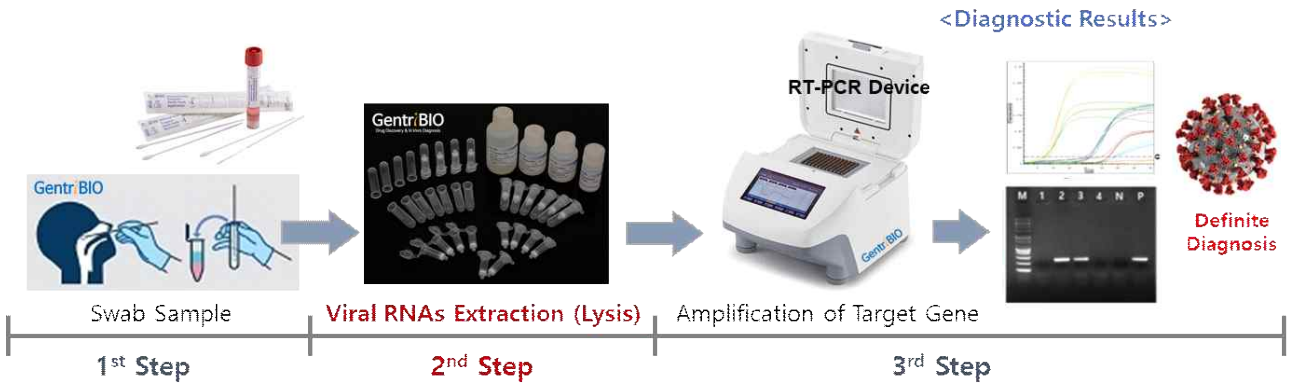


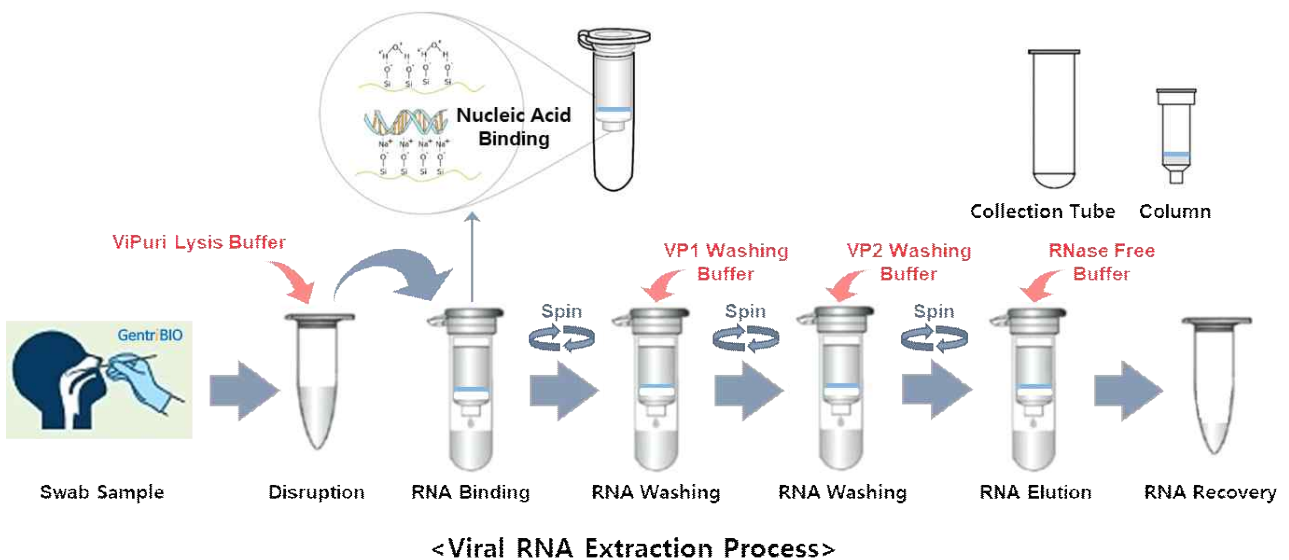
Viral RNA Isolation from Swab Sample in 20 min for RT-PCR Diagnosis

ViPuri™ Viral RNA Purification Kit

1. Diagnosis of viral infections is made through a three-step process.



- ✓ ViPuri™ Viral RNA Purification Kit is the essential reagent/kit for viral RNA extraction in the 2nd step during the viral infection diagnosis process.
- ✓ Viral RNAs is extracted through the steps such as virus disruption, RNAs bind into the column, washing, separation and recovery of RNAs from the collected sample.
 - : Most important of point to maintain the stability of viral RNA spilled into aqueous solution from complete disruption and disruption of the virus.



