



EliGene[®] COVID19 CONFIRM RT

REF

90078-RT (for 100 samples)

Kit components:

5 x 300 µl Confirm Mix
2 x 55 µl Enzyme Mix
2 x 260 µl IC RNA
1 x 150 µl PC SARS-CoV-2
1 x Instruction for Use

Storage and shelf life after first opening:

All components of the kit must be transported and stored at -20 °C. Kit and remaining MasterMixes must be stored at -20 °C in a dark.

Intended use

EliGene[®] COVID19 CONFIRM RT kit is intended for qualitative RNA detection of SARS-CoV-2 virus. The kit can be used for detection and to confirm the results obtained with another kit.

Principle of the method

This diagnostic kit is based on reverse transcription of SARS-CoV-2 viral RNA and subsequent one-step qPCR analysis. Innovative mixture of 3 sets of primers and 3 TaqMan probes (FAM labeled probes for virus detection and HEX labeled probe for internal control visualization) mixed in the ready-to-use SARS-CoV-2 Mix is used. The two targets amplify different SARS-CoV-2 specific sequences, however they all are detected in a single channel. This procedure ensures positive results even in case of virus mutation and was chosen with regard to the clear interpretation of results and user comfort. At the same time, such a format contributes to the high sensitivity of a method. The increased sensitivity and specificity of this kit is based on the amplification of two independent SARS-CoV-2 targets in a single PCR reaction. These are targets in the ORF1ab gene and in the E gene in the RNA sequence of the SARS-CoV-2 virus. Primers and probes utilized in the kit were approved and recommended by WHO. All specific primers and probes used in the kits are verified on a monthly basis, based on the GenBank database with new known virus sequences, to ensure complete functionality of the kits at all times. All oligonucleotides and targets used in this kit are different from the oligonucleotides and targets of the EliGene[®] COVID19 BASIC A RT kit, so these kits can be used independently for confirmation or detection in the event of laboratory contamination.

Introduction

In late December 2019, an outbreak of an unknown disease called pneumonia of unknown cause occurred in Wuhan, Hubei Province, China. The causative virus has been named as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the relevant infection disease has been named as coronavirus disease 2019 (COVID-19).

Coronaviruses were discovered in the 1960s and they were classified under family *Coronaviridae* that is the largest family within the order *Nidovirales*. SARS-CoV-2 is spherical positive single-stranded RNA virus that is characterized by spike proteins projecting from the virion surface. It is enveloped virus (envelope is a lipid bilayer derived from the host cell membrane) with the viral structure formed primarily of structural proteins such as spike (S), membrane (M), envelope (E), nucleocapsid (N), and hemagglutinin-esterase (HE). The RNA genome of coronaviruses is the second largest of all RNA viruses, SARS-CoV-2 has 29.9 kilobases in size.



Primary sample collection, handling and storage

Clinical material:	Recommended RNA isolation procedure:
nasopharyngeal swabs,	Manual: EliGene Viral RNA/DNA FAST Isolation kit (15 min protocol)
swabs, saliva, sputum,	chemagic Viral DNA/RNA Kit (chemagen - PerkinElmer)
urine	QIAamp Virus Spin Kit or kits recommended by Qiagen
	Vacuum/centrifugation: EliGene Viral RNA/DNA FAST 96 Vacuum Isolation Kit (<40 min/96 samples protocol)
serum, plasma	chemagic Viral DNA/RNA Kit (chemagen - PerkinElmer)
	QIAamp Virus Spin Kit or kits recommended by Qiagen
Automatic isolation:	ZEPHYRUS Magneto (ELISABETH PHARMACON)
	actually recommended kits
	chemagic 360 Instrument (chemagen - PerkinElmer)
	chemagic Viral DNA/RNA Kit
	chemagic Viral NA/gDNA Kit
	QIAcube Instrument (Qiagen)
	actually recommended kits

EliGene[®] COVID19 CONFIRM RT (90078-RT) and EliGene[®] COVID19 CONFIRM 500 RT (90078-RT-500) are intended for the primary detection of SARS-CoV-2 virus and are complementary with the kits EliGene[®] COVID19 BASIC A RT and EliGene[®] COVID19 BASIC A500 RT. Internal controls of all EliGene[®] kits for the detection of SARS-CoV-2 virus are identical, therefore, RNA isolated with internal control from BASIC kit can be analyzed by the CONFIRM kit and vice versa. EliGene[®] CONFIRM kits can be used for the confirmation of the positive or dubious results from other SARS-CoV-2 detection kits or can help to identify the source of the contamination in laboratory.

