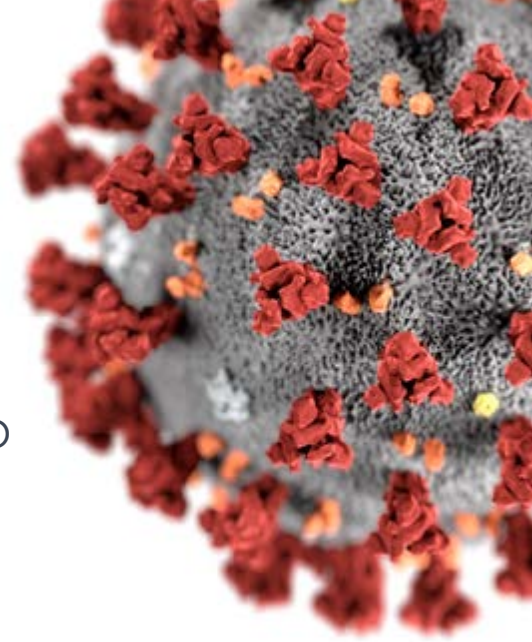


BIOVENDOR'S ASSAY KITS & REAGENTS RELATED TO COVID-19



WE HAVE ESTABLISHED A NEW PRODUCT SEGMENT WITHIN THE **BIOVENDOR** PORTFOLIO COVERING COVID-19 RELEVANT PRODUCTS.

1. COVID-19 DIAGNOSIS

REAL-TIME PCR TEST FOR DISEASE CONFIRMATION

PCR is the gold standard for diagnosing an infectious agent, therefore the RT-PCR tests represent a frontline response to the SARS-CoV-2 outbreak.

- › **A*STAR Fortitude 2.0 COVID-19 Real-Time RT-PCR Test** / 200 reactions / **IVD** /
Specimens: Nasopharyngeal swab
Target: a single target region on the SARS-CoV-2 sequence. IVD test kit under Provisional Authorization issued by Singapore's Health Sciences Authority (HSA).
- › **Liferiver Novel Coronavirus (2019-nCoV) Real Time Multiplex RT-PCR Kit** / 25 tests / **CE IVD** / Specimens: upper respiratory nasopharyngeal swab, oropharyngeal swabs, sputum, endotracheal aspirate, bronchoalveolar lavage
3 target genes: ORF1ab, Gene N, and Gene E

ELISA KITS FOR DETERMINATION OF anti-SARS-CoV-2 ANTIBODIES

The identification of anti-SARS-CoV-2 antibodies, both IgG and IgM, is a key support to counteracting viral outbreak. Serology testing maintains an essential role for both investigational and surveillance purposes.

- › **Anti-SARS-CoV-2 S1RBD IgG Human ELISA** / 96 wells / **RUO** / Specimens: serum
Precision detection of Human anti-Spike Protein S1 subunit containing a receptor-binding domain IgG class antibodies.
- › **Anti-SARS-CoV-2 NP IgG Human ELISA** / 96 wells / **RUO** / Specimens: serum
Precision detection of Human anti-Nucleocapsid Protein IgG class antibodies.
- › **Anti-SARS-CoV-2 NP IgM Human ELISA** / 96 wells / **RUO** / Specimens: serum
Precision detection of Human anti-Nucleocapsid Protein IgM class antibodies.

Validation study performed using samples collected from [COVID-19 confirmed cases](#).

IMMUNOCHROMATOGRAPHY RAPID TEST TO SUPPLEMENT RT-qPCR RESULTS AND FOR DISEASE FOLLOW-UP

- › **Rapid 2019-nCoV IgG/IgM Combo Test** / 1 tests card / **CE IVD** / Specimens: serum, plasma, whole blood
Detection of human anti-SARS-CoV-2 antibodies, both IgG and IgM classes

2. COVID-19 DIAGNOSIS AID AND DISEASE PROGNOSIS

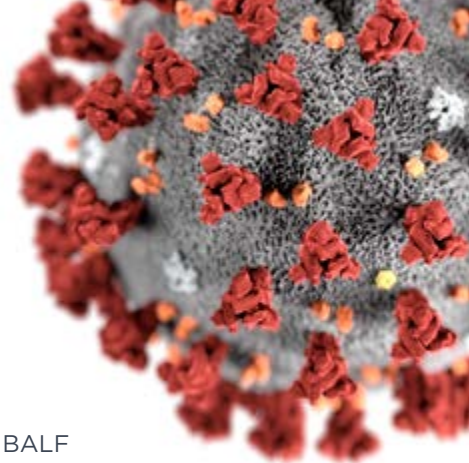
Since the most severe disease complications include acute respiratory distress syndrome (ARDS), cytokine storm, shock, acute kidney injury, and acute cardiac injury, we can offer the following relevant markers suitable for prognosis and severity prediction.

