

# Laboratory diagnosis of respiratory infections

by Real-Time PCR



## Acute respiratory infections

Acute respiratory infections are a group of infectious diseases caused by various pathogens and characterized by damage to the upper and lower respiratory tract.

The causative agents of respiratory infections can be an etiological factor in the development of complications

- acute respiratory distress syndrome (ARDS)
- acute respiratory failure
- pericarditis, myocarditis, nephritis
- lung abscess and pleurisy
- pneumonia
- secondary bacteremia, sepsis
- toxic shock syndrome

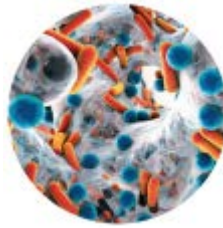


### Viruses



Influenza A and B (Inf A/B)  
Rhinoviruses (hRV)  
Adenoviruses (hAdV)  
Coronaviruses (229E, HKU1, NL63, OC43, SARS, MERS, SARS-CoV-2)  
Parainfluenza 1, 2, 3, 4 (hPIV 1-4)  
Metapneumovirus (hMpV)  
Respiratory syncytial virus (hRSV)  
Bocavirus (hBoV)

### Bacteria



*Streptococcus pneumoniae* *Haemophilus influenzae*  
*Klebsiella pneumoniae*  
*Streptococcus pyogenes* *Staphylococcus aureus*  
*Moraxella catarrhalis*  
*Neisseria meningitidis*  
*Chlamydia pneumoniae*  
*Legionella pneumophila*  
*Mycoplasma pneumoniae*  
*Bordetella spp.*

### Fungi



*Candida spp.*  
*Aspergillus fumigatus*  
*Pneumocystis jirovecii*  
*Cryptococcus neoformans*  
*Cryptococcus gattii*  
*Histoplasma capsulatum*  
*Blastomyces dermatitidis*  
*Coccidioides immitis*  
*Coccidioides posadasii*

Identification of pathogens using laboratory diagnostic methods makes it possible to start adequate treatment in time and avoid the development of complications.



- In most cases, acute respiratory infections occur with a similar clinical picture (runny nose, cough, sore throat), general intoxication, subfebrile, less often febrile fever
- With the same clinical signs, acute respiratory infections differ in the risk of developing different complications
- Modern methods of laboratory diagnostics allow us to determine the etiology of the disease and choose the right approach for the treatment of patients.

## Laboratory diagnosis of acute respiratory infections by real-time PCR

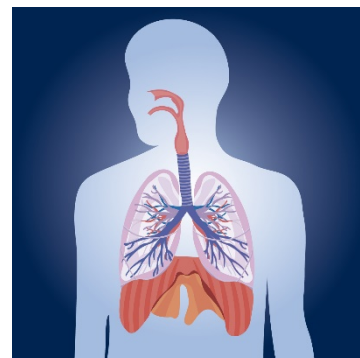
### Biological specimen:

**Specimen:** swab from the mucosa of the nasopharynx and oropharynx

**Storage:** up to 3 days – at 2-8 °C, longer – no more than at -16 °C

**Specimen:** Sputum (including induced), bronchoalveolar lavage, tracheal aspirate, pleural fluid

**Storage:** up to 24 hours – at 2-8 °C, longer – no more than at -16 °C



### Sampling instructions

#### Nasopharyngeal swab

A dry sterile probe is inserted with a slight movement along the outer wall of the nose to a depth of 2-3 cm to the lower tube; Then the probe is slightly lowered down, inserted into the lower nasal passage under the lower nasal concha, a rotational movement is made and taken out along the outer wall of the nose.

#### Oropharyngeal swab

The swab is taken by rotational movements from the surface of the tonsils, palatine arches and the posterior wall of the oropharynx by a dry sterile probe.

Place the working part of the probe in a test tube of transport solution. Rinse the probe thoroughly in the transport solution, press it well against the walls of the tube and remove. Close the tube tightly with the cap.

Biological material is taken no later than 3 days after the onset of the disease or on the first day of hospitalization, preferably before the start of therapy.



### PCR diagnosis of respiratory infections

- Definition of etiology, differential diagnosis and detection of mixed infections
- Diagnosis at an early stage of the disease
- Selection of specific means of etiotropic therapy and control of treatment
- Timely hospitalisation and rational guidance of patients
- Predicting the severity of the course of the disease, possible complications and outcomes of the disease

