ZYMO RESEARCH

*The Beauty of Science is to Make Things Simple*

# INSTRUCTION MANUAL

# DNA Clean & Concentrator™-5

Catalog Nos. **D4003T, D4003, D4004, D4013 & D4014**

## Highlights

- Quick, 2 minute recovery of ultra-pure DNA from PCR, enzymatic reactions, and other sources.
- DNA can be eluted in as little as 6 µl and is ideal for DNA ligation, sequencing, labeling, PCR, microarray, transfection, transformation, restriction digestion, etc.

## Contents




**ZYMO RESEARCH CORP.**

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Satisfaction of all Zymo Research products is guaranteed. If you should be dissatisfied with this product please call 1-888-882-9682.

## Product Contents

| **DNA Clean & Concentrator™-5** (Kit Size) | **D4003T** (10 Preps.) | **D4003, D4013** (50 Preps.) | **D4004, D4014** (200 Preps.) | **Storage Temperature** |
|---|---|---|---|---|
| **DNA Binding Buffer** | 10 ml | 50 ml | 2 x 100 ml | Room Temp. |
| **DNA Wash Buffer**[1] | 6 ml | 6 ml | 24 ml | Room Temp. |
| **DNA Elution Buffer** | 1 ml | 1 ml | 4 ml | Room Temp. |
| **Zymo-Spin™ Columns** | 10<br>Uncapped | 50<br>D4003 – uncapped<br>D4013 – capped | 200<br>D4004 – uncapped<br>D4014 – capped | Room Temp. |
| **Collection Tubes** | 10 | 50 | 200 | Room Temp. |
| **Instruction Manual** | 1 | 1 | 1 | - |

Integrity of kit components is guaranteed for up to one year from date of purchase. Reagents are routinely tested on a lot-to-lot basis to ensure they provide the highest performance and reliability.

[1] Ethanol must be added prior to use as indicated on the **DNA Wash Buffer** label. DNA Wash Buffer included with D4003S and D4003T is supplied ready-to-use and does not require the addition of ethanol prior to use.

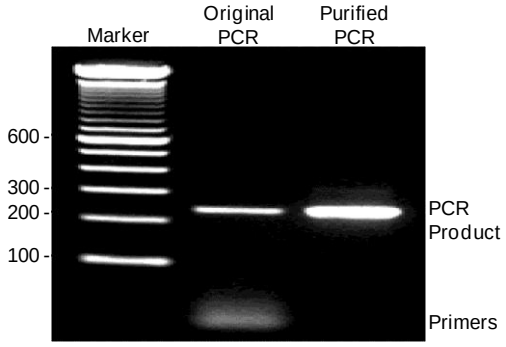
## Specifications

- **DNA Purity** – High-quality DNA ($A_{260}/A_{280}$ >1.8) ideal for ligation, sequencing, labeling, PCR, microarray, transfection, transformation, and restriction digestion procedures.
- **DNA Size Limits** – From ~50 bp to 23 kb.
- **DNA Recovery** – Typically, up to 5 µg total DNA per column can be eluted into as little as 6 µl of low salt **DNA Elution Buffer** or water. For DNA 50 bp to 10 kb, the recovery is 70-90%. For DNA 11 kb to 23 kb, the recovery is 50-70%.
- **Sample Sources** – DNA from enzymatic reactions (e.g., PCR, restriction endonuclease digestions), plasmid preparations, and impure preparations.
- **Product Detergent Tolerance** – ≤5% Triton X-100, ≤5% Tween-20, ≤5% Sarkosyl, ≤ 0.1% SDS.

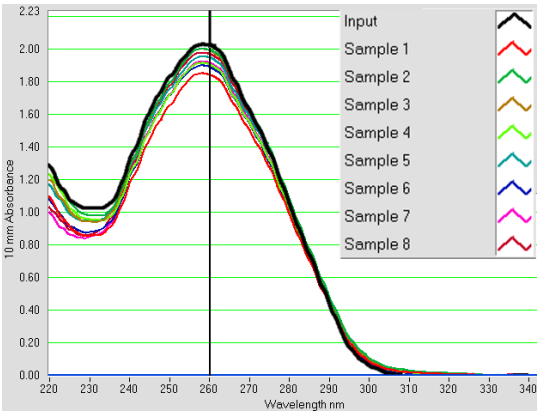
## Product Description

The **DNA Clean & Concentrator™-5** (**DCC™-5**) provides a hassle-free method for the rapid purification and concentration of high-quality DNA from PCR, endonuclease digestions, cell lysates, and other impure DNA preparations. It can also be used for post-RT cDNA clean-up and purification of sequencing-ready DNA from M13 phage. Simply add the specially formulated **DNA Binding Buffer** to your sample and transfer the mixture to the supplied **Zymo-Spin™ Column**. There is no need for organic denaturants or chloroform. Instead, the product features *Fast-Spin* column technology to yield DNA that is free of salts and contaminants in just 2 minutes. The purified DNA is ideal for DNA ligation, sequencing, labeling, PCR, microarray, transfection, transformation, and restriction digestion procedures.