2. ViPuri™ Viral RNA Purification Kit's components



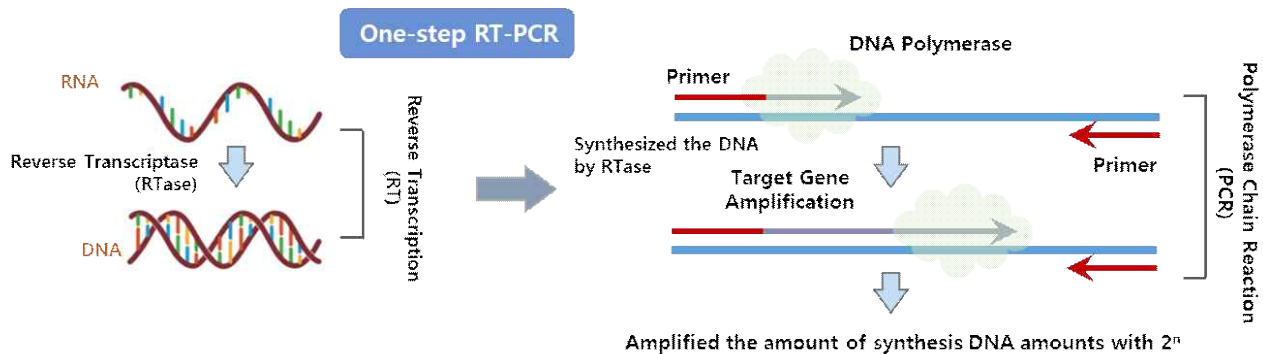
- ViPuri Lysis Buffer
 - ViPuri Carrier RNAs
 - VP1 Washing Buffer
 - VP2 Washing Buffer
 - RNase Free Water
 - ViPuri Viral RNA Mini Spin Columns
 - Collection Tubes
- ✓ ViPuri™ viral RNA Purification Kit can extract viral RNAs from the swab samples within 20 min using the spin method.
 - ✓ One box included 50 preps for virus RNA extraction.
 - ✓ Materials provided by user, not included in the kit but needed.
 - Pure Ethanol (100%)
 - RNase-free or sterilized 1.5 mL centrifuge tubes for RNA elution

3. Main Specifications

- ▶ Sensitivity
 - Limit of Detection : 7 virus particles at *in vitro* condition
- ▶ Specificity : 99.9%
 - Purity : 1.8 - 2.1 (A260/A280 nm)
 - Yield : > 50 µg (maximum)
- ▶ Detectable Capability : Viral Nucleic Acid (DNA, RNA)
 - Coronavirus' RNA including COVID-19 & Norovirus etc.
 - Viral DNA Extraction

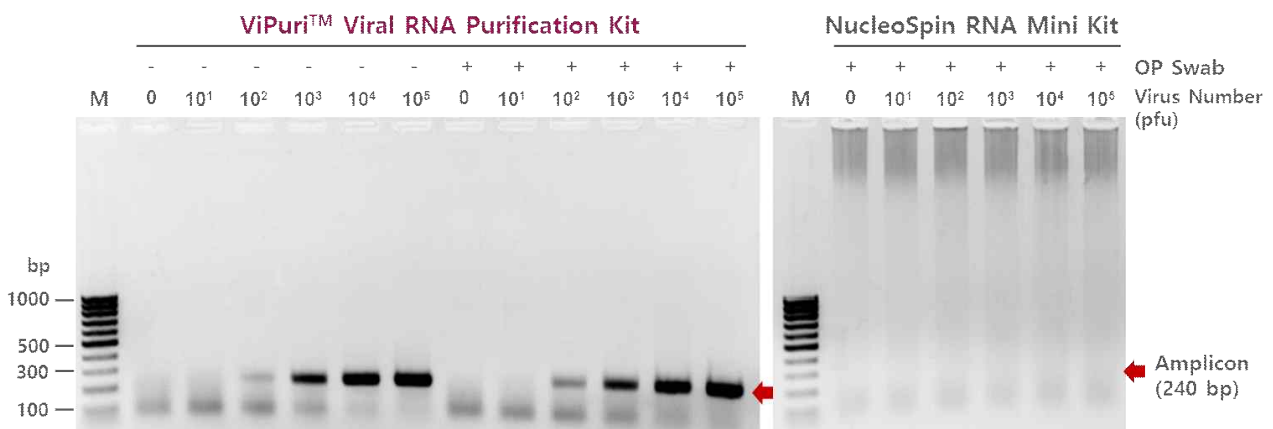
4. Identify the target gene from the isolated viral RNAs

- ✓ Confirmed the target gene identification through the RT-PCR (Reverse Transcriptase-DNA Polymerase Chain Reaction) method from the isolated viral RNAs.



