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SCHOOL OF LIFE SCIENCES

**B.S. ABDUR RAHMAN CRESCENT INSTITUTE OF SCIENCE AND TECHNOLOGY
CHENNAI – 600048. TAMIL NADU. INDIA**

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Research and Development in SLS

S. Hemalatha

School of Life Sciences

B.S.Abdur Rahman Crescent Institute of Science and Technology

Chennai – 600048, Tamil Nadu, India

❖ Pronounced Features of School of Life Sciences

- Established in the year 2013
- Well qualified and dedicated members of faculty with Ph.D and Post Doctoral experience from abroad
- State of- the Art Lab facilities
- 16 laboratories situated in 7 floors of SLS block
- Choice based and flexible credit system and semester pattern
- 360° feedback including all the stakeholders
- Summer internship in Abroad Universities
- Summer and winter Industrial Internships for UG and PG students in industries
- Organized International conferences every year in association with abroad Universities and sponsored by DST-SERB and ICMR, TNSCST
- Organized several Workshops / Seminars / Guest Lectures / Industrial Visits
- Focus on Teaching, Research and Extension activities
- Motto of the School: Creating employers
- Undergraduate and research scholars journal club
- Research grants secured from DST, ICMR, DBT, BIRAC-BioNEST, TNSCST, AYUSH, DST WOS-A, DST WOS-B
- Faculty members serving as Editor and reviewers in Elsevier, Taylor and Francis etc.
- Offering 3 credit course from University of Missouri on Life Sciences Innovations and management
- DBT-BIRAC BioNEST to nurture student Biotech entrepreneurship
- Biannual publication of SLS newsletter with ISBN 978-81-940854-0-9 is published from 2019
- 20 biotech products are ready to be commercialized
- 15 patents published
- 71 novel sequences deposited in GenBank, National Center for Biotechnology Information (NCBI), USA.

❖ Workshops / Conference/FDP Organized

- International Conference on Basic and Translational Cancer Research: Novel Ideas and Approaches (**ICBTCR 2020**) held on **June 25-27, 2020** organized by School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, India
- Online Faculty Development Programme (FDP) On Multiomics and traditional Approaches to combat covid 19/ Virus outbreak on **May 21- June 3- 2020** in association with Tamil Nadu State Council for Science and Technology (TNSCST)
- National Workshop on Medicinal Mushroom Technology held on January 30-31,2020 sponsored by TNSCST organized by School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, India
- Intra-School cultural event, **INTRON 2020** held on January 23, 2020 organized by School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, India
- International Conference on Bionanotechnology, Energy and Environment (**ICBEE 2020**) held on **Feb 18-19, 2020** organized by School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai, India

❖ Online Quizzes organized

1. World Microbiome Day 2020 quiz was organized on **June 27, 2020**.
2. World Sickle Cell Awareness Day 2020 – Quiz was organized in association with Unnat Bharat Abhiyan (UBA), MHRD, India on **June 19, 2020**
3. Desertification and drought day quiz was organized in association with Unnat Bharat Abhiyan (UBA), MHRD, India and Annavarshini foods Pvt Ltd on **June 17, 2020**
4. World Brain Tumor Day Quiz was organized in association with Winpath Lab & Healthcare, Mandaveli, Chennai and Unnat Bharat Abhiyan (UBA), MHRD, India on **June 09, 2020**
5. World Environment Day Quiz was organized in association with Unnat Bharat Abhiyan (UBA), MHRD, India on **June 5, 2020**
6. World IPR day Quiz was organized in association with Unnat Bharat Abhiyan (UBA), MHRD, India on **April 26, 2020**
7. COVID-19 Quiz was organized in association with Unnat Bharat Abhiyan (UBA), MHRD, India on **April 19, 2020**

❖ MoU Signed

Growmore Biotech ltd, Hosur MOU was signed on **January 25, 2020**

❖ Inauguration:

Association of Cancer education and research was inaugurated on **Feb 18, 2020**

Crescent Bioinformatics Association was inaugurated on INTRON2020 on **Jan 23, 2020**

❖ Online courses organized

1. School of Life Sciences, Crescent Bioinformatics Association & Association of Cancer Education and Research (ACER) Organized Paid Online Courses from **May 13, 2020** onwards