RNA is recommended to be eluted in water for molecular biology. Due to the composition of the elution buffers of some manufacturers, inhibition of PCR reaction by elution buffer compounds may occur. Elution buffer of EliGene Viral RNA/DNA FAST Isolation kit can be used with no fear of PCR inhibition, as well as elution buffers of isolation kits recommended above. If you intend to use isolation kits from other manufacturers, internal control of amplification (RNA) included in this kit must be added to RNA isolation to ensure that inhibition by elution buffer is excluded.

Serum or plasma:

According to standard protocol, take the sample of serum into sterile tube. Transport samples at 4 °C to the laboratory. Serum samples are stable for a maximum of 4 days under these conditions. For longer storage, freeze the sample at -70 °C.

We recommend use volume 200 µl of serum and elution volume 50 µl of PCR water. Before the isolation, 5 µl of Internal Control RNA (IC RNA) must be added to the sample after addition of lysis buffer.

Swabs:

These specimens should be collected according to standard protocol in collection tubes.



Recommended swabs:

Flocked swabs (swabs made by the flocking technique) are inserted into the virus transport medium after swabbing.

Do not use cotton swabs due to possible inhibition of the PCR reaction. Do not use dry swabs for transport!

Samples should be transported to the laboratory at 4 °C (blue ice). Oropharyngeal and nasopharyngeal swabs are stable at 4 °C in virus transport medium for at least 3 days after sampling. For longer storage, freeze the sample at -70 °C.

Another option is to use inactivating transport media. Each inactivation medium must be validated for used RNA isolation method!

In the case of sampling in transport medium, 200 µl or quantity recommended by instruction manual of used isolation kit should be used for RNA isolation. 5µl of Internal Control RNA (IC RNA) must be added to the sample used for RNA isolation after addition of lysis buffer.

Additional required equipment

- Automatic pipettes 1-1000 µl and sterile tips with filter DNA-, RNA- free, DNase-, RNase- free (we recommended plastic with CE certificate for diagnostic purposes).
- Sterile plastic (strips, plates, tubes) DNase-, RNase- free compatible with given qPCR system.
- Sterile stand DNA-, RNA- free, DNase-, RNase- free.
- Equipment for qPCR – the kit is designed for LightCycler® 480 (Roche), QuantStudio 3 and 5 (ThermoFisher Scientific), Rotor-Gene Q (Qiagen) and CFX96 (Bio-Rad). The RT-qPCR for the detection of SARS-CoV-2 RNA utilizes TaqMan technology (FAM and HEX probes) and can be performed on other instruments that can work in FAM and HEX channels
- Lab safety gloves and respirators FFP3. Please work in appropriate biohazard boxes. Also, centrifugation of samples must be performed in biohazard boxes. Keep in mind that also viral RNA can cause infection.
- As it is a serious pathogen, please follow actual WHO recommendations for BSL2+ or BSL3 laboratories.

Configuration of qPCR instrument

- For detection of target sequences of SARS-CoV-2 three probes labeled with FAM are used (exc. 494 nm – em. 518 nm)
- For detection of Internal control, the probe labeled with HEX is used (exc. 520 nm – em. 548 nm)

LightCycler® 480 (Roche):

Please, use white plates only intended for LightCycler® 480. The usage of natural plates can lead to decreased sensitivity of the kit. Do not reuse plates; the contamination of your laboratory could occur during the manipulation with plates.

In option Detection format choose “2 Color Hydrolysis probe”.

Set up the following temperature profile:

Step 1 - Analysis mode “None”, 1 Cycle

55°C	15 min	Ramp rate (4.4°C/s)	Acquisition mode “None”
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Step 2 - Analysis mode “None”, 1 Cycle

95°C	2 min	Ramp rate (4.4°C/s)	Acquisition mode “None”
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Step 2 - Analysis mode "Quantification", 45 Cycles

95°C	5 s	Ramp rate (4.4°C/s)	Acquisition mode "None"
55°C	15 s	Ramp rate (2.2°C/s)	Acquisition mode "Single"
67°C	15 s	Ramp rate (4.4°C/s)	Acquisition mode "None"

Step 3 - Analysis mode "None", 1 Cycle

40°C	20 s	Ramp rate (2.2°C/s)	Acquisition mode "None"
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The complete temperature profile can be up-loaded from Run Template "EliGene COVID19 CONFIRM _LC480.ix0". The Run Template can be imported to the software in menu "Navigator" by clicking to icon "Import" from the CD included in the kit.