Two minute **DCC-5™** procedure.




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




**Pure and Reliable Recovery with the DCC™-5**. Shown here is the recovery of 1 µg of 100 bp marker DNA eluted into 10 µl of water analyzed using a NanoDrop® spectrophotometer. The DNA Clean & Concentrator™-5 consistently recovers > 90% of input DNA.

## Available Formats

| | DCC™-5 | DCC™-25 | DCC™-100 | DCC™-500 | Genomic DCC™ | ZR-96 DCC™-5 |
|---|---|---|---|---|---|---|
| |  |  |  |  |  |  |
| Name | Zymo-Spin™ I & IC | Zymo-Spin™ II & IIC | Zymo-Spin™ V | Zymo-Spin™ VI | Zymo-Spin ™ IC-XL | Zymo-Spin™ I-96 |
| Capacity | 5 µg/ prep. | 25 µg/ prep. | 100 µg/ prep. | 500 µg/ prep. | 10 µg/ prep. | 5 µg/ prep. |
| Elution Vol. | ≥ 6 µl | ≥ 25 µl | ≥ 150 µl | ≥ 2 ml | ≥ 10 µl | ≥ 10 µl |
| Cat. Nos. | D4003, D4013 | D4005, D4033 | D4029, D4030 | D4031, D4032 | D4010, D4011 | D4023, D4024 |

## Typical DCC™ Applications

| | |
|---|---|
| **Post-PCR DNA Clean-up** | Efficient desalting of DNA with the removal of DNA polymerases, primers and free dNTPs. |
| **DNA Clean-up From Enzymatic Reactions** | Efficient desalting of DNA with the removal of modifying enzymes, RNA polymerases, ligases, kinases, nucleases, phosphatases, endonucleases, *etc.* |
| **Post-Reverse Transcription (RT) & cDNA Clean-up** | Efficiently purifies DNA following RT, either as a DNA/RNA complex or as single stranded cDNA following chemical hydrolysis of the RNA template. |
| **Plasmid DNA Clean-up** | Efficiently purifies plasmid DNA from "home-made" preparations of cell free lysates or from commercial kits. Plasmid DNA purified and concentrated using the **DCC™** has proven an excellent substrate for high quality DNA sequencing. |
| **Isotope and Dye Removal** | Efficiently removes unincorporated fluorescent (*i.e.*, AMCA, FITC, BIO, DIG, Cy3, Cy5, FAM, *etc.*) and radiolabeled dNTP derivatives from DNA following *in vitro* labeling reactions. |
| **Purification of M13 ssDNA** | The **DCC™** can be used for the rapid isolation of single stranded M13 phage DNA directly from phage-infected *E. coli* culture supernatant. |

- ✓ For purification of short DNA or RNA oligonucleotides ≥ 16 nt, use the **Oligo Clean & Concentrator (D4060, D4061)**.
- ✓ For ChIP (Chromatin Immunoprecipitation) sample cleanup, use **the ChIP DNA Clean & Concentrator (D5201, D5205)** for high quality DNA from any step in a standard ChIP protocol.
- ✓ For post-cycle sequencing samples, use the **ZR Sequencing DNA Clean-up Kit (D4050, D4051)** for dye blob elimination.
- ✓ For samples containing PCR inhibitors, use the ***OneStep*™ PCR Inhibitor Removal Kit (D6030, D6035)**.

## Selected Citations


Li, N. (2010). Whole genome DNA methylation analysis based on high throughput sequencing technology. *Methods, 52* (3), 221-232.

Lee, EJ. (2011). Targeted bisulfite sequencing by solution selection and massively parallel sequencing. *Nucleic Acids Research, 39*(19), e127, doi:10.1093/nar/gkr598

Papageorgiou, EA. (2009). Sites of differential DNA methylation between placenta and peripheral blood. *Am J Pathol, 174* (5), 1609-1618.

Ferguson, A.A. et al. (2009). Retrofitting ampicillin resistant vectors by recombination for use in generating *C. elegans* transgenic animals by bombardment. *Plasmid, 62*, 140-145.

