



# GBRC NEWS

Volume I, Issue I



## MESSAGE



**Shri Hareet Shukla, IAS**  
Secretary  
Department of Science and Technology  
EC & GB - Chairman, GBRC

It is a great delight to see that Gujarat Biotechnology Research Centre (GBRC), an autonomous society under the Department of Science and Technology, Government of Gujarat is publishing its first newsletter "GBRC NEWS".

GBRC has focused on addressing societal challenges and providing solutions for the same using Biotechnology. GBRC has taken lead in almost all the sectors including healthcare, environment, marine, agriculture, etc. It has also established itself as a state-of-art shared laboratory infrastructure for this region. Especially work undertaken by GBRC in the COVID-19 pandemic is remarkable.

The GBRC NEWS will cover the compilation of their working research as well as initiatives taken in various activities and scientific events. I congratulate GBRC for this venture and give felicitations for the continuous publication of GBRC NEWS.

## GBRC PARTICIPATION IN INDIAN INTERNATIONAL SCIENCE FESTIVAL 2020

GBRC is committed in promoting science and technology. GBRC participated and presented a virtual stall at Indian International Science Festival (IISF) 2020 jointly organized by science & technology-related Ministries and Departments of the Government of India (DST, MoES, DBT, CSIR, ICMR), and Vijnana Bharati (VIBHA). This Mega Science Festival was organized on a virtual platform between 22-25 December 2020. Honorable Prime Minister Shri Narendra Modi inaugurated the festival.

**Continue Reading.....Page 3**

## COVID-19 RESOURCES AT GBRC

Gujarat Biotechnology Research Centre had been the first state government laboratory to sequence the whole genome of SARS-CoV-2 in the country. Till now, 655 coronavirus samples have been sequenced and made freely accessible at the GBRC website. Six research papers on Covid-19 have either been published or under review in reputed journals. Researchers from GBRC and IIT Gandhinagar have collaborated to correlate the SARS-CoV-2 genetic load in wastewater with the number of cases at the district level to check if wastewater surveillance can be used as a warning tool for rising cases.

Link for GBRC COVID Resource web-site:  
<http://covid.gbrc.org.in/>

**Continue Reading.....Page 2**

## MESSAGE



**Prof. C.G. Joshi**  
Director, GBRC

It has now been well established that the field of Biotechnology is the key driver to achieve Hon. Prime Minister, Shri Narendra Modi's vision of "Atmanirbhar Bharat". With the vision to develop the biotechnology sector in the state, the government back then in 2004, established Gujarat State Biotechnology Mission (GSBTM) as a state nodal agency dedicated to biotechnology. It has taken another important leap with the vision to build biotechnology based research and development activities by establishing an independent organization Gujarat Biotechnology Research Centre (GBRC) under the Department of Science and Technology. I consider it a great privilege that the task of development of GBRC was bestowed on my shoulders.

It is immense pleasure for me that "GBRC NEWS" is being launched. I applaud the Editorial team for taking lead on such short notice and hope it will serve the purpose in upcoming times.

# CONTENTS

Page / 2

COVID-19 RESOURCES  
AT GBRC

Page / 3

INDIAN  
INTERNATIONAL  
SCIENCE FESTIVAL  
(IISF)

Page / 3

ARRIVAL AND  
DEPARTURES  
FACILITY

Page / 4

PRABODH

Page / 4

NATIONAL  
ORGANIZING  
SECRETARY AT  
GBRC

Page / 5

PUBLICATIONS

Page / 6

ANNOUNCEMENT

Page / 6

TRAINING

Page / 6

INVITED TALKS BY  
GBRC TEAM

## Scared of UK strain of Covid-19? Some mutations can also save lives: Study

Parth Bhattacharya | Times of India | Jan 4, 2021 | 07:00:00



AI (MEDSAB) At a time when the UK strain of Covid-19 has fuelled fear due to its reputation as a highly infectious strain, a local research on mutations in coronavirus has found that not all mutations are bad. Some can even be beneficial for humans.

A recent 'in-silico' computer simulation study by

researchers from Gujarat Biotechnology Research Centre (GBRC) along with other institutions claimed that C241T mutation – found in a large section of infected persons – could be responsible for lower mortality and improved recovery rates.

