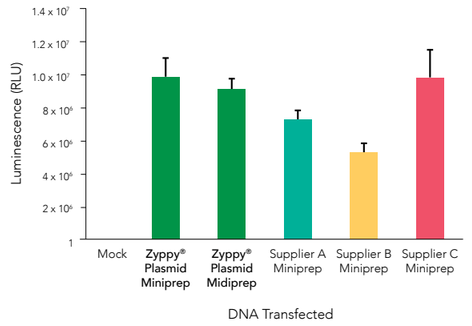
- ***Fastest:*** *8 minutes from culture flask to high-quality plasmid DNA.*
- ***Pellet-Free:*** *Direct lysis procedure omits cell-pelleting and resuspension steps.*
- ***High Quality:*** *Plasmid DNA is ready for PCR, sequencing, cloning, and transfection.*

Superior Yield



EcoRI digestion of plasmid DNA (pGEM®) isolated from *E. coli* culture using the Zyppy® Plasmid Miniprep Kit or the similar kit from Supplier Q. The amount of DNA loaded was standardized based on culture volume input. Performed in triplicate. The size marker "M" is a 1 kb ladder.

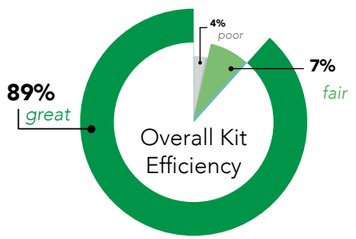
Transfection Ready



Luciferase activity was measured in lysates from cells transfected with DNA that was extracted using the pellet-free (Zyppy® system) or non-pellet-free (suppliers A, B, and C) formats. The luciferase activity is indicated as relative light units (RLU).

Proven Performance

would recommend
this kit to another researcher



Product	Cat. No.	Size	Processing Time	Culture Volume	Elution Volume	Plasmid Yield	Endotoxins
Zyppy® Plasmid Miniprep Kit	D4036 D4019 D4020 D4037	50 preps 100 preps 400 preps 800 preps	8 minutes	600 µl – 3 ml	≥ 30 µl	≤ 25 µg	≤ 50 EU/µg DNA
Zyppy®-96 Plasmid Miniprep Kit	D4041 D4042 D4043	2 x 96 preps 4 x 96 preps 8 x 96 preps	45 minutes	750 µl	≥ 30 µl	≤ 5 µg	≤ 50 EU/µg DNA

Automated Zyppy® Plasmid Purification

- ***Pellet-Free:*** *Rapid direct lysis procedure omits cell-pelleting and resuspension steps.*
- ***High Quality:*** *Ready for PCR, sequencing, cloning, and transfection.*
- ***Ideal for Synthetic Biology:*** *Fastest, high-throughput automated method for preparing high-quality plasmid DNA.*

Pellet-Free Workflow

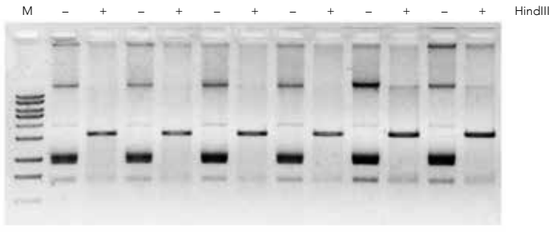
1. Add lysis buffer directly to bacterial culture

2. Neutralize

3. Beads remove debris without centrifugation

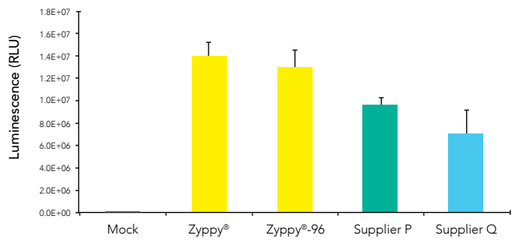
Workflow exemplary of automated procedure: Lysis buffer is added directly to *E. coli* culture with no centrifugation or pelleting necessary. MagClearing Beads are added following neutralization to remove cell debris resulting in a cleared supernatant.

High-Quality Plasmid DNA



Plasmid DNA (pGEM-3Zf(+)) was purified then digested with HindIII for one hour at 37°C. Both undigested (– lanes) and digested (+ lanes) samples were separated in a 1.0% agarose gel. The undigested samples show supercoiled plasmid, while the digested samples show the expected single linearized 3,197 bp fragment. The size marker "M" is a 1 kb ladder.

High Transfection Efficiency



Plasmid DNA isolated with Zyppy® show the highest transfection efficiencies. Luciferase activity was measured in lysates from cells transfected with plasmid DNA extracted using the Zyppy® Plasmid Miniprep Kit or products from Suppliers P and Q. The luciferase activity is indicated as relative light units (RLU).

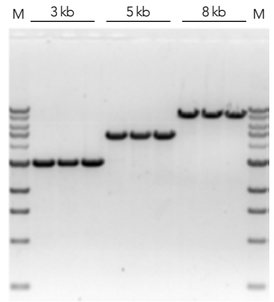
Product	Cat. No.	Size	Processing Time	Culture Volume	Elution Volume	Plasmid Yield	Endotoxins
Zyppy®-96 Plasmid MagBead Miniprep Kit	D4100 D4101 D4102	2 x 96 preps 4 x 96 preps 8 x 96 preps	60 minutes	750 µl	≥ 30 µl	≤ 5 µg	≤ 50 EU/µg DNA

ZR Plasmid Miniprep™ – Classic

- *Purify high-quality, transfection-grade plasmid DNA for restriction endonuclease digestion, DNA sequencing, transformation, cloning, transfection, in vitro transcription reactions, etc.*
- *Innovative colored P1, P2, and P3 buffers rapidly identify completion of bacterial cell lysis and neutralization steps.*
- *Unique column design enables 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 procedure that is simple, rapid, user-friendly, and reliable. It features a modified alkaline lysis protocol together with a unique Zymo-Spin™ Column to yield high-quality endotoxin-free plasmid DNA in minutes. The buffers are color-coded (red, green, yellow) for easy determination of complete cell lysis and neutralization. Plasmid DNA purified from this kit is well suited for use in restriction endonuclease digestion, sequencing, DNA ligation, cloning, PCR, bacterial transformation, transfection, etc.



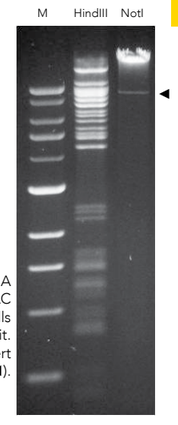
Plasmid products. Restriction endonuclease digestion of three different plasmids prepared using the ZR Plasmid Miniprep™-Classic, performed in triplicate. M: ZR 1 kb DNA marker (Zymo Research).

ZR BAC DNA Miniprep Kit

- *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 enables 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).

Product	Cat. No.	Size	Specifications	Uses
ZR Plasmid Miniprep™ – Classic	D4015 D4016 D4054	100 preps 400 preps 800 preps	Format: Spin-Column Sample Volume: 0.5 - 5.0 ml Processing Time: 15 minutes Elution Volume: ≥ 30 µl DNA Yield: ≤ 25 µg DNA Size Limits: ≤ 25 kb	Plasmid recovery from *E. coli* culture
ZR BAC DNA Miniprep Kit™	D4048 D4049	25 preps 100 preps	Format: Spin-Column Sample Volume: 0.5 - 5.0 ml Processing Time: 15 minutes Elution Volume: ≥ 10 µl DNA Yield: ≤ 10 µg DNA Size Limits: 50 bp to ≥ 200 kb	Large plasmid recovery from *E. coli* culture

Genomic DNA Purification

Innovation. Pure & Simple.™

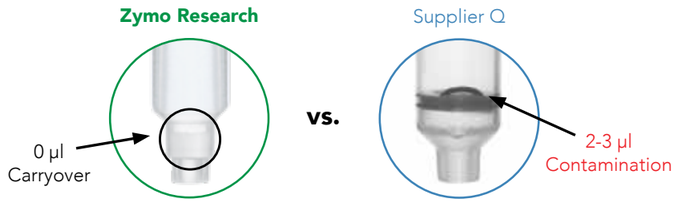
Zymo Research offers a range of genomic DNA isolation kits that are suitable for extracting high molecular weight DNA from a wide variety of sample types including tissue, fresh and paraffin-embedded tissue sections, cultured cells, saliva, buccal cells, whole blood, plasma, serum, urine, bacteria, fungi, yeast, algae, viruses, and mitochondria. Our genomic DNA isolation kits yield high-quality DNA that is ideal for use in any sensitive downstream applications such as PCR, DNA sequencing, endonuclease digestion, and methylation detection.

Technology Overview: *Quick*-DNA™ Kits

Accommodates a Wide Variety of Samples

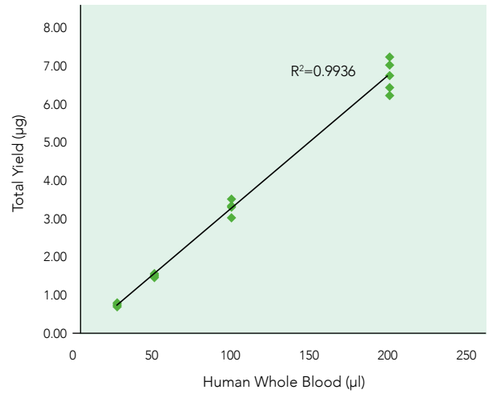
The *Quick*-DNA™ Kits are a simple solution for high-yield, ultra-pure total DNA extraction (e.g., genomic, plasmid, mitochondrial, viral) from any biological fluid, cell culture, or solid tissue sample. *Quick*™ technology ensures the fastest isolation of high-quality DNA by using a streamlined workflow optimized for nearly any sample type. These products feature a novel Zymo-Spin™ Column capable of effectively eluting high molecular weight DNA in as little as 10 µl. DNA is ultra-pure, highly concentrated, and immediately ready for any sensitive downstream application such as qPCR, Next-Gen Sequencing and arrays.

Purity By Design



With Zymo-Spin™ Technology, there is absolutely no carryover of buffers, salts, or any PCR inhibitors. The eluted DNA is ready for all sensitive downstream applications including qPCR, Next-Generation Sequencing, and methylation analysis.

Reliable & Consistent



DNA yields increase linearly with increasing volumes of human whole blood using the *Quick*-DNA™ Miniprep Plus Kit. Six replicates of 25, 50, 100, and 200 µl of human whole blood were processed.

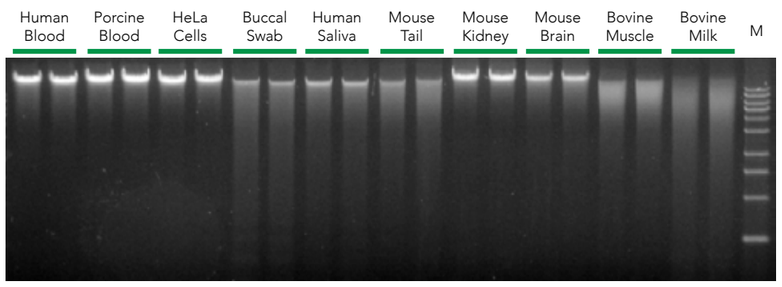
Quick-DNA™ and *Quick*-DNA™ Plus Kits

- ***Quick & Easy:*** *Simple 20 minute procedure.*
- ***Highest Yield:*** *Recover 3x more DNA.*
- ***Ultra-Pure:*** *Ready for qPCR, Next-generation sequencing, arrays, etc.*

Description

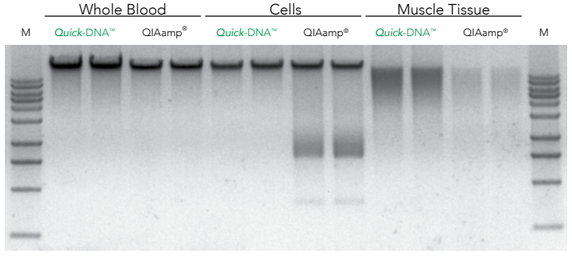
The *Quick*-DNA™ Plus Kits are the easiest method for high-yield total DNA extraction (e.g., genomic, plasmid, mitochondrial, viral) from any biological fluid, cell culture, or solid tissue sample. Innovative reagents and Zymo-Spin™ Column technologies allow for ultra-pure and concentrated genomic DNA > 50 kb to be eluted in as little as 10 µl. Zymo-Spin™ Columns ensure no buffer retention. Purified DNA is RNA-free, bypassing the need for RNase A treatment and enables accurate quantification. Isolated DNA is ideal for immediate use in sensitive downstream applications including qPCR, DNA-seq, arrays, and methylation analysis.

Universal Sample Compatibility



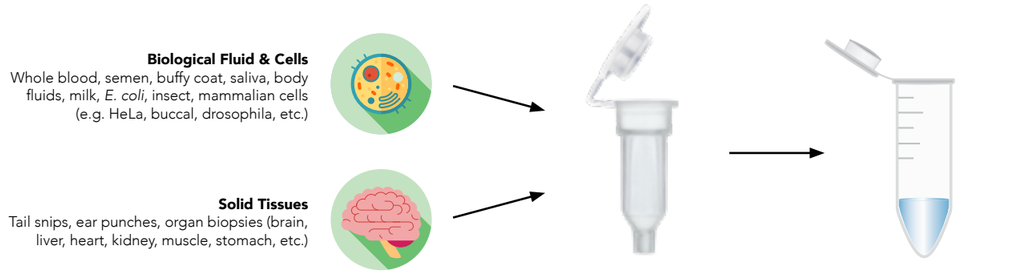
The *Quick*-DNA™ Miniprep Plus Kit is universal and accommodates any sample input including cultured cells, any type of tissue, whole blood, tough-to-lyse samples, milk, etc.

Superior Yields



The *Quick*-DNA™ Miniprep Plus kit isolates highly concentrated genomic DNA without any RNA contamination. *Quick*-DNA™ Miniprep Plus and QIAamp (Qiagen) were compared by processing porcine whole blood, HeLa cells, and bovine muscle tissue. The resultant DNA was analyzed on 1% (w/v) agarose gel.

Quick-DNA™ Plus Workflow



Quick-DNA™ Plus (Proteinase K Included)

Any Sample Type - Tissue, Cells, Whole Blood, etc.

Product	Cat. No.	Size	DNA Recovery	Minimum Elution	(Animal) Cells/Tissue
Quick-DNA™ Microprep Plus Kit	D4074	50 preps	5 µg	10 µl	≤ 10^6 cells ≤ 5 mg tissue
Quick-DNA™ Miniprep Plus Kit	D4068T D4068 D4069	10 preps 50 preps 200 preps	25 µg	35 µl	≤ 5 x 10^6 cells ≤ 25 mg tissue
Quick-DNA™ Midiprep Plus Kit	D4075	25 preps	125 µg	200 µl	≤ 3 x 10^7 cells ≤ 125 mg tissue
Quick-DNA™ 96 Plus Kit	D4070 D4071	2 x 96 preps 4 x 96 preps	5 µg	15 µl	≤ 10^6 cells ≤ 5 mg tissue
Quick-DNA™ Magbead Plus Kit	D4081 D4082	1 x 96 preps 4 x 96 preps	10 µg	75 µl	≤ 3 x 10^6 cells ≤ 25 mg tissue

Quick-DNA™ (No Proteinase K)

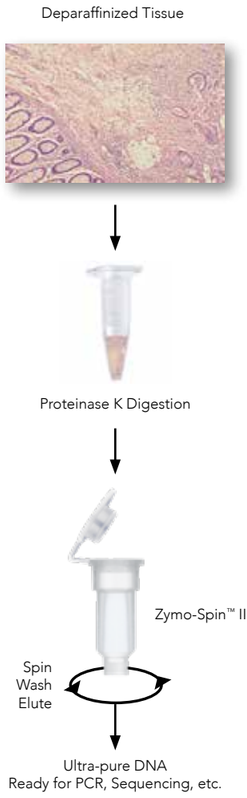
Whole Blood, Swabs, Cells

Product	Cat. No.	Size	DNA Recovery	Minimum Elution	(Animal) Cells
Quick-DNA™ Microprep Kit	D3020 D3021	50 preps 200 preps	5 µg	10 µl	≤ 10^6 cells
Quick-DNA™ Miniprep Kit	D3024 D3025	50 preps 200 preps	25 µg	25 µl	≤ 5 x 10^6 cells
Quick-DNA™ 96 Kit	D3010 D3011 D3012	2 x 96 preps 4 x 96 preps 10 x 96 preps	5 µg	30 µl	≤ 10^6 cells

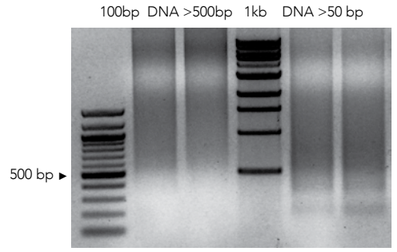
Quick-DNA™ FFPE Kit

- ***Quick & Easy:*** *Rapid dewaxing procedure (no xylene necessary).*
- ***Ultra-Pure:*** *Ready for qPCR, Next-Gen Sequencing, arrays, etc.*
- ***Highest Yield:*** *Recover 6x more DNA.*

Simplest Workflow

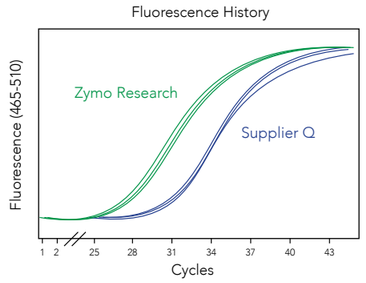


Size Selection Built In



The *Quick*-DNA™ FFPE Kit selectively isolates DNA > 50 bp or > 500 bp. Equivalent amounts of DNA resolved on a 1% agarose gel. 100 bp DNA ladder and 1 kb DNA ladder from Zymo Research

The Highest Recovery



DNA isolated using the *Quick*-DNA™ FFPE Kit consistently yielded lower Ct values as depicted by the amplification curves above. Equivalent amounts of DNA isolated using Zymo and Supplier Q procedures were used for real time PCR analysis.

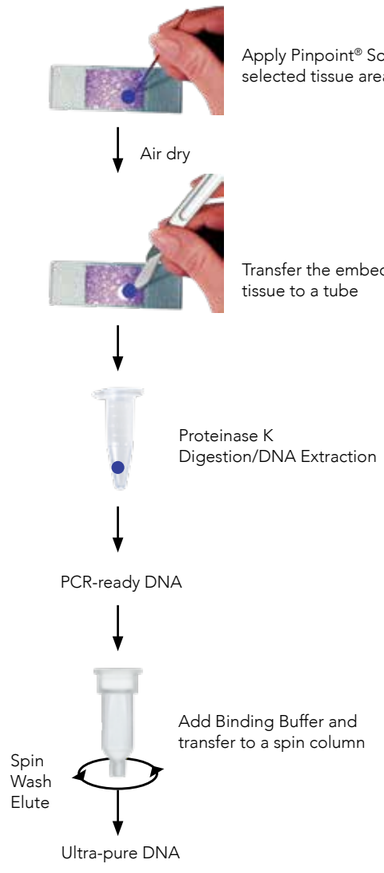
Product	Cat. No.	Size	Specifications	Uses
Quick-DNA™ FFPE Kit	D3067	50 preps	Format: Spin-Column Sample Size: up to 25 mg tissue Binding Capacity: 25 µg Elution Volume: ≥ 25 µl	DNA isolation from: FFPE blocks; FFPE tissue sections

Pinpoint® Slide DNA Isolation System

- *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. This eliminates the 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.

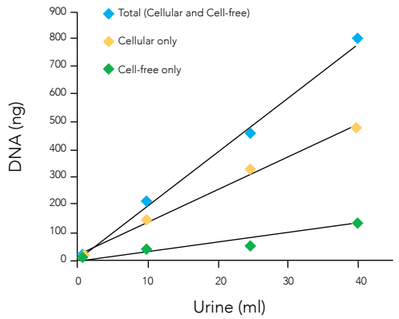


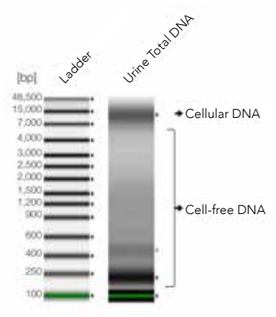
Product	Cat. No.	Size	Specifications	Uses
Pinpoint® Slide DNA Isolation System	D3001	50 preps	Format: Spin-Column Binding Capacity: 5 µg Elution Volume: ≥ 10 µl	DNA isolation from targeted ares of: tissue sections; FFPE tissue sections; glass slides

Quick-DNA™ Urine Kit

- ***Total DNA Recovery:*** *Recover cellular and/or cell-free DNA easily from ≤ 40 ml of urine.*
- ***Preservation Reagent Included:*** *Nucleic acid stabilized at room temperature for 30 days.*
- ***Ultra-Pure DNA:*** *Ready for qPCR, Next-generation sequencing, arrays, etc.*

Cellular DNA. Cell-free DNA. Or both!

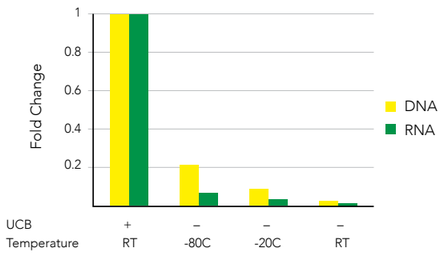




DNA yields increase linearly with increasing urine from healthy subjects extracted with the *Quick*-DNA™ Urine Kit. DNA was isolated from 1 ml, 10 ml, 25 ml, and 40 ml urine. DNA concentration was quantified by qPCR using the Femto™ Human DNA Quantification Kit (Zymo Research).

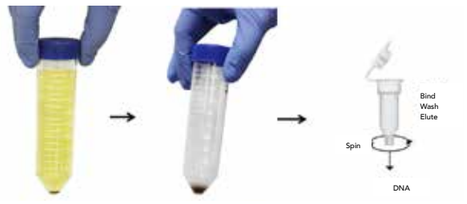
Both cellular and cell-free DNA was effectively purified from urine. 5 ml of urine from a healthy female donor was processed and DNA was eluted in 20 µl final volume. Purified DNA was analyzed using the Agilent 2200 TapeStation® system.

Superior Preservation



UCB provides more preservation compared to conventional methods. Urine (with or without UCB) was preserved using different storage conditions: Room temperature (RT), -20 °C, and -80 °C. After 2 weeks of storage, total DNA (yellow) and total RNA (green) were purified using the *Quick*-DNA™ Urine Kit and a custom RNA extraction protocol by Zymo Research, respectively. Corresponding fold change of preserved nucleic acids obtained from qPCR analysis.

Streamlined Workflow



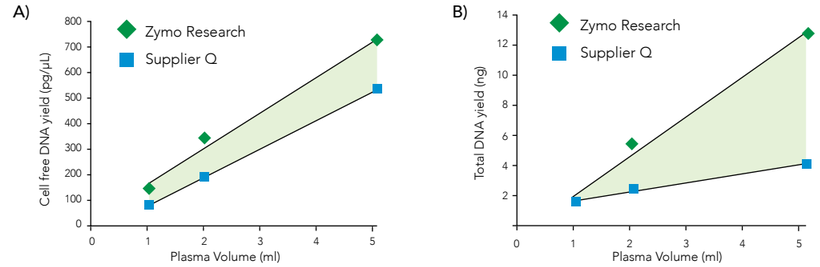
Precipitation | Proteinase K Digestion | DNA Purification

Product	Cat. No.	Size	Specifications	Uses
Quick-DNA™ Urine Kit	D3061	50 preps	Sample Volume: ≤ 40 ml Column Binding Capacity: 5 µg DNA Size: 100 bp to 23 kb	Cellular and cellular-free DNA isolation from urine

Quick-cfDNA™ Serum & Plasma Kit

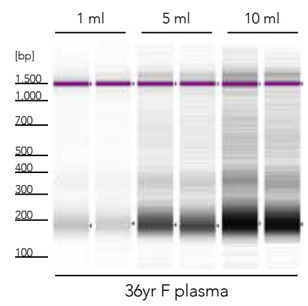
- ***High Processing Volume:*** *Purify ≤ 10 ml of serum or plasma and elute with 35 µl.*
- ***Highest Yields:*** *Consistently purify > 30% more cfDNA.*
- ***Ultra-Pure:*** *Ready for qPCR, Next-Gen Sequencing, etc.*

Highest Yields



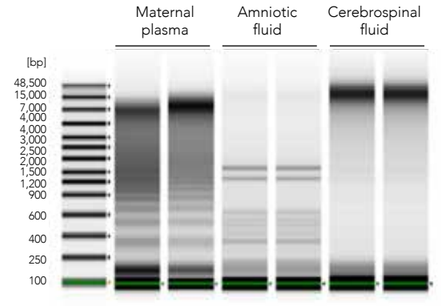
The *Quick*-cfDNA™ Serum & Plasma Kit recovers more cell-free DNA than a comparable Supplier Q kit. The DNA recovered is linearly proportional to the sample input volume when compared with Supplier Q. (A) Concentration of the smallest nucleosomal fragment DNA (N1, ~180 bp) was determined using the Agilent 2100 Bioanalyzer® system. (B) Total DNA recovery was quantified using the Zymo Research Femto™ Human DNA Quantification Kit on an Applied Biosystems® 7500 Real-Time PCR System.

Linear and Efficient Recovery of Cell-Free DNA



Cell-free DNA recovery scales proportionally with sample input using the *Quick*-cfDNA™ Serum & Plasma Kit. Cell-free DNA was isolated in duplicate from three healthy female donors, and visualized using the Agilent 2200 Tapestation® system.

Versatile Sample Compatibility



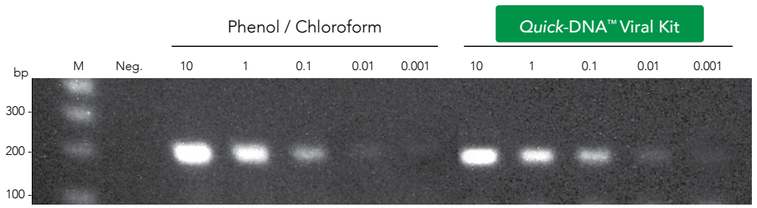
Total DNA, including both high and low molecular weight species, was purified in duplicate from human maternal plasma, amniotic fluid, and cerebrospinal fluid. DNA was visualized using the Agilent 2200 Tapestation® system.

Product	Cat. No.	Size	Specifications	Uses
Quick-cfDNA™ Serum & Plasma Kit	D4076	50 preps	Compatible with vacuum and centrifuge Processing Volume: ≤10 ml DNA Recovery: ≥ 100bp Elution Volume: ≥ 35 µl	DNA isolation from: Serum; Plasma; Amniotic fluid; Cerebrospinal fluid; saliva; Ideal for cell-free DNA
Quick-cfDNA™ Serum & Plasma Buffer Set	D4076-A	Refill		

Quick-DNA™ Viral Kits

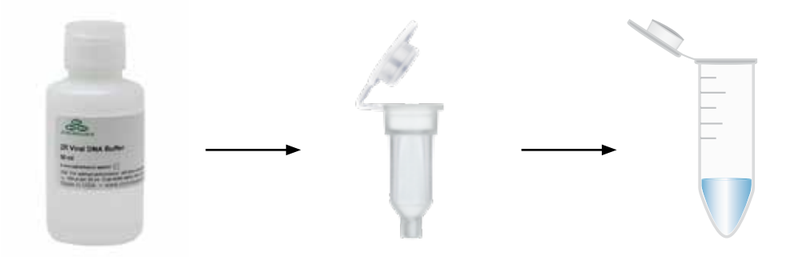
- ***Rapid Protocol:*** *Elute DNA in 6 µl within 10 minutes.*
- ***Ultra-Pure:*** *Ready for qPCR, Next-generation sequencing, arrays, etc.*
- ***High Sensitivity:*** *Yields increase linearly with sample input.*

Viral DNA in 10 minutes



Viral DNA is quickly and easily purified with the *Quick*-DNA™ Viral Kit. Human HBV DNA was isolated from 10 to 0.001 µl of human serum using phenol/chloroform or *Quick*-DNA™ Viral Kit. The presence of HBV DNA is evidenced by a ~200 bp PCR amplicon. The size marker M is a 100 bp DNA Ladder (Zymo Research) and "Neg." is the negative PCR control.

The Simplest Workflow



Lyse any Sample Input | Bind onto Column | Elute Ultra-Pure DNA

Product	Cat. No.	Size	Specifications	Uses
Quick-DNA™ Viral Kit	D3015 D3016	50 preps 200 preps	Format: Spin Column Elution Volume: ≥ 6 µl Processing Time: 15 minutes Binding Capacity: 5 µg DNA Size Limits: 100 bp - 50 kb	Viral DNA isolation from: Fresh/frozen soft tissue; Cultured cells; Whole blood
Quick-DNA™ Viral 96 Kit	D3017 D3018	2 x 96 preps 4 x 96 preps	Format: 96-Well Elution Volume: ≥ 10 µl Processing Time: 25 minutes Binding Capacity: 5 µg DNA Size Limits: 100 bp - 50 kb	

Environmental DNA Purification using *Quick*-DNA™ Kits

Innovation. Pure & Simple.™

Many techniques exist to extract DNA and RNA from challenging samples. However, mechanical lysis using bead bashing is often required to efficiently process tough-to-lyse organisms and environmental samples. The Zymo Research line of environmental purification kits feature unique BashingBead™ technology, which allows isolation of DNA from samples refractory to conventional lysis procedures. DNA from samples 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 is efficiently and rapidly extracted. These products produce high-yield and high-quality DNA suitable for downstream applications such as PCR, sequencing, hybridization, restriction digestion, and other enzymatic processes.

Environmental samples provide a unique challenge not present in other types of sample processing and analyses. Due to the inhibitors typically found in feces and soil, there is a need for inhibitor removal during DNA purification. These inhibitors - including humic acid, tannic acid, fulvic acid, heme, and polyphenolic compounds - can significantly affect downstream applications. For example, humic acid contamination in DNA samples can inhibit PCR. Our Zymo-Spin III-HRC Inhibitor Removal technology contains all the components needed for efficient removal of contaminants that can inhibit downstream enzymatic reactions (e.g. PCR and RT-PCR) from DNA and RNA preparations.

Technology Overview: BashingBead™ Lysis & Environmental 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 diagrammed below and on the following pages.

For processing, samples are simply transferred to the provided ZR BashingBead™ Lysis Tubes where they are rapidly and efficiently lysed by bead beating in novel 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 Zymo-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 is accomplished in as little as 15 minutes.

Microprep & Miniprep Formats

Pulverize Sample with
ZR BashingBead™ Lysis Tube

Filter Lysate with
Zymo-Spin™ IIIF

Bind, Wash, Elute DNA
with Zymo-Spin™ IC or IIC

PCR Ready Ultra-pure DNA

Continue with the following step for
Quick-DNA™ Fecal/Soil Microbe &
Quick-DNA™ Plant/Seed Kits only.

Polyphenolic Removal with
Zymo-Spin™ IV-µHRC or IV-HRC

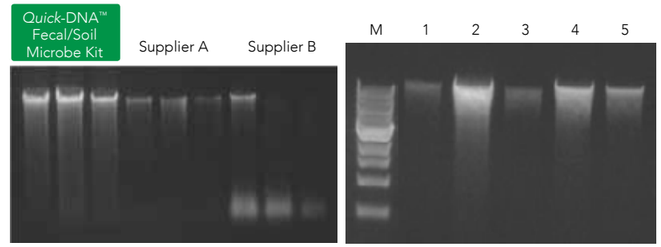
PCR Ready, Ultra-pure DNA

Quick-DNA™ Fecal/Soil Microbe Kits

- ***Boost Detection:*** *Included BashingBeads™ ensure complete lysis of tough-to-lyse samples.*
- ***Inhibitor-Free:*** *Ready for qPCR, Next-Gen Sequencing, arrays, etc.*
- ***Simple Workflow:*** *Lyse, purify on column, and filter to remove PCR inhibitors.*

Higher Yields

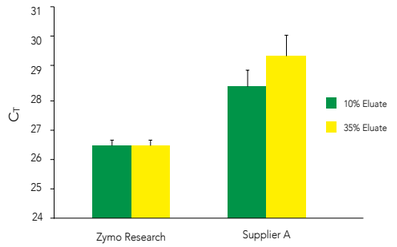
High-quality total DNA was isolated from different environmental sample sources using the *Quick*-DNA™ Fecal/Soil Microbe Kit and compared against other suppliers. (A) Equivalent amounts of feces were processed using each kit, then equal volumes of eluted DNA were analyzed on a 0.8% (w/v) agarose gel stained with EtBr. (B) 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).



Complete Homogenization

State-of-the-art BashingBeads™ are ideal for disrupting tough-to-lyse organisms when paired with bead mills or high speed cell disrupters.

Ultra-Pure & Inhibitor-Free DNA



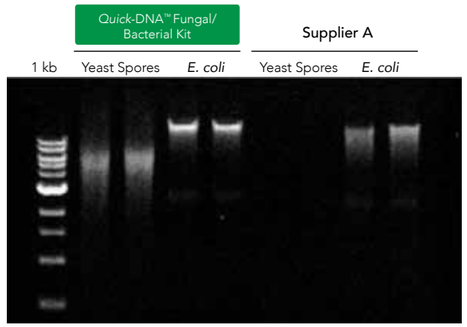
Real-time PCR was used to evaluate 10% or 35% of eluates recovered using the *Quick*-DNA™ Fecal/Soil Microbe Kit or Supplier A Kit to detect PCR inhibitors. Delayed amplification indicates PCR inhibition from inefficient inhibitor removal (n=8).

Product	Cat. No.	Size	Specifications	Uses
Quick-DNA™ Fecal/Soil Microbe Microprep Kit	D6012	50 preps	Format: Spin-Column Binding Capacity: 5 µg Elution Volume: ≥ 20 µl Processing Time: 20 min.	Total DNA isolation from: Feces; Gram (+) bacteria; Gram (-) bacteria; yeast; filamentous fungi; unicelluar algae; filamentous algae; protist; soil, sludge, clay
Quick-DNA™ Fecal/Soil Microbe Miniprep Kit	D6010	50 preps	Format: Spin-Column Binding Capacity: 25 µg Elution Volume: ≥ 50 µl Processing Time: 20 min.	
Quick-DNA™ Fecal/Soil Microbe Midiprep Kit	D6110	25 preps	Format: Spin-Column Binding Capacity: 125 µg Elution Volume: ≥ 150 µl Processing Time: 25 min.	
Quick-DNA™ Fecal/Soil Microbe 96 Kit	D6011	2 x 96 preps	Format: 96-Well Binding Capacity: 5 µg Elution Volume: ≥ 50 µl Processing Time: 50 min.	
Quick-DNA™ Fecal/Soil Microbe 96 Magbead Kit (includes ZR BashingBead™ Lysis Rack)	D6010-FM	2 x 96 preps	Format: Magnetic Bead Binding Capacity: 25 µg Elution Volume: 37.5 µl Processing Time: 2 hours	
Quick-DNA™ Fecal/Soil Microbe 96 Magbead Kit (Lysis Matrix Not Included)	D6011-FM	2 x 96 preps		
Quick-DNA™ Fecal/Soil Microbe 96 Magbead Kit (includes ZR BashingBead™ Lysis Tubes)	D6012-FM	2 x 96 preps		

Quick-DNA™ Fungal/Bacterial Kits

- ***Boost Detection:*** *Included BashingBeads™ ensure complete lysis of tough-to-lyse samples.*
- ***Ultra-Pure:*** *Ready for qPCR, Next-Gen Sequencing, arrays, etc.*
- ***Simple Workflow:*** *Fastest workflow (< 20 minutes).*

Highest Yields



DNA isolated from *Saccharomyces cerevisiae* (spores) and *E. coli* using the *Quick*-DNA™ Fungal/Bacteria Kit was high-quality and structurally intact. Equivalent amounts of yeast and bacteria were processed using the *Quick*-DNA™ Fungal/Bacterial Kit or the Supplier A kit. Equal volumes of eluted DNA were analyzed on a 0.8% (w/v) agarose gel stained with EtBr.

Simple Workflow

Homogenize sample with ZR BashingBead™ Lysis Tube

Filter Lysate with Zymo-Spin™ III-F

Bind, Wash, Elute DNA with Zymo-Spin™ IC or IIC

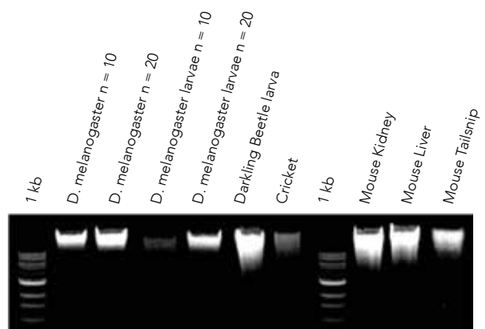
PCR Ready, Ultra-Pure DNA

Product	Cat. No.	Size	Specifications	Uses
Quick-DNA™ Fungal/Bacterial Microprep Kit	D6007	50 preps	Format: Spin-Column Binding Capacity: 5 µg Elution Volume: ≥ 10 µl Processing Time: 15 minutes	Total DNA isolation from: Gram (+) bacteria; Gram (-) bacteria; Yeast; Filamentous fungi; Unicellular algae; Filamentous algae; Protist; Either fungi or bacteria grown in media
Quick-DNA™ Fungal/Bacterial Miniprep Kit	D6005	50 preps	Format: Spin-Column Binding Capacity: 25 µg Elution Volume: ≥ 35 µl Processing Time: 15 minutes	
Quick-DNA™ Fungal/Bacterial Midiprep Kit	D6105	25 preps	Format: Spin-Column Binding Capacity: 125 µg Elution Volume: ≥ 150 µl Processing Time: 20 minutes	
Quick-DNA™ Fungal/Bacterial 96 Kit	D6006	2 x 96 preps	Format: 96-Well Binding Capacity: 5 µg Elution Volume: ≥ 25 µl Processing Time: 40 minutes	

Quick-DNA™ Tissue/Insect Kits

- ***Simple Workflow:*** *Lyse, purify on column, and filter to remove PCR inhibitors.*
- ***Highest Yield:*** *Included BashingBeads™ ensure complete lysis of tough-to-lyse samples.*
- ***Ultra-Pure:*** *Ready for qPCR, Next-Gen Sequencing, arrays, etc.*

High Recovery



Yields of DNA isolated from various insect and mouse samples using the *Quick*-DNA™ Tissue/Insect Kit. Various amounts of sample were processed then equal volumes of eluted DNA were analyzed on a 0.8% (w/v) agarose gel stained with EtBr.

Simple Workflow

Homogenize sample with ZR BashingBead™ Lysis Tube

Filter Lysate with Zymo-Spin™ III-F

Bind, Wash, Elute DNA with Zymo-Spin™ IC or IIC

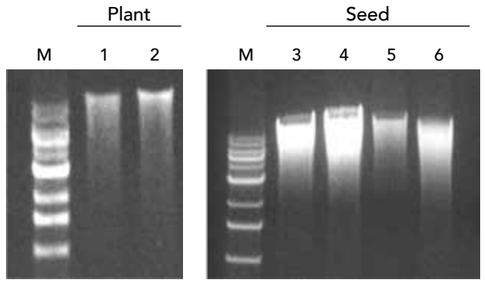
PCR Ready Ultra-Pure DNA

Product	Cat. No.	Size	Specifications	Uses
Quick-DNA™ Tissue/Insect Microprep Kit	D6015	50 preps	Format: Spin-Column Binding Capacity: 5 µg Elution Volume: ≥ 10 µl Processing Time: 15 minutes	DNA isolation from: Insects/arthropods; tough-to-lyse tissues; tough-to-lyse organisms; soft & solid tissues (food)
Quick-DNA™ Tissue/Insect Miniprep Kit	D6016	50 preps	Format: Spin-Column Binding Capacity: 25 µg Elution Volume: ≥ 35 µl Processing Time: 15 minutes	
Quick-DNA™ Tissue/Insect 96 Kit	D6017	2 x 96 preps	Format: 96-Well Binding Capacity: 5 µg Elution Volume: ≥ 25 µl Processing Time: 40 minutes	

Quick-DNA™ Plant/Seed Kits

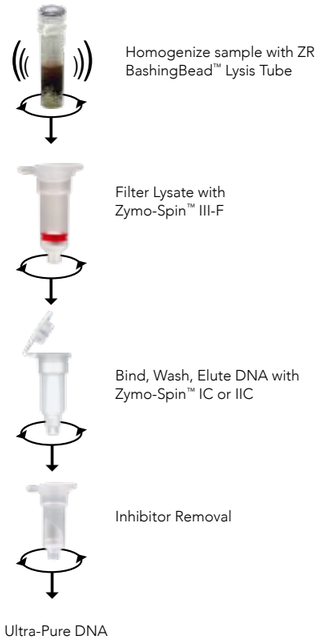
- ***Boost Detection:*** *Included BashingBeads™ ensure complete lysis of tough-to-lyse samples.*
- ***Inhibitor-Free:*** *Ready for qPCR, Next-Gen Sequencing, arrays, etc.*
- ***Simple Workflow:*** *Lyse, purify on column, and filter to remove PCR inhibitors.*

High Recovery



Comparison of DNA yields from various plant and seed samples using the *Quick*-DNA™ Plant/Seed Kit. Equivalent amounts of plant materials were processed with equal volumes of eluted DNA analyzed in a 0.8% (w/v) agarose gel stained with EtBr. Arabidopsis thaliana (1), juniper (2), corn kernel (3, 4), sunflower seed (5, 6).

Simple Workflow



Product	Cat. No.	Size	Specifications	Uses
Quick-DNA™ Plant/Seed Miniprep Kit	D6020	50 preps	Format: Spin-Column Binding Capacity: 25 µg Elution Volume: ≥ 50 µl Processing Time: 20 minutes	DNA isolation from: leaves; other plant material; seeds; fruit
Quick-DNA™ Plant/Seed 96 Kit	D6021	2 x 96 preps	Format: 96-Well Binding Capacity: 5 µg Elution Volume: ≥ 50 µl Processing Time: 50 minutes	

DNA Clean-up

DNA Clean-Up from any Enzymatic Reaction

High-quality, inhibitor-free DNA is crucial for successful PCR, DNA ligation/cloning, sequencing, arrays, etc. Our scientists have developed the most comprehensive technologies for DNA clean-up and concentration from any preparation. Core to these products is the total removal of salts/alcohol from samples with uniquely designed spin-columns and plates that ensure complete elution with no binding/wash buffer carryover. Coupled with uniquely formulated buffers, these technologies assure the purification of high-quality DNA without the inclusion of inhibitors.

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 cleaning and 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. DNA recovered with the DCC® kits is 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. Also, the Genomic DNA Clean & Concentrator® is available for rapid clean-up of large-sized DNA (up to and ≥ 200 kb) making it ideal for genomic DNA clean-up. The Oligo Clean & Concentrator™ provides a streamlined method for efficient recovery and clean-up of DNA fragments and oligonucleotides ≥16 nt. *Select-a-Size* DCC® is an innovative technology with size selection capabilities that are commonly used for Next-Generation Sequencing cleanups.

Which DNA Clean & Concentrator® Kit should I use?

DNA Clean & Concentrator® Kits

Ultra pure DNA in 2 minutes (50 bp to 23 kb) from PCR, impure preps and enzymatic digestions

Page 86-87

Format:
Spin-Column
96-Well Plate

Genomic DNA Clean & Concentrator® Kits

High molecular weight DNA clean-up (1 kb to > 200 kb)

Page 90

Format:
Spin-Column
96-Well Plate

Oligo Clean & Concentrator™ Kits

DNA & RNA oligos and probes (16 to 200 nt)

Page 88

Format:
Spin-Column
96-Well Plate

***Select-a-Size* DNA Clean & Concentrator®**

High-quality, size selected DNA in 7 minutes (library preparation and NGS applications)

Page 89

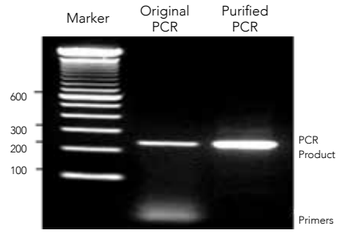
Format:
Spin-Column
MagBead

DNA Clean & Concentrator® -5 Kits

- *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 plate designs allow DNA to be eluted at high concentrations into minimal volumes of water or TE buffer.*
- *Eluted DNA is optimal for any downstream molecular biology application.*

Description

The DNA Clean & Concentrator®-5 (DCC®-5)and ZR-96 DNA Clean & Concentrator®-5 kits allow the purification of up to 5 µg of DNA from PCR, endonuclease digestions, DNA modification reactions, isotope/fluorescence labeling reactions, etc. The kits facilitate the removal of enzymes, as well as free dNTPs and their analogs including radiolabeled and fluorescent derivatives. Eluted DNA is suitable for PCR, arrays, ligation, sequencing, etc.



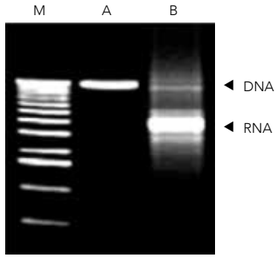
Clean & Concentrated DNA. DNA samples, such as the PCR products shown here, can be efficiently purified and concentrated using the DNA Clean & Concentrator®-5.

DNA Clean & Concentrator® -25 Kits

- *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 Zymo-Spin™ Column technology, which yields high-quality, purified DNA in just minutes and is compatible with cDNA and ssDNA. Eluted DNA is suitable for sequencing, microarray analysis, PCR, nucleotide blotting, and restriction endonuclease digestion procedures.



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

Product	Cat. No.	Size	Specifications	Uses
DNA Clean & Concentrator® -5 (uncapped columns)	D4003 D4003T D4004	50 preps 10 preps 200 preps	Format: Spin-Column Elution Volume: ≥ 6 µl Processing Time: 2 minutes Binding Capacity: 5 µg DNA Size Limits: 50 bp - 23 kb	
DNA Clean & Concentrator® -5 (capped columns)	D4013 D4014	50 preps 200 preps		
ZR-96 DNA Clean & Concentrator®-5	D4023 D4024	2 x 96 preps 4 x 96 preps	Format: 96-Well, Deep Well Elution Volume: ≥ 10 µl Processing Time: 15 minutes Binding Capacity: 5 µg DNA Size Limits: 50 bp - 23 kb	PCR clean-up; Enzyme removal; dNTP removal, dye removal; cDNA/ssDNA purification; probe purification; lysate DNA clean-up; M13 phage
DNA Clean & Concentrator® -25 (uncapped columns)	D4005 D4006	50 preps 200 preps	Format: Spin-Column Elution Volume: ≥ 25 µl Processing Time: 2 minutes Binding Capacity: 25 µg DNA Size Limits: 50 bp - 23 kb	
DNA Clean & Concentrator® -25 (capped columns)	D4033 D4034	50 preps 200 preps		

DNA Clean & Concentrator® -100 & 500 Kits

- *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, or syringe.*

Description

The DNA Clean & Concentrator®-100 & 500 are designed for the rapid desalting and purification of up to 100 µg & 500 µg of DNA, respectively, from PCR, large format restriction endonuclease digestions, or cell-free lysates. Eluted DNA is ideal 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 takes less than 20 minutes.

ZR-96 DNA Clean-up Kit™

- *Quick (20 minute), 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, 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. No need for organic denaturants or chloroform, instead our Zymo-Spin™ Plate technology yields high-quality, purified DNA in just minutes.

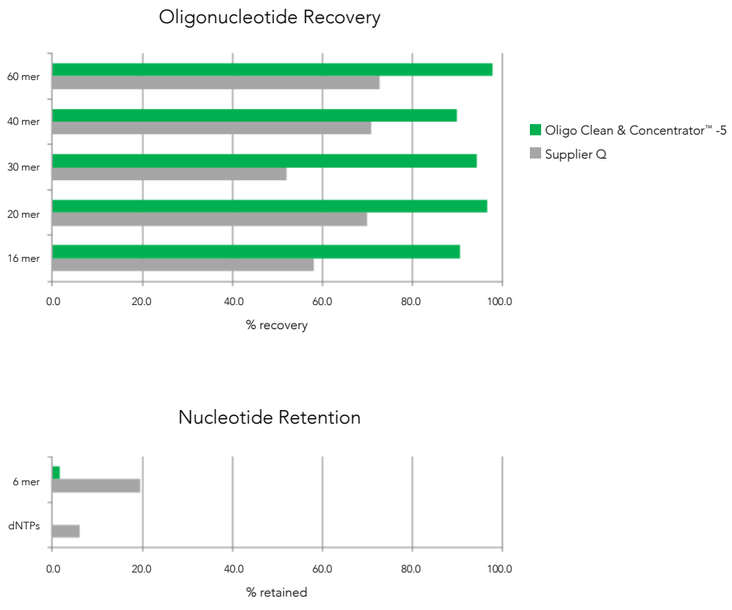
Product	Cat. No.	Size	Specifications	Uses
DNA Clean & Concentrator® -100	D4029 D4030	25 preps 50 preps	Format: Spin-Column Elution Volume: ≥ 150 µl Processing Time: < 20 minutes Binding Capacity: 100 µg DNA Size Limits: 50 bp - 23 kb	PCR clean-up; enzyme removal; nucleotide/dye removal; cDNA/ssDNA purification; probe purification ; lysate DNA clean-up; M13 phage
DNA Clean & Concentrator® -500	D4031 D4032	10 preps 20 preps	Format: Spin-Column Elution Volume: ≥ 2 ml Processing Time: 20 minutes Binding Capacity: 500 µg DNA Size Limits: 50 bp - 23 kb	
ZR-96 DNA Clean-up Kit™	D4017 D4018	2 x 96 preps 4 x 96 preps	Format: 96-Well, Shallow Well Elution Volume: ≥ 30 µl Processing Time: 20 minutes Binding Capacity: 5 µg DNA Size Limits: 50 bp - 23 kb	

Oligo Clean & Concentrator™ Kits

- *Quick (2 minute) recovery of ultra-pure DNA and RNA oligonucleotides.*
- *Complete removal of dyes, salts, enzymes, nucleotides, and short oligos.*
- *Eluted DNA/RNA is well suited for use in hybridization, sequencing, PCR, ligation, etc.*

Description

The Oligo Clean & Concentrator™ provides a streamlined method for efficient recovery and clean-up of DNA fragments, and oligonucletides from labeling (radioactive, biotin, DIG, etc.) and other enzymatic reactions. Unincorporated nucleotides, short oligos, dyes, enzymes, and salts are effectively removed by the clean-up procedure. There is no need for organic denaturants or chloroform since our Zymo-Spin™ Columns employ a single-buffer system that allows for efficient DNA/RNA adsorption. DNA/RNA is washed and concentrated into an elution of ≥ 6 µl. Purified DNA/RNA is available in just two minutes and is ideal for hybridization, gel shift assays, enzymatic reactions, ligation, sequencing, microarray analysis, etc.



