

Country perspectives – on COVID technologies needs and availability

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Technology Facilitation Consultative Meeting to address the Challenges of
COVID-19 Pandemic
23 August 2021 (Virtual)

Genomic Research Lab, BCSIR

- Underlying vision 2021, the government of the people's republic of Bangladesh had established a state-of-the-art genomic research laboratory in BCSIR back in 2018.
- It is the only organization in Bangladesh with the facilities to perform sequencing in large numbers and generate data rapidly.
- Establishment of state-of-the-art genomics research infrastructure to strengthen the country's capacity to address diseases which are of national interest.



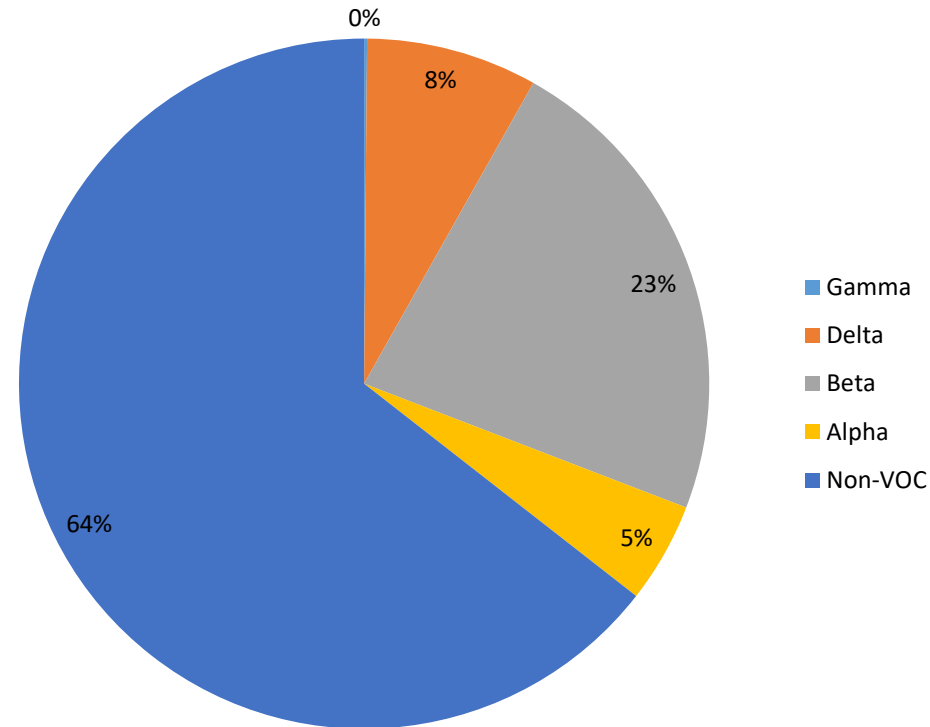
ACHIEVEMENTS



• Whole genome sequencing of 100 full length genome of Bangladeshi population



SARS-CoV-2 Whole genome Sequencing Project



- **BCSIR has completed whole genome sequencing of 723 isolates of SARS-CoV-2 from whole Bangladesh**
- **We have found that among the SARS-CoV-2 viral sample about 36% are variant of concern.**

