Department of Science & Technology (Government of Gujarat)

GBRC NEWS

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September 2022

MoU FOR THE FIRST BSL4 IN GUJARAT

Gujarat Biotechnology Research Centre and National Dairy Development Board (NDDB) signed pact for developing state of the art greenfield BSL-4 lab with ABSL facility.

It is the first high security disease research facility in Gujarat and the second in India after NIV, Pune. Apart from the BSL-4 lab, the center will also have other modules of BSL 3 and BSL-3+ safety levels for researchers to work with less dangerous pathogens.

Independent researchers and companies will also be able to conduct animal trials, research and vaccine studies at the facility on a shared basis.

GUJARAT STATE TASK FORCE ON THE LUMPY SKIN DISEASE VIRUS

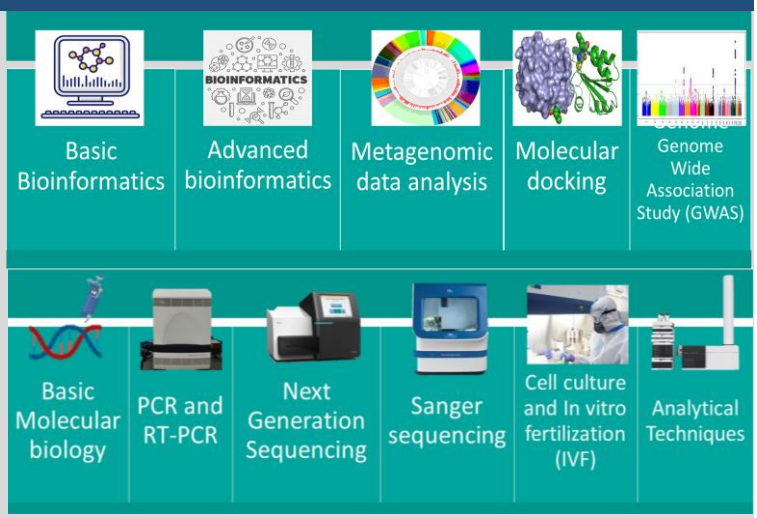
As the part of state task force on the surveillance of LUMPY Skin Diseases Virus, GBRC analyzed and submitted report to Animal Husbandry Department. GBRC has done genome sequencing of host animals and the virus isolated from them. The study was conducted for genomic surveillance and phylogenetic profiling of LSDV. Host transcriptome profiling of affected animal tissues as well as microbiome population associated with infected animals was also investigated.

NOMINATION OF PROF. C.G. JOSHI IN GEAC

Prof. Chaitanya Joshi, Director, GBRC has been nominated as a member of the Genetic Engineering Appraisal Committee (GEAC), Ministry of Environment, Forest & Climate Change, Government of India. GEAC functions in the Ministry of Environment, Forest and Climate Change (MoEF &CC). It is responsible for appraisal of activities involving large-scale use of hazardous microorganisms and recombinants in research and industrial production from the environmental angle. The committee is also responsible for appraisal of proposals relating to release of genetically engineered (GE) organisms and products into the environment including experimental field trials.

KAUSHALYA TRAINING PROGRAM FOR SKILL DEVELOPMENT IN BIOTECHNOLOGY

***KAUSHALYA (K**nowledge **A**dvancement **U**sing **S**kills **on H**igh-end **A**pplied **L**ifetechnolog**Y for A**spirants)* is an initiative by GBRC and sponsored by Gujarat State Biotechnology Mission (GSBTM) to help in developing biotechnological skills of the researchers, academicians and other stakeholders. The program's aim is to provide learners extensive and specialized practical knowledge for the development of their functional skill set in biotechnology and related fields. Total 30 trainings has been planned under the program on the different advance tools and technologies in the subject area of Biotechnology.



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MEDIA COVERAGE

City | AhmedabadMirror

India to get its second high security BSL-4 lab in Gujarat

CONTINUED FROM PAGE 1

Gandhinagar collector Dr Kuldeep Arya confirmed the development saying that the process to measure and evaluate the land and liaison with the R&B department is underway.

The only other such facility in India is the National Institute of Virology (NIV) in Pune. While another BSL-4 lab was planned at CCMB in Hyderabad, the plan was eventually abandoned, suggested reports in 2021.

On Wednesday, officials from the Gujarat Biotechnology Research Centre (GBRC) in Gandhinagar and the National Dairy Development Board (NDDB) in Anand signed an MoU for Consultancy Service Agreement and PMC services for the development of the greenfield BSL-4 lab with ABSL facility. NDDB has previously worked on similar projects in Bhopal and Bhubaneswar.

Apart from the BSL-4 lab, the centre will also have other modules of BSL 3 and BSL-3+ safety levels for researchers to work with less dangerous pathogens.

The inclusion of Animal Biosafety Level 4 (ABSL-4) facility at Gujarat's proposed BSL-4 laboratory indicates that the laboratory will have the capability to also study major diseases affecting animals. Currently, there are only two institutions in India studying the major zoonotic diseases -- the National Institute of High Security Animal Diseases (ICAR-NIHSAD) in Bhopal with BSL-3+ rating and the International Centre for Foot and Mouth Diseases (ICAR-ICFMD) in Bhubaneswar, with a BSL-3Ag rating.

DPRC to draw configuration of facility

The Detailed Planning Report Committee (DPRC) to draw up the configurations of the facilities, equipment required and manpower necessary for the undertaking was formed back in 2021 itself with experts from other major labs in India and independent experts, when Gujarat was still reeling from the drastic loss of lives as a result of the second Covid wave led by the Delta variant.

