BIOGENIX ECHO

Monthly newsletter that keeps you UpToDate

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SARS-CoV-2 variants: Are We Going into a new pandemic? [1]

Multiple SARS-CoV-2 variants have been identified globally (Table 1). Currently, there is no evidence that these variants cause more severe illness or increased risk of death. Some of the potential consequences of the emerging variants are the following:

- Ability to spread more quickly in people *(as* in D614G mutation).
- There is no evidence that these variants cause more severe disease than earlier ones.
- Ability to evade detection of specific viral genes. (e.g., B.1.1.7 variant which affects the detection of the S-gene with the ThermoFisher TaqPath COVID-19 assay). Which represents that importance of detecting multiple viral targets in PCR.
- Decreased susceptibility to therapeutic agents such as monoclonal antibodies.
- Ability to evade natural or vaccine-induced immunity. The virus would likely need to accumulate multiple mutations in the spike protein to evade immunity induced by vaccines or by natural infection.
- Over burden the strained health care resources, which require extended and more rigorous implementation of public health strategies.

Table 1: Characteristics of SARS-CoV-2 variants of concern, September 2020–January 2021.

Variant designation	First Identification		Characteristic mutations (protein: mutation)	Worldwide No. of current sequence-confirmed cases	No. of countries with sequences
	Location	Date			
B.1.1.7 (20I/501Y.V 1)	United Kingdom	Sep 2020	1- ORF1ab: T1001I, A1708D, I2230T, del3675–3677 SGF, 76 15,369 36 2- S: del69–70 HV, del144 Y, N501Y, A570D, D614G, P681H, T761I, S982A, D1118H 3- ORF8: Q27stop, R52I, Y73C 4- N: D3L, S235F	15,369	36
B.1.351 (20H/501Y.V 2)	South Africa	Oct 2020	ORF1ab: K1655N	415	13
P.1 (20J/501Y.V 3)	Brazil and Japan	Jan 2021	ORF1ab: F681L, I760T, S1188L, K1795Q, del3675–3677 SGF, E5662D	35	2

Gut Microbiota: An Unrecognized Player in COVID-19 Pandemic? [2]

A team of researchers from University of Urbino Carlo Bo, Urbino, Italy concluded that Gut microbiota could influence immune response, thereby affecting the disease progression. Both overactive and underactive immune response possibly associated with the gut microbiota status can lead to serious clinical complications in COVID-19. The unhealthy status of microbiota might then represent a still underscored risk factor. Since microbiota can be supported through the assumption of adequate, safe, and inexpensive prebiotics and probiotics, their prescription should be considered as either an adjunctive treatment to limit COVID-19 progression in infected patients, or a preventive strategy for non-infected people at risk in the course of COVID-19 expansion or secondary waves.

