ZYMO RESEARCH

*The Beauty of Science is to Make Things Simple*

# INSTRUCTION MANUAL

# ZR Serum DNA Kit™

Catalog No. **D3013**

## Highlights

- Process up to 250 ml serum or plasma using innovative *ZymoBead*™ silica-bead technology.
- Scalability facilitates processing of small (100 µl) or large (10 ml) sample volumes.
- Compatible with commonly used anticoagulants (i.e., EDTA, heparin, citrate).
- Isolated DNA is ideal for PCR and other sensitive analytical procedures.

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Satisfaction of all Zymo Research products is guaranteed. If you are not satisfied with this product please call 1-888-882-9682.

## Product Contents

| ZR Serum DNA Kit™ | D3013 (samples up to 250 ml) | Storage Temperature |
|---|---|---|
| **Genomic Lysis Buffer*** | 4 x 250 ml | Room Temp. |
| **DNA Wash Buffer*** | 24 ml | Room Temp. |
| **DNA Elution Buffer** | 4 ml | Room Temp. |
| **ZymoBeads™** | 1 ml | Room Temp. |
| **Instruction Manual** | 1 | - |

Note - 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 maximal performance and reliability.

* *Recommended*: Add beta-mercaptoethanol to 0.5%(v/v) i.e., 5 ml per 1000 ml.

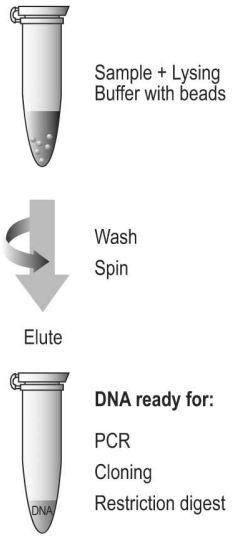
** Add 96 ml of 100% ethanol to the DNA Wash Buffer concentrate prior to use.

## Specifications

- **Sample Sources** – Plasma or serum from humans, mice, rats, etc. Also, a variety of low cell density biological liquids are effectively processed using this kit.
- **DNA Purity** – High-quality DNA is eluted with **DNA Elution Buffer** or water. DNA is well suited for PCR and other downstream applications. Typical absorption indices are $A_{260}/A_{280}$ >1.7
- **DNA Size Limits** – Capable of recovering DNA up to and above 40 kb. In most instances, mitochondrial DNA and viral DNA (if present) will also be recovered. Small DNA fragments as low as 50 bp can be isolated with modification to the protocol *(see sidebar pg. 4)*
- **ZymoBead™ Binding Capacity** – ~5 µg DNA per 10 µl ZymoBead™ suspension.
- **DNA Recovery** – Typically, DNA is eluted into 10-35 µl **DNA Elution Buffer** or water for the *standard procedure*. This volume can be adjusted to correct for increased sample volumes.
- **Equipment** – centrifuge and/or microcentrifuge, vortex

## Product Description

The **ZR Serum DNA Kit™** is based on a state of the art, single buffer procedure for rapid DNA isolation from large volume serum and plasma samples. The product has been optimized to yield high quality DNA from samples without RNA contamination. The **ZR Serum DNA Kit™** recovers genomic, mitochondria, and viral DNAs up to and above 40 kb and can also be used to isolate small DNA fragments from serum. The uniquely formulated **Genomic Lysis Buffer** efficiently lyses cells, virus, and/or cellular particles releasing DNA which is then adsorbed directly onto the surfaces of the provided **ZymoBeads™**. The resulting DNA/**ZymoBead™** complexes are separated by centrifugation and then washed to remove contaminants. DNA is eluted from the beads directly into the supplied low-salt **Elution Buffer** or water. DNA purified with the **ZR Serum DNA Kit™** is ideal for PCR and other sensitive analytical procedures.




Ultra-pure DNA is ideal for…

- ✓ PCR
- ✓ Endonuclease Digestion
- ✓ Genotyping, etc.

For **Technical Assistance**, please contact those at **Zymo Research's Technical Department** at 1-888-882-9682 or E-mail to tech@zymoresearch.com.

## Buffer Preparation

✓ *Before Starting*: Add 96 ml 100% ethanol to the DNA Wash Buffer concentrate.

✓ *Recommended*: Add beta-mercaptoethanol (user supplied) to the **Genomic Lysis Buffer** to a final dilution of 0.5%(v/v) i.e., 5 ml per 1000 ml.

*Note:* All procedures should be performed at room temperature (15-30 ºC) unless otherwise instructed. Most centrifugation steps can be performed at 2,000-2,500 x *g* (~5,000 rpm in a standard tabletop microcentrifuge).

## PROTOCOL

The following protocol is designed for serum and plasma samples. The volume(s) that can be processed can be adjusted depending on experimental needs. The "standard procedure" using 10 µl **ZymoBeads™** (examples 1 and 2 below) can also be used for other biological liquids having low cell densities (<1.0 x$10^4$ cells). However, the amount of ZymoBeads can be adjusted to suit any particular application.

For small DNA fragment isolation, add 0.3 volumes isopropanol to the mixture. (*For example, to a 1 ml mixture of serum, Genomic Lysis Buffer and ZymoBeads™, add 300 µl isopropanol.*)

1. Ensure that the **ZymoBeads™** are resuspended by vortexing. In a conical 50 ml tube add 4 volumes of **Genomic Lysis Buffer** to each volume of sample (4:1) and then add 10 µl of **ZymoBeads™**.