Sources in the DST told Mirror that Rs250 crore have been proposed as a new item to be allocated for the project in the state budget for FY 2023-24. It is expected to be completed in 30 months from start of construction, with officials hoping to begin operations by mid-2025. However, the name of the centre is yet to be decided.

Independent researchers and companies will also be able to conduct animal trials, research and vaccine studies at the facility on a shared basis.

GBRC has already floated a tender for a biosafety consultant and proof engineering consultant. It is shortly expected to float a tender to find a construction management agency to build a structure with BSL-4 level requirements of containment.

Vijay Nehra, secretary of DST, remained unavailable for comment.

Cover Story

India To Get Its Second High Security BSL-4 Lab In Gujarat

City | AhmedabadMirror Wednesday, S

World Alzheimer's Day

Research raises hope for early diagnostic kit for Alzheimer's

In light of late detection of neurological degenerative disorder, expert suggests prevention and delaying onset; researchers trying to identify biomarkers which will give early peek at symptoms

Brendan.Dabhi
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TWEETS @BrendanMIRROR

Medical research currently underway in Gujarat has thrown up hope for an early diagnostic kit to detect Alzheimer's Disease, a debilitating neurological degenerative disorder that slowly destroys memory, thinking and cognitive ability, taking away the ability of those suffering from it to eventually perform even the most basic tasks.

Gujarat Biotechnology Research Centre (GBRC) and the Hospital for Mental Health (HMH) in Ahmedabad have, for the last four years, been engaged in studying the human genes associated with various forms of dementia including Alzheimer's Disease with the ultimate goal of developing a simple blood test that can identify its early onset which can help patients and caregivers seek medical help to delay the degenerative processes that occur.

Researchers told Mirror that the biggest issue in Alzheimer's is late detection and the fact that degenerative changes are irreversible. There is currently no cure for it.

Researchers said, "We are trying to identify and isolate biomarkers which will give us an early indication of Alzheimer's onset. Once we do so, we will be able to pinpoint them and eventually hope to develop a kit. We made a panel of custom genes of which we have already proved 16 genes to have links to the disease. We found 19 SNP locations in 16 genes which could be associated with the disease and its significance is 0.05, which means 99.95 association with the disease." However, the sample size is too small at the moment.

"We have been working on this for four years. However, it continues to remain in R&D phase due to lack of people coming forward to enroll in the research. Currently, there are just 32 patients and 11 people in the control group," said researchers.

Meanwhile, eminent neurologist Dr Sudhir Shah said prevention strategies to delay or avoid Alzheimer's Disease would serve society well, especially as lifespans of Indian males are at 70+ years in 2011.

Dr Shah said, "Increase in pollution, lifestyle changes, stress and the effects of long Covid, coupled with the increased life expectancy, has made people more susceptible to neurological degenerative disorders like Alzheimer's and Parkinson. We have to understand there is no cure for Alzheimer's and the effects of drugs available do not last long. Prevention is the best method through creativity, art, learning new languages, new skills, etc."

FILE PHOTO

Lack of volunteers willing to enrol in research hampering efforts

Alzheimer's has no cure and effects of drugs available do not last long. Prevention through creativity, art, learning new skills best recourse.

'Omicron also shows immune escape'

Covid Adapts To Jabs, Herd Immunity: Study

Parth.Shastri@timesgroup.com

Ahmedabad: More than two years after the pandemic peaked — vaccination doses and herd immunity notwithstanding — the Covid-19 virus is down but not out. Many are still contracting Covid despite two or three doses of vaccination or their history of the infection. That is because the virus is also adapting to changing situations and has become less lethal but more infectious. Thus, the Omicron variant of Covid has also shown immune escape like its predecessor the Delta variant, indicates the latest study by an international consortium including Gujarat Biotechnology Research Centre (GBRC) from India. Omicron has been the dominant variant in Gujarat and India since the beginning of the year.

The paper 'Evaluation of immune evasion in SARS-CoV-2 Delta and Omicron variants' by Armi Chaudhari, Madhvi Joshi, Dinesh Kumar, Amrutlal Patel, Kiran Lokhande, and Chaitanya Joshi from GBRC among others was published recently in Elsevier's Computational and Structural Biotechnology Journal. Other authors are from Stanford University School of Medicine, University of Pastdam in Germany, University of Warsaw in Poland, University of California Berkeley, and Harvard Medical School.

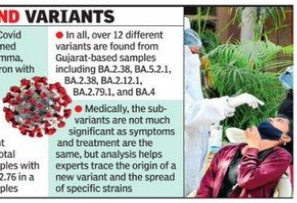
"The molecular dynamic (MD) simulation data and virus neutralization assays revealed that Omicron also exhibits immune escape, as antigenic beta-sheets appear to be disrupted," the study said. "The results of the present study demonstrate the higher possibility of immune escape and thereby achieved better fitness advantages by the Delta and Omicron variants." The study stressed the fact that both Delta and Omicron variants had higher transmissibility compared to wildtype (original) strain of the virus.

"We carried out simulations on the models of Omicron and Delta to understand the mechanism of immune escape, and found that in Delta, it was N-terminal domain (NTD) on the spike protein through which the virus docks on human cells," said a researcher: "In Omicron, the role of receptor-binding domain (RBD) is more prominent. Thus, we can say that the mechanism of immune escape has changed over time."

The researchers said that the implications of the study are about the spread in the future. A researcher said that due to vaccination and herd immunity, the impact of Covid-19 is no more than flu today for a majority of the population. "But it will take a relatively longer time for nearly-zero cases, as the virus is constantly mutating, adapting to the host situations," said a researcher: "While Delta had a relatively free run, Omicron had to surmount challenges of better immune system. Thus, we have seen far more variants for Omicron and will see more in the time to come before a completely new variant emerges."