## Buffer Preparation

- ✓ *Before starting:* Add 24 ml 100% ethanol (26 ml 95% ethanol) to the 6 ml **DNA Wash Buffer** concentrate. Add 96 ml 100% ethanol (104 ml 95% ethanol) to the 24 ml **DNA Wash Buffer** concentrate.

- ✓ DNA Wash Buffer included with D4001S and D4001T is supplied ready-to-use and does not require the addition of ethanol prior to use.

## Protocol

*All centrifugation steps should be performed between 10,000 - 16,000 x g.*

1. In a 1.5 ml microcentrifuge tube, add 2-7 volumes of **DNA Binding Buffer** to each volume of DNA sample (see table below). Mix briefly by vortexing.

| Application | DNA Binding Buffer : Sample | Example |
|---|---|---|
| Plasmid, genomic DNA (>2 kb) | 2 : 1 | 200 µl : 100 µl |
| PCR product, DNA fragment | 5 : 1 | 500 µl : 100 µl |
| ssDNA[1] (*e.g.* cDNA, M13 phage) | 7 : 1 | 700 µl : 100 µl |

For efficient recovery of genomic or large DNA (> 20 kb to > 200 kb), use the **Genomic DNA Clean & Concentrator™ (Cat. Nos. D4010, D4011)**.

2. Transfer mixture to a provided **Zymo-Spin™ Column**[2] in a **Collection Tube**.

3. Centrifuge for 30 seconds. Discard the flow-through.

4. Add 200 µl **DNA Wash Buffer** to the column. Centrifuge for 30 seconds. Repeat the wash step.

5. Add ≥ 6 µl **DNA Elution Buffer**[3] or water[4] directly to the column matrix and incubate at room temperature for one minute. Transfer the column to a 1.5 ml microcentrifuge tube and centrifuge for 30 seconds to elute the DNA.

   Ultra-pure DNA is now ready for use.

For **Assistance**, please contact Zymo Research Technical Support at 1-888-882-9682 or e-mail tech@zymoresearch.com.

**Notes:**

[1] For ssDNA purification, see **Appendix A** on page 5.

[2] The sample capacity of the column is 800 µl. Therefore, it may be necessary to load and spin a column multiple times if a sample has a volume larger than 800 µl.

[3] **DNA Elution Buffer**: 10 mM Tris-HCl, pH 8.5, 0.1 mM EDTA

[4] Elution of DNA from the column is dependent on pH and temperature. If water is used, make sure the pH is >6.0. Waiting 1 minute prior to elution may improve the yield of larger (> 6 kb) DNA. For even larger DNA (> 10 kb), the total yield may be improved by eluting the DNA with 60-70 °C **DNA Elution Buffer**.

For clean-up of short cDNAs or ESTs (≥ 16 nt), we recommend the **Oligo Clean & Concentrator ™ (Cat. Nos. D4060, D4061)**.

# Appendix A: ssDNA Purification

## *cDNA clean-up*

*The DCC™ kit can be used to effectively clean and concentrate cDNA (> 500 nt) following reverse transcription (RT) in the presence/absence of fluorescent dyes. Unincorporated free nucleotides and fluorescent derivatives are efficiently removed using the DCC™, and the recovered cDNA may be used directly for microarray analysis, second-strand cDNA synthesis, or indirect labeling with a fluorescent dye such as NHS ester Cy3 or Cy5.*

### *Hydrolysis*

1. Add 10 µl 0.5 M EDTA and 10 µl 1 N NaOH to 50 µl of RT reaction.

   The volumes of EDTA and NaOH should be scaled proportionally depending on the starting volume of the RT reaction.

2. Incubate at 65°C for 15 minutes.

### *Clean-up*

1. Add 490 µl (7 volumes) of **DNA Binding Buffer** to the hydrolysis reaction above. Mix well.

   Neutralization (pH) following RNA hydrolysis is not necessary as the **DNA Binding Buffer** will effectively neutralize the NaOH added to the reaction.

2. Continue with *Step 2* of the Protocol on page 4.

## *M13 phage ssDNA purification*

1. Centrifuge phage-infected bacterial culture at 8,000 x *g* for 1 minute
2. Transfer 100 µl of phage-containing supernatant to a 1.5 ml microcentrifuge tube and add 700 µl (7 volumes) of **DNA Binding Buffer**. Mix briefly by vortexing.

   Increased supernatant volumes may be processed by proportionally increasing the amount of **DNA Binding Buffer** added to the sample.