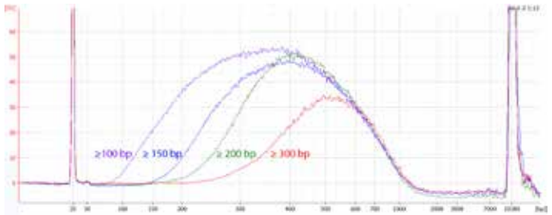
Product	Cat. No.	Size	Specifications	Uses
Oligo Clean & Concentrator™	D4060 D4061	50 preps 200 preps	Format: Spin-Column Elution Volume: ≥ 6 µl Processing Time: 2 minutes Binding Capacity: 10 µg ssDNA/RNA or 5 µg dsDNA Size Limit: ≥ 16 nt	Oligonucleotide clean-up; cDNA/ssDNA purification; Probe purification; Enzyme removal; Nucleotide/Dye removal
ZR-96 Oligo Clean & Concentrator™	D4062 D4063	2 x 96 preps 4 x 96 preps	Format: 96-Well Elution Volume: ≥ 10 µl Processing Time: 20 minutes Binding Capacity: 10 µg ssDNA/RNA or 5 µg dsDNA Size Limit: ≥ 16 nt	

Select-a-Size DNA Clean & Concentrator® Kit

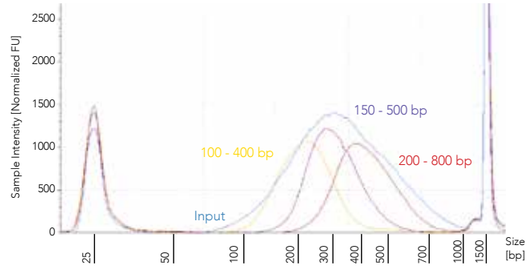
- *Quick (7 minute) protocol to select for ≥300 bp, ≥200 bp, ≥150 bp, ≥100 bp, ≥50 bp DNA fragments or perform a double size selection.*
- *Clean and concentrate DNA from enzymatic reactions in as little as 10 µl of DNA/RNA free water.*
- *Eluted DNA is well suited for use in Next-Generation sequencing, PCR, DNA ligation, endonuclease digestion, RT-PCR, etc.*

Description

The *Select-a-Size* DNA Clean & Concentrator® Kits provide the quickest and easiest method for purifying a desired range of DNA fragment sizes from PCR, endonuclease digestions, ligations, etc. Simply adjust the binding conditions for the desired cutoff then bind, wash, and elute. Selectively recover 100-400 bp DNA fragments or perform a double size selection. Our Zymo-Spin™ Column technology yields high-quality DNA, in as little as seven minutes, that is ideal for Next-Generation sequencing, PCR, and other downstream applications.



***Select-a-Size* DNA Clean & Concentrator® allows for selection at ≥300 bp, ≥200 bp, ≥150 bp, ≥100 bp and ≥50 bp.** DNA was size selected according to the *Select-a-Size* DNA Clean and Concentrator® protocol and the results were analyzed by Bioanalyzer. 700 ng of sonicated salmon sperm DNA was used as a standard input to evaluate size selection efficiency and cutoff. Eluted DNA was diluted 1:20 prior to being loaded on the High Sensitivity DNA Chip for analysis.



***Select-a-Size* DNA Clean & Concentrator® MagBead Kit** allows for adjustable size selection. Exemplary size selections (using 2 µg of sonicated DNA) were analyzed using the Agilent 2200 TapeStation® system.

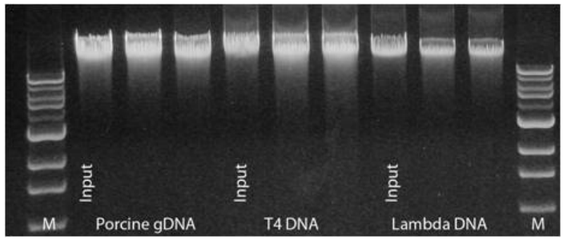
Product	Cat. No.	Size	Specifications	Uses
Select-a-Size DNA Clean & Concentrator®	D4080	25 preps	Format: Spin-Column Elution Volume: ≥ 10 µl Processing Time: 7 minutes Binding Capacity: 3 µg DNA Size Limits: 50 bp - 23 kb Cutoffs: ≥ 300, 200, 150, 100, 50 Double Size Selection	Next Generation sequencing; library prep; PCR clean-up; ligation
Select-a-Size DNA Clean & Concentrator® MagBead Kit	D4084 D4085	10 ml 50 ml	Format: Magnetic Bead Elution Volume: ≥ 10 µl Processing Time: 10 minutes Cutoffs: Left: 100 bp – 400 bp Right: 200 bp – 1000 bp Double Size Selection	DNA Size Selection, DNA Clean up, Automation

Genomic DNA Clean & Concentrator® Kits

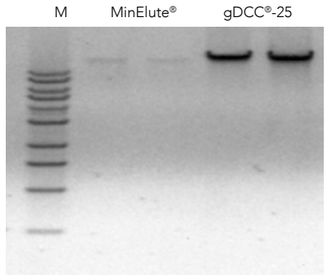
- *Quick (5 minute) spin-column recovery of large-sized DNA (e.g., genomic, mitochondrial, plasmid (BAC/PAC), viral, phage, (wga) DNA, etc.) from any enzymatic reaction or impure preparation (e.g., Proteinase K digestion). No messy precipitations!*
- *Unique spin-column for low volume (≥10 µl) elution of ultra-pure, high-yield DNA.*
- *Eluted DNA is ideal for PCR, restriction endonuclease digestion, Sanger and Next-Generation sequencing, etc.*

Description

The Genomic DNA Clean & Concentrator® is designed for the quick recovery of ultra-pure, large-sized DNA (e.g., genomic, mitochondrial, plasmid (BAC/PAC), viral, phage, etc.) from any enzymatic reaction or impure preparation (e.g., Proteinase K digestion). 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 ideal for sequencing, PCR, endonuclease digestion, and other enzymatic procedures. The product is also compatible with smaller DNA fragments (50 bp to 10 kb) from PCR, digestions, crude plasmid preparations, cDNA synthesis, etc.



High molecular weight DNA is efficiently purified using the Genomic DNA Clean &Concentrator®-10. Porcine gDNA (~35-50 kb), T4 phage DNA (170 kb), and lambda (λ) phage 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. The size marker "M" is a 1 kb ladder (Zymo Research).



High molecular weight DNA is efficiently purified using the Genomic DNA Clean & Concentrator®-25. Lambda (λ) phage DNA (48.5 kb) was purified (in duplicate) from input material using the Minelute® (Qiagen) and the Genomic DCC®-25 (gDCC®-25). The gDCC®-25 resulted in yields > 40% compared to the MinElute®. Eluted DNAs were analyzed in a 0.8% (w/v) TAE/agarose/EtBr gel. The size marker "M" is a 1 kb ladder (Zymo Research).

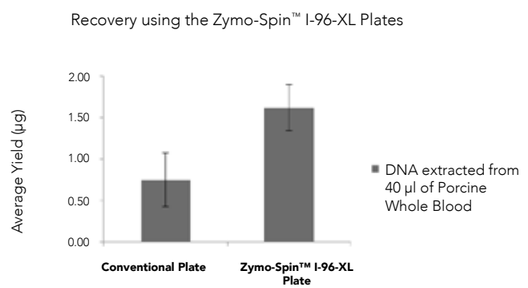
Product	Cat. No.	Size	Specifications	Uses
Genomic DNA Clean & Concentrator®-10	D4010 D4011	25 preps 100 preps	Format: Spin Column Elution Volume: ≥ 10 µl Processing Time: 5 minutes Binding Capacity: 10 µg DNA Size Limit: 50 bp to ≥ 200 kb	High-molecular weight DNA clean-up; PCR clean-up; enzyme removal; nucleotide/dye removal; lysate DNA clean-up
Genomic DNA Clean & Concentrator®-25	D4064 D4065	25 preps 100 preps	Format: Spin Column Elution Volume: ≥ 35 µl Processing Time: 5 minutes Binding Capacity: 25 µg DNA Size Limit: 23 bp up to 200 kb	

ZR-96 Genomic DNA Clean & Concentrator®-5

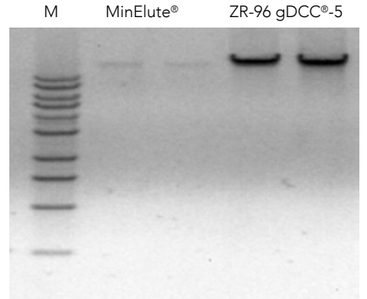
- *96-well plate recovery of large-sized DNA from any enzymatic reaction or impure preparation. No messy precipitations!*
- *Unique plate for low volume (≥15 µl) elution of ultra-pure, highly concentrated DNA.*
- *Eluted DNA is ideal for PCR, restriction endonuclease digestion, Sanger and Next-Generation Sequencing, etc.*

Description

The ZR-96 Genomic DNA Clean & Concentrator®-5 (DCC®) is made for high-throughput recovery of ultra-pure, large-sized DNA (e.g., genomic, mitochondrial, plasmid (BAC/PAC), viral, phage, (wga) DNA, etc.) from any enzymatic reaction or impure preparation (e.g., Proteinase K digestion). 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™ I-96-XL Plate. Eluted DNA is suitable for sequencing, PCR, endonuclease digestion, and other enzymatic procedures. The product is also compatible with smaller DNA fragments (50 bp to 10 kb) from PCR, digestions, crude plasmid preparations, cDNA synthesis, etc.



Zymo-Spin™ I-96-XL Plates result in superior yields to other conventional market columns. Genomic DNA extracted using the Zymo-Spin™ I-96-XL Plate results in higher yields from porcine whole blood.



High molecular weight DNA is efficiently purified using the ZR-96 Genomic DCC®-5. Lambda (λ) phage DNA (48.5 kb) was purified (in duplicate) from input material using the Minelute® and the ZR-96 Genomic DCC®-5 (ZR-96). The ZR-96 Genomic DCC®-5 resulted in yields > 340% compared to the MinElute®. 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).

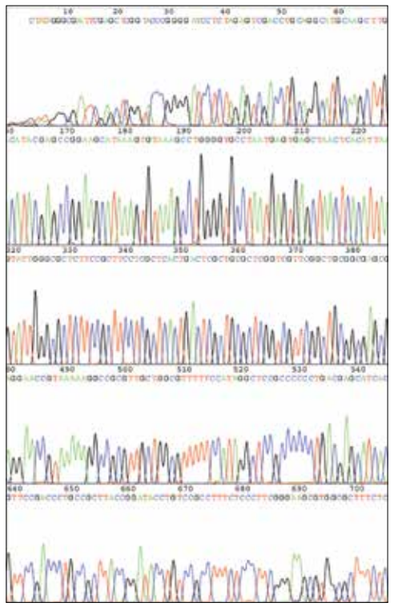
Product	Cat. No.	Size	Specifications	Uses
ZR-96 Genomic DNA Clean & Concentrator®-5	D4066 D4067	2 x 96 preps 4 x 96 preps	Format: 96-Well Elution Volume: ≥ 15 µl Processing Time: 20 minutes Binding Capacity: 5 µg DNA Size Limits: 50 bp - 23 kb	High-molecular weight DNA clean-up; PCR clean-up; enzyme removal; nucleotide/dye removal; lysate DNA clean-up

ZR DNA Sequencing Clean-Up Kits™

- *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 columns!*

Description

The ZR DNA Sequencing Clean-Up Kits™ provide simple and rapid methods for 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, including dye peaks or "dye blobs" which may obscure portions of the sequencing chromatogram and interfere with base-calling accuracy of sequencing analysis software. DNA can be eluted with a small volume of water or loading dye containing formamide.



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™.

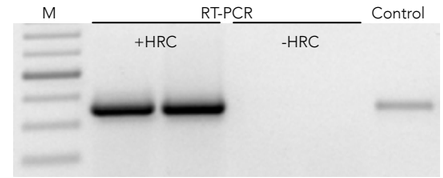
Product	Cat. No.	Size	Specifications	Uses
ZR DNA Sequencing Clean-Up Kits™	D4050 D4051	50 preps 200 preps	Format: Spin-Column Elution Volume: ≥ 6 µl Processing Time: 2 minutes Binding Capacity: 5 µg	Sequencing DNA clean-up; enzyme removal; dye terminator removal; nucleotide/dye removal
ZR-96 DNA Sequencing Clean-Up Kits™	D4052 D4053	2 x 96 preps 4 x 96 preps	Format: 96-Well Elution Volume: ≥ 15 µl Processing Time: 9 minutes Binding Capacity: 5 µg	

OneStep™ PCR Inhibitor Removal Kits

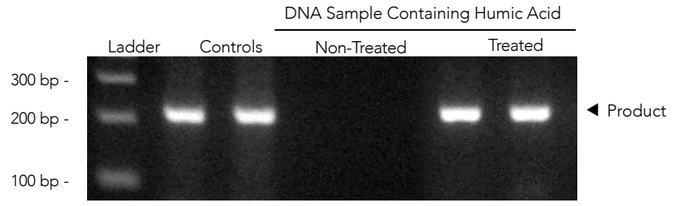
- *Removes PCR inhibitors such as polyphenolics, humic/fulvic acids, tannins, melanin, etc. from nucleic acid solutions to yield high-quality DNA or RNA.*
- *Fast, one-step procedure for cleaning impure samples prior to PCR, sequencing, reverse transcription (RT), etc.*

Description

The *OneStep*™ 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 or plate formats 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.



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).



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. The ladder is a 100 bp DNA marker (Zymo Research).

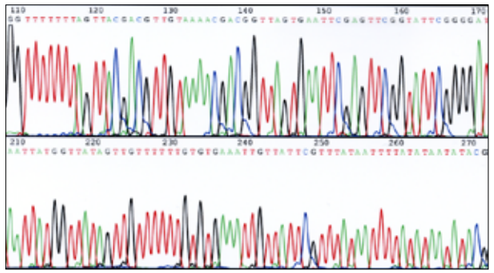
Product	Cat. No.	Size	Specifications	Uses
OneStep™ PCR Inhibitor Removal Kit	D6030	50 preps	Format: Spin Column Elution Volume: 50 - 200 µl Processing Time: 4 minutes DNA (RNA) Recovery: 80 - 100%	Polyphenolic PCR inhibitor removal from DNA & RNA (e.g. humic/fulvic acids, tannins, melanin)
OneStep™-96 PCR Inhibitor Removal Kit	D6035	2 x 96 preps	Format: 96-Well Elution Volume: 50 - 100 µl Processing Time: 13 minutes DNA (RNA) Recovery: 50 - 90%	

Zymoclean™ Gel DNA Recovery Kits

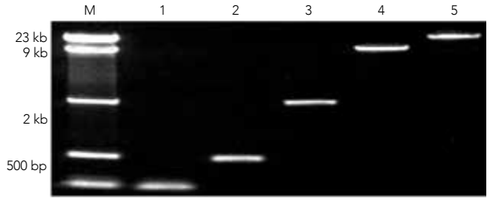
- *Quick (15 minute) recovery of ultra-pure DNA from agarose gels.*
- *Column design permits DNA elution at high concentrations into minimal volumes ≥ 6 µl.*
- *Eluted DNA is well suited for use in DNA ligation, sequencing, labeling, PCR, etc.*

Description

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



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

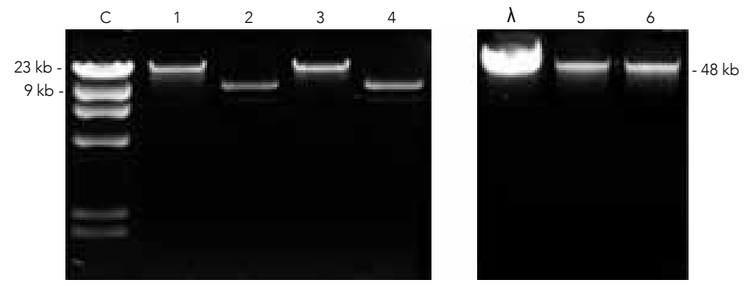
Product	Cat. No.	Size	Specifications	Uses
Zymoclean™ Gel DNA Recovery Kit (uncapped columns)	D4001 D4001T D4002	50 preps 10 preps 200 preps	Format: Spin-Column Elution Volume: ≥ 6 µl Processing Time: 15 minutes Binding Capacity: 5 µg DNA Size Limits: 50 bp - 23 kb	Recover DNA from TAE/TBE agarose gel slices
Zymoclean™ Gel DNA Recovery Kit (capped columns)	D4007 D4008	50 preps 200 preps		
ZR-96 Zymoclean™ Gel DNA Recovery Kit	D4021 D4022	2 x 96 preps 4 x 96 preps	Format: 96-Well Elution Volume: ≥ 15 µl Binding Capacity: 5 µg DNA Size Limits: 50 bp - 23 kb	

Zymoclean™ Large Fragment DNA Recovery Kit

- *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 (15 minute) 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, dissolve, and then transfer to the supplied Zymo-Spin™ IC-XL Column. No need for organic denaturants or chloroform, our Zymo-Spin™ Column technology yields high-quality, purified DNA in just minutes. DNA purified from this kit is ideal for PCR, sequencing, endonuclease digestion, ligation, etc.



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.

Product	Cat. No.	Size	Specifications	Uses
Zymoclean™ Large Fragment DNA Recovery Kit	D4045 D4046	25 preps 100 preps	Format: Spin-Column Elution Volume: ≥ 10 µl Processing Time: 15 minutes Binding Capacity: 10 µg DNA Size Limits: ≥ 50 bp ~ 200 kb	Recover high molecular weight DNA from TAE/TBE agarose gel slices

DNA Analysis

Tools for Effective DNA Analysis

Working with human, fungal, or bacterial DNA? Zymo Research has engineered our Femto™ Quantification Kits to ensure your DNA quantification is accurate. These products allow for the quantification of 20 femtograms of DNA in as little as 1 µl of sample. The Femto™ Quantification Kits have a high specificity and sensitivity to ensure accurate quantification, even with a non-target DNA background. Also, our DNA ladders ensure your DNA samples are of the highest quality for processing, making DNA size approximation easy for both PCR products as well as plasmid DNAs.

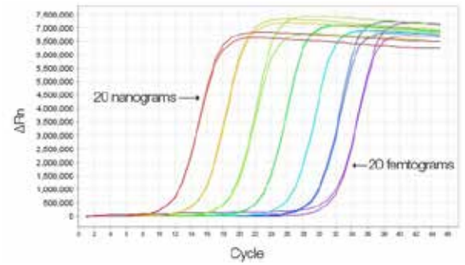
Femto™ Quantification Kits

- *Quantify as little 20 femtograms of DNA in as little as 1 µl of sample.*
- *High specificity and sensitivity for DNA in a background of non-target DNA.*
- *Fast and simple: add samples to the PreMix... and quantify.*

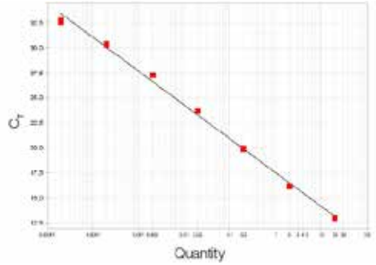
Description

The Femto™ Human DNA Quantification Kit can detect and quantify human DNA with high specificity and sensitivity. Human DNA can be reliably quantified in a background of non-human DNA such as bacterial, fungal, animal, plant DNA, etc. This is essential for downstream applications that require accurate DNA input amounts including STR analysis, quantifying bacteria DNA template for Next-Gen. sequencing library preparation, and metagenomic analysis. As little as 20 fg from 1 µl of purified biological liquids or other samples can be dependably quantified.

Amplification Plot



Standard Curve



Reliable standards for the qualification of bacterial DNA: Bacterial DNA Standards (measured in duplicates) comprise a 10-fold dilution series ranging from 20 ng to 20 fg.

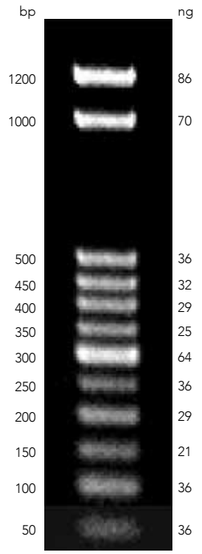
Product	Cat. No.	Size	Uses	Specifications
Femto™ Human DNA Quantification Kit	E2005	100 rxns	Human DNA detection and quantification	Detection Dye: SYTO 9® DNA Inpt: 20 fg - 20 ng Standards Included
Femto™ Bacterial DNA Quantification Kit	E2006	100 rxns	Bacterial DNA detection and quantification	
Femto™ Fungal DNA Quantification Kit	E2007	100 rxns	Fungal DNA detection and quantification	

SYTO® is a registered trademark of Molecular Probes, Inc.

ZR DNA Markers™

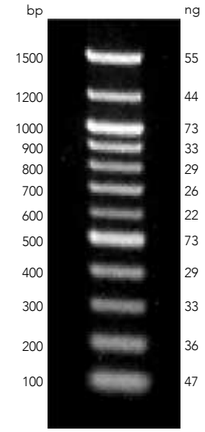
Description

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. Inclusion of an intensified band is provided in each marker for easy identification. Each marker comes with product information detailing the product and its application.



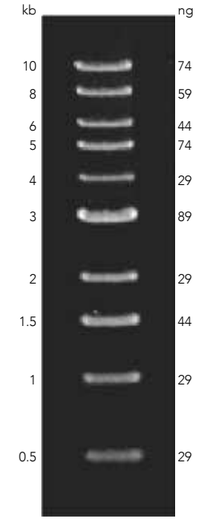
ZR 50 bp DNA Marker™

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.

Product	Cat. No.	Size	Specifications	Uses
ZR 50 bp DNA Marker™	M5001-50 M5001-200	50 µg / 100 µl 200 µg/400 µl	Ranges Available: 50 - 1200 bp	DNA size standard for gel electrophoresis
ZR 50 bp DNA Marker™ (ready-to-load)	M5004-50	50 µg / 600 µl		
ZR 100 bp DNA Marker™	M5002-50 M5002-200	50 µg / 100 µl 200 µg/400 µl	Ranges Available: 100 - 1500 bp	
ZR 100 bp DNA Marker™ (ready-to-load)	M5005-50	50 µg / 600 µl		
ZR 1 kb DNA Marker™	M5003-50 M5003-200	50 µg / 100 µl 200 µg/400 µl	Ranges Available: 0.5 - 10 kb	
ZR 1 kb DNA Marker™ (ready-to-load)	M5006-50	50 µg / 600 µl		

3 RNA Purification

RNA is truly an amazing and important biological molecule, playing absolutely critical roles in regulating many types of biological pathways and processes in all species of life. RNA is widely thought to have been both the first catalytic molecule and the first form of self-replicating genetic material during a period of history referred to as "The RNA World". Despite its obvious importance to biology, the numerous functions and activities carried out by RNA molecules have been underappreciated until recently, largely due to previous limitations in the technologies and tools available to use in RNA research. Recent work is uncovering new classes of RNAs and new activities mediated by RNA molecules. It has also become clear that the majority of genomes for most organisms, once thought to be "junk DNA", are actively transcribed to produce functional RNA species. Now, more than ever, it is evident that we are living in the New RNA World.

Zymo Research understands the central role that RNA plays in biological processes and now offers a complete portfolio of products to help researchers perform their RNA experiments efficiently and effectively. This section features information on our RNA products, ranging from the quickest and highest quality RNA purification procedures available to products for cleaning, concentrating, and isolating RNA from a wide variety of sources. The success of all RNA-based experiments depends on first isolating ultra-pure, high-quality RNA. Our industry-leading products ensure that your RNA samples are ready for all standard and Next-Generation applications to investigate this New RNA World!

RNA Purification Made Simple®

RNA Isolation

Samples in TRIzol®, TRI Reagent®, etc.
without phase separation in 7 min.

Direct-zol™ RNA Miniprep Plus Kit

100 µg total RNA (≥17 nt).
*DNase I included

Page 104-107

Format:
Spin-Column
96-Well Plate
Magnetic Bead

Cells

***Quick*-RNA™ Miniprep Kit**

100 µg total RNA (≥17 nt).
*DNase I included

Page 110

Format:
Spin-Column
96-Well Plate
Magnetic Bead

Biological Fluids & Tissues

***Quick*-RNA™ Miniprep Plus Kit**

100 µg total RNA (≥17 nt) from cells, all tissue types, & blood.
*DNase I, Proteinase K, DNA/RNA Shield™ included

Page 111

Format:
Spin-Column

Quick-RNA™ Viral Kits

Serum, plasma, culture supernatant, urine, saliva, blood, CSF.

Page 112

Format:
Spin-Column
96-Well Plate

Quick-RNA™ Whole Blood Kit

Mammalian whole blood, plasma, serum, pelleted blood cells, nucleated blood.

Page 113

Format:
Spin-Column

Quick Product Guide

RNA Isolation

Fixed Tissues

Pinpoint™ Slide RNA Isolation System I & II

Total RNA from fresh (I) and FFPE (II) tissue

Page 114

Format:
Spin-Column

Quick-RNA™ FFPE Kit

Zymo-Spin™ column isolation of high-quality RNA

Page 115

Format:
Spin-Column

Microbial

Culture

***Quick*-RNA™ Fungal/Bacterial Kits**

50 µg total RNA (≥17 nt)

*BashingBeads™ included

Page 117

Format:
Spin-Column

YeaStar™ RNA Kit

25 µg total RNA

*Zymolyase included

Page 183

Format:
Spin-Column

Environmental
(Fecal, soil, water filtrate and other)

ZymoBIOMICS® RNA Miniprep Kit

Accurate inhibitor-free RNA for microbiomics, metagenomics, and any other molecular applications

Page 158

Format:
Spin-Column

***Quick*-RNA™ Fecal/Soil Microbe Microprep Kit**

50 µg total RNA (≥17 nt)

*OneStep PCR Inhibitor Removal, BashingBeads™ included

Page 117

Format:
Spin-Column

Plant

***Quick*-RNA™ Plant Miniprep Kit**

50 µg total RNA (≥17 nt) from leaves, stems, seeds, etc.

*OneStep PCR Inhibitor Removal, BashingBeads™ included

Page 118

Format:
Spin-Column

3 RNA Purification

Quick Product Guide

RNA Clean-Up

Enzymatic Reactions, Impure and Diluted Samples

Inhibitor Removal

Gel Excisions

RNA Clean & Concentrator™ Kits

RNA and (ss)DNA (≥17 nt)
*Optionally supplied with DNase I

Page 119

Format:
Spin-Column
96-Well Plate
Magnetic Bead

Oligo Clean & Concentrator™ Kits

DNA & RNA (16 to 200 nt) oligos and probes.

Page 88

Format:
Spin-Column
96-Well Plate

***OneStep*™ PCR Inhibitor Removal Kits**

Removal of polyphenolics, humic/fulvic acids, tannins, melanins, etc. from DNA & RNA.

Page 93

Format:
Spin-Column
96-Well Plate

Zymoclean™ Gel RNA Recovery Kit

RNA (>200 nt) from agarose gels.

Page 120

Format:
Spin-Column

ZR small-RNA™ PAGE Recovery Kit

RNA (and DNA) (≥17 nt) from PAGE gels.

Page 121

Format:
Spin-Column

www.zymoresearch.com | info@zymoresearch.com | tel: (949) 679-1190 | toll-free: (888) 882-9682 | fax: (949) 266-9452

Total RNA Purification

Innovation. Pure & Simple.™

High-quality RNA from Diverse Sample Sources

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/swabs, whole blood, plasma, serum, urine, yeast, or RNA viruses. All of our RNA isolation kits feature Zymo-Spin™ Column technology, which yields highly concentrated RNA perfect for applications such as microarrays, denaturing-gel electrophoresis, Northern blotting, and RT-PCR (or other sensitive downstream applications). Each kit has been optimized for a particular application with specialized, nuclease-free components to 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.

GET IT DIRECT

TRIzol® In. RNA Out.

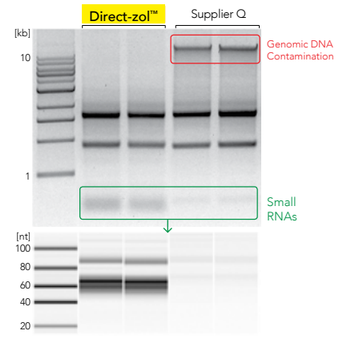
Direct-zol™ RNA Kits

- ***Easy Handling:*** *No phase separation or precipitation steps.*
- ***NGS-Ready:*** *Ultra-pure RNA without phenol carryover. No DNA contamination (DNase I included).*
- ***Non-Biased:*** *Complete RNA recovery without miRNA loss.*

Description

The Direct-zol™ RNA kits facilitate efficient and consistent purification of high-quality (DNA-free) total RNA (including miRNAs) directly from samples stored in TRIzol®, TRI Reagent®, and all other acid-guanidinium-phenol based reagents, directly on column. The innovative Direct-zol™ procedure bypasses phase separation and precipitation steps with a spin-column format, saving time and also eliminating phenol carryover without compromising RNA quality. Direct-zol™ technology couples the effectiveness of TRI Reagent®, useful for infectious agent inactivation and sample preservation, with a convenient, hassle-free, mess-free procedure for DNA-free RNA.

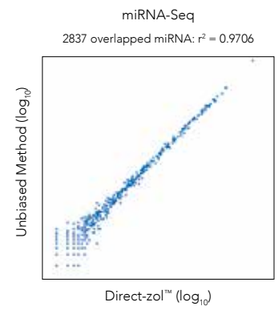
NGS-Ready RNA from TRIzol® in 7 Minutes



Bind RNA directly to a spin-column

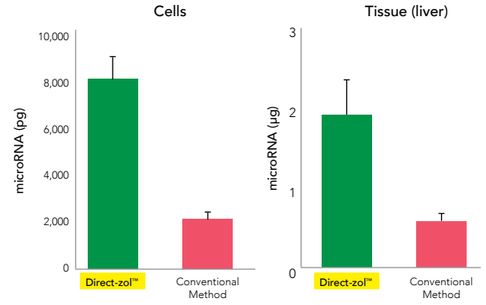
High-quality, intact, small and large RNA are efficiently recovered using a Direct-zol™ RNA kit compared to using a Supplier Q kit. RNA is DNA-free and ready for all downstream applications, including NGS.

Non-Biased miRNA Recovery



RNA purified from TRIzol® using Direct-zol™ RNA compared to an unbiased method (mirVana™, Ambion). Data is highly correlated (2837 overlapped miRNA: $r^2 = 0.9706$). Analysis was performed using miRNA-Seq (MiSeq™, Illumina).

Highest Yields



Direct-zol™ RNA kits recovered ~4-fold more miRNA (<40 nt) than conventional methods. miRNA purified from cells and tissue were quantified using Bioanalyzer small RNA chip.

Product	Cat. No.	Size	Binding Capacity	Minimum Elution	(Animal) Cells	Tissue
Direct-zol™ RNA Miniprep Plus Kit	R2070, R2071* R2072, R2073*	50 preps 200 preps	100 µg	50 µl	≤ 10^7	≤ 50 mg
Direct-zol™ RNA Miniprep Kit	R2050, R2051* R2052, R2053*	50 preps 200 preps	50 µg	25 µl	≤ 5 x 10^6	≤ 25 mg
Direct-zol™ RNA Microprep Kit	R2060, R2061* R2062, R2063*	50 preps 200 preps	10 µg	6 µl	≤ 10^6	≤ 5 mg
Direct-zol™ -96 RNA Kit	R2054, R2055* R2056, R2057*	2 x 96 preps 4 x 96 preps	10 µg	10 µl	≤ 10^6	≤ 5 mg
Direct-zol™ -96 MagBead RNA Kit	R2100, R2101* R2102, R2103* R2104, R2105*	2 x 96 preps 4 x 96 preps 8 x 96 preps	10 µg	50 µl	≤ 10^6	≤ 5 mg

* Supplied with TRI Reagent®.
Compatible with samples stored in TRIzol®, TRI-Reagent®, RNAzol®, QIAzol®, and all other acid-guanidinium-phenol reagents.

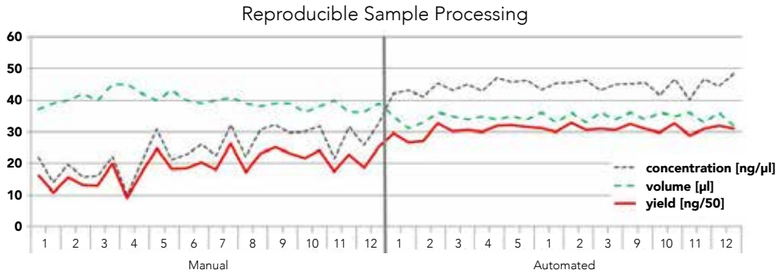
Direct-zol™ 96 Magbead RNA Kit

- *High-throughput, magnetic bead based purification of high-quality (DNA-free) total RNA directly from samples stored in TRIzol®, TRI Reagent® and all other acid-guanidinium-phenol based reagents.*
- *Eliminates phase separation and precipitation procedures.*
- *Efficient, broad range purification of small and large RNAs from cells, tissues, biological liquids, in vitro transcripts, etc.*
- *Automation ready!*

Description

The Direct-zol™ 96 Magbead RNA Kit is a high-throughput adaptation of Direct-zol™ technology for high-quality RNA isolation directly from samples in TRI Reagent® and similar. The magnetic bead format allows the procedure to be easily automated. The extraction method inactivates viruses and other infectious agents. Total RNA including small and non-coding RNAs (17-200 nt) is effectively isolated from a variety of sample sources (cells, tissues, serum, plasma, blood, biological liquids, etc.) using this product.

RNA Directly from TRI Reagent® – Now Automated!



Comparison between manual and automated (Freedom EVO®, Tecan) sample processing with the Direct-zol™ 96 Magbead RNA Kit across a 96-Well plate. RNA was purified from human epithelial cells (5 x 10^5/well).

Product	Cat. No.	Size	Specifications	Uses
Direct-zol™ 96 Magbead RNA Kit	R2100, R2101* R2102, R2103* R2104, R2105*	2 x 96 preps 4 x 96 preps 8 x 96 preps	Format: Magnetic Beads Elution Volume: 50 µl Binding Capacity: 10 µg/prep. Size Limits: 17 - 200 nt Processing Time: 45 minutes	HTP & automated RNA isolation from samples stored in TRI Reagent® (Molecular Research Center, Inc.), RNAzol®, QIAzol®, TriPure®, TriSure® (Bioline) and all other acid-guanidinium-phenol reagents including cells from culture; Solid tissue; Plasma; Serum; Whole blood; *in vitro* processed RNA

*Supplied with TRI Reagent®

Direct-zol™ DNA/RNA Miniprep Kit

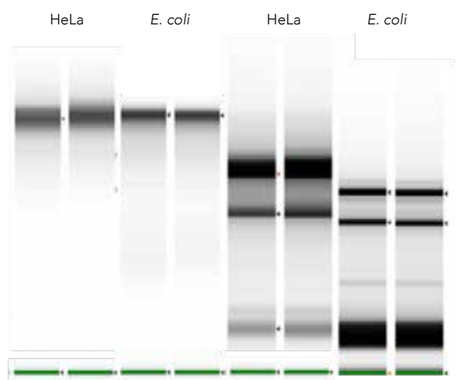
- ***One Input, One Column:*** *Purify DNA & RNA directly from TRIzol® with just one spin-column.*
- ***Easy Handling:*** *No phase-separation or precipitation steps.*
- ***High-Quality:*** *DNA & RNA (including small & micro RNA) ready for Next-Gen Sequencing, qPCR and RT-qPCR, hybridization, etc.*

Description

The Direct-zol™ DNA/RNA kits provide an innovative method for the purification of DNA and total RNA from a variety of samples freshly lysed in TRIzol® or similar, including animal cells, tissue, bacteria, yeast, plant, biological liquids and etc.

Upon lysis of the sample with TRIzol® or similar, RNA and DNA is bound directly to the Zymo-Spin™ Column. Then simply spin, wash, and elute high-quality RNA and DNA into separate fractions. No phase separation, precipitation, or post-purification steps are necessary. The eluted nucleic acids are suitable for all subsequent molecular manipulations and analyses including Next-Gen sequencing, RT/qPCR, hybridization, etc.

NGS-Ready DNA and RNA



High quality DNA and RNA purified in duplicate from the same input of mammalian (HeLa) and bacterial (*E. coli*) cells using the **Direct-zol™ DNA/RNA Miniprep Kit**. Samples were visualized using the Agilent 2200 TapeStation® system.

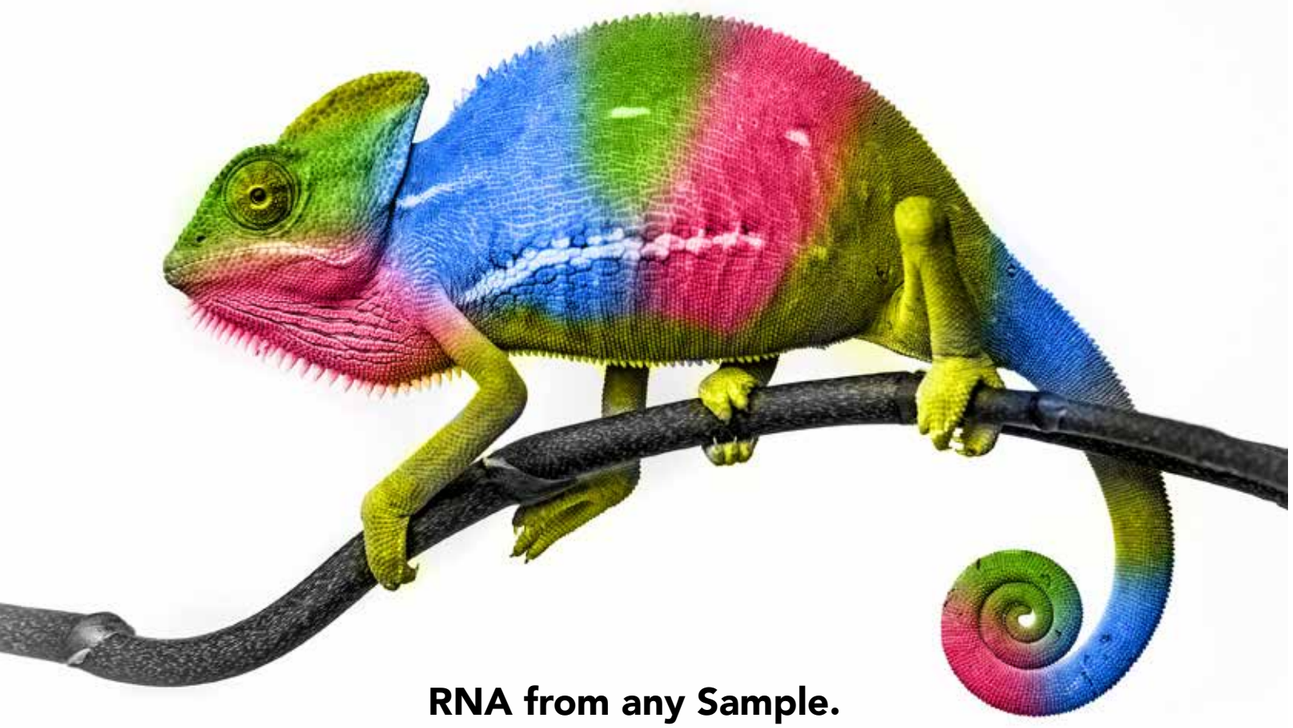
DNA and RNA *directly* from TRIzol®

in separate fractions

Product	Cat. No.	Size	Binding Capacity	Minimum Elution
Direct-zol™ DNA/RNA Miniprep Kit	R2080T R2080 R2081*	10 preps 50 preps 50 preps	25 µg DNA and 50 µg RNA	25 µl

*Supplied with TRI Reagent®

Adjust to your surroundings.



RNA from any Sample.

Quick-RNA™ Kits

- ***Broad Range:*** *Extract total RNA (including small/micro RNA) from any sample.*
- ***DNA-Free:*** *Genomic DNA removal column and DNase I included.*
- ***NGS-Ready:*** *RNA is ready for all downstream applications including Next-Gen Sequencing, RT-qPCR, hybridization, etc.*

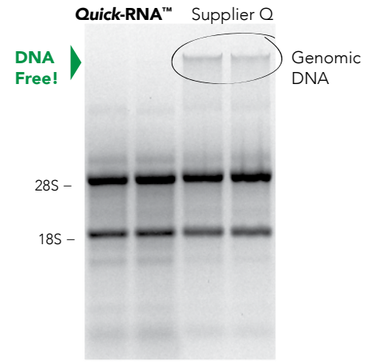
Technology Overview: *Quick*-RNA™

High Quality DNA-free RNA from Diverse Sample Sources

Speed, precision, and phenol-free purification of total RNA (including miRNAs) from diverse sample sources. The *Quick*-RNA™ kits have been optimized for rapid, specific isolation of total (≥17 nt), large (≥200 nt), or small (17-200 nt) RNA species. The included Zymo-Spin™ Column and Plate technologies enable unprecedented sample concentration with elution volumes as little as 6 µl. The *Quick*-RNA™ kits remove the vast majority of genomic DNA (Spin-Away™ Filter) and feature convenient in-column DNase I treatment.

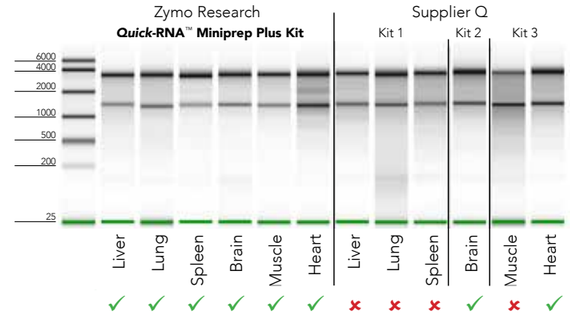
All *Quick*-RNA™ kits include **DNase I** for DNA-free RNA – Right Away!

Quality



The *Quick*-RNA™ kits yield high quality total RNA. High levels of genomic DNA contamination are present in the preps from Suppliers Q but not with the *Quick*-RNA™ kits. Total RNA was isolated from human epithelial cells (sans DNase treatment).

Versatility



High-quality total RNA is isolated from various tissue types using the *Quick*-RNA™ Miniprep Plus Kit. In comparison, RNA isolated from the same tissue types using three kits recommended by Supplier Q (Agilent 2200 TapeStation®; Red = low quality).

Value

	***Quick*-RNA™**	Supplier Q
Small RNA (≥17 nt) recovery	Yes	No
DNase I included	Yes	No
gDNA removal column included	Yes	No
Proteinase K	Yes*	No
DNA/RNA Shield™ (for sample storage)	Yes*	No

**Quick*-RNA™ Miniprep Plus Kit*

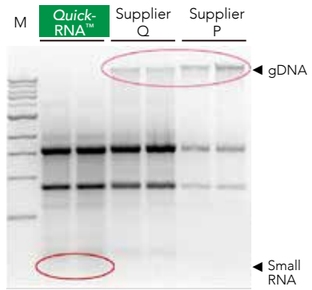
Quick-RNA™ Kits

- **Broad Range:** *Extract total RNA (including small/micro RNA) from any sample.*
- **DNA-Free:** *Genomic DNA removal column and DNase I included.*
- **NGS-Ready:** *RNA is ready for all downstream applications including Next-Gen Sequencing, RT-qPCR, hybridization, etc.*

Description

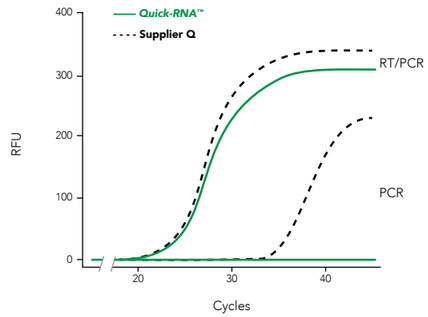
The *Quick*-RNA™ kits are innovative products designed for the easy, reliable, and rapid isolation of DNA-free total RNA from a wide range of cell and tissue samples. *Quick*-RNA™ and Zymo-Spin™ Column technologies enable a high yields of quality total RNA (including small RNAs 17-200 nt) in minutes. Simply add the provided RNA Lysis Buffer to extract total RNA from the sample of interest, then purify the RNA using the provided Zymo-Spin™ columns or plate. The result is highly-concentrated, DNA-free RNA that is suitable for subsequent RNA-based methods including RT-qPCR, hybridization, sequencing etc. In addition, the kit can be used for enrichment of small and large RNAs in two separate fractions.

High-Quality RNA



Broad range RNA without genomic DNA contamination. The *Quick*-RNA™ Miniprep Kit compared to kits from Suppliers Q and P. 1% (w/v) agarose gel, M is a 1 kb DNA marker.

Ultra-Pure



RNA isolated with *Quick*-RNA™ is DNA-free compared to a Supplier Q kit. Total RNA was isolated from 106 human epithelial cells (with in-column DNase treatment for both kits, n=3).

Product	Cat. No.	Size	Specifications	Uses
Quick-RNA™ Microprep Kit	R1050 R1051	50 preps 200 preps	Format: Spin-Column Elution Volume: ≥ 6 µl Binding Capacity: 10 µg Sample Size: ≤ 10^6 cells Processing Time: 10 minutes	RNA isolation from: Cultured cells; Fresh/frozen/soft tissue; Buccal cells/ swabs; Buffy coat; Bioligical fluids
Quick-RNA™ Miniprep Kit	R1054 R1055	50 preps 200 preps	Format: Spin-Column Elution Volume: ≥ 50 µl Binding Capacity: 100 µg Sample Size: ≤ 10^7 cells Processing Time: 10 minutes	
Quick-RNA™ Midiprep Kit	R1056	25 preps	Format: Spin-Column Elution Volume: ≥ 200 µl Binding Capacity: 1 mg Sample Size: 10^3 - 10^8 cells Processing Time: 15 minutes	
Quick-RNA™ 96 Kit	R1052 R1053	2 x 96 preps 4 x 96 preps	Format: 96-Well Elution Volume: ≥ 25 µl Binding Capacity: 10 µg Sample Size: ≤ 10^6 cells Processing Time: 30 minutes	

Also available in MagBead format. See page 126.

Quick-RNA™ Miniprep Plus Kit

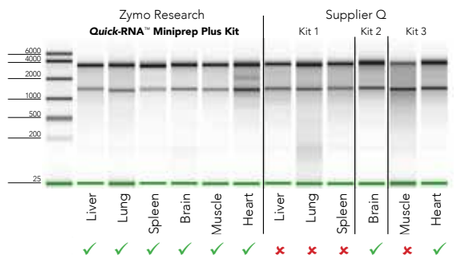
- *High-quality total RNA (including small/micro RNAs) from all tissues, cells, whole blood, and biological fluids.*
- *Worry-free sample storage at ambient temperatures with provided DNA/RNA Shield™.*
- *DNA-free RNA is ready for use in any downstream application.*
- *No organic denaturants!*

Description

The *Quick*-RNA™ Miniprep Plus Kit is an innovative and versatile product designed for the easy, reliable, and rapid isolation of DNA-free RNA from all tissue types (up to 50 mg), cells (up to 10^7 animal), whole blood, and biological fluids. The provided DNA/RNA Shield™ stabilizes samples, allowing them to be stored without the need for immediate freezing or processing for up to one month. Furthermore, DNA/RNA Shield™ inactivates RNases as well as microbial pathogens (viruses, bacteria, etc.). The procedure combines a unique buffer system with Zymo-Spin™ Column technology to yield high quality total RNA (including small RNAs 17-200 nt).

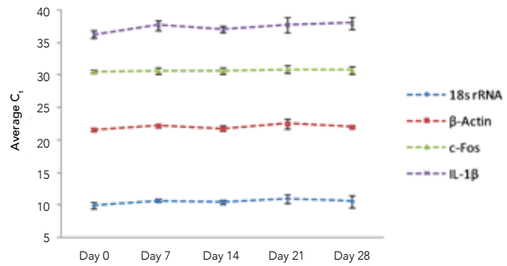
Simply add DNA/RNA Shield™ and Proteinase K to extract total RNA from any tissue, then purify the RNA using the Zymo-Spin™ Column workflow. The result is highly-concentrated, DNA-free RNA that is suitable for RT-qPCR, hybridization, sequencing, etc. In addition, the kit can be used for the enrichment of small and large RNAs in two separate fractions.

Versatility



High-quality total RNA is isolated from various tissue types using the *Quick*-RNA™ Miniprep Plus Kit. In comparison, RNA isolated from the same tissue types using three kits recommended by Supplier Q (Agilent 2200 TapeStation®; Red = low quality).

RNA Preservation at Ambient Temperature



RNA from tissue stored in DNA/RNA Shield™ (included with the *Quick*-RNA™ Miniprep Plus Kit) is preserved at ambient temperature. RNA from muscle tissue (mouse) was purified using the *Quick*-RNA™ Miniprep Plus Kit and analyzed by RT-PCR.