Publication



GENOME SEQUENCES



Coding-Complete Genome Sequences of Three SARS-CoV-2 Strains from Bangladesh

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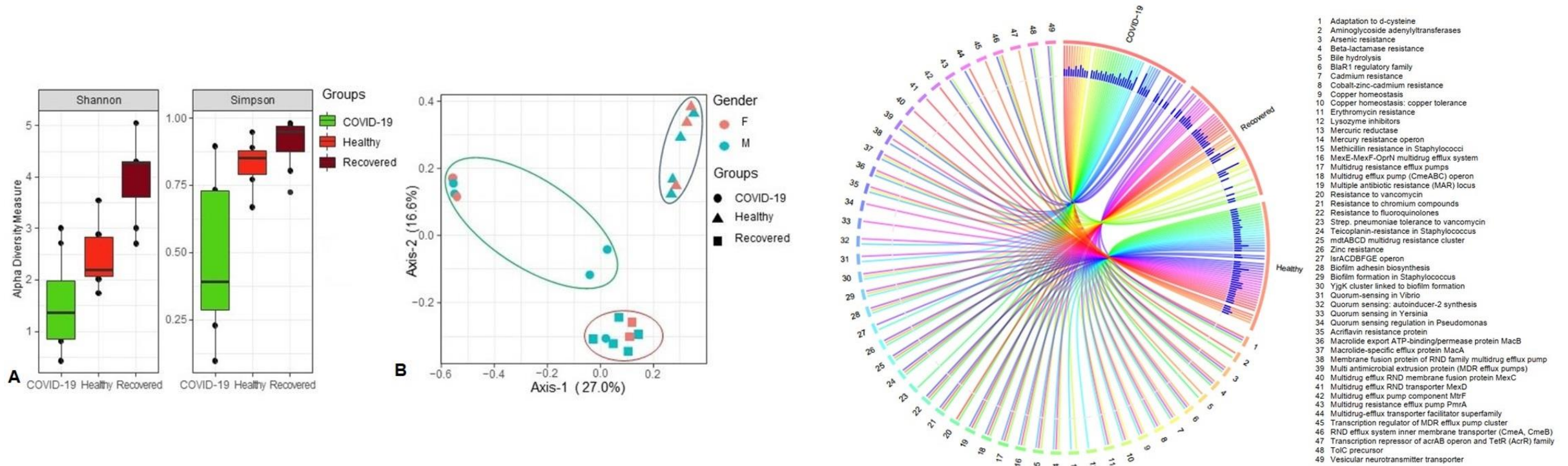
GENOME SEQUENCES



Genome Sequence of a SARS-CoV-2 P.1 Variant of Concern (20J/501Y.V3) from Bangladesh

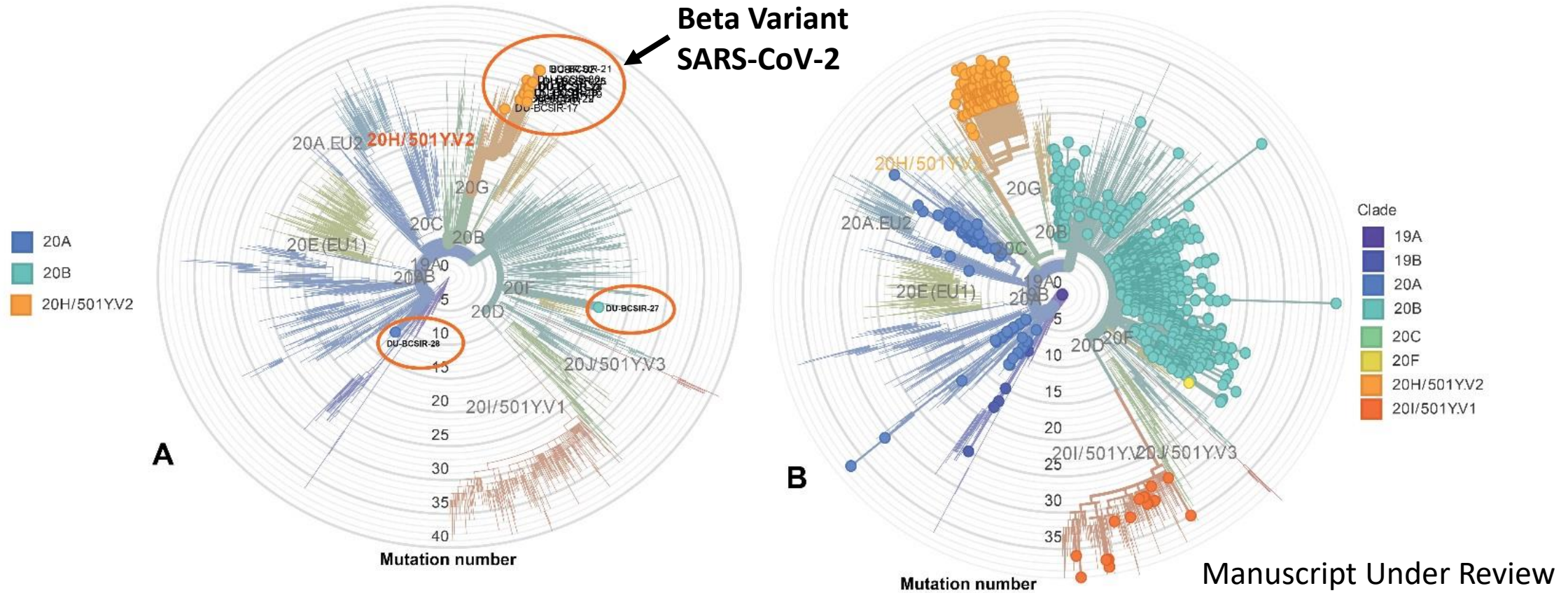
M. Murshed Hasan Sarker,^a Mohammad Fazle Alam Rabbi,^{b,c} Shahina Akter,^a Tanjina Akhtar Banu,^a Barna Goswami,^a Iffat Jahan,^a M. Saddam Hossain,^a Eshrar Osman,^a Mohammad Samir Uzzaman,^d M. Ahashan Habib,^a Abu Sayeed Mohammad Mahmud,^a Firoz Kabir,^b Kazi Nadim Hasan,^{b,e} M. Mizanur Rahman,^{b,f} M. Abdul Khaleque,^{b,e} Sharif Akhteruzzaman,^{b,g} M. Salim Khan^a