2. Free online Courses from **April 27, 2020** onwards

3. NEET Mock Test on **April 25-26, 2020**

❖ Invited Talk/Guest Lecture

Dr. S. Hemalatha delivered lectures Department of Biotechnology, School of Bio and Chemical Engineering, Kalasalingam Academy of Research and Education, Krishnankoil on **May 11-12, 2020** & International Conference on Research Outlook, Innovations and Research Trends (ICROIRT-2020) on **August 29-30, 2020**

Dr. P. Ashok Kumar delivered lectures at Department of Botany, Periyar University Arts & Science College, Harur on **March 3, 2020** & Department of Biotechnology, Periyar University PG Extension centre, Dharmapuri on **March 9, 2020**

Dr. Soumen Bera delivered lectures Department of Biotechnology, School of Bio and Chemical Engineering, Kalasalingam Academy of Research and Education, Krishnankoil on **May 11, 2020** & Department of Microbiology and Biotechnology, Thassim Beevi Abdul Kader College for Women, Kilakarai, Ramanathapuram **June 16, 2020**

Dr. D. MubarakAli delivered lectures Department of Biotechnology, School of Bio and Chemical Engineering, Kalasalingam Academy of Research and Education, Krishnankoil on **June 8, 2020**; Kamaraj College of Engineering and Technology, Virudhunagar on **June 25-26, 2020**; Virtual Conference on Marine Natural Products - 2020, Sathyabama Institute of Science and Technology, Chennai on **August 17-21, 2020**

❖ International Internship

Mr. B. Sriram, Final year B.Tech student completed his final year project in Kangwon National University, Republic Korea from **January-June 2020**

❖ Awards and Honours:

Dr. D. MubarakAli awarded a “*Young Scientist Award for the year 2020*” Conferred at International Conference on Materials and Technology - Synthesis, Processing and

Applications (ICMAT - SPA) 2020 organized by PG and Research Department of Physics, Sri S. Ramasamy Naidu Memorial College, India held on **March 13-14, 2020**.

Ms. B. Kavviya B.Tech Biotechnology appointed as Operations Head (2019-2020) in Crescent Literary Society, BSACIST

Ms. S. Kanchana from **B.Sc Biotechnology** participated in Marathon at K I University, Andhra Pradesh held on **March 2020**

Ms. V.G. Shankari from **B.Sc Biotechnology** participated in All India Inter University Target ball Tournament at K I University, Andhra Pradesh held on **March 2020**

Ms. Sharvani from **B.Sc Biotechnology** participated All India Inter University Target ball Tournament by K I University, Andhra Pradesh held on **March 2020**

Ms. Architha from **M.Sc Biotechnology** awarded **best post presentation award** at Prince college, Chennai held on **Feb 29, 2020**

Ms. V.G. Shankari from **B.Sc Biotechnology** participated in Skia Shotokan International Karate championship at Goa held on **February 2020**

Ms. V.G. Shankari from **B.Sc Biotechnology** participated in All India Inter University Karate Tournament, Sathyabama University, Chennai held on **January, 2020**

❖ **Entrepreneurship activities**

Students are encouraged to start their own start-ups under mentor by the faculty to apply for funding to various funding agency

Number of Start-Up's signed: 8 & implementation phase: 2

End to End Ecosystem building model Product launch in ICBN 2019 Published in Dinamani



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❖ Association



Crescent Bioinformatics Association

Asfar Lathif Syed

B.Tech Biotechnology, School of Life Sciences, B.S.Abdur Rahman Crescent Institute of Science and Technology, Chennai-600048, Tamil Nadu, India

ABOUT: Research realms in life sciences especially in the field of biotechnology is rapidly evolving with the advent of new technologies like high throughput sequencing and advanced molecular techniques. These advancements in the field have paved a way for the generation what is now popularly called the “Big Data” in biological research domains. This constant creation of large amounts of data makes it impossible for researchers to look at them manually and get meaningful insights. This is where bioinformatics comes into play by helping researchers in understanding data and infer biologically significant meanings that might be hidden in it. It is hard to cope with this rapidly evolving field if one sticks with whatever is there in their college textbook. This is a huge roadblock for someone who is passionate about pursuing a career in this field. **Crescent Bioinformatics Association (CBA)** is a student’s-run club at the School of Life Sciences that aims to foster interests and engage students in developing knowledge and skills in the field of **Bioinformatics and Computational biology**. The virtues and knowledge obtained from this club will be valuable for the students in securing job prospects and higher studies almost all of which expects candidates to be familiar with the recent advancements in the field and possess relevant experience or knowledge.