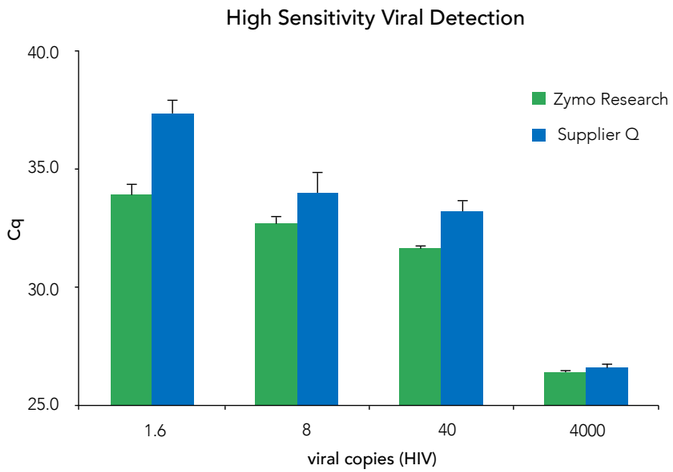
Product	Cat. No.	Size	Specifications	Uses
Quick-RNA™ Miniprep Plus Kit	R1057T R1057 R1058	10 preps 50 preps 200 preps	Format: Spin-Column Elution Volume: ≥ 50 µl Binding Capacity: 100 µg Sample Size: ≤ 50 mg	RNA isolation from all tissue types (fibrous, lipid, tough-to-lyse); Whole blood; Cells (buccal/buffy coat; Swabs; Biological fluids

Quick-RNA™ Viral Kits

- ***Sample Input:*** *Compatible with plasma/serum, cell culture media, biological fluids, swabs, feces.*
- ***Streamlined Workflow:*** *Sample inactivation and easy one-step lysis enables fast processing.*
- ***High-Sensitivity:*** *Optimized for low viral copy detection for Next-Gen Sequencing and RT-qPCR.*

Description

The *Quick*-RNA™ Viral and *Quick*-RNA™ Viral 96 Kit enable rapid isolation of high-quality viral RNA from a wide range of biological sources. Powerful enough to isolate viral RNA from cell-free body fluids as well as cellular suspensions, this kit has 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). The eluted RNA is ideal for use in various subsequent procedures including RT-qPCR.



The *Quick*-RNA™ Viral Kit from Zymo Research ensures high sensitivity viral detection compared to that of Supplier Q. Viral RNA was isolated from plasma samples using the *Quick*-RNA™ Viral Kit. Data are the mean (+/- SD) of triplicate RT-qPCR measurements.

Product	Cat. No.	Size	Specifications	Uses
Quick-RNA™ Viral Kit	R1034 R1035	50 preps 200 preps	Format: Spin-Column Elution Volume: ≥ 6 µl Binding Capacity: 10 µg Processing Time: 5 minutes	Viral RNA recovery from cultured cells; Plasma; Serum; Culture supernatant; Urine; Virus
Quick-RNA™ Viral 96 Kit	R1040 R1041	2 x 96 preps. 4 x 96 preps	Format: 96-Well Elution Volume: ≥ 10 µl Binding Capacity: 10 µg Processing Time: 15 minutes	

Also available in MagBead format for DNA/RNA co-purification. See page 130.

Quick-RNA™ Whole Blood Kit

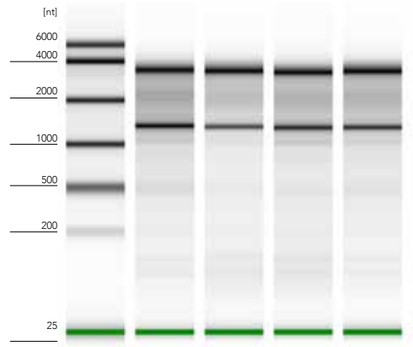
- ***Superior Yields:*** *Recover total RNA (including small/micro RNA) without sample loss.*
- ***Protection:*** *Worry-free blood sample storage at ambient temperatures for up to 30 days.*
- ***High-Quality:*** *RNA is ready for all downstream applications including Next-Gen Sequencing, RT-PCR, etc.*

Description

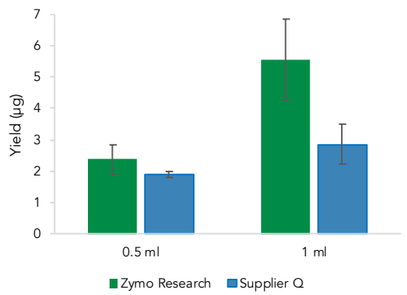
The *Quick*-RNA™ Whole Blood Kit utilizes DNA/RNA Shield™, a unique preservation and lysis technology, to enable rapid isolation of total RNA from whole, partitioned blood, or a cell pellet (after red blood cell lysis). The procedure uses Zymo-Spin™ Column technology, enabling concentrated, ultra-pure RNA. The RNA is eluted into ≥ 6 µl of RNase-free water and is ready for any downstream application including RT-qPCR, sequencing, etc.

High-Quality RNA

High-quality RNA was extracted from human whole blood using the *Quick*-RNA™ Whole Blood Kit. Blood was stored in DNA/RNA Shield™ at ambient temperatures for two days prior to extraction (n=4). RNA was visualized using the Agilent 2200 Tapestation® system.

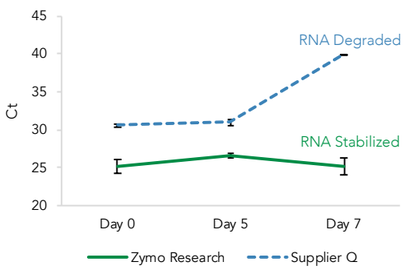


Superior Yields



Amount of RNA extracted from 1 ml of human whole blood was significantly higher using the *Quick*-RNA™ Whole Blood Kit vs the Supplier Q kit (n=3).

Protection



RT-qPCR shows the Zymo Research workflow stabilizes RNA, while the Supplier Q workflow leads to degradation. Whole blood was stored up to 7 days at ambient temperatures and extracted at the indicated time points using the Zymo Research or Supplier Q preservatives and workflows.

Product	Cat. No.	Size	Specifications	Uses
Quick-RNA™ Whole Blood Kit	R1201	50 preps	Format: Spin-Column Elution Volume: ≥ 6 µl Binding Capacity: 10 µg Sample Size: ≤ 1 ml	RNA isolation from mammalian whole blood (fresh or stored in DNA/RNA Shield™ 2X concentrate); Plasma; Serum; Pelleted blood cells (PBMCs, WBCs, buffy coat, pelleted samples from PAXgene® Blood RNA Tube(Qiagen), etc.); Nucleated blood

ZR Urine RNA Isolation Kit™

- *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

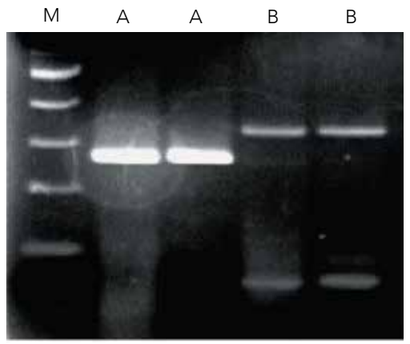
Isolate total RNA from cells and biological sediment in urine reliably and rapidly with the ZR Urine RNA Isolation Kit™. Urine RNA isolation has never been easier! This innovative product enables isolation of cells from urine using a syringe fitted with a uniquely-designed syringe filter. Following separation, 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 under 10 minutes with the technologies featured in the kit. Total RNA isolated with the ZR Urine RNA Isolation Kit™ is ideal for RT-qPCR, etc.

Pinpoint™ Slide RNA Isolation Systems

- *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 Zymo-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-qPCR.



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).

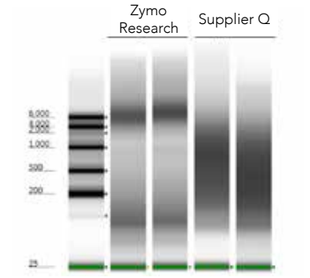
Product	Cat. No.	Size	Specifications	Uses
ZR Urine RNA Isolation Kit™	R1038 R1039	20 preps 50 preps	Format: Spin Column Elution Volume: ≥ 6 µl Binding Capacity: 10 µg RNA Size Limits: ≥17 nt Processing Time: 10 minutes	RNA isolation from urine; Cells; Biological sediment; Microvesicles; Exosomes
Pinpoint™ Slide RNA Isolation System I Kit	R1003	50 preps	Format: Spin Column Elution Volume: ≥ 6 µl Binding Capacity: 10 µg RNA Size Limits: ≥17 nt	RNA isolation from: Tissue sections (Systems I & II) FFPE tissue sections (System II)
Pinpoint™ Slide RNA Isolation System II Kit	R1007	50 preps		

Quick-RNA™ FFPE Kit

- ***Easy Processing:*** *Includes Deparaffinization Solution for simple paraffin removal. No xylene necessary.*
- ***Improved Recovery:*** *Optimized Proteinase K digestion ensures maximum recovery.*
- ***High-Quality:*** *Non-crosslinked DNA and DNA-free RNA are ready for all downstream applications including PCR, Next-Gen Sequencing, etc.*

Description

The *Quick*-RNA™ FFPE Kit provides a simple and reliable method for RNA isolation from formalin-fixed, paraffin embedded (FFPE) tissue samples. The unique chemistries of this kit have been optimized for maximum recovery of both large and small RNA species. Simply deparaffinize tissues using the Deparaffinization Solution, digest using Proteinase K, heat to reverse chemical crosslinks, and then purify using Zymo-Spin™ Column technology. The result is high-quality total RNA (including small RNAs 17-200 nt), which is DNA-free and is ready for RT-qPCR, hybridization, sequencing, etc.



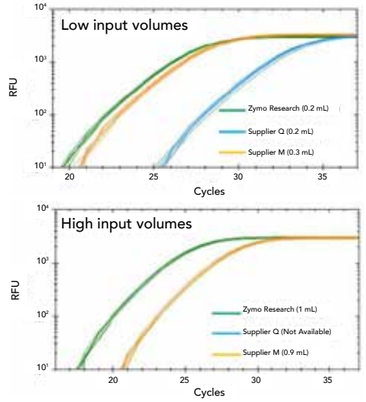
RNA isolated with the *Quick*-RNA™ FFPE Kit is higher quality (left); compared to Supplier Q procedures (right). Quality assessed by Agilent TapeStation 2200®.

*Quick-cf*RNA™ Serum & Plasma Kit

- ***Quick & Easy:*** *Simple spin-column based isolation. No phenol/chloroform or precipitation.*
- ***Highest Yields:*** *Efficient isolation of total cell-free RNA. Recover up to 515 times more microRNA.*
- ***Ultra-Pure:*** *Ready for RT-qPCR, Next-Gen Sequencing, nCounter®, etc.*

Description

The *Quick-cf*RNA™ Serum & Plasma enables simple, reliable, and efficient preparation of high-quality circulating cell-free RNA (including protein-bound, exosomal, miRNA and other small RNAs) from serum, plasma and other biological fluids. Zymo-Spin™ technology allows for ultra-pure RNA, suitable for all downstream applications including RT-qPCR and Next-Generation sequencing.



2x and 8x more yields achieved from low and high input volumes, respectively, compared to the next best product from other supplier. Kit from Supplier Q cannot process input volume higher than 0.2 ml. Common sample source used (55y male plasma).

Product	Cat. No.	Size	Specifications	Uses
Quick-RNA™ FFPE Kit	R1008	50 preps	Format: Spin-Column Elution Volume: ≥ 25 µl Binding Capacity: 50 µg RNA Size Limits: ≥17 nt	RNA isolation from: FFPE blocks; FFPE tissue sections
*Quick-cf*RNA™ Serum & Plasma Kit	R1059	50 preps	Format: Spin-Column Elution Volume: ≥ 6 µl RNA Recovery: 1-100 ng/ml RNA Size Limits: ≥17 nt	RNA isolation from: Serum; Plasma; Amniotic fluid; Cerebrospinal fluid

Environmental RNA Purification with *Quick*-RNA™ Kits

Innovation. Pure & Simple.™

Are you isolating RNA from tough-to-lyse and environmental samples? We offer a variety of kits which feature our superior mechanical lysis, BashingBead™, technology. With these kits, RNA can be isolated from samples otherwise resistant to conventional lysis procedures, including solid tissues, plants, seeds, food, arthropods, Gram-positive and Gram-negative bacteria, yeast, filamentous fungi, unicellular or filamentous algae, and protozoa. The result is high-yield, high-quality RNA that is suitable for downstream applications such as RT-PCR and more.

Technology Overview: BashingBeads™ Lysis & Environmental RNA Purification

Our BashingBead™ RNA purification kits feature novel technology 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 and Miniprep spin-column formats.

Simply transfer samples into the provided ZR BashingBead™ Lysis Tubes and bead beat, as normal, in any bead mill, pulverizer, or vortex that can accommodate standard 2.0 ml tubes. The tubes contain a specially formulated lysis buffer. Following lysis, RNA is isolated using Zymo-Spin™ technology and special filtration technologies, which remove polyphenolic inhibitors that can inhibit reverse transcriptase (RT) for plant, fecal, and soil samples.

By the tube
Our state-of-the-art BashingBeads™ are created with the densest and highest-quality ceramic material. The beads are ideal for when a sample requires homogenization/lysis. Novel technology enables the beads to be chemically inert, minimizing RNA shearing by physical and chemical methods.

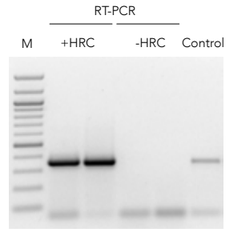
Our state-of-the-art BashingBeads™ are constructed of the highest quality, densest ceramic material available today. They are used when thorough sample homogenization/lysis is required by the researcher. RNA shearing by physical and chemical methods are minimized since the beads are fracture resistant and chemically inert. They are unique amongst the lysis matrices offered by other companies for RNA isolation from tough-to-lyse materials.

Quick-RNA™ Fecal/Soil Microbe Microprep Kit

- *Simple and efficient method for inhibitor-free RNA from soil and fecal samples.*
- *Ultra-high density BashingBeads™ can be used with any bead mill, disrupter, or vortex.*

Description

Purify inhibitor-free RNA from soil and fecal samples rapidly and reliably with the *Quick*-RNA™ Fecal/Soil Microbe Microprep Kit. The kit is designed for isolation of total RNA including small RNAs (≥ 17 nt) from tough-to-lyse bacteria, fungi, protozoa, algae, etc. in various soil types, sludge, sediment, and/or fecal samples. Samples are efficiently homogenized by ZR BashingBead™ Lysis Tubes. Zymo-Spin™ Column technologies allow for quick removal of genomic DNA and polyphenolic RT/PCR inhibitors (e.g., humic acids, polyphenols, tannins). The purified RNA is highly-concentrated and ideal for subsequent RNA-based methods including RT-qPCR, hybridization, etc.



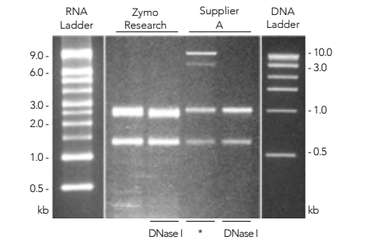
PCR amplification of a eukaryotic transcript post-RT: Total RNA isolated from sludge with or without inclusion of the Zymo-Spin™ IV-HRC spin filter during the *Quick*-RNA™ Fecal/Soil Microbe Microprep Kit protocol. M is a ZR 1 kb DNA Marker (Zymo Research).

Quick-RNA™ Fungal/Bacterial Kits

- *Quick (15 minute) isolation of total RNA from tough-to-lyse bacteria, yeast, and fungi.*
- *Zymo-Spin™ Column technology allows RNA to be eluted into minimal volumes (≥ 6 µl).*

Description

The *Quick*-RNA™ Fungal/Bacterial Microprep and Miniprep Kit delivers rapid (15 minute) isolation of total RNA from pelleted tough-to-lyse bacteria (e.g., Gram-positive), yeast, and/or fungal cells. Both kits utilize ultra-high density BashingBeads™ for sample homogenization and a robust buffer system for total RNA purification (small RNAs included). Zymo-Spin™ Column technology allows eluted RNA volumes in as little as 6 µl, which is ideal for subsequent procedures including RT-PCR.



Total RNA was isolated from equal amounts of *E.coli* cells containing plasmid DNA (pGEM®) using the *Quick*-RNA™ Fungal/Bacterial Microprep Kit 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.

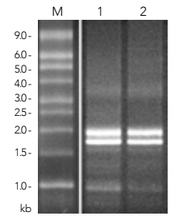
Product	Cat. No.	Size	Specifications	Uses
Quick-RNA™ Fecal/Soil Microbe Microprep Kit	R2040	50 preps	Format: Spin-Columns Elution Volume: ≥ 6 µl Binding Capacity: 10 µg Processing Time: 15 minutes	RNA isolation from: Soil; Sediment; Sludge; Feces
Quick-RNA™ Fungal/Bacterial Microprep Kit	R2010	50 preps	Format: Spin-Columns Elution Volume: ≥ 6 µl Binding Capacity: 10 µg Processing Time: 15 minutes	RNA isolation from: Gram (+) and (-) bacteria; Yeast; Filamentous fungi; Unicellular algae; Filamentous algae; Protists; Soft tissue (limited); Food
Quick-RNA™ Fungal/Bacterial Miniprep Kit	R2014	50 preps	Format: Spin-Columns Elution Volume: ≥ 25 µl Binding Capacity: 50 µg Processing Time: 15 minutes	

Quick-RNA™ Tissue/Insect Microprep Kit

- *Quick (15 minute) isolation of RNA from insects and tough-to-lyse tissues.*
- *Omits the use of organic denaturants and proteases.*

Description

The *Quick*-RNA™ Tissue/Insect Microprep Kit delivers rapid (15 minute) isolation of total RNA from various tissue samples, insect and other arthropod specimens (e.g., mosquitoes, bees, lice, ticks, Drosophila melanogaster). Mammalian tissues can also be processed with this kit. The product utilizes ultra-high density BashingBeads™ for sample homogenization and a robust buffer system to deliver total RNA purification (small RNAs included). RNA eluted in DNase/RNase Free Water is perfect for subsequent procedures including RT-qPCR.



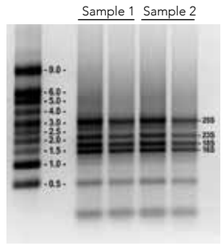
Analysis of *Quick*-RNA™ Tissue/Insect Microprep Kit. Isolation of total RNA from n=2 Drosophila sp. individuals was performed in duplicate (lanes 1 and 2). Samples were processed (2 x 30 sec at 6 m/s) using a FastPrep®-24 Instrument (MP Biomedicals) and resolved alongside (lane M) RNA Millenium™ Markers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

Quick-RNA™ Plant Miniprep Kit

- *Quick, 10 minute isolation of inhibitor-free total RNA (~50 µg) from a wide variety of plant samples using ultra-high density BashingBeads™ and Zymo-Spin™ Column technologies.*
- *High-quality RNA eluted in ≥ 25 µl is ready for reverse transcription, microarray, sequencing, etc.*

Description

Isolation of total RNA from various plant samples (e.g., leaves, stems, buds, flowers, fruit, seeds, etc.) has never been easier with the *Quick*-RNA™ Plant Miniprep Kit. Taking only 15 minutes, the kit completely eliminates DNA and polyphenolic inhibitors from samples. The RNA is eluted into volumes as little as 25 µl and is suitable for use in various downstream procedures including RT-PCR.



Isolation of total RNA from 10 mg of a fresh leaf material (*Nicotiana sp.*) using the *Quick*-RNA™ Plant Miniprep Kit. 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.

Product	Cat. No.	Size	Specifications	Uses
Quick-RNA™ Tissue/Insect Microprep Kit	R2030	50 preps	Format: Spin-Columns Elution Volume: ≥ 6 µl Binding Capacity: 10 µg Processing Time: 15 minutes	RNA isolation from: Soft tissue; Solid tissue; Tough-to-lyse tissues; Tough-to-lyse organisms; Insects/arthropods; Food
Quick-RNA™ Plant Miniprep Kit	R2024	50 preps	Format: Spin-Columns Elution Volume: ≥ 25 µl Binding Capacity: 50 µg Processing Time: 15 minutes	RNA isolation from: Plant material; Seeds; Fruit

RNA Clean-Up

Inhibitor-free RNA from any Enzymatic Reaction

The RNA Clean & Concentrator™ (RCC™) kits 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. Our Zymoclean™ Gel RNA Recovery Kit and the ZR small-RNA™ PAGE Recovery Kit are designed for the recovery of RNA from agarose and polyacrylamide gel matrices. All clean-up kits feature our state-of-the-art Zymo-Spin™ Column technology, which enables RNA to be eluted in minimal volumes (i.e., ≥ 6 µl) 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-(q)PCR.

RNA Clean & Concentrator™ Kits

- ***NGS-Ready:** RNA is ready for all downstream applications including Next-Gen Sequencing, RT-qPCR, hybridization, etc.*
- ***Ultra-Pure:** Eliminate contaminants and inhibitors in 5 minutes.*
- ***Maximum Recovery:** Recover >90% and elute in as little as 6 µl.*

Description

The RNA Clean & Concentrator™ kits provide simple and reliable methods for the rapid preparation of high-quality RNA. The kit owes its simplicity to a unique single-buffer system and Zymo-Spin™ technology. Simply add the binding buffer to your sample, adjust the conditions for binding by adding ethanol, then 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 perfect for subsequent RNA-based methods including RT-PCR, hybridization, etc.

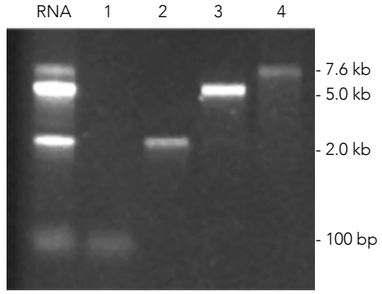
Product	Cat. No.	Size	Specifications	Uses
RNA Clean & Concentrator™-5	R1015 R1016	50 preps 200 preps	Format: Spin-Columns Elution Volume: ≥ 6 µl Binding Capacity: 10 µg RNA Size Limits: ≥ 17 nt Processing Time: 5 minutes	RNA clean-up; DNA-free RNA; Enzyme removal; Nucleotide/dye removal; Small-RNA/probe purification
RNA Clean & Concentrator™-5 w/ DNase I	R1013 R1014	50 preps 200 preps		
ZR-96 RNA Clean & Concentrator™-5	R1080	2 x 96 preps	Format: 96-Well Elution Volume: ≥ 10 µl Binding Capacity: 25 µg RNA Size Limits: ≥ 17 nt Processing Time: 20 minutes	
RNA Clean & Concentrator™-25	R1017 R1018	50 preps 100 preps	Format: Spin-Columns Elution Volume: ≥ 25 µl Binding Capacity: 50 µg RNA Size Limits: ≥ 17 nt Processing Time: 5 minutes	
RNA Clean & Concentrator™-100	R1019	25 preps	Format: Spin-Columns Elution Volume: ≥ 100 µl Binding Capacity: 250 µg RNA Size Limits: ≥ 17 nt Processing Time: 10 minutes	
RNA Clean & Concentrator™ MagBead Kit	R1081	10 ml	Elution Volume: ≥ 10 µl Cutoffs: Left: 17 nt or 200 nt	RNA Clean up, Automation

Zymoclean™ Gel RNA Recovery Kit

- *Quick (30 minute) recovery of purified RNA fragments from agarose gels.*
- *Recovery ≥ 80% for RNA > 500 nt.*

Description

Recover purified RNA fragments from agarose gels in only 30 minutes with the Zymoclean™ Gel RNA Recovery Kit. The procedure combines a unique, single-step agarose dissolving/RNA binding buffer with Zymo-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%).

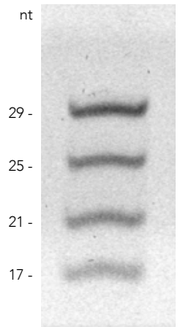


The recovery of RNA from an agarose gel. Different sized RNAs on the left were excised from the gel and recovered using the Zymoclean™ Gel RNA Recovery Kit (lanes 1-4).

ZR small-RNA™ Ladder

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™. Sequence available upon request.



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.

Product	Cat. No.	Size	Specifications	Uses
Zymoclean™ Gel RNA Recovery Kit	R1011	50 preps	Format: Spin-Columns Elution Volume: ≥ 6 µl Binding Capacity: 10 µg RNA Size Limits: ≥ 200 nt Processing Time: 30 minutes	RNA from agarose gel slices
ZR small-RNA™ Ladder	R1090	10 µg	Ladder for four microRNAs (17, 21, 25, 29 nt) Concentration: 20 ng/µl Amount: 10 µg Storage: -20° C	Isolated RNA; Small RNA fraction

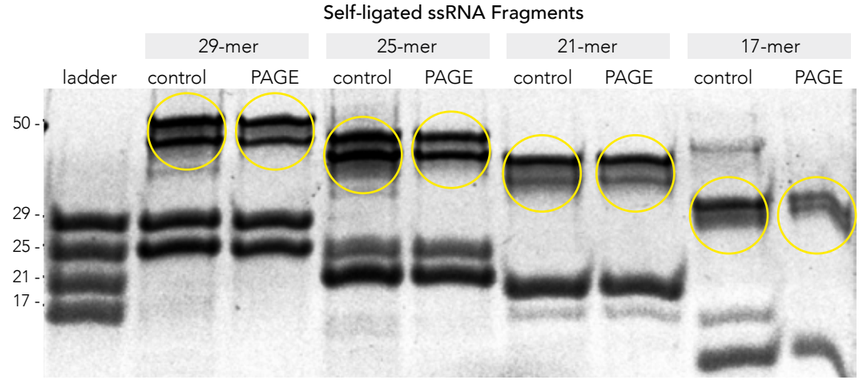
ZR small-RNA™ PAGE Recovery Kit

- *For concentrated recovery of small RNA (& DNA) fragments from polyacrylamide gels.*
- *Compatible with up to 25% (w/v) polyacrylamide.*

Description

Extract high-quality small RNAs from polyacrylamide gels (native or denatured) easily and efficiently with the ZR small-RNA™ PAGE Recovery Kit. This kit is an improvement of the "crush and soak" method, which incorporates a unique buffer system together with Zymo-Spin™ Column technologies for improved recovery and convenience. Recovered RNA can be concentrated into volumes ≥ 6 µl, making it ideal for downstream enzymatic reactions and manipulations.

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



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).

Product	Cat. No.	Size	Specifications	Uses
ZR small-RNA™ PAGE Recovery Kit	R1070	20 preps	Format: Spin-Columns Elution Volume: ≥ 6 µl Binding Capacity: 10 µg Size Limits: 17 - 200 nt Processing Time: 45 minutes	RNA (&DNA) from polyacrylamide gel slices

GelStar® is a registered trademark of FMC Corporation and is covered by U.S. Patent 5,436,134.

4 DNA/RNA Co-Purification

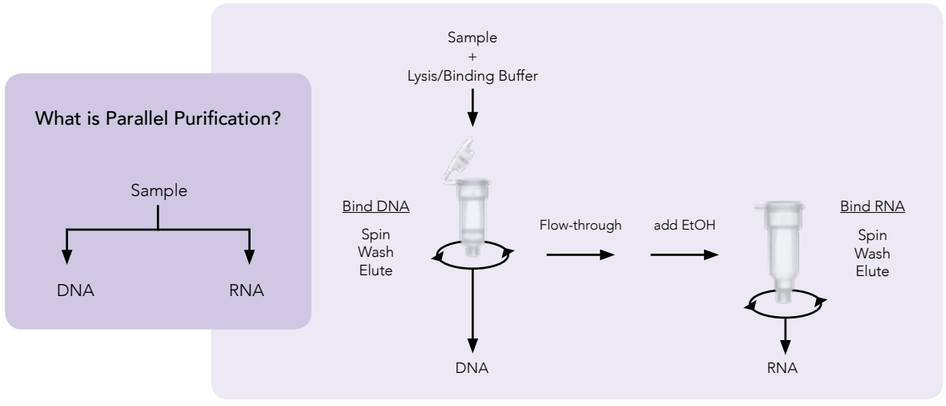
To meet the needs of researchers who wish to extract DNA and RNA from the same source simultaneously, Zymo Research developed a line of DNA/RNA co-purification kits. Both parallel purification (DNA and RNA separately) or co-purification (DNA and RNA together) products provide high-quality DNA and RNA while the procedures are fast and simple to perform. The *Quick*-DNA/RNA™ Miniprep Kit 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. Cells or tissues can be processed with the *Quick*-DNA/RNA™ Viral Miniprep Kit to purify DNA and RNA from the same sample into separate elutions. The ssDNA/RNA Clean & Concentrator™ facilitates the rapid recovery of both small oligos, probes and transcripts while removing enzymes, dNTPs and other reaction components. The spin column format facilitates concentration of single stranded nucleic acids ≥ 17 nt into as little as 6 µl. Finally, our revolutionary ZymoBIOMICS® DNA/RNA kits are designed to handle a wide variety of sample inputs. These kits are designed to eliminate bias during extraction by lysing all microbes including gram negative bacteria, gram positive bacteria, fungus, protozoans and algae. Together, the Zymo Research DNA/RNA purification kits quickly and easily handle a wide variety of samples while extracting high-quality, inhibitor-free nucleic acids that are ready for downstream applications.

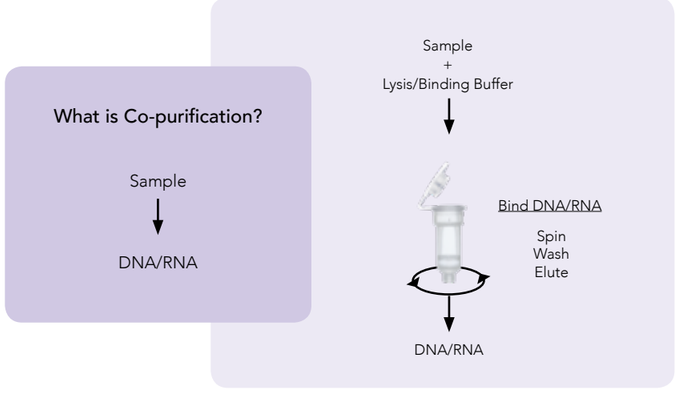
DNA/RNA Co-Purification

Technology Overview: Parallel Purification & Co-Purification

Purify DNA & RNA from the Same Sample

To meet the needs of researchers who wish to extract DNA and RNA from the same source simultaneously, Zymo Research developed a line of DNA/RNA co-purification kits. Both parallel purification (DNA and RNA separately) or co-purification (DNA and RNA together) products provide high-quality DNA and RNA while the procedures are fast and simple to perform. The *Quick*-DNA/RNA™ Miniprep Kit 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 nucleic acid including small RNA molecules. Cells or tissues can be processed with the *Quick*-DNA/RNA™ Viral Miniprep Kit to purify DNA and RNA from the same sample into separate elutions. The ssDNA/RNA Clean & Concentrator™ facilitates the rapid recovery of both small oligos, probes and transcripts while removing enzymes, dNTPs and other reaction components. The spin column format facilitates concentration of single stranded nucleic acids ≥ 17 nt into as little as 6 µl. Finally, our revolutionary ZymoBIOMICS® DNA/RNA kits are designed to handle a wide variety of sample inputs. These kits are designed to eliminate bias during extraction by lysing all microbes including gram negative, gram positive, fungus, protozoans and algae. Together, the Zymo Research DNA/RNA purification kits quickly and easily handle a wide variety of samples while extracting high-quality, inhibitor-free nucleic acids that are ready for downstream applications.





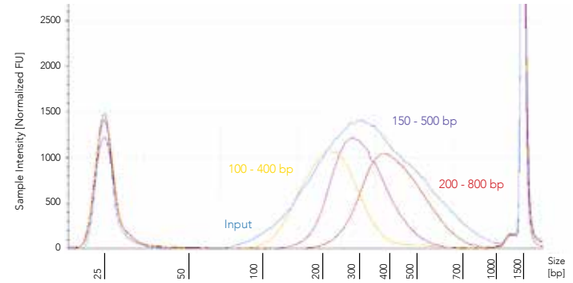
DNA & RNA Clean-Up and Size Selection

DNA and RNA Clean & Concentrator™ Kits

(library preparations, PCR, restriction digests and other enzymatic reactions, etc.)

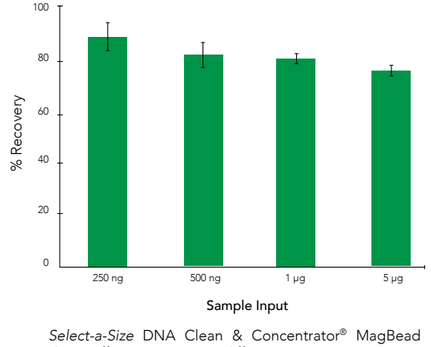
- ***Tunable:*** *Size selection can be tuned from 100 bp to 1000 bp with left, right, or double size selection.*
- ***Ultra-Pure:*** *10 µl elutions are ready for Next-Gen Sequencing, etc.*
- ***Automation Ready:*** *Scripts and automation support readily available.*

Easy Size Selection



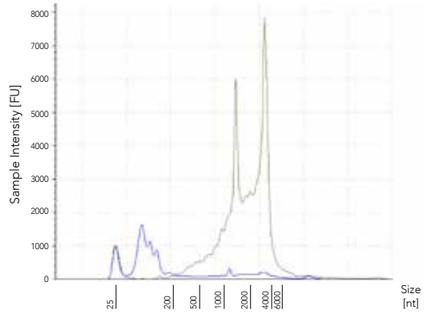
Select-a-Size DNA Clean & Concentrator® MagBead Kit allows for adjustable size selection. Exemplary size selections (using 2 µg of sonicated DNA) were analyzed using the Agilent 2200 TapeStation® system.

High DNA Yield



Select-a-Size DNA Clean & Concentrator® MagBead shows efficient recovery at different concentrations. DNA recovery (≥80%) is consistent from low to high amounts of genomic DNA input (n=3).

Small RNA Separation



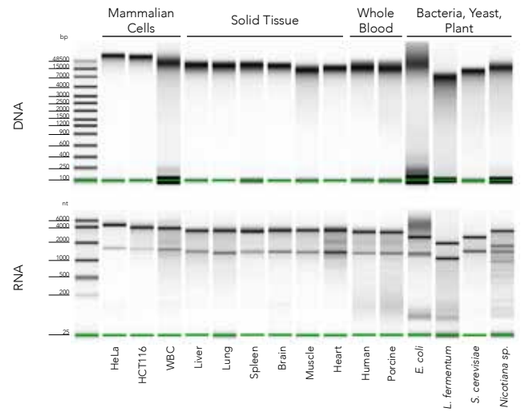
Small RNA (<200 nt) is separated from large RNA (>200 nt) using the RNA Clean & Concentrator™ MagBead. Size was analyzed using the Agilent 2200 TapeStation® system.

Product	Cat. No.	Size	Specifications	Uses
Select-a-Size DNA Clean & Concentrator® MagBead Kit	D4084 D4085	10 ml 50 ml	Elution Volume: ≥ 10 µl Cutoffs: Left: 100 bp – 400 bp Right: 200 bp – 1000 bp Double Size Selection	DNA Size Selection, DNA Clean up, Automation
RNA Clean & Concentrator™ MagBead Kit	R1081	10 ml	Elution Volume: ≥ 10 µl Cutoffs: Left: 17 nt or 200 nt	RNA Clean up, Automation

Quick-DNA/RNA™ Kit

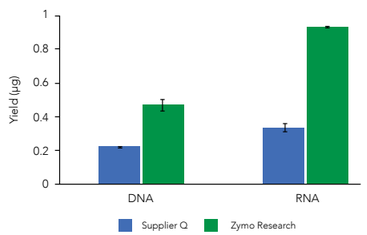
- ***Quick & Easy:*** *Extract DNA and RNA from the any sample in <15 minutes.*
- ***Sensitive:*** *Single cell-level recovery of DNA and RNA.*
- ***Ultra-Pure:*** *Ready for Next-generation sequencing, RT-qPCR, arrays, etc.*

Universal Sample Compatibility



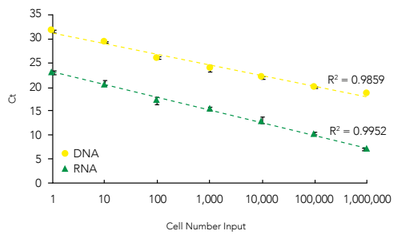
The *Quick*-DNA/RNA™ Plus technology is universal and accommodates any sample input including cultured cells, any tissue, blood, tough-to-lyse samples, etc.

Highest Yields



DNA and total RNA recovery is higher using the *Quick*-DNA/RNA™ Microprep Plus Kit compared to a Supplier Q kit. Nucleic acids were extracted from 50K HeLa cells (n=2).

Single-Cell Detection



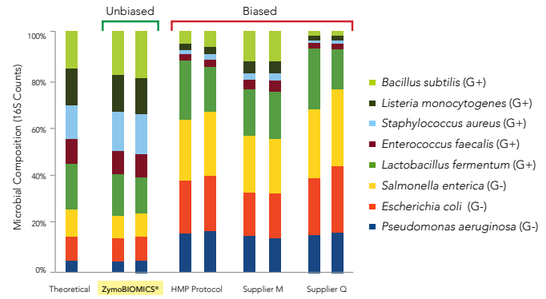
HeLa cells were titrated down to a single cell, and DNA and total RNA were extracted using the *Quick*-DNA/RNA™ Microprep Plus Kit. Analysis by RT-qPCR shows high linear recovery of DNA & RNA down to the single-cell level (n=2).

Product	Cat. No.	Size	Binding Capacity	Minimum Elution	Sample Input
Quick-DNA/RNA™ Microprep Plus Kit	D7005*	50 preps	10 µg	6 µl	Cells, Soft Tissue
Quick-DNA/RNA™ Miniprep Kit	D7001	50 preps	25 µg	25 µl	
Quick-DNA/RNA™ Miniprep Plus Kit	D7003T D7003	10 preps 50 preps	100 µg	50 µl	Cells, Any Tissue, Whole Blood
Quick-DNA/RNA™ Magbead Kit	R2130 R2131	1 x 96 preps 4 x 96 preps	20 µg	50 µl	

ZymoBIOMICS® DNA/RNA Miniprep Kit

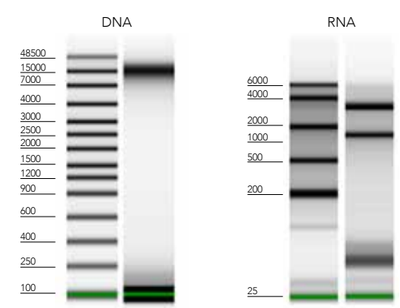
- ***Unbiased Lysis:*** *Efficient and unbiased lysis of microbes including Gram positive/negative bacteria, fungi, protozoans, and viruses from any sample.*
- ***High Sensitivity:*** *Increased detection limit of very low abundance organisms.*
- ***Ultra-Pure:*** *Inhibitor-free DNA/RNA (including small/micro RNAs) and ready for qPCR and microbiome measurements using Next-Gen Sequencing.*

Accurate Community Profiling



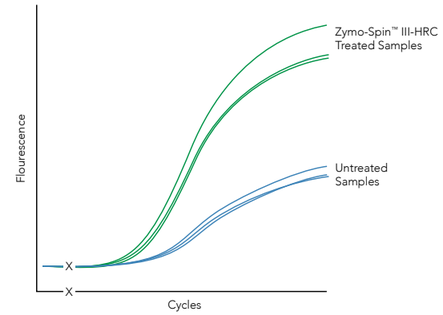
The ZymoBIOMICS® DNA/RNA Miniprep Kit provides accurate representation of the organisms extracted from the ZymoBIOMICS® Microbial Community Standard.

High Quality



Human stool genomic DNA and total RNA isolated with the ZymoBIOMICS® DNA/RNA Miniprep Kit is highly intact. Quality assessed by Agilent 2200 TapeStation®.

Ultra-Pure RNA from Inhibitor-rich Samples



Total RNA isolated from human stool with or without inclusion of the Zymo-Spin™ III-HRC Spin Filter during the ZymoBIOMICS® RNA Miniprep Kit protocol. Earlier amplification cycles indicate complete removal of PCR inhibitors.

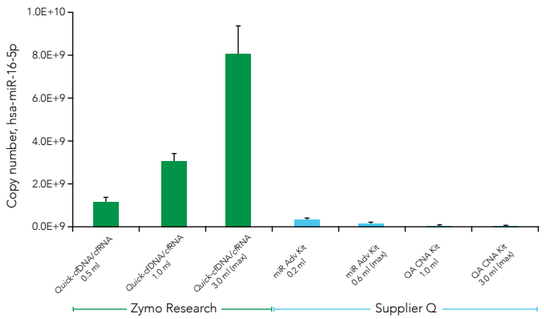
Product	Cat. No.	Size	Specifications	Uses
ZymoBIOMICS® DNA/RNA Miniprep Kit	R2002	50 preps	Format: Spin Column Binding Capacity: 100 µg Elution Volume: ≥ 50 µl RNA Size: ≥ 17 nucleotides	Accurate DNA/RNA isolation of microbial communities from any sample type (feces, soil, water, biofilms, swabs, body fluid, etc.)

4 DNA/RNA Co-Purification

*Quick-cf*DNA/*cf*RNA™ Serum & Plasma Kit

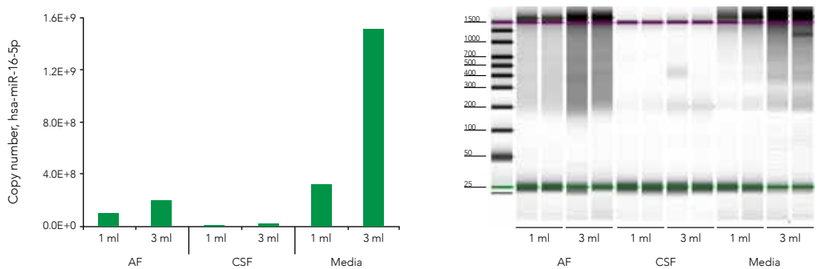
- ***Quick & Easy:*** *Simple spin-column based isolation. No phenol/chloroform or precipitation.*
- ***Highest Yields:*** *Efficient isolation of total cell-free RNA. Recover up to 515 times more microRNA.*
- ***Ultra-Pure:*** *Ready for Next-generation sequencing, RT-qPCR, nCounter®, etc.*

Highest Recovery of Cell-Free miRNA



Cell-free RNA recovery scales proportionally with sample input using the *Quick-cf*DNA/*cf*RNA™ Serum & Plasma Kit. Cell-free RNA yields from the same plasma donor (61y-F) show linear and efficient recovery of plasma microRNA (hsa-miR-16-5p) when analyzed by RT-qPCR.

Proven Compatibility with Various Biological Fluids



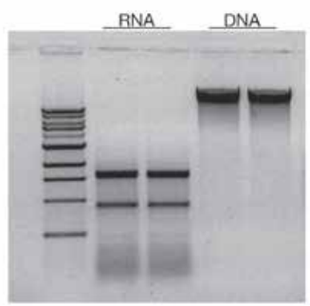
Cell-free nucleic acids were isolated from Amniotic fluid (AF), cerebrospinal fluid (CSF), or spent HeLa cell culture media (Media) using the *Quick-cf*DNA/*cf*RNA™ Serum & Plasma kit. (Right) Endogenous cell-free DNA from each sample type visualized using the Agilent TapeStation. (Left) Human miR-16-5p assay using the protocol from Busk P. K., BMC Bioinformatics, 2014.

Product	Cat. No.	Size	Sample Input
*Quick-cf*DNA/*cf*RNA™ Serum & Plasma Kit	R1072	50 preps	Serum, Plasma, CSF or amniotic fluid

Quick-DNA/RNA™ Blood Tube Kit

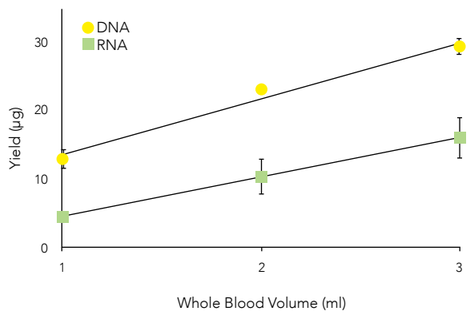
- ***Quick & Easy:*** *Sample protection in DNA/RNA Shield™ coupled to high quality extraction.*
- ***Highest Yields:*** *Purify up to 30 ug DNA and/or 30 ug RNA in 50 µl elution volumes.*
- ***Ultra-Pure:*** *Ready for Next-generation sequencing, RT-qPCR, Microarray, etc.*

High Quality DNA/RNA Without Reagent Removal



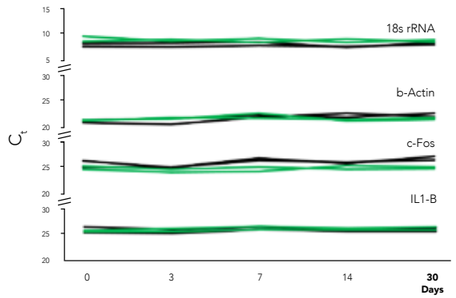
High quality DNA and RNA is effectively purified from blood stored in DNA/RNA Shield™. High molecular weight DNA remains with no apparent degradation. Also, RNA was high quality, DNA-free and includes small RNAs.

Highest Yields



Linear recovery of DNA and RNA using the *Quick*-DNA/RNA™ Blood Tube Kit. Aliquots (1-3 ml) of whole blood stored in DNA/RNA Shield™ were used for purification and the total DNA/RNA yield measured(n=3).

Nucleic Acid Stabilization at Ambient Temperature



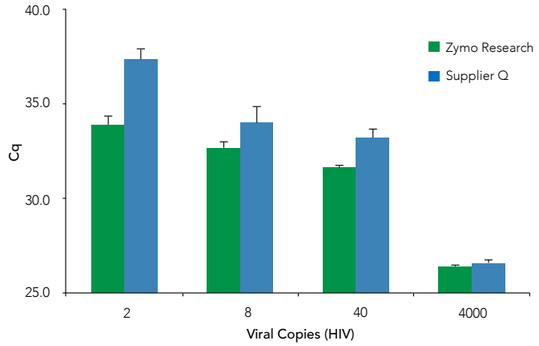
RNA in blood is effectively stabilized in DNA/RNA Shield™ at ambient temperature. Graph shows cellular RNA from human whole blood stabilized in DNA/RNA Shield™ at the indicated time points and analyzed by (RT)-qPCR.

Product	Cat. No.	Size	Sample Input
Quick-DNA/RNA™ Blood Tube Kit	R1151	50 preps	Up to 3 ml Whole Blood

Quick-DNA/RNA™ Viral Kit

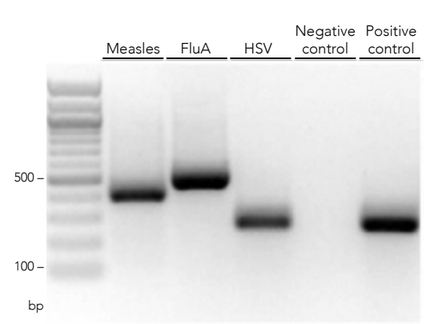
- ***Quick & Easy:*** *Co-purify DNA and RNA from samples in <15 minutes.*
- ***High Sensitivity:*** *Optimized for recovery of low viral copy.*
- ***Ultra-Pure:*** *Ready for Next-generation sequencing, RT-qPCR, arrays, etc.*

Sensitive Detection



The *Quick*-RNA™ Viral Kits ensure high sensitivity viral detection compared to the Supplier Q kit. Viral RNA was isolated from plasma samples. Data shows the mean (+/- SD) of triplicate RT-qPCR measurements.

High Quality DNA/RNA



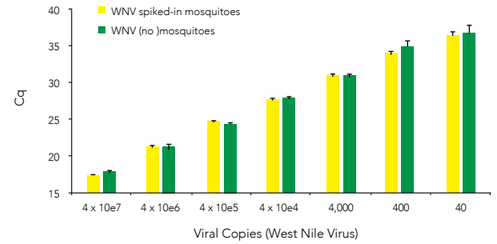
RT-PCR detection of DNA/RNA from a mixed virus population extracted using the *Quick*-DNA/RNA™ Viral Kit. Influenza type A (FluA); Herpes-simplex virus (HSV); Negative control (no template); Positive control (HSV).

Product	Cat. No.	Size	Binding Capacity	Minimum Elution	Sample Input
Quick-DNA/RNA™ Viral Kit	D7020 D7021	50 preps 200 preps	25 µg DNA/50 µg RNA	35 µl	Plasma, Serum, CSF, Cell culture media, cellular suspensions, whole blood, urine, saliva, swab, fecal, and any sample in DNA/RNA Shield™
Quick-DNA/RNA™ Viral 96 Kit	D7022 D7023	2 x 96-well plate 4 x 96-well plate	10 µg	10 µl	
Quick-DNA/RNA™ Viral Magbead Kit	R2140 R2141	96 preps 4 x 96 preps	10 µg per 20 µl magnetic beads	50 µl	

Quick-DNA/RNA™ Pathogen Kit

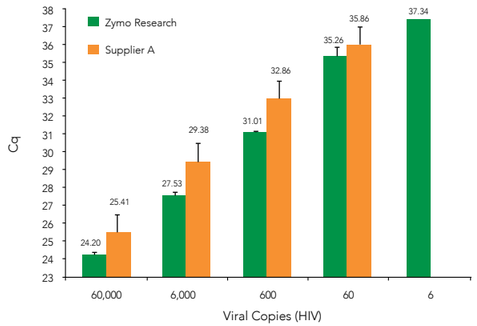
- ***Quick & Easy:*** *Pathogen inactivation and DNA/RNA extraction from a variety of with provided DNA/RNA Shield™.*
- ***High Sensitivity:*** *Reliable recovery of total nucleic acid.*
- ***Ultra-Pure:*** *Ready for Next-generation sequencing, RT-qPCR, arrays, etc.*

Sensitive Detection of West Nile Virus in Mosquitoes



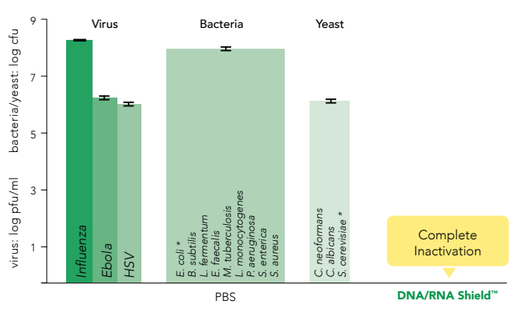
Hard-to-lyse and inhibitor-rich mosquito vectors were homogenized using ZR BashingBeads™ and purified using *Quick*-DNA/RNA™ Pathogen. Ultra-pure, inhibitor-free West Nile Virus nucleic acids (spike-in) were detected by RT-qPCR down to 40 viral copies.