COVID-19 associated changes in structure and composition of the nasopharyngeal microbiomes



SARS-CoV-2 infection cause the microbial dysbiosis among the COVID-19 patients even after few month of their recovery

Infection After Vaccination



We found that most of the COVID-19 positive patients after vaccination were infected with Beta variant (South African variant)

On going Technology development

- COVID-19 testing is critical for:
 - For surveillance and screening efforts
 - To monitor effectiveness of control measures
 - To inform public health and economic decisions

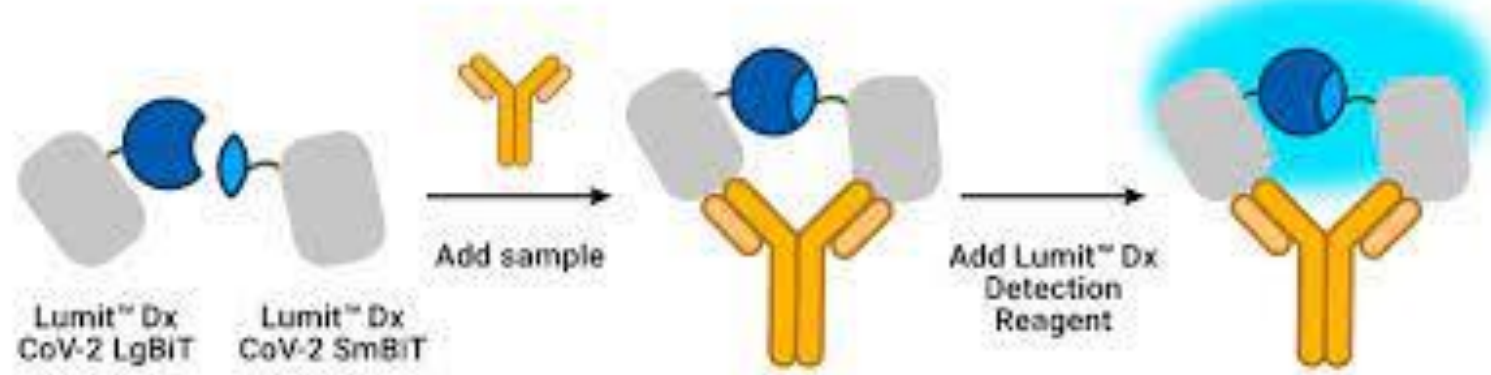
Obstacles for COVID-19 testing

- 100% import based
- Expensive
- Shortage of supply
- Might not be able to identify all variants circulating in the country

- **Objective:** Capacity build up for molecular test kit development
- **Short term vision:** COVID-19 real time PCR kit development
- **Long term vision:** Real time PCR kit development for tropical infectious disease, Cancer screening marker

R&D project by Institute of Technology Transfer and Innovation, BCSIR

Institute of Technology and Innovation, BCSIR has taken another initiative on the “Evaluation of the development of anti-SARS-CoV-2 IgG antibodies in COVID-19 infected, uninfected and vaccinated people



This study would anticipate the immunological status of general population of Bangladesh in response to the newly found deadly virus, SARS-CoV-2 for 1000 cases.