3. Continue with *Step 2* of the Protocol on page 4.

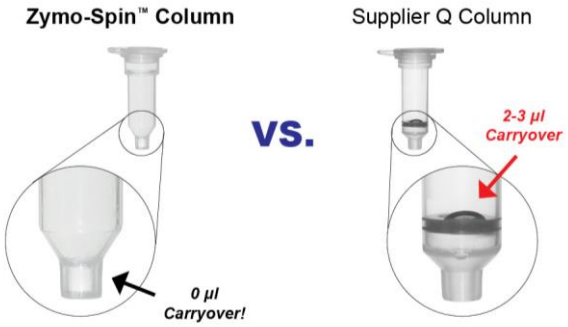
## Appendix B: Troubleshooting

### *Low Recovery*

- **Improperly Prepared/Stored DNA Wash Buffer**
  Make sure ethanol has been added to the **DNA Wash Buffer** concentrate. Cap the bottle tightly to prevent evaporation over time.
- **Addition of DNA Elution Buffer**
  Add elution buffer directly to the column matrix and not to the walls of the column. Elution buffer requires contact with the matrix for at least 1 minute for large DNA ≥ 10 kb.
- **Incomplete Elution**
  1. DNA elution is dependent on pH, temperature, and time. For large genomic DNA (≥ 50 kb), apply heated elution buffer (60-70 °C) and incubate for several minutes prior to elution.
  2. Sequential elutions may be performed for quantitatively higher recovery but lower final DNA concentration. This is recommended for DNA ≥ 10 kb.

### *Low $A_{260}/A_{230}$ Ratios*

- **Column Tip Contaminated**
  When removing the column from the collection tube, be careful that the tip of the column does not come into contact with the flowthrough. Trace amounts of salt from the flowthrough can contaminate a sample resulting in low $A_{260}/A_{230}$ ratios. Ethanol contamination from the flowthrough can also interfere with DNA elution. Zymo-Spin™ columns are designed for complete elution with no buffer retention or carryover (see below).




### *Following Clean-up with the DCC™, Multiple Bands Appear in an Agarose Gel*

- **Acidification of DNA Loading Dye**
  Most loading dyes do not contain EDTA and will acidify (pH ≤ 4) over time due to some microbial growth. This low pH is enough to cause DNA degradation. Therefore, if water is used to elute the DNA, 6X Loading Dye containing 1 mM EDTA is recommended.

## Ordering Information

| Product Description | Catalog No. | Kit Size (Preps.) |
|---|---|---|
| **DNA Clean & Concentrator™-5**<br>(for purification of up to 5 µg DNA per prep.)<br>*Supplied with **uncapped columns*** | D4003T<br>D4003<br>D4004 | 10<br>50<br>200 |
| **DNA Clean & Concentrator™-5**<br>(for purification of up to 5 µg DNA per prep.)<br>*Supplied with **capped columns*** | D4013<br>D4014 | 50<br>200 |
| **ZR-96 DNA Clean & Concentrator™-5**<br>(for 96-well purification of up to 5 µg DNA per well) | D4023<br>D4024 | 2 x 96<br>4 x 96 |
| **DNA Clean & Concentrator™-25**<br>(for purification of up to 25 µg DNA per prep.)<br>*Supplied with **uncapped columns*** | D4005<br>D4006 | 50<br>200 |
| **DNA Clean & Concentrator™-25**<br>(for purification of up to 25 µg DNA per prep.)<br>*Supplied with **capped columns*** | D4033<br>D4034 | 50<br>200 |
| **DNA Clean & Concentrator™-100**<br>(for purification of up to 100 µg DNA per prep.) | D4029<br>D4030 | 25<br>50 |
| **DNA Clean & Concentrator™-500**<br>(for purification of up to 500 µg DNA per prep.) | D4031<br>D4032 | 10<br>20 |
| **Oligo Clean & Concentrator™**<br>(for purification of up to 5 µg of oligonucleotides per prep.) | D4060<br>D4061 | 50<br>200 |
| **Genomic DNA Clean & Concentrator™**<br>(for purification of up to 10 µg genomic DNA per prep.) | D4010<br>D4011 | 25<br>100 |