High-sensitivity Detection of HIV-1 Virus at Low Titer



HIV-1 viral RNA particles (spiked-in plasma), purified using the *Quick*-DNA/RNA™ Pathogen kit and detected by RT-qPCR.

Pathogen Inactivation



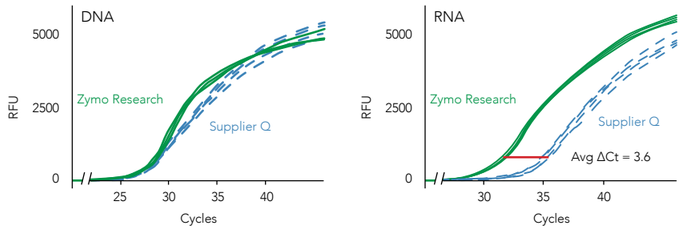
Viruses, bacteria, and yeast are effectively inactivated by DNA/RNA Shield™ (included in workflow) compared to mock (PBS) treatment for 5 minutes. Titer was subsequently determined by plaque assay (PFU) or growth assay (CFU).

Product	Cat. No.	Size	Binding Capacity	Minimum Elution	Sample Input
Quick-DNA/RNA™ Pathogen Miniprep Kit	R1042 R1043	50 preps 200 preps	50 µg	≥ 25 µl	Vectors, Tissue, Biological liquids
Quick-DNA/RNA™ Pathogen MagBead Kit	R2145 R2146	96 preps 4 x 96 preps	10 µg per 20 µl magnetic beads	≥ 30 µl	

Quick-DNA/RNA™ FFPE Kit

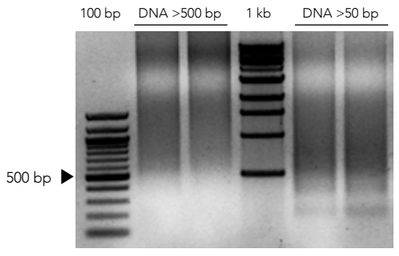
- ***Easy Processing:*** *Included Deparaffinization Solution for simple paraffin removal. No xylene necessary.*
- ***Improved Recovery:*** *Optimized Proteinase K digestion and heat ensures maximum recovery.*
- ***High Quality:*** *Non-crosslinked DNA and DNA-free RNA are ready for all downstream applications including PCR, Next-Gen Sequencing, etc.*

Improved Recovery



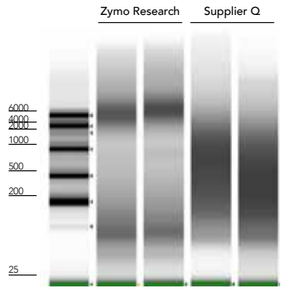
DNA & RNA isolated using the *Quick*-DNA/RNA™ FFPE Kit are high quality and consistently outperforms RNA isolated using a Supplier Q kit (Avg ΔCt = 3.6) as depicted by the RT-PCR amplification curves (n=4).

High-Quality FFPE DNA



Equivalent amounts of DNA resolved in a 1% agarose/TAE/EtBr gel show binding conditions may be adjusted with the *Quick*-DNA™ FFPE Kit to selectively isolate DNA >50 bp or >500 bp. 100 bp and 1 kb DNA ladder shown.

High-Quality FFPE RNA



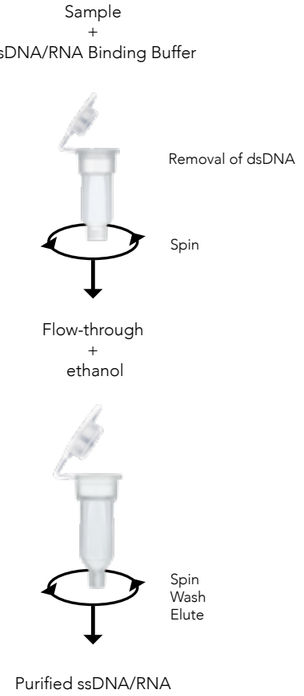
RNA isolated with the *Quick*-RNA™ FFPE Kit is higher quality (left) compared to a Supplier Q kit (right). Quality assessed using the Agilent 2200 TapeStation® system.

Product	Cat. No.	Size	Binding Capacity	Minimum Elution	Input Amount
Quick-DNA/RNA™ FFPE Kit	R1009	50 preps	50 µg	25 µl	≤ 25 mg

ssDNA/RNA Clean & Concentrator™

- ***Quick and Reliable:*** *10 min clean-up and concentration of ssDNA/RNA (17-200 nt).*
- ***Concentrated:*** *Up to 10 µg sample in ≥6 µl elution.*
- ***Clean and Pure:*** *ssDNA/RNA ready for downstream applications like PCR, RT-qPCR, etc.*

Clean and Concentrate ssDNA/RNA into ≥ 6 µl in 10 minutes



Zymo-Spin™ column technology and a single buffer system removes dsDNA (e.g. genomic DNA) from ssDNA/RNA samples (transcripts, probes, primers, etc.) in 10 minutes. Column format allows for elution in ≥6 µl, keeping purified DNA/RNA concentrated for downstream applications such as PCR, RT-qPCR, hybridization, etc.

Product	Cat. No.	Size	Specifications	Uses
ssDNA/RNA Clean & Concentrator™	D7010 D7011	20 preps 50 preps	Format: Spin-Columns Elution Volume: ≥ 6 µl Processing Time: 10 minutes Binding Capacity: 10 µg Size Limits: 17 - 200 nt	Isolate ss nucleic acids from a mixture of ss and ds species

5 Sample Collection and Preservation

Sample collection and preservation stand as the origin of all workflows that use nucleic acids. The methods and technologies used to collect and store samples can profoundly impact analyses and downstream applications of nucleic acids. Compositional changes and bias can occur because of nucleic acid degradation, cellular growth or decay, and the logistics of collection. Current collection and transportation methods require the use of costly cold-chain logistics to prevent or slow down these processes. Without proper storage conditions, the aforementioned changes and biases can lead to misrepresentation of an analyte's abundance, systematic bias, reduced sensitivity, complete signal loss, poor reproducibility, and an inability to compare results between labs. RNA is especially vulnerable to degradation due to the ubiquity of RNases and the inherent instability of the RNA phosphoester bond. Even DNA is prone to rapid degradation and complete signal loss. For instance, when detecting *H. Pylori* in a stool sample, by real-time PCR, it is necessary to store the samples in a preservative or the DNA rapidly degrades.

There are a plethora of other factors within collection and storage that can affect downstream use of nucleic acids. Microbial growth and decay can significantly alter the composition of a sample if the organisms are not inactivated. Compositional changes associated with other collection methodologies, especially if phase separation (e.g. precipitation) is utilized, can also significantly bias downstream analyses.[1] Small nucleic acids (e.g. miRNA) are particularly vulnerable to such biases and/or complete signal loss because of their aberrant behavior when compared to larger nucleic acids. The ease of processing a sample post storage in a preservation solution is critical to cost and throughput. Additionally, methodologies that require phase separation and/or reagent removal impose significant and costly challenges for high throughput applications and automation. Another major consideration when choosing a sample stabilization reagent is the logistics and cost of transporting samples potentially containing pathogens.

Zymo Research has overcome these challenges with a range of DNA/RNA Shield™ sample collection devices, which can reliably provide a genetic snapshot at the time of collection by stabilizing nucleic acids at ambient temperature for up to 30 days, inactivating pathogens, and rendering the sample noninfectious for safe transport. Samples collected in DNA/RNA Shield™ devices are prepared for hassle-free transport and are ready for any downstream purification. Also, unlike any preservative on the market, there is no need for removal of the DNA/RNA Shield™ reagent for purification of nucleic acid.

At Zymo Research, we have made it our goal to standardize sample collection in the clinical/research setting.

DNA/RNA Shield™ Collection Devices

1. Kim, Young-Kook, et al. "Short structured RNAs with low GC content are selectively lost during extraction from a small number of cells." Molecular cell 46.6 (2012): 893-895.

Protect your precious samples

Sample transportation medium for any biological sample without cold-chain

DNA/RNA Shield™

- *Nucleic acid preservation (at ambient temperature; cold-free)*
- *Pathogen inactivation (bacteria, fungi, parasites & viruses)*
- *Streamlined purification (no reagent removal, universally compatible, automatable)*

Safety At All Levels

DNA/RNA Shield™ lyses and effectively inactivates pathogens in a sample. This includes tough-to-lyse microbes and viruses without the need for additional steps, such as heat-treatment, homogenization, or alcohol sterilization.

DNA/RNA Shield™ has been rigorously tested to ensure its capability to inactivate even the toughest of viruses. In an independent study, the virucidal activity was shown to inactivate murine parvovirus.[1] DNA/RNA Shield™ abides by the Centers for Disease Control's (CDC) guidelines for pathogen inactivation.[2]

CERTIFIED BY Eurovir® Hygiene-Labor Antivirale Validierung & Rabies

CDC Centers for Disease Control and Prevention

Transport | Handling | Processing

Used by Scientists around the world for studying:

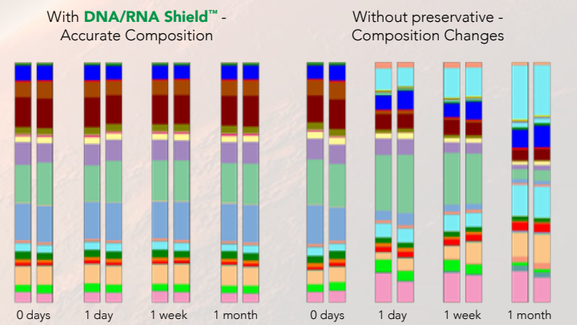
Bacteria	Viruses	Yeast & Eukaryotes
B. subtilis	Parvovirus	*C. albicans*
E. faecalis	Chikungunya Virus	*C. neoformans*
E. coli	Dengue Virus	*S. cerevisiae*
L. fermentum	Ebolavirus	*P. malariae*
L. monocytogenes	Herpes Simplex Virus-1	
M. tuberculosis	Herpes Simplex Virus-2	
P. aeruginosa	Influenza A	
S. enterica	Rhinovirus	
S. aureus	MERS-coronavirus	
S. pneumoniae	West Nile Virus	
X. fastidiosa		

1. Dr. Thraenhart and Dr. Jursch. Virucidal activity of the nucleic acid preservation product "DNA/RNA Shield™" against the murine parvovirus (MVM) at 20 °C.
2. Guidance on the inactivation or removal of select agents and toxins for future use. Centers for Disease Control (CDC)

Transport Any Sample, Anywhere

DNA/RNA Shield™ preserves the genetic integrity of a sample at the point of collection for sensitive down-stream analyses (i.e. Next-gen sequencing, RT-PCR, etc.). Any sample type can be stored in DNA/RNA Shield™ for transport at ambient temperature, even in the most extreme conditions.

Scientists at NASA are utilizing DNA/RNA Shield™ to collect biological specimens from astronauts to assess how the human microbiome is affected by a microgravity environment. DNA/RNA Shield™ serves a vital role in preserving the genetic profiles of their samples in ever-changing and uncontrollable conditions of space.

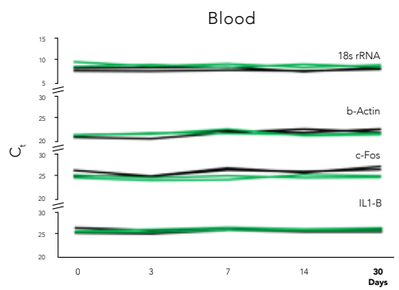


Microbial genus composition of stool is unchanged after one month at ambient temperature with DNA/RNA Shield™. The extracted DNA was subjected to microbial composition profiling via 16S rRNA gene targeted sequencing.

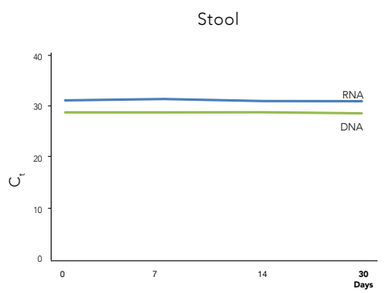
Accommodates Any Sample

including cells, tissues, fecal samples, tough-to-lyse samples, soil samples, plants, microorganisms, and bodily fluids

Nucleic Acid Stabilization at Ambient Temperature



RNA in blood is effectively stabilized in DNA/RNA Shield™ at ambient temperature.



RNA in stool is effectively stabilized in DNA/RNA Shield™ at ambient temperature.

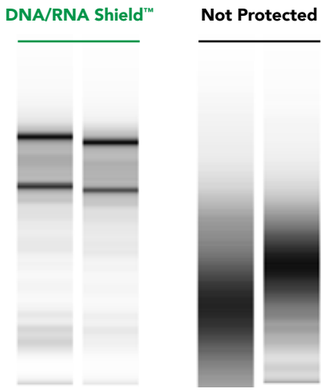
Protect Your Samples During Freeze-Thaw

Today's most common practice for storing biological specimens, whether it be short or long-term, is the use of freezers. Unfortunately, freezers are not impervious to failing for a number of reasons - most notably due to mechanical failure and power outages.

DNA/RNA Shield™ provides peace of mind to scientists, as it preserves the genetic integrity even under stressful freeze-thaw cycles, ensuring that precious samples will not be lost due to such events.

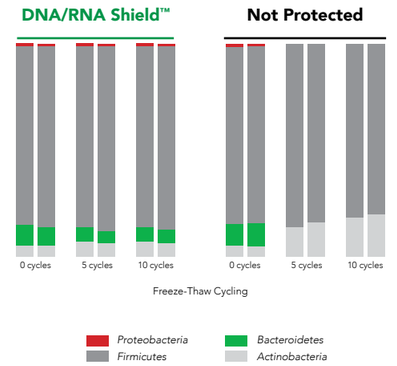
Add DNA/RNA Shield™ Reagent to
Already Frozen or Fresh Samples & Prevent Degradation

Frozen Blood RNA



High-quality RNA from blood stored in DNA/RNA Shield™ that was freeze-thawed from -80°C to room temperature.[1]

Frozen Stool DNA



High-quality DNA from stool stored in DNA/RNA Shield™ after up to 10 freeze-thaw cycles. Microbial composition profiling via 16S rRNA gene targeted sequencing.

DID YOU KNOW?
One of the world's largest repositories of autism brain samples suffered a freezer failure in its tissue bank, losing a third of its samples. Researchers reported at the time that the priceless collection took over 14 years to collect and could set autism research back by a decade[2].

1. Whole blood samples +/- DNA/RNA Shield™ were subjected to > 2 freeze thaw cycles. Total RNA was subsequently purified using the *Quick*-RNA™ Whole Blood Miniprep Kit.
2. Weintraub, Karen. (2012, June 11). "Freezer failure at brain bank hampers autism research". *The Boston Globe*.

DNA/RNA Shield™ - Swab and Collection Tube

Description

A general swab collection system (12 x 80 mm screwcap tube) that allows for the collection of samples including mouth, nose, throat, etc. The swab is collected into a tube prefilled with DNA/RNA Shield™, which effectively inactivates viral, bacterial, and other pathogens. Samples stored in DNA/RNA Shield™ are ready for downstream purification and any nucleic acid-based analysis.

Applications

- *Mouth, nose, and throat sample collection*
- *Environmental sample collection*
- *Pathogen inactivation and detection*

DNA/RNA Shield™ Saliva Collection Kit

Description

The DNA/RNA Shield™ Saliva Collection Kit ensures sample stability during storage/transport at ambient temperatures without a need for refrigeration or specialized equipment. DNA/RNA Shield™ reagent effectively inactivates pathogens (e.g., virus, bacteria) in collected samples. Each collection kit comes with a tube pre-filled with 2 ml of DNA/RNA Shield™.

Applications

- *Microbiomic analysis*
- *Gene expression analysis*
- *miRNA analysis*
- *Pathogen detection*

Product	Cat. No.	Size	Specifications	Uses
DNA/RNA Shield™ - Swab & Collection Tube	R1106 R1107	10 pack (1 ml fill) 50 pack (1 ml fill)	• Contains a sterile nylon swab with short (80 mm) breakpoint • Prefilled with DNA/RNA Shield™ (1 or 2 ml) and sterilized • Ideal for the general collection of swab samples (i.e., nose, mouth, throat)	General swab collection of samples (mouth, nose, throat, surfaces, etc.)
DNA/RNA Shield™ - Collection Tube w/ Swab	R1108 R1109	10 pack (2 ml fill) 50 pack (2 ml fill)		
DNA/RNA Shield™ Saliva Collection Kit	R1210	1 unit	• A saliva collection tube, equipped with funnel for easy saliva collection. • Separate tube containing DNA/RNA Shield (2ml) to be added after saliva collection.	Saliva sample collection (2ml of saliva)

*Products not shown at actual size.

DNA/RNA Shield™ - Blood Collection Tube

Description

Conveniently collect whole blood directly into DNA/RNA Shield™ blood vacuum tubes. Each evacuated tube instantly inactivates any harmful/pathogenic organisms and stabilizes the nucleic acid for prolonged periods at ambient temperature. Blood tubes are compatible with most blood collection sets designed for venipuncture (i.e., winged/ butterfly needle).

Applications

- *Gene expression analysis*
- *miRNA analysis*
- *Bloodbourne pathogen detection*

DNA/RNA Shield™ - Fecal Collection Tube

Description

Store and inactivate fecal samples with the DNA/RNA Shield™ Fecal Collection Tube, which includes a fecal scoop cup, a scoop attached to its screwcap, and a lysis tube. Samples collected are ready for downstream microbiomic analysis.

Applications

- *Microbiomic analysis*
- *Gene expression analysis*
- *miRNA analysis*
- *Pathogen detection*

Product	Cat. No.	Size	Specifications	Uses
DNA/RNA Shield™ - Blood Collection Tube	R1150	50 pack	• A sterile evacuated blood collection tube (10 ml) that is prefilled with 6 ml DNA/RNA Shield™ • The blood draw volume of the tube is 3 ml	Whole blood collection
DNA/RNA Shield™ - Fecal Collection Tube	R1101	10 pack	• A 15 ml tube prefilled with 9 ml of DNA/RNA Shield™ • The tube is equipped with a scoop attached to its screwcap for convenient sample collection • The tube can collect up to 1 g or 1 ml of fecal specimen	Fecal sample collection (up to 1 g/1 ml)

*Products not shown at actual size.

DNA/RNA Shield™ - Lysis Tube (Microbe)

Description

Collect and inactivate samples in lysis tubes prefilled with DNA/RNA Shield™. Each tube is filled with ultra-high density BashingBeads™, specifically designed for optimal microbial lysis. Samples collected are ready for any sensitive downstream analysis. Each lysis tube can be paired with a sterile swab for initial sample handling.

Applications

- *Microbiomic analysis*
- *Gene expression analysis*
- *miRNA analysis*
- *Pathogen detection*

DNA/RNA Shield™ - Lysis Tube (Tissue)

Description

Collect and inactivate samples in lysis tubes prefilled with DNA/RNA Shield™. Each tube is also filled with ultra-high density BashingBeads™, specifically designed for optimal tissue lysis. Samples collected are ready for any sensitive downstream analysis.

Applications

- *Microbiomic analysis*
- *Gene expression analysis*
- *miRNA analysis*
- *Pathogen detection*

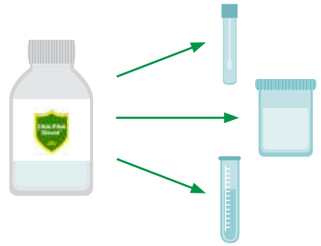
Product	Cat. No.	Size	Specifications	Uses
DNA/RNA Shield™ - Lysis Tube (Microbe)	R1103	50 tubes	• A 2 ml tube prefilled with 1 ml of DNA/RNA Shield™ • Contains ultra-high density BashingBeads™ for homogenization	Collection and storage of tough-to-lyse microbes from feces, saliva, soil, etc.
DNA/RNA Shield™ - Lysis Tube (Microbe) with Swab	R1104	50 tubes/50 swabs		
DNA/RNA Shield™ - Lysis Tube (Tissue)	R1105	50 tubes		Collection of tissue, whole insects, and tough-to-lyse pathogens
DNA/RNA Shield™ - Collection Tube (BashingBeads™ not included)	R1102	50 tubes		Collection of solid tissues, and biological liquids

*Products not shown at actual size.

DNA/RNA Shield™

Description

DNA/RNA Shield™ ensures nucleic acid stability during sample storage/transport at ambient temperatures. There is no need for refrigeration or specialized equipment. DNA/RNA Shield™ effectively lyses cells, inactivates nucleases and infectious agents (bacteria, fungi, parasites, and viruses), and is compatible with various collection and storage devices (vacutainers, swabs, nasal, buccal, fecal, etc.)



Custom Fill in Any Device

Contact us with any custom needs at
busdev@zymoresearch.com

Urine Conditioning Buffer™ (UCB™)

- *Effectively preserves DNA and RNA in urine at ambient temperatures.*
- *Facilitates pelleting of both cellular and cell-free nucleic acids from large volume urine samples.*
- *Inhibits microbial growth during long-term (cold-free) storage of urine samples.*

Description

Urine Conditioning Buffer™ (UCB™) ensures nucleic acid stability in urine during sample storage/transport at ambient temperatures. There is no need for refrigeration or specialized equipment. UCB™ can be added to any urine collection device.

Product	Cat. No.	Size	Applications	Uses
DNA/RNA Shield™	R1100-50 R1100-250	50 ml 250 ml	• Microbiomic analysis • Gene expression analysis • miRNA analysis • Pathogen detection	Sample stabilization at ambient temperatures; Ready for transport; Infectious agent inactivation
DNA/RNA Shield™ (2X concentrate)	R1200-25 R1200-125	25 ml 125 ml		
Urine Conditioning Buffer™ (UCB™)	D3061-1-140	140 ml	Store and/or transport urine samples with UCB™ for later purification of high-quality DNA/RNA.	Urine collection and preservation

6 Microbiomics

In recent years, the advances in DNA sequencing and other genome-enabled technologies have lowered the cost and time requirements needed to sequence any organism. Next-Generation sequencing (NGS) of microbial communities has dramatically increased the amount of research and exploration in both the human and environmental microbial ecosystem. When asked, many of the leading government agencies researching microbiomes expressed a strong interest in microbiome research as a means to solving problems, particularly those related to the production of food, the improvement of human health and ecosystem health, the production of clean, renewable energy, and the manufacture of microbiome-based therapeutics and products[1].

Advancements in NGS, as well as increased funding, have enabled large-scale, multi-lab research of microbial communities. However, early quality control studies on microbiomics research suggest that, while the technology and funding are readily available, there are no standard reference materials or controls. The field is littered with data containing errors and bias. The combination of variation in measurements between labs and lack of standard reference materials have led to growing concern within the scientific community regarding the reproducibility of research [2].

Despite the significant amounts of bias stalking every step of a microbiomics workflow, there are currently no established methods, references, and standards that could be used to gain quality microbiomics insights. The absence of these metrics removes the fundamental cornerstone of the scientific method: reproducability. From the smallest research lab to large commercial service providers, lack of replicable results is a known problem within the field.

The ZymoBIOMICS® product line was developed with the goal of eliminating bias across the entire microbiomic workflow. This new workflow employs the use of a collection reagent and storage devices, specially designed to inactivate all microbes (including viruses) and take a molecular snapshot of a sample at the time of collection, DNA extraction methods to uniformly lyse easy and tough-to-lyse microbes, and two novel sets of microbial standards to assess bias at extraction and analysis at each step of the workflow. The ZymoBIOMICS® product line is intended to offer a standardized metric to determine the accuracy of microbiomics/metagenomics workflows and enhance data reproducibility across labs.

ZymoBIOMICS®

ZymoBIOMICS®

1.Stulberg, Elizabeth, et al. "An assessment of US microbiome research." Nature Microbiology 1 (2016): 15015.
2. Sinha, Rashmi, et al. "The microbiome quality control project: baseline study design and future directions." Genome Biology 16.276 (2015): 1.

The Challenges and Solutions of Microbiomics Research

Early quality control studies of microbiomics research suggest that the field is littered with bias, which has led to unintentionally inaccurate and irreproducible data (Stulberg et al., 2016). These inaccuracies stem from the complicated multi-step workflows starting at sample collection, all the way through bioinformatics analyses. Each step of a microbiomics workflow contains potential for enormous amounts of variation. As multi-lab and longitudinal microbiomic studies have become more common, there is an urgent need for microbial reference materials to establish validated methods for reproducible data. Bias must be systemically evaluated through entire workflows and eliminated (or substantially reduced) by addressing its root cause in each step of these workflows.

Zymo Research has strived to eliminate bias across the entire microbiomics workflow. The ZymoBIOMICS® product line achieves this objective through a complete offering of standardized tools and services; this includes microbial standards, sample collection and preservation devices, streamlined purification kits, and services, all of which are optimized and validated to ensure the most accurate microbial profiling.

Microbiome Standards

To improve the quality and reproducibility of microbiomics analyses, Zymo Research has endeavored to develop microbial reference materials. ZymoBIOMICS® Microbial Community Standard is the first commercially available standard for microbiomics and metagenomics studies. The microbial standard is a well-defined, accurately characterized mock community consisting of Gram-negative and Gram-positive bacteria and yeast, with varying sizes and cell wall composition. The wide range of organisms with different properties enables characterization, optimization, and validation of lysis methods such as bead beating. The standard can be used as a defined input to assess the performance of entire microbiomics/metagenomics workflows, therefore enabling workflows to be optimized and validated. A mock microbial DNA community standard allows researchers to focus on the optimization post DNA extraction.

Sample Collection and Storage

The start of any microbiome analysis begins with sample collection. Reliable collection and preservation are critical steps for achieving high quality reproducible results. When a sample is stored or transported at ambient temperature, without a protective mechanism in place (e.g. preservation reagents or effective cold chain), microbes have markedly varied growth and survival rates which leads to drastically altered community profiles. While freezing samples is an effective solution, access to freezers is inconvenient or unfeasible in many situations, and transporting samples that require refrigeration or freezing is costly. However, if left unprotected, nucleic acids can be degraded by active nucleases leading to under-representation of microbes present in the samples. Preservation reagents that stabilize nucleic acids solve this problem. Some preservation reagents also require reagent removal that can introduce bias by inadvertently causing uneven partitioning of the sample. DNA/RNA Shield™, designed by Zymo Research, satisfies the requirements for accurate community profiling, including preserving nucleic acids at ambient temperature, inactivating organisms, and enabling high-throughput, streamlined purification. Ambient temperature storage, for up to one month, allows for cold-free transportation and significantly reduces cold-free associated costs. DNA/RNA Shield™ inactivates organisms (bacteria, fungi, virus, etc.), including pathogens contained in a sample, eliminating safety concerns during transportation and sample processing. DNA/RNA Shield™ also does not require reagent removal, enabling high-throughput automation and mitigating biases associated with phase separations. DNA/RNA Shield™ takes a molecular snapshot of samples at the time of collection guaranteeing accurate microbial compositions, and is available in various prefilled sample collection devices (e.g. swab/tubes, scoop/tubes, bead beating tubes, etc.).

DNA Extraction

Ineffective cell lysis during nucleic extraction methods greatly biases microbial profiles. Researchers have evaluated many different cell lysis mechanisms including mechanical, chemical, thermal, and enzymatic. Processes that involve chemical or thermal lysis often cause over-representation of easy-to-lyse organisms (e.g. Gram-negative bacteria) due to poor liberation of DNA from tough-to-lyse organisms (e.g. Gram-positive bacteria and yeast). Enzymatic lysis suffers from its inherent non-stochastic nature and is vulnerable to biases, especially from highly diverse sample types such as soil. Mechanical lysis methodologies (e.g. sonication, blending, liquid nitrogen/mortar and pestle, French pressing, and bead beating) are considered the best approach due to their stochastic nature, with bead beating accepted most widely in the community as the gold standard. However, not all methods perform equally, and each can suffer from specific problems such as low yields, excessive nucleic acid shearing, and non-uniform lysis. Even bead beating methodologies that have not been fully optimized, characterized, and validated for microbiomic applications can be biased. Simply combining an array of cell lysis mechanisms to achieve unbiased lysis does not necessarily reduce bias, despite potentially improving yields. When performing microbial composition profiling, combining more cell lysis mechanisms might only introduce additional types of bias into the process as opposed to reducing the bias overall.

For nucleic acid extraction, Zymo Research offers the only kits designed specifically for microbiomics and validated using a mock microbial community standard. ZymoBIOMICS® DNA and RNA Kits (pages 156-158) were developed to achieve uniform cell lysis from a wide range of organisms (e.g. Gram-negative/positive bacteria, fungi, protozoans, and algae) to ensure accurate microbial profiling; this is achieved by utilizing Zymo Research's unique bead beating matrix (featuring ultra-high density mixed beads) and novel chemistry that protects DNA and RNA against severe fragmentation during bead beating. The kits are also equipped with our unique OneStep™ PCR Inhibitor removal spin-column, allowing ultra-pure DNA and RNA extraction from a variety of sample types, including feces, saliva, swabs, soil, water, sediments, biofilms, etc. The extracted DNA is ready for any downstream applications, including 16S rRNA gene sequencing and shotgun metagenomic sequencing.

Library Prep

The library preparation process is also prone to bias and error. The 16S rRNA gene sequencing library preparation process can suffer from potentially significant bias due to the inherent weaknesses of its primary step, PCR. A common source of PCR-related bias includes GC content variation in templates and degeneracy in primers. Amplification of the 16S rRNA gene using broad coverage primers is further challenged by the high similarity of the targets. PCR chimeric sequences - which are a result of the recombination between similar targets/templates - are thought to be the worst contributors of error and bias in 16S library preparation (Gohl et al, 2016; Haas, et al, 2014). Library preparation for shotgun metagenomic sequencing can also be challenged by some PCR related bias/error. Besides PCR-related bias, shotgun library preparation can be inaccurate in other ways, such as biased DNA fragmentation.

Zymo Research released the *Quick*-16S™ NGS Library Prep Kit to resolve major challenges in 16S library preparation. The kit features real time PCR, rather than regular PCR, allowing users to control PCR chimera formation. The kit contains two novel primer sets that target 16S V1-V2 and V3-V4 regions, dramatically improving phylogenetic coverage. The kits workflow is highly streamlined, which significantly reduces hands-on time.

Bioburden

As the field of microbiomics continues to develop, another form of bias and error that has appeared is bioburden (nucleic acid contamination) introduced through complex and lengthy sample handling, reagents, and kits required to sequence DNA from a sample (Salter et al., 2014; Naccache et al., 2013). Because of the highly sensitive nature of NGS-based microbiome sequencing, contaminations introduced can be readily detected. Thus, bioburden can result in over-representation of the true microbial diversity of samples by introducing false positives microbial identifications. The impact of bioburden becomes magnified as sample biomass decreases, complicating the balance of signal to background. Therefore, the level of bioburden dramatically impacts the detection limit of the technology. All ZymoBIOMICS® DNA Kits are rigorously tested and certified low-bioburden.

Bioinformatics

Popular bioinformatics solutions for 16S sequencing data analysis (such as QIIME and mothur) mostly rely on clustering sequences into Operational Taxonomic Units (OTUs). These processes utilize a variety of clustering algorithms, however, there is no consensus on the best method. The situation is even more challenging when analyzing shotgun metagenomic data, because of limited read length in NGS technologies. De novo assembly of complete genomes from metagenomes is facing challenges that have no concrete solutions. If the focus is on microbial identification and composition profiling, assembly-free methods (such as MetaPhlan2 and mOTU) that rely on direct comparison of sequencing reads with a reference database might serve better. There have been many such assembly-free programs published in the literature are available from commercial vendors. Their performance varies significantly in the resolution of taxonomy levels, sensitivity, and specificity.

For 16S data analysis, Zymo Research has established a pipeline that allows species-level resolution with regular Illumina® 16S sequencing data, using Dada2 to infer unique 16S sequences from the sequencing data. Species-level resolution is achieved by combining a novel taxonomy assignment method with a well-curated 16S database.
ZymoBIOMICS® – Standardizing Microbiomics

ZymoBIOMICS®

A Complete Microbiomics Solution from Collection to Conclusion

Standards

Microbiomics-Grade Quality Control

ZymoBIOMICS® Microbial Community Standards II (Log Distribution)

Microbial standard with a log distribution used to assess microbiomics workflows

Page 152-153

ZymoBIOMICS® Microbial Community DNA Standard

Assess bias and errors in NGS-based microbial composition profiling workflows

Page 151

ZymoBIOMICS® Microbial Community Standard

Assess bias and errors in NGS-based microbial composition profiling workflows

Page 150

Sample Collection

Fecal Samples

DNA/RNA Shield™ - Fecal Collection Tube

A 15 ml tube prefilled with DNA/RNA Shield™ equipped with a scoop attached to the screwcap for convenient sample collection

Page 155

Swab Samples

DNA/RNA Shield™ - Swab & Collection Tube

A sterilized screwcap tube prefilled with DNA/RNA Shield™ (1 or 2 ml) with flocked swab

Page 155

Microbial Samples

DNA/RNA Shield™ - Lysis Tube (Microbe)

Screwcap tube prefilled with DNA/RNA Shield™ and ultra-high density BashingBeads™ for homogenization

Page 155

Quick Product Guide

DNA & RNA Isolation

DNA Isolation

ZymoBIOMICS® DNA Kits

Inhibitor-free microbial DNA from any sample validated for microbiomic and metagenomic analyses

Page 156-157

RNA Isolation

ZymoBIOMICS® RNA Kits

Purification of microbial RNA for microbiome and metagenome analyses

Page 158

DNA/RNA Isolation

ZymoBIOMICS® DNA/RNA Kits

Purification of microbial DNA/RNA for microbiome and metagenome analyses

Page 127

Microbial DNA Isolation

HostZERO™ Microbial DNA Kit

Purification of microbial DNA coupled with depletion of host DNA from biological samples

Page 160

Analysis

Quantification

ZymoBIOMICS® PCR PreMix

Low bioburden PCR PreMix with a hot-start polymerase

Page 162

Next-Gen Sequencing

Femto™ Bacterial DNA Quantification Kit

Quantify as little 20 femtograms of bacterial DNA

Page 162

***Quick*-16S NGS Library Prep Kit**

A streamlined solution to convert up to 96 DNA samples to a single, ready-to-sequence 16S library

Page 161

ZymoBIOMICS® Microbial Community Standard

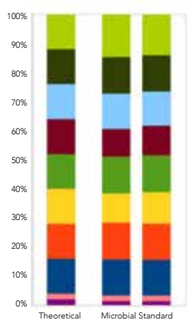
- ***Microbiome Standard:*** *Mock microbial community of well-defined composition.*
- ***Identify Bias:*** *Contains both tough-to-lyse and easy-to-lyse organisms.*
- ***Accurate Characterization:*** *Ideal for validation, optimization, and quality control of complete microbiome workflows.*

Description

Microbial composition profiling techniques powered by Next-Generation sequencing are becoming routine in microbiomics and metagenomics studies. However, these analytical techniques can suffer from significant bias from collection to analysis. The ZymoBIOMICS® Microbial Community Standard is designed to assess bias and errors in the extraction methods of a microbiomics workflow. The Microbial Community Standard mimics a mixed microbial community of well-defined composition, containing three easy-to-lyse Gram-negative bacteria, five tough-to-lyse Gram-positive bacteria, and two tough-to-lyse yeasts. Acting as a defined input from the beginning, the Microbial Community Standard can guide construction and optimization of entire workflows and can also be used as a routine quality control.

Defined Microbial Community

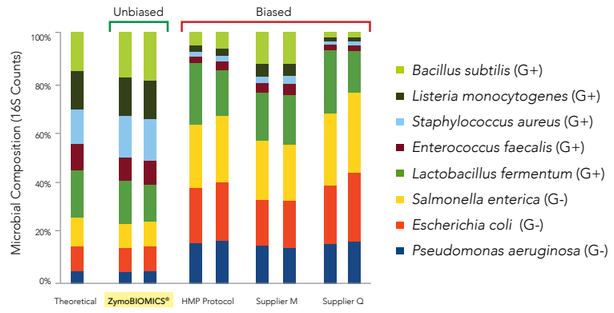
The ZymoBIOMICS® Microbial Community Standard contains three easy-to-lyse bacteria, five tough-to-lyse bacteria, and two tough-to-lyse yeasts.



Species	Avg. GC (%)	Gram Stain	gDNA Abun. (%)
Pseudomonas aeruinosa	66.2	-	12
Escherichia coli	56.8	-	12
Salmonella enterica	52.2	-	12
Lactobacillus fermentum	52.8	+	12
Enterococcus faecalis	37.5	+	12
Syaphylococcus aureus	32.7	+	12
Listeria monocytogenes	38.0	+	12
Bacillus subtilis	43.8	+	12
Saccharomyces cerevisiae	38.4	Yeast	2
Cryptococcus neoformans	48.2	Yeast	2

Identify and Eliminate Bias

The ZymoBIOMICS® Microbial Community Standard was used to compare different DNA extraction protocols. DNA samples were profiled by 16S rRNA gene targeted sequencing.



Product	Cat. No.	Size	Specifications	Uses
ZymoBIOMICS® Microbial Community Standard	D6300	10 preps	Source: A mixture of ten inactivated microorganisms (bacterial and fungal) Storage Solution: cells are suspended in DNA/RNA Shield™ (R1100-50) Impurity Level: < 0.01% foreign microbial DNA	Assess bias within collection, storage, and extraction protocol

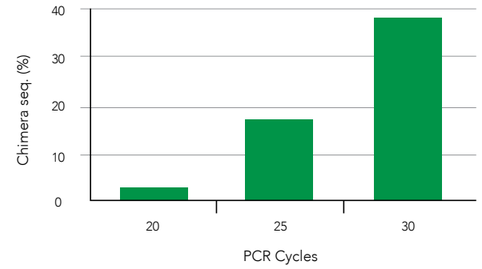
ZymoBIOMICS® Microbial Community DNA Standard

- ***Microbiome DNA Standard:*** *Eight bacteria and two yeast genomes.*
- ***Identify Bias in Library Prep Methods:*** *DNA has a wide GC range of 15% - 85%.*
- ***Accurate Composition:*** *Ideal for validation, optimization, and quality control of microbiome workflows.*

Description

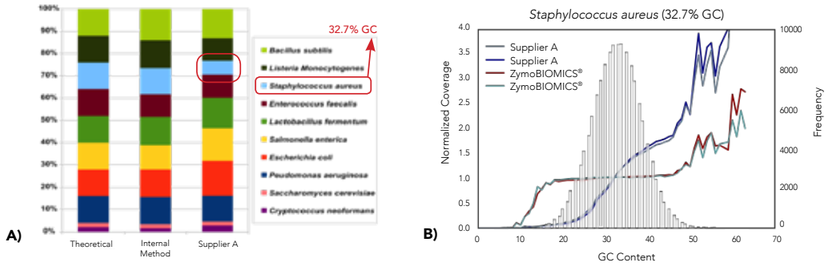
One of the major challenges in the emerging field of microbiomics is the bias and errors introduced in the complex workflows. Besides nucleic acid purification, bias also arises from sequencing library preparation and subsequent processes. The ZymoBIOMICS® Microbial Community DNA Standard is designed to assess bias, errors, and other artifacts after nucleic acid purification. The DNA standard is created by pooling DNA extracted from pure cultures; it has accurately defined composition, negligible impurities (<0.01%), and contains genomes of a wide range of GC content (15% - 85%). The DNA standard is designed to have the same microbial composition as the cellular version, the ZymoBIOMICS® Microbial Community Standard, so that they can be more powerful when working in tandem.

Address & Reduce PCR Chimera



The occurrence of PCR chimera increases with the number of PCR cycles during 16S library preparation. The ZymoBIOMICS® Microbial Community DNA Standard can be used as a positive control to optimize the number of cycles needed in a prep.

Assess GC Bias



Assess GC bias in library preparations. A) Compared to the ZymoBIOMICS® services, Supplier A's shotgun metagenomic sequencing was biased due to GC content variation. **B)** Coverage of the 10 microbial genomes was normalized to evaluate the effects of GC content.

Product	Cat. No.	Size	Specifications	Uses
ZymoBIOMICS® Microbial Community DNA Standard	D6305 D6306	200 ng 2,000 ng	Source: a mixture of genomic DNA from ten microbial strains Storage Solution: 10mM Tris-HCl and 0.1 mM EDTA, pH 8.0 Impurity Level: < 0.01% foreign microbial DNA	Assessing bias in library preparation for 16S and shotgun sequencing

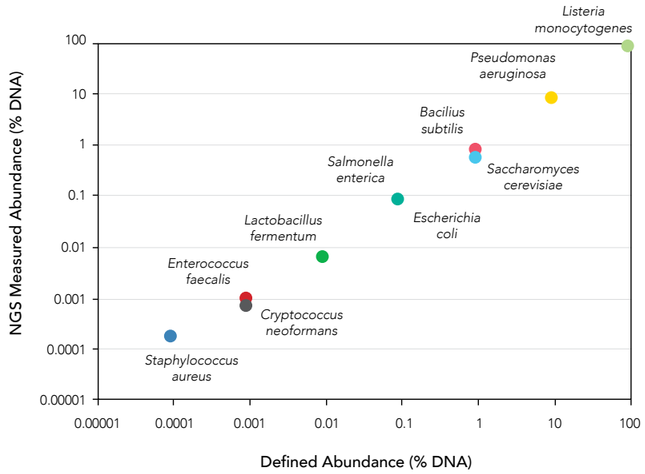
ZymoBIOMICS® Microbial Community Standards II (Log Distribution)

- ***Assess Detection Limit:*** *Log distributed abundance enables reliable positive identification down to 100 microbes.*
- ***Accurate Composition:*** *Cross-validated with multiple measurements.*
- ***Microbiome QC:*** *Quality control for microbiome profiling and pathogen identification.*

Description

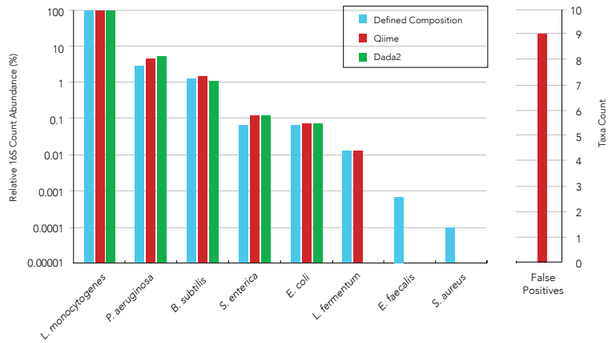
The ZymoBIOMICS® Microbial Community Standard II (Log Distribution) is a mock microbial community, including DNA, consisting of eight bacterial and two fungal strains used to assess the performance of microbiomics workflows. These standards are accurately characterized and contain negligible impurity (< 0.01%). Cells or DNA of the 10 microbes were mixed to create log-distributed abundance (see table below), which allows the user to easily assess the detection limit of a microbiomics workflow.

Accurate Composition with Log Distribution



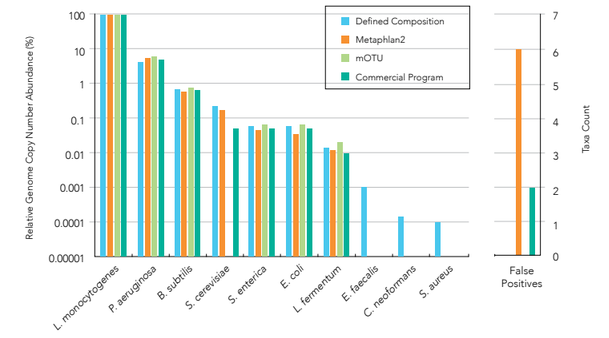
NGS analysis of the ZymoBIOMICS® Microbial Community Standard II (Log Distribution) agrees with the defined composition. DNA was extracted using the ZymoBIOMICS® DNA Miniprep kit. The library was prepared with an internal method and sequenced using an Illumina® MiSeq™. Abundance was inferred by mapping raw sequencing reads against reference genomes.

Assess Performance of 16S Sequencing



The 16S sequencing results from the ZymoBIOMICS® Microbial Community Standard II (Log Distribution) were analyzed using Qiime 1.9.0 and Dada2 analysis pipelines. DNA was extracted using the ZymoBIOMICS® DNA Miniprep kit. A library of 16S V3-V4 region was prepared with the *Quick*-16S™ NGS Library Prep kit. Sequencing was performed using an Illumina® MiSeq® generating 93,762 paired-end reads (2 x 300 bp). Dada2 showed no false positives. The Qiime pipeline predicted 9 false positives, but had a lower detection limit identifying the presence of *L. fermentum* while Dada2 did not.

Assess Performance of Shotgun Metagenomic Sequencing



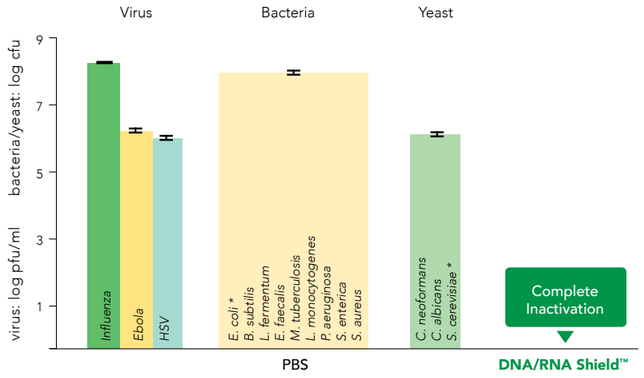
The shotgun sequencing data of the ZymoBIOMICS® Microbial Community Standard II (Log Distribution) were analyzed using three different bioinformatics pipelines, MetaPhlan2, mOTU, and a commercial program. The library prepared with an internal method was sequenced using an Illumina® MiSeq®. The three analysis pipelines had similar detection limits down to a relative genome copy number abundance of ~0.01% (*L. fermentum* abundance). Metaphlan2 and the commercial program led to false positives; while the mOTU pipeline made no false predictions, it was unable to detect yeast.

Product	Cat. No.	Size	Specifications	Uses
ZymoBIOMICS® Microbial Community Standard II (Log Distribution)	D6310	10 preps	Source: eight bacteria (3 Gram-negative and 5 Gram-positive) and 2 yeasts. Storage solution: DNA/RNA Shield™ for microbial inactivation and stabilization. Impurity level: < 0.01% foreign microbial DNA. Relative-abundance deviation in average: <30%	Assessing accuracy of taxonomy identification Assessing bias in composition measurement
ZymoBIOMICS® Microbial Community DNA Standard II (Log Distribution)	D6311	220 ng/20µl	Source: genomic DNA of eight bacteria and two yeasts. Impurity level: < 0.01% foreign microbial DNA. Relative-abundance deviation in average: <30%	Assessing accuracy of taxonomy identification Assessing bias in composition measurement
Human HCT116 DKO Non-Methylated DNA	D5014-1	5 µg	Source: DNA purified from HCT116 DKO cells. Concentration: 250 ng/µl in buffer	Used in conjuction with D6311, simulation of real samples of human DNA mixed with microbial DNA.

Illumina® and MiSeq® are registered trademarks of Illumina, Inc.

Technology Overview: DNA/RNA Shield™

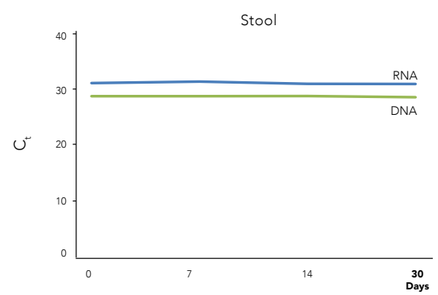
Take a molecular snapshot of your sample with DNA/RNA Shield™. This stabilization reagent breaks the cold chain and ensures nucleic acid stability during sample storage/transport at ambient temperatures. DNA/RNA Shield™ effectively lyses cells and inactivates nucleases and infectious agents, and it is compatible with various collection and storage devices (vacuum tubes, swabs (nasal, buccal, fecal), etc.).



Microbial Inactivation

Viruses, bacteria and yeast are effectively inactivated by DNA/RNA Shield™. Samples containing the infectious agent (virus, bacteria, yeast) were treated for 5 minutes with DNA/RNA Shield™ or mock (PBS). Titer (PFU) was subsequently determined by plaque assay. Validated by: Influenza A - D. Poole and Prof. A. Mehle, Department of Medical Microbiology and Immunology, University of Wisconsin, Madison; Ebola (Kikwit) - L. Avena and Dr. A. Griffiths, Department of Virology and Immunology, Texas Biomedical Research Institute; HSV-1/2 - H. Oh, F. Diaz and Prof. D. Knipe, Virology Program, Harvard Medical School; *E. coli, L. fermentum, B. subtilis, S. cerevisiae* – Zymo Research Corporation).

*Disclaimer: This graph only displays results from *E. coli* inactivation. Each microbe was tested independently and were combined into one graph for brevity. Bacterial cultures were grown between 10^8 - 10^9 cells and yeast cultures were grown between 10^7 - 10^8 cells.

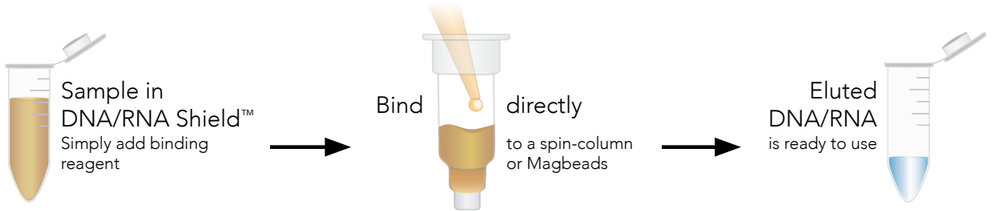


Nucleic Acid Stabilization at Ambient Temperature

DNA and RNA in stool is effectively stabilized in DNA/RNA Shield™ at ambient temperature. Graphs show: DNA and RNA controls from stool purified at the indicated time points and analyzed by (RT)qPCR.

Streamlined Purification

No Reagent Removal. Compatible with ZymoBIOMICS® Purification Products.



*Also compatible with most other purification products.

