ZYMO RESEARCH

DNA Purification Made Simple™

Quick-DNA™ Viral Kit

Rapid and simple isolation of ultra-pure viral DNA from biological liquids and cells.

Highlights

- Quick (*15 minute)* recovery of viral DNA from a wide range of sample sources using Zymo-Spin™ Technology.
- Column design allows DNA to be eluted at high concentrations into minimal volumes (≥6 µl) of water or elution buffer.
- Eluted DNA is suitable for use in PCR, arrays, and other sensitive downstream applications.

Catalog Numbers:
D3015, D3016

Scan with your smart-phone camera to view the online protocol/video.

Table of Contents

Product Contents

Quick-DNA™ Viral Kit	D3015 (50 Preps.)	D3016 (200 Preps.)	Storage Temperature
Viral DNA Buffer[1]	50 ml	100 ml (2x)	Room Temp.
DNA Wash Buffer (Concentrate)[2]	6 ml	24 ml	Room Temp.
DNA Elution Buffer	4 ml	10 ml	Room Temp.
Zymo-Spin™ IC Columns	50	200	Room Temp.
Collection Tubes	50	200	Room Temp.
Instruction Manual	1	1	Room Temp.

[1] Recommended: Add beta-mercaptoethanol to 0.5%(v/v) i.e., 250 µl per 50 ml *or* 500 µl per 100 ml prior to use.
[2] Add 24 ml of 100% ethanol to the 6 ml DNA Wash Buffer concentrate prior to use (for D3015) or 96 ml of 100 % ethanol to the 24 ml DNA Wash Buffer concentrate prior to use (for D3016).

Specifications

- **Sample Sources**[1] – Whole blood, plasma, or serum from humans, mice, rats, etc. Also, cells from culture, buccal cells, as well as a variety of biological liquids are effectively processed using this kit. Tissue already digested with Proteinase K or mechanically homogenized can also be processed.

- **Workflow Overview** – Unique lysis buffer system omits the need for Proteinase K digestion for biological fluids and cell culture samples.

- **DNA Purity** – High-quality DNA is eluted with **DNA Elution Buffer** or water. DNA is especially well suited for PCR and other downstream applications. A_{260}/A_{280}>1.8

- **DNA Size Limits** – From 100 bp up to 50 kb.

- **DNA Recovery** – Typically, up to 5 µg total DNA is eluted into 6-10 µl **DNA Elution Buffer**. For DNA 75 bp to 10 kb, the recovery is 70-90%. For DNA 11 kb to 50 kb the recovery is 50-70%.

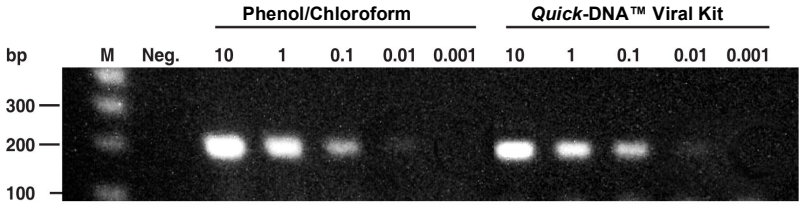
- **Product Detergent Tolerance** – ≤5% Triton X-100, ≤5% Tween-20, ≤5% Sarkosyl, ≤0.1% SDS

- **Equipment** – Microcentrifuge and vortex

[1] For DNA isolation from biological fluids, cell cultures, and solid tissues utilizing Proteinase K, use the ***Quick-DNA™ Miniprep Plus Kit*** (D4068, D4069).

Product Description

The ***Quick*-DNA™ Viral Kit** from Zymo Research provides a streamlined method for rapid isolation of high-quality viral DNA from a wide range of biological sources. Denaturation of viral particles and recovery of DNA is accomplished using a unique **Viral DNA Buffer** and **Zymo-Spin™ IC Column**, respectively. Reagents in the kit are optimized for the recovery of viral DNA from whole blood, (fresh and stored), tissue, ascites, cultured cells, and liquid samples. DNA can be eluted with either water or the supplied elution buffer. Eluted DNA is suitable for PCR, arrays, and other downstream applications.



Human HBV DNA was isolated from 10 to 0.001 µl of human serum using phenol/chloroform or Zymo Research's ***Quick*-DNA™ Viral Kit**. The presence of HBV DNA is evidenced by a ~200 bp PCR product. Lane "M" is a 100 bp DNA Ladder and "Neg" is the negative control for PCR.

Protocol

Buffer Preparation:

- ✓ Before starting, add 24 ml of 100% ethanol to the 6 ml **DNA Wash Buffer** concentrate (96 ml 100% ethanol to the 24 ml **DNA Wash Buffer** concentrate) to obtain the final DNA Wash Buffer solution.