   **Example #1:** 800 µl of plasma, add 3.2 ml of **Genomic Lysis Buffer** and 10 µl of **ZymoBeads™**.
   **Example #2:** 5.0 ml of serum, add 20 ml of **Genomic Lysis Buffer** and 10 µl of **ZymoBeads™.**

2. Mix by placing sample on a rotator/rocker for 2 hours at room temperature or overnight at 0-4ºC.

3. Centrifuge tube for 1-2 minutes. Discard the supernatant.

The pellet should be completely resuspended to ensure no impurities are transferred to the next step.

4. Add 500 µl of **DNA Wash Buffer** to the **ZymoBeads™**. Resuspend the pellet and then transfer mixture to a 1.5 ml microcentrifuge tube.

5. Centrifuge for 1 minute in a microcentrifuge. Discard the supernatant.

6. Add another 500 µl of **DNA Wash Buffer** to the **ZymoBeads™**. Resuspend the pellet and centrifuge for 1 minute. Discard the supernatant.

7. Recentrifuge briefly and remove any residual wash buffer. Air-dry the pellet for 15 minutes.

Elution of DNA from the ZymoBeads™ is dependent on pH and temperature. If water is used, ensure the pH is >6.0. Also, the total yield may be improved by eluting the DNA with Elution Buffer or water pre-equilibrated to 60-70°C.

8. Add 10-35 µl **DNA Elution Buffer** or water to the **ZymoBeads™** and resuspend by repeated pipetting.

9. Centrifuge at 10,000 *x g* for 1 minute.

10. Collect the supernatant which contains the purified DNA. The DNA can be used immediately or stored at -20ºC for later use.

## Troubleshooting:

1. DNA degradation: Check for DNase contamination. All reagents and components supplied with the **ZR Serum DNA Kit™** are DNase-free. However, DNase contamination could result during the processing of some samples. Check pipets, pipet tips, microcentrifuge tubes, etc., and exercise the appropriate precautions during the DNA purification procedure.

2. DNA is not performing well in subsequent experiments: Ensure the correct volume of **Genomic Lysis Buffer** has been added to the sample. Also, make sure all centrifugation steps are completed for the indicated times and speeds (rcfs). Failure to do so may result in incomplete washing, which may cause salts to be eluted with the DNA affecting quantitation and subsequent experiments including enzymatic processes like PCR.

3. RNA contamination: The buffers and spin columns provided in this kit are designed to efficiently remove RNA during the DNA purification procedure. However, additional RNA removal (e.g., digestion with RNase A) may be necessary for subsequent applications sensitive to trace amounts of RNA.

## Ordering Information

| Product Description | Catalog No. |
|---|---|
| **ZR Serum DNA Kit™** | D3013 |

| For Individual Sale | Catalog No. | Amount |
|---|---|---|
| **Genomic Lysis Buffer** | D3004-1-50<br>D3004-1-100 | 50 ml<br>100 ml |
| **DNA Wash Buffer** | D4003-2-6<br>D4003-2-24 | 6 ml<br>24 ml |
| **DNA Elution Buffer** | D3004-4-4<br>D3004-4-16 | 4 ml<br>16 ml |
| **ZymoBeads™** | D3004-3-1<br>D3004-3-4 | 1 ml<br>4 x 1ml |

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# *Popular Products From Zymo Research*

| Product | Description | Kit Size (Preps) | Catalog No. (Format) |
|---|---|---|---|
| | ***Fragment DNA Purification*** | | |
| **DNA Clean & Concentrator™-5** | Clean and concentrate up to 5µg 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 & 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 (15 minute), high-output recovery of up to 5 µg pure DNA into 10-15 µl minimum elution volume allows for highly concentrated DNA. | 2x96<br>4x96 | **D4023**<br>**D4024** |
| **Genomic DNA Clean & Concentrator™** | Quick (5 minute) clean-up of up to 10 µg high molecular weight DNA (≤200 kb) from any enzymatic reaction or impure preparation without precipitations. | 25<br>100 | **D4010** (capped)<br>**D4011** (capped) |
| **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. | 2x96<br>4x96 | **D4021**<br>**D4022** |
| **Zymoclean™ Large Fragment DNA Recovery Kit** | Purify high molecular weight DNA (≤200 kb) from high and low-melting agarose gels in minutes | 25<br>100 | **D4045** (capped)<br>**D4046** (capped) |
| ***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>2x96 | **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. | 2x96<br>4x96<br>8x96 | **D4041**<br>**D4042**<br>**D4043** |
| **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). | 50<br>100<br>400 | **D4036**<br>**D4019**<br>**D4020** |
| | ***Genomic DNA Purification*** | | |
| ***Quick-gDNA*™ MiniPrep** | Easy purification of genomic DNA from whole blood, plasma, serum, body fluids, buffy coat, lymphocytes, tissue, swabs or cultured cells in as little as 15 minutes without the use of Proteinase K or organic denaturants. | 50<br>200<br>50<br>200 | **D3006** (uncapped)<br>**D3007** (uncapped)<br>**D3024** (capped)<br>**D3025** (capped) |
| **ZR-96 *Quick-gDNA*™** | Simple, high throughput (96-well) purification of DNA from whole blood, plasma, serum, body fluids, buffy coat, lymphocytes, tissue, swabs, or cultured cells in about 30 minutes. | 2x96<br>4x96<br>10x96. | **D3010**<br>**D3011**<br>**D3012** |
| **ZR-Genomic DNA™-Tissue MiniPrep** | For 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 | | **Visit website for a comprehensive list** |

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