Real-Time  
PCR is a direct  
method of  
DNA/RNA  
detection

✓ Viruses

✓ Bacteria

✓ Fungi

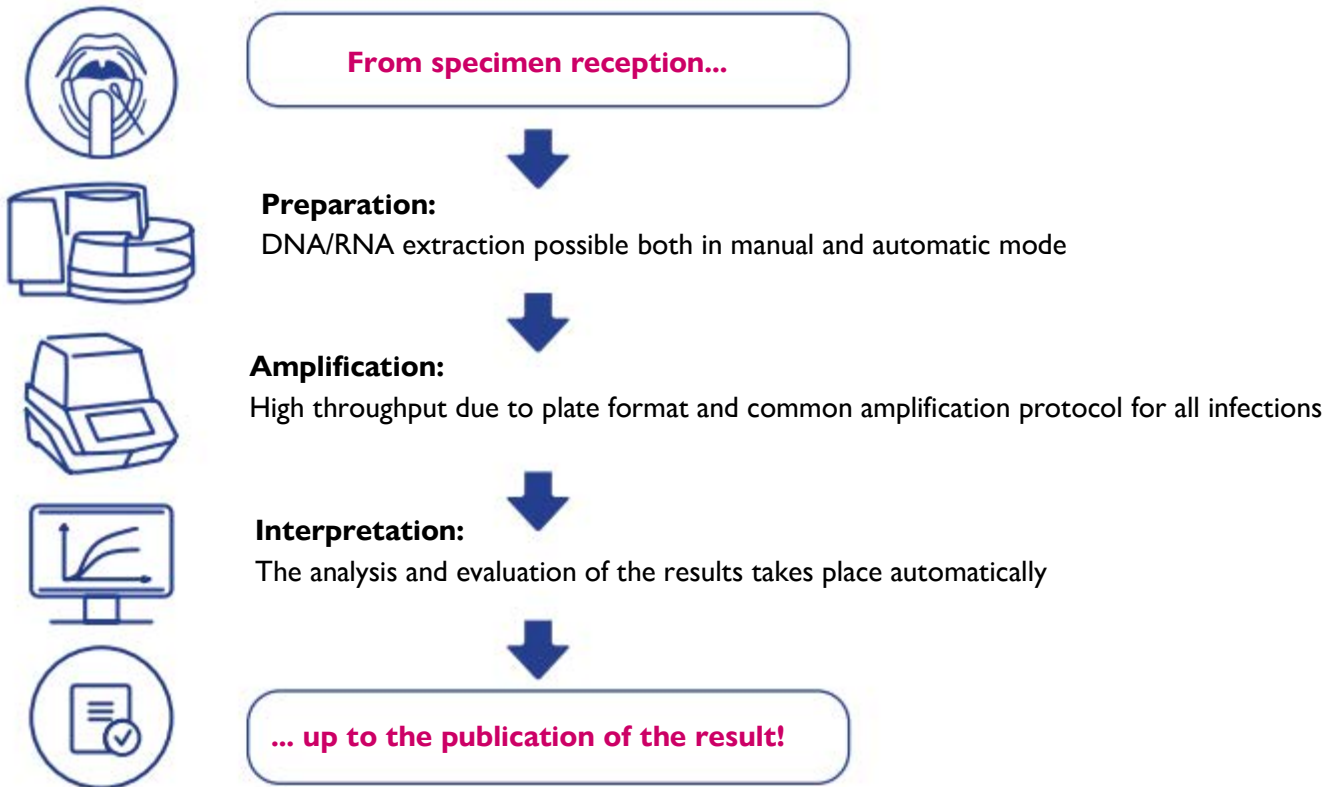
Real-Time PCR has wide possibilities for diagnosing respiratory diseases of bacterial and viral etiology, as well as for screening.



## RealBest® Technology: solution for PCR diagnosis of acute respiratory infections



- **Ready Master Mix for PCR/RT-PCR:** just add extracted NA to the test tube and start the reaction
- **Multiplexity:** detection of two or more infectious markers in one tube
- **Universal protocol:** performing all tests in one run
- **Possibility of automation:** improving the quality and quantity of testing
- **Wide range of biomaterials:** solution to any diagnostic problems
- **Easy to store and transport:** no freezing required



## Reagent kits for the diagnosis of acute respiratory infections by real-time PCR

Cat. №	Kit name	Number of tests
<b>Extraction kits for the isolation of nucleic acids</b>		
8847	RealBest Sorbitus (variant 4x24)	96 (4x24)
8848	RealBest Sorbitus (variant 1x96)	96 (1x96)
8883	RealBest UniMag	96 (4x24)
8896	RealBest Extraction 100	48 (6x8)
<b>Validation of biological specimen sampling</b>		
8888 €€	RealBest Sample Validation	96
<b>Kits for respiratory infections detection</b>		
5580 €€	RealBest RNA SARS-CoV-2	96
5586 €€	RealBest DNA Bordetella species/Bordetella pertussis/Bordetella bronchiseptica	48
5592 €€	RealBest DNA Haemophilus influenzae	48
5594	RealBest DNA Chlamydomphila pneumoniae	48
5596 €€	RealBest DNA Mycoplasma pneumoniae	48
5590	RealBest DNA Streptococcus pneumoniae	48
5598 €€	RealBest DNA Legionella pneumophila	48
5560	RealBest-ARVI RNA hMpV/hPIV2 (human metapneumovirus/human parainfluenza virus type 2)	96
5561	RealBest-ARVI RNA hRV (human rhinovirus)	96
5562	RealBest-ARVI DNA hAdV/hBoV (humanadenovirus B, C, E/human bocavirus)	96
5563	RealBest-ARVI RNA hPIV 1/3 (human parainfluenza virus type 1/type 3)	96
5564	RealBest-ARVI RNA Influenza virus A/B (influenza A virus/influenza B virus)	96
5565	RealBest-ARVI RNA hCoV OC43/HKU1 (human coronavirus OC43/HKU1)	96
5566	RealBest-ARVI RNA hCoV 229E/NL63 (human coronavirus 229E/NL63)	96
5567	RealBest-ARVI RNA hRSV/hPIV4 (human respiratory syncytial virus/human parainfluenza virus type 4)	96

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