This club was founded by Syed Asfar Lathif who was an alumnus of SLS. The initial executive team include: Farheen N, Rishivanth S, Shahariyar K M, Roshini P, Pradeep Parthasarathy. Dr Subhamoy Banerjee is the faculty coordinator for CBA.

Current executive team includes the following:

1. **Preesha Christina Anand** – President

2. **Tasneem Juzer** – Vice President and Social Media Management
3. **Pooja C, Juvad, Adithya S, Divya and Teena** – Operations team
4. **Aravind** – Social Media Management

Activities:

1. Organize weekly journal clubs on articles / methodologies in computational biology and bioinformatics
2. Weekly Coding club for students interested in learning programming languages like Python and R.
3. Webinars and online talks on bioinformatic niches to create awareness among the significance and future prospects on this field.
4. Publish blog articles in our website about topics related to life sciences and bioinformatics (<https://cresbioinfoclub.wordpress.com/>)
5. Guest lectures and workshops to keep updated with the recent research advancements and develop valuable skills that can be presented as assets in application for jobs and higher studies related to bioinformatics.



Students speaking about their interests in bioinformatics



Journal Club presentation on Metagenomics by Preesha



CBA inauguration at INTRON 2020

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❖ Mini Review

CDC Documentation Process for Detecting COVID19 Infections

Arshad Wahab

B.Tech. Biotechnology, School of Life Sciences, B.S.Abdur Rahman Crescent Institute of Science and Technology, Chennai-600048, Tamil Nadu, India

Abstract

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it's important that you also practice respiratory etiquette (for example, by coughing into a flexed elbow). Protect yourself and others from infection by washing your hands or using an alcohol based rub frequently and not touching your face. At this time, there are no specific vaccines or treatments for COVID-19. However, there are many ongoing clinical trials evaluating potential treatments. WHO along with CDC will continue to provide updated information as soon as clinical findings become available.

Introduction:

Centres for Disease Control and Prevention (CDC): It is a national public health institute in the United States. It is a United States federal agency, under **the Department of Health and Human Services** Its main goal is to protect public health and safety through the control and prevention of disease, injury, and disability in the US and internationally. The CDC focuses national attention on developing and applying disease control and prevention. It especially focuses its attention on infectious disease, food borne pathogens, environmental health, occupational safety and health, health promotion, injury prevention and educational activities designed to improve the health of United States citizens. At this time, there are no specific vaccines or treatments for COVID-19. However,

there are many ongoing clinical trials evaluating potential treatments. WHO will continue to provide updated information as soon as clinical findings become available.

Strategic Priority Infection Prevention and Control Activities

The goal of IPC activities in the coronavirus disease 2019 (COVID-19) response is to support the maintenance of essential healthcare services by preventing healthcare-associated transmission of SARS-CoV-2 among healthcare workers (HCW) and patients.

This requires:

- Rapid identification of suspect cases
- Immediate isolation and referral for testing
- Safe clinical management
- Adherence to standard IPC precautions

This document focuses on implementation of rapid identification of COVID-19 in healthcare facilities, which forms the basis for subsequent isolation, testing and management decisions. Planning and coordination of activities should be conducted in collaboration with emergency response officials, in addition to relevant public health officials (e.g., Ministry of Health, sub-national health offices, facility administration).