COVID AND VARIANTS

- So far, main Covid variants are named Alpha, Beta, Gamma, Delta and Omicron with several sub-variants
- In Gujarat, currently Omicron sub-variants account for 92% of the total sequenced samples with BA.2.75 and BA.2.76 in a majority of samples
- In all, over 12 different variants are found from Gujarat-based samples including BA.2.38, BA.5.2.1, BA.2.38, BA.2.12.1, BA.2.79.1, and BA.4
- Medically, the sub-variants are not much significant as symptoms and treatment are the same, but analysis helps experts trace the origin of a new variant and the spread of specific strains



Many Omicron sub-variants at play

12 Covid Deaths In City In 12 Days, Preceding 12 In 127 Days

Parth.Shastri@timesgroup.com

Ahmedabad: The newly-discovered Omicron sub-variant BA.5.2.1 is one of the many found in samples from Covid patients in the state by genome sequencing carried out by Gujarat Biotechnology Research Centre (GBRC).

Analysis of Covid variants in past one month for Ahmedabad city found BA.2.38 was the dominant subvariant, followed by its parent sub-variant BA.2, with both found in nearly 90% of samples sequenced. Other sub-variants found include BA.2.12.1, BA.2.37, BA.2.38, BA.2.38.1, BA.2.74, BA.2.75, BA.2.76, BA.4, BA.5.1 and BA.5.2. While BA.2.38 is considered the dominant strain in states such as Maharashtra, BA.2.75 has been nicknamed 'Centaurus' and is being reported from several countries including Singapore.

City-based experts say it's too early to link the spike in the cases with a specific variant, even though it's important to keep an eye on changes in the dominant variant. Dr Urvesh Shah, professor and head of microbiology at GCS Medical College, said the sub-variant BA.5.2.1 is relatively new and has been reported in small numbers from countries such as the US and the UK.

"The L452R mutation is found in both BA.4 and BA.5 sub-variants. This mutation may provide a significant advantage in transmission, pathogenicity and immune escape. We must keep in mind that studying sub-variants is primarily to understand the virus and may not have a significant impact on symptoms and treatment," said Dr Shah, adding that it's natural for virus to mutate after a certain period based on the human hosts and factors such as the weather.

GENOME STUDY

To put the spike in cases into perspective, Ahmedabad city recorded 4,111 Covid cases in the past 15 days, from 3,147 in the preceding fortnight, a 31% increase. The figure for Gujarat is 40%, from 7,798 to 10,938.

With four of every 10 cases outside major cities, the focus has again shifted to more testing and tracking.

The state recorded 12 Covid deaths in 12 days, while the preceding 12 deaths had come in 127 days.

Manoj Aggarwal, ACS (health), said the increase in deaths is being monitored. "Almost all deaths in July so far are those of elderly people with comorbidities. If we see the overall case trend, the majority are older than 20 years. There's no major change in the variant profile in the state," he said.

Dr Kamlesh Naik, president of Ahmedabad Family Physicians' Association (AFPA), said the symptoms in suspected Covid patients coming to OPDs at general physicians are mostly mild. "They are often seen in clusters in families or a specific area. Hospitalization has remained low," he said.

File photo

STATE OF COVID

Cases	12.47 lakh ▲937
Deaths	10,960 ▲1

PATIENTS DISCHARGED

July 23	Up by
12.3 lakh	745

COVID VACCINATION (DOSE 1)

July 23	Up by
5.42cr	3,523

GBRC director now on GEAC

An office order from the ministry of environment, forests and climate change (MoEFCC) on July 13 announced the reconstitution of the Genetic Engineering Appraisal Committee (GEAC) at the national level. Prof Chaitanya Joshi, director of Gujarat Biotechnology Research Centre (GBRC), has been appointed a member in the independent outside expert category. The committee has 22 members. Headed by Naresh Pal Gangwar, additional secretary of MoEFCC, the committee 'will function as a statutory body for approval of activities involving large-scale use of hazardous living microorganisms and recombinants of research and industrial production from the environmental angle,' the order states. TNN

Fourth Covid death in city in 3 days

TIMES NEWS NETWORK

Ahmedabad: On Saturday, an 82-year-old woman succumbed to the Covid infection in the city. She had comorbidities, said state health department officials. It was the third consecutive day on which Ahmedabad recorded the death of a Covid patient.

It was also the third consecutive day on which the city registered 300-plus daily Covid cases. The active cases have reached 2,064 in Ahmedabad.

For Gujarat, it was a 164-day high daily tally at 937. Other cases included 83 in Vadodara city, 66 in Mehsana, 45 each in Surat city and Gandhinagar, 36 in Vadodara, 34 in Gandhinagar city, and 32 in Sabarkantha. Four of the 33 districts in Gujarat had zero active cases.

The state in 24 hours vaccinated 3,523 persons for the first dose and 9,076 for the second. In all, 5.42 crore have been administered the first and 5.36 crore the second dose of Covid vaccines. The state administered booster doses to 36,555 senior citizens, taking the total to 43.53 lakh.

STAFF WELFARE CLUB ACTIVITY

An association has been initiated which is quoted as Staff Welfare Club. The main object of the association is to establish, promote, subsidize, encourage, provide, maintain, organize, undertake, manage, equip, develop, recondition, operate, conduct and to run for in the music, dance, sports, social welfare, carry out scientific and technical, other than political activities.