4.1. Comparison of viral RNAs extraction ability of ViPuri™ Viral RNA Purification Kit and NucleoSpin RNA Virus Kit.

- ✓ Result of performing RT-PCR by separating RNA from norovirus, a type of coronavirus, using ViPuri™ Viral RNA Purification Kit.



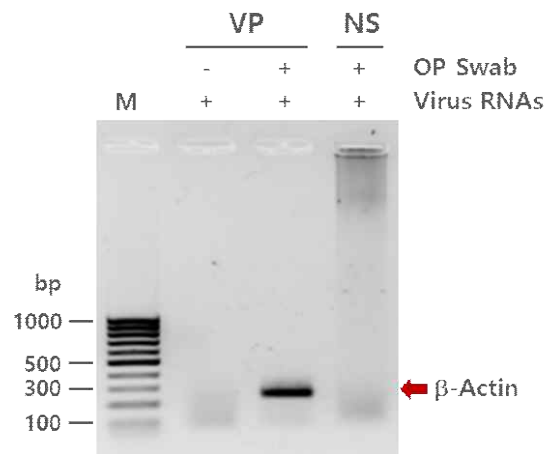
- After mixing norovirus by concentration and saliva, moisten it on a swab, isolate viral RNA using this product, and check the presence or absence of viral RNA using one-step RT-PCR kit which is developed by GentiBIO Inc.
- 100 virus particles in 2 mL of PBS buffer was the LoD (Limit of Detection, 7 virus particles) in ViPuri™ Viral RNA Purification Kit. However, NucleoSpin RNA Mini Kit (Machery-Nagel) can't

detect the viral signal in non-cell free condition.

The most probable cause of the NucleoSpin failure would be oropharyngeal cells which derived the capacities of the kit to the limit.

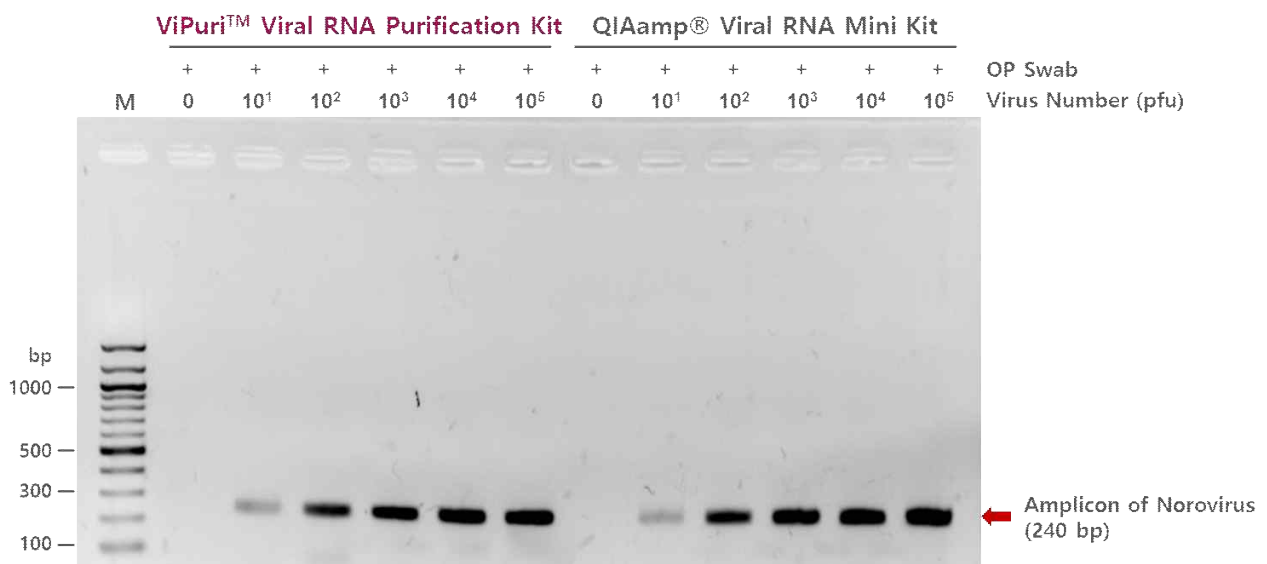
4.2. Verified the detection of human β -actin mRNA expression to confirm the ability of RNA extraction from oropharyngeal (OP) swap samples using RT-PCR.