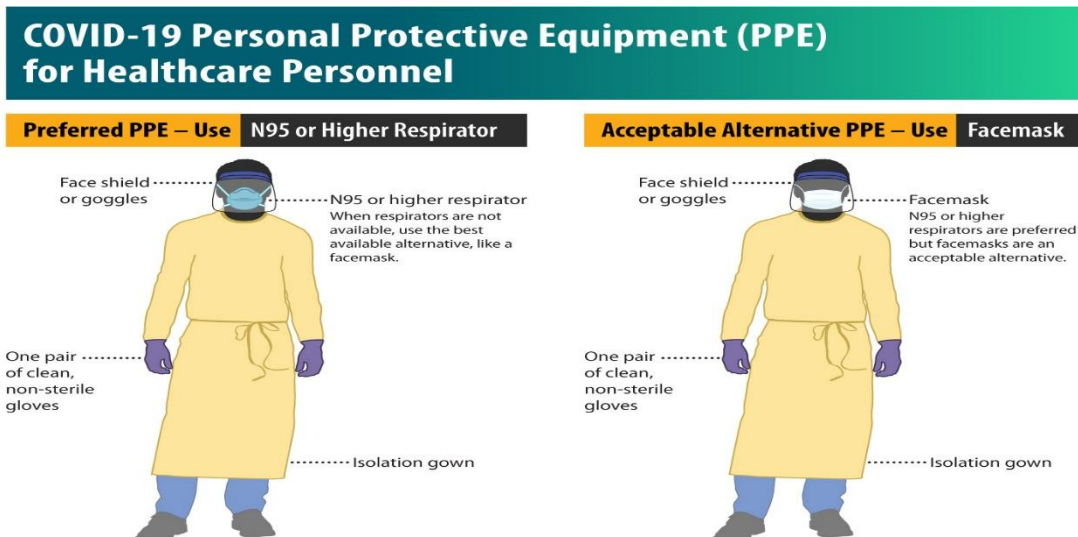


Fig 1. CDC issued guidelines for early detection of covid-19

This document addresses specific details on prioritized activities around rapid identification of COVID-19 in healthcare facilities under four different epidemiological scenarios of COVID-19 transmission. However, national and sub-national public health

authorities and healthcare facilities in all countries should be doing certain core activities to support and prepare for the start of any of the activities outlined in section 5, regardless of the current state of COVID-19 transmission in the country.

National activities to support and enable prioritized facility IPC activities

- Development of national or sub-national policies and guidance on implementation of priority activities outlined in section 5 of this document in healthcare facilities
- Linkage of Ministry of Health and sub-national IPC focal points to COVID-19 preparedness planning work
- Development of forecasting plans for personal protective equipment (PPE) and other IPC consumables (e.g., alcohol-based hand rub) that prioritize:
 1. Healthcare system needs
 2. Development of plans for stockpiling PPE
 3. Deploying stocks when need arises
 4. Communication with facilities to ensure continuity of stocks
- Assessment of IPC readiness for facility inpatient areas for priority activities
 1. Define national referral networks to direct suspected or confirmed cases to designated, prepared hospitals.
 2. Strengthen priority IPC areas at all hospitals, starting with highest risk, in preparation for limited and widespread community transmission.
- Development of national policies and procedures to avoid overwhelming healthcare facilities from influx of suspected COVID-19 cases, particularly mild cases. This should include:
 1. Consideration of remote triage capabilities for suspected COVID-19 cases through hotlines, telemedicine or other modalities
 2. Communicating with symptomatic contacts of known COVID-19 cases to alert designated authorities in advance of presenting for medical care
- Development of messaging on this topic for healthcare facilities and general population (e.g., stay at home except to get medical care)
- Ensuring the availability of COVID-19 laboratory testing in country and linkages to healthcare facilities that may need testing services
- Development of training materials on priority IPC activities to prevent healthcare-associated spread of COVID-19
 - ✓ Dissemination of training materials to professional societies, sub-national public health authorities, healthcare facilities, and front-line healthcare workers

STEPS NEED TO BE FOLLOWED ISSUED BY CDC IN THE TESTING FACILITY CENTRE

- Develop plans to carry out actions prevent the spread of acute respiratory infections (ARI), such as COVID-19, within the facility
- Develop SOPs for environmental cleaning procedures, particularly for the triage and isolation areas where suspected or confirmed COVID-19 patients will be placed
- Develop contingency plans for PPE shortages and other IPC consumable (e.g., alcohol-based hand rub)
- Develop communication plans to ensure adequate internal and external communication regarding COVID-19
- Develop policies for visitor restriction (e.g., restrict visitors who are sick with ARI)
- Establish communication channels between healthcare facilities and public health authorities who can facilitate linkages with laboratory testing and epidemiology/contact tracing

SCENARIOS IN WHICH CDC CLASSIFIED DETECTED ZONES

1. **No known cases in country**
2. **Confirmed cases, but no known community transmission**
 - a. If secondary cases present, all are linked to other confirmed cases
3. **Confirmed cases, limited community transmission**
 - a. Limited amount of unlinked cases identified in the community
4. **Confirmed cases, widespread community transmission**
 - a. Many unlinked cases identified in the community

Laboratory testing guiding principles for patients who meet the suspect case definition

The decision to test should be based on clinical and epidemiological factors and linked to an assessment of the likelihood of infection. PCR testing of asymptomatic or mildly symptomatic contacts can be considered in the assessment of individuals who have had contact with a COVID-19 case. Screening protocols should be adapted to the local situation. Rapid collection and testing of appropriate specimens from patients meeting the suspect case definition for COVID-19 is a priority for clinical management and outbreak control and should be guided by a laboratory expert. Suspect cases should be screened for the virus with nucleic acid amplification tests (NAAT), such as **RT-PCR**.