QuantStudio 3 and 5 (ThermoFisher Scientific):

Use the Experiment type, "Presence/Absence", Chemistry "TaqMan Probes", and Run Mode "Standard".

Set up the following temperature profile:

Holding stage

55°C 15 min Ramp rate (1.6°C/s)

Holding stage

95°C 2 min Ramp rate (1.6°C/s)

Cycling stage – 45 cycles

95°C 5 s Ramp rate (1.6°C/s)

55°C 15 s Ramp rate (1.6°C/s) Data collection ON

67°C 15 s Ramp rate (1.6°C/s)

Post-Read Stage

40°C 20 s Ramp rate (1.6°C/s)

Collect emission signal at the second step at 55 °C

The complete temperature profile can be up-loaded from Run Template "EliGene COVID19 CONFIRM _QS3_v00.edt" or "EliGene COVID19 CONFIRM _QS5_v00.edt". The Run Template can be copied from the CD included in the kit.

RotorGene 6000 or Q (Qiagen):

In the "New Run" window choose "Three Step" run

Choose the appropriate "Rotor Type" and click "Next".

Set up the following temperature profile:

Holding stage

55°C 15 min

Holding stage

95°C 2 min

Cycling stage – 45 cycles

95°C 5 s

55°C 15 s Acquiring in channels "Green" and "Yellow"

67°C 15 s



Holding stage

40°C 20 s

For the Gain optimization in all channels select option “Automatic gain optimization before first acquisition”. The complete temperature profile can be up-loaded from Run Template “EliGene COVID19 CONFIRM_Q-GENE_v00.ret”. The Run Template can be copied from the CD included in the kit.

CFX96 Touch (Bio-Rad):

In Startup Wizard Create a new Experiment for CFX96 instrument and Create New Protocol.

Set up the following temperature profile:

Step 1	55°C	15 min
Step 2	95°C	2 min
Step 3	95°C	5 s
Step 4	55°C	15 s + Plate Read
Step 5	67°C	15 s
Step 6	GOTO Step 3 44x	
Step 7	40°C	20 s

Enter the Sample Volume 20ul

Collect emission signal at the Step 4 at 55° C.

For filter settings use the “Scan Mode” All Channels but in Plate Manager select for the samples only fluorophores FAM and HEX. Then assign the samples with positions and Targets FAM and HEX as an Unknown sample (Samples) or Standard. The complete temperature profile can be up-loaded from Run Template “EliGene COVID19 CONFIRM_CFX_v00.prcl”. The Run Template can be copied from the CD included in the kit.

Reagent preparation

- To avoid the contamination, keep all tubes closed and follow the instructions.
- Before the usage, all reagents must be completely thawed, briefly mixed on vortex and shortly spun.
- Add 5 µl of Internal Control RNA (IC RNA) to sample with lysis buffer. Never add Internal Control RNA to isolated RNA before starting PCR!

WARNING: The contamination in laboratory space is also possible. Use separate pipette for Master Mixes, separate pipette for positive controls and separate pipette for samples! Follow all recommendations for laboratories providing RNA analyses.

Preparation of Master Mix

1. Take the SARS-CoV-2 Mix tube and the Enzyme Mix tube and thaw at room temperature. Immediately after thawing, spin briefly in centrifuge. Prepare the Master Mix by mixing 14 µl Confirm Mix and 1 µl Enzyme Mix per reaction and spin briefly.
2. Detection: Add 15 µl of the Master Mix to the amplification tubes or plates and add 5 µl of the isolated RNA sample. Be careful when pipetting the sample to avoid cross-contamination of the samples. The prepared Master Mix should be used within 30 minutes and cannot be reused. Do not freeze prepared Master Mix.
3. Positive Control: Pipette 15 µl of the Master Mix separately into the amplification tube or plate. Then add 5µl of PC RNA SARS-CoV-2. Be careful when pipetting the positive control to avoid contamination of samples. **Use a**



different micropipette for pipetting only positive controls.

Insert the microtubes or plate into the qPCR instrument and run the program as described in Configuring the qPCR Instrument above.

Result reading

LightCycler® 480 (Roche):

In “Sample Editor” menu choose “Abs Quant” workflow.