*Refer to Page 3 for column design specifics in each kit.*

| For Individual Sale | Catalog No. | Size |
|---|---|---|
| **DNA Binding Buffer** | D4003-1-L<br>D4004-1-L | 50 ml<br>100 ml |
| **DNA Wash Buffer** (concentrate) | D4003-2-6<br>D4003-2-24 | 6 ml<br>24 ml |
| **DNA Elution Buffer** | D3004-4-1<br>D3004-4-4 | 1 ml<br>4 ml |
| **Zymo-Spin™ I Columns** (uncapped) | C1003-50<br>C1003-250 | 50 columns<br>250 columns |
| **Zymo-Spin™ IC Columns** (capped) | C1004-50<br>C1004-250 | 50 columns<br>250 columns |
| **Collection Tubes** | C1001-50<br>C1001-500<br>C1001-1000 | 50 tubes<br>500 tubes<br>1000 tubes |

# *Popular Products From Zymo Research*

| Product | Description | Kit Size (Preps.) | Catalog No. (Format) |
|---|---|---|---|
| ***DNA Clean-up, Concentration & Recovery*** | | | |
| **DNA Clean & Concentrator™-5** | Clean and concentrate up to 5 µg DNA into ≥6 µl elution volume in as little as 2 minutes with no wash residue carryover. | 50<br>200<br>50<br>200 | **D4003** (uncapped)<br>**D4004** (uncapped)<br>**D4013** (capped)<br>**D4014** (capped) |
| **DNA Clean & Concentrator™-25** | Clean and concentrate 25 µg of DNA into ≥25 µl elution volume in as little as 2 minutes with no wash residue carryover. | 50<br>200<br>50<br>200 | **D4005** (uncapped)<br>**D4006** (uncapped)<br>**D4033** (capped)<br>**D4034** (capped) |
| **ZR-96 DNA Clean & Concentrator™-5** | Quick (30 minute), high throughput recovery of up to 5 µg pure DNA into 10-15 µl minimum elution volume allows for highly concentrated DNA. | 2 x 96<br>4 x 96 | **D4023**<br>**D4024** |
| **Genomic DNA Clean & Concentrator™** | Quick (5 minute) clean-up of up to 10 µg high molecular weight DNA (≥ 20kb - 200 kb) from any enzymatic reaction or impure preparation without precipitations. | 25<br>100 | **D4010**<br>**D4011** |
| **Zymoclean™ Gel DNA Recovery Kit** | Purify DNA from high and low-melting agarose gels in minutes. | 50<br>200<br>50<br>200 | **D4001** (uncapped)<br>**D4002** (uncapped)<br>**D4007** (capped)<br>**D4008** (capped) |
| **ZR-96 Zymoclean™ Gel DNA Recovery Kit** | High-throughput DNA purification from high and low-melting agarose gels. | 2 x 96<br>4 x 96 | **D4021**<br>**D4022** |
| **Zymoclean™ Large Fragment DNA Recovery Kit** | Purify high molecular weight DNA (≥ 20 kb - 200 kb) from high and low-melting agarose gels in minutes. | 25<br>100 | **D4045**<br>**D4046** |
| ***OneStep*™ PCR Inhibitor Removal Kit** | Fast, one step procedure for removal of PCR inhibitors such as polyphenolics, humic/fulvic acids, melanin, etc. for successful PCR and other downstream applications. | 50<br>2 x 96 | **D6030**<br>**D6035** |
| ***Plasmid DNA Purification*** | | | |
| **Zyppy™ Plasmid Miniprep Kit** | Pellet-Free™ plasmid DNA purification in less than 10 minutes. Recover up to 25 µg DNA in as low as 30 µl. | 50<br>100<br>400 | **D4036**<br>**D4019**<br>**D4020** |
| **Zyppy™-96 Plasmid Miniprep** | The fastest and simplest high-throughput method for plasmid purification. Magnetic bead format available for automated liquid handling platforms. | 2 x 96<br>4 x 96<br>8 x 96<br>2 x 96<br>4 x 96<br>8 x 96 | **D4041** (spin plate)<br>**D4042** (spin plate)<br>**D4043** (spin plate)<br>**D4100** (magnetic bead)<br>**D4101** (magnetic bead)<br>**D4102** (magnetic bead) |
| **Zyppy™ Plasmid Midiprep Kit** | Pellet-Free™ plasmid DNA purification in 15 minutes in a 150 µl minimum elution volume. | 25<br>50 | **D4025**<br>**D4026** |
| **ZR Plasmid MiniPrep™-*Classic*** | Plasmid DNA purification in minutes: (alkaline lysis/spin column format for low 30 µl elution volume). | 100<br>400<br>800 | **D4015**<br>**D4016**<br>**D4054** |
| ***Genomic DNA Purification*** | | | |
| ***Quick-gDNA*™ MiniPrep** | Easy purification from whole blood, plasma, serum, body fluids, buffy coat, tissue, swabs or cultured cells ≥15 minutes without the use of Proteinase K or organic denaturants. | 50/200<br>50/200 | **D3006/D3007** uncapped)<br>**D3024/D3025** (capped) |
| **ZR Genomic DNA™-Tissue MiniPrep** | High quality DNA purification from solid tissues (e.g., tail snips, ear punches, adipose tissue, etc.), body fluids, cultured cells, buccal cells, FFPE tissues, hair, and other biological sources using Proteinase K and Fast. | 50<br>200 | **D3050**<br>**D3051** |
| **Environmental DNA Purification Kits** | Unique BashingBead™ technology allows isolation of DNA from samples refractory to conventional lysis procedures including tough-to-lyse tissues, soil samples, feces, plants, seeds, insects, bacteria, yeast, filamentous fungi, unicellular and filamentous algae, and protozoa | Spin Column<br>&<br>96-well Plate | **Visit website for a comprehensive list** |
| ***RNA Purification*** | | | |
| **RNA Clean & Concentrator™-5** | Clean and concentrate up to 5 µg RNA into ≥6 µl elution volume in as little as 5 minutes with no wash residue carryover. | 50<br>200 | **R1015**<br>**R1016** |
| **Direct-Zol™ RNA MiniPrep** | Quick, spin column purification of high-quality (DNA-free) total RNA ***directly*** from *TRI-Reagent*® or similar acid-guanidinium-phenol based reagents (TRIzol®, RNAzol®, QIAzol®, TriPure, RNA-Bee *etc.*). | 50<br>200 | **R2051**<br>**R2053** |
| **ZR RNA MiniPrep** | Rapid (15 minute) RNA isolation from a variety of sources using *Fast-Spin* column technology without the use of organic denaturants.. | 50<br>200 | **R1064**<br>**R1065** |