- ✓ *Recommended*: Add beta-mercaptoethanol (user supplied) to the **Viral DNA Buffer**[1] to a final dilution of 0.5%(v/v) i.e., 250 µl per 50 ml *or* 500 µl per 100 ml.

Biological Liquids and Cells

The following protocol is designed for the recovery of viral DNA from ≤200 µl biological liquid (e.g., serum, plasma, CSF, etc.) or ≤200 µl cells in suspension at a concentration of ≤1x10^5 cells/ml.

1. In a 1.5 ml microcentrifuge tube, add 4 volumes of **Viral DNA Buffer** to each volume of sample (e.g., 800 µl Viral DNA Buffer to 200 µl sample). Mix briefly by vortexing. Allow to stand at room temperature for 5-10 minutes.

2. Transfer the mixture to a **Zymo-Spin™ IC Column**[2] in a **Collection Tube**. Centrifuge for 1 minute at ≥ 10,000 *x g*. Discard the flow through from the Collection Tube.

3. Add 300 µl **DNA Wash Buffer** to the column. Centrifuge for 1 minute at ≥ 10,000 *x g*. Discard the flow through. Repeat this step.

4. Place the **Zymo-Spin™ IC Column** into a microcentrifuge tube. Add 6-10 µl **DNA Elution Buffer** or water directly to the column matrix. Let stand at room temperature for 1 minute. Centrifuge for 1 minute to elute the DNA.

5. Place the **Zymo-Spin™ IC Column** into a microcentrifuge tube. Add 6-10 µl **DNA Elution Buffer** or water[3,4] directly to the column matrix. Let stand at room temperature for 1 minute. Centrifuge for 1 minute at top speed to elute the DNA.

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[1] The addition of BME to the Genomic Lysis Buffer is recommended for optimal performance when working with protein rich samples (tissue lysate, whole blood, etc.). If BME is not added, please ensure the sample is thoroughly homogenized in the Viral DNA Buffer prior to purification.
[2] The column capacity is 800 µl.
[3] Elution of DNA from the column 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 60-70ºC.
[4] The **DNA Elution Buffer** contains 10 mM Tris-HCl, pH 8.5, 0.1 mM EDTA. If required, pure water can also be used to elute the DNA.

Solid Tissue Samples

For Proteinase K digested materials, follow the protocol for ***Proteinase K Digested Samples*** *(see page 6). Otherwise, mechanically homogenize*[1] *up to 5 mg of fresh or frozen tissue in 500 µl of* ***Viral DNA Buffer.***

1. Centrifuge the lysate at ≥ 10,000 *x g* for 5 minutes. Making sure not to disturb the pelleted debris, transfer the supernatant to a **Zymo-Spin™ IC Column**[2] in a **Collection Tube** and centrifuge at ≥ 10,000 *x g* for one minute. Discard the Collection Tube with the flow through.

2. Add 300 µl **DNA Wash Buffer** to the column. Centrifuge for 1 minute at ≥ 10,000 *x g*. Discard the flow through. Repeat this step.

3. Place the **Zymo-Spin™ IC Column** into a microcentrifuge tube. Add 6-10 µl **DNA Elution Buffer** or water directly to the column matrix. Let stand at room temperature for 1 minute. Centrifuge for 1 minute to elute the DNA.

4. Place the **Zymo-Spin™ IC Column** into a microcentrifuge tube. Add 6-10 µl **DNA Elution Buffer** or water[3,4] directly to the column matrix. Let stand at room temperature for 1 minute. Centrifuge for 1 minute at top speed to elute the DNA.

[1] For solid tissues, Proteinase K treatment or mechanical homogenization is required. For purification of up to 25 µg DNA/prep utilizing Proteinase K, we recommend using the **Quick-DNA™ Miniprep Plus Kit** (D4068, D4069).
[2] The column capacity is 800 µl.
[3] Elution of DNA from the column 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.
[4] The **DNA Elution Buffer** contains 10 mM Tris-HCl, pH 8.5, 0.1 mM EDTA. If required, pure water can also be used to elute the DNA.

Proteinase K Digested Samples

The following protocol is designed for up to 200 µl of lysate derived from Proteinase K digested samples[1].

1. Add 4 volumes of **Viral DNA Buffer** to each volume of liquid sample (4:1). (e.g., add 800 µl of Viral DNA Buffer to 200 µl liquid sample). Mix briefly by vortexing, then let stand at room temperature for 5-10 minutes[2].

2. Centrifuge the mixture at 10,000 *x g* for 5 minutes.

3. Transfer the supernatant to a **Zymo-Spin™ IC Column**[2] in a **Collection Tube**. Centrifuge for 1 minute at ≥ 10,000 *x g*. Discard the flow through from the Collection Tube.

4. Add 300 µl **DNA Wash Buffer** to the column. Centrifuge for 1 minute at ≥ 10,000 *x g*. Discard the flow through. Repeat this step.