In menu “Analysis” choose “Abs Quant/2nd Derivative Max” option.

Positive result for SARS-CoV-2: The positive result is characterized by the growth of fluorescence signal in FAM channel (465-510). In a case of negative results, the amplification will not occur.

The Internal Control must be amplified in each sample. The Internal Control amplification is characterized by a growth of signal in HEX channel (533-580).

QuantStudio 3 and 5 (ThermoFisher Scientific):

In “Analyse Settings” choose “Automatic Threshold” and “Automatic Baseline” option and analyze results.

Positive result for SARS-CoV-2: The positive result is characterized by the growth of fluorescence signal in FAM channel (em. 518 nm). In a case of negative results, the amplification will not occur.

The Internal Control must be amplified in each sample. The Internal Control amplification is characterized by the growth of fluorescence signal in HEX channel (em. 548 nm).

Rotor-Gene Q (Qiagen):

Click to “Analysis” icon in the menu and choose Analysis option “Quantitation”. In “Quantitation Analysis” window choose “Dynamic Tube” and “Slope Correct” option.

Positive result for SARS-CoV-2: The positive result is characterized by the growth of fluorescence signal in FAM channel (Green). In a case of negative results, the amplification will not occur.

The Internal Control must be amplified in each sample. The Internal Control amplification is characterized by the growth of fluorescence signal in HEX channel (Yellow).

The values of “Calc. conc.” correspond to the quantity of positive result; “Negative” means negative result.

CFX96 Touch (Bio-Rad):

In the Data Analysis window, choose “Quantification”. In “Settings” menu, choose “Baseline Setting” option, and select “Baseline Subtracted Curve Fit” and “Apply Fluorescence Drift Correction”.

In Data Analysis window choose “Quantification”. In “Settings” menu choose option “Baseline Threshold” and select “Baseline Cycles” option as “Auto Calculated” and “Single Threshold” option as “Auto calculated”.

In Data Analysis window select a single fluorophore (FAM or HEX) by the clicking the box next to the fluorophore name located under the amplification chart and read the results for individual samples.

Positive result for SARS-CoV-2: The positive result is characterized by the growth of fluorescence signal in FAM channel (em. 518 nm). In a case of negative results, the amplification will not occur.

The Internal Control must be amplified in each sample. The Internal Control amplification is characterized by the growth of fluorescence signal in HEX channel (em. 548 nm).



Interpretation of results

Negative result:

If the increase of amplification signal in FAM channel does not appear before cycle number 40, the result of test should be interpreted as probably negative or with concentration of RNA below the detection limit of this kit (5 genomic RNA/reaction). The signal for Internal Control must be positive – see article Quality control. This result does not exclude the occurrence of SARS-CoV-2 infection because results of this test are dependent on proper sample collection and processing. Results are also dependent on adequate quantity of analyzed SARS-CoV-2 RNA. **It has been reported that the virus can be secreted intermittently, and even in an infected patient, the virus level in clinical specimens may be below the detection limit of any RT-qPCR method in given days. For this reason, it is recommended to perform at least two, ideally more RT-qPCR examinations in a single patient over several days.**

Positive result:

Amplification signal in FAM channel appears before cycle number 40. SARS-CoV-2 RNA was detected in the sample. The sample is SARS-CoV-2 RNA positive.

Inhibited sample:

In the case that increase of the amplification signal specific for SARS-CoV-2 in FAM channel and also increase the of amplification signal specific for internal control in HEX channel is not observed, the analysis should be repeated preferably with newly isolated RNA samples. Make sure the elution buffer does not inhibit the PCR reaction. In this case it is recommended to perform elution into water for molecular biology.

Control procedure

EliGene® COVID19 CONFIRM Kit involves Internal Control (IC RNA). Internal Control follows the quality of RNA isolation and detects the occurrence of an inhibition of reverse transcription and amplification process. To control isolation yield and occurrence of an inhibition of amplification process the Internal Control (IC RNA) must be added before the RNA isolation directly to the sample. In the case that the sample is SARS-CoV-2 RNA negative, cycle number of Internal Control must be lower than 32.

Additionally, **cycle number values of all the samples undergoing the same procedure of RNA isolation must have cycle number value of IAC in the HEX channel within the range of 3 cycles.** The higher fluctuation of the cycle number values in a single qPCR run indicates non-standard conditions in the RNA isolation. However, this condition does not apply to highly positive samples (cycle number in FAM channel < 20).