CYTOKINE STORM

Patients with severe COVID-19 infection can develop Cytokine Release Syndrome (CRS), also termed hyperinflammation, showing a marked increase in pro-inflammatory cytokines such as IL-6, IL-1 β , IL-2R, IL-8, TNF- α . CRS is a complication of COVID-19 and is associated with high morbidity. Early identification of hyperinflammation in COVID-19 is essential.

- › **Interleukin-6 (IL-6) Human ELISA** / 96 wells / **CE IVD** / Specimens: serum, plasma, BALF
Detectable serum SARS-CoV-2 viral load (RNAemia) may be closely associated with a drastically elevated interleukin 6 (IL-6) level in critically ill COVID-19 patients.

- › **Interleukin-1 beta Human ELISA** / 96 wells / **RUO** / Specimens: serum, plasma
- › **Interleukin-2 Receptor Human ELISA** / 96 wells / **RUO** / Specimens: serum, plasma
- › **Interleukin-8 Human ELISA** / 96 wells / **RUO** / Specimens: serum, plasma
- › **TNF-alpha Human ELISA** / 96 wells / **RUO** / Specimens: serum, plasma
- › **TNF-alpha, High Sensitivity Human ELISA** / 96 wells / **RUO** / Specimens: serum, plasma



PULMONARY INFLAMMATION MARKERS

- › **Surfactant Protein D Human ELISA** / 96 wells / **CE IVD** / Specimens: serum, plasma, BALF
- › **Surfactant Protein A Human ELISA** / 96 wells / **RUO** / Specimens: serum, plasma, BALF
- › **Club Cell Protein (CC16) Human ELISA** / 96 wells / **CE IVD** / Specimens: serum, plasma
SP-A, SP-D, and CC16 are important host defense components against respiratory allergens and pathogens. SP-D is involved in interlinking innate and adaptive immune pathways and correlates significantly with anti-SARS-CoV-specific antibodies. Monitoring systemic SP-D was suggested for monitoring the alveolar integrity in SARS-classic-type pneumonia. Serum SP-D and SP-A can be used for the assessment of pulmonary fibrosis onset or disease progression.
- › **KL-6 Human ELISA** / 96 wells / **RUO** / Specimens: serum
- › **Nanopia KL-6 Immunoturbidimetric assay** / 320 tests / **RUO** / Specimens: serum, plasma
KL-6, a mucinous high-molecular-weight glycoprotein, expressed on type II pneumonocytes, is elevated in the serum of patients with active interstitial pneumonia.

INFECTIOUS DISEASE MARKERS

- › **MxA Protein Human ELISA** / 96 wells / **RUO** / Specimens: whole blood
Research data show that MxA protein is selectively increased in patients with viral infections and has the potential to greatly enhance the rapid distinction between viral and bacterial respiratory infections. MxA protein may offer advantages as a marker for viral infection over other induced proteins because of its very low basal concentration and long half-life.
- › **Procalcitonin Human ELISA** / 96 wells / **CE IVD** / Specimens: serum, urine
- › **CRP Human ELISA** / 96 wells / **CE IVD** / Specimens: serum, urine
- › **hsCRP Human ELISA (High Sensitivity)** / 96 wells / **CE IVD** / Specimens: serum, urine
C-reactive protein and procalcitonin have established positions as general biomarkers for bacterial infections. Although these biomarkers lack adequate clinical specificity to differentiate a viral from a bacterial infection, they play a key role in the identification of secondary bacterial infection, one of the complications associated with severe COVID-19 status.

3. REAGENTS FOR RESEARCH AND ASSAY DEVELOPMENT

SARS-CoV-2 & SARS-CoV STRUCTURAL PROTEINS

- › **SARS-CoV-2 (2019-nCoV) Spike Glycoprotein-S1, HEK293 Recombinant**
- › **SARS-CoV-2 (2019-nCoV) Spike Glycoprotein-S2, HEK293 Recombinant**
- › **SARS-CoV-2 (2019-nCoV) Spike-E-M Mosaic E.coli Recombinant**
- › **SARS-CoV-2 (2019-nCoV) Nucleocapsid Protein, E.coli Recombinant**
- › **SARS-CoV-2 (2019-nCoV) Nucleocapsid Protein, Mosaic E.coli Recombinant**
- › **SARS-CoV-2 Nucleocapsid Protein (NP)**
- › **SARS-CoV-2 Spike Protein S1 Receptor-Binding Domain (S1RBD)**
- › **SARS-CoV-2 Spike-E-M Mosaic Protein**
- › **SARS-CoV Nucleocapsid Protein, E.coli Recombinant**

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