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XPRIZE SHINE - Paper-based SARS-CoV-2 NP Test

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XPRIZE Rapid Covid Tes...



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Protocol status: Working

We use this protocol and it's working

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Abstract

This protocol describes how to perform a SHINE paper-based assay to detect SARS-CoV-2 RNA from a self-collected nasopharyngeal sample. This protocol is intended for in-home use. All enzymatic components are provided as a single-test freeze-dried pellet for shelf-stable storage, and all steps of the protocol are performed at ambient temperature. The protocol presented here is an improved version of the method presented in Arizti-Sanz J*, Freije CA*, *et al.* Integrated sample inactivation, amplification, and Cas13-based detection of SARS-CoV-2. *bioRxiv* (2020).

Image Attribution

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Materials






















MATERIALS

- ✕ Nalgene® Dropper Bottles with Control Dispensing Tip, 4mL, white **Thermo Fisher Catalog #2750-9125**
- ✕ FastAmp® Viral and Cell Solution for Covid-19 Testing Solution B **Catalog #4633**
- ✕ Reagent Mix A (Paper-based SARS-CoV-2 resuspension mix)
- ✕ Lyophilized Reagent Mix B (Paper-based SARS-CoV-2 detection mix)
- ✕ HybriDetect — Universal Lateral Flow Assay Kit **Catalog #MGHD 1**
- ✕ Inoculating Loops and Needles Sterile 10 uL **VWR International (Avantor) Catalog #12000-810**
- ✕ Custom nasopharyngeal swab and collection tube

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Troubleshooting

Safety warnings

-  Please take care with potentially infectious sample material that does not come into contact with the provided viral lysis solution contained within the NP sample collection tube.

Before start

Download the HandLens application on the user-provided smart device (smartphone, tablet, etc.). Wash hands prior to starting the protocol.





Sample Collection and Viral Lysis



- 1 Open the nasopharyngeal (NP) collection tube and rotate the nasal swab (attached to the NP collection tube cap) 4 times around the inside of each nostril. Return the swab to the collection tube and cap the tube.

Nasopharyngeal collection tube contains necessary volume of FastAmp® Viral and Cell Solution.

 FastAmp® Viral and Cell Solution for Covid-19 Testing Solution B **Catalog #4633**


 Custom nasopharyngeal swab and collection tube

- 2 Mix NP sample and FastAmp® Viral and Cell Solution by shaking the closed sample collection tube for  00:00:10

- 3 Wait  00:05:00 , incubating sample at  Room temperature , before proceeding to Step 4.

SARS-CoV-2 Detection

- 4 Add the entire volume in the dropper bottle containing Reagent Mix A to the tube containing lyophilized Reagent Mix B. Cap the tube.


 Nalgene® Dropper Bottles with Control Dispensing Tip, 4mL, white **Thermo Fisher Catalog #2750-9125**

 Reagent Mix A (Paper-based SARS-CoV-2 resuspension mix)





 Lyophilized Reagent Mix B (Paper-based SARS-CoV-2 detection mix)

- 5 Mix Reagent Mix A and B by shaking for approximately  00:00:10 .




- 6 Dip the inoculation loop into the sample collection tube (a small layer of liquid should be contained within the loop).

 Inoculating Loops and Needles Sterile 10 uL **VWR International (Avantor) Catalog #12000-810**



- 7 Transfer liquid in inoculation loop to the Reagent Mix A and B tube by dipping the loop into tube and stirring for  00:00:05 . Remove and discard the inoculation loop and cap the tube.
- 8 Mix the sample combined with Reagent Mix A and B by shaking for approximately  00:00:10 .
- 9 Wait  01:30:00 , incubating sample at  Room temperature , before proceeding to Step 10.

Paper-based Readout and Automated Analysis

- 10 Open the Sample-Reagent Mix A and B tube and place the test strip into the liquid with the arrows on the test strip pointing upward and towards you.
 HybriDetect — Universal Lateral Flow Assay Kit **Catalog #MGHD 1**
- 11 Wait  00:05:00 with sample at  Room temperature for visible horizontal bands to appear on the test strip.
- 12 With the user-provided smart device such as a smartphone, open the HandLens application and select paper-based as the test type.
- 13 Take a photo of the test strip, and select upload. The result of the test will appear on the smart device screen.