Reference material:

To monitor the all examination process covering RNA isolation and RealTime PCR detection is possible to use reference viral material positive for SARS-CoV-2. The commercial positive material is not available. Do not use artificial RNA or DNA, or positive controls from other manufacturers.

Troubleshooting:

1. If there is no amplification of Internal Control, there is some problem in the isolation of RNA or the kit is after the expiration date or there is qPCR instrument malfunction.
2. If the cycle number range of the Internal Amplification Control is higher than 3 cycles, there is a non-homogeneity in the RNA isolation cause probably by the partial inhibition of the qPCR. Repetition of the RNA isolation should be considered in this case. Another possibility is to dilute the isolated RNA twice, alternatively more times.



3. If there is no amplification of Positive Control, the kit is after the expiration date or there is qPCR instrument malfunction. It may also be a failure to follow the recommended procedure for sample preparation and analysis.

Performance characteristics

Analytical performance characteristics:

Analytical sensitivity of EliGene® COVID19 CONFIRM RT kit is 5 genomic RNA added in Master Mix. Sensitivity of PCR procedure depends on the method of RNA isolation. The sensitivity of method was verified as follows. There were prepared dilution series of positive RNA samples of known concentration. Totally it was tested for three times. The SARS-CoV-2 detection was 100% successful in all the samples which contain 5 and more RNA in reaction Mix.

Analytical sensitivity is 5 copies of SARS-CoV-2 RNAs in reaction Mix.

Analytical specificity of method is 100%. All the primers and probes were approved and recommended by WHO. Additionally, analytical specificity of method was analysed by comparison of primers and probes sequences with all known RNA and DNA sequences in GenBank database and no cross reaction was found. No cross reaction with human genome was found.

Clinical specificity and sensitivity was tested on 143 clinical specimens. As reference material samples, nasopharyngeal swabs and saliva samples were used. Samples were independently tested by EliGene® COVID19 CONFIRM RT kit and by four reference methods - by one different method recommended by WHO (Charité - Corman VM, Landt O, Kaiser M, et al. Detection of 2019 novel coronavirus (2019-nCoV) by real-time RT-PCR. Euro Surveill 2020;25) and by three CE IVD marked kits of competitive manufacturers. EliGene® COVID19 CONFIRM RT kit showed in comparison with all reference methods 100% agreement:

Really positive (A) = 61 (53 nasopharyngeal swabs, 8 saliva samples)
False positive (B) = 0
False negative (C) = 0
Really negative (D) = 82

Sensitivity = $A/(A+C) = 61/(61+0) = 100\%$
Specificity = $D/(D+B) = 82/(82+0) = 100\%$

Clinical sensitivity and specificity of EliGene® COVID19 CONFIRM RT kit is 100%.

Diagnostic performance characteristics:

Measuring interval

The kit enables the detection of 5×10^0 - 5×10^8 of viral RNA molecules in Reaction Mix.

Internal control of quality

As an internal control of quality, the Internal Control (IC RNA) for checking the process of RNA isolation, reverse transcription and DNA amplification is used. Positive Control for functional control of Master Mix and as a reference sample is used.



Limitation of the examination procedure

The sensitivity of kit depends on handling with specimen (isolation of RNA). It is strictly recommended to use isolation kits and procedures recommended in this manual.

Negative result does not exclude the occurrence of SARS-CoV-2 infection. Results of this test are dependent on proper sample collection and elaboration. Results are also dependent on enough quantity of analysed SARS-CoV-2 RNA. The presence of SARS-CoV-2 RNA in clinical samples of infected persons is dependent on infection phase and could be intermittent. The final conclusion on the diagnosis and treatment of patients must be given by the attending physician.

Biological reference intervals

Not applicable information for this kit.

Warning

After the preparation, the Master Mix is stable for 30 minutes. Do not freeze tubes with Master Mix repeatedly! Do not mix components of the kits of different lots!

Warnings and general precautions

This kit is intended for *in vitro* use only.

