

Celemics Comprehensive Respiratory Virus Panel (CRV Panel)

Key Features

Provision of SARS-CoV-2 WGS and all related mutations

- Variant detection also capable

Coverage of wide range of respiratory pathogens

- Testing of 39 strains for 9 different virus types

Double pandemic/coinfection detection

- Simultaneous testing of all relevant viral strains
- High 1X coverage levels to guarantee detection and whole genome capture

Inclusion of stand-alone BI analysis software (Celemics Virus Verifier)

- Deliverance of results in-house
- Guarantee security of client sequence information

Clear results even from low- quality clinical specimens

- Samples collected from several patient sites (upper respiratory tract, NP/OP swabs)

High detection sensitivity and consensus sequence generation rate

- Pathogen detection at as little as 100 copies
- >99% mean depth up to 100x coverage

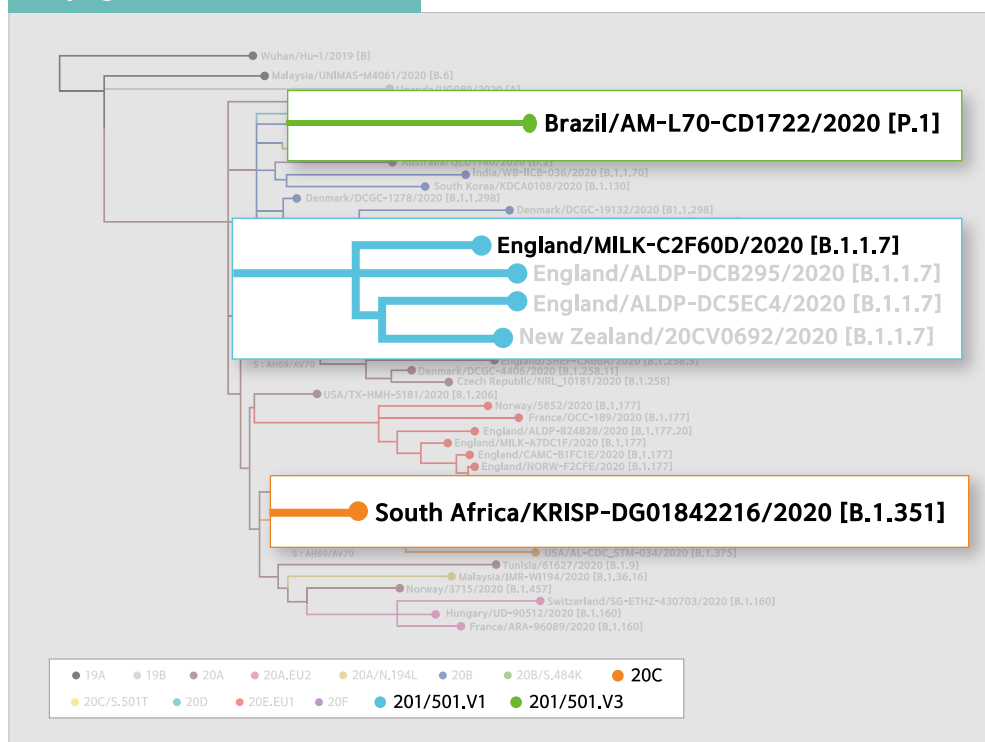
One day workflow using hybridization enhancer technology

Inclusion of all required kit components (RNA to cDNA, cDNA to captured library)

Detection panel for the accurate sequencing and identification of prominent whole viral genomes, including SARS-CoV-2 mutations and variants.

Viruses are continuously evolving in ways that make them increasingly infectious and difficult to cure. Thus, the discovery of specific disease-causing viral strains and research into their ability to spread within individuals in a given population have become a paramount public health issue. The Celemics Comprehensive Respiratory Virus Panel (CRV Panel) was developed to detect and sequence respiratory disease-causing viruses in humans using the NCBI RefSeq database as its foundation. It allows for the Whole Genome Sequencing of SARS-CoV-2 and all its relevant mutations and variants, and enables simultaneous testing of 9 different virus types and its 39 strains of clinically significant and prevalent respiratory viruses.

Phylogenetic tree. SARS-CoV-2



※ Variants of global importance highlighted in bold.