Ms. Ezhuthachan Mithu , Awarded For Best Monthly Presentation For July-2022

Dr. Vamsi Satyavolu, Awarded For Best Monthly Presentation For August-2022

Ms. Pooja Doshi, Awarded For Best employee of the Month For July-2022

Ms. Yesha Upadhyay, Awarded For Best Question in PRABODH For July-2022

Dr. Arpan Modi, Awarded For Best Question in PRABODH For August-2022

Mr. Nitin Shukla, Awarded For Best employee of the Month For August-2022

Proteomics Lab, Awarded as the Best cubicle of the Month For July-2022

NGS Lab, Awarded as the Best cubicle of the Month For August-2022

INVITED TALKS DELIVERED BY GBRC TEAM

- **Prof. Chaitanya G. Joshi, Director, GBRC,** delivered online lecture in on "Host-microbiome interaction in augmenting productivity of ruminants" on 24th August 2022 at Uttar Pradesh Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan, Mathura.
- **Dr. Madhvi Joshi, Joint Director, GBRC** delivered a talk on "Environmental Surveillance of COVID-19: Trash to Treasure", as a part of the Student Innovation Festival (SIF)-2022 at Silver Oak Institute of Science on 10th August.
- **Dr. Madhvi Joshi** has been invited for an expert lecture at Digital PCR user forum on 19th July, 2022**.**
- **Dr. Madhvi Joshi** has been invited as Chief Guest on occasion of week-long hands-on training program for DST-funded Karyashala on Atomic Force Microscopy organized by IIT Gandhinagar on 22nd September.
- **Dr. Madhvi Joshi** has been invited as guest of honor in the National Conference in Climate, Community & Conservation hosted by Navrachna University on 26th September.
- **Dr. Madhvi Joshi** attended live synchronous session on 4th batch on AMR star course-4 funded by BBRC UK on 30th September.
- **Dr. Madhvi Joshi, Dr. Niraj Singh, Dr. Apurvasinh Puvar, Dr. Ishan Raval, Dr. Haidar Abbas, & Dr. Krishna Bharwad GBRC,** has given the lectures on different topics. These lectures were the part of a series of lectures organized by Vigyan Gurjari for the celebration of 75 glorious years of independence (Azadi Ka Amrit Mahotsav). Students were familiarized with importance of science in routine life and how innovation helped in shaping humanity.

ARRIVAL & DEPARTURE

GBRC would like to extend a hearty Welcome of the new members to family

- Dr. Sanman Samova, Scientist-B
- Dr. Pritesh Sabara, Scientist-B
- Dr. Vamsi Satyavolu, Technical Assistant
- Dr. Ankur Sharma, Technical Assistant

GBRC wishes best for the future of the bright minds who had left

- Dr. Neha Trivedi
- Yesha Upadhyay
- Chinmay Gadkari
- Ritika Pant
- Kunjan Parikh
- Dr. Harshavdan D Patel
- Dr. Kiran Bharat Lokhande
- Ezhuthachan Mithu Mohanan
- Rahul Ramsinh Parmar
- Tejaswini Rajiv Mehta
- Shivangi Rajendrasinh Gohil
- Amiben Vinubhai Lakhani
- Dr. Abhishek Bachubhai Parmar

VISIT BY DIGNITARIES

Visit on 10th September 2022

Dr. N. Kalaiselvi, *DG-CSIR & Secretary, DSIR, New Delhi*,
Dr. Geetha Vani Rayasam- *Principal Scientist & Head, Business Development CSIR-IGIB New Delhi*,
Dr. B.N. Tripathi, *DDG-ICAR Headquarters, New Delhi*,
Dr. J. Shrikanda P. Balan

Visit on 09th September 2022

Dr. Purnima Rupal, *Head, SCDD, CSIR, Ministry of Science and Technology (GOI), Delhi*
Dr. Vibha Malhotra Sawhney, *Scientist 'H' and Head, TMD, CSIR, Ministry of Science and Technology (GOI), Delhi*
Dr. Alka Sharma, *Scientist 'H'/Senior Adviser, DBT, Ministry of Science and Technology (GOI), Delhi*
Dr. Rajesh Gokhale, *Secretary, DBT, Ministry of Science and Technology (GOI), Delhi*
Dr. Alok Chadar, *Senior Principal Scientist (Scientist - 'F') CSIR, New Delhi*
Dr. Mahendra Darokar, *Chief Scientist, Technology Management Directorate, CSIR, Delhi*

Visit on 01st September 2022

Dr. R. V. Upadhyay, *Provost (Vice-Chancellor)*
Dr. Devang Joshi, *Registrar*
Prof. Datta Madamwar, *Scientific Advisor*
Dr. Ashok Patel, *Advisor-IT & Adm Affairs*
from Charusat University

Visit on 12th September 2022

Dr. A K S Suryavanshi,
Vice Chancellor (Provost), Karnavati University

Visit on 10th September 2022

Dr. Pradeep Kumar Agarwal,
Senior Principal Scientist, CSIR-CSMCRI

VISIT BY DIGNITARIES

Visit on 11th September 2022

Prof. Sunil Kumar Singh,
Director, National Institute of Oceanography- Goa

Visit on 10th September 2022

Dr. Shiho Oikawa,
Assistant Director, Japan Ayurveda School

Visit on 16th September 2022

Dr. Anup Thakar, *Director, Institute of Teaching and Research in Ayurveda (ITRA), Jamnagar*

VISIT BY COLLEGE/ ACADEMIC INSTITUTES

Visit on 15th July 2022

Visit on 8th August 2022

Students of Parul University, Vadodara

Visit on 25th August 2022

Students of Bhagwan Mahavir College of Biotechnology, VNSGU, Surat

Visit on 10th September 2022

Students of Department of Biotechnology, VVP Engineering College, Rajkot

VISIT BY COLLEGE/ ACADEMIC INSTITUTES

Visit on 16th September 2022

Students of Department of Microbiology and Department of Biotechnology, P.P. Savani University, Surat

