



ZYMO RESEARCH

RNA
Purification
Made Simple

Quick-DNA/RNA™ Viral Kit

Viral DNA & RNA from any biological sample

Highlights

- Quick, spin-column purification of viral DNA and RNA from plasma, serum, urine, cell culture media, blood, saliva, cellular suspensions, swab, fecal and biopsy samples
- High-quality DNA/RNA is ready for Next-Gen sequencing, RT/qPCR, hybridization, etc.
- DNA/RNA Shield is included for sample collection, inactivation, storage and preservation.

Catalog Numbers:
D7020, D7021



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



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Product Contents

Quick-DNA/RNA™ Viral Kit	D7020 (50 prep)	D7021 (200 prep)
DNA/RNA Shield™ (2X concentrate)	25 ml	125 ml
Viral DNA/RNA Buffer ¹	25 ml (x2)	100 ml (x2)
Viral Wash Buffer ² (concentrate)	6 ml (x2)	24 ml (x2)
DNase/RNase-Free Water	6 ml	6 ml (x2)
Zymo-Spin™ IIC-XLR Columns	50	200
Collection Tubes	100	400
Instruction Manual	1 pc	1 pc

Storage Temperature - Store all kit components (i.e., buffers, columns) at room temperature.

Before use:

1 Add beta-mercaptoethanol (β-Me; user provided) to 0.5% (v/v) *i.e.*, add 125 µl or 500 µl β-Me per 25 ml or 100 ml **Viral DNA/RNA Buffer**.

2 Add 24 ml of 100% ethanol (26 ml of 95% ethanol) to the 6 ml **Viral Wash Buffer** concentrate (D7020) or 192 ml of 100% ethanol (204 ml of 95% ethanol) to the 48 ml **Viral Wash Buffer** concentrate (D7021).

Specifications

- **Sample Sources** – ≤ 400 µl plasma, serum, saliva, swab, urine, cell culture media, blood, cellular suspension, fecal sample or ≤ 25 mg biopsy sample.

For samples in UTM®/VTM®, PBS or saline, see Sample Preparation, page 5.

- **Purity** – DNA/RNA is ready for Next-Gen Sequencing, RT/qPCR, etc.
- **Binding Capacity** – 50 µg DNA/RNA (**Zymo-Spin™ IIC-XLR Columns**).
- **Elution Volume** – ≥ 50 µl **DNase/RNase-Free Water**.
- **Equipment Needed** (user provided) – Beta-mercaptoethanol (β-Me), Ethanol (95-100%), Microcentrifuge.
- **Materials** (available separately) –

DNase I Set (E1010; 50 rxns.; 250 U DNase I (lyophilized) supplied w/ DNA Digestion Buffer, 4 ml)

DNA/RNA Prep Buffer (D7010-2-50; 50 ml)

DNA/RNA Wash Buffer (concentrate) (D7010-3-6, 6 ml)

Proteinase K Set (D3001-2-20; 20 mg Proteinase K (lyophilized) supplied w/ Storage Buffer).