For more information about DNA/RNA Shield™ Bulk Reagent, **see page 143**

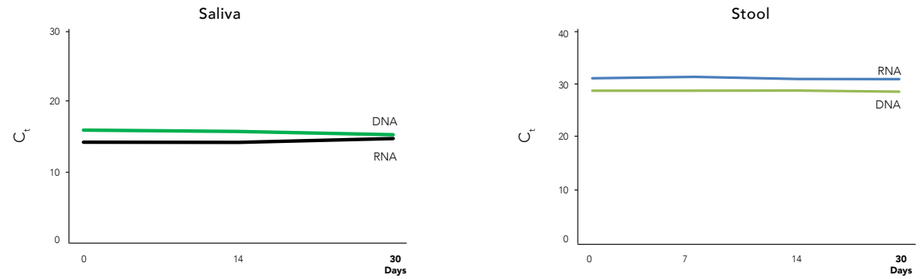
DNA/RNA Shield™ Collection Devices

- *Provides an accurate "molecular snapshot" of the sample at the time of collection by preserving nucleic acids at ambient temperature and inactivating microbes.*
- *Nucleic acid preservation (at ambient temperature; cold-free)*
- *Pathogen inactivation (bacteria, fungus, parasites & viruses)*
- *Streamlined purification (no reagent removal, universally compatible, automatable)*

Description

DNA/RNA Shield™ Collection Devices ensure nucleic acid stability during sample storage and transport at ambient temperatures. There is no need for refrigeration during transport or reagent removal during subsequent nucleic acid purification. The collection devices are ideal for the unbiased collection and storage of microbes to allow for non-biased microbiomics analysis. These collection devices effectively lyse cells and inactivate nucleases and infectious agents (virus), taking a molecular snapshot of a sample at the time of collection.

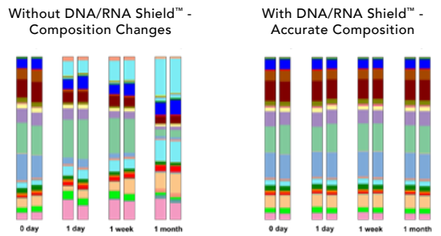
Nucleic Acid Stabilization At Ambient Temperature



DNA and RNA in saliva and stool is effectively stabilized in DNA/RNA Shield™ at ambient temperature. Graphs show: spike-in DNA and RNA controls from saliva and stool purified at the indicated time points and analyzed by (RT)qPCR. Controls: HSV-1 and HIV (AcroMetrix™, Life Technologies).

DNA/RNA Shield™ Preserves Microbial Composition at Ambient Temperature

Microbial composition of stool is unchanged after one month at ambient temperature with DNA/RNA Shield™. Stool samples suspended in DNA/RNA Shield™ and stored at room temperature were compared to stool without preservative for one month. They were sampled at the indicated time points and processed with ZymoBIOMICS® DNA Miniprep Kit. The extracted DNA was then subjected to microbial composition profiling via 16S rRNA gene targeted sequencing. Samples stored with DNA/RNA Shield™ had a constant microbial composition while the samples stored without shifted dramatically.



Product	Cat. No.	Size	Specifications	Uses
DNA/RNA Shield™ - Lysis Tube (Microbe)	R1103	50 pack	Tube Size: 2 ml Contents: mixed size BashingBeads™	Sample stabilization at ambient temperatures; Infectious agent inactivation; Ready for transport; Uniformly lyses all microbes; Directly compatible with ZymoBIOMICS® DNA or RNA Miniprep Kit workflow
DNA/RNA Shield™ - Lysis Tube (Microbe) with Swab	R1104	50 tubes/50 swabs		
DNA/RNA Shield™ - Swab & Collection Tube	R1106 R1107 R1108 R1109	10 pack (1 ml fill) 50 pack (1 ml fill) 10 pack (2 ml fill) 50 pack (2 ml fill)	Tube Size: 5 ml Contents: Sterile swab	Sample stabilization at ambient temperatures; Infectious agent inactivation; Ready for transport; Directly compatible with ZymoBIOMICS® DNA or RNA Miniprep Kit workflow
DNA/RNA Shield™ - Fecal Collection Tube	R1101	10 pack	Tube Size: 15 ml Contents: collection spoon attached to screwcap	

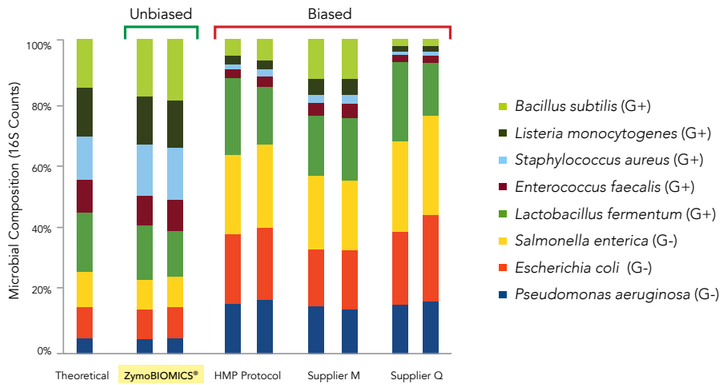
ZymoBIOMICS® DNA Kits

- ***Microbiomics-grade DNA Extraction:*** *Unbiased cellular lysis for accurate microbiome measurements and certified low bioburden.*
- ***Ultra-pure:*** *Inhibitor-free DNA from any sample that is ready for qPCR, NGS, etc.*
- ***Simple 20 Minute Workflow:*** *No precipitations or lengthy incubations.*

Description

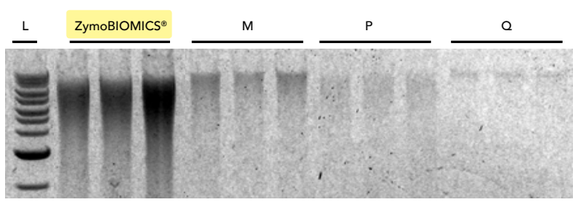
The ZymoBIOMICS® DNA Kits are designed for purifying DNA from a variety of sample inputs that is immediately ready for microbiome or metagenome analyses. The ZymoBIOMICS® lysis system eliminates bias associated with unequal lysis efficiencies of different organisms (e.g. Gram-negative/positive bacteria, fungi, protozoans, and algae) making it ideal for microbial community profiling. Uniform mechanical lysis of tough microbes is achieved by bead beating with the innovative ultra-high density BashingBeads™. The kit is equipped with our *OneStep*™ PCR Inhibitor Removal technology, enabling PCR reaction from inhibitor-rich environmental samples. Purified DNA is ideal for all downstream applications including PCR, arrays, 16S rRNA gene sequencing, and shotgun sequencing. DNA Size is 15-20 kb.

Microbiomics-grade Unbiased DNA Extraction



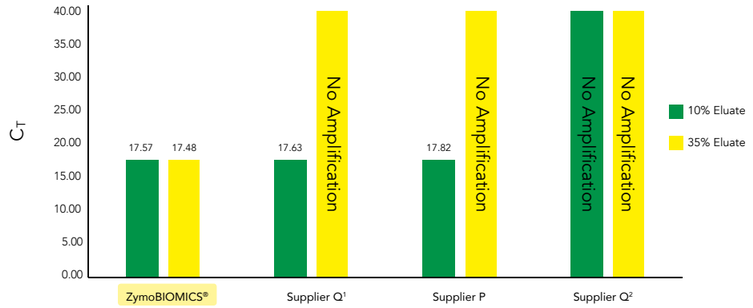
The ZymoBIOMICS® DNA Miniprep Kit extracts DNA without bias towards any cell type. Four different extraction methods were assessed using the ZymoBIOMICS® Microbial Community Standard and 16S sequencing.

Superior Microbial Lysis & Yield



The ZymoBIOMICS® DNA Miniprep Kit provides superior yields when compared the Suppliers, M, P, and Q.

Ultra-pure DNA from Inhibitor-Rich Samples



The ZymoBIOMICS® DNA Miniprep Kit provides inhibitor-free DNA even when challenged with extremely inhibitor-rich samples. Real-time PCR was used to evaluate eluates recovered using the ZymoBIOMICS® DNA Miniprep Kit, and kits from Suppliers Q1, P, and Q2. Reaction volumes consisted of either 10% or 35% of the eluate from each kit to detect the presence of PCR inhibitors. Each reaction contained 25 ng of *Brettanomyces* DNA. No amplification indicated PCR inhibition from inefficient inhibitor removal.

Streamlined 20 Minute Workflow

Accurate lysis using ZR BashingBead™ Lysis Tubes

Superior yields and purity with Zymo-Spin™ technology

PCR inhibitor removal eliminates polyphenolics, humic/fulvic acid, and melanin

Product	Cat. No.	Size	Specifications	Uses
ZymoBIOMICS® DNA Miniprep Kit	D4300 D4300T	50 preps 10 preps	Format: Spin-Cloumn Binding Capacity: 25 µg Elution Volume: 50 µl Processing Time: 20 minutes	Accurately isolates DNA of microbial communities from any sample type (feces, soil, water, biofilms, swabs, body fluids, etc.)
ZymoBIOMICS® DNA Miniprep Kit (Lysis Matrix Not Included)	D4304	50 preps		
ZymoBIOMICS® DNA Microprep Kit	D4301	50 preps	Format: Spin-Cloumn Binding Capacity: 5 µg Elution Volume: 10 µl Processing Time: 20 minutes	
ZymoBIOMICS® 96 DNA Kit (includes ZR BashingBead™ Lysis Rack)	D4303	2 x 96 preps	Format: 96-Well Binding Capacity: 5 µg Elution Volume: 20 µl Processing Time: 45 minutes	
ZymoBIOMICS® 96 DNA Kit (includes ZR BashingBead™ Lysis Tubes)	D4309	2 x 96 preps		
ZymoBIOMICS® 96 DNA Kit (Lysis Matrix Not Included)	D4307	2 x 96 preps	Format: 96-Well Binding Capacity: 5 µg Elution Volume: 20 µl Processing Time: 45 minutes	

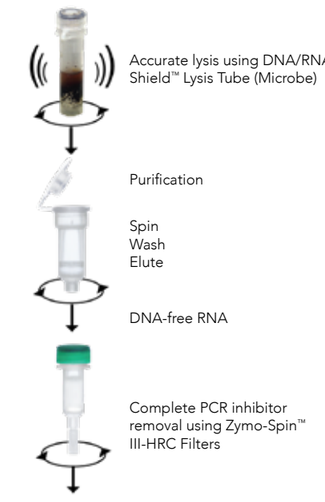
ZymoBIOMICS® RNA Miniprep Kit

- *Rapid, robust, and simple purification of high quality, inhibitor-free total RNA (including small/micro RNAs) from any sample including feces, soil, water, biofilms, swabs, saliva, body fluids, etc.*
- *ZymoBIOMICS® innovative lysis system enables efficient and unbiased lysis of microbes including Gram-positive/negative bacteria, fungi, protozoans, algae, viruses, etc.*
- *DNA-free RNA is ready for use in any downstream application. DNase I included.*

Description

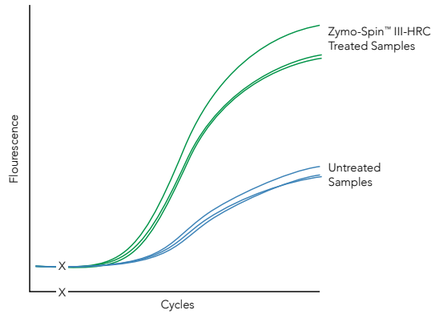
The ZymoBIOMICS® RNA Miniprep Kit is designed for purifying RNA from a wide array of sample inputs that is ready for microbiome or metagenome analyses. The ZymoBIOMICS® lysis system eliminates bias associated with unequal lysis efficiencies of different organisms (e.g. Gram-negative/positive bacteria, fungi, protozoans, and algae). The procedure uses Zymo-Spin™ Column technology that results in high-quality total RNA (including small RNAs 17-200 nt) that is free of PCR inhibitors and is ready for RT-PCR, hybridization, sequencing, etc.

Streamlined Workflow



Ultra-pure Total RNA

Ultra-pure RNA from Inhibitor-rich Samples

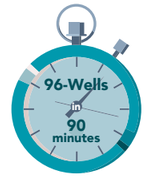


Total RNA isolated from human stool with or without inclusion of the Zymo-Spin™ III-HRC Spin Filter during the ZymoBIOMICS® RNA Miniprep Kit protocol. Earlier amplification cycles indicate complete removal of PCR inhibitors.

Product	Cat. No.	Size	Specifications	Uses
ZymoBIOMICS® RNA Miniprep Kit	R2001	50 preps	Format: Spin-Column Binding Capacity: 100 µg Elution Volume: ≥ 50 µl RNA Size: ≥ 17 nucleotides	Accurately isolates RNA of microbial communities from any sample type (feces, soil, water, biofilms, swabs, body fluids, etc.)

ZymoBIOMICS® 96 MagBead DNA Kit

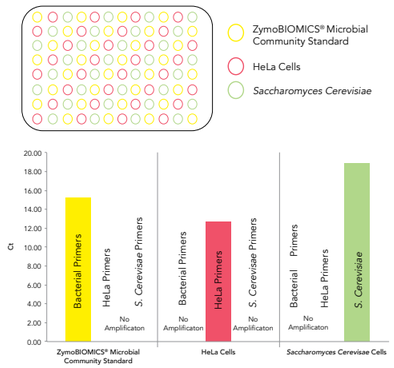
- *High-throughput purification of high quality, inhibitor-free DNA from any sample including feces, soil, water, biofilms, swabs, saliva, and body fluids.*
- *The ZymoBIOMICS® innovative lysis system enables efficient and unbiased lysis of microbes including Gram-positive/negative bacteria, fungi, protozoans, algae, etc.*
- *The automation friendly workflow enables nearly any sample to be processed in as little as 90 minutes for 96 preps.*



Description

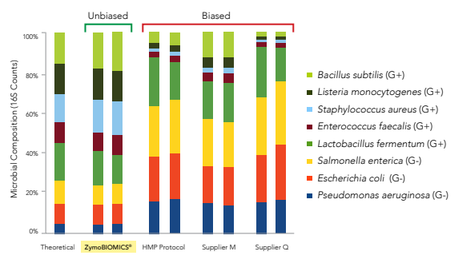
The ZymoBIOMICS® 96 MagBead DNA Kit is designed for purifying DNA from a wide array of sample inputs that is immediately ready for microbiome or metagenome analyses. The ZymoBIOMICS® lysis system eliminates bias associated with unequal lysis efficiencies of different organisms (e.g. Gram-negative/positive bacteria, fungi, protozoans, and algae), making it ideal for microbiomic studies. Unbiased mechanical lysis of tough microbes is achieved by bead beating with ultra high-density BashingBeads™. The automation-friendly workflow integrates PCR inhibitor removal technology directly into the purification system, removing complex precipitation steps commonly used in other methodologies. The kit's unique system allows for a simple bind, wash, elute procedure, which is unmatched in providing ultra-pure DNA, free of PCR inhibitors. Purified DNA is ideal for all downstream applications including PCR, arrays, 16S rRNA gene sequencing, and shotgun sequencing.

No Cross-Contamination



The ZymoBIOMICS® 96 MagBead DNA Kit provides cross-contamination free samples across a standard 96-well plate purification performed on a liquid handler. Samples were evaluated using quantitative PCR with primer sets targeted at the bacterial 16S gene, the human LINE gene, and the fungal ITS gene. PCR was performed in technical duplicates.

Accurate Profiling



The ZymoBIOMICS® 96 MagBead Kit provides accurate representation of the organisms extracted from the ZymoBIOMICS® Microbial Community Standard.

No Precipitation or Centrifugation Required

Bias-free Lysis | Quick Bind, Wash, Elute Workflow | Superior Yields and Integrity Ultra-Pure DNA

Product	Cat. No.	Size	Specifications	Uses
ZymoBIOMICS® 96 MagBead DNA Kit (includes ZR BashingBead™ Lysis Rack)	D4302	2 x 96 preps	Format: 96-Well Binding Capacity: 10 µg Elution Volume: ≥ 50 µl Processing Time: 90 minute	Accurate high-throughput DNA isolation of microbial communities from any sample type (feces, soil, water, biofilms, swabs, body fluids, etc.)
ZymoBIOMICS® 96 MagBead DNA Kit (Lysis Matrix Not Included)	D4306	2 x 96 preps		
ZymoBIOMICS® 96 MagBead DNA Kit (includes ZR BashingBead™ Lysis Tubes)	D4308	2 x 96 preps		

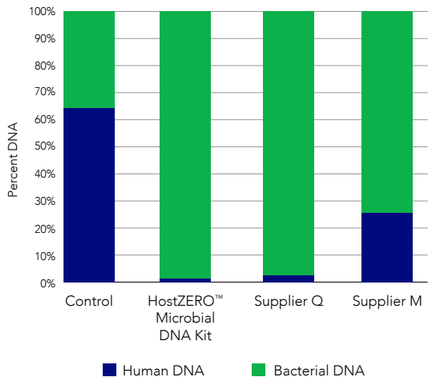
HostZERO™ Microbial DNA Kit

- ***Depletes Host DNA:*** *≥90% depletion in applicable sample types.*
- ***Preserves Microbial DNA:*** *≥85% recovery of microbial DNA and minimal impact on microbiome profile.*
- ***Simple and Fast:*** *Only 30 minutes of hands-on time.*

Description

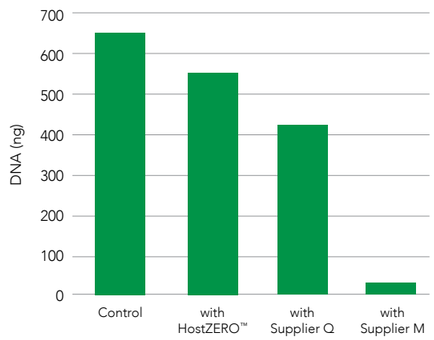
The HostZERO™ Microbial DNA Kit is designed to overcome the challenge of contaminating host nucleic acids in microbial samples. The kit uses a novel method to reduce the amount of contaminating host DNA by selectively lysing the eukaryotic cells and degrading this DNA prior to total DNA purification. Paired with Zymo Research's non-biased purification technology, the HostZERO™ Microbial DNA Kit allows for the exclusive capture of DNA from living microbial cells in a biological sample.

Best Depletion of Host DNA



The HostZERO™ Microbial DNA Kit depletes host DNA. The same human saliva sample was processed using the HostZERO™ Microbial DNA Kit or kits from Suppliers Q and M. Triplicate samples of purified DNA were evaluated by Real-time PCR. The composition of the DNA is shown in terms of relative bacterial and human DNA abundance. The control sample was processed with the ZymoBIOMICS® DNA Microprep Kit, which extracts total DNA from the sample without host DNA depletion.

Highest Recovery of Bacterial DNA



Bacterial DNA is efficiently recovered with HostZERO™ technology. The same human saliva sample was processed using the HostZERO™ Microbial DNA Kit or kits from Suppliers Q and M. Triplicate samples of purified DNA were evaluated by Real-time PCR. The control sample was processed with the ZymoBIOMICS® DNA Microprep Kit, which extracts total DNA from the sample without host DNA depletion.

Product	Cat. No.	Size	Specifications	Uses
HostZERO™ Microbial DNA Kit	D4310	50 preps	Format: Spin-Column Binding Capacity: 5 µg Elution Volume: 20 µl Host Depletion: ≥90%	Accurately isolates DNA of microbial communities while removing host DNA from applicable sample types

Quick-16S™ NGS Library Prep Kit

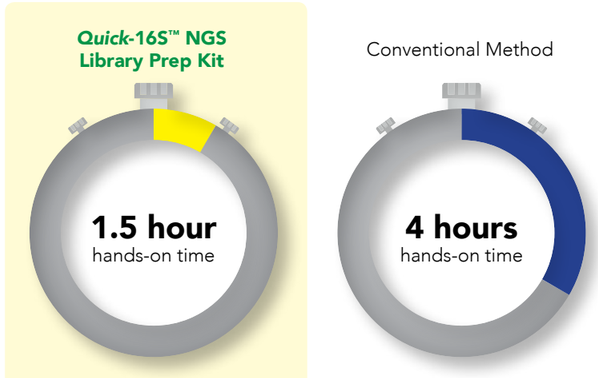
- ***Fast & Simple:*** *Only 1.5 hours of hands-on time. No TapeStation® analyses or AMPure® clean-ups.*
- ***Accurate:*** *Real-time PCR limits PCR chimera formation by up to 10 times.*
- ***Increased Coverage:*** *Novel primers increase phylogenetic coverage of bacteria and archaea, enabling species-level resolution for human microbiome profiling.*

Description

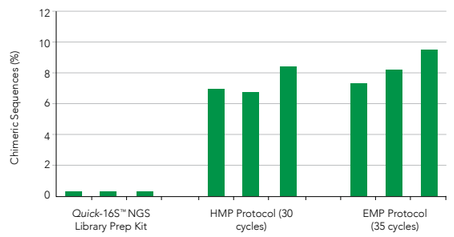
The *Quick*-16S™ NGS Library Prep Kit and included *Quick*-16S™ Primer Sets enable users to convert up to 96 DNA samples to a single, ready-to-sequence 16S library without the need for additional reagents. A streamlined protocol simplifies primer management and eliminates numerous cleanups and quantifications. The best phylogenetic coverage is made possible by innovative new primers that allow users to choose which region of the 16S genome to target.

Fastest 16S Library Prep

The *Quick*-16S™ NGS Library Prep Kit is >2.5 times faster than the conventional 16S library prep method. The *Quick*-16S™ Kit simplifies the 16S library prep workflow by quantifying libraries using qPCR, instead of TapeStation® analyses, and by using a single-tube library cleanup.

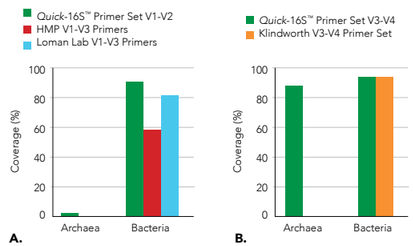


Minimize PCR Chimera Formation



The *Quick*-16S™ NGS Library Prep Kit minimizes PCR chimera formation compared to two common protocols: Human Microbiome Project (HMP) and Earth Microbiome Project (EMP). Equivalent amounts of the same fecal DNA sample were used as input. Chimeric sequences were predicted with Uchime (https://www.drive5.com/uchime).

Best Phylogenetic Coverage



A. The *Quick*-16S™ Primer Set V1-V2 includes coverage of common human-associated microbes, including *Bifidobacterium*, *Propionibacterium*, and *Chlamydia*, which are missed in common V1-V2 or V1-V3 primers.
B. The *Quick*-16S™ Primer Set V3-V4 provides up to 87% coverage for archaea, organisms commonly found in the human gut. However, the common V3-V4 primers provide 0% coverage for archaea.

Product	Cat. No.	Size	Specifications	Uses
Quick-16S™ NGS Library Prep Kit	D6400	96 rxns	Input: 10-40 ng of purified DNA Hands-on Time: 90 min Target Regions: 16S V1-V2 and 16S V3-V4 Chimera Formation: ≤2% Compatible Systems: Illumina® MiSeq®	Converts up to 96 DNA samples to a single, ready-to-sequence 16S library with improved 16S coverage and simple processing

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AMPure® is a registered trademark of Beckman Coulter, Inc.

ZymoBIOMICS® PCR PreMix

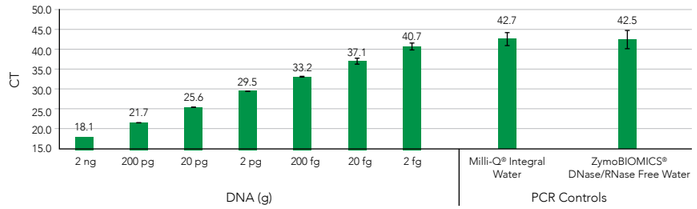
- ***High Sensitivity PCR:*** *Robust amplification and detection of low copy DNA.*
- ***DNA-Free:*** *Certified low bioburden.*
- ***Simple Setup:*** *Add water, DNA, and primers.*

Description

The ZymoBIOMICS® PCR PreMix is supplied as a 2X concentrated "master mix", which contains all the reagents needed to perform PCR and other molecular downstream analysis with the addition of probes or fluorescent dyes. It features a "hot-start" DNA polymerase that has 3'-terminal transferase activity. The PreMix is validated low-bioburden in regards to bacterial contamination. The addition of "A" overhangs to amplified DNA makes it ideal for use in TA-cloning. Simple and easy to use: just add water, primers, and template DNA to the ZymoBIOMICS® PCR PreMix, then heat and go!

Sensitive Detection Range, DNA-Free

Amplification of the 16S rRNA gene can be quantified down to 2 femtograms (fg) of bacterial genomic DNA. Quantified non-template controls, including Milli-Q and ZymoBIOMICS® DNase and RNase-free water, demonstrate the minimal bacterial DNA contamination.



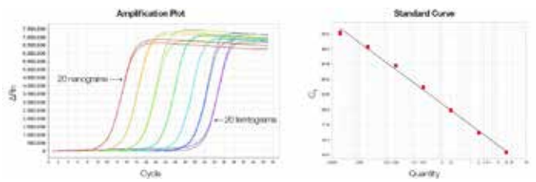
Femto™ Bacterial DNA Quantification Kit

- ***Femtogram Sensitivity:*** *Quantify as little as 20 femtograms of DNA.*
- ***Reliable Quantification:*** *High specificity and sensitivity for bacterial DNA.*
- ***Fast and simple:*** *Add samples to the PreMix and quantify.*

Description

The Femto™ Bacterial DNA Quantification Kit can detect and quantify as little as 20 fg of bacterial DNA in 1 µl of purified biological liquids with high specificity and sensitivity. Bacterial DNA can be reliably quantified in a background of non-bacterial DNA, making it ideal for downstream applications that require accurate DNA input amounts such as quantifying bacterial DNA template for Next-Generation sequencing library preparation and metagenomic analysis.

Reliable Quantification



Reliable standards for the quantification of bacterial DNA: Bacterial DNA Standards (measured in duplicates) comprise a 10-fold dilution series ranging from 20 ng to 20 fg.

Product	Cat. No.	Size	Specifications	Uses
ZymoBIOMICS® PCR Premix	E2056 E2057	50 rxns 200 rxns	Source: Recombinant Enzyme Activity: 5' - 3' DNA polymerization Optimum Reaction Temperature: 72 °C	For amplification of DNA intended for highly sensitive applications; Low bioburden
Femto™ Bacterial DNA Quantification Kit	E2006	100 rxns	Detection Dye: SYTO® 9 DNA Input: 20 fg - 20 ng Standards Included	Bacterial DNA quantification

ZymoBIOMICS® Services

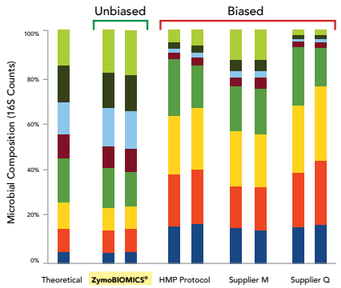
- *Zymo Research offers the most comprehensive services for 16S rRNA and Shotgun sequencing from any sample type.*
- *ZymoBIOMICS® Services are validated using the ZymoBIOMICS® Microbial Community Standards to ensure accurate, publication-quality data.*
- *Services include low-bioburden processing and DNA/RNA isolation, using the ZymoBIOMICS® product line, for the most accurate taxonomic profiling.*

Description

Next-Generation sequencing services for discovery, identification, and characterization of microbial communities. All ZymoBIOMICS® Services feature state-of-the-art sample prep technologies, validation using the ZymoBIOMICS® Microbial Community Standards, Illumina® Sequencing Technologies, cutting-edge bioinformatics, and competitive pricing. Each project is fully customizable; simply send in your samples and you will receive publication-ready data.

A Comprehensive Solution for Microbiomics and Metagenomics

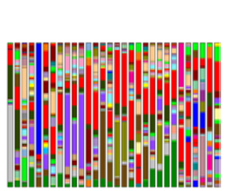
Validated, Accurate Workflows from Collection to Analysis



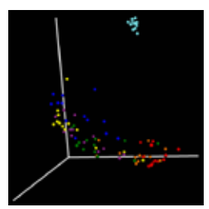
ZymoBIOMICS® Services are validated using the ZymoBIOMICS® Microbial Community Standards for unbiased, accurate community profiling

- *Bacillus subtilis* (G+)
- *Lactobacillus fermentum* (G+)
- *Listeria monocytogenes* (G+)
- *Salmonella enterica* (G-)
- *Staphylococcus aureus* (G+)
- *Escherichia coli* (G-)
- *Enterococcus faecalis* (G+)
- *Pseudomonas aeruginosa* (G-)

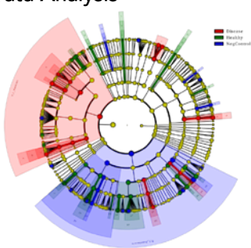
Comprehensive, Customizable Bioinformatics & Data Analysis



Composition Barplots



Beta-Diversity

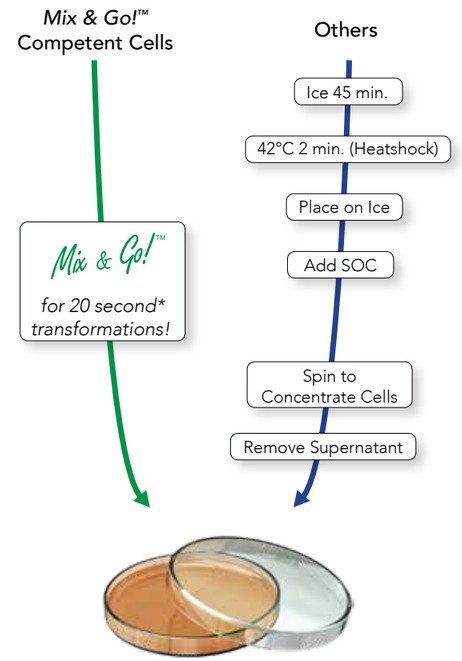


LEfSe Cladogram

Inquire today at **www.zymoresearch.com/zymobiomics**

7 *E. coli*

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 per 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 *Mix & Go!*™ Competent Cells from Zymo Research, a scientist can transform cells in less than 20 seconds (p. 167). Zymo Research also provides reagents that enable researchers to make their own homemade *Mix & Go!*™ *E. coli*. We have developed a specially formulated medium, ZymoBroth™ (p. 171), 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, increase transformation efficiency and decrease transformation time!



*Ampicillin selection only

Product Guide: *Mix & Go!*™ Competent Cells

	JM109	DH5 Alpha	HB101	TG1	Zymo 10B
Specifications					
Strain Background	K-12	K-12	K-12	K-12	K-12
General Cloning	✓	✓	✓	✓	✓
Plasmid Isolation	✓	✓	✓	✓	✓
Recombinant Protein Expression	✓				
Production of ssDNA (F'episome)	✓			✓	
Suppression of Amber Mutations (glnV44 or supE44)	✓	✓	✓	✓	
Blue-White Selection (lacZΔM15)	✓	✓		✓	✓
High-quality and Yield of Plasmid Miniprep DNA (endA1)	✓	✓			✓
Reduced Recombination. Insert Stability (recA1 or recA13)	✓	✓			✓
Plasmid Size	Up to 10-15 kb		Up to 10-15 kb	Up to 10-15 kb	
Transformation of Large Plasmids (deoR)		Up to 20-32 kb			Up to 20-32 kb
Ampicillin Resistant (bla or ampR)					
Chloramphenicol Resistant (cat or CmR or CamR)					
Tetracycline Resistant (Tn10 or tetR)					
Kanamycin Resistant (KanR)					
Nalidixic Acid Resistant (gyrA96 or NalR)	✓	✓			
Streptomycin Resistant (StrR)			✓		✓
Genotype	F'[traD36 proA+B+ laclq Δ(lacZ)M15] Δ(lac-proAB) glnV44 (supE44) e14- (McrA-) thi gyrA96 (NalR) endA1 hsdR17(rk-mk+) relA1 recA1	F- φ80lacZΔM15 Δ(lacZYA-argF)U169 deoR nupG recA1 endA1 hsdR17(rK-mK+) phoA glnV44 (supE44) thi-1 gyrA96 relA1, λ-	F- Δ(gpt-proA)62 leuB6 glnV44 (supE44) ara-14 galK2 lacY1 Δ(mcrC-mrr) xyl-5 mtl-1 recA13 thi-1 rpsL20 (SmR)	F'[traD36 laclq Δ(lacZ) M15 proA+B+] glnV (supE) thi-1 Δ(mcrB-hsdSM)5 (rK- mK-McrB-) thi Δ(lac-proAB)	F- mcrA Δ(mrr-hsdRMS-mcrBC) Φ80lacZΔM15 ΔlacX74 recA1 endA1 araD139 Δ(ara leu) 7697 galU galK rpsL nupG λ-
Catalog Number	T3003	T3007	T3011	T3017	T3019

Mix & Go!™ Competent Cells

- *Mix & Go!™ transformation procedure with transformation efficiencies of 10^8 - 10^9 transformants/µg of plasmid DNA.*
- *Simply add DNA and then spread. DNA transformation in as little as 20 seconds!*
- *Uses: bacterial transformations, DNA cloning, blue-white screening*

Description

The *Mix & Go!™* Competent Cells are premade, chemically competent cells for simple and highly efficient DNA transformation. *Mix & Go!™* Competent 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 *Mix & Go!™* Competent Cells are highly efficient (> 10^8 transformants / µg pUC19) and can be used for cloning, sub-cloning, PCR fragment cloning, library construction, etc. *Mix & Go!™* 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.

JM109

		Cat. No.	Size
Genotype	F`[traD36 proA+B+ laclq Δ(lacZ)M15] Δ(lac-proAB) glnV44 (supE44) e14- (McrA-) thi gyrA96 (NalR) e ndA1 hsdR17(rk- mk+) relA1 recA1	T3003	10 x 100 µl aliquots (10 tubes)
		T3005	96 x 50 µl aliquots (12 x 8-tube strips)

DH5 Alpha

		Cat. No.	Size
Genotype	F-φ80lacZΔM15 Δ(lacZYA-argF)U169 deoR nupG recA1 endA1 hsdR17(rK-mK+) phoA glnV44 (supE44) thi-1 gyrA96 relA1, λ-	T3007	10 x 100 µl aliquots (10 tubes)
		T3009	96 x 50 µl aliquots (12 x 8-tube strips)
		T3010	96 x 50 µl aliquots (96-well plate)

HB101

		Cat. No.	Size
Genotype	F- Δ(gpt-proA)62 leuB6 glnV44 (supE44) ara-14 galK2 lacY1 Δ(mcrC-mrr) xyl-5 mtl-1 recA13 thi-1 rpsL20 (SmR)	T3011	10 x 100 µl aliquots (10 tubes)
		T3013	96 x 50 µl aliquots (12 x 8-tube strips)

TG1

		Cat. No.	Size
Genotype	F'[traD36 laclq Δ(lacZ) M15 proA+B+] glnV (supE) thi-1 Δ(mcrB-hsdSM)5 (rK-mK- McrB-) thi Δ(lac-proAB)	T3017	10 x 100 µl aliquots (10 tubes)

Zymo 10B

		Cat. No.	Size
Genotype	F- mcrA Δ(mrr-hsdRMS-mcrBC) Φ80lacZΔM15 ΔlacX74 recA1 endA1 araD139 Δ(ara leu) 7697 galU galK rpsL nupG λ-	T3019	10 x 100 µl aliquots (10 tubes)
		T3020	96 x 50 µl aliquots (12 x 8-tube strips)

Product Guide: XJ Autolysis™ *E. coli* Strains

	XJa Autolysis™	XJa (DE3) Autolysis™	XJb Autolysis™	XJb (DE3) Autolysis™
Specifications				
Strain Background	K-12	K-12	B	B
General Cloning	✓	✓		
Plasmid Isolation	✓	✓		
For General Screening	✓	✓		
Recombinant Protein Expression	✓	✓	✓	✓
Production of ssDNA (F'episome)	✓	✓		
T7 Promoter Transcription (λDE3)		✓		✓
Autolysis (ΔaraB::λR)	Autolysis inducible by Arabinose	Autolysis Inducible by Arabinose	Autolysis Inducible by Arabinose	Autolysis Inducible by Arabinose
Suppression of Amber Mutations (glnV44 or supE44)	✓	✓		
Blue-White Selection (lacZΔM15)	✓	✓		
High-quality and Yield of Plasmid Miniprep DNA (endA1)	✓	✓		
Reduced recombination. Insert stability (recA1 or recA13)	✓	✓		
Plasmid Size	Up to 10 kb	Up to 10 kb	Up to 10 kb	Up to 10 kb
Transformation of Large Plasmids (deoR)				
Ampicillin Resistant (bla or ampR)				
Chloramphenicol Resistant (cat or CmR or CamR)	✓	✓	✓	✓
Tetracycline Resistant (Tn10 or tetR)				
Kanamycin Resistant (KanR)				
Nalidixic Acid Resistant (gyrA96 or NalR)				
Streptomycin Resistant (StrR)				
Genotype	F'[traD36 proA+B+ laclq Δ(lacZ)M15] Δ(lac-proAB) glnV44 (supE44) e14- (McrA-) thi gyrA96 (NalR) endA1 hsdR17(rK- mK+) relA1 recA1 ΔaraB::λR, cat (CmR)	F'[traD36 proA+B+ laclq Δ(lacZ)M15] Δ(lac-proAB) glnV44 (supE44)e14- (McrA-) thi gyrA96 (NalR) endA1 hsdR17(rK- mK+) relA1 recA1 ΔaraB::λR, cat (CmR), λ(DE3)	F- ompT hsdSB(rB- mB-) gal dcm ΔaraB::λR, cat (CmR)	F- ompT hsdSB(rB- mB-) gal dcm ΔaraB::λR, cat (CmR), λ(DE3)
Catalog Number	T3021/T5021	T3031/T5031	T3041/T5041	T3051/T5051

XJ Autolysis™ *E. coli* Strains

- *Straightforward transformation procedure with up to 10^8 - 10^9 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. They are also applicable for nucleic acid purification, and available with a DE3 lysogen encoding the T7 polymerase for expressing recombinant proteins driven by the T7 promoter.

	XJa Autolysis™ (*E. coli*, K-strain JM109)	XJb Autolysis™ (*E. coli*, 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 *E. coli* K-strains.
Autolysis	Lyses easily. 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 $proA^+B^+$ $lacI^q$ 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)

Product	Cat. No.	Size
XJa Autolysis™	T5021	1 glycerol stock, 1 ml 500X L-Arabinose
	T3021	10 x 100 µl *Mix & Go!*™ Competent Cells, 1 ml 500X L-Arabinose
XJa (DE3) Autolysis™	T5031	1 glycerol stock, 1 ml 500X L-Arabinose
	T3031	10 x 100 µl *Mix & Go!*™ Competent Cells, 1 ml 500X L-Arabinose
XJb Autolysis™	T5041	1 glycerol stock, 1 ml 500X L-Arabinose
	T3041	10 x 100 µl *Mix & Go!*™ Competent Cells, 1 ml 500X L-Arabinose
XJb (DE3) Autolysis™	T5051	1 glycerol stock, 1 ml 500X L-Arabinose
	T3051	10 x 100 µl *Mix & Go!*™ Competent Cells, 1 ml 500X L-Arabinose

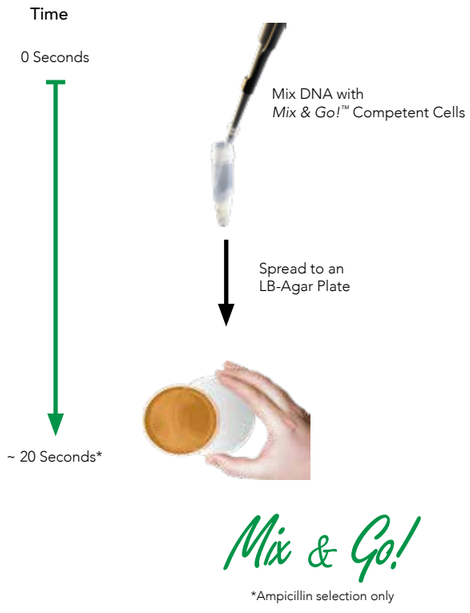
Mix & Go!™ E. coli Transformation Kit & Buffer Set

- *Make your own highly efficient chemically competent cells: 10^8-10^9 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 *Mix & Go!™ E. coli* Transformation Kit and *Mix & Go!™ E. coli* Buffer Set are convenient methods for the preparation of competent *E. coli* cells for simple and highly efficient DNA transformation. The *Mix & Go!™* method completely eliminates the requirement for heat shocking and related procedures. Instead, *Mix & Go!™* bacterial transformation can be performed by adding DNA to *Mix & Go!™* Competent Cells and spreading onto a plate. Transformation efficiencies are typically on the order of 10^8-10^9 transformants/µg plasmid DNA with most *E. coli* strains.

Uniquely formulated reagents make it easy to generate *Mix & Go!™* 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 *Mix & Go!™ E. coli* Transformation Kit includes all buffers and ZymoBroth™ medium to generate 20 ml of *Mix & Go!™* Competent Cells. The *Mix & Go!™ E. coli* Transformation Buffer Set includes all buffers that are required to generate 60 ml of *Mix & Go!™* Competent Cells, and the medium (broth) is supplied by the user.



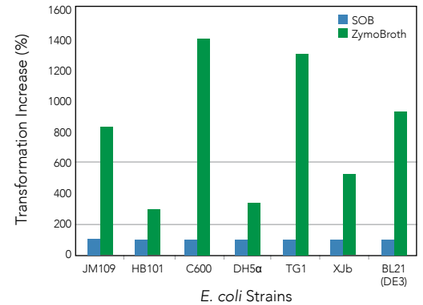
Product	Cat. No.	Size	Specifications	Uses
Mix & Go!™ E. coli Transformation Kit	T3001	up to 20 ml	Reagents for Competent Cell Preparation ZymoBroth™ Growth Medium	Preparation of competent *E. coli*
Mix & Go!™ E. coli Transformation Buffer Set	T3002	up to 60 ml	Reagents for Competent Cell Preparation	

ZymoBroth™

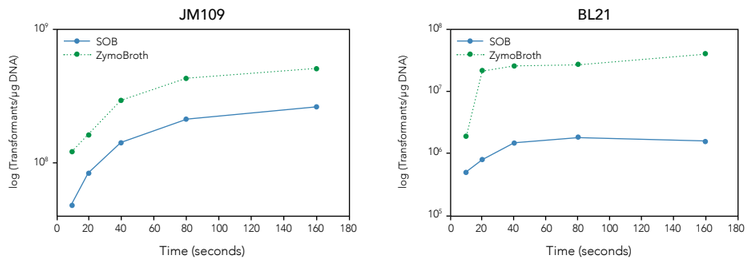
- *Uniquely formulated growth medium for making highly competent E. coli for DNA transformation.*
- *Choice growth medium for difficult-to-transform E. coli strains.*

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 *Mix & Go!™ E. coli* Transformation Kit, ZB enables researchers to generate their own homemade *Mix & Go!™ 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.).



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. *Mix & Go!™ E. coli* prepared with ZymoBroth™ display fast transformation kinetics and high transformation efficiencies.

Product	Cat. No.	Size	Uses
ZymoBroth™	M3015-100 M3015-500	100 ml 500 ml	Chemically competent *E. coli* preparation

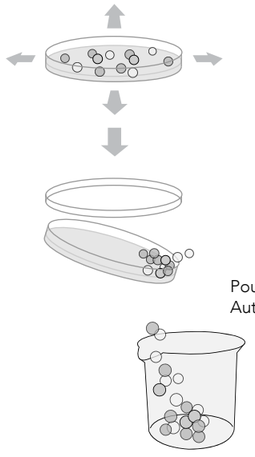
Rattler™ Plating Beads

- *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 researchers 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 autoclaving.

Shake Beads to Spread Cells



Pour off Rattler™ Beads, Autoclave, and Reuse

Product	Cat. No.	Size	Specifications	Uses
Rattler™ Plating Beads - 230 g/bottle	S1001 S1001-5	1 bottle 5 bottles	Material: Solid, glass 4.5mm beads can be washed, autoclaved, and reused Packaging: Polycarbonate, autoclavable wide mouth bottle. The bulk format is supplied non-sterile as a 25 kg bag	Spreading inocula on solid media (plates)
Rattler™ Plating Beads - bulk format (non-sterile)	S1001-B	25 kg bag		

FAQs about *Mix & Go!*™ Competent Cells

Premade *Mix & Go!*™ Competent Cells:

Will performing heat shock improve my transformation efficiency?
It may be beneficial if making a library, otherwise the heat shock is not needed.

Can my volume of DNA input be greater than the recommended <5%?
The efficiency can decrease several fold as the volume increases. If your DNA is too dilute, we recommend using the DNA Clean & Concentrator® (see p. 86) prior to transformation.

Mix & Go!™ Transformation Kit and Buffer Set:

I'm working with a wild-type strain of bacteria, will it work and how can I boost transformation efficiency?
This system is optimized for use with lab strains (K12 and B derivatives). Wild type strains generally have low efficiencies. Here are some tips for boosting efficiency:

1. **ZymoBroth™:**
   E. coli cells prepared with this optimized growth medium exhibit faster transformation kinetics and higher transformation efficiencies. This may be as high as several fold to a log increase.
2. **Boosting Transformation:**
   a. Heat Shock: Incubate with DNA on ice for 30 minutes, followed by 5 minutes at 37°C. This is a mild heat shock step and has no detrimental effects, it will only improve transformation efficiency.
   b. Outgrowth: After the transformation mixture has incubated, add 4 volumes of SOC and incubate for 1 hour at 37°C with gentle shaking at 200-300 rpm. Afterwards, spread the mixture directly onto pre-warmed culture plates.

8 Yeast Research

At Zymo Research, our first products were designed to simplify yeast research. This inspired the three "budding yeast" of our 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 ≥ 50%. 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/a-Factor Mating Pheromone and 5-Fluoroorotic Acid. The Zymolyase and Yeast Protein Kit remain important reagents for yeast lysis and protein purification, respectively.

Zymolyase - Yeast Lytic Enzyme

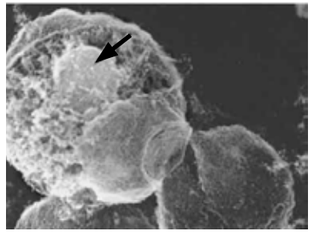
- ***100T Equivalent:*** *Prepared from Arthrobacter luteus. Essential enzyme activities are β-1,3-glucanase and β-1,3-glucan laminaripentao-hydrolase.*
- ***Convenient:*** *Provided lyophilized along with a storage buffer for reconstitution.*
- ***Efficient Cell Wall Digestion:*** *Supplied storage buffer has been optimized to confer maximum levels of enzymatic activity.*

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 laminaripentao-hydrolase, 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, Schizosaccahromyces, 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

Product	Cat. No.	Size	Specifications	Uses
Zymolyase - Yeast Lytic Enzyme	E1004 E1005	1,000 U 2,000 U	Enzyme Concentration: 5 U/µl Total Protein Concentration: 10 - 15 mg/ml Storage: -70°C	Spheroplast/Protoplast formation; Yeast cell fusion; Yeast transformation
R-Zymolyase (with RNase)	E1006	1,000 U	Unit Definition: One lytic unit (U) is defined as a 10% decrease in O. D. at 800 nm for 30 minutes	

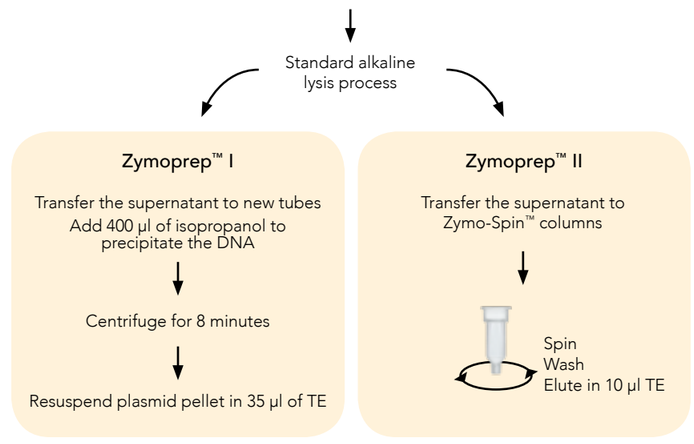
Zymoprep™ Yeast Plasmid Miniprep I, II

- ***Simple:*** *Quickly and easily rescue plasmid from yeast.*
- ***Efficient Isolation:*** *Works well with low-copy and hard-to-isolate plasmids.*
- ***High-Quality:*** *Isolated plasmid DNA is ideal for molecular biology techniques, 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, with 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



Product	Cat. No.	Size	Specifications	Uses
Zymoprep™ Yeast Plasmid Miniprep I	D2001	100 preps	Format: Isopropanol Precipitation Elution Volume: ≥ 35 µl Processing Time: 35 - 90 minutes DNA Size Limits: ≤ 23 kb	Plasmid recovery from yeast
Zymoprep™ Yeast Plasmid Miniprep II	D2004	50 preps	Format: Spin-Column Elution Volume: ≥ 10 µl Processing Time: 35 - 90 minutes Binding Capacity: 5 µg DNA Size Limits: ≤ 23 kb	

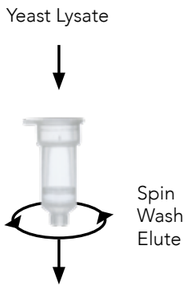
8 Yeast Research

YeaStar™ Genomic DNA Kit

- ***Simple:*** *Fast spin-column procedure yields pure yeast genomic DNA without using glass beads or phenol.*
- ***Versatile:*** *Efficient DNA isolation from a broad spectrum of fungal species susceptible to Zymolyase.*
- ***High-Quality:*** *Isolated genomic DNA is ready for Southern blotting, PCR, restriction enzyme digestion, etc.*

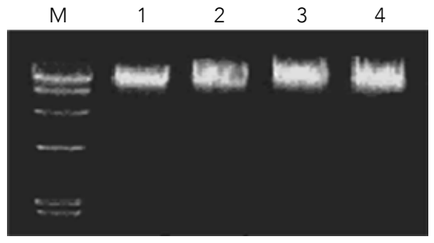
Description

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 nivens var. aureus, Candida albicans, Pichia pastoris, Saccharomyces cerevisiae, Schizosaccharomyces pombe*, and any fungi whose cell walls are susceptible to yeast lytic enzyme. The kit is based on a highly efficient enzyme lysis and Zymo-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 for 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*.