Capability for Sample Collection



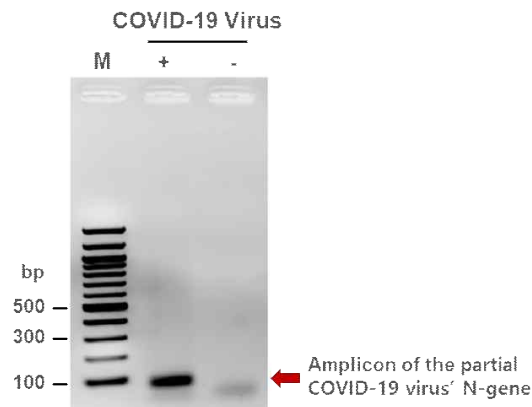
VP : ViPuri Viral RNA Purification Kit, NS : NucleoSpin RNA, Mini Kit.

4.3. Comparison result of viral RNAs extraction ability between the ViPuri™ Viral RNA Purification Kit and QIAamp® Viral RNA Mini Kit (Qiagen).



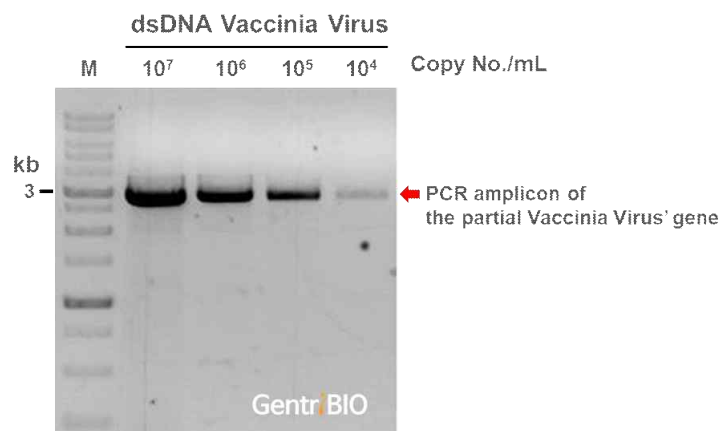
- 150 μ L from 2 mL of VTM with oropharyngeal (OP) cells was used for a single column of the ViPuri Viral RNA Purification Kit and QIAamp Viral RNA mini Kit. Target RT-PCR amplicon of norovirus (240 bp) detected by conventional RT-PCR.

4.4. Detection of COVID-19 virus' N-gene from the saliva of COVID-19 virus infected patient with ViPuri™ Viral RNA Purification Kit.



- RT-PCR experiment was performed with 1 μ L of the isolated RNAs and One-Step RT-PCR master mix with following conditions: Reverse Transcription (RT) at 50° C for 15 min; RT inactivation at 95° C for 2 min; 35 cycles of the following steps: 95° C for 15 sec, and 60° C for 30 sec.
- To detect whether COVID-19 virus infected or not, we use the primer set as like US CDC 2019-nCoV_N1 (72 bp).

4.5 ViPuri™ Viral RNA Purification Kit effectively isolated the viral DNAs from the vaccinia virus.



5. ViPuri™ Viral RNA Purification kit particular features

- ✓ Has better sensitivity to extraction of viral RNAs from swab sample of infected patients than other competitor.
 - ViPuri™ Viral RNA Purification Kit could extracted the viral RNAs from various concentrations of virus such as 100 virus particles in 2 mL of PBS buffer (Limit of Detection, 7 virus particles).
- ✓ Effectively extract the viral RNAs from cell free and non-cell free conditions.
 - When the swab sample is taken from a viral infected patient, epithelial cells are collected together, which interferes with the extraction of viral RNAs.
 - Even if the cells included in the swab sample are present, this kit is possible to extract nucleic acids effectively from the small amount of virus.
- ✓ Rapid, accurate and easily isolated the viral RNAs.
- ✓ Effectively prevents RNA disruption that occurs during the separation process of viral nucleic acids.
- ✓ Has price competitiveness by lower supply price compared to competitors.
- ✓ Effectively isolated the viral RNAs from COVID-19 coronavirus infected patient and can diagnosis through RT-PCR experiment using the isolated viral RNA immediately.

6. Contact Information

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