MEMORANDUM OF UNDERSTANDING (MoUs)

MoU BETWEEN GBRC AND TRUST FOR EDUCATION AND TRAINING IN CYTOMETRY (TETC), JAIPUR

An MoU has been signed between Gujarat Biotechnology Research Centre (GBRC), Gandhinagar and Trust for Education and Training in Cytometry (TETC), Jaipur. The main objective of the MoU was to conduct 24th Indo-US flowcytometry workshop. The aim of the workshop is to bring experts from India and abroad to the same platform, where their expertise is being harnessed by the participants to understand the basics and advance concepts in flow cytometry and to apply this insight to their biological and clinical research.

MoU BETWEEN GBRC AND NATIONAL DAIRY DEVELOPMENT BOARD (NDDB)

This MoU is signed for Development of Greenfield BSL-4 Lab that will allow scientists to Study, Culture And Biobank Most Infectious, Virulent Pathogens affecting humans and animals.

MOU BETWEEN GBRC AND SCRIPTICS TECHNOLOGIES INC

This MoU is signed to enhance research in AMR and bioinformatics through Machine Learning, Deep Learning, Computer Vision, Artificial Intelligence and Big Data Analytics.

GBRC signed MoU with Cosmo Research Foundation for undertaking a collaboration in the research and development of traditional knowledge.

PRABODH

GBRC is conducting "PRABODH" (Promoting Research Awareness in Biotechnology for Development of Human Resource) to accelerate the research work and to develop research-oriented thought processes in staff.

INVITED GUESTS

Expert (16/07/2022)

Shri Deepak Joshi,

IAS (Retd.)

Topic: "Significance of Science Communication."
Shri Deepak Joshi has told about the importance of books, which were written by the great scientists to elaborate the science to a normal non-scientific person. He encouraged the students, fellows and the scientific staff of GBRC to read books because books have great influence on polishing the minds. It always helps in becoming what we are not, always uplift and recruit new thoughts and perspectives

Expert (22/08/2022)

Prof. Partha Majumder,

Professor,

National Institute of

Biomedical Genomics (NIBMG),

Kalyani, Kolkata

Topic : "Enabling Precision Medicine for Cancer".
He talked about precision medicine, a branch of medicine that makes use of a patient's own genes or proteins to treat, diagnose, or prevent illness. Precision medicine is used to diagnose cancer, design a patient's course of treatment, assess the effectiveness of that treatment, and determine the patient's prognosis. He continues by discussing the prevalence of breast and ovarian cancer in women.

Expert (17/09/2022)

Dr. Mitul Trivedi,

Scientist, Archaeologist &

Historian

Topic: "Physiology in Vedas."

Dr. Mitul Trivedi was present as the external expert to give a talk on "Physiology in Vedas". He talked about Modern Science and Ancient Vedic Science in the human physiology.

Expert (17/09/2022)

Dr. Madhvi Sheth,

MBBS, MS – Ophthalmology,

Retina Surgeon

Topic : "New horizons in Eye Research".
Dr. Madhvi Sheth talked about optic diseases like cataracts, diabetic retinopathy, glaucoma, retinal detachment and optical atrophies /conditions in human as well as in animals. She talked regarding vascular insults, maculopathies and intravitreal implants.

PRESENTATIONS FROM GBRC MEMBERS

Article: Whitefly hijacks a plant detoxification gene that neutralizes plant toxins.

Journal: Cell

Impact factor: 66.85

Dr. Darshan Dharajiya
Scientist-B, GBRC

Article: Arabidopsis P4 ATPase-mediated cell detoxification confers resistance to *Fusarium graminearum* and *Verticillium dahlia*.

Journal: Nature Communication

Impact factor: 17.69

Dr. Komal Sapara
RA, GBRC

PRABODH

PRESENTATIONS FROM GBRC MEMBERS

Dr. Haidarabbas Masi
Scientist-B, GBRC

Article: A stable antimicrobial peptide with dual functions of treating and preventing citrus Huanglongbing.
Journal: PNAS
Impact factor: 12.78

Dr. Monika Jain
RA, GBRC

Article: An activated-platelet-sensitive nano carrier enables targeted delivery of tissue plasminogen activator for effective thrombolytic therapy.
Journal: Journal of Controlled Release
Impact factor: 11.47

Dr. Apurvsinh Puvar
Scientist- B, GBRC

Article: Integrating taxonomic, functional and strain level profiling of diverse microbial communities with bioBakery 3.
Journal: eLife
Impact factor: 8.140

GUEST LECTURES

Prof. Utpal Tatu,
Professor, IISc, Bangalore

Topic: Research on orphan diseases

Dr. Ajai Tripathi,
Sr. Scientist, Merck, USA

Topic: The effect of microglial dicer loss on demyelination and remyelination

RECENT PUBLICATIONS

GENETIC SEQUENCING DETECTED THE SARS-COV-2 DELTA VARIANT IN WASTEWATER A MONTH PRIOR TO THE FIRST COVID-19 CASE IN AHMEDABAD (INDIA).