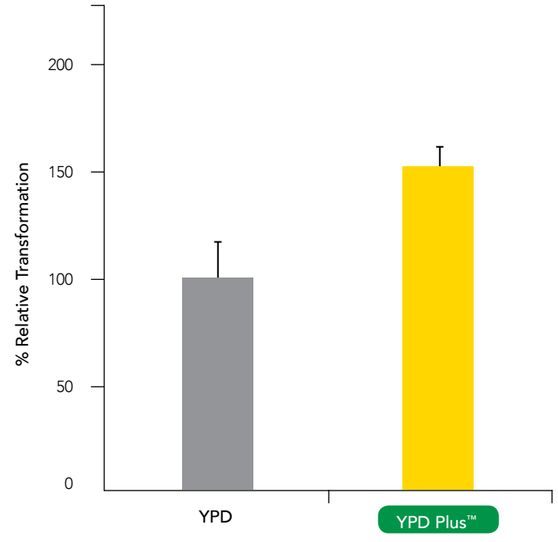
Product	Cat. No.	Size	Specifications	Uses
YeaStar™ Genomic DNA Kit	D2002	40 preps	Format: Spin-Column Binding Capacity: 25 µg Elution Volume: ≥ 60 µl Processing Time: 1.5 hours	Yeast; Zymolyase-sensitive fungi; gDNA isolation

YPD Plus™

- ***Maximize Transformation Efficiency:*** *Specially-formulated yeast outgrowth medium increases yeast transformation efficiencies by > 50%.*
- ***Better Results:*** *Recommended for mutant yeast strains exhibiting poor growth characteristics that are not amenable to transformation.*
- ***Simple:*** *Just supplement the yeast transformation reaction mixture with YPD Plus™ to achieve consistent increases in yeast transformation efficiencies.*

Description

The outgrowth step in yeast transformation protocols is often critical for increasing overall yeast transformation efficiencies. This is useful when attempting to maximize transformation efficiencies for library screening or transforming yeast with multiple plasmids. YPD Plus™ is a specially formulated to increase 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.

Product	Cat. No.	Size	Uses
YPD™ Plus	Y1003-50 Y1003-100	50 ml 100 ml	Yeast transformation & outgrowth

Frozen-EZ Yeast Transformation II™ Kit

- ***Fast:*** *Yeast cells with high transformation efficiencies can be prepared in under 10 minutes.*
- ***Simple:*** *Easy method to transform yeast with single or multiple plasmids in ≤ 1 hour without carrier DNA.*
- ***Versatile:*** *Can be used with S. cerevisiae, as well as other fungi, including C. albicans, S. pombe, and P. pastoris. Compatible with both circular and linear DNA.*

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 can be transformed immediately 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.*

Product	Cat. No.	Size	Specifications	Uses
Frozen-EZ Yeast Transformation II™ Kit	T2001	120 rxns	Transformation Efficiency: 10^5 - 10^6 cfu/µg Transformation DNA Input: 0.2 - 1.0 µg Competent Cell Stability: ≥ 1 year at -70°C	Competent yeast cell preparation; Compatibility: *S. cerevisiae, S. pombe, C. albicans, P. pastoris*

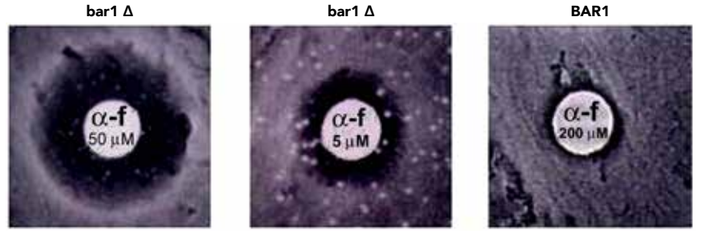
α-Factor Mating Pheromone

- *Aqueous solution of yeast α-factor (alpha-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.



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 (G_1 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.

a-Factor Mating Pheromone

- *Aqueous solution of yeast a-factor (A-factor) mating pheromone.*

Description

a-Factor is one of two mating pheromones in baking yeast. It is the "opposite" sex of mating pheromone α-Factor (alpha-factor). When yeast a and α cells encounter the opposite mating pheromones, they induce genes necessary for mating, arrest the cell cycle in G1, altering cell surface and nuclear determinants, and also cause morphological changes.

Product	Cat. No.	Size	Specifications	Uses
α-Factor Mating Pheromone	Y1001	240 µl	Concentration: 10 mM in 0.1 M sodium acetate, pH 5.2, (i.e., 4 mg/240 µl) Molecular Weight: 1684.0 Activity Test: G1 arrest Purity: > 98% by HPLC Storage: -20°C	Yeast mating induction; G1 phase arrest
a-Factor Mating Pheromone	Y1004-500	500 µl	Concentration: 1 mg/ml in methanol Molecular Weight: 1630 Activity Test: G1 arrest Purity: > 80% by HPLC Storage: -20°C	

8 Yeast Research

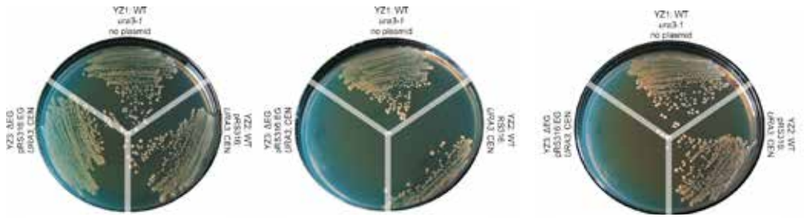
5-Fluoroorotic Acid (5-FOA)

- ***Yeast Genetic Counter-Selection Agent:*** *Commonly used for curing yeast strains of plasmids, plasmid shuffling, allelic replacement, and two-hybrid screens.*
- ***Convenient:*** *Available as a pure powder or ready-to-use solution in DMSO.*
- ***Ultra-Pure:*** *Determined > 98% by thin-layer chromatography (TLC), melting point, and lot comparison.*

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-flurouracil) in strains expressing the functional URA3 gene coding for orotine-5′-monophosphate decarboxylase that is involved in the synthesis of uracil. Yeast strains that are phenotypically Ura+ become Ura- and 5-FOAR after selection.

The question of 5-FOA solubility is often raised by researchers 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. This has been tested and validated on the basis of counter selection activity (see below).



1: Synthetic Complete: SC | 2: SC-5FOA: Powder | 3: SC-5FOA: 100X Solution

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 (ΔEG) 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-5-FOA (SC-5-FOA made from ultra-pure 5-FOA powder, 1 g/liter) 3. SC-5-FOA made from 100X 5-FOA solution.

For each plate, Top: Yeast strain: YZ1 wild-type, Ura- (wt, ura-3-52), Right: Yeast strain: YZ2, wt carrying a low copy, URA3 plasmid alone, and Left: Yeast strain: YZ3: ΔEG, 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-FOA^R colonies evident (see left panels, YZ3: in plates 2, and 3). Cells from control strains YZ1 and YZ2 were able to grow on 5-FOA media.

Product	Cat. No.	Size	Specifications	Uses
5-FOA (powder)	F9001-1 F9001-5	1 g 5 g	Molecular Weight: 174.0 Method for Determining Identity: TLC, melting point and lot comparison Purity: Estimated >98% byt TLC, melting point, and lot comparison Solubility: 50 mg in 1 ml (1:1 NH_4OH:H_2O) with gentle heating, > 100 mg/ml DMSO Storage: Store in freezer	Yeast Counter-selection; Yeast Two-hybrid Screen; Plasmid Curing; Plasmid Shuffling; Allelic Replacement
100X 5-FOA (liquid)	F9003	10 ml		

YeaStar™ RNA Kit

- ***Simple:*** *Fast spin-column procedure yields pure yeast RNA without using glass beads or phenol.*
- ***Versatile:*** *Efficient RNA isolation from a broad spectrum of fungal species susceptible to Zymolyase.*
- ***High-Quality:*** *Isolated RNA is suitable for use in RT-PCR, northern blotting, etc.*

Description

The YeaStar™ RNA Kit enables RNA isolation from a broad spectrum of fungi including: *Aspergillus fumigatus, Aspergillus nidulans, Aspergillus nivens var. aureus, Candida albicans, Pichia pastoris, Saccharomyces cerevisiae, Schizosaccharomyces pombe.* The kit is ideal 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 Zymo-Spin™ Column technology.

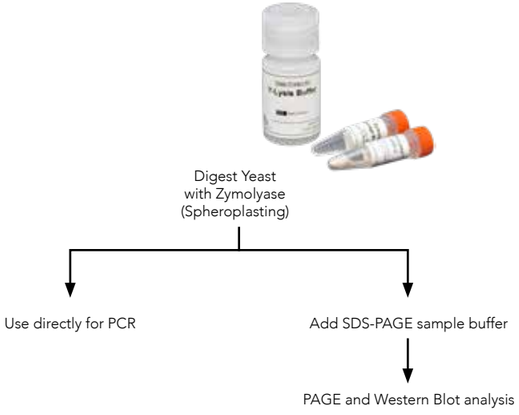
Product	Cat. No.	Size	Specifications	Uses
YeaStar™ RNA Kit	R1002	40 preps	Format: Spin Columns Elution Volume: ≥ 60 µl Binding Capacity: 25 µg/prep Size Limits: ≥ 200 nt Processing Time: 30 minutes	Yeast; Fungi sensitive to lysis with yeast lytic enzyme (i.e. Zymolayse); RNA isolation

Yeast Protein Kit™

- ***Convenient:*** *Rapid method for efficient lysis of yeast for downstream protein and DNA analyses.*
- ***Versatile:*** *Procedure suitable for any fungal species susceptible to Zymolyase.*
- ***Effective Spheroplasting:*** *Ideal protocol for western blotting and PCR.*

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 generate spheroplasts of yeast cells, making them ideal for both protein and DNA analyses including Western blotting and PCR, respectively.



Product	Cat. No.	Size	Uses
Yeast Protein Kit™	Y1002	200 preps	Yeast Cell Lysis; Protein Analysis; DNA Analysis

9 Protein Expression & Enzymes

Although the expression of recombinant proteins in *E. coli* is a routine procedure, high level expression or overexpression is not always attainable. Zymo Research has 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 (p. 169) 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 Zymo-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 epigenetic enzymes presented in the Epigenetics Section (p. 38-43), Zymo Research offers several others, including DNase I (RNase-free), Proteinase K, RNase A, and Zymolyase that are detailed in this chapter.

Dual Media Set™

- *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 2). 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 1).

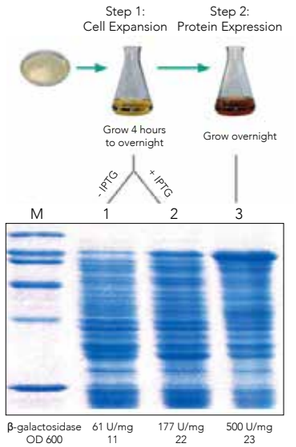


Figure 1. Controlled overexpression of β-galactosidase. Cells were grown in EB, where only background levels of the T7-lac promoter-controlled product are produced (1). Moderate amounts of the enzyme were produced by incubating overnight in EB with IPTG (2), the highest amounts of protein are produced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

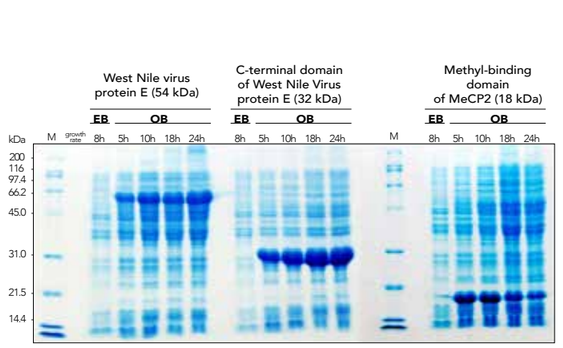


Figure 2. SDS-PAGE of cell proteins after growth using the Dual Media Set™. M – protein markers; 1-5, West Nile virus protein E (54 kDa): 1, repressed expression in EB, 2-5, over-expression in OB for 5, 10, 18, and 24 hours, respectively, after inoculation with uninduced EB culture; 6-10, C-terminal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

Product	Cat. No.	Size	Uses
Dual Media Set™ (EB + OB)	M3011	100 ml EB - 500 ml OB	Recombinant protein expression
Expansion Broth (EB)	M3012-100 M3012-500	100 ml 500 ml	
Overexpression Broth (OB)	M3013-100 M3013-500	100 ml 500 ml	

Tag-Spin Technology Overview

Protein purification is an essential step in research to identify and study the structure, function and interaction of proteins. Technologies for protein purification are particularly crucial for rapidly emerging fields where high-throughput screening of proteins with high purity but short processing times are necessary.

Affinity chromatography is a widely used technique to simplify the purification of recombinant proteins. For this, the protein of interest is fused to an affinity tag which mediates specific binding of the target protein to immobilized ligands. Frequently used affinity tags that facilitate very efficient purification of recombinant proteins include poly(His)-tag, Strep-tag® and maltose binding protein (MBP).

Zymo Research offers an extremely fast and highly innovative spin-column based technology to perform affinity purification of proteins. The Tag-Spin technology is ideal for purifying recombinant proteins from cell-free extracts for screening purposes of protein functions.

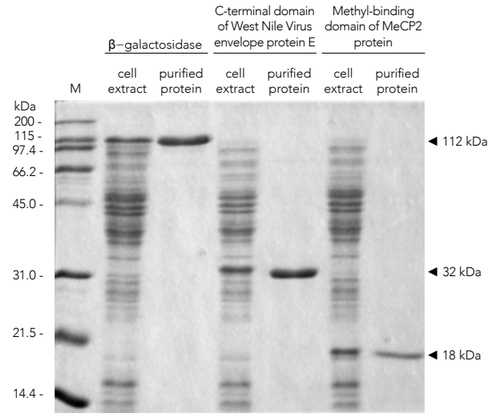
The straightforward spin-wash-elute protocols allow isolation of pure recombinant protein in only a few minutes for small-scale protein studies.

His-Spin Protein Miniprep™

- *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 Zymo-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™.

Product	Cat. No.	Size	Specifications	Uses
His-Spin Protein Miniprep™	P2001 P2002	10 preps 50 preps	Format: Spin-Column Protein Binding Capacity: 1 mg His-affinity Gel	His-tagged protein purification
His-Affinity Gel	P2003-2	14 ml		

Strep-Spin™ Protein Miniprep Kit

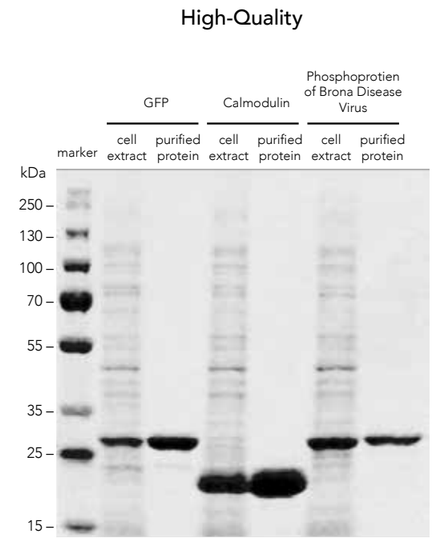
- ***Fast & Simple:*** *Purify Strep-tagged proteins from cell-free extracts using a spin-column in ≥ 5 minutes.*
- ***Easy Identification:*** *Screen recombinant colonies directly for protein products rather than plasmid inserts.*
- ***High-Quality:*** *Purified proteins are ready for sensitive assays to study enzyme kinetics, biochemical analyses, SDS-PAGE, etc.*

Description

The Strep-Spin Protein Miniprep Kit™ provides a fast purification technology for Strep-tagged proteins. The procedure is based on a novel Strep-Tactin® XT Superflow® resin which binds efficiently to Twin-Strep-tag® as well as single Strep-tag.

Up to 600 µg of Strep-tagged protein can be eluted in only 7 minutes. The purified protein is ideal for enzymatic assays, protein biochemical analyses, SDS-PAGE and other applications.

The straightforward spin-wash-elute protocol dramatically simplifies protein purification: get results in minutes, not hours!



The Srep-Spin™ Protein Miniprep Kit purifies high-quality Strep-tagged proteins directly from a spin-column. C-terminal Twin-Strep-tag fusion proteins expressed in *E. coli* and purified using the Strep-Spin™ Protein Miniprep Kit were analyzed by SDS-PAGE on a 15% gel, and stained with Coomassie Blue. (GFP 28 kD, Calmodulin 19,8 kD, BDV-P 25,5 kD)

Product	Cat. No.	Size	Uses
Strep-Spin™ Protein Miniprep Kit	P2004 P2005	10 preps 50 preps	Strep-tagged protein purification

MBP-Spin™ Protein Miniprep Kit

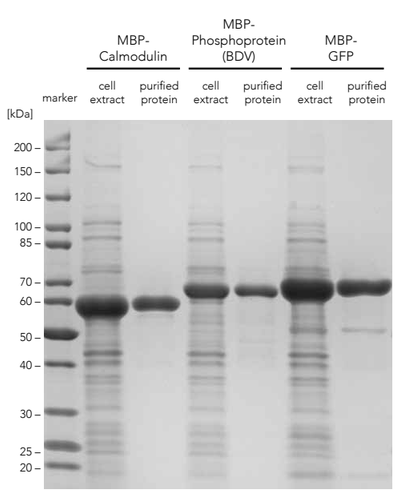
- ***Fast & Simple:*** *Purify MBP-tagged proteins from cell-free extracts using a spin-column in ≥ 6 minutes.*
- ***High-Quality:*** *Prepare pure proteins for small-scale studies.*
- ***Convenient:*** *No special instrumentation needed other than a microcentrifuge.*

Description

The MBP-Spin Protein Miniprep Kit™ provides a fast purification technology for MBP-tagged proteins. The easy-to-follow procedure is based on an affinity matrix composed of amylose resin to specifically bind proteins fused to maltose-binding protein (MBP), and the unique Zymo-Spin™ Technology.

Up to 1 mg of MBP-tagged protein can be eluted into ≥ 200 µl of the provided MBP-Elution Buffer in only 6 minutes. The purified protein is ultra-pure and is ideal for enzymatic assays, biochemical analyses, SDS-PAGE and other sensitive applications.
The straightforward spin-wash-elute protocol dramatically simplifies protein purification: get results in minutes, not hours!

High-Quality



Fast & Simple

The MBP-Spin™ Protein Miniprep Kit purifies high-quality MBP-tagged proteins directly from a spin-column. N-terminal MBP-tag fusion proteins were expressed in *E. coli* cells, and the cell extracts as well as the proteins purified using the MBP-Spin™ Protein Miniprep Kit were analyzed by SDS-PAGE on a 4-20% gel and stained with InstantBlue™; (MBP-Calmodulin 55 kDa, MBP-BDV-Phosphoprotein 65 kDa, MBP-GFP 69 kDa).

Product	Cat. No.	Size	Uses
MBP-Spin™ Protein Miniprep Kit	P2006 P2007	10 preps 50 preps	MBP-tagged protein purification

Enzymes

5-hmC Glucosyltransferase

5-hmC Glucosyltransferase from Zymo Research is a highly active enzyme that specifically tags 5-hydroxymethylcytosine in DNA with a glucose moiety yielding glucosyl-5-hydroxymethylcytosine. Glucosylation of 5-hydroxymethylcytosine by 5-hmC Glucosyltransferase can be used for sequence-specific, locus-specific, as well as global quantification of 5-hydroxymethylcytosine. See p. 42 for details.

Specifications: Provided with 10X 5-hmC GT Reaction Buffer and 10X UDPG.
Enzyme Concentration: 2 U/µl
Optimum Reaction Temperature: 30°C
Standard Reaction Time: 2 hours
Unit Definition: One unit (U) is defined as the amount of enzyme needed to protect 1 µg of 5-hmC DNA Standard [D5405-3] from Csp6I restriction enzyme digestion via glucosylation in a reaction incubated at 30°C for 1 hour.

Cat. No.	Size
E2026	100 U
E2027	200 U

Atlantis dsDNase

Atlantis dsDNase is a double-strand DNA specific endonuclease that cleaves phosphodiester bonds in DNA to yield homogeneous populations of core nucleosomes.

Specifications: Typical buffer consists of 20 mM Tris-HCl (pH 7.5) and 5 mM $MgCl^2$.
Enzyme Concentration: 0.1 U/µl
Inactivation: 5X MN Stop Buffer or EDTA.
Optimum Reaction Temperature: 42°C
Standard Reaction Time: 20 min.
Unit Definition: One unit (U) is defined as the amount of enzyme needed to produce an increase in absorbance at 260 nm of 0.001 per minute, using 50 mg/ml high MW DNA in 50 mM Na-acetate pH 5.0 and 5 mM MgCl2 (Kunitz, 1950).

Cat. No.	Size
E2030	12.5 U

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 p. 41 for details.

Specifications: Provided in solution (4 U/µl) with 10X CpG Reaction Buffer and 20X SAM (S-adenosylmethionine).
Source: Recombinant methylase is isolated from *E. coli* expressing the methyltransferase gene from Spiroplasma sp. strain MQ1.
Heat Inactivation: 65°C for 20 min.
Unit Definition: One unit (U) is the amount of enzyme required to protect 1µg of λ DNA from cleavage by BstUI restriction endonuclease in a total reaction volume of 20 µl for 1 hour at 37°C.

Cat. No.	Size
E2010	200 U
E2011	400 U

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 p. 41 for details.

Specifications: Provided in solution (4 U/µl) with 10X GpC 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 (U) 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
E2014	200 U
E2015	1,000 U

DNase I Set

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: Lyophilized enzyme provided with DNA Digestion Buffer.
Heat Inactivation: 65°C for 10 min.
Unit Definition: One unit (U) 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 $MgCl^2$, and 10 mM $CaCl^2$). One unit of enzyme is equivalent to one Kunitz unit under these assay conditions.

Cat. No.	Size
E1010	250 U

DNA Degradase™ and DNA Degradase Plus™

DNA Degradase™ and DNA Degradase Plus™ from Zymo Research are nuclease mixes that quickly and efficiently degrade DNA into individual nucleotides or nucleosides, respectively. DNA Degradase™ is ideal for whole-genome DNA methylation analysis by a number of downstream applications (i.e., HPLC, LC/MS, TLC, etc.). Digestion is performed via a simple one-hour, one-step procedure. See p. 40 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.
**Above specifications are for DNA Degradase™*

Cat. No.	Product	Size
E2016	DNA Degradase™	500 U
E2017	DNA Degradase™	2,000 U
E2020	DNA Degradase™ Plus	250 U
E2021	DNA Degradase™ Plus	1,000 U

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 20 mM Tris-HCl, (pH 8.8), 1 mM $CaCl^2$. $CaCl^2$ is essential for activity.
Enzyme Commission Number: (E.C. 3.1.31.1)
Enzyme Concentration: 0.1 U/µl
Optimum Reaction Temperature: 37°C
Unit Definition: One unit (U) 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
D5220-1	10 U/100 µl

dsDNA Shearase™ Plus

dsDNA Shearase™ Plus is an endonuclease that cleaves phosphodiester bonds in DNA to yield oligonucleotides with 5′-phosphate and 3′-hydroxyl termini. It has a particularly strong preference for dsDNA and generates random-ended DNA fragments of the desired size in a single step. This enzyme is compatible with low volume inputs thus minimizing sample loss. See p. 42 for details.

Specifications: Provided with 5X dsDNA Shearase™ Plus Reaction Buffer.
Enzyme Concentration: 1 U/µl
Inactivation: 65°C for 5 min.
Optimum Reaction Temperature: 42°C
Standard Reaction Time: 20 min.
Unit Definition: One unit (U) is defined as the amount of enzyme required to convert 250 ng human DNA into fragments in the range of 100-500 bp in 20 minutes at 42°C in a total reaction volume of 10 µl.

Cat. No.	Size
E2018-50	50 U
E2018-200	200 U

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 with Proteinase K Storage 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
D3001-2-5	5 mg
D3001-2-20	20 mg

QuestTaq™ PreMix and *QuestTaq*™ qPCR PreMix

QuestTaq™ PreMix is supplied as a convenient 2X concentrated "master mix for robust PCR with little or no by-product formation. It has been optimized for the non-biased amplification of cystosine, 5-methylcytosine (5-mC), 5-hydroxymethylcytosine (5-hmC), and glucosyl-5-hydroxymethylcytosine (g5-hmC) containing DNA, ensuring high yield amplification across a wide range of templates. The *QuestTaq*™ PreMix differs from *QuestTaq*™ qPCR PreMix in that it excludes SYTO® 9 dye from the PreMix solution, making it compatible with real-time and quantitative PCR with fluorescent dyes of the researcher's choosing. *QuestTaq*™ DNA Polymerase has 3′-terminal transferase activity. The addition of "A" overhangs to amplified DNA makes it ideal for use in TA-cloning. See p. 39 for details.

Specifications: Provided as a 2X PreMix (E2050, E2051) or 2X qPCR PreMix (E2052, E2053) containing SYTO® 9 dye.
Source: Recombinant Enzyme
Activity: 5′ – 3′ polymerization
Enzyme Concentration: Reaction conditions at 1X (20 µl total volume) will contain 2 units of Quest*Taq*™ DNA polymerase
Optimum Reaction Temperature: 72°C
Unit Definition: One unit (U) is defined as the amount of enzyme required for the incorporation of 10 nmol dNTPs into an acid-insoluble form in 30 minutes at 72°C.

Product	Cat. No.	Size
Quest*Taq*™ PreMix	E2050 E2051	50 rxns 200 rxns
Quest*Taq*™ qPCR PreMix	E2052 E2053	50 rxns 200 rxns

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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.
Enzyme Commission Number: (EC 3.1.27.5)
Source: Bovine Pancreas
Enzymatic Activity: 50 - 100 Kunitz units per mg protein.

Cat. No.	Size
E1008-8	8 mg
E1008-24	24 mg
E1008-30	30 mg

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 are 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. See p. 174 for details.

Specifications: Lyophilized enzyme provided with Zymolyase Storage buffer.
Source: *Arthrobacter luteus*
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 (OD800) in 30 minutes at 30°C.
Assay Condition: Yeast (0.8 - 1.0 OD_{800}) in 50 mM potassium phosphate, pH 7.5, 10 mM 2-mercaptoethanol.

Product	Cat. No.	Size
Zymolyase	E1004 E1005	1,000 U 2,000 U
R-Zymolyase	E1006	1,000 U

ZymoTaq™ DNA Polymerase

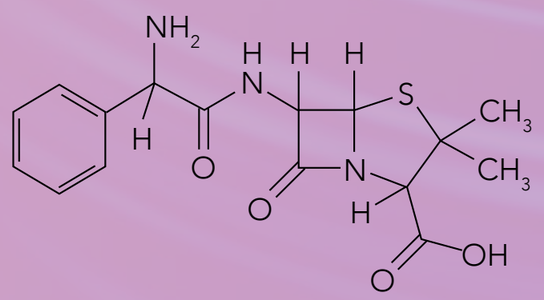
ZymoTaq™ DNA Polymerase contains all the reagents needed to perform "hot-start" PCR. The inclusion of a heat-activated, thermostable DNA polymerase reduces primer dimer and nonspecific product formation that can occur during PCR. This unique product is specifically designed for the amplification of bisulfite-treated 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 p. 38 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
Optimum Reaction Temperature: 72°C
Unit Definition: One unit (U) 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.

Product	Cat. No.	Size
Zymo*Taq*™ DNA Polymerase	E2001 E2002	50 rxns 200 rxns
Zymo*Taq*™ PreMix	E2003 E2004	50 rxns 200 rxns

10 Antibiotics & Chemicals

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 (shown below), chloramphenicol, kanamycin, and tetracycline solutions are perfect for use in bacterial selection procedures.



Antibiotic	Description	Resistance	Working Concentration (For *E. coli*)
Ampicillin (Ap)	For Gram (+) and (-) bacteria. Penicillin derivative that prevents bacterial cell wall synthesis.	Resistance to ampicillin is conferred by the *bla* gene which encodes β-lactamase that cleaves the β-lactam bond of the antibiotic.	20 - 100 µg/ml
Chloramphenicol (Cm)	For Gram (+) and (-) bacteria and some mycobacteria. Chlorampenicol inhibits bacterial protein synthesis by binding the 50S ribosomal subunit.	Resistance to chloramphenicol is conferred by the *cat* gene which encodes an acetyltransferase that acetylates and inactivates the antibiotic.	20 µg/ml
Kanamycin (Km)	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 µg/ml
Tetracycline (Tc)	For Gram (+) and (-) bacteria. Tetracycline inhibits bacterial protein synthesis by binding the 30S ribosomal subunit.	Resistance to tetracycline is conferred by the *tet* gene product that alters the bacterial cell membrane and transport of the antibiotic into the cell.	10 - 20 µg/ml

Antibiotics

Ampicillin Sodium

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%
Concentration: 100 mg/ml
Storage: -20°C

Cat. No.	Size
A1001-5	5 ml
A1001-25	5 x 5 ml

Chloramphenicol

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%
Concentration: 10 mg/ml
Storage: -20°C

Cat. No.	Size
A1002-5	5 ml
A1002-25	5 x 5 ml

Kanamycin Sulfate

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%
Concentration: 35 mg/ml
Storage: -20°C

Cat. No.	Size
A1003-5	5 ml
A1003-25	5 x 5 ml

Tetracycline Hydrochloride - Reagent Grade

Premade tetracycline solution. Tetracycline inhibits bacterial protein synthesis by binding the 30S ribosomal subunit. Effective against both Gram (-) and Gram (+) bacteria.

Purity: ≥ 98%
Concentration: 10 mg/ml
Storage: -20°C

Cat. No.	Size
A1004-5	5 ml
A1004-25	5 x 5 ml

Chemicals

5-FOA (5-Fluoroorotic Acid)

Synthetic 5-FOA monohydrate powder or 100X (100 mg/ml) solution in DMSO. See p. 182 for details.

Formula: $C_5H_3FN_2O_4 \bullet H_2O$
M. W.: 174.0 g/mol
Purity: ≥ 98%

Cat. No.	Size
F9001-1	5-FOA 1g (Powder)
F9001-5	5-FOA 5g (Powder)
F9003	100X 5-FOA 10 ml (Liquid)

Arabinose

Concentrated arabinose inducer for XJ Autolysis™ strains.

Concentration: 500X; 1.5 M L-arabinose, 0.5 M MgCl2
Storage: -20°C

Cat. No.	Size
A2001-1	1 ml
A2001-10	10 x 1ml

His-Affinity Gel

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™, p. 185, for details.

Concentration: 50% suspension in 30% ethanol
Storage: 4°C

Cat. No.	Size
P2003-2	14 ml

IPTG (Isopropyl-β-D-thiogalactopyranoside)

Premade IPTG in water.

Purity: 98%
Concentration: 0.5 M
Storage: -20°C

Cat. No.	Size
I1001-5	5 ml
I1001-25	5 x 5 ml

X-Gal (5-bromo-4-chloro-3-indolyl β-D-galactopyranoside)

Sterile, ready to use X-Gal solution.

Concentration: 2% w/v in DMF
Storage: -20°C

Cat. No.	Size
X1001-5	5 ml
X1001-25	5 x 5 ml

11 Columns, Plates, Instruments & Accessories

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 are highlighted in this chapter.

Column design is crucial to the quality of eluted nucleic acid. 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, which are optimized for maximal adsorption of DNA and/or RNA, and can efficiently remove contaminants during the purification process. Our Zymo-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 zero retention volume and an elution volume as low as 6 µl, something no other supplier can claim. Likewise, the Zymo-Spin™ I-96 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 nucleic acids in centrifugation based protocols. Other Zymo-Spin™ columns are designed for processing larger samples and binding greater amounts of nucleic acids, but the principle is the same: high-quality, high-yield DNA or RNA.

Products featuring BashingBead™ lysis technology were spotlighted in the chapters on environmental DNA and RNA purification. ZR BashingBead™ Lysis Tubes and ZR-96 BashingBead™ Lysis Racks may be purchased separately. Additionally, we carry cell disruptors 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*, other insects, etc.

Technology Overview: Zymo-Spin™ Columns

Zymo-Spin™ I Columns

Name	Zymo-Spin™ I	Zymo-Spin™ IC	Zymo-Spin™ IC-XL	Zymo-Spin™ IC-S
Format	DNA/RNA binding	DNA/RNA binding	DNA/RNA binding	DNA binding
DNA Binding Capacity / RNA Binding Capacity	5 µg / 10 µg	5 µg / 10 µg	10 µg	5 µg
Elution	≥ 6 µl	≥ 6 µl	≥ 10 µl	≥ 10 µl
Compatibility	microcentrifuge	microcentrifuge	microcentrifuge, vacuum manifold	microcentrifuge
Matrix / Construction	silica-based / polypropylene	silica-based / polypropylene	silica-based / polypropylene	silica-based / polypropylene
Cat. No. / Size	C1003-50 – 50 pack C1003-250 – 250 pack	C1004-50 – 50 pack C1004-250 – 250 pack	C1002-25 – 25 pack C1002-100 – 100 pack	C1015-25 – 25 pack C1015-100 – 100 pack

Zymo-Spin™ II Columns

Name	Zymo-Spin™ II	Zymo-Spin™ IIC	Zymo-Spin™ IIN	Zymo-Spin™ IIC-XL
Format	DNA/RNA binding	DNA/RNA binding	DNA/RNA binding	DNA/RNA binding
DNA Binding Capacity / RNA Binding Capacity	25 µg / 50 µg	25 µg / 50 µg	25 µg / 50 µg	25 µg / 50 µg
Elution	≥ 25 µl	≥ 25 µl	≥ 25 µl	≥ 35 µl
Compatibility	microcentrifuge	microcentrifuge, vacuum manifold	microcentrifuge, vacuum manifold	microcentrifuge, vacuum manifold
Matrix / Construction	silica-based / polypropylene	silica-based / polypropylene	silica-based / polypropylene	silica-based / polypropylene
Cat. No. / Size	C1008-50 – 50 pack C1008-250 – 250 pack	C1011-50 – 50 pack C1011-250 – 250 pack	C1019-50 – 50 pack C1019-250 – 250 pack	C1102-25 – 25 pack C1102-50 – 50 pack

Zymo-Spin™ III Columns

Name	Zymo-Spin™ III	Zymo-Spin™ IIICG
Format	DNA/RNA binding	DNA/RNA binding
DNA Binding Capacity / RNA Binding Capacity	25 µg / 100 µg	25 µg / 100 µg
Elution	≥ 50 µl	≥ 50 µl
Compatibility	microcentrifuge, vacuum manifold	microcentrifuge, vacuum manifold
Matrix / Construction	silica-based / polypropylene	silica-based /polypropylene
Cat. No. / Size	C1005-50 – 50 pack C1005-250 – 250 pack	C1006-50-G – 50 pack C1006-250-G – 250 pack

Zymo-Spin™ III and IV Columns

Name	Zymo-Spin™ III-F	Zymo-Spin™ III-HRC	Zymo-Spin™ IV
Format	filtration column	DNA/RNA inhibitor removal filtration column	filtration column
Volumetric Capacity	800 ul	50 - 200 ul	700 µl
Compatibility	microcentrifuge, vacuum manifold	microcentrifuge, vacuum manifold	microcentrifuge, vacuum manifold
Matrix / Construction	proprietary/polypropylene, attached snap cap	polyethylene-based with 55 - 120 µm pore size, PCR/RT inhibitor removal resin / polypropylene, attached snap cap	silica-based with 10-20 µm pore size / polypropylene, snap off base, sealable screw cap
Cat. No. / Size	C1057-50 – 50 pack	C1058-50 – 50 pack	C1007-50 – 50 pack C1007-250 – 250 pack

Zymo-Spin™ V Columns

Name	Zymo-Spin™ V	Zymo-Spin™ V-E
Format	DNA/RNA binding	DNA/RNA binding
DNA Binding Capacity / RNA Binding Capacity	100 µg	125 µg / 250 µg
Elution	≥ 100 µl	≥ 100 µl
Compatibility	microcentrifuge, centrifuge, vacuum manifold	microcentrifuge, centrifuge, vacuum manifold, syringe (luer-lok top)
Matrix / Construction	silica-based / polypropylene	silica-based / polypropylene
Cat. No. / Size	C1012-25 – 25 pack C1012-50 – 50 pack	C1024-25 – 25 pack C1024-50 – 50 pack

Zymo-Spin™ VI Columns

Name	Zymo-Spin™ VI	Zymo-Spin™ VI-P
Format	DNA binding	Plasmid DNA binding
Binding Capacity / Elution	500 µg / ≥ 2 ml	10 mg / ≥ 2 ml
Compatibility	centrifuge, vacuum manifold, luer-lok bottom assembly	centrifuge, vacuum manifold, luer-lok bottom assembly
Matrix / Construction	silica-based / polypropylene	silica-based / polypropylene
Cat. No. / Size	C1013-10 – 10 pack C1013-20 – 20 pack	C1044-5 – 5 pack

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11 Columns, Plates, Instruments & Accessories

Zymo-Spin™ I

The Zymo-Spin™ I column can be used in microcentrifuges 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 of DNA, and 10 µg of RNA, in ≥ 6 µl eluate. Capacity is 800 µl.

Cat. No.	Size
C1003-50	50 pack
C1003-250	250 pack

Zymo-Spin™ IC

Capped version of the Zymo-Spin™ I column. The Zymo-Spin™ IC column can be used in microcentrifuges 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 of DNA, and 10 µg of RNA, in ≥ 6 µl eluate. Capacity is 800 µl.

Cat. No.	Size
C1004-50	50 pack
C1004-250	250 pack

Zymo-Spin™ IC-XL

The Zymo-Spin™ IC-XL column can be used either in microcentrifuges or on vacuum manifolds for the purification of DNA and/or RNA. The Zymo-Spin™ IC-XL features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 10 µg of DNA in ≥ 10 µl eluate. Capacity is 1 ml.

Cat. No.	Size
C1002-25	25 pack
C1002-50	50 pack

Zymo-Spin™ IC-S

The Zymo-Spin™ IC-S column can be used in microcentrifuges for the purification of DNA and/or RNA and fluorescent dye removal. The Zymo-Spin™ IC-S features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 5 µg of DNA in ≥ 10 µl eluate. Capacity is 900 µl.

Cat. No.	Size
C1015-25	25 pack
C1015-50	50 pack

Zymo-Spin™ IB

The black, opaque Zymo-Spin™ IB column can be used in microcentrifuges 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 of DNA in ≥ 6 µl eluate. Capacity is 800 µl.

Cat. No.	Size
C1014-50	50 pack
C1014-250	250 pack

Zymo-Spin™ PI

The Zymo-Spin™ PI column features durable polypropylene construction and is the same column featured in the His-Spin Protein Miniprep™ (p. 187). Capacity is 800 µl. Note: Column only, does not contain His-Affinity Gel.

Cat. No.	Size
P2003-1	50 pack

Zymo-Spin™ II

The Zymo-Spin™ II column features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 25 µg of DNA, and 50 µg of RNA, in ≥ 25 µl eluate. Capacity is 800 µl.

Cat. No.	Size
C1008-50	50 pack
C1008-250	250 pack

Zymo-Spin™ IIC

The Zymo-Spin™ IIC 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 of DNA, and 50 µg of RNA, in ≥ 25 µl eluate. Capacity is 900 µl.

Cat. No.	Size
C1011-50	50 pack
C1011-250	250 pack

Zymo-Spin™ IIC-XL

The Zymo-Spin™ IIC-XL column can be used either in microcentrifuges or on vacuum manifolds for the purification of high molecular weight DNA and/or RNA. The Zymo-Spin™ IIC-XL features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 25 µg of DNA, and 50 µg of RNA, in ≥ 35 µl eluate. Capacity is 900 µl.

Cat. No.	Size
C1102-25	25 pack
C1102-50	50 pack

Zymo-Spin™ IIN

The Zymo-Spin™ IIN 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 of DNA, and 50 µg of RNA, in ≥ 25 µl eluate. Capacity is 900 µl.

Cat. No.	Size
C1019-50	50 pack
C1019-250	250 pack

Zymo-Spin™ III

The Zymo-Spin™ III 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 of DNA, and 100 µg of RNA, in ≥ 50 µl eluate. Capacity is 800 µl.

Cat. No.	Size
C1005-50	50 pack
C1005-250	250 pack

Zymo-Spin™ IIICG

Capped version of the Zymo-Spin™ III column with a green retention ring. The Zymo-Spin™ IIICG column can be used either in microcentrifuges or on vacuum manifolds for the purification of DNA and/or RNA. The Zymo-Spin™ IIICG features durable polypropylene construction and contains a unique silica-based matrix that allows purification of up to 25 µg of DNA, and 100 µg of RNA, in ≥ 50 µl eluate. Capacity is 800 µl.

Cat. No.	Size
C1006-50-G	50 pack
C1006-250-G	250 pack

Zymo-Spin™ III-F

The Zymo-Spin™ III-F is a durable polypropylene filtration column that features an attached snap cap. It is ideal for clarifying solutions, including crude cell lysates and homogenates. Capacity is 800 µl.

Cat. No.	Size
C1057-50	50 pack

Zymo-Spin™ III-HRC

The Zymo-Spin™ III-HRC is a durable polypropylene filtration column filled with a unique matrix that features an attached snap 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 55 - 120 µm pore size. Capacity is 50 - 200 µl.

Cat. No.	Size
C1058-50	50 pack

Zymo-Spin™ IV

The Zymo-Spin IV™ is a durable polypropylene 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. Capacity is 700 µl.

Cat. No.	Size
C1007-50	50 pack
C1007-250	250 pack

Zymo-Spin™ V

The versatile Zymo-Spin™ V column can be used either in microcentrifuges, centrifuges, or on-vacuum manifolds for the purification of DNA. 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 ≥ 150 µl eluate. Capacity is 800 µl.

Cat. No.	Size
C1012-25	25 pack
C1012-50	50 pack

Zymo-Spin™ V-E

The versatile Zymo-Spin™ V-E 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 250 µg RNA in ≥ 100 µl elution buffer or water. The capacity of the spin column is 400 µl.

Cat. No.	Size
C1024-25	25 pack
C1024-50	50 pack

Zymo-Spin™ VI

The versatile Zymo-Spin™ VI column can be used either in centrifuges or on-vacuum manifolds for the purification of DNA. 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 in ≥ 2 ml eluate. Capacity is 15 ml.

Cat. No.	Size
C1013-10	10 pack
C1013-20	20 pack

Zymo-Spin™ VI-P

Available as a refill for the ZymoPURE™ II Plasmid Gigaprep Kit. The Zymo-Spin™ VI-P can be used in centrifuges or on vacuum manifolds for the purification of plasmid DNA. Exclusive to this column is a Luer-Lock bottom assembly and conical tip. The Zymo-Spin™ VI-P features durable polypropylene construction and a unique silica-based matrix that allows for purification of up to 10 mg of plasmid DNA in ≥ 2 ml eluate when used in combination with ZymoPURE™ Plasmid buffers. Capacity is 15 ml and can be increased to 615 ml when used in conjunction with the 600 ml reservoir (Cat No. C1033-5).

Cat. No.	Size
C1044-5	5 pack

Collection/Filter Assemblies

Zymo-Spin™ III-P with 15 ml and 50 ml Reservoir

Available as a refill for the ZymoPURE™ II Plasmid Midiprep Kit. The versatile Zymo-Spin™ III-P with 15 ml conical and 50 ml reservoirs can be used in centrifuges or on vacuum manifolds for the purification of plasmid DNA. The Zymo-Spin™ III-P features durable polypropylene construction and a unique silica-based matrix that allows for purification of up to 400 µg of plasmid DNA in ≥ 100 µl eluate when used in combination with ZymoPURE™ Plasmid buffers. Capacity with reservoir assembly is 65 ml.

Cat. No.	Size
C1040-5	5 pack

Zymo-Spin™ V with Reservoir

The Zymo-Spin™ V with Reservoir assembly can be used in conjunction with centrifuges and on vacuum manifolds for the purification of DNA. The spin-column and reservoir feature durable polypropylene construction, and features a unique silica-based matrix for the purification of up to 100 µg DNA in ≥ 150 µl elution buffer or water. Capacity of the spin column with reservoir is 15 ml.

Cat. No.	Size
C1016-25	25 pack
C1016-50	50 pack

Zymo-Spin™ V-P with 15 ml and 50 ml Reservoir

Available as a refill for the ZymoPURE™ II Plasmid Maxiprep Kit. The versatile Zymo-Spin™ V-P with 15 ml conical and 50 ml reservoirs can be used in centrifuges or on-vacuum manifolds for the purification of plasmid DNA. The Zymo-Spin™ V-P features durable polypropylene construction and a unique silica-based matrix that allows for purification of up to 1.2 mg of plasmid DNA in ≥ 200 µl eluate when used in combination with ZymoPURE™ Plasmid buffers. Capacity with reservoir assembly is 65 ml.

Cat. No.	Size
C1042-5	5 pack

Zymo-Spin™ V-E with Zymo Midi Filter™

The Zymo-Spin™ V-E with 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 250 µg RNA in ≥ 100 µl elution buffer or water. The capacity of the spin-column with filter is 15 ml.

Cat. No.	Size
C1021-25	25 pack

Zymo-Spin™ VI with Reservoir

The Zymo-Spin™ VI with Reservoir assembly can be used with vacuum manifolds for the purification of DNA. 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 in ≥ 2 ml elution buffer or water. The capacity of the spin-column with filter is 75 ml.

Cat. No.	Size
C1018-10	10 pack
C1018-20	20 pack

Zymo-Spin™ VI with Zymo Maxi Filter™

The Zymo-Spin™ VI with Zymo Maxi Filter™ assembly can be used with vacuum manifolds for the purification of DNA. 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 in ≥ 2 ml elution buffer or water. The capacity of the spin-column with filter is 75 ml.

Cat. No.	Size
C1017-10	10 pack
C1017-20	20 pack

ZymoPURE™ Syringe Filter and Plunger Set

The ZymoPURE™ Syringe Filter features durable polypropylene construction and novel filtration media that allows for rapid clarification of up to 60 ml of neutralized bacterial lysate using the supplied polypropylene plunger. Each ZymoPURE™ Syringe Filter also includes a pre-attached ABS Luer-Lock plug in order to keep the tip clean and free from leaking during processing. Syringe filters and plungers are non-sterile and coated with silicone lubricant for easier handling.

Cat. No.	Size
C1036-5	5 pack

ZymoPURE™ Giga Filter

The ZymoPURE™ Giga Filter features durable polypropylene construction and novel filtration media that allows for rapid clarification of up to 500 ml of neutralized bacterial lysate using a vacuum source. The ZymoPURE™ Giga Filter also has a uniquely designed fitting that permits use with either 33 mm or 45 mm-neck glass bottles. Filter units are non-sterile and include a polypropylene cap for the reservoir.

Cat. No.	Size
C1038-1	1 pack

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 RNA Isolation kit.

Cat. No.	Size
C1009-20	20 pack
C1009-50	50 pack

Reservoirs

15 ml Conical Reservoir

The 15 ml Reservoir, used in conjunction with a luer-lock column, can be used for the purification of DNA and/or RNA. The reservoir features durable polypropylene construction. The volume capacity of the reservoir is 15 ml.

Cat. No.	Size
C1031-25	25 pack

50 ml Conical Reservoir

The 50 ml Reservoir, used in conjunction with a luer-lock column, can be used with vacuum manifolds for the purification of DNA and/or RNA. The reservoir is designed to ensure no liquid is left behind during processing. The reservoir features durable polypropylene construction. The volume capacity of the reservoir is 50 ml.

Cat. No.	Size
C1032-25	25 pack

600 ml Reservoir

The 600 ml Reservoir, used in conjunction with a luer-lock column, can be used with vacuum manifolds for the purification of DNA and/or RNA. The large volume capacity is perfect for large-scale purification such as plasmid Gigapreps (e.g. ZymoPURE™ Gigaprep). The reservoir is designed to ensure no liquid is left behind during processing. The reservoir features durable polypropylene construction. The volume capacity of the reservoir is 600 ml.

Cat. No.	Size
C1033-5	5 pack

Tubes

Collection Tube (2.0 ml)

Durable polypropylene collection tube that is used in conjunction with the Zymo-Spin™ columns (i.e., Zymo-Spin™ I through Zymo-Spin™ V). Capacity is 2 ml.

Cat. No.	Size
C1001-50	50 tubes
C1001-500	500 tubes
C1001-1000	1000 tubes

DNase/RNase-free Tube (1.5 ml)

DNase/RNase-free 1.5 ml microcentrifuge tubes made of durable polypropylene construction.

Cat. No.	Size
C2001-50	50 tubes
C2001-100	100 tubes

Clear Tubes (2.0 ml)

Clear 2.0 ml skirted tubes made of durable polypropylene construction. Available as V-bottom or U-bottom tubes provided with caps.

	Cat. No.	Size
V-bottom	C1025-50	50 tubes
	C1025-500	500 tubes
U-bottom	C1027-50	50 tubes
	C1027-500	500 tubes

Amber Tubes (2.0 ml)

Amber 2.0 ml skirted tubes made of durable polypropylene construction. Available as V-bottom or U-bottom tubes provided with caps.

	Cat. No.	Size
V-bottom	C1026-50	50 tubes
	C1026-500	500 tubes
U-bottom	C1028-50	50 tubes
	C1028-500	500 tubes

ZR BashingBead™ Lysis Tubes (2.0 mm)

Each impact resistant 2 ml tube contains 0.7 ml (dry volume) 2.0 mm BashingBeads™. The state of the art, ultra-high density beads are fracture resistant, chemically inert, and ideal for disrupting tough-to-lyse biological tissues, insects, plant material, etc.

Cat. No.	Size
S6003-50	50 pack

ZR BashingBead™ Lysis Tubes (mixed 0.1mm & 0.5 mm)

Each impact resistant 2 ml tube contains 0.6 ml (dry volume) mixed 0.1 & 0.5 mm BashingBeads™. The state of the art, ultra-high density beads are fracture resistant, chemically inert, and ideal for disrupting tough-to-lyse biological samples, such as microbes and fungi in soil, feces, sludge, etc.

Cat. No.	Size
S6012-50	50 pack

DNA Affinity Beads

MagBinding Beads

Paramagnetic DNA affinity matrix. Featured in Zyppy™ 96 Plasmid MagBead Miniprep (p. 68) and EZ DNA Methylation™ Magpreps (p. 13-15).