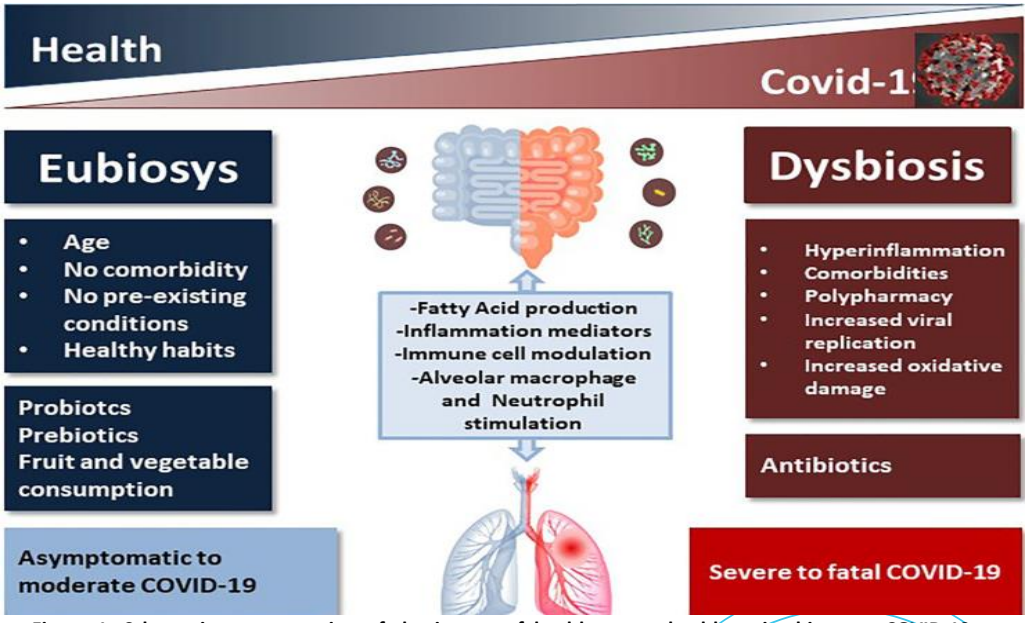

Figure 1: Schematic representation of the impact of healthy vs. unhealthy microbiota on COVID-19 outcome. The complex intercommunication through the gut-lung axis might be important in predetermining the susceptibility of airways to SARS-CoV-2 infection and COVID

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Allergic Reactions After the First Dose of Pfizer Vaccine, why? [3]

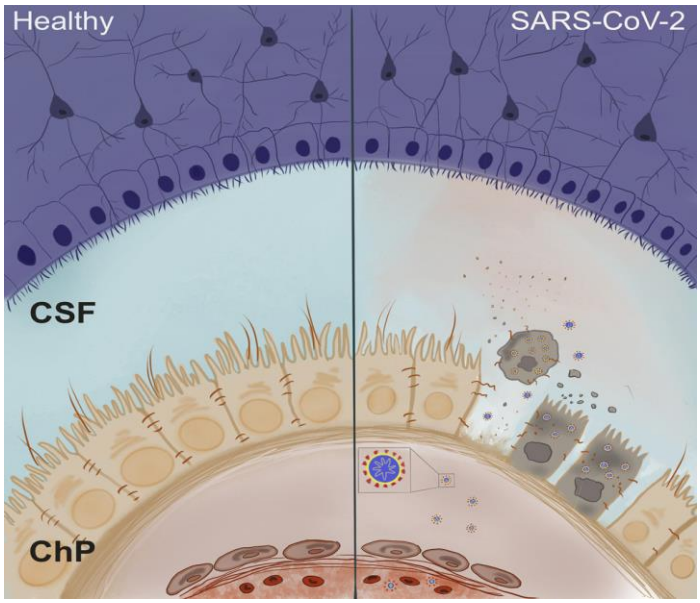
Anaphylaxis is a severe, life-threatening allergic reaction that occurs rarely after vaccination. During December 14–23, 2020, monitoring by the Vaccine Adverse Event Reporting System(US) detected 21 cases of anaphylaxis after administration of a reported 1,893,360 first doses of the Pfizer-BioNTech COVID-19 vaccine. However, 81% of these reported cases had a history of allergies, including some with previous anaphylaxis events; up to 30% of persons in the general population might have some type of allergy or history of allergic reactions.

Fatigue and Anxiety in COVID-19 Patients [4]

Neurological symptoms have been observed in some COVID-19 patient. However, the cause of these complications is currently unknown.

A study conducted in Cambridge Biomedical Campus concluded that infection with SARS-CoV-2 damages the choroid plexus epithelium, leading to leakage across this important barrier that normally prevents entry of pathogens, immune cells, and cytokines into cerebrospinal fluid and the brain.

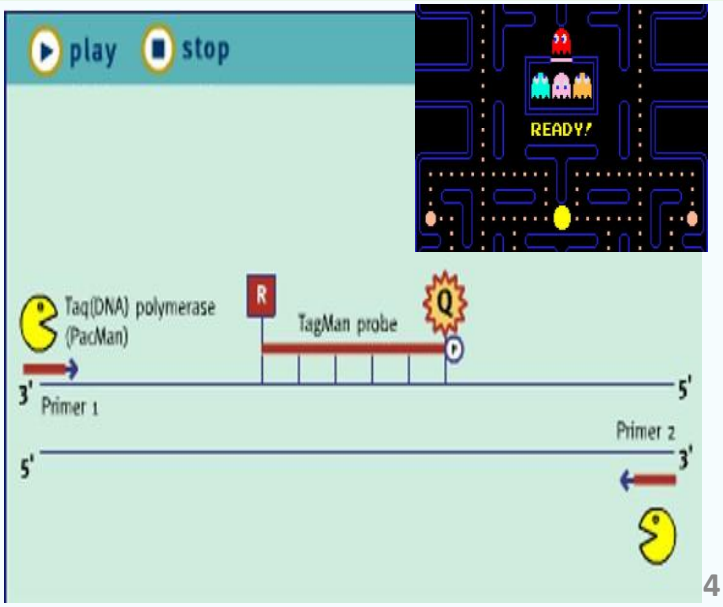
The interpretation of the results showed that the neurological symptoms reported in COVID-19 patients are mainly due to an indirect, secondary consequence of viral infection of support cells in the brain, rather than neurons themselves. Which might be the cause of neurological disturbances such as chronic fatigue and nonrestorative sleep disturbances seen in COVID-19 patients.