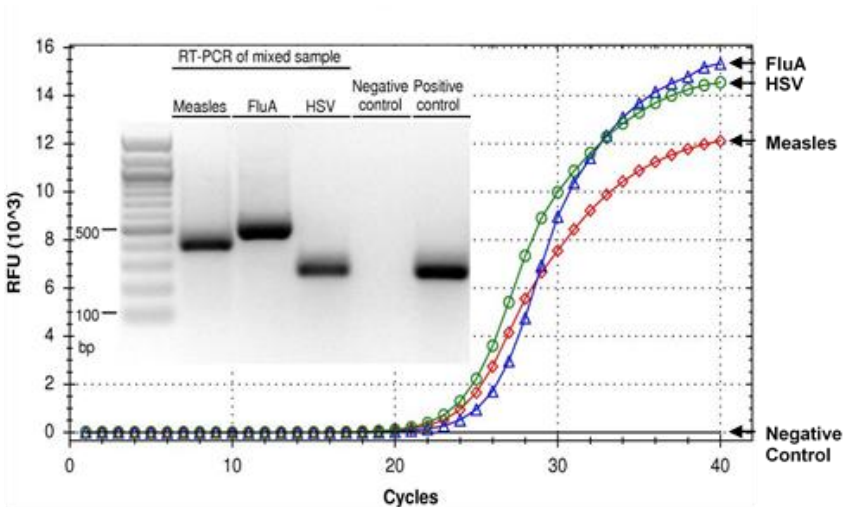
Product Description

The **Quick-DNA/RNA™ Viral Kit** is a quick, purification of viral DNA and/or RNA from plasma, serum, urine, cell culture media, blood, saliva, cellular suspensions, biopsies, swab and fecal samples stored in **DNA/RNA Shield™** (for sample collection, nucleic acid preservation and inactivation of pathogens).

The kit also features a buffer system that facilitates complete viral particle lysis for efficient nucleic acid isolation. Small (> 50 nt) and large (> 200 kb) DNA and RNA are bound to the column, washed and eluted.

The isolated high-quality nucleic acids are ready for all downstream applications such as Next-Gen sequencing, hybridization-based and RT/qPCR detection.

Detection of DNA & RNA Viruses from a Mixed Population



Viral nucleic acids were isolated from liquid samples using the **Quick-DNA/RNA™ Viral Kit**. Data shows RT-qPCR Ct values for measles, influenza type A (FluA), and herpes-simplex (HSV) viruses, 23.05 (diamonds), 24.56 (triangles), 22.92 (circles), respectively. Negative control – RT-PCR (no template w/ HSV specific primers). Positive control – PCR (HSV template w/ HSV primers).

Protocol

The protocol consists of: (I) Buffer Preparation, (II) Sample Preparation and (III) DNA/RNA Purification.

(I) Buffer Preparation

- ✓ Add beta-mercaptoethanol (user provided) to 0.5% (v/v) i.e., add 125 μ l or 500 μ l β -Me per 25 ml or 100 ml **Viral DNA/RNA Buffer**.
- ✓ Add 24 ml of 100% ethanol (26 ml of 95% ethanol) to the 6 ml **Viral Wash Buffer** concentrate (D7020) or 96 ml of 100% ethanol (104 ml of 95% ethanol) to the 24 ml **Viral Wash Buffer** concentrate (D7021).

(II) Sample Preparation

- ✓ Perform all steps at room temperature (20-30°C).
- ✓ Up to 400 µl sample can be processed per prep.

Samples in DNA/RNA Shield™¹ collection devices (swabs, saliva, etc.)
Proceed directly with purification, page 6.

Swabs (UTM®/VTM®, PBS, saline, etc.)

Proceed directly with purification, page 6.

Optional - To inactivate, store and preserve samples at room temperature prior to further processing, add **DNA/RNA Shield™**. See **Liquids**, below.

Liquids (plasma², serum², CSF, blood, saliva, urine, cell suspension, cell culture media)
Add an equal volume of **DNA/RNA Shield™** (2X concentrate) to a volume of liquid sample (1:1) and mix well. Proceed with purification, page 6.

Tissue² (LCM, needle biopsy)

Add 400 µl **DNA/RNA Shield™** (1X) to a tissue sample (up to 25 mg) and mix well. Proceed with purification, page 6.

Optional - **Proteinase K treatment**³ (protein-rich samples e.g., plasma, serum, saliva, sputum, tissue, can be treated). Materials sold separately.

Add 1% **Proteinase K** (v/v) at 20 mg/ml directly to a liquid sample. Mix well and incubate at room temperature for 15 minutes. Note: Up to 5% Proteinase K can be added (e.g., tissue). For example: Add 4-20 µl Proteinase K to each 400 µl sample.