Image Reference: Times of India article published on 04<sup>th</sup> Jan

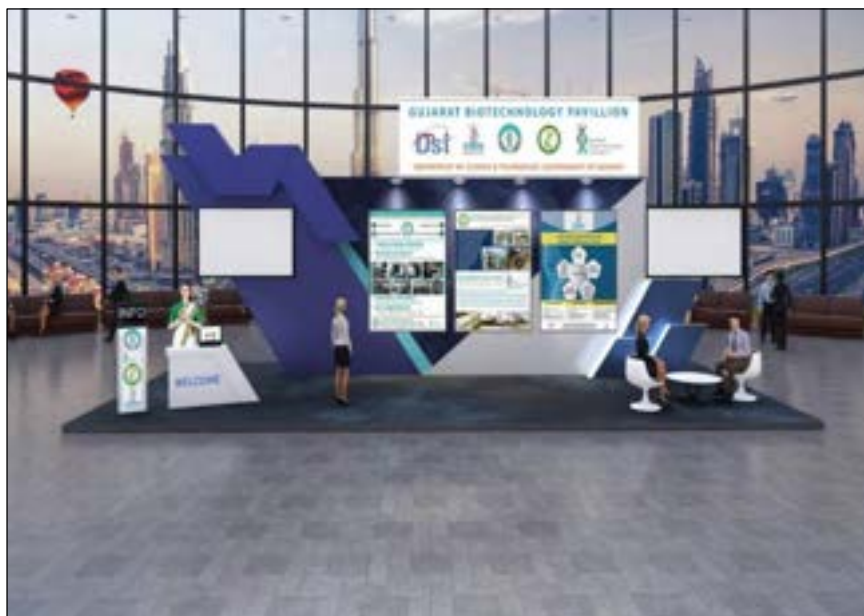
## COVID-19 RESOURCES AT GBRC

Gujarat Biotechnology Research Centre had been the first state government laboratory to sequence the whole genome of SARS-CoV-2 in the country. Till now, 655 coronavirus samples have been sequenced and made accessible at the GBRC website. Six research papers on Covid-19 have either been published or under review in reputed journals. Researchers from GBRC and IIT Gandhinagar have collaborated to correlate the SARS-CoV-2 genetic load in wastewater with the number of cases at the district level and to check if wastewater surveillance can be used as a warning tool for rising cases. GBRC has been successful in detecting three novel mutations from the samples obtained from across the Gujarat state and also analyzed that two of them might be associated with mortality of the patients. Another *In-silico* study revealed that C241T mutation could be responsible for lower mortality and higher recovery rate. Article based on the same study was published in Times of India dated 04<sup>th</sup> January 2021. Along with that researchers have also studied the effect of herbal formulations on SARS-CoV-2 proteins using molecular dynamics simulation. Several polyherbal formulations may have anti-COVID-19 potential and can be used for treatment and adequate monitoring. Thus, GBRC has been contributing actively in fighting the COVID-19 pandemic starting from sequencing the virus and analyzing them to search for potential treatment. All the data generated at GBRC about the COVID-19 samples are published and accessible. GBRC is also shared lab facility where any student/ industry personnel/ Govt. Organization/ Institute/ Acedemics/ Incubatee can utilize the facility. For more information, please visit below mentioned link.

Link for GBRC COVID Resource website:  
<http://covid.gbrc.org.in/>

Link for Shared Lab facility at GBRC: <https://gbrc.org.in/>

“Article  
published on  
'In-silico'  
study  
conducted on  
UK strain at  
GBRC in  
Times of India  
dated 04<sup>th</sup>  
January  
2021.”