Authors: Madhvi Joshi, Manish Kumar, Vaibhav Srivastava, Dinesh Kumar, Dalipsingh Rathore, Ramesh Pandit, David W. Graham, and Chaitanya G. Joshi

Journal: Environmental Pollution
Impact factor: 8.071

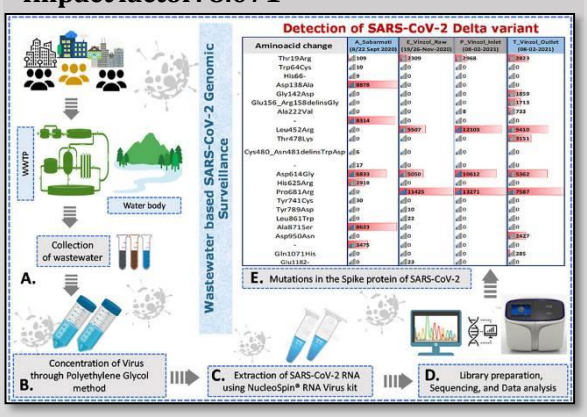


Figure showing graphical abstract.

Joshi et al., 2022

In the present study four samples were analyzed to detect key mutations in the SARS-CoV-2 genome and track circulating variants in Ahmedabad during the first wave (Sep/Nov 2020) and before the second wave (in Feb 2021) of COVID-19 in India using waste water based surveillance of pandemic. Thirty-four mutations in the spike protein across samples categorized into 23 types. These mutations were linked to the VOC-21APR-02; B.1.617.2 lineage (Delta variant) with 57% frequency in wastewater samples of Feb 2021. These mutations appeared before the massive second wave of COVID-19 cases, which in India started in early April 2021. In addition, genetic traces of the omicron were also found in samples more than a month prior to the first clinically confirmed case in Ahmedabad, Gujarat. Thus, the current study provide the evidence of circulating SARS-CoV-2 variants in Ahmedabad and confirms the consequential value of wastewater surveillance for the early detection of variants of concerns (VOCs).

RECENT PUBLICATIONS

DETECTION OF *CARICA PAPAYA* ADULTERATION IN *PIPER NIGRUM* USING CHLOROPLAST DNA MARKER-BASED PCR ASSAYS

Authors: Tasnim Travadi, Abhi P. Shah, Ramesh Pandit, Sonal Sharma, Chaitanya Joshi, and Madhvi Joshi

Journal: Food Analytical Methods

Impact factor: 3.498

The spice made from the fruits of *Piper nigrum* (PN) has economic and medicinal importance. Due to the high demand, as well as export and trade, the quality is threatened by the mixture of cheap and morphologically similar materials, mainly *Carica papaya* (CP) seeds. The primary objective of this study was to develop a PCR assay to detect the CP adulteration and also confirm the presence of PN. For that, PN and CP specific primers were designed from the unique nucleotide sequence regions in the chloroplast genomes of both the plants. Sanger sequencing of the specific amplicon revealed that PN primer sequences fall within the region of the rps16 gene and CP primer sequences fall within the region of the trnK-UUU (CP) gene. The designed primers were subjected to optimization of PCR conditions, sensitivity, and cross-reactivity assay. We have sequentially optimized simplex, duplex, and digital PCR (dPCR) to detect the lower quality and quantity of the DNA extracted from blended formulations. Thus, the developed primers and assay can be used for the detection of adulteration of CP seeds in PN products.

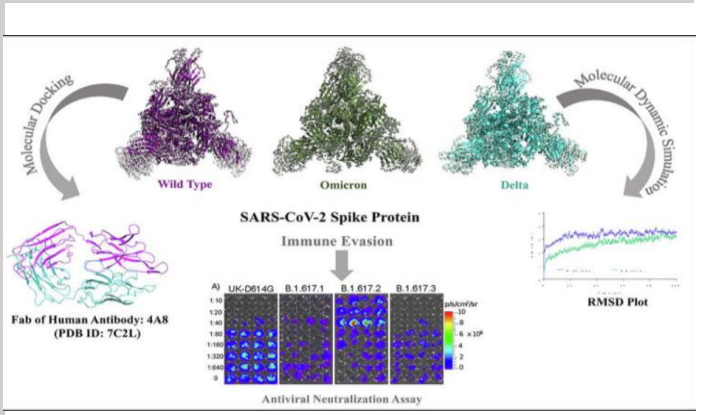
EVALUATION OF IMMUNE EVASION IN SARS-COV-2 DELTA AND OMICRON VARIANTS

Authors: Armi M.Chaudhari, Madhvi Joshi, Dinesh Kumar, Amrutlal Patel, Kiran Bharat Lokhande, Anandi Krishnan Katja Hanack, Slawomir Filipe, Dorian Liepmann, Venkatesan Renugopalakrishnan, Ramasamy Paulmurugan, Chaitanya Joshi.

Journal: Computational and Structural Biotechnology Journal

Impact factor: 6.155

In this study, we explored the genomic and structural basis of SARS CoV2 variants for their lineage defining mutations of the spike protein through computational analysis, protein modeling, and molecular dynamic (MD) simulations. Furthermore, computational studies of 4A8 monoclonal antibody (mAb) revealed a reduced binding of Delta variant compared to the wild-type strain. The results of the present study demonstrate the higher possibility of immune escape and thereby achieved better fitness advantages by the Delta and Omicron variants. This study, identified the probable mechanism through which the Delta and Omicron variants are more pathogenically evolved with higher transmissibility as compared to the wild-type strain.