COVID-19 Molecular Diagnostic Test through RT-PCR

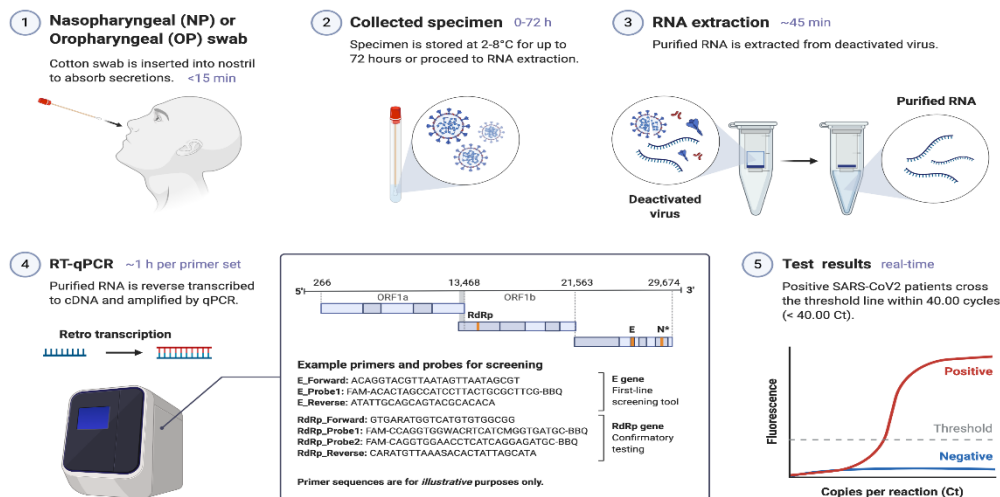


Fig 2. Bulletin for understanding RT-PCR

In an early study in Wuhan, the mean incubation period for COVID-19 was 5.2 days among 425 cases, though it varies widely between individuals (11,12,13). Virus shedding patterns are not yet well understood and further investigations are needed to better understand the timing, compartmentalization and quantity of viral shedding to inform optimal specimen collection. Though respiratory samples have the greatest yield, the virus can be detected in other specimens, including stool and blood (14,15,16). This is how 14 days isolation period came into existence for the infected or symptomatic individual.

WATCH FOR SYMPTOMS

People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. Symptoms may appear **2-14 days after exposure to the virus**. People with these symptoms may have COVID-19:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting

- Diarrhea

What is the difference between Influenza (Flu) and COVID-19?

Influenza (Flu) and COVID-19 are both contagious respiratory illnesses, but they are caused by different viruses. COVID-19 is caused by infection with a new coronavirus (called SARS-CoV-2) and flu is caused by infection with influenza viruses. Because some of the symptoms of flu and COVID-19 are similar, it may be hard to tell the difference between them based on symptoms alone, and testing may be needed to help confirm a diagnosis. Flu and COVID-19 share many characteristics, but there are some key differences between the two.

What patients can do before and upon arrival to a healthcare facility

Inform healthcare providers if they are seeking care for respiratory symptoms (e.g. cough, fever, shortness of breath) by calling ahead of time Wear a facemask, if available, during transport and while at triage in the healthcare facility Notify triage registration desk about respiratory symptoms as soon as they arrive Wash hands at healthcare facility entrance with soap and water or alcohol-based hand rub Carry paper or fabric tissues to cover mouth or nose when coughing or sneezing. Dispose paper tissues in a trash can immediately after use Maintain social distance by staying at least one meter away, whenever possible, from anyone, including anyone that is with the patient (e.g., companion or caregiver)

Coronavirus Self-Checker

The Coronavirus Self-Checker is an interactive clinical assessment tool that will assist individuals ages 13 and older, and parents and caregivers of children ages 2 to 12 on deciding when to seek testing or medical care if they suspect they or someone they know has contracted COVID-19 or has come into close contact with someone who has COVID-19. The online, mobile-friendly tool asks a series of questions, and based on the user's responses, provides recommended actions and resources.