Wide Spectrum of Respiratory Virus Species Coverage

The Celemics Comprehensive Respiratory Virus Panel (CRV Panel) was designed using 9 respiratory virus types and 39 strains, each specifically chosen based on their prevalence in human populations and referenced using the NCBI RefSeq database. This includes currently relevant viruses such as SARS-CoV-2 and Influenza A/B, along with virus types commonly researched in lab and clinical environments such as human rhinovirus A/B/C, respiratory syncytial virus, and parainfluenza virus. This conglomeration of viruses not only allows for a wider breadth of respiratory virus testing possibilities, but also allows researchers to perform experiments testing for double pandemic and coinfection possibilities. Taking into consideration the heavy toll the COVID-19 pandemic has had on the world, it is more important than ever to understand the effect multiple infections may have on disease and treatment, and the CRV Panel lends itself as an ideal tool for extensive research in the field of respiratory pathogens.

Virus Species	Number of Strains Covered	Virus Species	Number of Strains Covered
Human Adenovirus	8	Influenza A	3
Bocavirus	4	Influenza B	1
Human Rhinovirus (A/B/C)	3	Parainfluenza Virus	5
Coronavirus	5	Respiratory Syncytial Virus	3
Human Enterovirus	7		

Table 1. Respiratory viral species and strains covered by CRV Panel

High Rates of Sequence/Strain Detection

One of the most important aspects in any viral detection panel is its ability to not only correctly identify and sequence specific strains present in the given sample, but also accurately detect each individual strain present in a sample that may contain multiple pathogens. The Celeemics CRV Panel solves both these issues by providing researchers with the ability to detect viral concentrations in as low as 100 copies per strain and a 99.9% at 1X coverage level for samples with multiple infections present. This was tested by combining 1,000,000 copies each of 6 different non-clinical reference virus species and universal human reference (UHR) samples and sequencing the six species together. With both high sensitivity and consensus sequence generation rates, the CRV Panel will be a powerful tool in the future of respiratory virus research, and to also look into the possibilities of double pandemics and coinfection, a rising area of study with the growing potential of global pandemics.

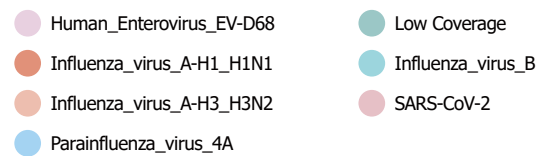
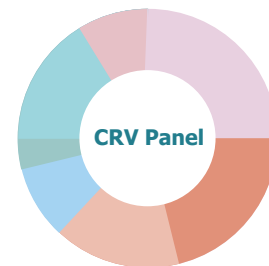


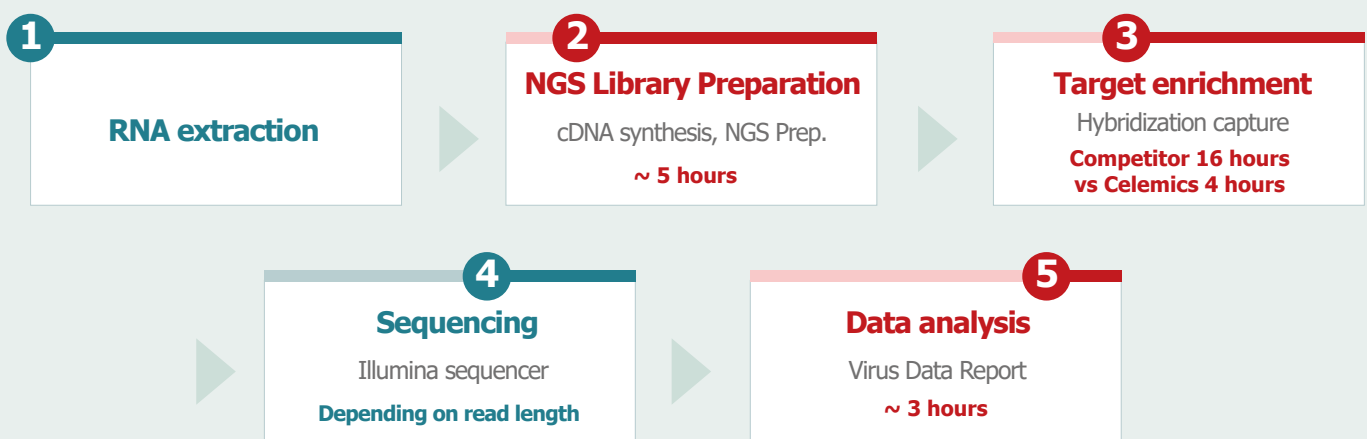
Figure 1. Example viral strain identification in clinical sample

The performance test results from clinical samples show excellent whole genome coverage.

