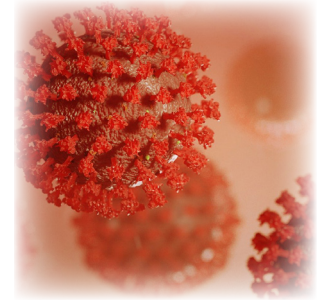


# SmartGene

## SmartGene's IDNS® Coronavirus Module for Monitoring Viral Diversity

### SmartGene® Coronavirus:

- Applicable to beta-Coronaviridae including SARS-CoV-2
- Compatible with all sequencing platforms
- Easy to use, no local hardware or maintenance
- Cloud-based, enabling collaborative networks



### The global challenges of Coronavirus outbreaks:

The COVID-19 pandemic prompted unprecedented global health emergency responses. Genetic analyses of SARS-CoV-2 and other Coronaviruses have an increasingly important role to play, both in the current fight against COVID-19 and in preventing future epidemics of Coronaviruses.

While SARS-CoV-2 is the current focus, this virus exists in the context of other alpha- and beta-coronaviridae found in different hosts, which have created serious outbreaks in the past and will do so again in the future. Understanding the genetic diversity of Coronaviruses is essential for:

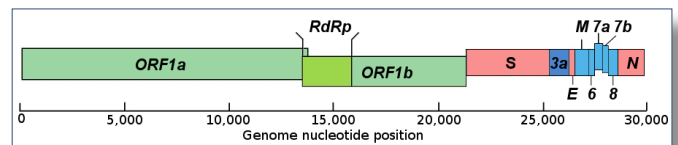
- development of sensitive and specific diagnostics
- selecting effective therapies and vaccine targets
- surveillance and monitoring of outbreaks.

### With SmartGene's Coronavirus Module you can:

- survey an epidemic and the viral evolution
- detect viral subpopulations
- monitor genetic stability of primer sites for molecular diagnostics
- perform data mining to identify and validate vaccine and therapeutic targets
- establish multi-center, collaborative networks.

### SmartGene's unique expertise:

SmartGene is a leading provider of cloud-based solutions for genotype analysis of infectious agents (e.g. Influenza, HIV, HCV, HSV) for clinical research and routine use. Drawing upon our established expertise addressing highly diverse infectious agents, SmartGene provides and maintains SaaS solutions for gene and genome analyses of Coronaviruses.



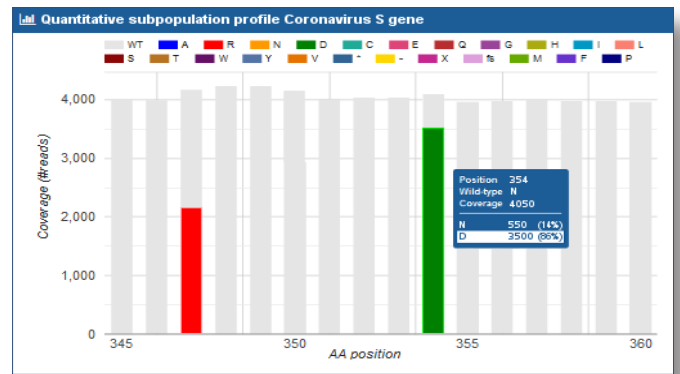
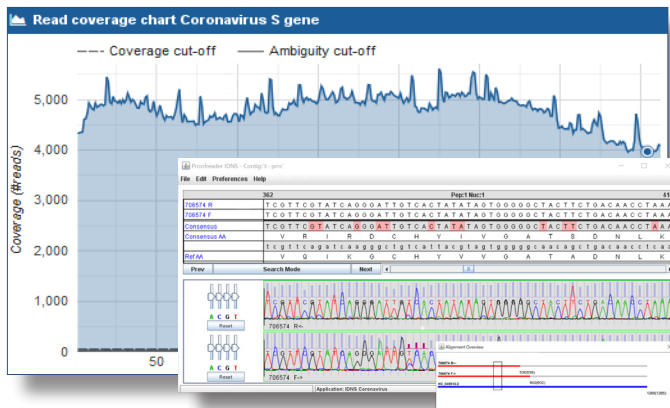
### SmartGene's Coronavirus Module features:

- automated pipelines for shotgun WGS
- detection of minority variants by deep sequencing
- a comprehensive, updated reference database, with representative strains, fuelled by SmartGene's proprietary, profile-based extraction logic
- configurable and searchable sample archive for sequences and metadata
- comparing and aligning sequences, plotting dendrograms, searching mutation patterns and sequence motifs
- detection of mutations and genetic patterns relevant for inferring virulence, pathogenicity, spread, and evolving drug resistance.