Passive Case Finding Strategies

- Suspected cases are identified by the healthcare worker who sees the case in their normal work activities and who then reports suspect cases to those that need to know

Enhanced Passive Case Finding Strategies

- Suspect cases are identified by the healthcare worker who sees the case in their normal work activities supplemented by a system that reminds the healthcare worker to check for suspect case and to report to appropriate authorities

General Best Practices for Case Finding Activities

- ❖ Train and educate healthcare workers

Example: Training on detection among inpatients and self-recognition of symptoms

- ❖ Monitor and manage ill and exposed healthcare workers

Example: Implement sick leave policies that are flexible and do not include punishment for missing work

- ❖ Establish reporting within and between healthcare facilities and to public health authorities

Example: Communicate and collaborate with public health authorities.

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❖ Opinion**Coffee Biotechnology****Vengadesan D**

B.Tech. Biotechnology, School of Life Sciences, B.S.Abdur Rahman Crescent Institute of Science and Technology, Chennai-600048, Tamil Nadu, India

Research Highlights:

Coffee has reached its pinnacle in the last three decades. Its transformation from being an ecstasy to a requisite is purely a sales pursuit. It is a largely traded commodity. The coffee bean is cultivated around 80 countries and it generates a lot of foreign currency. The aroma of the coffee has conquered the people's zeal and grossed remarkably well around the globe. It was first harvested in Ethiopian plateaus. And it got traded to the Arabian Peninsula. After which it reached a magnanimous growth. It also gained a lot of attention in the field of biotechnology research. Scientists, belonging to various institutions started researching on this crop. It provided us a lot of analytical data and new methods of cultivation. There are more than 100 varieties of coffee bean, which is garnished to different types of coffee. Thus, making the domain of coffee much substantial. There are two varieties of mostly used commercial coffees, They are Arabic Coffee (*Coffea Arabica L.*) and Robusta Coffee (*Coffea canephora p.*). The analytical data suggests that Arabica bean yields us premium coffee with less resistance to pest instead Robust offers us high resistance to pests and minimal quality of coffee. Coffee

Biotechnology is an emerging field which is centralized only to coffee bean and its various biological aspects. It increased the processing of the crop and refined it. By Subsequent years of research, The field of Coffee Biotechnology has reached the genetic level. The traits of every plant is observed for every generation. Hybridization is followed. Many markers are used to investigate coffee beans and its characteristics. R The major milestones in the field of coffee biotechnology are in vitro manipulation of coffee beans,

multiplication of coffee and development in gene transfer protocols in order to assist in yield of transgenic coffee plants with specific traits. The regeneration of crops using tissue culture is concentrated majorly on the obtain protocols to produce an hybridized species. The advancement has altered the prospect of the technique. Methods like somatic embryogenesis, meristem and axillary bud culture and induction of adventitious buds are devised to improve the quality. The limitations like pest, slow duration and dormancy can be controlled. The specific phenotype expression has to be eliminated. It is done through Marker Assisted Selection. Various Markers such as Restriction Fragment Length Polymorphism (RFLP), RAPD, AFLP, ISSR, etc. are used in genetic diversity studies. The genome analysis of coffee is done by SNP's and PCR-RFLP. An Organization is established to sequence the coffee genome by high-throughput screening and let us explore every features of the coffee genome and its diversities. International Coffee Genome Network (ICGN) is made use by many of laboratories around the world.

Transgenic coffee is developed on the context of developing a coffee of desired traits. It will established by introducing targeted DNA in to the host. First of all, the candidate gene is finalized. There are already many candidate genes which are under scrutiny. Some of them are Mex- 1 gen , SH3 gene. CaM XMTI is theobromine synthase gene for suppressing caffeine biosynthesis. Some promoters like CaMV35S is used in transgenic constructs. It catalyses the process of developing transgenic plant. *hpt* hygromycin-R, *nptII* kanamycin-R are the selection marker genes used for coffee transformation. It has a significant operation in selection of transformants. The genes are delivered by various methods like Indirect delivery of DNA, Microprojectile Bombardment, Electroporation. The output is a plant with resistance to abiotic stress, pests. So, it lets us explore every perspective and gives us a path to experiment in people's favorite beverage.