Sample Type	Coverage[1X]	Coverage[10X]	Coverage[100X]
Clinical specimen (illumina 2X75bp)	99.95%	99.87%	98.95%

Table 2. Sample clinical samples coverage using CRV Panel

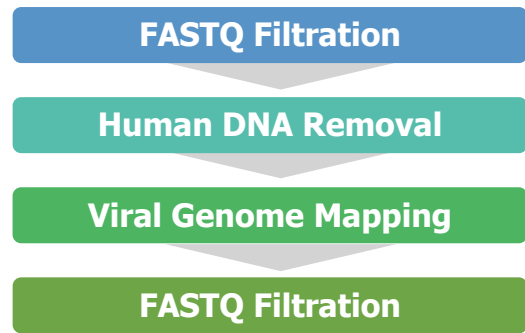
Workflow. Inclusive preparation kit provided directly from Celeemics



- Portions of the procedure covered through the Complete Kit are **highlighted in Red**
- Competitors: 16 hours (Target Enrichment step, Hybridization Capture)

In-house BI Analysis Provision (Celemics Virus Verifier)

The Celemics Virus Verifier program, curated specifically for usage with CRV Panel, is a stand-alone BI workflow created to help visualize the results of CRV Panel and give ease of access to research institutions and clients by eliminating the need to outsource their data for analysis. In addition to sequencing data and virus distribution, along with sequencing quality, the Virus Verifier program also gives insight into coverage per detected strain and the 1X coverage level for those strains as well. The program is provided as a downloadable for Ubuntu-equipped devices along with an installation and usage manual.



Accurate Results from BI analysis software developed by Celemics (Stand-alone SW)

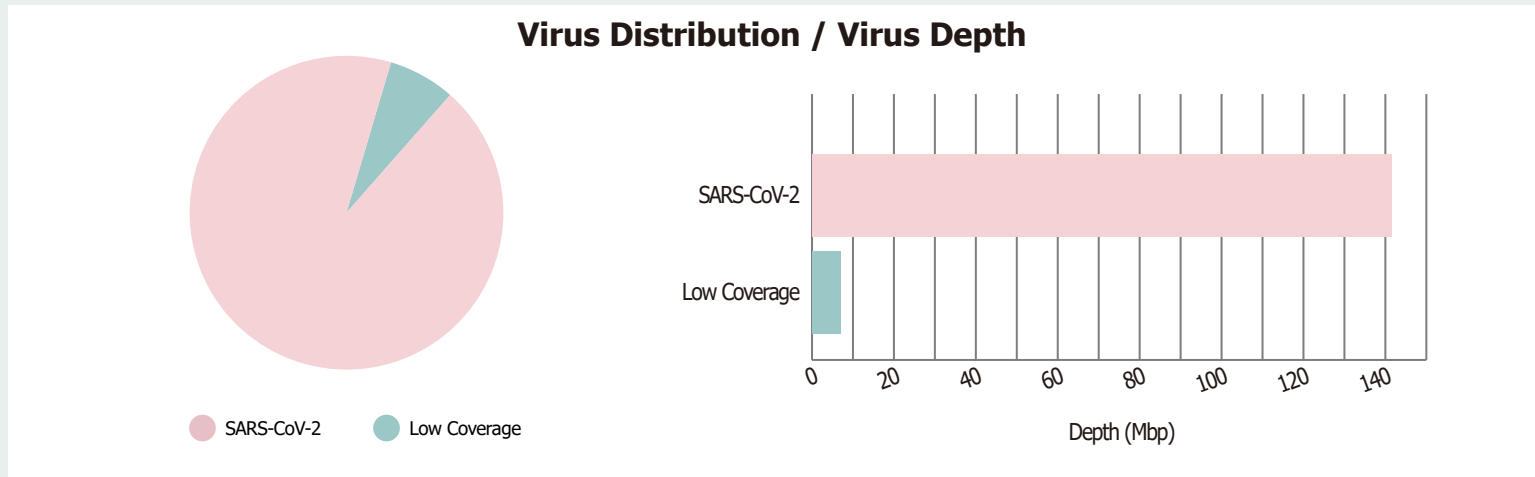
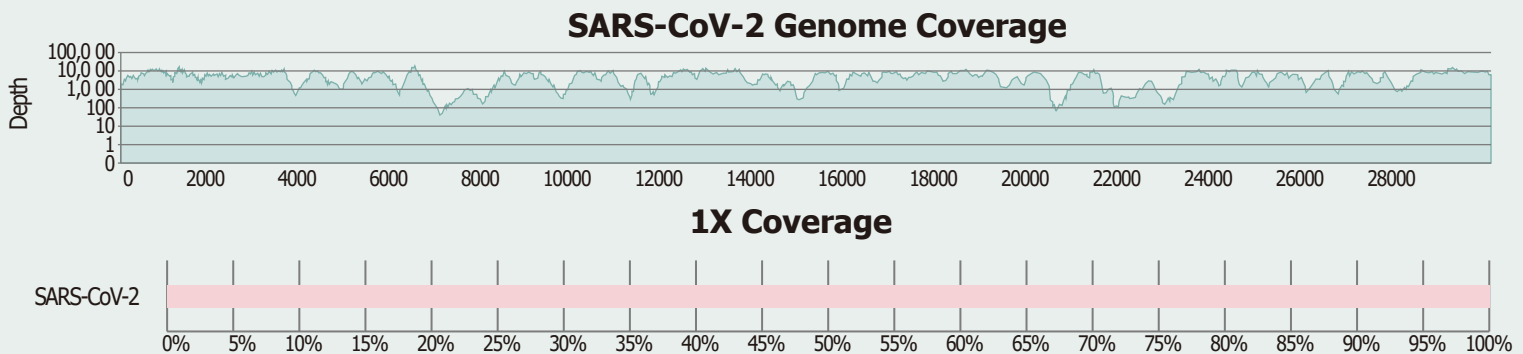


