ZYMO RESEARCH

Load N' Go™ *Quick*-DNA/RNA™ HT

Automation-ready: Rapid, high-throughput nucleic acid extraction from any biological sample

Highlights

- **Save Time and Focus on Discovery:** Pre-filled 96-well reagent plate technology that offers multi-platform compatibility and reduces hands-on time by 75%.
- **Precision Meets Versatility:** High-throughput, magnetic-bead based purification of DNA and RNA from plasma, serum, urine, cell culture media, blood, saliva, cellular suspensions, swab, fecal, and biopsy samples.

Catalog Numbers:
R2152

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

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Table of Contents

Product Contents

Load N' Go™ Quick-DNA/RNA™ HT	Volume / Qty
DNA/RNA Shield™ (2x)	125 ml
Proteinase K (lyophilized)	60 mg
Proteinase K Storage Buffer	10 ml
Plate 1: HT MagBinding Beads	250 µl x 96
Plate 2: HT Binding Plate	600 µl x 96
Plate 3: MagBead DNA/RNA Wash 1	250 µl x 96
Plate 4: MagBead DNA/RNA Wash 2	250 µl x 96
Plate 5: E-Wash 1	250 µl x 96
Plate 6: E-Wash 2	250 µl x 96
Plate 7: Elution	30 µl x 96
96 Tip Combs[1] (For V-Bottom Deep Well Plate)	2 pc
Instruction Manual	1 pc

- **Materials/Equipment Needed (user provided)**
  - ✓ Beta-mercaptoethanol (β-Me)
  - ✓ Nuclease-free water
  - ✓ Centrifuge with microplate carriers
  - ✓ Vortex Mixer
  - ✓ Liquid handler or bead mover laboratory automation
- **Materials Available Separately (not provided)**
  - ZR BashingBead™ Lysis Tubes (S6003-50; 2.0 mm beads), (S6012-50; 0.1 & 0.5 mm beads), (S6014-50; 0.1 & 2.0 mm beads)
  - DNase I Set (E1011; 1500 U DNase I (lyophilized) supplied with DNA Digestion Buffer, 4 ml)
  - DNA/RNA Prep Buffer (D7010-2-50, 50 ml)

1 Compatible with platforms such as KingFisher™ Flex, KingFisher™ Apex, IsoPure™ 96, Auto-Pure 96 systems.

Specifications

- **Sample Sources –** Any biological sample (e.g., swabs, liquids, cells, tissue, etc.), and samples collected/stored in media (e.g., UTM, VTM, saline, PBS, DNA/RNA Shield™, PAXgene®, RNA*later*™, RNAprotect®, etc.).

- **Binding Capacity –** 5 µg DNA/RNA per prep.

- **Elution Volume –** 30 µl **DNase/RNase-Free Water.**

- **Purity –** High quality, inhibitor-free DNA/RNA is eluted with DNase/RNase Free Water and is suitable for all downstream applications including PCR and Next-Generation Sequencing.

- **Storage Temperature and Stability –**

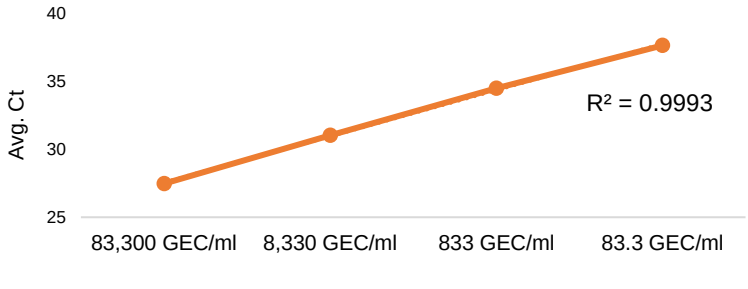
  - ✓ Store all components (i.e., buffers/reagents, columns) at room temperature (15-30°C).
  - ✓ Expiration dates for each of the unopened components are indicated on the individual component labels. These storage conditions apply to both opened and unopened components.
  - ✓ Eluted DNA/RNA can be used immediately or stored frozen (-20/-80°C).

Product Description

The **Load N' Go™ *Quick*-DNA/RNA™ HT** kit is intended for rapid, high-throughput nucleic acid extraction from any biological or clinical sample (e.g., swabs – nasal/nasopharyngeal, oropharyngeal, etc.; biological liquids – blood, plasma, serum, saliva, sputum, cells in suspension, etc.; tissue – needle biopsies, LCM, etc.) and/or samples stored in most collection matrices and devices (e.g., UTM, VTM, DNA/RNA Shield™, RNA*later*™, RNAProtect®, etc.).

The kit is compatible with robotic-type sample processors (e.g., bead movers, liquid handlers) in combination with sensitive downstream molecular amplification assays. High-quality DNA/RNA extracted with the **Load N' Go™ *Quick*-DNA/RNA™ HT** kit can be used for Next-Gen sequencing, RT/qPCR and more.