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❖ Idea Corner**Idea Corner with special reference to COVID 19****Kiran G., Janani Prabha, G.**

B.Tech. Biotechnology, School of Life Sciences, B.S.Abdur Rahman Crescent Institute of Science and Technology, Chennai-600048, Tamil Nadu, India

α Many of them suggesting this pandemic is going to get under control. But situation now in India seems there's no control to this COVID-19. People still goes to market to buy vegetables, grocery shop etc. in a group of people gathering in one place and they have risk of getting infected by this pandemic. How this people know that they are having the chances of getting infected or the person standing besidehim/ her prone to this pandemic. By using an COVID-19 tracker app, which informs u if u come in close proximity with positive cases. It is an instant app for android, and it is process to build an application for mobile. Once the app is installed in smartphone, the app detects other devices with COVID-19 tracker app. The app can calculate the risk of infection based on parameters if any of the contacts is tested positive. You will be alerted if someone come in close proximity of people with COVID-19 positive.

α Viral vaccines can be found out by identifying the antibodies that blocks the replication. Or even precautionary measures can be adopted in a very fast way to stop further spread. Antigen responsible for causing the disease can be identified and the antibody which can combine with it and stop its replication process must be processed. Live attenuated samples can be produced and tested by reducing its virulence. The identified antibodies can be produced in labs. These can be tested on animals and can be left on human trials

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❖ RESEARCH HIGHLIGHTS

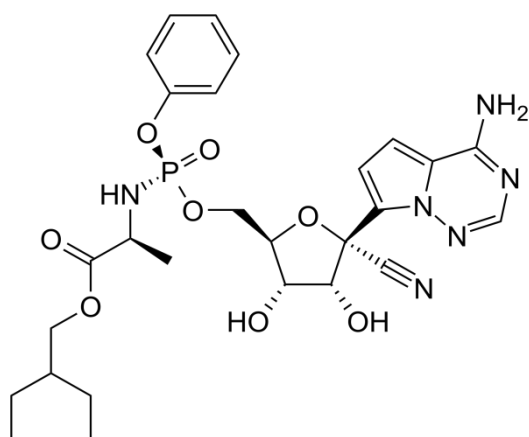
Role of Remdesivir in COVID19

Syed Masood Ahmed, G

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Research Highlights:

Remdesivir is a novel antiviral drug in the class of nucleotide analogs. Remdesivir is an adenosine analogue, which incorporates nascent viral RNA chains and causes their premature termination. It was developed by Gilead Sciences as a treatment for antiviral activity against other single stranded RNA viruses such as Nipah virus, Hendra virus, and the coronaviruses (including MERS and SARS viruses). It is being studied for SARS-CoV-2 and Henipavirus infections. Remdesivir is a novel drug that has antiviral capabilities. It is synthesized from Ribose Derivatives. This drug was invented by Gilead Sciences. It was developed as a treatment for Ebola and Marburg infections. It is also found to be very useful in treating feline coronainfections. It comes under the class of nucleotide analogs. This drug is an adenosine analogue, which assimilates nascent viral RNA chains, thus causing premature termination. Development Code: GS-5734



Chemical structure of Remdesivir

Mode of action: Remdesivir is a prodrug that metabolizes into its active form GS-441524. An adenosine nucleotide analog, GS-441524 interferes with the action of viral RNA-dependent RNA polymerase and evades proofreading by viral exoribonuclease (ExoN), causing a decrease in viral RNA production. It was unknown whether it terminates RNA chains or causes mutations in them. However, it has been learned that the RNA-dependent RNA polymerase of ebola virus is inhibited for the most part by delayed chain termination. Remdesivir has been recently recognized as a promising antiviral drug against a wide array of RNA viruses (including SARS/MERS-CoV5) infection in cultured cells, mice and nonhuman primate (NHP) models. It is currently under clinical development for the treatment of Ebola virus infection.

Remdesivir is an adenosine analogue, which incorporates nascent viral RNA chains and results in premature termination. Our time-of-addition assay showed remdesivir functioned at a stage post virus entry, which is in agreement with its putative anti-viral mechanism as a nucleotide analogue. Warren et al. showed that in NHP model, intravenous administration of 10 mg/kg dose of remdesivir resulted in concomitant persistent levels of its active form in the blood (10 μ M) and conferred 100% protection against Ebola virus infection. They further reported that EC90 value of remdesivir against 2019-nCoV in Vero E6 cells was 1.76 μ M, suggesting its working concentration is likely to be achieved in NHP and remdesivir also inhibited virus infection efficiently in a human cell line (human liver cancer Huh-7 cells), which is sensitive to 2019-nCoV.”