- Lab safety gloves and respirators FFP3 are necessary for work. Please work in appropriate biohazard boxes. Also centrifugation of samples must be performed in biohazard boxes. Keep in mind that also viral RNA can cause infection.
- **As SARS-CoV-2 is a serious pathogen, please follow actual WHO recommendations for BSL2+ or BSL3 laboratories!**
- Handle and dispose of all biological samples as if they could transmit infective agents. Avoid direct contact with the biological samples. Avoid splashing or spraying. The materials that come into contact with biological samples must be treated with 3% sodium hypochlorite for at least 30 minutes or autoclaved at 121 °C for one hour before disposal.
- Handle and dispose of all reagents and all assay materials as if they could transmit infective agents. Avoid direct contact with the reagents. Avoid splashing or spraying. Waste must be treated and disposed of in compliance with the appropriate safety standards. Disposable combustible materials must be incinerated. Liquid waste containing acids or bases must be neutralized before disposal.
- Wear suitable protective clothing and gloves and protect eyes/face.
- Never pipette solutions by mouth.
- Do not eat, drink, smoke or apply cosmetic products in the work areas.
- Wash hands carefully after handling samples and reagents.
- Dispose of leftover reagents and waste in compliance with regulations in force.
- Read all the instructions provided with the kit before running the assay.
- Follow the instructions provided with the kit while running the assay.
- Do not use the kit after the expiry date.
- Only use the reagents provided in the kit and those recommended by the manufacturer.
- Do not mix reagents from different batches.
- Do not use reagents from other manufacturer's kit.
- Do not change recommended protocol for PCR analysis!



Warnings and precautions for molecular biology

- Molecular biology procedures, such as extraction, reverse transcription, amplification and detection of nucleic acids, require qualified staff to prevent the risk of erroneous results, especially due to degradation of the nucleic acids contained in the samples or due to sample contamination by amplification products.
- It is necessary to have separate areas for the extraction/preparation of amplification reactions and for the amplification/detection of amplification products. Never introduce an amplification product in the area designed for extraction/preparation of amplification reactions.
- It is necessary to have lab coats, gloves and tools which are exclusively employed in the extraction/preparation of amplification reactions and for the amplification/detection of amplification products. Never transfer lab coats, gloves or tools from the area designed for the amplification/detection of amplification products to the area designed for the extraction/preparation of the amplification reactions.
- The samples must be exclusively employed for this type of analysis. Samples must be handled under a laminar flow hood. Tubes containing different samples must never be opened at the same time. Pipettes used to handle samples must be exclusively employed for this specific purpose. The pipettes must be of the positive displacement type or be used with aerosol filter tips. The tips employed must be sterile, free from DNases and RNases, free from DNA and RNA.
- Reagents must be handled in PCR box. The reagents required for amplification must be prepared in such a way that they can be used in a single session. The pipettes employed to handle the reagents must be used exclusively for this purpose. The pipettes must be of the positive displacement type or be used with aerosol filter tips. The tips employed must be sterile, free from DNases and RNases, free from DNA and RNA.
- Amplification products must be handled in such a way as to reduce dispersion into the environment as much as possible, in order to avoid the possibility of contamination. Pipettes used to handle amplification products must be employed exclusively for this specific purpose.

Warnings and precautions specific to components of the kit

The tubes containing SARS-CoV-2 Mix and Enzyme Mix are disposable and therefore must be used once only in the preparation of the reaction mixture.

These Mixes carry the following safety warnings (P):

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P281 Use personal protective equipment as required.

The tubes containing IC RNA are disposable and therefore must be used once only in the preparation of the reaction mixture.

In case of any problems, please contact ELISABETH PHARMACON, Ltd.

Literature










He F, Deng Y, Li W. Coronavirus Disease 2019 (COVID-19): What we know? J Med Virol. 2020 Mar 14. doi: 10.1002/jmv.25766.

Khan S, Siddique R, Shereen MA, Ali A, Liu J, Bai Q, Bashir N, Xue M. The emergence of a novel coronavirus (SARS-CoV-2), their biology and therapeutic options. J Clin Microbiol. 2020 Mar 11. pii: JCM.00187-20. doi: 10.1128/JCM.00187-20.

Ashour HM, Elkhatib WF, Rahman MM, Elshabrawy HA. Insights into the Recent 2019 Novel Coronavirus (SARS-CoV-2) in Light of Past Human Coronavirus Outbreaks. Pathogens. 2020 Mar 4;9(3). pii: E186. doi: 10.3390/pathogens9030186.



Symbols

	Catalog number
	Upper limit of temperature
	Batch code
	Use by (last day of month)
	<i>in vitro</i> diagnostic medical device
	Fulfilling the requirements of European Directive 98\79\EC for <i>in vitro</i> diagnostic medical device.
	Contains sufficient for "N" tests
	Attention, consult instructions for use
	Manufacturer

Manufacturer

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