Cat. No.	Size
D4100-2-6	6 ml
D4100-2-8	8 ml
D4100-2-12	12 ml
D4100-2-16	16 ml
D4100-2-24	24 ml

Technology Overview: Zymo-Spin™ Plates

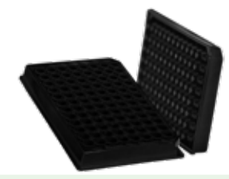
Silicon-A™ Plates

Name	**Silicon-A™ Plate**
Format	DNA/RNA binding - up to 5 µg of DNA, and 10 µg of RNA, per well
Capacity / Elution	600 µl per well / ≥ 30 µl
Dimensions (HxWxL)	19 mm x 83 mm x 125 mm
Compatibility	centrifuge
Matrix / Construction	silica-based / polypropylene
Cat. No. / Size	C2001 – 2 plates

Zymo-Spin™ I-96 Plates

Name	**Zymo-Spin™ I-96 Plate**	**Zymo-Spin™ I-96 Shallow Well Plate**
Format	DNA/RNA binding - up to 5 µg of DNA, and 10 µg of RNA, per well	DNA/RNA binding - up to 5 µg of DNA, and 10 µg of RNA, per well
Capacity / Elution	1.1 ml per well / ≥ 10 µl	600 µl per well / ≥ 10 µl
Dimensions (HxWxL)	35 mm x 83 mm x 125 mm	19 mm x 83 mm x 125 mm
Compatibility	centrifuge	centrifuge
Matrix / Construction	silica-based / polypropylene	silica-based / polypropylene
Cat. No. / Size	C2004 – 2 plates	C2004-SW – 2 plates

Zymo-Spin™ IB-96 Plates



Zymo-Spin™ I-96-XL Plates

Name	**Zymo-Spin™ IB-96 Plate**	**Zymo-Spin™ I-96-XL Plate**
Format	DNA binding - up to 5 µg of DNA per well	DNA binding - up to 5 µg of DNA per well
Capacity / Elution	600 µl per well / ≥ 15 µl	1.1 ml per well / ≥ 15 µl
Dimensions (HxWxL)	19 mm x 83 mm x 125 mm	35 mm x 83 mm x 125 mm
Compatibility	centrifuge	centrifuge
Matrix / Construction	silica-based / polypropylene	silica-based / polypropylene
Cat. No. / Size	C2006 – 2 plates	C2010 – 2 plates

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 of DNA, and 10 µg of RNA, in ≥ 30 µl eluate per well. Capacity is 600 µl per well.

Cat. No.	Size
C2001	2 plates

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 durable polypropylene construction and unique silica-based matrix make it perfect for purifying up to 5 µg of DNA, and 10 µg of RNA, in ≥ 10 µl eluate per well. Capacity is 1.1 ml (C2004) or 600 µl (C2004-SW) per well.

Cat. No.	Size
C2004	2 plates
C2004-SW	2 plates

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 of DNA in ≥ 15 µl/well elution buffer or water. Opaque black in color. Capacity is 600 µl per well.

Cat. No.	Size
C2006	2 plates

Zymo-Spin™ I-96-XL Plate

The Zymo-Spin™ I-96-XL Plate can be used in centrifuges for the large-scale (i.e., 96-well) purification of high molecular weight DNA. Its deep-well, durable polypropylene construction and unique silica-based matrix make it perfect for purifying up to 5 µg of DNA in ≥15 µl eluate per well. Capacity is 1.1 ml per well.

Cat. No.	Size
C2010	2 plates

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™ I-96-XL plates. Capacity is 1.2 ml per round bottom well.

Cat. No.	Size
C2002	2 plates

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.	Size
C2003	2 plates

96-Well PCR/Conversion Plate

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 200 µl per well.

Cat. No.	Size
C2008	2 plates
C2005	2 plates/foils

96-Well Block

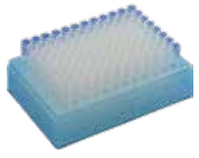
96-Well Block features durable, clear polypropylene construction. Each has a level footprint and conforms to laboratory standards. Capacity is 2 ml per round bottom well.

Cat. No.	Size
P1001-2	2 blocks
P1001-10	10 blocks

96-Well Block with Cover Foil

96-Well Block with Cover Foil feature durable, clear polypropylene construction. Each has a level footprint and conforms to laboratory standards. Provided with adhesive, pierceable foil cover. Capacity is 2 ml per round bottom well.

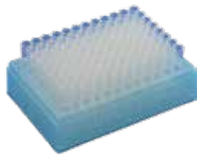
Cat. No.	Size
P1002-2	2 blocks/foils



ZR-96 BashingBead™ Lysis Rack (0.1 & 0.5 mm)

Each impact resistant 1.1 ml tube contains 0.5 ml (dry volume) 0.1 & 0.5 mm BashingBeads™. 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.

Cat. No.	Size
S6002-96-3	1 rack



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.

Cat. No.	Size
S6002-96-2	1 rack

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.

Cat. No.	Size
C2007-2	2 foils
C2007-6	6 foils

Cell Disruptors & Accessories

TerraLyzer™

The TerraLyzer™ can be used to lyse microbes in soil, sediment, sludge, and fecal samples and can effectively process tough-to-lyse fungal, algal, plant, and animal tissues. It can be used at any remote location and in most weather conditions when immediate sample collection, processing, and preservation are required by the researcher. The device is compatible with most 2.0 ml tubes containing lysis matrix, though ZR BashingBead™ Tubes should be used to obtain maximum yields of DNA/RNA/Protein from tough-to-lyse and environmental sample sources.

Description	Cat. No.	Size
TerraLyzer™	S6022	1 unit

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.	Size
120V	S6001-2-120	1 unit
230V, European Plug	S6001-2-230	1 unit

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.	Size
S6005	1 unit

FastPrep® Accessories

A

B

C

Description	Cat. No.	Size
A. HiPrep™ Adapter (48 x 2 ml tubes)	S6005-1	1 unit
B. CoolPrep™ Adapter (24 x 2 ml tubes)	S6005-2	1 unit
C. TeenPrep™ Adapter (12 x 15 ml tubes)	S6005-3	1 unit

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.	Size
H1001	10 pack
H1001-50	50 pack

Squisher™-8 with 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.	Size
H1002-5	5 pk/1 blocks
H1002-20	20 pk/2 blocks

Squisher™-96 with 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.	Size
H1004-2	2 pk/2 blocks
H1004-5	5 pk/5 blocks

Plating Beads

Rattler™ Plating Beads

Rattler™ Plating Beads save 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 p. 152 for more details.

Cat. No.	Size
S1001	1 bottle
S1001-5	5 bottles
S1001-B	25kg bag (bulk)

Other Instruments & Accessories

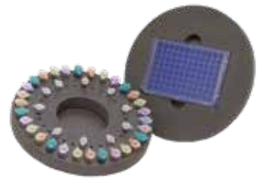
Vortex-Genie® 2

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.	Size
120V	S5001	1 unit
230V, European Plug	S5002	1 unit

Vortex Genie® is registered trademarks of Scientific Industries, Inc.

Vortex-Genie® Family Accessories



A & B

C

D

Description	Cat. No.	Size
A. Microtube Foam Inserts: Accommodates up to 60 microtubes. Fits into 6 in. platform	S5001-1	2 units
B. Microplate Foam Inserts: Accommodates one microplate. Fits into 6 in. platform	S5001-2	2 units
C. 29-37mm Tube Foam Inserts: Fits into recessed platform	S5001-3	2 units
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

E

F

G

Description	Cat. No.	Size
E. Horizontal 50 ml Tube Holder: Holds 6 tubes	S5001-5	1 unit
F. Horizontal 15 ml Tube Holder: Holds 12 tubes. Use with any Vortex-Genie® 2	S5001-6	1 unit
G. Horizontal Microtube Holder: Holds 24 microtubes. Use with any Vortex-Genie® 2	S5001-7	1 unit

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	Cat. No.	Size
120V	S5009	1 unit

EZ-Vac™ Vacuum Manifold

The EZ-Vac™ Vacuum Manifold features durable chemical-resistant construction and is capable of processing up to 20 samples simultaneously using vacuum pressure. The vacuum manifold allows researchers to simplify their nucleic acid purification workflows further by eliminating the need for multiple centrifugation steps and disposal of flow-through from collection tubes.

Cat. No.	Size
S7000	1 unit

Vortex Genie®, Disruptor Genie®, and MagStir Genie® are registered trademarks of Scientific Industries, Inc.

DNA Clean-up

Product Chart

	DNA Clean & Concentrator®-5	ZR-96 DNA Clean & Concentrator®-5	DNA Clean & Concentrator®-25	DNA Clean & Concentrator®-100	DNA Clean & Concentrator®-500	ZR-96 DNA Clean-up Kit™	Oligo Clean & Concentrator™	ZR-96 Oligo Clean & Concentrator™	*Select-a-Size* DNA Clean & Concentrator®	*Select-a-Size* DNA Clean & Concentrator® MagBead Kit
Specifications										
Format	Spin-Column	96-Well	Spin-Column	Spin-Column	Spin-Column	96-Well	Spin-Column	96-Well	Spin-Column	Magbead
Binding Capacity	5 µg	5 µg	25 µg	100 µg	500 µg	5 µg	5 µg	5 µg	3 µg	10 mg
Elution Volume	≥ 6 µl	≥ 6 µl	≥ 25 µl	≥ 150 µl	≥ 2 ml	≥ 30 µl	≥ 6 µl	≥ 10 µl	≥ 10 µl	≥ 10 ml
Processing Time	2 min.	15 min.	2 min.	15 min.	25 min.	20 min.	2 min.	20 min.	7 min.	10 min.
Applications										
cDNA/ssDNA Purification	•	•	•	•	•	•				
M13 Phage DNA	•	•	•	•	•	•				
PCR Clean-up	•	•	•	•	•	•			•	•
Enzyme Removal	•	•	•	•	•	•	•	•	•	•
dNTP/Dye Removal	•	•	•	•	•	•	•	•	•	
Probe Purification	•	•	•	•	•	•	•	•	•	•
DNA/RNA Oligo Clean-up							•	•		
High Molecular Weight DNA Clean-up										•
Size Selection (eg. Library Prep, primer dimer removal)									•	•
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DNA Clean-up

Product Chart

	Genomic DNA Clean & Concentrator®-10	Genomic DNA Clean & Concentrator®-25	ZR-96 Genomic DNA Clean & Concentrator®-5	ZR DNA Sequencing Clean-up Kit™	ZR-96 DNA Sequencing Clean-up Kit™	*OneStep*™ PCR Inhibitor Removal	*OneStep*-96™ PCR Inhibitor Removal	Zymoclean™ Gel DNA Recovery Kit	ZR-96 Zymoclean™ Gel DNA Recovery Kit	Zymoclean™ Large Fragment DNA Recovery Kit
Specifications										
Format	Spin-Column	Spin-Column	96-Well	Spin-Column	96-Well	Spin-Column	96-Well	Spin-Column	96-Well	Spin-Column
Binding Capacity	10 µg	25 µg	5 µg	5 µg	5 µg	No DNA/RNA Binding	No DNA/RNA Binding	5 µg	5 µg	10 µg
Elution Volume	≥ 10 µl	≥15 µl	≥15 µl	≥ 6 µl	≥ 15 µl	50 - 200 µl	50 - 100 µl	≥ 6 µl	≥ 15 µl	≥ 10 µl
Processing Time	5 min.	5 min.	20 min.	2 min.	10 min.	5 min.	10 min.	15 min.	20 min.	15 min.
Applications										
PCR Clean-up	•	•	•							
Enzyme Removal	•	•	•	•	•					
dNTP/Dye Removal	•	•	•	•	•					
Probe Purification				•	•					
High Molecular Weight DNA Clean-up	•	•	•							
Sequencing DNA Clean-up				•	•					
Dye Terminator Removal				•	•					
Removal of Polyphenolic Inhibitors						•	•			
DNA From Agarose Gel Slices								•	•	
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Plasmid DNA Purification

Product Chart

	ZymoPURE™ Plasmid Miniprep Kit	ZymoPURE™ II Plasmid Midiprep Kit	ZymoPURE™ II Plasmid Maxiprep Kit	ZymoPURE™ II Plasmid Gigaprep Kit	ZymoPURE-Express™ Plasmid Midiprep Kit
Specifications					
Format	Spin-Column	Spin-Column	Spin-Column	Spin-Column	Spin-Column
Elution Volume	≥ 25 µl	≥ 100 µl	≥ 200 µl	≥ 2 ml	≥ 200 µl
Processing Time	15 min.	18 min.	18 min.	50 min.	15 min.
Culture Input	5 ml	50 ml	150 ml	2.5 L	25 ml
DNA Yield	up to 100 µg	up to 300 µg	up to 1.2 mg	up to 10 mg	up to 1.2 mg
Endotoxins	≤ 0.9 EU/µg	≤ 0.025 EU/µg	≤ 0.025 EU/µg	≤ 0.025 EU/µg	≤ 0.025 EU/µg
Applications					
For Use In Transfection	•	•	•	•	•
For Use in Highly Sensitive Aplications					
Pellet-free (Direct From Culture)					•
Plasmid Recovery From *E. coli*	•	•	•	•	•
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Plasmid DNA Purification

Product Chart

	Zyppy® Plasmid Miniprep Kit	Zyppy® -96 Plasmid Miniprep Kit	Zyppy® -96 Plasmid MagBead Miniprep	ZR Plasmid Miniprep™ -Classic	ZR BAC DNA Miniprep Kit	Zymoprep™ Yeast Plasmid Miniprep I	Zymoprep™ Yeast Plasmid Miniprep II
Specifications							
Format	Spin-Column	96-Well	Magnetic Beads	Spin-Column	Spin-Column	Isopropanol Precipitation	Spin-Column
Elution Volume	≥ 30 µl	≥ 30 µl	≥ 30 µl	≥ 30 µl	≥ 10 µl	≥ 35 µl	≥ 10 µl
Processing Time	8 min.	45 min.	1 hr.	15 min.	15 min.	15 min.	25 min.
Culture Input	600 µl - 3 ml	750 µl	750 µl	up to 5 ml	500 µl - 5 ml	0.5 - 1 ml	0.1-1.5 ml
DNA Yield	up to25 µg	up to 10 µg	up to 10 µg	20 - 100 µg	up to 10µg	0.01-0.3 ng	0.01-0.3 ng
Endotoxins	< 50 EU/µg	< 50 EU/µg	< 50 EU/µg	< 50 EU/µg	-	-	-
Applications							
For Use In Transfection	•	•	•	•	•	•	•
Pellet-free (Direct from Culture)	•	•	•				
Plasmid Recovery from *E. coli*	•	•	•	•			
Large Plasmid Recovery from *E. coli*					•		
Plasmid Recovery from Yeast						•	•
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Genomic DNA Purification

Product Chart

	Quick-DNA™ Microprep Plus	*Quick*-DNA™ Miniprep Plus	*Quick*-DNA™ Midiprep Plus	*Quick*-DNA™ 96 Plus Kit	*Quick*-DNA™ Magbead Plus Kit	*Quick*-DNA™ Microprep	*Quick*-DNA™ Miniprep	*Quick*-DNA™ 96 Kit
Specifications								
Format	Spin-Column	Spin-Column	Spin-Column	96-Well	Magbead	Spin Column	Spin-Column	96-Well
Binding Capacity	5 µg	25 µg	125 µg	5 µg	10 mg	5 µg	25 µg	5 µg
Elution Volume	≥ 10 µl	≥ 50 µl	≥ 150 µl	≥ 15 µl	100 ml	≥ 10 µl	≥ 50 µl	≥ 30 µl
Processing Time	15 min.	15 min.	30 min.	45 min.	1 hr.	15 min.	15 min.	30 min.
Applications/Samples								
Cultured Cells	•	•	•	•	•	•	•	•
Buccal Cells/Swabs/Saliva	•	•	•	•	•	•	•	•
Whole Blood	•	•	•	•	•	•	•	•
Semen	•	•	•	•	•	•	•	•
Fresh/Frozen Soft Tissue	•	•	•	•	•	•	•	•
Fresh/Frozen Solid Tissue	•	•	•	•	•			
Tail Snips/Ear Punches	•	•	•	•	•			
Hair and Feathers	•	•	•	•	•			
Glass Slide								
FFPE Tissue Sections								
Tissue Sections								
Mitochondria	•	•	•	•	•	•	•	•
Viral DNA	•	•	•	•	•			
Plasma/Serum -Cell Free DNA								
Urine -Cell Free & Cellular DNA								
Urine Sediment	•	•	•	•	•			
Cerebrospinal Fluid								
Amniotic Fluid								
Microbes previously lysed with enzymes or mechanical methods	•	•	•	•	•	•	•	•
Fungi Susceptible to Yeast Lytic Enzyme								
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Genomic DNA Purification

Product Chart

	Quick-DNA™ Urine Kit	*Quick*-cfDNA™ Serum & Plasma Kit	*Quick*-DNA™ FFPE Kit	Pinpoint® Slide DNA Isolation System	YeaStar™ Genomic DNA Kit	*Quick*-DNA™ Viral Kit	*Quick*-DNA™ Viral 96 Kit
Specifications							
Format	Spin-Column	Spin-Column	Spin-Column	Spin-Column	Spin-Column	Spin-Column	96-Well
Binding Capacity	5 µg	≤100ng	25 µg	5 µg	25 µg	5 µg	5 µg
Elution Volume	≥ 10 µl	≥ 35 µl	≥ 30 µl	≥ 10 µl	≥ 60 µl	≥ 6 µl	≥ 10 µl
Processing Time	15 min.	varies	1 hr.	5 hr.	30 min.	15 min.	25 min.
Applications/Samples							
Cultured Cells						•	•
Buccal Cells/Swabs/Saliva							
Whole Blood						•	•
Semen							
Fresh/Frozen Soft Tissue							
Fresh/Frozen Solid Tissue			•				
Tail Snips/Ear Punches							
Hair and Feathers							
Glass Slide			•	•			
FFPE Tissue Sections			•	•			
Tissue Sections				•			
Mitochondria							
Viral DNA						•	•
Plasma/Serum -Cell Free DNA		•				•	•
Urine -Cell Free & Cellular DNA	•						
Urine Sediment	•						
Cerebrospinal Fluid		•					
Amniotic Fluid		•					
Microbes previously lysed with enzymes or mechanical methods							
Fungi Susceptible to Yeast Lytic Enzyme					•		
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Environmental DNA Purification

Product Chart

	Quick-DNA™ Fecal/Soil Microbe Microprep Kit	*Quick*-DNA™ Fecal/Soil Microbe Miniprep Kit	*Quick*-DNA™ Fecal/Soil Microbe Midiprep Kit	*Quick*-DNA™ Fecal/Soil Microbe 96 Kit	*Quick*-DNA™ Fungal/Bacterial Microprep Kit	*Quick*-DNA™ Fungal/Bacterial Miniprep Kit	*Quick*-DNA™ Fungal/Bacterial Midiprep Kit	*Quick*-DNA™ Fungal/Bacterial 96 Kit
Specifications								
ZR BashingBead™ Lysis	•	•	•	•	•	•	•	•
Format	Spin-Column	Spin-Column	Spin-Column	96-Well	Spin-Column	Spin-Column	Spin-Column	96-Well
Binding Capacity	5 µg	25 µg	125 µg	5 µg	5 µg	25 µg	125 µg	5µg
Elution Volume	≥ 10 µl	≥ 25 µl	≥ 150 µl	≥ 50 µl	≥ 10 µl	≥ 25 µl	≥ 150 µl	≥ 50 µl
Removal of Humic, Fulvic, and Polyphenolic Substances	•	•	•	•				
Processing Time	15 min.	15 min.	25 min.	50 min.	10 min.	10 min.	20 min.	40 min.
Applications								
Environmental Sources								
Soil	•	•	•	•				
Sediment	•	•	•	•				
Sludge	•	•	•	•				
Feces	•	•	•	•				
Microorganisms								
Bacteria	•	•	•	•	•	•	•	•
Fungi	•	•	•	•	•	•	•	•
Algae	•	•	•	•	•	•	•	•
Protists	•	•	•	•	•	•	•	•
Tough-to-Lyse Tissues								
Soft Tissues	some	some	some	some	some	some	some	some
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Environmental DNA Purification

Product Chart

	Quick-DNA™ Plant/Seed DNA Miniprep Kit	*Quick*-DNA™ Plant/Seed 96 Kit	*Quick*-DNA™ Tissue & Insect Microprep Kit	*Quick*-DNA™ Tissue & Insect DNA Miniprep Kit	*Quick*-DNA™ Tissue & Insect 96 Kit
Specifications					
ZR BashingBead™ Lysis	•	•	•	•	•
Format	Spin-Column	96-Well	Spin-Column	Spin-Column	96-Well
Binding Capacity	25 µg	5 µg	5 µg	25 µg	5 µg
Elution Volume	≥ 25 µl	≥ 25 µl	≥ 10 µl	≥ 25 µl	≥ 50 µl
Removal of Humic, Fulvic, and Polyphenolic Substances	•	•			
Processing Time	15 min.	50 min.	10 min.	10 min.	40 min.
Applications					
Tough-to-Lyse Tissues					
Soft Tissues			•	•	•
Solid Tissues (Food)			•	•	•
Tough-to-Lyse Tissues			•	•	•
Tough-to-Lyse Organisms			•	•	•
Insects/Arthropods			•	•	•
Plant Material	•	•			
Seeds	•	•			
Fruit	•	•			
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RNA Clean-up

Product Chart

	RNA Clean & Concentrator™ -5	RNA Clean & Concentrator™ -25	RNA Clean & Concentrator™ -100	ZR-96 RNA Clean & Concentrator™	Zymoclean™ Gel RNA Recovery Kit	ZR small-RNA™ PAGE Recovery Kit	*OneStep*™ PCR Inhibitor Removal	*OneStep*™ -96 PCR Inhibitor Removal
Specifications								
Format	Spin-Column	Spin-Column	Spin-Column	96-Well	Spin-Column	Spin-Column	Spin-Column	96-Well
Binding Capacity	10 µg	50 µg	250 µg	25 µg	10 µg	10 µg	No DNA/RNA Binding	
Elution Volume	≥ 6 µl	≥ 25 µl	≥ 100 µl	≥ 10 µl	≥ 6 µl	≥ 6 µl	50 - 200 µl	50 - 100 µl
Processing Time	5 min.	5 min.	15 min.	20 min.	30 min.	45 min.	5 min.	10 min.
Applications								
RNA Clean-up	•	•	•	•				
DNA-free RNA	•	•	•	•				
Enzyme Removal	•	•	•	•				
Nucleotide/Dye Removal	•	•	•	•				
Small-RNA/Probe Purification	•	•	•	•				
RNA From Agarose Gel Slices					•			
RNA From Polyacrylamide Gel Slices						•		
Removal of Polyphenolic RT Inhibitors							•	•
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RNA Isolation

Product Chart

	Direct-zol™ RNA Microprep Kit	Direct-zol™ RNA Miniprep Kit	Direct-zol™ RNA Miniprep Plus Kit	Direct-zol™ 96 RNA Kit	Direct-zol™ 96 MagBead RNA Kit	*Quick*-RNA™ Microprep Kit	*Quick*-RNA™ Miniprep Kit	*Quick*-RNA™ Miniprep Plus Kit	*Quick*-RNA™ Midiprep Kit	*Quick*-RNA™ 96 Kit
Specifications										
Format	Spin-Column	Spin-Column	Spin-Column	96-Well	96-Well	Spin-Column	Spin-Column	Spin-Column	Spin-Column	96-Well
Binding Capacity	10 µg	50 µg	100 µg	10 µg	10 µg	10 µg	100 µg	100 µg	1 mg	10 µg
Elution Volume	≥ 6 µl	≥ 25 µl	≥ 50 µl	≥ 10 µl	≥ 50 µl	≥ 6 µl	≥ 50 µl	≥ 50 µl	≥ 200 µl	≥ 25 µl
Processing Time	10 min.	10 min.	10 min.	30 min.	2 hr.	10 min.	10 min.	10 min.	10 min.	30 min.
Features										
Isolation from TRIzol®, TRI Reagent®, etc.	•	•	•	•	•					
Non-Organic RNA Extraction						•	•	•	•	•
Viral Inactivation	•	•	•	•	•			•		
Small RNA Purification (miRNA)	•	•	•	•	•	•	•	•	•	•
DNA/RNA Shield™ Compatible	•	•	•	•	•	•	•	•	•	•
Applications										
Fresh/Frozen Soft Tissue	•	•	•	•	•	•	•	•	•	•
Cultured Cells	•	•	•	•	•	•	•	•	•	•
Buccal Cells/Swabs	•	•	•	•	•	•	•	•	•	•
Buffy Coat	•	•	•	•	•	•	•	•	•	•
Whole Blood	•	•	•	•	•			•		
Plasma/Serum	•	•	•	•	•			•		
Virus	•	•	•	•	•			•		
Biological Fluids						•	•	•	•	•
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RNA Isolation

Product Chart

	Quick-RNA™ Viral Kit	*Quick*-RNA™ Viral 96 Kit	*Quick*-RNA™ Whole Blood Kit	ZR Urine RNA Isolation Kit™	Pinpoint™ Slide RNA Isolation System I Kit	Pinpoint™ Slide RNA Isolation System II Kit	*Quick*-RNA™ FFPE Kit	*Quick-cf*RNA™ Serum & Plasma Kit	YeaStar™ RNA Kit
Specifications									
Format	Spin-Column	96-Well	Spin-Column	Spin-Column	Spin-Column	Spin-Column	Spin-Column	Spin-Column	Spin-Column
Binding Capacity	10 µg	10 µg	10 µg	10 µg	10 µg	10 µg	50 µg	≤100ng	25 µg
Elution Volume	≥ 6 µl	≥ 10 µl	≥ 6 µl	≥ 6 µl	≥ 6 µl	≥ 6 µl	≥ 25 µl	15 µl	≥ 60 µl
Processing Time	6 min.	15 min.	45 min.	15 min.	1.5 hr.	6.5 hr.	1.5 hr.	2 hr.	1 hr.
Applications									
Frozen Tissue Sections					•				
Fixed Tissue Sections						•	•		
Buccal Cells/Swabs	•	•							
Plasma/Serum	•	•	•					•	
Urine				•					
Virus	•	•							
Microvesicles				•					
Exosomes				•					
Fungi Susceptible to Yeast Lytic Enzyme									•
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Environmental RNA Purification

Product Chart

	Quick-RNA™ Fecal/Soil Microbe Microprep Kit	*Quick*-RNA™ Fungal/Bacterial Microprep Kit	*Quick*-RNA™ Fungal/Bacterial Miniprep Kit	*Quick*-RNA™ Tissue & Insect Microprep Kit	*Quick*-RNA™ Plant RNA Miniprep Kit
Specifications					
Format	Spin-Column	Spin-Column	Spin-Column	Spin-Column	Spin-Column
Binding Capacity	10 µg	10 µg	50 µg	10 µg	50 µg
Elution Volume	≥ 6 µl	≥ 6 µl	≥ 25 µl	≥ 6 µl	≥ 25 µl
Removal of Polyphenolic RT Inhibitors	•				•
Processing Time	15 min.	15 min.	15 min.	15 min.	15 min.
Applications					
Soil	•				
Sediment	•				
Sludge	•				
Feces	•				
Bacteria	•	•	•		
Fungi	•	•	•		
Algae	•	•	•		
Protists	•	•	•		
Food		•	•	•	
Soft Tissues				•	
Tough-to-Lyse Tissues				•	
Tough-to-Lyse Organisms				•	
Insects/Arthropods				•	
Plant Material					•
Seeds					•
Fruit					•
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DNA/RNA Co-Purification

Product Chart

	Quick-DNA/RNA™ Miniprep Kit	ssDNA/RNA Clean & Concentrator™	*Quick*-DNA/RNA™ Viral Kit	*Quick*-DNA/RNA™ Viral 96 Kit
Specifications				
Format	Spin-Column	Spin-Column	Spin-Column	96-Well
Binding Capacity	25 µg DNA 25 µg RNA	10 µg	25ug DNA 50ug RNA	10 µg
Elution Volume	≥ 50 µl DNA ≥ 25 µl RNA	≥ 6 µl	≥ 35 µl	≥ 10 µl
Processing Time	15 min.	10 min.	5 min.	15 min.
Applications				
Parallel Purification	•			
Co-Purification		•	•	•
Fresh/Frozen Soft Tissue	•			
Fresh/Frozen Solid Tissue	limited			
Bacteria	limited			
Yeast	limited			
Buffy Coat	•			
Cultured Cells	•			
Small RNA	•	•		
Probe Purification		•		
Whole Blood (≤ 50 µl)			•	•
Plasma/Serum			•	•
Virus			•	•
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DNA/RNA Co-Purification

Product Chart

	Quick™-DNA/RNA Magbead	*Quick*™-DNA RNA Blood Tube	*Quick*™-DNA/RNA FFPE	Zymobiomics DNA/RNA Miniprep	*Quick*™-DNA/RNA Pathogen	*Quick*™-DNA/RNA Pathogen Magbead
Specifications						
Format	Magbead	Spin Column	Spin column	Spin Column	Column	Magbead
Binding Capacity	20 ug	50 ug	50 ug	100 ug	50 ug	10 ug
Elution Volume	50 ul	> 50 ul	>25 ul	50 ul	25 ul	50 ul
Processing Time	60 min	50 min	90 min	25 min	10 min	35 min
Applications						
Parallel Purification	•		•	•		
Co-Purification	•	•	•	•	•	•
Fresh/Frozen soft tissue	•				•	•
Fresh/Frozen solid tissue	limited				•	•
Bacteria	limited			•	•	•
Yeast	limited			•	•	•
Buffy Coat	•				•	•
Cultured Cells	•					
Liquid Biopsies	•				•	•
Small RNA	•	•	•	•		
Probe Purification						
Whole Blood (<50 ul)	•	•			•	•
Blood Tube (< 3 ml)		•				
Plasma/Serum						
Virus					•	•
Plants	limited				•	•
Insects					•	•
Soil	limited			•		
Swabs	•			•		
Feces	limited			•		
FFPE	limited		•			
Water	limited			•		
Urine	limited					
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Sample Collection & Storage

Product Chart

	DNA/RNA Shield™ -Blood Collection Tube	DNA/RNA Shield™ -Fecal Collection Tube	DNA/RNA Shield™ -Lysis Tube (Microbe)	DNA/RNA Shield™ -Lysis Tube (Tissue)	DNA/RNA Shield™ Swab & Collection Tube	Urine Conditioning Buffer™ (UCB™)	DNA/RNA Shield™ Reagent	DNA/RNA Shield™ Reagent (2X concentrate)
Specifications								
Format	Evacuated Blood Tube	Fecal Collection Tube with Scoop	Lysis Tube	Lysis Tube	Collection Tube & Sterile Swab	Bulk Reagent	Bulk Reagent	Bulk Reagent
Bottle or Tube Size	10 ml	15 ml tube	2 ml (0.1 & 0.5 mm beads)	2 ml (2.0 mm beads)	12 x 80 mm screwcap tube	8 or 140 ml	50 or 250 ml	25 or 125 ml
Tube Fill	6 ml	9 ml	1 ml	1 ml	1 ml & 2 ml	N/A	N/A	N/A
Uses								
Blood Samples	•						•	•
Fecal Samples		•	•		•		•	•
Swab Samples			•		•		•	•
Environmental Samples			•		•		•	•
Pathogen Samples			•		•		•	•
Tissue & Insect Samples				•			•	•
Urine Samples						•		
Applications								
Microbiomic Analysis	•	•	•	•	•	•	•	•
Gene Expression Analysis	•	•	•	•	•	•	•	•
Pathogen Detection	•	•	•	•	•	•	•	•
miRNA Analysis	•	•	•	•	•	•	•	•
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Microbiomics

Product Chart

	ZymoBIOMICS® Microbial Community Standard	ZymoBIOMICS® Microbial Community DNA Standard	ZymoBIOMICS® Microbial Community DNA Standard	ZymoBIOMICS® Microbial Community Standard II (Log Distribution)	ZymoBIOMICS® Microbial Community DNA Standard II (Log Distribution)
Specifications					
Size	10 preps	200 ng	2,000 ng	10 preps	220 ng
Storage solution	DNA/RNA Shield™	10 mM Tris-HCl and 0.1 mM EDTA, pH 8.0		DNA/RNA Shield™	10 mM Tris-HCl and 0.1 mM EDTA, pH 8.0
Impurity level	< 0.01% foreign microbial DNA				
Source					
A mixture of ten inactivated microorganisms (bacterial and fungal)	•			•	
A mixture of genomic dna from ten microbial strains		•	•		•
Applications					
Assessment of bias that comes from DNA Extraction protocol and all other downstream steps	•			•	
Assessment of bias within library preparation and 16S rRNA sequencing		•	•		•
Assessment of bias within library preparation and whole genome sequencing		•	•		•
Assessment of detection limit of workflows due to logrithmic distribution				•	•
Assessment of profiling accuracy across a broad range of abundance				•	•
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Microbiomics

Product Chart

	ZymoBIOMICS® DNA Microprep Kit	ZymoBIOMICS® DNA Miniprep Kit	ZymoBIOMICS® 96 DNA Kit	ZymoBIOMICS® 96 MagBead Kit	ZymoBIOMICS® RNA Miniprep Kit	ZymoBIOMICS® DNA/RNA Miniprep Kit
Specifications						
Format	Spin-Column	Spin-Column	96-Well	96-Well	Spin-Column	Spin-Column
Binding Capacity	5 µg	25 µg	5 µg	5-20 µg	100 µg	100 µg
Elution Volume	≥10 µl	≥ 50 µl	≥ 20 µl	≥ 50 µl	≥ 50 µl	≥ 50 µl
Processing Time	20 min.	20 min.	45 min.	90 min.	20 min.	20 min.
Features						
Mixed Beads For Accurate Lysis From Diverse Microbial Communities	•	•	•	•	•	•
Low Bioburden	•	•	•	•	•	•
PCR Inhibitor Removal Technology	•	•	•	•	•	•
Applications						
Fecal	•	•	•	•	•	•
Soil	•	•	•	•	•	•
Water	•	•	•	•	•	•
Biofilm	•	•	•	•	•	•
Swabs	•	•	•	•	•	•
Biological Fluids	•	•	•	•	•	•
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Index by Catalog Number

Cat. No.	Description	Size	Page
A1001-5	Ampicillin Sodium	5 ml	198
A1001-25	Ampicillin Sodium	5 x 5 ml	198
A1002-5	Chloramphenicol	5 ml	198
A1002-25	Chloramphenicol	5 x 5 ml	198
A1003-5	Kanamycin Sulfate	5 ml	198
A1003-25	Kanamycin Sulfate	5 x 5 ml	198
A1004-5	Tetracycline Hydrochloride	5 ml	198
A1004-25	Tetracycline Hydrochloride	5 x 5 ml	198
A2001-1	Arabinose	1 ml	199
A2001-10	Arabinose	10 x 1 ml	199
A3002-15	Anti-5-Methylcytosine (clone 7D21)	0.5 µg/15 µl	26
A3002-30	Anti-5-Methylcytosine (clone 7D21)	0.5 µg/30 µl	26
A3002-50	Anti-5-Methylcytosine (clone 7D21)	0.5 µg/50 µl	26
A3002-200	Anti-5-Methylcytosine (clone 7D21)	0.5 µg/200 µl	26
A4001-25	Anti-5-Hydroxymethylcytosine Polyclonal Antibody	25 µg/25 µl	33
A4001-50	Anti-5-Hydroxymethylcytosine Polyclonal Antibody	50 µg/50 µl	33
A4001-200	Anti-5-Hydroxymethylcytosine Polyclonal Antibody	200 µg/200 µl	33
C1001-50	Collection Tubes (2 ml)	50 pack	209
C1001-500	Collection Tubes (2 ml)	500 pack	209
C1001-1000	Collection Tubes (2 ml)	1,000 pack	209
C1002-25	Zymo-Spin™ IC-XL	25 pack	204
C1002-50	Zymo-Spin™ IC-XL	50 pack	204
C1003-50	Zymo-Spin™ I Columns	50 pack	204
C1003-250	Zymo-Spin™ I Columns	250 pack	204
C1004-50	Zymo-Spin™ IC Columns	50 pack	204
C1004-250	Zymo-Spin™ IC Columns	250 pack	204
C1005-50	Zymo-Spin™ III Columns	50 pack	205
C1005-250	Zymo-Spin™ III Columns	250 pack	205
C1006-50-F	Spin-Away™ Filters	50 pack	Online
C1006-50-G	Zymo-Spin™ IIICG Columns	50 pack	205
C1006-250-F	Spin-Away™ Filters	250 pack	Online
C1006-250-G	Zymo-Spin™ IIICG Columns	250 pack	205
C1007-50	Zymo-Spin™ IV Columns	50 pack	206
C1007-250	Zymo-Spin™ IV Columns	250 pack	206
C1008-50	Zymo-Spin™ II Columns	50 pack	205
C1008-250	Zymo-Spin™ II Columns	250 pack	205
C1009-20	ZRC-GF Filter™	20 pack	208
C1009-50	ZRC-GF Filter™	50 pack	208
C1011-50	Zymo-Spin™ IIC Columns	50 pack	205
C1011-250	Zymo-Spin™ IIC Columns	250 pack	205
C1012-25	Zymo-Spin™ V Columns	25 pack	206
C1012-50	Zymo-Spin™ V Columns	50 pack	206
C1013-10	Zymo-Spin™ VI Columns	10 pack	206
C1013-20	Zymo-Spin™ VI Columns	20 pack	206
C1014-50	Zymo-Spin™ IB Columns	50 pack	204
C1014-250	Zymo-Spin™ IB Columns	250 pack	204
C1015-25	Zymo-Spin™ IC-S Columns	25 pack	204
C1015-100	Zymo-Spin™ IC-S Columns	100 pack	204
C1016-25	Zymo-Spin™ V Columns with Reservoir	25 pack	207
C1016-50	Zymo-Spin™ V Columns with Reservoir	50 pack	207
C1017-10	Zymo-Spin™ VI Columns with Zymo Maxi Filter™	10 pack	208
C1017-20	Zymo-Spin™ VI Columns with Zymo Maxi Filter™	20 pack	208
C1018-10	Zymo-Spin™ VI Columns with Reservoir	10 pack	208
C1018-20	Zymo-Spin™ VI Columns with Reservoir	20 pack	208
C1019-50	Zymo-Spin™ IIN Columns	50 pack	205
C1019-250	Zymo-Spin™ IIN Columns	250 pack	205
C1021-25	Zymo-Spin™ V-E Columns with Zymo Midi Filter™	25 pack	207
C1024-25	Zymo-Spin™ V-E Columns	25 pack	206
C1024-50	Zymo-Spin™ V-E Columns	50 pack	206
C1025-50	2.0 mL V-bottom Clear Tube, with caps	50 pack	209
C1025-500	2.0 mL V-bottom Clear Tube, with caps	500 pack	209
C1026-50	2.0 mL V-bottom Amber Tube, with caps	50 pack	210

Cat. No.	Description	Size	Page
C1026-500	2.0 mL V-bottom Amber Tube, with caps	500 pack	210
C1027-50	2.0 mL U-bottom Clear Tube, with caps	50 pack	209
C1027-500	2.0 mL U-bottom Clear Tube, with caps	500 pack	209
C1028-50	2.0 mL U-bottom Amber Tube, with caps	50 pack	210
C1028-500	2.0 mL U-bottom Amber Tube, with caps	500 pack	210
C1031-25	15 ml Conical Reservoir	25 pack	209
C1032-25	50 ml Conical Reservoir	25 pack	209
C1033-5	600 ml Reservoir	5 pack	209
C1036-5	ZymoPURE™ Syringe Filter and Plunger Set	5 pack	208
C1038-1	ZymoPURE™ Giga Filter	1 pack	208
C1040-5	Zymo-Spin™ III-P with 15 ml and 50 ml Reservoir	5 pack	207
C1042-5	Zymo-Spin™ V-P with 15 ml and 50 ml Reservoir	5 pack	207
C1044-5	Zymo-Spin™ VI-P	5 pack	207
C1102-25	Zymo-Spin™ IIC-XL Columns	25 pack	205
C1102-50	Zymo-Spin™ IIC-XL Columns	50 pack	205
C2001	Silicon-A™ Plate	2 plates	212
C2001-50	DNase/RNase-free Tubes (1.5 ml)	50 tubes	209
C2001-100	DNase/RNase-free Tubes (1.5 ml)	100 tubes	209
C2002	Collection Plate	2 plates	213
C2003	Elution Plate	2 plates	213
C2004	Zymo-Spin™ I-96 Plate (deep-well)	2 plates	212
C2004-SW	Zymo-Spin™ I-96 Plate (shallow-well)	2 plates	212
C2005	96-Well PCR / Conversion Plate with Cover Foil	2 plates/foils	213
C2006	Zymo-Spin™ IB-96 Plate (shallow-Well)	2 plates	212
C2007-2	96-Well Plate Cover Foil	2 foils	214
C2007-6	96-Well Plate Cover Foil	6 foils	214
C2007-8	96-Well Plate Cover Foil	8 foils	Online
C2007-12	96-Well Plate Cover Foil	12 foils	Online
C2007-24	96-Well Plate Cover Foil	24 foils	Online
C2008	96-Well PCR / Conversion Plate	2 plates	213
C2009	Silicon-A™-HRC Plate	2 plates	Online

Cat. No.	Description	Size	Page
C2010	Zymo-Spin™ I-96-XL Plate	2 plates	212
C2011-2	Air Permeable Sealing Cover	2 pack	Online
C2011-4	Air Permeable Sealing Cover	4 pack	Online
C2011-8	Air Permeable Sealing Cover	8 pack	Online
C2020	96-Well ELISA Plate (12 x 8-well strips)	1 plate	Online
D1000	dNTP Mix [10 mM]	500 µl	43
D1000-1	dNTP Mix [10 mM]	100 µl	43
D1005	dATP [100 mM]	250 µl	43
D1010	dTTP [100 mM]	250 µl	43
D1015	dGTP [100 mM]	250 µl	43
D1020	dCTP [100 mM]	250 µl	43
D1030	5-Methylcytosine dNTP Mix [10 mM]	250 µl	43
D1035	5-Methyl dCTP [10 mM]	100 µl	43
D1040	5-Hydroxymethylcytosine dNTP Mix [10 mM]	250 µl	43
D1045	5-Hydroxymethyl dCTP [100 mM]	100 µl	43
D2001	Zymoprep™ Yeast Plasmid Miniprep I	100 preps	177
D2001-1-15	Solution 1, Digestion Buffer	15 ml	Online
D2001-2-15	Solution 2, Lysis Buffer	15 ml	Online
D2001-3-15	Solution 3, Neutralizing Buffer	15 ml	Online
D2002	YeaStar™ Genomic DNA Kit	40 preps	178
D2002-1	YD Digestion Buffer	4.8 ml	Online
D2002-2	YD Lysis Buffer	4.8 ml	Online
D2004	Zymoprep™ Yeast Plasmid Miniprep II	50 preps	177
D2004-1-10	Solution 1, Digestion Buffer	10 ml	Online
D2004-2-10	Solution 2, Lysis Buffer	10 ml	Online
D2004-3-20	Solution 3, Neutralizing Buffer	20 ml	Online
D3001	Pinpoint® Slide DNA Isolation System	50 preps	75
D3001-1	Pinpoint® Solution	1 ml	Online
D3001-2-5	Proteinase K with Storage Buffer	5 mg	193
D3001-2-20	Proteinase K with Storage Buffer	20 mg	193
D3001-3	Pinpoint® Extraction Buffer	2.5 ml	Online
D3001-4	Pinpoint® Binding Buffer	6 ml	Online
D3001-5	Pinpoint® Wash Buffer	2.4 ml	Online

Cat. No.	Description	Size	Page
D3004-1-100	Genomic Lysis Buffer	100 ml	Online
D3004-1-150	Genomic Lysis Buffer	150 ml	Online
D3004-1-200	Genomic Lysis Buffer	2 x 100 ml	Online
D3004-1-250	Genomic Lysis Buffer	250 ml	Online
D3004-1-1000	Genomic Lysis Buffer	1000 ml	Online
D3004-2-50	g-DNA Wash Buffer	50 ml	Online
D3004-2-100	g-DNA Wash Buffer	100 ml	Online
D3004-2-200	g-DNA Wash Buffer	200 ml	Online
D3004-2-250	g-DNA Wash Buffer	250 ml	Online
D3004-2-400	g-DNA Wash Buffer	4 x 100 ml	Online
D3004-4-1	DNA Elution Buffer	1 ml	Online
D3004-4-4	DNA Elution Buffer	4 ml	Online
D3004-4-10	DNA Elution Buffer	10 ml	Online
D3004-4-16	DNA Elution Buffer	16 ml	Online
D3004-4-50	DNA Elution Buffer	50 ml	Online
D3004-5-15	DNA Pre-wash Buffer	15 ml	Online
D3004-5-30	DNA Pre-wash Buffer	30 ml	Online
D3004-5-50	DNA Pre-wash Buffer	50 ml	Online
D3004-5-250	DNA Pre-wash Buffer	250 ml	Online
D3010	*Quick*-DNA™ 96 Kit	2 x 96 preps	73
D3011	*Quick*-DNA™ 96 Kit	4 x 96 preps	73
D3012	*Quick*-DNA™ 96 Kit	10 x 96 preps	73
D3015	*Quick*-DNA™ Viral Kit	50 preps	78
D3015-1-50	Viral DNA Buffer	50 ml	Online
D3016	*Quick*-DNA™ Viral Kit	200 preps	78
D3016-1-100	Viral DNA Buffer	100 ml	Online
D3017	*Quick*-DNA™ Viral 96 Kit	2 x 96 preps	78
D3018	*Quick*-DNA™ Viral 96 Kit	4 x 96 preps	78
D3020	*Quick*-DNA™ Microprep Kit	50 preps	73
D3021	*Quick*-DNA™ Microprep Kit	200 preps	73
D3024	*Quick*-DNA™ Miniprep Kit (capped)	50 preps	73
D3025	*Quick*-DNA™ Miniprep Kit (capped)	200 preps	73
D3061	*Quick*-DNA™ Urine Kit	50 preps	76
D3061-1-140	Urine Conditioning Buffer™ (UCB™)	140 ml	143
D3067	*Quick*-DNA™ FFPE Kit	50 preps	74

Cat. No.	Description	Size	Page
D4001	Zymoclean™ Gel DNA Recovery Kit (uncapped columns)	50 preps	94
D4001T	Zymoclean™ Gel DNA Recovery Kit (uncapped columns)	10 preps	94
D4001-1-50	ADB (Agarose Dissolving Buffer)	50 ml	Online
D4001-1-100	ADB (Agarose Dissolving Buffer)	100 ml	Online
D4002	Zymoclean™ Gel DNA Recovery Kit (uncapped columns)	200 preps	94
D4003	DNA Clean & Concentrator®-5 (uncapped columns)	50 preps	86
D4003T	DNA Clean & Concentrator®-5 (uncapped columns)	10 preps	86
D4003-1-L	DNA Binding Buffer	50 ml	Online
D4003-1-25	DNA Binding Buffer	25 ml	Online
D4003-2-6	DNA Wash Buffer	6 ml	Online
D4003-2-24	DNA Wash Buffer	24 ml	Online
D4003-2-48	DNA Wash Buffer	48 ml	Online
D4004	DNA Clean & Concentrator®-5 (uncapped columns)	200 preps	86
D4004-1-L	DNA Binding Buffer	100 ml	Online
D4005	DNA Clean & Concentrator®-25 (uncapped columns)	50 preps	86
D4006	DNA Clean & Concentrator®-25 (uncapped columns)	200 preps	86
D4007	Zymoclean™ Gel DNA Recovery Kit (capped)	50 preps	94
D4008	Zymoclean™ Gel DNA Recovery Kit (capped columns)	200 preps	94
D4010	Genomic DNA Clean & Concentrator®-10	25 preps	90
D4011	Genomic DNA Clean & Concentrator®-10	100 preps	90
D4013	DNA Clean & Concentrator®-5 (capped columns)	50 preps	86
D4014	DNA Clean & Concentrator®-5 (capped columns)	200 preps	86
D4015	ZR Plasmid Miniprep™-*Classic*	100 preps	69
D4016	ZR Plasmid Miniprep™-*Classic*	400 preps	69
D4017	ZR-96 DNA Clean-up Kit™	2 x 96 preps	87
D4018	ZR-96 DNA Clean-up Kit™	4 x 96 preps	87
D4019	Zyppy® Plasmid Miniprep Kit	100 preps	67
D4020	Zyppy® Plasmid Miniprep Kit	400 preps	67