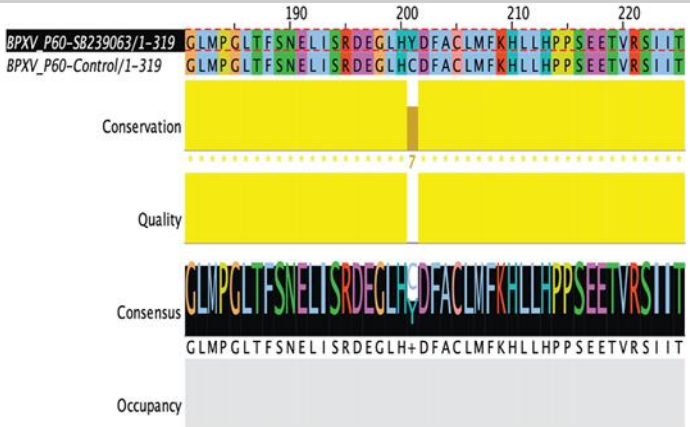


RESISTANCE EVOLUTION AGAINST HOST-DIRECTED ANTIVIRAL AGENTS: BUFFALOPOX VIRUS SWITCHES TO USE p38-υ UNDER LONG-TERM SELECTIVE PRESSURE OF AN INHIBITOR TARGETING p38-α

Authors: Yogesh Chander, Ram Kumar, Assim Verma, Nitin Khandelwal, Himanshu Nagori, Namita Singh, Shalini Sharma, Yash Pal, Apurvasinh Puvar, Rameshchandra Pandit, Nitin Shukla, Priyank Chavada, Bhupendra N. Tripathi, Sanjay Barua and Naveen Kumar.

Journal: Molecular Biology and Evolution

Impact factor: 8.8



In this study, authors have demonstrated that inhibition of p38 mitogen-activated protein kinase (a cellular protein) suppresses buffalo pox virus (BPXV) protein synthesis by targeting p38-MNK1-eIF4E signaling pathway. The P60-SB239063 virus exhibited significant resistance to SB239063 as compared to the P60-Control virus. It was demonstrated that unlike the wild type (WT) virus which is dependent on p38-α isoform, the resistant virus (BPXV-P60-SB239063) switches over to use p38-ϒ so as to efficiently replicate in the target cells. This is a rare evidence wherein a virus was shown to bypass the dependency on a critical cellular factor under selective pressure of a drug.

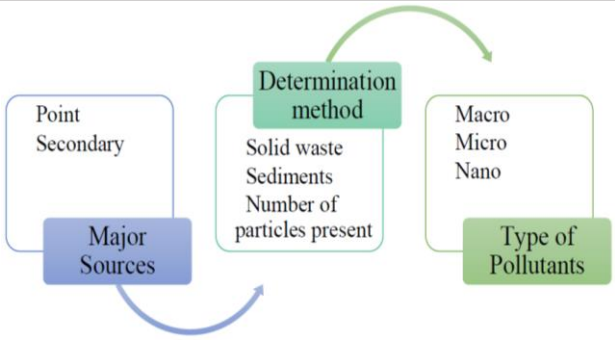
RECENT PUBLICATIONS

PLASTIC WASTE CONVERSION: A NEW SUSTAINABLE ENERGY MODEL IN CIRCULAR ECONOMY ERA

Authors: Aditya Dharaiya and Rushika Patel

Journal: In a Book entitled "Renewable Energy and Artificial Intelligence for Sustainable Development" CRC PRESS, Taylor and Francis

Increasing human population leads to the utilization of resources to satisfy individual needs. The plastic waste generated is a sustainable new energy source which is converted into either byproducts or value-added energy sources. The chapter focused on the role of plastic in CE from manufacturing to the final recycling model. The four successful plastic waste conversion models deployed are waste to new plastic, waste to fuel and chemicals, and waste to fertilizer, which might be carried out by technologies such as, biochemical, thermo chemical, thermal, and mechanical. This will help in the sustainability and betterment of the environment in the near future.

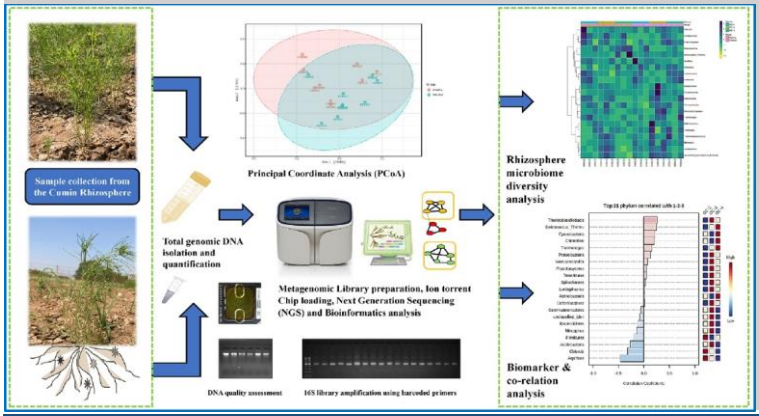


RHIZOSPHERE MICROBIOME ANALYSIS OF HEALTHY AND INFECTED CUMIN (*Cuminum cyminum* L.) VARIETIES FROM GUJARAT, INDIA

Authors: Dinesh Kumar, Meenu Saraf, Chaitanya G Joshi, and Madhvi Joshi.

Journal: Current Research in Microbial Sciences

Impact factor: 1.106



Cumin (*Cuminum cyminum* L.; Jeera) is a popular herbal seed spice used in culinary preparation. However, production of cumin is suffering from loss of crop production due to the plant pathogen infections, especially from *Fusarium oxysporium* sp. Rhizomicrobiomeis the key modulator of plant health, revitalizing nutrients and disease response against plant pathogens. The research findings will enhance our understanding of healthy and infected plant rhizosphere microbiome for better crop productivity, disease resistance and management of the crop varieties against plant pathogens.