Did you Know:

From PacMan to TaqMan [5]

The TaqMan process is based on the PacMan principle - a computer game introduced more than twenty years ago. Who remembers it? PacMan, a fictitious character, was moved with the aid of a joystick through a labyrinth containing thousands of tiny blue ghosts which had to be caught to add points to the player's score. The TaqMan probe follows the same principle. Continuing the analogy, PacMan is represented by the enzyme Taq DNA polymerase. The internal TaqMan probe has two fluorescent tags and is analogous to the 'target' of the PacMan, thus theTaqMan probe is 'eaten up' by Taq DNA polymerase, causing release of the fluorescence which is coupled to the probe .



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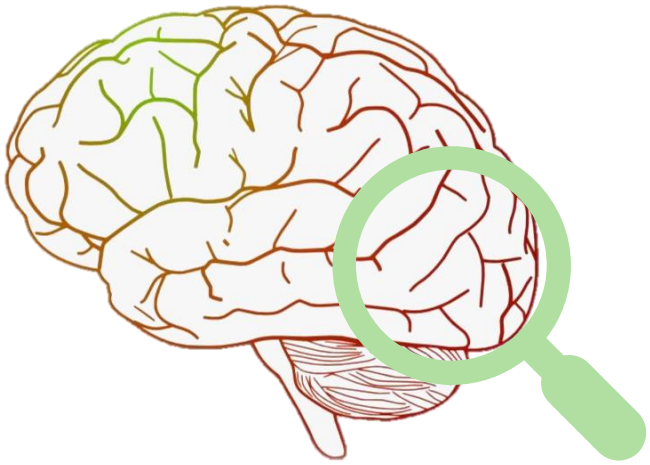
A Snapshot of What Actually Occurs In Brain Tumors using CSF [6]



Evaluating the molecular characteristics of brain tumors is limited by the near impossibility of obtaining tissue specimens and by the blood-brain barrier which prevents ctDNA from entering the blood circulation. Therefore, a team of researchers from Tianjin Medical University Cancer Institute and Hospital, National Clinical Research Center for Cancer, Key Laboratory of Cancer Prevention and Therapy, Tianjin's Clinical Research Center for Cancer, Tianjin, China

studied and concluded that sequencing of CSF ctDNA may reveal specific mutation patterns in driver genes in brain metastases among patients with brain tumours which could provide a snapshot of what occurs in brain metastases to more precisely guide therapy.CSF is a new form of liquid biopsy that could help in improving the management of patients with brain metastases

Melting Proteins for a quick Sickle Cell Anemia Diagnosis [7]

A team from University of Colorado had developed a novel Acoustic Thermal Shift Assay (ATSA) strategy that demonstrates unprecedented speed and sensitivity for label-free analysis of protein thermodynamic stability in real time. It requires less sample volume and is faster than any current TSA methods in measuring single protein melting curve without any needs of molecular markers, using only ultrasound to heat the sample into chips. allowing its broad potential applications in fast diagnosis, such as in Sickle cell anemia.

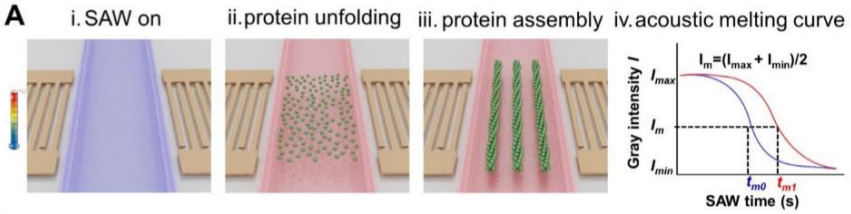


Figure 1: Schematic illustrating the working principle: (i) acoustic waves generated (SAW)(ii) protein unfolding and precipitation, (iii) assembled and concentrated precipitated proteins, and (iv) generated acoustic melting curves.