5. Place the **Zymo-Spin™ IC Column** into a microcentrifuge tube. Add 6-10 µl **DNA Elution Buffer** or water directly to the column matrix. Let stand at room temperature for 1 minute. Centrifuge for 1 minute to elute the DNA.

6. Place the **Zymo-Spin™ IC Column** into a microcentrifuge tube. Add 6-10 µl **DNA Elution Buffer** or water[3,4] directly to the column matrix. Let stand at room temperature for 1 minute. Centrifuge for 1 minute at top speed to elute the DNA.

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[1] For solid tissues, Proteinase K treatment or mechanical homogenization is required. For purification of up to 25 µg DNA/prep utilizing Proteinase K, we recommend using the ***Quick*-DNA™ Miniprep Plus Kit** (D4068, D4069).
[2] The column capacity is 800 µl.
[3] Elution of DNA from the column 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 60-70ºC
[4] The **DNA Elution Buffer** contains 10 mM Tris-HCl, pH 8.5, 0.1 mM EDTA. If required, pure water can also be used to elute the DNA.

Samples in DNA/RNA Shield™

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 and inactivates nucleases and infectious agents (virus), and it is compatible with various collection and storage devices (vacutainers, swabs, nasal, buccal, fecal, etc.).*

DNA/RNA Shield™ can be purchased separately (R1100-50 or R1100-250).

See page 8 for performing a Proteinase K Digestion on tissue samples stored in DNA/RNA Shield™.

1. Add 400 µl of **Viral DNA Buffer** to 100 µl of the sample/shield mixture prepared according to the **DNA/RNA Shield™** specifications (4:1).

2. Mix completely by vortexing 4-6 seconds, then let stand 5-10 minutes at room temperature[1].

3. Transfer the mixture to a **Zymo-Spin™ IC Column**[2] in a **Collection Tube**. Centrifuge for 1 minute at ≥ 10,000 *x g*. Discard the flow through from the Collection Tube.

4. Add 300 µl **DNA Wash Buffer** to the column. Centrifuge for 1 minute at ≥ 10,000 *x g*. Discard the flow through. Repeat this step.

5. Place the **Zymo-Spin™ IC Column** into a microcentrifuge tube. Add 6-10 µl **DNA Elution Buffer** or water directly to the column matrix. Let stand at room temperature for 1 minute. Centrifuge for 1 minute to elute the DNA.

6. Place the **Zymo-Spin™ IC Column** into a microcentrifuge tube. Add 6-10 µl **DNA Elution Buffer** or water[3,4] directly to the column matrix. Let stand at room temperature for 1 minute. Centrifuge for 1 minute at top speed to elute the DNA.

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[1] For Proteinase K digested or homogenized material, centrifuge the mixture at 10,000 *x g* for 5 minutes after incubating. Transfer up to 800 µl of supernatant to the **Zymo-Spin™ IC** Column in Step 3.
[2] The column capacity is 800 µl.
[3] Elution of DNA from the column 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 60-70ºC.
[4] The **DNA Elution Buffer** contains 10 mM Tris-HCl, pH 8.5, 0.1 mM EDTA. If required, pure water can also be used to elute the DNA.

Proteinase K Digestion with DNA/RNA Shield™

*The following protocol requires the additional purchase of **DNA/RNA Shield** (R1100-50 or R1100-250), **Proteinase K w/ Storage Buffer Set** (D3001-2-5 or D3001-2-20) and **PK Digestion Buffer** (R1200-1-5 or R1200-1-20).*

Reagent Preparation

✓ Add 260 µl or 1,040 µl **Proteinase K Storage Buffer** to reconstitute the lyophilized **Proteinase K**, 5 mg (D3001-2-5) or 20 mg (D3001-2-20), respectively (final concentration of 20 mg/ml). Vortex to dissolve. Store at -20ºC.

Protocol

1. Add 300 µl of DNA/RNA Shield™ to ≤ 5 mg of solid tissue sample[1]. Tissue samples can be mechanically homogenized for optimal extraction efficiency.

2. Add 30 µl of PK Digestion Buffer and 15 µl Proteinase K to the sample. Mix and then incubate at 55ºC until tissue dissolves or up to 5 hours[2].

3. Add 4 volumes of **Viral DNA Buffer** to each volume of Proteinase K digestion (4:1). (e.g., add 1,200 µl of Viral DNA Buffer to 300 µl of digestion). Mix briefly by vortexing, then let stand at room temperature for 5-10 minutes. Centrifuge the mixture at ≥ 10,000 *x g* for 5 minutes.

4. Transfer 800 µl of supernatant to the **Zymo-Spin™ IC Column** in a **Collection Tube**. Centrifuge at ≥ 10,000 *x g* for one minute and discard the flow through in the Collection Tube. Repeat this step with the remaining supernatant.