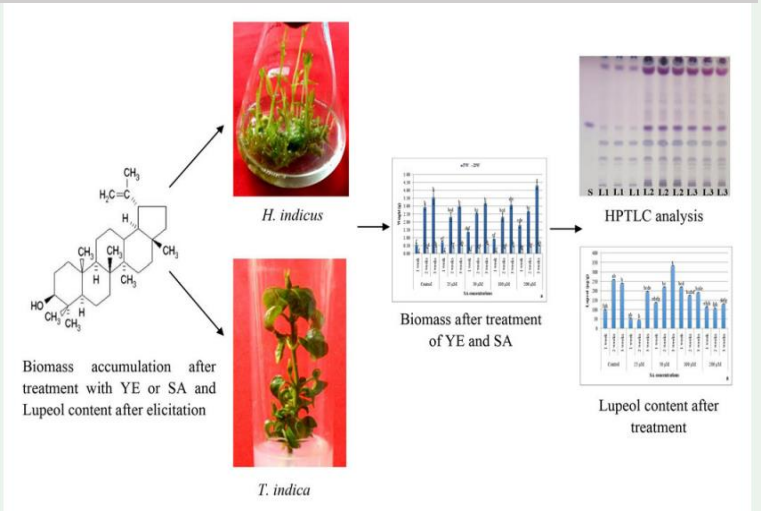
ELICITOR MEDIATED ENHANCEMENT OF SHOOT BIOMASS AND LUPEOL PRODUCTION IN *Hemidesmus indicus* (L.)R. Br. ex. Schult. AND *Tylophora indica* (Burm. F.) MERRILL USING YEAST EXTRACT AND SALICYLIC ACID

Authors: Ashutosh R. Pathak, Swati R. Patel, Aruna G. Joshi, Neeta Shrivastava, Gaurang Sindhav, Sonal Sharma & Hafsa Ansari

Journal: Natural Product Research

Impact factor: 2.488

Hemidesmus indicus (L.) R. Br. ex Schult. and *Tylophora indica* (Burm. F.) Merrill shoot cultures were treated with different concentrations of yeast extract (YE; 25-200 mg/L) and salicylic acid (SA; 50-200 µM), and their effect on lupeol production was assessed. The maximum dry weight (DW) biomass was recorded when *H. indicus* shoots were treated with SA (50 µM) and *T. indica* shoots with YE (200 mg/L). Highest lupeol yield (335.40 ± 0.04 µg/g DW) was obtained in *H. indicus* shoots after treatment with 50 µM of SA for 3 weeks. Whereas in *T. indica*, maximum lupeol content (584.26 ± 8.14 µg/g DW) was recorded by giving treatment with 25 µM of SA for 6 weeks. Research work has been conducted outside GBRC.



Award and Achievement

Dr. Rushika Patel, Research Associate, GBRC presented oral presentation on "Utilizing a multi-omic approach to assess the effectiveness of panchkarma therapy for amvata (rheumatoid arthritis)" under the "Bioinformatics, IPR and Bioenterpreunership" category in International Conference, Post-pandemic Resilience Through Biotechnology Interventions, GTU ICON 2022 on 23rd September, 2022. She was awarded for the best oral presentation.

KAUSHALYA TRAINING PROGRAMS SPONSORED BY GSBTM

COMPLETED TRAININGS

No	Training	Date
1	"Basic Bioinformatics" Jointly organized by GBRC and Genexplore Diagnostics and Research Centre Pvt. Ltd. Ahmedabad.	22nd to 26th August, 2022
2	"Basic Molecular Biology Techniques" Jointly organized by GBRC and Sankalchand Patel University, Visnagar.	29th August to 02nd September, 2022
3	"PCR, RT-PCR & Digital PCR". Jointly organized by GBRC and School of Applied Sciences and Technology, Gujarat Technological University, Ahmedabad.	5th to 9th September, 2022
4	"Advanced Bioinformatics". Jointly organized by GBRC and Sterling Accuris Diagnostics, Ahmedabad.	12th to 16th September, 2022
5	"Basic Molecular Biology Techniques". Jointly organized by GBRC and Ganpat University.	19th to 23rd September, 2022
6	"Metagenomic Data Analysis", Jointly organized by GBRC and Gujarat University, Ahmedabad.	26th to 30th September, 2022

UPCOMING TRAININGS

No	Training	Date
1	"Metagenomic Data Analysis", Jointly organized by GBRC and Gujarat University, Ahmedabad.	7th to 11th November, 2022
2	"Sanger Sequencing" Jointly organized by GBRC and National Forensic Sciences University, Gandhinagar.	14th to 18th November, 2022
3	"*In Vitro* Fertilization" Jointly organized by GBRC and Kamdhenu University, Gandhinagar	21st to 25th November, 2022
4	"Next Generation Sequencing" Jointly organized by GBRC and SN Gene Lab, Surat.	28th November to 2nd December, 2022

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GUJARAT BIOTECHNOLOGY RESEARCH CENTRE

DEPARTMENT OF SCIENCE & TECHNOLOGY

GOVERNMENT OF GUJARAT

ANNOUNCES

Shared LAB

Online System

- NGS Illumina NovaSeq 6000
- NGS Illumina MiSeq
- NGS Ion S5 & S5 Plus
- NGS IonChef
- BD Flow Cytometer & Cell sorter
- Capillary ABI 3500 Sequencer
- PCR + Gel Doc
- Nanodrop, Qubit
- Lyophilizer
- HPLC
- GC-MS (Clarus 680/Clarus SQ8C)
- LC-MS
- Digital PCR
- Real time PCR machine
- HPC Server & Param Shavak Server for Bioinformatics (with CLC Genomics)

GBRC shared lab online booking system:

https://gbrc.org.in