## ARRIVAL & DEPARTURE

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

- Dr. Fenil Patel
- Dr. Rameshchandra Pandit
- Dr. Bhumika Prajapati
- Dr. Dhvani Jhala
- Dr. Satyamitra Shiekh
- Dr. Arpit Shukla
- Dr. Bhakti Patel
- Dr. Sonal Sharma
- Dr. Haidarabbas Masi
- Dr. Krupa Kansara
- Dr. Manan Patel
- Dr. Parth Thakor
- Mr. Bhadreshsinh Gohil
- Mr. Akshay Joshi
- Mr. Dalipsingh Rathore
- Mr. Nimeshbhai Patel
- Mr. Priyank chavda
- Mr. Pruthviraj Jadeja
- Mr. Sureshkumar Mesara
- Mr. Vikas Patidar
- Mr. Bhargav Waghela
- Mr. Jaykumar Rangani
- Ms. Avani Desai
- Ms. Avani Nakum
- Ms. Devki Prabhu
- Ms. Kajal Patel
- Ms. Khushbu Rabadiya
- Ms. Twinle Soni
- Mr. Dipesh Parikh
- Mr. Gaurav Jethva

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

- Dr. Neelam Nathani
- Dr. Apurvasinh Puvar
- Dr. Neha Rajapara
- Dr. Raghwendra Kumar
- Dr. Nidhi Raddadiya
- Ms. Labdhi Pandya
- Ms. Nidhi Patel
- Mr. Pramitkumar Patel
- Ms. Sapna Mahera
- Ms. Sweta Padhiyar
- Ms. Devika Manek
- Mr. Hrimkar Buch
- Ms. Pinal Trivedi

## INDIAN INTERNATIONAL SCIENCE FESTIVAL 2020

Indian International Science Festival (IISF) 2020 is an annual event jointly organized by science & technology-related Ministries and Departments of the Government of India (DST, MoES, DBT, CSIR, ICMR) and Vijnana Bharati (VIBHA). This year, the organizing department of IISF was the Council of Scientific and Industrial Research (CSIR) and the Nodal Organization was CSIR-National Institute of Science, Technology and Development Studies (NISTADS), New Delhi. This Mega Science Festival was organized on a virtual platform during 22-25 December 2020. Honorable Prime Minister Shri Narendra Modi inaugurated the sixth edition of IISF, a four days' science carnival. This was the sixth edition since its inception in 2015.

Total 41 events have been identified to be held at IISF-2020. This year the festival began on December 22, 2020, and culminated on December 25, 2020, the birthdays of world-renowned Indian Mathematician Srinivas Ramanujan and former Prime Minister of the country Sri Atal Bihari Vajpayee, respectively. Both these stalwarts were deeply committed to the belief that science and technology will always be at the core of the nation's progress. Honorable Vice President Shri M Venkaiah Naidu also addressed the IISF on December 25, 2020. GBRC along with GSBTM (Gujarat State Biotechnology Mission) and GBU (Gujarat Biotechnology University) also established a virtual stall in this mega event.



**INDIA  
INTERNATIONAL  
SCIENCE  
FESTIVAL  
2020**



## PRABODH

GBRC has initiated “PRABODH” (Promoting Research Awareness in Biotechnology for Development of Human Resource) to accelerate the research work and to develop research-oriented thought process in staff.

### INVITED GUEST

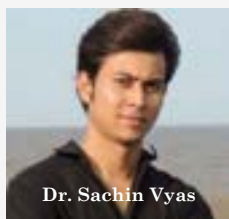


*Dr. P.G. Shah (19/12/2020) Residue analyst and head of the Pesticide Residue laboratory, Anand Agricultural University (AAU).*

The talk was given by Dr. P. G. Shah emphasized the use of pesticides and their impact. He mainly discussed the All India Coordination of Research Project on Pesticide Residues in which total of 13 centers were sanctioned in different states where Gujarat Agricultural University, Anand, Gujarat was one of them. Different case studies were included in their project like- Pesticides & Food Production, Methyl Parathion Poisoning & Insecticide Act, Pesticide Residues in milk, Food Safety Act 2006, MPRN Project 2008, Death of 23 Children in Bihar due to Monocrotophos poisoning, Export Rejection of sesame seeds from Gujarat, Funding of 12.5 Crore under RKVY project in 2018. The lecture explained, how our daily life is affected by the use of compounds or ingredients that are dangerous and how setting dosage for using these chemicals by the government requires immediate attention.