Figure 2. Sample results sheet generated through Celemics Virus Verifier

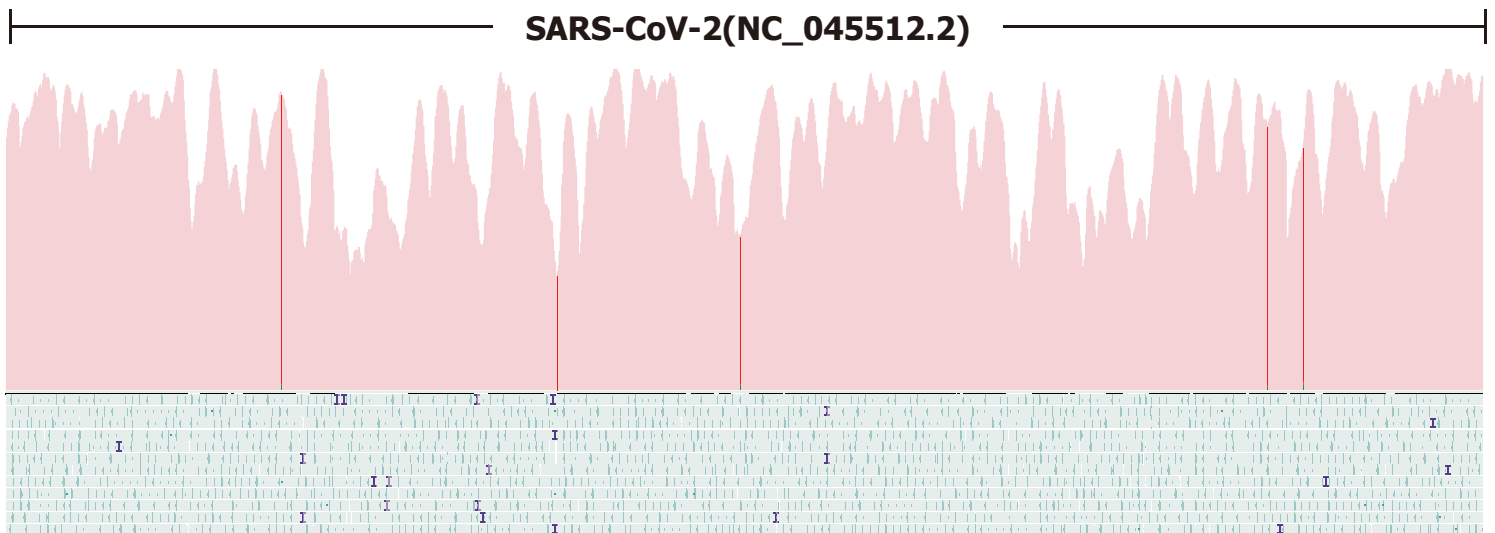


Figure 3. Graphical view of captured NGS data of SARS-CoV-2