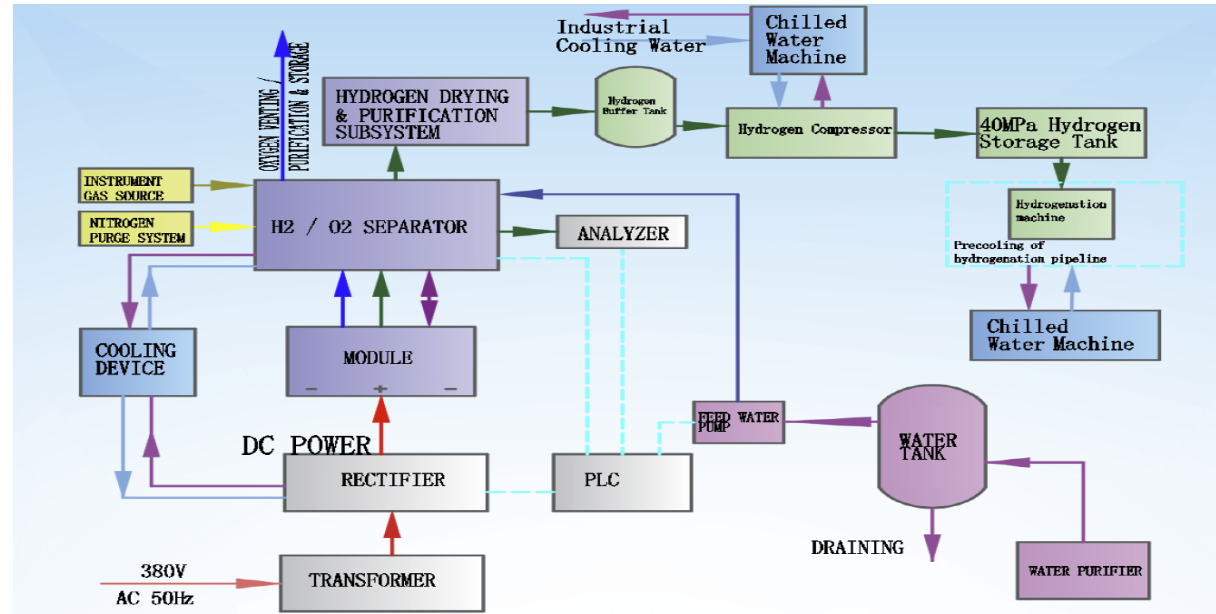
An effective single-dose mRNA vaccine against SARS-CoV-2

Globe Biotech Limited, a pioneer biotech company in Bangladesh, has developed a first effective single-dose vaccine based on mRNA technology that has shown strong protection in human cells and animal models against SARS-CoV-2 virus with a single dose. The proposed commercial names for GBPD060 vaccine are BANCROID® and BANGAVAX®



Intelligent High Pressure On-site Hydrogen & Oxygen Generation, Storage and Refueling System in Chattogram, Bangladesh.

2. Brief PID diagram



System Specification

Rated Hydrogen flow rate	: 2.5Nm ³ /h (0°C,1atm)
Rated Oxygen flow rate	: 1.25Nm ³ /h (0°C,1atm)
Delivery hydrogen purity	: ≥99.999% (after Purification)
Delivery oxygen purity	: ≥99.3%
System operation pressure	: 3.2Mpa(Gauge pressure)
Hydrogen dew point	: ≤-70°C
Rated DC consumption	: ≤4.8KWh/Nm ³ H ₂
Control Design	PLC + touch screen + unattended automatically
D.I. Water Flow	: 2.5Kg/h
Cooling water consumption	: 0.5m ³ /





Thank You!

STAY SAFE
together we will get through this

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