Based on this experimental data, we can agree on the fact that Remdesivir is one of those drugs that can effectively treat the virus causing the pandemic worldwide. Even though it's tough to argue the fact that this drug can be the only one that would save the world without clinical trials, we'll have to go through all 4 phases of the trial to get the recommended approval for public release. To confirm whether the drug is active as per the question, the results have shown explicitly that the drug is proactive (*in vivo*) even before the virus entry takes place.

Experiments Around the Globe: An Experiment conducted by Wang suggested that Remdesivir and chloroquine inhibit the effect of novel Coronavirus causing COVID-19 in vitro. The cytotoxicity of virus and infection rate is measured by standard assays. The candidate compound undergoes CCK8 assay to test toxicity. The test drug is administered at different levels to the cells which were infected. The efficacy is analyzed by running a RT-PCR and getting to know the viral copies generated. It is confirmed through visualization of the nucleoprotein by using fluorescent microscopy. It is identified to be effective among RNA viruses such as MERS-CoV and SARS. The Clinical trials on Patients have already started by Gilead Sciences. It is under Phase III of study. The Pregnant Women and Children are exceptional to this trial.

Further Reading:

1. <https://www.nature.com/articles/s41422-020-0282-0>
2. <https://www.europeanpharmaceuticalreview.com/news/116223/two-phase-iii-trials-to-study-remdesivir-in-covid-19-patients-initiated/>
3. https://en.wikipedia.org/wiki/Remdesivir#Research_usage
4. <https://www.rndsystems.com/resources/articles/ace-2-sars-receptor-identified>
5. https://www.medicinenet.com/angiotensin_ii_receptor_blockers/article.htm

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JOURNALS /WORKSHOPS/ CONFERENCE/ INTERNSHIPS**D. MubarakAli***

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Special Issues:**Sustainability (MDPI): IF: 2.657**Special Issue on Microalgal Process and Sustainability: **March 2021****Guest Editors:** Praveenkumar, R., MubarakAli, D.**Nanotechnology (Frontiers):**Special Issue on Nanomaterials for sustainable use for health and environment: **March 2021****Guest Editors:** Saravanakumar, K., Wang, M., MubarakAli, D and Gasidit Panusuwon**Workshop:**

1. ACS Talk series: Workshop on THE COALESCE Network: Measuring and Tracking Down the Carbonaceous Aerosol Culprits Across India by Prof. Ramya Sunder Raman, Department of Earth and Environmental Sciences, IISER Bhopal on **September 25, 2020**.
2. ACS Talk series: Workshop on Reversible Chemical Tools to Capture Life in Action by Prof. Ankona Datta, Department of Chemical Sciences, Tata Institute of Fundamental Research, Mumbai on **September 4, 2020**
3. ACS Talk series: Workshop on Molecular Engineering: Small Peptides Mimicking Proteins by Prof. Nandita Madhavan, Department of Chemistry, Indian Institute of Technology, Bombay on **August 26, 2020**.

Conference:

1. Indo-UK International Virtual Conference on Advanced Nanomaterials for Energy and Environmental Applications (ICANEE-2020) to be held on September 16-18, 2020 organized by Alagappa University, Karaikudi, India
2. Virtual Conference on Marine Natural Products – VMNP – 2020 at Sathyabama Institute of Science and Technology, Chennai, India To be held on Aug 18-21, 2020
3. National Conference “Host-pathogen interaction: present and future perspective” at National Institute of Technology (NIT), Rourkela, Odisha to be held from September 24 to 25, 2020.

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- ✓ References: The research paper referred must be assessed from renowned publishers (science, nature etc.,) and the references must be mentioned in the article.
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- ✓ The article should be typed in double space in word format limited to > 1000 words with font “Cambria” and font size 12 with 1.5 line spacing.
- ✓ Illustration and tables: Illustrations must be reduced to one – third of the page. Typed tables should be provided with tittles. Authors are specially requested to reduce the number of tables, illustrations and diagrams to a minimum (maximum 2).
- ✓ The SLS newsletter assumes no responsibility for statements and opinions advanced by the contributors to the journal.



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