Limit of Detection Preliminary Assay from Biological Specimens using Automated Extraction



Concentration in Dilution Tested (GEC/ml)

Concentration in Dilution	83,300 GEC/ml (5,000 GEC/rxn)	8,330 GEC/ml (500 GEC/rxn)	833 GEC/ml (50 GEC/rxn)	83.3 GEC/ml (5 GEC/rxn)	8.33 GEC/ml (0.5 GEC/rxn)
Avg. Ct	27.5	31.0	34.5	37.6	Not detected
Positive, n=5	5/5	5/5	5/5	5/5	0/5

Automated extraction of whole genome viral RNA (i.e., SARS-CoV-2) spiked in sputum/swab samples collected in DNA/RNA Shield™ was performed with the **Load N' Go™ *Quick*-DNA/RNA™ HT** kit format, followed by quantification by RT-qPCR. Preliminary limit of detection (LoD) assay determined the lowest concentration for which 5/5 independent replicates tested positive.

Protocol

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

(I) Loading Scripts

Contact **automation@zymoresearch.com** to obtain the script and other reference materials related to this **Load N' Go™ *Quick*-DNA/RNA™ HT** kit on your automation platform[1].

Examples of popular systems that are compatible include, but are not limited to:

- ✓ AllSheng Auto-Pure 96
- ✓ Accuris IsoPure™ 96
- ✓ Thermo Scientific™ KingFisher™ Flex
- ✓ Thermo Scientific™ KingFisher™ Apex
- ✓ Tecan Fluent®
- ✓ Hamilton Microlab® Star™
- ✓ Opentrons™ OT-2

If you are unsure about compatibility, reach out to **automation@zymoresearch.com** for verification.

(II) Buffer Preparation

- ✓ Reconstitute lyophilized **Proteinase K** at 20 mg/ml with **Proteinase K Storage Buffer** and mix by vortexing. Use immediately or store frozen aliquots:

  For each **60 mg**, add 3.12 ml **Proteinase K Storage Buffer**

- ✓ Optional: add 3 µl beta-mercaptoethanol (user supplied) to each well for **Plate 2: HT Binding Plate**, (final 0.5% (v/v)).

- ✓ Optional: To prepare DNA/RNA Shield™ (1X)[2], dilute the 2X concentrate with an equal volume of nuclease-free water (user provided) (1:1) and mix well.

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1 If intended workflow requires a DNase I treatment, specify this in the outreach email and the appropriate scripts will be sent out.

2 DNA/RNA Shield™ is a sample collection medium for storage and preservation of nucleic acids. It also inactivates pathogens and prevents viral infectivity. Specimens stored and transported in DNA/RNA Shield™ can be processed directly without reagent removal, using standard laboratory operating procedures, for the detection of nucleic acids with molecular amplification assays.

(III) Sample Preparation

✓ Perform all steps at room temperature (15-30°C)

Sample Input – Depending on the sample type, up to 200 µl can be processed per prep (see examples below).

Swabs		
Nasal/Nasopharyngeal	Oropharyngeal	Buccal/cheek
Vaginal	Fecal	

Stored in UTM, VTM, saline, PBS, DNA/RNA Shield™, etc.

Optional - To inactivate, store and preserve samples at room temperature, add 100 µl **DNA/RNA Shield™** (2X concentrate)[1] to 100 µl sample (1:1). Mix well[2].

Liquids (I)		
Plasma	Serum	CSF
Cells in suspension		

Optional - To inactivate, store and preserve samples at room temperature, add 100 µl **DNA/RNA Shield™** (2X concentrate)[1] to 100 µl sample (1:1). Mix well[2].

Liquids (II)		
Whole blood	Saliva	Sputum
Urine		

Recommended: To inactivate, lyse and preserve samples at room temperature, add 100 µl **DNA/RNA Shield™** (2X concentrate)[1] to 100 µl sample (1:1). Mix well[2], centrifuge debris and process the cleared supernatant.

Tissue	
Tissue (< 5 mg)	Feces (< 20 mg)

LCM, needle biopsy or samples stored in media/device.

Recommended: To inactivate, lyse and preserve samples at room temperature, add 200 µl **DNA/RNA Shield** (1X)[1,3] and homogenize[4]. Mix well, centrifuge debris and process the cleared supernatant.

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1 At this point, samples in DNA/RNA Shield™ can be stored at ambient temperature (4-30°C) for a month, 7 days at 35°C, or long-term (> 1 year) at -20°C or below.
2 For all buffer additions and incubation steps, **mix well** for ≥1 minute by pipetting the beads up and down and/or by shaking (vortexing) at ~1,300 rpm. Optimization may be required.
3 To prepare DNA/RNA Shield (1X), dilute the **2X concentrate** with an equal volume of nuclease-free water (1:1) and mix well.
4 For efficient homogenization of tough-to-lyse tissue samples, bead-beat with ZR BashingBead™ Lysis Tubes (S6003, S6012, S6014), see Ordering Information on page 10 for more details.

