# BNG® Quick RNA Isolation and Molecular Transport Kit Instructions for Use

## Product name:

**BNG® Quick RNA Isolation and Molecular Transport Kit**

## Intended use:

**BNG®** is a transport system used for collection and transport of cells and viruses from clinical samples or from environment, for isolation of nucleic acids that will be used in nucleic acid amplification tests.

## Summary and explanation of the test:

Amplification of nucleic acids isolated from the cells or microorganisms by methods like polymerase chain reaction (PCR) is widely used for various purposes as detection of infectious agents including **SARS-CoV-2**, identification of the genotypes, identification of DNA sequences that lead to genetic diseases, drug resistance, etc.1 The sensitivity of these methods is very much dependent on appropriate collection and transpor of the samples. **BNG®** is a sampling and transport kit especially designed for this purpose. Commonly, laboratories use extraction kits for the isolation of nucleic acids before nucleic acid amplification tests. It has been shown in several studies that simply lysing the organisms and releasing the nucleic acids, is sufficient for nucleic acid amplification without further purification.2-4 **BNG®** releases the nucleic acids and makes them ready for the nucleic acid amplification tests. **BNG®** is made up of two parts: Sterile dacron swab in plastic package for collecting the sample and sterile transport medium in crack proof plastic tube. Sample obtained by dacron swab is put in the transport medium. Specimens like biopsy, scrapings, discharge can also directly be put into the medium. The cells and microorganisms will be lysed within minutes and nucleic acids will be released, ready to be amplified by nucleic acid amplification tests like PCR. Nuclease inhibitors, present in BNG solution, prevent their degradation.

Many other transport media on the market do not inactivate viruses and present a potential infection risk during the transport and handling. The dissolvent included in the transport medium of **BNG®** will disintegrate **SARS-CoV-2** and the virus will be inactivated. Therefore **BNG®** is one of the few and most suitable kits on the market for the transport of the SARS-COV-2 in avoiding infection risks.

## Limitations:

**BNG** is not suitable for bacterial or viral culture.

## Principles of the procedure:

**BNG®** is designed in a way to enable easy collection and appropriate transport of the virus samples. The transport medium has a pH around 8.0, which is suitable for nucleic acid preservation. Samples may contain nucleases (DNAse and RNASE) which will digest free nucleic acids and prevent their amplification. These enzymes require Mg** as their co-factor to be functional. **BNG** contains a ligand and chelating agent that strongly binds Mg+* and thus inhibits nucleases and preserves nucleic acids.5-7 Furthermore, the lysis solution releases the nucleic acids.

## Ingredients:

One box contains:

200 x sterile dacron swab in plastic package.

200 x nucleic acid transport medium 3mL (a buffer solution (pH 8.0), a lytic, ligand and chelating agent) in plastic tube.

## Cautions and warnings:

FOR IN VITRO DIAGNOSTIC USE.

Laboratory procedures involving infectious organisms require special equipment and techniques to minimize biohazards. People who apply these techniques are recommended to have special training in this area. Specimen preparation must be done in a biological safety cabinet. To reduce the risks of accidental exposure to infectious agents, additional precautions should be taken. At a minimum, specimen manipulation should be done in a biological safety cabinet. To reduce the risks of accidental exposure to infectious agents, additional precautions should be taken. At a minimum, speciman manipulation should be done in a contained environment having controlled access, which has an infectious agent exposure control plan. The locations should have surfaces that can be easily decontaminated using an appropriate topical disinfectant.

## Storage instructions:

Store at room temperature, in a dry place.

## Shelf life:

The shelf life is two years.

**Indications of instability or deterioration:**

Do not use the media if you observe any turbidity or leakage of the liquid.

## Specimen collection:

1- Remove the swab from its package paying attention to sterility.

2- Take the sample according to the recommendations.

3- Remove the tube cap and put the swab into the transport medium.

4- Break the shaft of the swab so that it will fit in the tube.

5- Close the cap securely.

6- Write on the tube the necessary information about the patient and sample. Send the tube as soon as possible to the laboratory.

7- At the laboratory, vortex the sample. Take a sample from the fluid and proceed to nucleic acid amplification.

## Time restrictions:

Viral nucleic acids are expected to be stable for at least one week at room temperature and up to one month at 2-8°C in **BNG®**. This may change according to the type of virus. If the samples are needed to be preserved longer, they should be kept at -20°C or better at -85°C, if available.

6, 7

**Quality control:** Quality control is done by nucleic acid amplification of viral DNA extracted from samples carried in **BNG®.**

## Bibliography:


1- Laboratory Methods in Basic Virology. Bailey & Scott's Diagnostic Microbiology, Ninth Edition. Mosby-Year Book Inc. St. Louis, MO. USA. 1994, chapter 42, p:641-680.

2- Kocagöz T., E. Yılmaz, Ş. Özkara, S. Kocagöz, M. Hayran, M. Sachedeva, H. F. Chambers. Detection of Mycobacterium tuberculosis in Sputum Samples by Polymerase Chain Reaction Using a Simplified Procedure. J Clin Microbiol. 31(6):1435-1438, 1993.

3- Merindol et al. SARS-CoV-2 detection by direct rRT-PCR without RNA extraction. J Clin Virology. 2020;128:104423.

4- Fukumoto T. et al. Efficacy of a novel SARS-CoV-2 detection kit without RNA extraction and purification. Int J Infect Dis. 2020;98:16-17

5- Inactivation of Tobacco Rattle Virus by EDTA, and the Role of Divalent Metal Ions in the Stability of the Virus. J. gen. Virol. 1977: 34: 547-50

6- Prachayasittikul V. et al. EDTA-induced Membrane Fluidization and Destabilization: Biophysical Studies on Artificial Lipid Biochimica Membranes. Acta et Biophysica Sinica 2007:39(11):901-13

7- Grant PR, Kitchen A, Barbara JA, Hewitt P,Sims CM, Garson JA, Tedder RS. Effects of handling and storage of blood on the stability of hepatitis C virus RNA: implications for NAT testing in transfusion practice. Vox Sang. 2000;78(3)::137-42.


## Manufacturer:


BIONANOGEN Tec. Dev. Ind. And Tra. INC.
Adatepe Mah. 10 Sk. No:5/A BUCA/İZMİR
Phone Number: +90 232 440 62 46
Fax:+90232 420 20 01
Mail: info@bionanogen.com.tr
Web: www.bionanogen.com.tr