# *Epigenetics Products From Zymo Research*

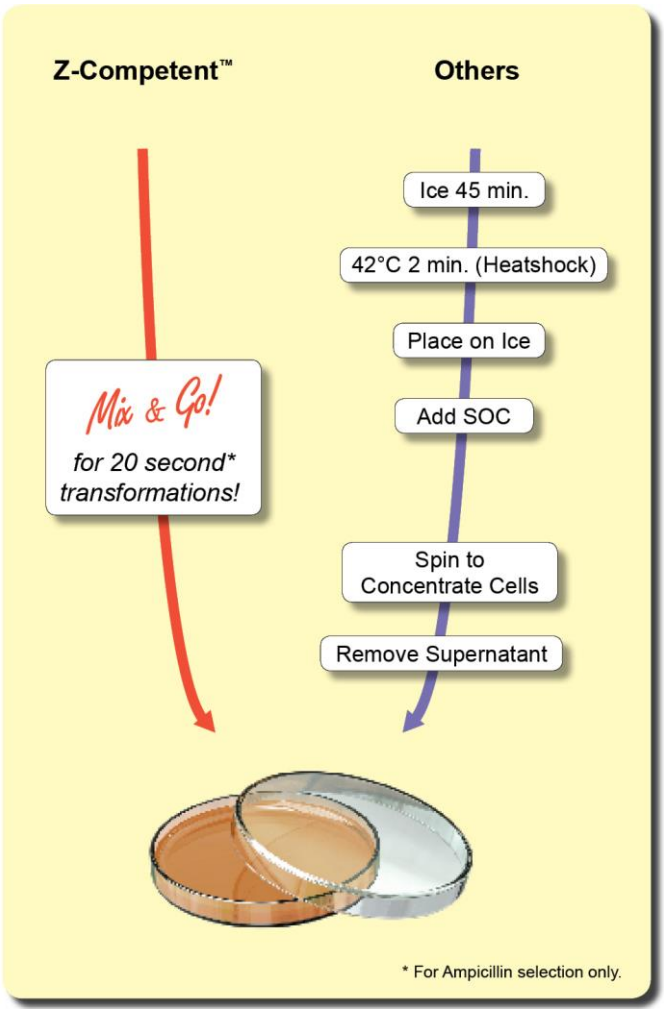
| Product | Description | Kit Size | Cat. No. (Format) |
|---|---|---|---|
| ***Bisulfite Kits for DNA Methylation Detection*** | | | |
| **EZ DNA Methylation™ Kit** | For the conversion of unmethylated cytosines in DNA to uracil via the chemical-denaturation of DNA and a specially designed CT Conversion Reagent. *Fast-Spin* technology ensures ultra-pure, converted DNA for subsequent DNA methylation analysis. Magnetic bead format for automated liquid handling platforms. | 50/200 Rxns.<br>2 x 96 Rxns.<br>2 x 96 Rxns.<br>4 x 96 Rxns. | **D5001/D5002** (column)<br>**D5003** (shallow-well plate)<br>**D5004** (deep-well plate)<br>**D5040** (magnetic bead) |
| **EZ DNA Methylation-Gold™ Kit** | For the fast (3 hr.) conversion of unmethylated cytosines in DNA to uracil via heat/chemical-denaturation of DNA and a specially designed CT Conversion Reagent. *Fast-Spin* technology ensures ultra-pure, converted DNA for subsequent DNA methylation analysis. Magnetic bead format for automated liquid handling platforms. | 50/200 Rxns.<br>2 x 96 Rxns.<br>2 x 96 Rxns.<br>4 x 96 Rxns. | **D5005/D5006** (column)<br>**D5007** (shallow-well plate)<br>**D5008** (deep-well plate)<br>**D5042** (magnetic bead) |
| **EZ DNA Methylation-Direct™ Kit** | Simple and reliable DNA bisulfite conversion directly from blood, tissue (FFPE/LCM), and cells without the prerequisite for DNA purification in as little as 4-6 hrs. The increased sensitivity of this kit makes it possible to amplify bisulfite converted DNA from as few as 10 cells or 50 pg DNA. Magnetic bead format for adaptation to automated liquid handling platforms. | 50/200 Rxns.<br>2 x 96 Rxns.<br>2 x 96 Rxns.<br>4 x 96 Rxns. | **D5020/D5021** (column)<br>**D5022** (shallow-well plate)<br>**D5023** (deep-well plate)<br>**D5044** (magnetic bead) |
| **EZ DNA Methylation-Lightning™ Kit** | Complete bisulfite conversion in about an hour using a unique liquid format conversion reagent. *Fast-Spin* technology ensures ultra-pure, converted DNA for subsequent DNA methylation analysis. Magnetic bead format for automated liquid handling platforms. | 50/200 Rxns.<br>2 x 96 Rxns.<br>2 x 96 Rxns.<br>4 x 96 Rxns. | **D5030/D5031** (column)<br>**D5032** (shallow-well plate)<br>**D5033** (deep-well plate)<br>**D5046** (magnetic bead) |
| **EZ DNA Methylation-Startup™ Kit** | Designed for the first time user requiring a consolidated product to perform DNA methylation analysis. Includes technologies for sample processing, bisulfite treatment of DNA, and PCR amplification of "converted" DNA for methylation analysis. | 1 Kit | **D5024** |
| ***Methylated DNA Standards*** | | | |
| **Universal Methylated Human DNA Standard** | Human (male) genomic DNA having all CpG sites methylated. To be used for the evaluation of bisulfite-mediated conversion of DNA. Supplied with a control primer set. | 1 Set | **D5011** |
| **Universal Methylated Mouse DNA Standard** | Mouse (male) DNA having all CpG sites methylated. To be used for the evaluation of bisulfite-mediated conversion of DNA. Supplied with a control primer set. | 1 Set | **D5012** |
| ***Region-Specific DNA Methylation Screening*** | | | |