### PRESENTATION FROM GBRC RESEARCH FELLOWS

In post-lunch session, two research fellows from GBRC, Dr. Sachin Vyas and Mr. Afzal Ansari gave a presentation on “Assessing oil accumulation in the oleaginous yeast *Cystobasidium oligophagum* JRC1 using dairy waste cheese whey as a substrate” and “Genome-wide Association Study of Severe COVID-19 with Respiratory Failure” respectively.



Dr. Sachin Vyas



Mr. Afzal Ansari



## NATIONAL ORGANIZING SECRETARY OF VIBHA AT GBRC

Shri Jayant Sahasrabudhe (National organizing secretary VIBHA) along with Mr. Vivekananda Pai – Secretary, VIBHA; Dr. Vidhaydhar Vaidya, Member of National Executive Council, VIBHA; Dr. Prashant Kunjadiya, Secretary, Vigyan Gurjari, Gujarat Prant; Dr. Sunil Kahar, Joint Secretary, Vigyan Gurjari, Gujrat Prant, Mr. Shivam Munshi, Membership Drive Coordinator, Vigyan Gurjari, Gujrat Prant; Dr. Mounik Jani, I/C President, Vigyan Gurjari, Vadodara Unit, and Mr. Jigenesh Borisagar, Team Member, Gujarat Prant visited GBRC facility on 08<sup>th</sup> January 2021. Prof. Chaitanya Joshi and Dr. Madhvi Joshi gave detour of facilities of GBRC. Shri Jayant Sahasrabudhe (National organizing secretary VIBHA) delivered a lecture on how our Indian culture has always been rich in scientific inventions from ancient times. From *Vedas*, *Upanishads* to ancient time inventions such as *Golapada* (Chapter) by Arya Bhatt, the history of Hindu Chemistry by P.C. Ray, History of metals in Indian history of metals including 103 alloys. He also mentioned how Einstein adopted the idea and extended it to atoms. This led to the prediction of the existence of phenomena, which became known as Bose-Einstein condensate. He specifically mentioned, “we need to uphold our roots and contribute to scientific inventions”.

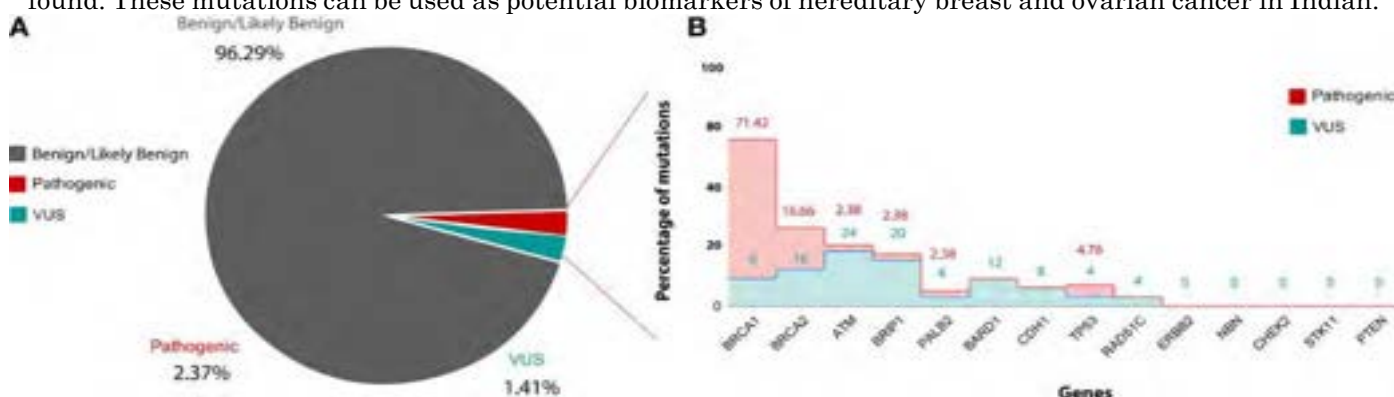
## RECENT PUBLICATIONS

### Mutational Landscape for Indian Hereditary Breast and Ovarian Cancer cohort suggest need for identifying population-specific genes and biomarkers for screening

Authors: Kadri MS, Patel KM, Bhargava PA, Shah FD, Badgujar NV, Tarapara BV, Patel PS, Shaikh MI, Shah K, Patel A, Pandya S.