### Match list of a sequence similarity search against the SmartGene Coronavirus reference database

Query sequence - locus spike gene												
Dataset	Seq. length	Creation date	Physician / sender	Patient id	Sample date	Sample label	Remark	Submit Date	Retrieve Date	Seq. date	S Mutations	NGS generated
Private CoV database	3822	15.04.2020		Q1324	12.04.2020	ST0020		13.04.2020	13.04.2020	16.04.2020		Yes
Similar sequences found												
Dataset	Creation date	S - Accession	Seq. length	Identities	Mismatches	Match length	Score					
SmartGene Coronavirus database	30.03.2020	<a href="#">NC_045512.2</a>	3822	3822 (100%)	0	3822	<b>7059</b>					
SmartGene Coronavirus database	07.03.2020	<a href="#">LC529905.1</a>	3822	3822 (100%)	0	3822	<b>7059</b>					
SmartGene Coronavirus database	11.02.2020	<a href="#">MN988713.1</a>	3822	3821 (100%)	1	3822	<b>7055</b>					
SmartGene Coronavirus database	15.04.2020	<a href="#">MT263461.1</a>	3822	3820 (99%)	2	3822	<b>7051</b>					
SmartGene Coronavirus database	06.04.2020	<a href="#">MT246482.1</a>	3822	3819 (99%)	3	3822	<b>7047</b>					
SmartGene Coronavirus database	06.04.2020	<a href="#">MT322423.1</a>	3822	3818 (99%)	4	3822	<b>7046</b>					

# SmartGene



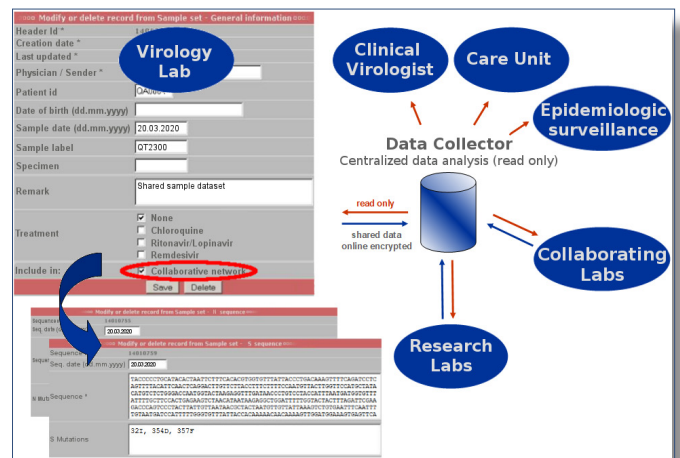
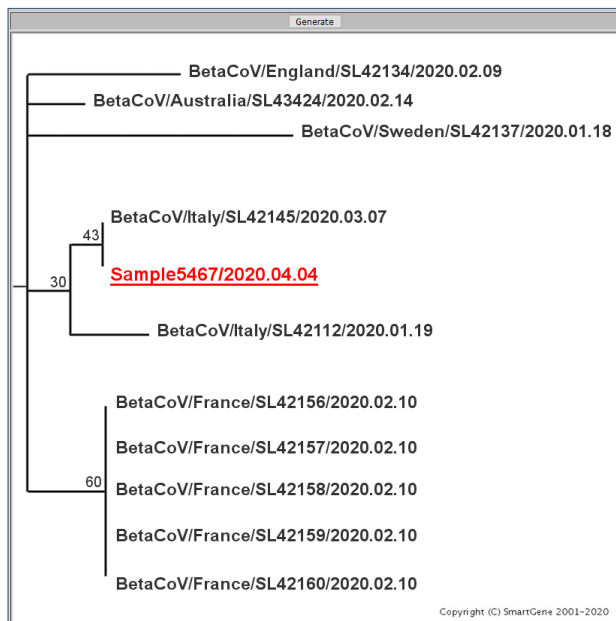
## Networking data to advance the science:

Importantly for surveillance, the SmartGene IDNS® Data Collector combines Web and database technology to enable:

- secure multisite collaboration
- the creation of large, longitudinal, cohort databases.

## Just like all our Modules, SmartGene Coronavirus:

- is compatible with all major sequencing instruments, including Sanger
- is cloud-based, secure and maintenance free, with no need for local installation, expensive hardware, or bioinformatics expertise
- enables simultaneous, multi-user access via personalized accounts, through a certified and encrypted connection
- allows adding records, viewing results in real time
- offers intuitive, integrated work flows from raw data upload to reports, and professional support.



SmartGene's established technology already supports several national networks of users for epidemiological surveillance and clinical research of pathogens.

Worldwide  
(Outside the USA and Canada)

SmartGene Services  
EPFL Innovation Park  
Building C  
CH-1015 Lausanne  
Switzerland

contact@smartgene.com  
Tel: +41 21 508 48 00  
Fax: +41 21 508 48 05

USA and Canada

SmartGene, Inc.  
P.O. Box 99543  
Raleigh, NC 27624-9543  
USA

contact-us@smartgene.com  
Tel: +1 919 844 6145  
Fax: +1 888 866 8130

For more information, please contact us



www.smartgene.com