Knowledge Revival

American Society for Clinical Pathology is the world's largest professional membership organization for pathologists and laboratory professionals. The mission of the ASCP is to provide excellence in education, certification, and advocacy on behalf of patients, pathologists and laboratory professionals.

ASCP provides educational commentaries for its members on various clinical topics in means of continuing medical education
Educational Commentary for the month is :

ASCP Educational Commentary – Current Methods In Antimicrobial Susceptibility Testing

Antimicrobial susceptibility testing (AST) is performed on pathogenic bacteria isolated from clinical cultures to determine which antimicrobial agent might be effective in treating the infection caused by the bacteria. educational commentary will focus on phenotypic AST methods commonly performed in the clinical microbiology laboratory.

Access the Education Commentary on g42nextcloud : https://drive.g42.ae/s/gBBtfrQpRJLDr57

Password for accessing the link : 2020ascP

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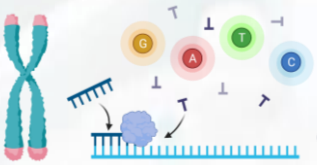
Biogenix Laboratory Departments

In order of recently established departments to previously established.

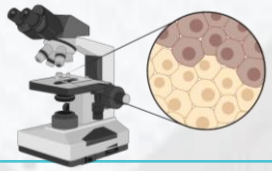


Clinical Genomics

Our Clinical Genomics Lab is an unprecedent in the UAE. Therefore, it is adding a value to the diagnostic field by providing a significant advances in diseases management and treatment through; understanding genetic variations, prenatal diagnosis and testing, premarital screening, infectious diseases sequencing, identifying novel and rare cancer mutations, and personalized medicine.
The main techniques used are based on Next Generation Sequencing (NGS) on MGI, ONT, and Illumina platforms for whole genome sequencing, whole exome sequencing, or targeted sequencing depending on the purpose of the test.

Virology

The scope of service for Virology Department includes Viral culture, Viral Plaque Assay and Plaque Reduction Neutralization Test, which is a gold standard method to detect antibody level in individual with history of infection and/or vaccination.



Anatomical Pathology

Anatomic pathology is the branch of lab medicine that involves the study of body organs and tissues (groups of cells) to give a definitive diagnosis of the disease.
There are two main subdivisions within anatomical pathology. The first is histopathology, which involves the examination of sampled whole tissues under the microscope. This is often aided using special staining techniques and immunohistochemistry. The second subdivision is cytopathology (cytology), which is the examination of single cells in body fluids and fine needle aspirational biopsies. A common cytology test is the cervical smear.

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Laboratory Departments

In order of recently established departments to previously established.

Microbiology

Performed tests include, gram stain for the initial characterization of bacteria, API 20E for Enterobacteriaceae and gram-negative bacteria identification, Ziehl-nieselen stain to identify acid- fast bacilli and Mycobacterium tuberculosis and KOH preparation to identify fungal infections.

In addition to blood culture to identify sepsis, endotracheal aspirate and sputum culture to diagnose lower respiratory tract infections, urine culture to diagnose urinary tract infections, urogenital tract culture to diagnose infections or to rule out specific sexually transmitted disease, stool culture to diagnose gastrointestinal tract infections, ear swab culture to diagnose Otitis externa , eye swab culture for diagnosis of conjunctivitis and wound swab culture for lesion infections.

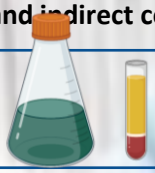
To detect possible drug resistance in common pathogens antimicrobial susceptibility testing is available on the laboratory.

Clinical Microscopy is a microbiology department that performs urinalysis, stool analysis semen analysis and motility.

Clinical Hematology

The Clinical Hematology Laboratory performs routine hematology testing including CBC , peripheral smear preparation, hemoglobin and protein electrophoresis to diagnose hemoglobinopathies and identify the presence of abnormal proteins respectively, and coagulation panels (PT, APTT and D-Dimer). Malarial Parasite Antigen test to screen for malaria is performed in the department too.

In addition to blood banking tests such as, ABO\RH typing , Direct Coomb's test (Anti-human globulin) to detect autoimmune hemolytic anemia and indirect coombs test for prenatal antibody screening and pre-transfusion testing.



Clinical Chemistry

Various tests are performed including, Lipid profile , liver profile, renal profile, cardiac profile, electrolyte panel, inflammation panel , diabetes panel, and hormones.