Journal: Frontiers in Oncology (Impact Factor: 4.8)

Breast and Ovarian cancer are one of the leading causes of death in Indian women. Early detection followed by early intervention can reduce the healthcare burden of breast and ovarian cancer. Genomic tools can be used as the profound approach to finding the disease-associated genetic variants which can further help in disease prognosis. GBRC has made an effort to identify the association of 14 genes with a high to moderate risk of breast and ovarian cancer. Forty-two pathogenic mutations have been identified mostly related to BRCA1 and BRCA2 gene, which contributed 88.09%. Pathogenic mutations were also being detected in the TP53 gene, BRIP1, PALB2, and ATM genes that have the contribution of 11.91% of total pathogenic mutations found. These mutations can be used as potential biomarkers of hereditary breast and ovarian cancer in Indian.



**Image A:** Classification of variants based on their impact on health

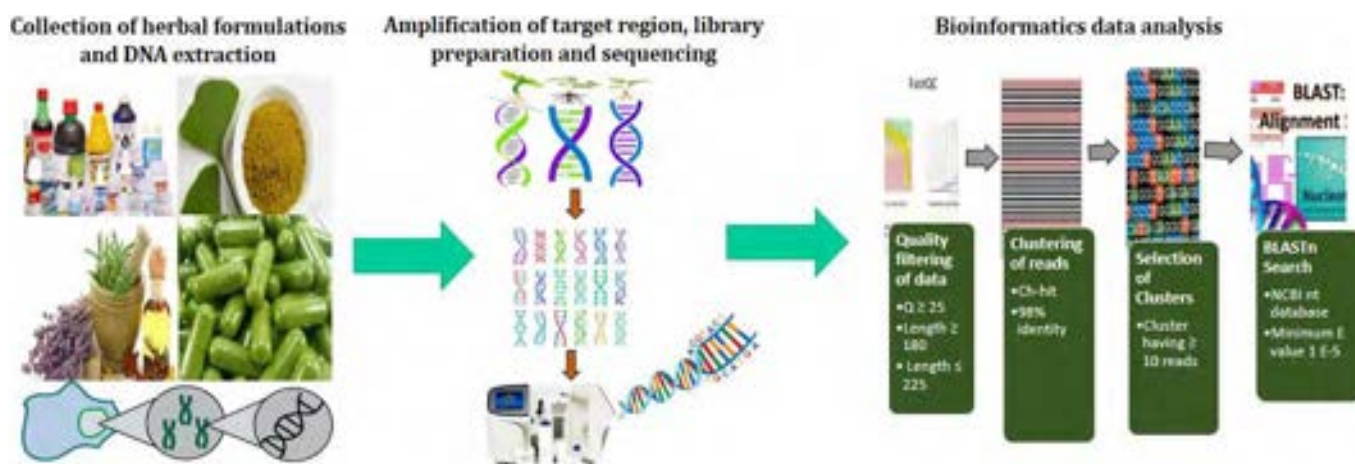
**Image B:** Percentage of variants per gene have pathogenic and VUS mutation. X-axis have name of genes and Y-axis showing percentage of pathogenic and VUS mutation.

### DNA-metabarcoding using rbcL based mini-barcode revealed the presence of unspecified plant species in the Ayurvedic polyherbal formulations

Authors: Pandit R, Travadi T, Sharma S, Joshi C, Joshi M.

Journal: Phytochemical Analysis (Impact Factor: 2.7)

Adulteration is the mixing of different plant species with genuine herbal material. To encounter such problem, DNA based advancements like DNA barcoding can be used as the salvage. The amalgamation of this DNA barcoding with cutting edge sequencing can be a shelter to affirm the identity of targets and non-targets botanicals in polyherbal formulations in details. GBRC have demonstrated concern about the social impact of adulteration and attempted to develop new DNA based approaches for quality control of natural medications. Researchers at GBRC while doing the metabarcoding analysis of over the counter herbal material found that only one herbal formulation contained all plants and matched with the listed contents. In two formulations, only 10 out of 21 and 11 out of 20 plants were detected correctly. In these formulations plant species which are not referenced have additionally been distinguished which brings up the issue of the immaculateness of the natural material. Results of the research have been published in the esteemed journal Phytochemical Analysis.