(III) Sample Preparation (continued)

Proteinase K Treatment (optional)

✓ At this point, protein-rich samples (e.g., plasma, serum, saliva, sputum, tissue) can be treated by **Proteinase K**.

1. Add 1% **Proteinase K** (v/v) at 20 mg/ml[1] directly to a liquid sample. Mix well[2].

   Note: Up to 5% Proteinase K (v/v) at 4 mg/ml can be added to protein-rich samples (e.g., tissue).

2. Incubate at room temperature for 15 minutes.

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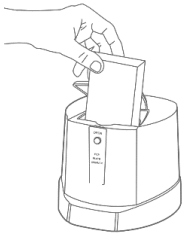
1 For automation platforms with "dead volume" liquid handler dispensing, the lyophilized Proteinase K can be reconstituted to a working concentration of 4-20 mg/ml.
2 For all buffer additions and incubation steps, **mix well** for ≥1 minute, by pipetting the beads up and down and/or by shaking (vortexing) at ~1,300 rpm. Optimization may be required.

(IV) DNA/RNA Purification

✓ Perform all steps at room temperature (15-30°C)

1. **Spin down elution plate.**



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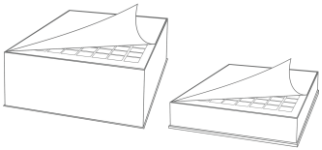
2. **Remove foil seals from all plates.**



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3. **Load 200 µL of prepped sample[1] into each well of sample plate.**

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4. **Run extraction script**

1 If using < 200 µl sample, increase the total sample input volume to 200 µl using DNA/RNA Shield (1x).

Appendices

Appendix A: FAQ

Question	Suggested Solutions
How do I avoid background contamination?	- Clean workspace, centrifuge, and pipettes with 10% bleach to routinely to avoid contamination. - If use of kit is in an exposed environment without proper filtration. Check pipettes, pipette tips, microcentrifuge tubes, workspace, etc. for contamination.
How do I fix low DNA yield?	Lysis Method - Bead beating devices that oscillate in a single dimension (only vertically or only horizontally) have been observed to inefficiently lyse very recalcitrant species. Devices that oscillate three-dimensionally or in a figure-8 motion often lyse microbes efficiently. Input - Reference Section III on Page 5 for information on your input limit based on sample.
How do I know if my automation instrument is compatible?	Examples of popular systems that are compatible include, but are not limited to: - AllSheng Auto-Pure 96 - IsoPure™ 96 - KingFisher™ Flex - KingFisher™ Apex - Tecan Fluent® - Hamilton Microlab® STAR™ - Opentrons™ OT-2 If you are unsure about compatibility, reach out to automation@zymoresearch.com for verification.
How do I get scripts for this kit on my automation platform?	Please contact automation@zymoresearch.com to send a request for scripts and additional reference material.

For any other technical assistance, please email automation@zymoresearch.com

Appendix B: DNase I Treatment

- ✓ For DNA-free RNA, DNase I treatment can be performed using **DNase I Set** and **DNA/RNA Prep Buffer**, materials sold separately[1].
- ✓ To run the DNase I treatment on your automation platform, please contact automation@zymoresearch.com for additional support and scripts.

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	
Nuclease-free water (user provided)	40 µl
DNA Digestion Buffer	5 µl
DNase I (reconstituted; 1 U/µl)[2]	5 µl

Proceed with additional script and protocol supplied from automation@zymoresearch.com to complete DNase I treatment[3].

1 See Ordering Information on page 10 for more information.
2 Prior to use, reconstitute lyophilized 250 U DNase I (E1009-A) to 1 U/µl (final concentration) with 275 µl nuclease-free water (user provided), mix by gentle inversion and store frozen aliquots.
3 Additional plastics will be required for the use of DNase I on an automation platform, see Ordering Information on page 10 for more details.

Ordering Information

Product Description	Catalog No.	Size
Load N' Go™ *Quick*-DNA/RNA™ HT	R2152	96 preps
DNase I Set	E1011	1500 U
DNA/RNA Shield™	R1100-250	250 ml
DNA/RNA Shield™ (2x)	R1200-125	125 ml
DNA/RNA Prep Buffer	D7010-2-50	50 ml
96 Deep Well Plate (V-Bottom 2.2 ml)	C2018-5	5 Plates
96 Deep Well Plate (V-Bottom 2.2 ml)	C2018-50	50 Plates
ZR BashingBead™ Lysis Tubes (2 mm)	S6003-50	50 Tubes
ZR BashingBead™ Lysis Tubes (0.1 & 0.5 mm)	S6012-50	50 Tubes
ZR BashingBead™ Lysis Tubes (0.1 & 2.0 mm)	S6014-50	50 Tubes

Notes

Notes

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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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