Drug of abuse testing such as barbiturates, benzodiazepine, cocaine and opiates are available in addition to therapeutic drug monitoring tests.

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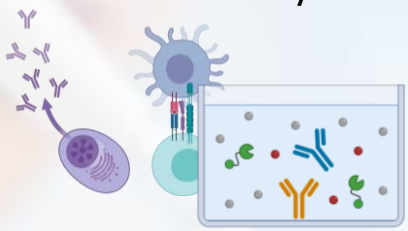
Biogenix Laboratory Departments

In order of recently established departments to previously established.



Serology and immunology

This department was first established to conduct qualitative and quantitative testing for SARS2-COV IgG and IgM antibodies directed against the spike, envelope and nucleocapsid proteins. To support in the nation-wide campaign of combating SARS-CoV-2.

Multiple platforms are utilized to conduct the testing such as Diasorin (CLIA), Alinity I (CIMA), URANUS AE (ELISA) and DYNEX D2 (ELISA).

The scope extends to include the testing for HCV antibodies, HBV antibodies and antigens, HIV antigens and antibodies, CMV antibodies, Rubella antibodies, Toxoplasma antibodies, all food and inhalation allergy panels are performed in addition to food intolerance tests and more.

Molecular

Biogenix molecular lab. was the first established laboratory department since the launch of the diagnostic center. It performs on the gold standard method of testing for COVID-19 which is the Polymerase Chain reaction on the MGI platform. Various advanced technologies are used including thermofisher, LamPORE, Pockit, GeneChecker, Abbott, and Cobas to provide the highest quality and throughput of COVID-19 molecular testing.

The scope of the department extends by utilizing the BioFire a PCR Multiplix technology to test for 20 different pathogens (bacteria and viruses) for upper respiratory tract infections.

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" Make your life a masterpiece, imagine no limitation on what you can be, have or do."

- Brian Tracy

Biogenix: Quick Hits

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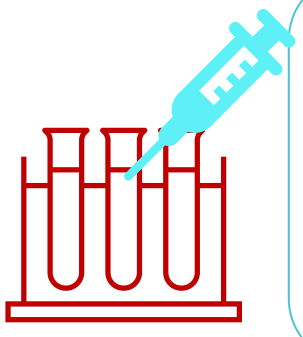

Biogenix Laboratory is the only approved lab to assess antibody levels in vaccinated individuals as per Abu Dhabi Department of Health.

January 2021
SARS-CoV-2 Antibodies Testing

Biogenix Laboratory was granted the DOH approval to be a CME provider for healthcare professionals.

22nd of February 2021
Approved CME Provider

Biogenix Laboratory have officially processed 1 Million RT-PCR tests in less than a year of its opening date.

14th March 2021
One million RT-PCR Test

Biogenix Laboratory have tested more than 50,000 students and staff for the Back-to-School Project.

21st March 2021
Back To School

Opening of the Vaccination Centre to support the national efforts in mitigating the pandemic. #Bringlifebacktolife

25th March 2021
Vaccination Center

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Happy Anniversary!

It feels just like yesterday since we all started working here together whereas it is already been a year. We must acknowledge that we all have come a long way as professionals in our organization and we appreciate your efforts. With our best compliments on your one-year anniversary, we pray for more amazing years of work together.

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Hard work joined us together.

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We learn together and we grow together.

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Celebrations were fun!

Biogenix: The Family

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Thank You!

You are the backbone of our success!

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A General Practitioner and a Mother of Three

Meet Dr. Roshan Ashraf

Dr Roshan Ashraf, General Practitioner, hailing from God's own country, Kerala. Did my schooling here in Abu Dhabi, completed my MBBS degree from India, worked at a hospital in my hometown for many years in the ER and was actively involved in the hospital management at the time.

Later, I worked in Dubai in Aster Women and Child hospital for some time before joining Ahalia Hospital, Abu Dhabi. Currently I am pursuing MRCGP, Family Medicine specialty. I joined G42 in the month of February and has been enjoying every minute of it since.

"I am mother of 3 lovely girls. I love everything fun, love to cook, eat and so much more."

Being able to work in different countries, dealing with wide range of people, has taught me to be open to all possible complaints, problems and questions about illnesses and health from everyone, young and old alike. *It has helped me in my career build up, and in making a meaningful impact in the lives of people.*

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If you want to learn more about the topics in the Roundup section, visit the below references

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