## ANNOUNCEMENTS

Training on “**Vitrification of Embryos**” jointly organized by Kamdhenu University and GBRC on **19<sup>th</sup> February 2021** at GBRC, Gandhinagar.

[Click Here for Registration](#)

Embryologists are encouraged to apply.

Training on “**Cryopreservation of Bovine Embryos**” jointly organized by Kamdhenu University and GBRC on **25<sup>th</sup> & 26<sup>th</sup> February 2021** at GBRC, Gandhinagar.

[Click Here for Registration](#)

Veterinary science students are encouraged to apply.

## IN HOUSE BIOINFORMATICS TRAINING

In the field of biological science, the noteworthiness of informatics is developing. Learning and comprehension of bioinformatics is the need of the hour. GBRC has understood this and prepared a module on fundamentals in bioinformatics to train their employees in computational biology as a part of skill development. The in-house training of basics in bioinformatics was conducted for 15 days in the month of January 2021. The training included an introduction to Linux OS, usage of databases like NCBI, UCSC, and processing and analysis of genome sequence data.



**Training on Vitrification of Embryos**

Jointly organised by

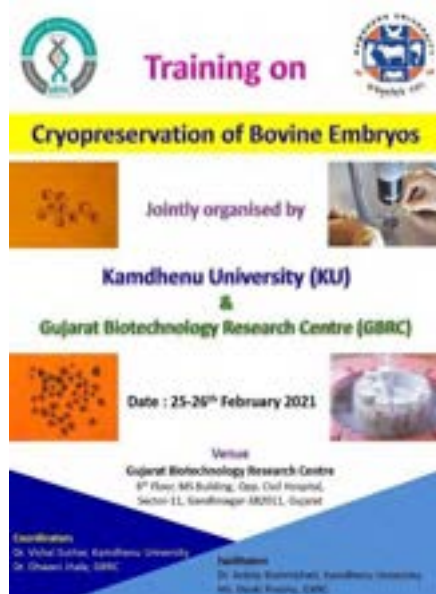
**Kamdhenu University (KU)**  
&  
**Gujarat Biotechnology Research Centre (GBRC)**

**Date : 19<sup>th</sup> February 2021**

**Venue**  
Gujarat Biotechnology Research Centre  
4<sup>th</sup> Floor, 4th Building, 1<sup>st</sup> Cross, Gandhinagar,  
Sector-11, Gandhinagar-382011, Gujarat

**Coordinators**  
Dr. Vinod Salunke, Kamdhenu University  
Dr. Shreshth Patel, GBRC

**Facilitators**  
Dr. Arjun Sakshibhargava, Kamdhenu University  
Ms. Tejas Prabhu, GBRC



**Training on Cryopreservation of Bovine Embryos**

Jointly organised by

**Kamdhenu University (KU)**  
&  
**Gujarat Biotechnology Research Centre (GBRC)**

**Date : 25-26<sup>th</sup> February 2021**

**Venue**  
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Ms. Tejas Prabhu, GBRC



## INVITED TALKS BY GBRC TEAM

➤ Prof. Chaitanya Joshi was invited to give different talks on

1. The correlation of host genotype with severity and outcome of COVID-19 infection, in an International Conference organized by Thermo Fisher Scientific, 8th December 2020.
2. MetaRNAseq analysis of Surti buffalo rumen content reveals that transcriptionally active microorganisms need not be abundant, Veterinary college Mhow, 11th December 2020.

➤ Dr. Madhvi Joshi was invited to give different talks on

1. COVID-19: Molecular Biology Tools for Tracking and Tackling Pandemic on a digital platform. The lecture has been given as part of online seminar on Man Vs Microbe: The story of COVID 19 at Government Science College, Gandhinagar on the 3<sup>rd</sup> of January 2021.
2. Keynote address on AMR- Fighting resistance with resilience in the international conference on Emerging Strategies in Antimicrobial Agents and Bio-Innovations hosted by R.K University between 18-19 December 2020.
3. In the Indo-UK virtual conference on the 5C's of Water Vulnerability: Climate Change, Contaminants, Co-occurrence, Conflicts, and COVID-19 from December 14 to 16, 2020 hosted by IIT-Gandhinagar.