5. Add 300 µl **DNA Wash Buffer** to the column. Centrifuge for 1 minute at ≥ 10,000 *x g*. Discard the flow through. Repeat this step.

6. Place the **Zymo-Spin™ IC Column** into a microcentrifuge tube. Add 6-10 µl **DNA Elution Buffer** or water[3,4] directly to the column matrix. Let stand at room temperature for 1 minute. Centrifuge for 1 minute to elute the DNA.

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[1] Solid Tissue Samples should be completely submerged in **DNA/RNA Shield™**, add as needed.
[2] Optimal incubation times may vary with tissue type and homogenization method.
[3] Elution of DNA from the column 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 60-70ºC.
[4] The DNA Elution Buffer contains 10 mM Tris-HCl, pH 8.5, 0.1 mM EDTA. If required, pure water can also be used to elute the DNA.

Troubleshooting

Problem	Possible Causes and Suggested Solutions
DNA degradation	Check for DNase contamination. All reagents supplied with the ***Quick*-DNA™ Viral 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.
DNA is not performing well in subsequent experiments.	Ensure the correct volume of **Viral DNA 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.
RNA contamination	The buffers in this kit are designed to efficiently hydrolyze and remove RNA during the DNA purification procedure. However, RNA contamination can potentially occur if the DNA extraction is overloaded with too much sample.

Ordering Information

Product Description	Catalog No.	Size
***Quick*-DNA™ Viral Kit**	D3015 D3016	50 preps. 200 preps.
***Quick*-DNA™ Viral 96 Kit**	D3017 D3018	2 x 96 preps. 4 x 96 preps.

Individual Kit Components	Catalog No.	Amount
Viral DNA Buffer	D3015-1-50 D3016-1-100	50 ml 100 ml
DNA Wash Buffer (Concentrate)	D4003-2-6 D4003-2-24	6 ml 24 ml
DNA Elution Buffer	D3004-4-4 D3004-4-10	4 ml 10 ml
Zymo-Spin™ IC Columns	C1004-50 C1004-250	50 250
Collection Tubes	C1001-50 C1001-500 C1001-1000	50 500 1,000

Complete Your Viral Detection Workflow

✓ **Safe Transport and Preservation of Samples at Ambient Temperature**

DNA/RNA Shield™ Collection Devices	Size	Catalog No.
DNA/RNA Shield™ Collection Tube w/Swab	1 ml Fill 2 ml Fill	R1107 R1109
DNA/RNA Shield™ Saliva Collection Kit	2 ml Fill	R1210
DNA/RNA Shield™ Collection Tube	50 Pack	R1102
DNA/RNA Shield™ Lysis Tubes (Tissue)	50 Pack	R1105

✓**Fast and Reliable Viral RNA Purification from a Variety of Sample Types**

Quick-RNA™ Viral Kits	Size	Catalog No.
Quick-RNA™ Viral Kit	50 Preps 200 Preps 50 Preps (DX) 200 Preps (DX)	R1034 R1035 R1034-E R1035-E
Quick-RNA™ Viral 96 Kit	2 x 96 Preps 4 x 96 Preps 2 x 96 Preps (DX) 4 x 96 Preps (DX)	R1040 R1041 R1040-E R1041-E

✓ **Rapid and Efficient Copurification of Viral DNA and RNA**

Quick-DNA/RNA™ Viral Kits	Size	Catalog No.
Quick-DNA/RNA™ Viral Kit	50 Preps 200 Preps	D7020 D7021
Quick-DNA/RNA™ Viral 96 Kit	2 x 96 Preps 4 x 96 Preps	D7022 D7023
Quick-DNA/RNA™ Viral Magbead	250 Preps 1000 Preps 250 Preps (DX) 1000 Preps (DX)	R2140 R2141 R2140-E R2141-E

✓ **Convenient and Easy Solutions for PCR**

ZymoTaq™	Size	Catalog No.
ZymoTaq™ Premix	50 Rxns. 200 Rxns.	E2003 E2004
ZymoTaq™ Polymerase	50 Rxns. 200 Rxns.	E2001 E2002
ZymoTaq™ qPCR Premix	50 Rxns. 200 Rxns.	E2054 E2055
ZymoScript™ One-Step RT-qPCR Kit	100 Rxns.	R3014

Notes

100% satisfaction guarantee on all Zymo Research products, or your money back.

Zymo Research is committed to simplifying your research with quality products and services. If you are dissatisfied with this product for any reason, please call 1(888) 882-9682.

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.

This product is for research use only and should only be used by trained professionals. It is not for use in diagnostic procedures. Some reagents included with this kit are irritants. Wear protective gloves and eye protection. Follow the safety guidelines and rules enacted by your research institution or facility.

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tech@zymoresearch.com www.zymoresearch.com Toll Free: (888) 882-9682