1 At this point, samples in DNA/RNA Shield™ can be stored at ambient temperature (4-25°C) for a month, 3 days at 37°C, or long-term (> 1 year) -20°C or below.

2 To remove particulate debris or cryoprecipitates (if any), centrifuge and transfer up to 400 µl of the cleared supernatant into a nuclease-free plate/tube (not provided).

3 Prior to use, reconstitute the lyophilized Proteinase K (D3001-2-20) and add 1,040 µl Storage Buffer. Mix well and store frozen aliquots.

(III) DNA/RNA Purification

- ✓ Perform all steps at room temperature and centrifugation at 10,000-16,000 x g.
- ✓ The sample input can be scaled up or down, proportionally.

1. Add 800 µl **Viral DNA/RNA Buffer** to each 400 µl sample¹ (2:1) and mix well.
2. Transfer the mixture into a **Zymo-Spin™ IIC-XLR Column**² in a **Collection Tube** and centrifuge for 2 minutes. Transfer the column into a **new** collection tube.

Optional: At this point, DNase I treatment can be performed (see Appendices, page 7).

3. Add 500 µl **Viral Wash Buffer** to the column, centrifuge for 30 seconds and discard the flow-through. Repeat this step.
4. Add 500 µl ethanol (95-100%) to the column and centrifuge for 1 minute to ensure complete removal of the wash buffer. Carefully, transfer the column into a nuclease-free tube (not provided).
5. Add 50 µl **DNase/RNase-Free Water** directly to the column matrix and centrifuge for 30 seconds.

Alternatively, for highly concentrated DNA/RNA use ≥ 35 µl elution.

The eluted DNA/RNA³ can be used immediately or stored frozen.

1 Up to 400 µl sample can be processed per prep.

2 To process > 700 µl, the column can be reloaded.

3 It is recommended to titrate the DNA/RNA eluate for downstream applications (i.e., RT/qPCR, etc.).

Appendices

DNase I Treatment

- ✓ For DNA-free RNA, DNase I treatment can be performed using DNase I Set (E1010; 50 reactions), DNA/RNA Prep Buffer (D7010-2-50) and DNA/RNA Wash Buffer (concentrate) (D7010-3-6); materials sold separately.

For each sample to be treated, prepare **DNase I Reaction Mix** in an RNase-free tube (not provided) and mix by gentle inversion:

DNase I Reaction Mix	
DNA Digestion Buffer	75 μ l
DNase I (reconstituted; 1 U/ μ l) ^{1,2}	5 μ l

1. Following DNA/RNA binding (page 6, step 2), add 400 μ l **DNA/RNA Wash Buffer**³ to the column, centrifuge and discard the flow-through.
2. Add 80 μ l **DNase I Reaction Mix** directly to the matrix of the column.
3. Incubate at room temperature for (20-30°C) for 15 minutes.
4. Add 500 μ l **DNA/RNA Prep Buffer** to the column, centrifuge and discard the flow-through.
5. Proceed with DNA/RNA Purification (page 6, step 3).

1 Prior to use, reconstitute lyophilized 250 U **DNase I** (E1009-A) to 1U/ μ l (final concentration) with 275 μ l nuclease-free water (not provided), mix by gentle inversion and store frozen aliquots.

2 Unit definition – one unit increases the absorbance of a high molecular weight DNA solution at a rate of 0.001 A260 units/ml of reaction mixture at 25°C.

3 Before use, add 24 ml of 100% ethanol (26 ml of 95% ethanol) to the 6 ml **DNA/RNA Wash Buffer** concentrate.

Ordering Information

Product Description	Catalog No.	Size
Quick-DNA/RNA™ Viral Kit	D7020	50 preps.
	D7021	200 preps.