**5C's OF WATER VULNERABILITY**  
CLIMATE CHANGE | CONTAMINANTS | CONFLICTS | COVID-19

**INTERNATIONAL CONFERENCE ON EMERGING STRATEGIES IN ANTIMICROBIAL AGENTS AND BIO-INNOVATIONS**  
18<sup>th</sup> & 19<sup>th</sup> December, 2020

**KEYNOTE SPEAKER**  
**Dr. Madhvi Joshi**  
Scientist D and Joint Director,  
Gujarat Biotechnology Research Centre,  
Gandhinagar, Gujarat, India

## MESSAGE FROM JOINT DIRECTORS

We have come a long way since our inception. Making a humble beginning of GBRC in 2017 as an independent research organization, today we are a fully-functional research institute undertaking cutting-edge research in state priority areas. The recent COVID -19 pandemic is a huge challenge but so has been the enthusiasm and efforts of our team. We have decoded 655 SARS-CoV-2 genomes within a short time frame, which helps in

the development of vaccines and understanding pandemic progression as well as developing diagnostics. With GBRC news we try to bring the latest developments of the centre with the concerned stakeholders.



Dr. Madhvi Joshi- Joint Director, GBRC

GBRC conducts research in various areas of Biotechnology such as NGS, development of diagnostics kits to address society's problems. The sharing of wide-ranging activities & research work by GBRC is very important. This newsletter will help in spreading awareness about GBRC so that other agencies can utilize the capabilities of the institute. This

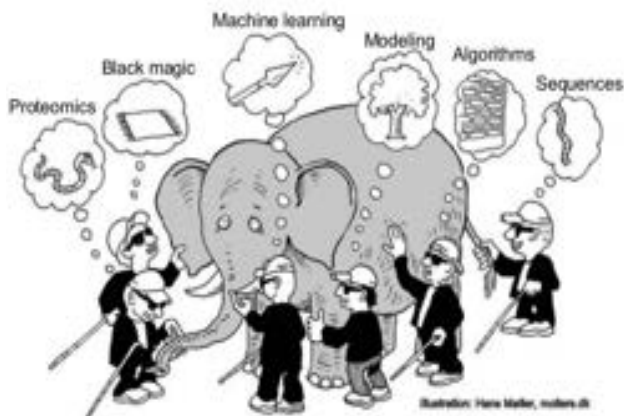
will also encourage and motivate fellows and staff members to excel in research. I would like to appreciate the efforts of the team behind the "GBRC NEWS" and wishes all the very best for upcoming times.



Dr. Amrutlal Patel- Joint Director, GBRC

## ON LIGHTER NOTE

### Bioinformatics is a broad field



### Why Do We Need Bioinformatics?



<http://www.phikaillawayab.ca/images/Caricatures/privacy%20cartoon2.jpg>

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For Shared Lab Facility : <https://gbrc.org.in/>



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Joint-Director – GBRC              Joint-Director – GBRC

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Deshna Shah (Junior Research Fellow- GBRC)  
Dr. Bhakti Patel (Technical Assistant – GBRC)  
Dr. Sonal Sharma (Technical Assistant- GBRC)





**GUJARAT BIOTECHNOLOGY RESEARCH CENTRE**  
DEPARTMENT OF SCIENCE AND TECHNOLOGY  
GOVERNMENT OF GUJARAT



ANNOUNCES

**Shared LAB**

ONLINE SYSTEM



**Facilities under shared lab**

- NGS Illumina MiSeq
- NGS Ion S5 Semiconductor Sequencer
- NGS Ion Proton
- NGS Ion Personal Genome Machine
- BD Flow Cytometer & Cell sorter
- Capillary ABI 3500 Sequencer
- Real time PCR machine
- PCR+ Gel Doc
- Nanodrop, Qubit
- Lyophilizer
- GC-MS (Clarus 680 /Clarus SQ8C with column C18)
- HPC Server & Param Shavak Server for Bioinformatics (with CLC Genomics and MATLAB)



GBRC SHARED LAB ONLINE BOOKING SYSTEM: <https://gbrc.gujarat.gov.in>



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