| ***OneStep* qMethyl™ Kit** | Single step real-time PCR procedure for bisulfite-free determination of DNA methylation status. Available without fluorescent dye for probe-based detection (Lite). | 1 x 96 Rxns.<br>1 x 96 Rxns. | **D5310**<br>**D5311** (Lite) |
| ***OneStep* qMethyl™ Array** | Premade 96-well assay for bisulfite-free determination of region-specific DNA methylation assessment in the promoter region of any one of the following prominent tumor suppressor genes: RASSF1, RARB, CDKN2A (p16), MGMT, or CCND2. | 1 x 96 Rxns. | **D5312** |
| ***Epigenetics Services***<br>*For more information, visit* http://www.zymoresearch.com/services *or inquire at* services@zymoresearch.com. | | | |
| **Services for Methylated DNA Analysis**<br>Simplify biomarker discovery with our 5-mC Analysis platforms that combine Zymo's well-established bisulfite technologies with next-generation sequencing for the most comprehensive DNA methylation analysis services available. | | | |
| **Services for Hydroxymethylated DNA Analysis**<br>Novel genome-wide 5-hmC analysis platform featuring cutting-edge 5-hmC DNA enrichment, library prep, and next-generation sequencing technologies to ensure the sensitivity of 5-hmC detection in genome-wide context. | | | |
| ***Hydroxymethylation Detection*** | | | |
| **Quest 5-hmC™ DNA Enrichment Kit** | Featuring J-base binding protein (JBP) for the specific enrichment of 5-hmC containing DNA, the consolidated workflow makes the procedure reliable for robust analysis of multiple samples. | 25 Rxns.<br>50 Rxns. | **D5420**<br>**D5421** |
| **Quest 5-hmC™ DNA ELISA Kit** | Streamlined workflow for both the direct and relative quantitation of 5-hmC, in a global genomic context, with a robust colorimetric readout. | 1 x 96 Rxns.<br>2 x 96 Rxns. | **D5425**<br>**D5426** |
| **Anti-5-Hydroxymethylcytosine Polyclonal Antibody** | Polyclonal antibody has been engineered to maximize sensitivity to low amounts of hydroxymethylated gDNA while minimizing crossreactivity with unmodified or methylated cytosine residues. The antibody is suitable for use in ELISA, IP, and immunohistochemical labeling. | 50 µg<br>200 µg | **A4001-50**<br>**A4001-200** |
| **DNA Degradase™**<br>**DNA Degradase Plus™** | Whole genomic DNA can be treated with these enzyme cocktails for processing to individual nucleotides (Degradase™) or nucleosides (Degradase Plus™) for interrogation in chromatographic and spectroscopic methods including TLC, LC/MS, MALDI-TOF, and more. | 500 U<br>2000 U<br>250 U<br>1000 U | **E2016**<br>**E2017**<br>**E2020**<br>**E2021** |
| ***Other…*** | | | |
| **Zymo*Taq*™ DNA Polymerase** | Zymo*Taq*™ "hot start" DNA Polymerase is specifically designed for the amplification of "difficult" DNA templates including: bisulfite-treated DNA for methylation detection. The product generates specific amplicons with little or no by-product formation. | 50 Rxns.<br>200 Rxns | **E2001/E2001** (system)<br>**E2003/E2004** (premix) |
| **Methylated-DNA IP Kit** | IP with a highly specific anti-5-methylcytosine monoclonal antibody. Designed for the enrichment of 5-methylcytosine-containing DNA from any pool of fragmented genomic DNA for use in genome-wide methylation analysis. | 10 Rxns. | **D5101** |