Individual Kit Components	Catalog No.	Amount
DNA/RNA Shield™ (2X concentrate)	R1200-25	25 ml
	R1200-125	125 ml
Viral DNA/RNA Buffer	D7020-1-25	25 ml
	D7020-1-100	100 ml
Viral Wash Buffer (concentrate)	R1034-2-24	24 ml
	R1034-2-48	48 ml
Zymo-Spin™ IIC-XLR	C1104-25	25
	C1104-50	50
Collection Tubes	C1001-50	50
	C1001-500	500
DNase/RNase-Free Water	W1001-30	30 ml
	W1001-100	100 ml
DNA/RNA Shield™ Fecal Collection Tube	R1101	10
DNA/RNA Shield™ Collection Tube	R1102	50
DNA/RNA Shield™ Lysis Tube (microbe)	R1103	50
DNA/RNA Shield™ Lysis Tube (microbe) w/ swab	R1104	50
DNA/RNA Shield™ Lysis Tube (tissue)	R1105	50
DNA/RNA Shield™ Collection Tube w/ Swab (1 ml fill)	R1106	10
	R1107	50
DNA/RNA Shield™ Collection Tube w/ Swab (2 ml fill)	R1108	10
	R1109	50
DNA/RNA Shield™ Saliva Collection Kit (2 ml fill)	R1210	1
DNase I Set (250 U DNase I (lyophilized) supplied with DNA Digestion Buffer, 4 ml)	E1010	1
DNA/RNA Prep Buffer	D7010-2-50	50 ml
	D7010-2-200	200 ml
DNA/RNA Wash Buffer	D7010-3-6	6 ml
	D7010-3-24	24 ml
Proteinase K Set supplied w/ Storage Buffer	D3001-2-5	5 mg
	D3001-2-20	20 mg

Complete Your Workflow

- ✓ For sample collection, inactivation of pathogens, storage and preservation of nucleic acids, use DNA/RNA Shield™ collection devices:

DNA/RNA Shield™ Collection Devices	
DNA/RNA Shield™ Collection Tube w/ Swab (1 ml fill or 2 ml fill) #R1107, R1109	For swab samples of nasal, throat, etc.
DNA/RNA Shield™ Saliva Collection Kit (2 ml fill) #R1210	For saliva, sputum, etc.
DNA/RNA Shield™ Collection Tube DNA/RNA Shield™ Lysis Tube (microbe) DNA/RNA Shield™ Lysis Tube (microbe) w/ swab DNA/RNA Shield™ Lysis Tube (tissue) #R1102-R1105	For microbes, tissue, etc. (2 ml lysis tubes used for bead beating homogenization)

- ✓ For RNA clean-up (purification) from the aqueous phase (e.g., TRIzol, TRI Reagent or similar) or from any enzymatic reaction (e.g., DNase I treated RNA):

RNA Clean & Concentrator	
Microprep #R1013, R1015	DNase I Set included (#R1013)
MagBeads #R1081, R1082	(#R1082)

Troubleshooting Guide

Problem	Possible Causes and Suggested Solutions
RNA degradation	<p>To prevent RNA degradation:</p> <p>Immediately collect and lyse fresh sample into a stabilization reagent (i.e., DNA/RNA Shield™) to ensure nucleic acid stability. Homogenized samples in DNA/RNA Shield™ can be stored frozen for later processing.</p>
Low nucleic acid content and/or low sensitivity in downstream application	<p>Incomplete deproteinization due to high-protein content in the sample (blood, plasma/serum, tissue etc.):</p> <ul style="list-style-type: none">- Increase the volume of DNA/RNA Shield™ to the sample.- Perform Proteinase K treatment (see Sample Preparation, page 4). <p>Increase eluate input:</p> <ul style="list-style-type: none">-Titrate the DNA/RNA eluate for downstream applications (i.e., RT/qPCR).
DNA contamination	<p>To remove DNA:</p> <ul style="list-style-type: none">- Perform DNase I treatment during the purification (page 6) or perform DNase I treatment post-purification (#R1017), then clean-up the treated sample.

For technical assistance, please contact 1-888-882-9682 or email tech@zymoresearch.com

Notes



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