Cat. No.	Description	Size	Page
D4021	ZR-96 Zymoclean™ Gel DNA Recovery Kit	2 x 96 preps	94
D4022	ZR-96 Zymoclean™ Gel DNA Recovery Kit	4 x 96 preps	94
D4023	ZR-96 DNA Clean & Concentrator®-5	2 x 96 preps	86
D4024	ZR-96 DNA Clean & Concentrator®-5	4 x 96 preps	86
D4027-1-10	Buffer P1	10 ml	Online
D4027-1-20	Buffer P1	20 ml	Online
D4027-1-80	Buffer P1	80 ml	Online
D4027-1-160	Buffer P1	160 ml	Online
D4027-1-320	Buffer P1	320 ml	Online
D4027-2-10	Buffer P2	10 ml	Online
D4027-2-20	Buffer P2	20 ml	Online
D4027-2-80	Buffer P2	80 ml	Online
D4027-2-160	Buffer P2	160 ml	Online
D4027-2-250	Buffer P2	250 ml	Online
D4027-2-320	Buffer P2	320 ml	Online
D4027-3-12	Buffer P3	12 ml	Online
D4027-3-50	Buffer P3	50 ml	Online
D4027-3-220	Buffer P3	220 ml	Online
D4027-3-440	Buffer P3	440 ml	Online
D4027-4-6	Plasmid Wash Buffer (concentrate)	6 ml	Online
D4027-4-12	Plasmid Wash Buffer (concentrate)	12 ml	Online
D4027-4-24	Plasmid Wash Buffer (concentrate)	24 ml	Online
D4027-4-48	Plasmid Wash Buffer (concentrate)	48 ml	Online
D4029	DNA Clean & Concentrator®-100	25 preps	87
D4030	DNA Clean & Concentrator®-100	50 preps	87
D4031	DNA Clean & Concentrator®-500	10 preps	87
D4032	DNA Clean & Concentrator®-500	20 preps	87
D4033	DNA Clean & Concentrator®-25 (capped columns)	50 preps	86
D4034	DNA Clean & Concentrator®-25 (capped columns)	200 preps	86
D4036	Zyppy® Plasmid Miniprep Kit	50 preps	67
D4036-1-6	7X Lysis Buffer	6 ml	Online
D4036-1-12	7X Lysis Buffer	12 ml	Online
D4036-1-30	7X Lysis Buffer	30 ml	Online
D4036-1-48	7X Lysis Buffer	48 ml	Online
D4036-1-60	7X Lysis Buffer	60 ml	Online
D4036-2-20	Neutralization Buffer	20 ml	Online
D4036-2-40	Neutralization Buffer	40 ml	Online
D4036-2-160	Neutralization Buffer	160 ml	Online
D4036-2-200	Neutralization Buffer	200 ml	Online
D4036-3-6	Endo-Wash Buffer	6 ml	Online
D4036-3-15	Endo-Wash Buffer	15 ml	Online
D4036-3-30	Endo-Wash Buffer	30 ml	Online
D4036-3-60	Endo-Wash Buffer	60 ml	Online
D4036-3-120	Endo-Wash Buffer	120 ml	Online
D4036-3-240	Endo-Wash Buffer	240 ml	Online
D4036-4-6	Zyppy® Wash Buffer	6 ml	Online
D4036-4-12	Zyppy® Wash Buffer	12 ml	Online
D4036-4-24	Zyppy® Wash Buffer	24 ml	Online
D4036-4-48	Zyppy® Wash Buffer	48 ml	Online
D4036-5-5	Zyppy® Elution Buffer	5 ml	Online
D4036-5-10	Zyppy® Elution Buffer	10 ml	Online
D4036-5-20	Zyppy® Elution Buffer	20 ml	Online
D4036-5-30	Zyppy® Elution Buffer	30 ml	Online
D4036-5-60	Zyppy® Elution Buffer	60 ml	Online
D4036-5-100	Zyppy® Elution Buffer	100 ml	Online
D4037	Zyppy® Plasmid Miniprep Kit	800 preps	67
D4041	Zyppy® 96 Plasmid Miniprep Kit	2 x 96 preps	67
D4041-1-30	Deep Blue Lysis Buffer	30 ml	Online
D4041-1-48	Deep Blue Lysis Buffer	48 ml	Online
D4041-4-100	Neutralization/Clearing Buffer	100 ml	Online
D4041-4-200	Neutralization/Clearing Buffer	200 ml	Online
D4042	Zyppy® 96 Plasmid Miniprep Kit	4 x 96 preps	67
D4043	Zyppy® 96 Plasmid Miniprep Kit	8 x 96 preps	67
D4045	Zymoclean™ Large Fragment DNA Recovery Kit	25 preps	95
D4046	Zymoclean™ Large Fragment DNA Recovery Kit	100 preps	95
D4048	ZR BAC DNA Miniprep Kit	25 preps	69
D4049	ZR BAC DNA Miniprep Kit	100 preps	69
D4050	ZR DNA Sequencing Clean-up Kit™	50 preps	92
D4050-1-14	Sequencing Binding Buffer	14 ml	Online
D4050-1-55	Sequencing Binding Buffer	55 ml	Online
D4050-1-500	Sequencing Binding Buffer	500 ml	Online
D4050-2-20	Sequencing Wash Buffer	20 ml	Online
D4050-2-70	Sequencing Wash Buffer	70 ml	Online
D4050-2-500	Sequencing Wash Buffer	500 ml	Online
D4051	ZR DNA Sequencing Clean-up Kit™	200 preps	92
D4052	ZR-96 DNA Sequencing Clean-up Kit™	2 x 96 preps	92
D4053	ZR-96 DNA Sequencing Clean-up Kit™	4 x 96 preps	92
D4054	ZR Plasmid Miniprep™-*Classic*	800 preps	69
D4060	Oligo Clean & Concentrator™	50 preps	88
D4060-1-10	Oligo Binding Buffer	10 ml	Online
D4060-1-40	Oligo Binding Buffer	40 ml	Online
D4061	Oligo Clean & Concentrator™	200 preps	88
D4062	ZR-96 Oligo Clean & Concentrator™	2 x 96 preps	88
D4063	ZR-96 Oligo Clean & Concentrator™	4 x 96 preps	88
D4064	Genomic DNA Clean & Concentrator®-25	25 preps	90
D4065	Genomic DNA Clean & Concentrator®-25	100 preps	90
D4066	ZR-96 Genomic DNA Clean & Concentrator®-5	2 x 96 preps	91
D4067	ZR-96 Genomic DNA Clean & Concentrator®-5	4 x 96 preps	91
D4068	*Quick*-DNA™ Miniprep Plus Kit	50 preps	73
D4068T	*Quick*-DNA™ Miniprep Plus Kit	10 preps	73
D4069	*Quick*-DNA™ Miniprep Plus Kit	200 preps	73
D4070	*Quick*-DNA™ 96 Plus Kit	2 x 96 preps	73
D4071	*Quick*-DNA™ 96 Plus Kit	4 x 96 preps	73
D4074	*Quick*-DNA™ Microprep Plus Kit	50 preps	73
D4075	*Quick*-DNA™ Midiprep Plus Kit	25 preps	73
D4076	*Quick*-cfDNA™ Serum & Plasma Kit	50 preps	77
D4076-A	*Quick*-cfDNA™ Serum & Plasma Buffer Set	Refill	77
D4080	*Select-a-Size*™ DNA Clean & Concentrator®	25 preps	89
D4081	*Quick*-DNA™ Magbead Plus Kit	1 x 96 preps	73
D4082	*Quick*-DNA™ Magbead Plus Kit	4 x 96 preps	73
D4084	*Select-a-Size*™ DNA Clean & Concentrator® MagBead Kit	10 ml	89
D4085	*Select-a-Size*™ DNA Clean & Concentrator® MagBead Kit	80 ml	89
D4100	Zyppy® 96 Plasmid MagBead Miniprep Kit	2 x 96 preps	68
D4100-1-10	MagClearing Beads	10 ml	Online
D4100-1-20	MagClearing Beads	20 ml	Online
D4100-1-40	MagClearing Beads	40 ml	Online
D4100-2-6	MagBinding Beads	6 ml	210
D4100-2-8	MagBinding Beads	8 ml	210
D4100-2-12	MagBinding Beads	12 ml	210
D4100-2-16	MagBinding Beads	16 ml	210
D4100-2-24	MagBinding Beads	24 ml	210
D4101	Zyppy® 96 Plasmid MagBead Miniprep Kit	4 x 96 preps	68
D4102	Zyppy® 96 Plasmid MagBead Miniprep Kit	8 x 96 preps	68
D4200	ZymoPURE™ II Plasmid Midiprep Kit	25 preps	63
D4201	ZymoPURE™ II Plasmid Midiprep Kit	50 preps	63
D4202	ZymoPURE™ II Plasmid Maxiprep Kit	10 preps	63
D4203	ZymoPURE™ II Plasmid Maxiprep Kit	20 preps	63
D4204	ZymoPURE™ II Plasmid Gigaprep Kit	5 preps	63
D4208T	ZymoPURE™ Plasmid Miniprep Kit	10 preps	64
D4209	ZymoPURE™ Plasmid Miniprep Kit	50 preps	64
D4210	ZymoPURE™ Plasmid Miniprep Kit	100 preps	64
D4211	ZymoPURE™ Plasmid Miniprep Kit	400 preps	64
D4212	ZymoPURE™ Plasmid Miniprep Kit	800 preps	64
D4213	ZymoPURE-Express™ Plasmid Midiprep Kit	25 preps	65
D4300	ZymoBIOMICS® DNA Miniprep Kit	50 preps	157
D4300T	ZymoBIOMICS® DNA Miniprep Kit	10 preps	157
D4301	ZymoBIOMICS® DNA Microprep Kit	50 preps	157
D4302	ZymoBIOMICS® 96 MagBead DNA Kit	2 x 96 preps	159
D4303	ZymoBIOMICS® 96 DNA Kit	2 x 96 preps	157
D4304	ZymoBIOMICS® DNA Miniprep Kit	50 preps	157
D4305	ZymoBIOMICS® DNA Microprep Kit	50 preps	Online

Cat. No.	Description	Size	Page
D4306	ZymoBIOMICS® 96 MagBead DNA Kit	2 x 96 preps	159
D4307	ZymoBIOMICS® 96 DNA Kit	2 x 96 preps	157
D4308	ZymoBIOMICS® 96 MagBead DNA Kit	2 x 96 preps	159
D4309	ZymoBIOMICS® 96 DNA Kit	2 x 96 preps	157
D4310	HostZERO™ Microbial DNA Kit	50 preps	160
D5001	EZ DNA Methylation™ Kit	50 rxns	15
D5001-1	CT Conversion Reagent (10 conversions)	1 tube	Online
D5001-1-50	CT Conversion Reagent (5 x 10 conversions)	5 tubes	Online
D5001-2	M-Dilution Buffer	1.3 ml	Online
D5001-3	M-Binding Buffer	20 ml	Online
D5001-4	M-Wash Buffer	6 ml	Online
D5001-5	M-Desulphonation Buffer	10 ml	Online
D5001-6	M-Elution Buffer	1 ml	Online
D5002	EZ DNA Methylation™ Kit	200 rxns	15
D5002-2	M-Dilution Buffer	5.2 ml	Online
D5002-3	M-Binding Buffer	80 ml	Online
D5002-4	M-Wash Buffer	24 ml	Online
D5002-5	M-Desulphonation Buffer	40 ml	Online
D5002-6	M-Elution Buffer	4 ml	Online
D5003	EZ-96 DNA Methylation™ Kit (shallow-well)	2 x 96 rxns	15
D5003-1	CT Conversion Reagent (96 conversions)	1 bottle	Online
D5004	EZ-96 DNA Methylation™ Kit (deep-well)	2 x 96 rxns	15
D5005	EZ DNA Methylation-Gold® Kit	50 rxns	15
D5005-2	M-Dilution Buffer	1.5 ml	Online
D5005-3	M-Binding Buffer	30 ml	Online
D5005-6	M-Dissolving Buffer	500 µl	Online
D5006	EZ DNA Methylation-Gold® Kit	200 rxns	15
D5006-2	M-Dilution Buffer	7 ml	Online
D5006-3	M-Binding Buffer	125 ml	Online
D5006-6	M-Dissolving Buffer	1.2 ml	Online
D5007	EZ-96 DNA Methylation-Gold® Kit (shallow-well)	2 x 96 rxns	15
D5007-4	M-Wash Buffer	36 ml	Online

Cat. No.	Description	Size	Page
D5007-6	M-Elution Buffer	8 ml	Online
D5008	EZ-96 DNA Methylation-Gold® Kit (deep-well)	2 x 96 rxns	15
D5011	Universal Methylated Human DNA Standard	1 set	24
D5012	Universal Methylated Mouse DNA Standard	1 set	24
D5013	Human WGA Methylated & Non-methylated DNA Set	1 set	23
D5013-1	Human WGA Non-methylated DNA	5 µg / 20 µl	Online
D5013-2	Human WGA Methylated DNA	5 µg / 20 µl	Online
D5014	Human Methylated & Non-methylated DNA Set	1 set	23
D5014-1	Human HCT116 DKO Non-methylated DNA	5 µg / 20 µl	153
D5014-2	Human HCT116 DKO Methylated DNA	5 µg / 20 µl	Online
D5015	Bisulfite-Converted Universal Methylated Human DNA Standard	1 set	24
D5016	*E. coli* Non-methylated Genomic DNA	5 µg / 20 µl	24
D5017	Methylated & Non-methylated pUC19 DNA Set	1 set	24
D5018	Human Matched DNA Set	1 set	21
D5018-1	Human Brain DNA	5 µg	Online
D5018-2	Human Spleen DNA	5 µg	Online
D5019	Mouse 5hmC & 5mC DNA Set	1 set	21
D5019-1	Mouse Brain DNA	5 µg	Online
D5019-2	Mouse Kidney DNA	5 µg	Online
D5019-3	Mouse Liver DNA	5 µg	Online
D5019-4	Mouse Thymus DNA	5 µg	Online
D5020	EZ DNA Methlyation-Direct™ Kit	50 rxns	14
D5020-7	M-Solubilization Buffer	4.5 ml	Online
D5020-8	M-Reaction Buffer	1 ml	Online
D5020-9	M-Digestion Buffer (2X)	4 ml	Online
D5021	EZ DNA Methlyation-Direct™ Kit	200 rxns	14
D5021-7	M-Solubilization Buffer	18 ml	Online
D5021-8	M-Reaction Buffer	4 ml	Online
D5021-9	M-Digestion Buffer (2X)	15 ml	Online
D5022	EZ-96 DNA Methylation-Direct™ Kit (shallow-well)	2 x 96 rxns	14

Cat. No.	Description	Size	Page
D5023	EZ-96 DNA Methylation-Direct™ Kit (deep-well)	2 x 96 rxns	14
D5024	EZ DNA Methylation -Startup™ Kit	50 rxns	12
D5030	EZ DNA Methylation-Lightning® Kit	50 rxns	13
D5030T	EZ DNA Methylation-Lightning® Kit	10 rxns	13
D5030-1	Lightning Conversion Reagent	1.5 ml	Online
D5030-5	L-Desulphonation Buffer	10 ml	Online
D5031	EZ DNA Methlyation-Lightning® Kit	200 rxns.	13
D5031-5	L-Desulphonation Buffer	40 ml	Online
D5032	EZ-96 DNA Methylation-Lightning® Kit (shallow-well)	2 x 96 rxns	13
D5032-1	Lightning Conversion Reagent, 1 bottle	15 ml	Online
D5033	EZ-96 DNA Methylation-Lightning® Kit (deep-well)	2 x 96 rxns	13
D5040	EZ-96 DNA Methylation™ MagPrep	4 x 96 rxns	15
D5040-3	M-Binding Buffer	250 ml	Online
D5040-4	M-Wash Buffer	72 ml	Online
D5040-5	M-Desulphonation Buffer	80 ml	Online
D5041	EZ-96 DNA Methylation™ MagPrep	8 x 96 rxns	15
D5041-6	M-Elution Buffer	40 ml	Online
D5042	EZ-96 DNA Methylation-Gold® MagPrep	4 x 96 rxns	15
D5043	EZ-96 DNA Methylation-Gold® MagPrep	8 x 96 rxns	15
D5044	EZ-96 DNA Methylation-Direct™ MagPrep	4 x 96 rxns	14
D5045	EZ-96 DNA Methylation-Direct™ MagPrep	8 x 96 rxns	14
D5046	EZ-96 DNA Methylation-Lightning® MagPrep	4 x 96 rxns	13
D5046-5	L-Desulphonation Buffer	80 ml	Online
D5047	EZ-96 DNA Methylation-Lightning® MagPrep	8 x 96 rxns	13
D5101	Methylated-DNA IP Kit	10 rxns	27
D5101-2	Methylated/Non-methylated Control DNA & Primer Set	1 Set	Online
D5101-3-20	MIP Buffer	20 ml	Online
D5101-4-1	DNA Denaturing Buffer	1 ml	Online
D5101-5-6	IP DNA Binding Buffer	6 ml	Online
D5201	ChIP DNA Clean & Concentrator® (uncapped)	50 preps	36

Cat. No.	Description	Size	Page
D5201-1-50	ChIP DNA Binding Buffer	50 ml	Online
D5201-1-100	ChIP DNA Binding Buffer	100 ml	Online
D5205	ChIP DNA Clean & Concentrator® (capped)	50 preps	36
D5206	ZR-96 ChIP DNA Clean & Concentrator®	2 x 96 rxns	36
D5207	ZR-96 ChIP DNA Clean & Concentrator®	4 x 96 preps	36
D5209	Zymo-Spin™ ChIP Kit	10 preps	36
D5210	Zymo-Spin™ ChIP Kit	25 preps	36
D5210-1-30	Chromatin Shearing Buffer	30 ml	Online
D5210-2-30	Chromatin Dilution Buffer	30 ml	Online
D5210-3-30	Chromatin Wash Buffer I	30 ml	Online
D5210-4-30	Chromatin Wash Buffer II	30 ml	Online
D5210-5-30	Chromatin Wash Buffer III	30 ml	Online
D5210-6-10	5X Chromatin Elution Buffer	10 ml	Online
D5210-7-1	5M NaCl	1 ml	Online
D5220	EZ Nucleosomal DNA Prep Kit	20 preps	37
D5220-1	Micrococcal Nuclease	10 U / 100 µl	193
D5220-2	Nuclei Prep Buffer	50 ml	Online
D5220-3	MN Digestion Buffer	50 ml	Online
D5220-4	5X MN Stop Buffer	6 ml	Online
D5310	*OneStep* qMethyl™ Kit	1 x 96 well	28
D5310-1	2X Test Reaction PreMix	0.5 ml	Online
D5310-2	2X Reference Reaction PreMix	0.5 ml	Online
D5311	*OneStep* qMethyl™-Lite	1 x 96 well	28
D5311-1	2X Test Reaction-Lite PreMix	0.5 ml	Online
D5311-2	2X Reference Reaction-Lite PreMix	0.5 ml	Online
D5325	5-mC DNA ELISA Kit	1 x 96 rxns	25
D5325-1-15	5-mC Coating Buffer	15 ml	Online
D5325-1-30	5-mC Coating Buffer	30 ml	Online
D5325-2-250	5-mC ELISA Buffer	250 ml	Online
D5325-3-15	Secondary Antibody	15 µl	Online
D5325-3-30	Secondary Antibody	30 µl	Online
D5325-5-1	Negative Control	50 µl	Online
D5325-5-2	Positive Control	50 µl	Online
D5326	5-mC DNA ELISA Kit	2 x 96 rxns	25

Cat. No.	Description	Size	Page
D5405	5-Methylcytosine & 5-Hydroxymethylcytosine DNA Standard Set	1 set	21
D5405-1	Cytosine DNA Standard	2 µg	Online
D5405-2	5-Methylcytosine DNA Standard	2 µg	Online
D5405-3	5-Hydroxymethylcytosine DNA Standard	2 µg	Online
D5410	Quest 5-hmC Detection Kit™	25 preps	33
D5411	Quest 5-hmC Detection Kit™	50 preps	33
D5415	Quest 5-hmC Detection Kit™ -Lite	25 preps	33
D5416	Quest 5-hmC Detection Kit™ -Lite	50 preps	33
D5425	Quest 5-hmC™ DNA ELISA Kit	1 x 96 rxns	32
D5425-1-15	Coating Buffer	15 ml	Online
D5425-1-30	Coating Buffer	30 ml	Online
D5425-2-30	10X ELISA Buffer	30 ml	Online
D5425-2-60	10X ELISA Buffer	60 ml	Online
D5425-3-100	Anti-DNA HRP Antibody	100 µl	Online
D5425-3-200	Anti-DNA HRP Antibody	200 µl	Online
D5425-4-15	HRP Developer	15 ml	Online
D5425-4-30	HRP Developer	30 ml	Online
D5425-5-1	Control A	4 µg	Online
D5425-5-2	Control B	4 µg	Online
D5425-5-3	Control C	4 µg	Online
D5425-5-4	Control D	4 µg	Online
D5425-5-5	Control E	4 µg	Online
D5425-5-C	Control DNA Set	5 x 40 µl	Online
D5426	Quest 5-hmC™ DNA ELISA Kit	2 x 96 rxns	32
D5450	RRHP™ 5-hmC Library Prep Kit	12 preps	34
D5451	RRHP™ 5-hmC Library Prep Kit	25 preps	34
D5455	Pico Methyl-Seq™ Library Prep Kit	10 preps	29
D5456	Pico Methyl-Seq™ Library Prep Kit	25 preps	29
D6001-3-40	BashingBead Buffer	40 ml	Online
D6001-3-100	BashingBead Buffer	100 ml	Online
D6001-3-150	BashingBead Buffer	150 ml	Online
D6005	*Quick*-DNA™ Fungal/Bacterial Miniprep Kit	50 preps	82
D6006	*Quick*-DNA™ Fungal/Bacterial 96 Kit	2 x 96 preps	82

Cat. No.	Description	Size	Page
D6007	*Quick*-DNA™ Fungal/Bacterial Microprep Kit	50 preps	82
D6010	*Quick*-DNA™ Fecal/Soil Microbe Miniprep Kit	50 preps	81
D6010-FM	*Quick*-DNA™ Fecal/Soil Microbe 96 Magbead Kit	2 x 96 preps	81
D6011	*Quick*-DNA™ Fecal/Soil Microbe 96 Kit	2 x 96 preps	81
D6011-FM	*Quick*-DNA™ Fecal/Soil Microbe 96 Magbead Kit	2 x 96 preps	81
D6012	*Quick*-DNA™ Fecal/Soil Microbe Microprep Kit	50 preps	81
D6012-FM	*Quick*-DNA™ Fecal/Soil Microbe 96 Magbead Kit	2 x 96 preps	81
D6015	*Quick*-DNA™ Tissue/Insect Microprep Kit	50 preps	83
D6016	*Quick*-DNA™ Tissue/Insect Miniprep Kit	50 preps	83
D6017	*Quick*-DNA™ Tissue/Insect 96 Kit	2 x 96 preps	83
D6020	*Quick*-DNA™ Plant/Seed Miniprep Kit	50 preps	84
D6021	*Quick*-DNA™ Plant/Seed 96 Kit	2 x 96 preps	84
D6030	*OneStep*™ PCR Inhibitor Removal Kit	50 preps	93
D6035	*OneStep*™-96 PCR Inhibitor Removal Kit	2 x 96 preps	93
D6035-1-30	Prep Solution	30 ml	Online
D6105	*Quick*-DNA™ Fungal/Bacterial Midiprep Kit	25 preps	82
D6110	*Quick*-DNA™ Fecal/Soil Microbe Midiprep Kit	25 preps	81
D6300	ZymoBIOMICS® Microbial Community Standard	10 preps	150
D6305	ZymoBIOMICS® Microbial Community DNA Standard	200 ng	151
D6306	ZymoBIOMICS® Microbial Community DNA Standard	2,000 ng	151
D6310	ZymoBIOMICS® Microbial Community Standard II (Log Distribution)	10 preps	153
D6311	ZymoBIOMICS® Microbial Community Standard II (Log Distribution)	220 ng/20 µl	153
D6400	*Quick*-16S™ NGS Library Prep Kit	96 rxns	161
D7001	*Quick*-DNA/RNA™ Miniprep Kit	50 preps	126
D7001-1-50	DNA/RNA Lysis Buffer	50 ml	Online

Cat. No.	Description	Size	Page
D7001-1-200	DNA/RNA Lysis Buffer	200 ml	Online
D7001-2-12	DNA Prep Buffer	12 ml	Online
D7001-2-25	DNA Prep Buffer	25 ml	Online
D7003	*Quick*-DNA/RNA™ Miniprep Plus Kit	50 preps	126
D7003T	*Quick*-DNA/RNA™ Miniprep Plus Kit	10 preps	126
D7005	*Quick*-DNA/RNA™ Microprep Plus Kit	50 preps	126
D7010	ssDNA/RNA Clean & Concentrator™	20 preps	133
D7010-1-10	DNA/RNA Binding Buffer	10 ml	Online
D7010-1-25	DNA/RNA Binding Buffer	25 ml	Online
D7010-1-50	DNA/RNA Binding Buffer	50 ml	Online
D7010-2-10	DNA/RNA Prep Buffer	10 ml	Online
D7010-2-25	DNA/RNA Prep Buffer	25 ml	Online
D7010-2-250	DNA/RNA Prep Buffer	250 ml	Online
D7010-3-6	DNA/RNA Wash Buffer (concentrate)	6 ml	Online
D7010-3-12	DNA/RNA Wash Buffer (concentrate)	12 ml	Online
D7010-3-24	DNA/RNA Wash Buffer (concentrate)	24 ml	Online
D7011	ssDNA/RNA Clean & Concentrator™	50 preps	133
D7020	*Quick*-DNA/RNA™ Viral Kit	25 preps	130
D7020-1-25	Viral DNA/RNA Buffer	25 ml	Online
D7020-1-100	Viral DNA/RNA Buffer	100 ml	Online
D7021	*Quick*-DNA/RNA™ Viral Kit	100 preps	130
D7022	Quick-DNA/RNA™ Viral 96 Kit	2 x 96 preps	130
D7023	Quick-DNA/RNA™ Viral 96 Kit	4 x 96 preps	130
E1004	Zymolyase with Storage Buffer	1,000 U	176, 195
E1005	Zymolyase with Storage Buffer	2,000 U	176, 195
E1006	R-Zymolyase with Storage Buffer	1,000 U	176, 195
E1008-8	RNase A	8 mg	194
E1008-24	RNase A	24 mg	194
E1008-30	RNase A	30 mg	196
E1010	DNase I Set	250 U	193
E2001	Zymo*Taq*™ DNA Polymerase	50 rxns	38, 195

Cat. No.	Description	Size	Page
E2002	Zymo*Taq*™ DNA Polymerase	200 rxns	38, 195
E2003	Zymo*Taq*™ PreMix	50 rxns	38, 195
E2004	Zymo*Taq*™ PreMix	200 rxns	38, 195
E2005	Femto™ Human DNA Quantification Kit	100 rxns	96
E2006	Femto™ Bacterial DNA Quantification Kit	100 rxns	96, 162
E2007	Femto™ Fungal DNA Quantification Kit	100 rxns	96
E2010	CpG Methylase (M. SssI)	200 U	41, 191
E2010-2	10X CpG Reaction Buffer	1 ml	Online
E2010-3	20X SAM (S-adenosylmethionine)	200 µl	Online
E2011	CpG Methylase (M. SssI)	400 U	41,191
E2014	GpC Methylase (M. CviPI)	200 U	41, 192
E2014-2	10X GpC Reaction Buffer	1 ml	Online
E2015	GpC Methylase (M. CviPI)	1,000 U	41, 192
E2016	DNA Degradase™	500 U	40, 192
E2017	DNA Degradase™	2,000 U	40, 192
E2018-50	dsDNA Shearase™ Plus	50 U	42, 192
E2018-200	dsDNA Shearase™ Plus	200 U	42, 192
E2019-50	dsDNA Shearase™ Plus + DCC®-5	50 U + 50 preps	42
E2019-200	dsDNA Shearase™ Plus + DCC®-5	200 U + 200 preps	42
E2020	DNA Degradase Plus™	250 U	40, 192
E2021	DNA Degradase Plus™	1,000 U	40, 192
E2026	5-hmC Glucosyltransferase	100 U	42, 191
E2027	5-hmC Glucosyltransferase	200 U	42, 191
E2030	Atlantis dsDNase	12.5 U	191
E2030-1	Atlantis Digestion Buffer	50 ml	Online
E2050	Quest*Taq*™ PreMix	50 rxns	39, 194

Cat. No.	Description	Size	Page
E2051	Quest*Taq*™ PreMix	200 rxns	39, 194
E2052	Quest*Taq*™ qPCR PreMix	50 rxns	39, 194
E2053	Quest*Taq*™ qPCR PreMix	200 rxns	39, 194
E2054	Zymo*Taq*™ qPCR PreMix	50 rxns	38
E2055	Zymo*Taq*™ qPCR PreMix	200 rxns	38
E2056	ZymoBIOMICS™ PCR Premix	50 rxns	162
E2057	ZymoBIOMICS™ PCR Premix	200 rxns	162
F9001-1	5-Fluoroorotic Acid (powder)	1 g	199
F9001-5	5-Fluoroorotic Acid (powder)	5 g	199
F9003	100X 5-Fluoroorotic Acid (liquid)	10 ml	199
H1001	Squisher™-Single	10 pack	216
H1001-50	Squisher™-Single	50 pack	216
H1002-5	Squisher™-8 with 96-Well Block	5 pack & 1 block	216
H1002-20	Squisher™-8 with 96-Well Block	20 pack & 2 blocks	216
H1004-2	Squisher™-96 with 96-Well Block	2 pack & 2 blocks	216
H1004-5	Squisher™-96 with 96-Well Block	5 pack & 5 blocks	216
I1001-5	Isopropyl-β-D-thiogalactopyranoside (IPTG)	5 ml	199
I1001-25	Isopropyl-β-D-thiogalactopyranoside (IPTG)	5 x 5 ml	199
M2001	ZymoMag Protein A	200 µl	Online
M3011	Dual Media Set™ (100 ml EB & 500 ml OB)	1 Set	186
M3012-100	Expansion Broth (EB)	100 ml	186
M3012-500	Expansion Broth (EB)	500 ml	186
M3013-100	Overexpression Broth (OB)	100 ml	186
M3013-500	Overexpression Broth (OB)	500 ml	186
M3015-100	ZymoBroth™	100 ml	171
M3015-500	ZymoBroth™	5 x 100 ml	171
M5001-50	ZR 50 bp DNA Marker™	50 µg / 100 µl	97
M5001-200	ZR 50 bp DNA Marker™	200 µg / 400 µl	97
M5002-50	ZR 100 bp DNA Marker™	50 µg / 100 µl	97
M5002-200	ZR 100 bp DNA Marker™	200 µg / 400 µl	97

Cat. No.	Description	Size	Page
M5003-50	ZR 1 kb DNA Marker™	50 µg / 100 µl	97
M5003-200	ZR 1 kb DNA Marker™	200 µg / 400 µl	97
M5004-50	ZR 50 bp DNA Marker™ (ready-to-load)	50 µg / 600 µl	97
M5005-50	ZR 100 bp DNA Marker™ (ready-to-load)	50 µg / 600 µl	97
M5006-50	ZR 1 kb DNA Marker™ (ready-to-load)	50 µg / 600 µl	97
P1001-2	96-Well Block	2 blocks	213
P1001-10	96-Well Block	10 blocks	213
P1002-2	96-Well Block with Cover Foil	2 blocks/foils	214
P1005	ZR-96 MagStand	1 stand	Online
P2001	His-Spin Protein Miniprep™	10 preps	188
P2002	His-Spin Protein Miniprep™	50 preps	188
P2003-1	Zymo-Spin™ PI Columns	50 pack	204
P2003-2	His-Affinity Gel	14 ml	188, 199
P2003-3	His-Binding Buffer	50 ml	Online
P2003-4	His-Wash Buffer	50 ml	Online
P2003-5	His-Elution Buffer	25 ml	Online
P2004	Strep-Spin™ Protein Miniprep Kit	10 preps	189
P2005	Strep-Spin™ Protein Miniprep Kit	50 preps	189
P2006	MBP-Spin™ Protein Miniprep Kit	10 preps	190
P2007	MBP-Spin™ Protein Miniprep Kit	50 preps	190
R1001-1	YR Digestion Buffer	3.2 ml	Online
R1001-2	YR Lysis Buffer	6.4 ml	Online
R1002	YeaStar™ RNA Kit	40 preps	183
R1003	Pinpoint® Slide RNA Isolation System I	50 preps	114
R1003-2-3	RNA Extraction Buffer	3 ml	Online
R1003-2-12	RNA Extraction Buffer	12 ml	Online
R1003-2-50	RNA Extraction Buffer	50 ml	Online
R1003-2-100	RNA Extraction Buffer	100 ml	Online
R1003-3-6	RNA Wash Buffer	6 ml	Online
R1003-3-12	RNA Wash Buffer	12 ml	Online
R1003-3-24	RNA Wash Buffer	24 ml	Online
R1003-3-48	RNA Wash Buffer	48 ml	Online

Cat. No.	Description	Size	Page
R1007	Pinpoint® Slide RNA Isolation System II	50 preps	114
R1007-1	RNA Digestion Buffer	1.2 ml	Online
R1008	*Quick*-RNA™ FFPE Kit	50 preps	115
R1009	*Quick*-DNA/RNA™ FFPE Kit	50 preps	132
R1011	Zymoclean™ Gel RNA Recovery Kit	50 preps	120
R1011-1-50	RAD Buffer (RNA Agarose Dissolving Buffer)	50 ml	Online
R1013	RNA Clean & Concentrator™-5 w/ DNase I	50 preps	119
R1013-2-25	RNA Binding Buffer	25 ml	Online
R1013-2-50	RNA Binding Buffer	50 ml	Online
R1013-2-100	RNA Binding Buffer	100 ml	Online
R1013-2-1000	RNA Binding Buffer	1000 ml	Online
R1014	RNA Clean & Concentrator™-5 w/ DNase I	200 preps	119
R1015	RNA Clean & Concentrator™-5	50 preps	119
R1016	RNA Clean & Concentrator™-5	200 preps	119
R1017	RNA Clean & Concentrator™-25	50 preps	119
R1018	RNA Clean & Concentrator™-25	100 preps	119
R1019	RNA Clean & Concentrator™-100	25 preps	119
R1020-2-12	RNA Pre-wash Buffer	12 ml	Online
R1020-2-25	RNA Pre-wash Buffer	25 ml	Online
R1020-2-50	RNA Pre-wash Buffer	50 ml	Online
R1020-2-100	RNA Pre-wash Buffer	100 ml	Online
R1022-2-50	RBC Lysis Buffer	50 ml	Online
R1022-2-100	RBC Lysis Buffer	100 ml	Online
R1034	*Quick*-RNA™ Viral Kit	50 preps	112
R1034-1-50	Viral RNA Buffer	50 ml	Online
R1034-1-100	Viral RNA Buffer	100 ml	Online
R1034-2-6	Viral RNA Wash Buffer (concentrate)	6 ml	Online
R1034-2-24	Viral RNA Wash Buffer (concentrate)	24 ml	Online
R1034-2-48	Viral RNA Wash Buffer (concentrate)	48 ml	Online
R1035	*Quick*-RNA™ Viral Kit	200 preps	112
R1038	ZR Urine RNA Isolation Kit™	20 preps	114
R1039	ZR Urine RNA Isolation Kit™	50 preps	114
R1040	*Quick*-RNA™ Viral 96 Kit	2 x 96 preps	112

Cat. No.	Description	Size	Page
R1041	*Quick*-RNA™ Viral 96 Kit	4 x 96 preps	112
R1042	*Quick*-DNA/RNA™ Pathogen Miniprep Kit	50 preps	131
R1043	*Quick*-DNA/RNA™ Pathogen Miniprep Kit	200 preps	131
R1050	*Quick*-RNA™ Microprep Kit	50 preps	110
R1051	*Quick*-RNA™ Microprep Kit	200 preps	110
R1052	*Quick*-RNA™ 96 Kit	2 x 96 preps	110
R1053	*Quick*-RNA™ 96 Kit	4 x 96 preps	110
R1054	*Quick*-RNA™ Miniprep Kit	50 preps	110
R1055	*Quick*-RNA™ Miniprep Kit	200 preps	110
R1056	*Quick*-RNA™ Midiprep Kit	25 preps	110
R1057	*Quick*-RNA™ Miniprep Plus Kit	50 preps	111
R1057T	*Quick*-RNA™ Miniprep Plus Kit	10 preps	111
R1058	*Quick*-RNA™ Miniprep Plus Kit	200 preps	111
R1059	*Quick-cf*RNA™ Serum & Plasma Kit	50 preps	115
R1060-1-50	RNA Lysis Buffer	50 ml	Online
R1060-1-100	RNA Lysis Buffer	100 ml	Online
R1060-2-10	RNA Prep Buffer	10 ml	Online
R1060-2-25	RNA Prep Buffer	25 ml	Online
R1060-2-50	RNA Prep Buffer	50 ml	Online
R1060-2-100	RNA Prep Buffer	100 ml	Online
R1070	ZR small-RNA™ PAGE Recovery Kit	20 preps	121
R1070-1-10	RNA Recovery Buffer	10 ml	Online
R1070-2-20	RNA MAX Buffer	20 ml	Online
R1072	*Quick*-cfDNA/cfRNA™ Serum & Plasma Kit	50 preps	128
R1072-1-150	*Quick*-cfDNA/cfRNA™ Digestion Buffer	150 ml	Online
R1072-2-150	*Quick*-cfDNA/cfRNA™ Binding Buffer	150 ml	Online
R1072-3-20	Cell-free Recovery Buffer	20 ml	Online
R1080	ZR-96 RNA Clean & Concentrator™	2 x 96 preps	119
R1081	RNA Clean & Concentrator™ MagBead Kit	10 ml	119, 125
R1090	ZR small-RNA™ Ladder	10 µg	120
R1100-50	DNA/RNA Shield™	50 ml	143
R1100-250	DNA/RNA Shield™	250 ml	143

Cat. No.	Description	Size	Page
R1101	DNA/RNA Shield™ - Fecal Collection Tube	10 pack	141, 155
R1102	DNA/RNA Shield™ - Collection Tube	50 tubes	142
R1103	DNA/RNA Shield™ - Microbe Lysis Tube	50 tubes	142, 155
R1104	DNA/RNA Shield™ - Microbe Lysis Tube with Swab	50 tubes/ 50 swabs	142, 155
R1105	DNA/RNA Shield™ - Lysis Tube (Tissue)	50 tubes	142
R1106	DNA/RNA Shield™ - Swab & Collection Tube	10 pack (1 ml fill)	140, 155
R1107	DNA/RNA Shield™ - Swab & Collection Tube	50 pack (1 ml fill)	140, 155
R1108	DNA/RNA Shield™ - Swab & Collection Tube	10 pack (2 ml fill)	140, 155
R1109	DNA/RNA Shield™ - Swab & Collection Tube	50 pack (2 ml fill)	140, 155
R1150	DNA/RNA Shield™ - Blood Collection Tube	50 pack	141
R1151	*Quick*-DNA/RNA™ Blood Tube Kit	50 preps	129
R1200-25	DNA/RNA Shield™ (2X concentrate)	25 ml	143
R1201	*Quick*-RNA™ Whole Blood Kit	50 preps	113
R1210	DNA/RNA Shield™ - Saliva Collection Kit	1 unit	140
R2001	ZymoBIOMICS® RNA Miniprep Kit	50 preps	158
R2002	ZymoBIOMICS® DNA/RNA Miniprep Kit	50 preps	127
R2010	*Quick*-RNA™ Fungal/Bacterial Microprep Kit	50 preps	117
R2014	*Quick*-RNA™ Fungal/Bacterial Miniprep Kit	50 preps	117
R2024	*Quick*-RNA™ Plant Miniprep Kit	50 preps	118
R2030	*Quick*-RNA™ Tissue/Insect Microprep Kit	50 preps	118
R2040	*Quick*-RNA™ Fecal/Soil Microbe Microprep Kit	50 preps	117
R2040-1-50	S/F RNA Lysis Buffer	50 ml	Online
R2050	Direct-zol™ RNA Miniprep Kit	50 preps	105
R2050-1-50	TRI Reagent®	50 ml	Online
R2050-1-200	TRI Reagent®	200 ml	Online
R2050-2-40	Direct-zol™ RNA PreWash (concentrate)	40 ml	Online

Cat. No.	Description	Size	Page
R2050-2-160	Direct-zol™ RNA PreWash (concentrate)	160 ml	Online
R2051	Direct-zol™ RNA Miniprep Kit+ TRI Reagent®	50 preps	105
R2052	Direct-zol™ RNA Miniprep Kit	200 preps	105
R2053	Direct-zol™ RNA Miniprep Kit + TRI Reagent®	200 preps	105
R2054	Direct-zol™ 96 RNA Kit	2 x 96 preps	105
R2055	Direct-zol™ 96 RNA + TRI Reagent®	2 x 96 preps	105
R2056	Direct-zol™ 96 RNA Kit	4 x 96 preps	105
R2057	Direct-zol™ 96 RNA Kit + TRI Reagent®	4 x 96 preps	105
R2060	Direct-zol™ RNA Microprep Kit	50 preps	105
R2061	Direct-zol™ RNA Microprep Kit + TRI Reagent®	50 preps	105
R2062	Direct-zol™ RNA Microprep Kit	200 preps	105
R2063	Direct-zol™ RNA Microprep + TRI Reagent®	200 preps	105
R2070	Direct-zol™ RNA Miniprep Plus Kit	50 preps	105
R2071	Direct-zol™ RNA Miniprep Plus Kit + TRI Reagent®	50 preps	105
R2072	Direct-zol™ RNA Miniprep Plus Kit	200 preps	105
R2073	Direct-zol™ RNA Miniprep Plus Kit + TRI Reagent®	200 preps	105
R2080	Direct-zol™ DNA/RNA Miniprep Kit	50 preps	107
R2080T	Direct-zol™ DNA/RNA Miniprep Kit	10 preps	107
R2081	Direct-zol™ DNA/RNA Miniprep Kit	50 preps	107
R2100	Direct-zol™ 96 MagBead RNA Kit	2 x 96 preps	105, 106
R2100-1-5	Direct-zol™ Binding Buffer	5 ml	Online
R2100-1-10	Direct-zol™ Binding Buffer	10 ml	Online
R2100-1-20	Direct-zol™ Binding Buffer	20 ml	Online
R2100-2-200	Direct-zol™ MagBead PreWash	200 ml	Online
R2101	Direct-zol™ 96 MagBead RNA Kit + TRI Reagent®	2 x 96 preps	105, 106
R2102	Direct-zol™ 96 MagBead RNA Kit	4 x 96 preps	105, 106
R2103	Direct-zol™ 96 MagBead RNA Kit + TRI Reagent®	4 x 96 preps	105, 106
R2104	Direct-zol™ 96 MagBead RNA Kit	8 x 96 preps	105, 106
R2105	Direct-zol™ 96 MagBead RNA Kit + TRI Reagent®	8 x 96 preps	105, 106

Cat. No.	Description	Size	Page
R2130	*Quick*™-DNA/RNA Magbead Kit	1 x 96 preps	126
R2132	*Quick*™-DNA/RNA Magbead Kit	4 x 96 preps	126
R2140	*Quick*-DNA/RNA™ Viral Magbead Kit	96 preps	130
R2141	*Quick*-DNA/RNA™ Viral Magbead Kit	4 x 96 preps	130
R2145	*Quick*-DNA/RNA™ Pathogen Magbead Kit	96 preps	131
R2146	*Quick*-DNA/RNA™ Viral Pathogen Kit	4 x 96 preps	131
R5001	EZ RNA Methylation™ Kit	50 preps	16
R5001-1-1	RNA Conversion Reagent	1.5 ml	Online
R5001-3-10	RNA Desulphonation Buffer	10 ml	Online
R5001-3-40	RNA Desulphonation Buffer	40 ml	Online
R5002	EZ RNA Methylation™ Kit	200 preps	16
S1001	Rattler™ Plating Beads, 230 g	1 bottle	172, 216
S1001-5	Rattler™ Plating Beads, 230 g	5 bottles	172, 216
S1001-B	Rattler™ Plating Beads - bulk format (non-sterile)	25 kg bag	172, 216
S5001	Vortex-Genie® 2 (120V)	1 unit	216
S5001-1	Microtube Foam Inserts	2 units	217
S5001-2	Microplate Foam Inserts	2 units	217
S5001-3	29-37 mm Tube Foam Inserts	2 units	217
S5001-4	Pop-off Cup	1 unit	217
S5001-5	Horizontal 50 ml Tube Holder	1 unit	217
S5001-6	Horizontal 15 ml Tube Holder	1 unit	217
S5001-7	Horizontal Microtube Holder	1 unit	217
S5002	Vortex-Genie® 2 (230V, Euro plug)	1 unit	216
S5009	MagStir Genie® (120V)	1 unit	217
S6001-2-120	Disruptor Genie® (120V)	1 unit	215
S6001-2-230	Disruptor Genie® (230V, Euro plug)	1 unit	215
S6002-96-2	BashingBead™ Lysis 96 Rack (2 mm)	1 rack	214
S6002-96-3	BashingBead™ Lysis 96 Rack (0.1 & 0.5 mm)	1 rack	214
S6003-50	BashingBead™ Lysis Tubes (2 mm)	50 tubes	210
S6005	FastPrep®-24	1 unit	215
S6005-1	HiPrep™ Adapter (48 x 2 ml tubes)	1 unit	215

Cat. No.	Description	Size	Page
S6005-2	CoolPrep™ Adapter (24 x 2 ml tubes)	1 unit	215
S6005-3	TeenPrep™ Adapter (12 x 15 ml tubes)	1 unit	215
S6010	ZR BashingBead™ Lysis/Filtration Tubes with 0.5 mm Beads (50 ml)	25 pack	Online
S6011	ZR BashingBead™ Lysis/Filtration Tubes with 2.0 mm Beads (50 ml)	25 pack	Online
S6012-50	BashingBead™ Lysis Tubes (0.5 & 0.1 mm)	50 tubes	210
S6022	TerraLyzer™	1 unit	215
S7000	EZ-Vac™ Vacuum Manifold	1 manifold	217
T2001	Frozen-EZ Yeast Transformation II™ Kit	120 rxns	180
T2002	Frozen-EZ Solution 1	60 ml	Online
T2003	Frozen-EZ Solution 2	6 ml	Online
T2004	Frozen-EZ Solution 3	60 ml	Online
T3001	*Mix & Go!™ E. coli* Transformation Kit	up to 20 ml	170
T3001-2-10	*Mix & Go!™* 2X Stock Wash Buffer	10 ml	Online
T3001-2-30	*Mix & Go!™* 2X Stock Wash Buffer	30 ml	Online
T3001-3-10	*Mix & Go!™* 2X Stock Competent Buffer	10 ml	Online
T3001-3-30	*Mix & Go!™* 2X Stock Competent Buffer	30 ml	Online
T3001-4-20	*Mix & Go!™* Dilution Buffer	20 ml	Online
T3001-4-60	*Mix & Go!™* Dilution Buffer	60 ml	Online
T3002	*Mix & Go!™ E. coli* Transformation Buffer Set	up to 60 ml	170
T3003	*Mix & Go!™* Competent Cells - Strain JM109	10 x 100 µl	167
T3005	*Mix & Go!™* Competent Cells - Strain JM109	96 x 50 µl	167
T3007	*Mix & Go!™* Competent Cells - DH5 Alpha	10 x 100 µl	167
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T3010	*Mix & Go!™* Competent Cells - DH5 Alpha w/ 96-well PCR plates and Cover Foils	96 x 50 µl	167
T3011	*Mix & Go!™* Competent Cells - HB101	10 x 100 µl	167
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T3021	*Mix & Go!*™ Competent Cells - XJa Autolysis™	10 x 100 µl	169
T3031	*Mix & Go!*™ Competent Cells - XJa(DE3) Autolysis™	10 x 100 µl	169
T3041	*Mix & Go!*™ Competent Cells - XJb Autolysis™	10 x 100 µl	169
T3051	*Mix & Go!*™ Competent Cells - XJb(DE3) Autolysis™	10 x 100 µl	169
T5021	XJa Autolysis™, Glycerol Stock	1 tube	169
T5031	XJa(DE3) Autolysis™, Glycerol Stock	1 tube	169
T5041	XJb Autolysis™, Glycerol Stock	1 tube	169
T5051	XJb(DE3) Autolysis™, Glycerol Stock	1 tube	169
W1001-1	DNase/RNase-free Water	1 ml	Online
W1001-4	DNase/RNase-free Water	4 ml	Online
W1001-6	DNase/RNase-free Water	6 ml	Online
W1001-10	DNase/RNase-free Water	10 ml	Online
W1001-30	DNase/RNase-free Water	30 ml	Online
X1001-5	5-bromo-4-chloro-3-indolyl β-D-galactopyranoside (X-GAL)	5 ml	199
X1001-25	5-bromo-4-chloro-3-indolyl β-D-galactopyranoside (X-GAL)	5 x 5 ml	199
Y1001	α-Factor Mating Pheromone	240 µl	181
Y1002	Yeast Protein Kit™	200 preps	183
Y1002-1-100	Y-Lysis Buffer	100 ml	Online
Y1002-1-6	Y-Lysis Buffer	6 ml	Online
Y1003-50	YPD Plus™	50 ml	179
Y1003-100	YPD Plus™	2 x 50 ml	179
Y1004-500	a-Factor Mating Pheromone	500 µl	181

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Zymo Research Locations

Zymo Research Corporation (USA)
Corporate Headquarters
17062 Murphy Ave.
Irvine, CA 92614

Tel: 1-888-882-9682 • 1-949-679-1190
Fax: 1-949-266-9452
Email: info@zymoresearch.com
Web: www.zymoresearch.com

Zymo Research (Europe) GmbH
Mülhauser Str.9
79110 Freiburg im Breisgau,
Germany

Tel.: +49 (0) 761 6006871 0
Fax: +49 (0) 761 6006871 20
Email: orders@zymoresearch.de
Web: www.zymoresearch.de

Zymo Research (China)
170 Beiyuan Road, Suite 1809, Tower E
Chaoyang District, Beijing, 100101
P.R. China

Tel: +86-010-58235289
Fax: +86-010-58235289
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The dsDNA Shearase™, EZ DNA Methylation-Gold™, EZ DNA Methylation-Direct™, Zymo-Spin™ V-E, Direct-zol, Zyppy® plasmid prep, and ZymoPURE™ plasmid prep technologies are patent pending and subject to issued patents below

Zymo Product Patents

Direct-zol™ is patented: US Patent No: 9,051,563 B2; EP Patent No: 2,479,274 A1, 2,479,274 B1, and 3,106,518 A1.

XJ Autolysis™ is patented: US Patent No: 7,892,811 B2.

Zyppy® is patented: US Patent No: 7,754,873 B2.

TerraLyzer™ is patented: US Patent Nos: 9,150,826 B2, US 9,410,115 B2 and D668,563 S.

ZymoPURE™ is patent pending.
Additional plasmid preparation technologies are patented: US Patent Nos.: 7,858,363 B2 and 7,867,751 B2.

Zymo-Spin™ V-E and Zymo-Spin™ V-P Columns (Universal Columns) is patented: US Patent No.: D613,873 S.

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17062 Murphy Ave.
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Product Information: info@zymoresearch.com
www.zymoresearch.com

Zymo Research Europe GmbH

Mülhauser Str.9
79110 Freiburg im Breisgau, Germany
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Product Information: orders@zymoresearch.de
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