# Mix & Go!

## Premade Z-Competent™ *E. coli* for 20 Second Transformations

*(>$10^8$ transformants/µg DNA)*

- ✓ **NO Heat Shock!**
- ✓ **NO Lengthy Incubations!**
- ✓ **NO Outgrowth Procedures!**
- ✓ **NO Wait!!**




### Premade Z-Competent™ *E. coli* Cells

| *Product* | *Cat. No.* | *Size* |
|---|---|---|
| C600 | T3015 | 10 x 100 µl aliquots (10 tubes) |
| Zymo 5α (Same as DH5α) | T3007 | 10 x 100 µl aliquots (10 tubes) |
| | T3009 | 96 x 50 µl aliquots (96-well plate) |
| HB101 | T3011 | 10 x 100 µl aliquots (10 tubes) |
| | T3013 | 96 x 50 µl aliquots (96-well plate) |
| JM109 | T3003 | 10 x 100 µl aliquots (10 tubes) |
| | T3005 | 96 x 50 µl aliquots (96-well plate) |
| TG1 | T3017 | 10 x 100 µl aliquots (10 tubes) |
| XJa Autolysis™ | T3021 | 10 x 100 µl aliquots (10 tubes), 1 ml 500X L-Arabinose |
| XJa(DE3) Autolysis™ | T3031 | 10 x 100 µl aliquots (10 tubes), 1 ml 500X L-Arabinose |
| XJb Autolysis™ | T3041 | 10 x 100 µl aliquots (10 tubes), 1 ml 500X L-Arabinose |
| XJb(DE3) Autolysis™ | T3051 | 10 x 100 µl aliquots (10 tubes), 1 ml 500X L-Arabinose |

### Make Your Own Z-Competent™ *E. coli* Cells

| *Product* | *Cat. No.* | *Size* |
|---|---|---|
| Z-Competent™ *E. coli* Transformation Kit (ZymoBroth™ included) | T3001 | up to 20 ml |
| Z-Competent™ *E. coli* Transformation Buffer Set (ZymoBroth™ not included) | T3002 | up to 60 ml |
| ZymoBroth™ | M3015-100 | 100 ml |
| | M3015-500 | 500 ml |