

GBRC NEWS

Volume II. Issue III December 2022



KAUSHALYA TRAINING PROGRAM FOR SKILL DEVELOPMENT IN BIOTECHNOLOGY

KAUSHALYA (Knowledge Advancement Using Skills on High-end Applied Lifetechnology for Aspirants) 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.

REGISTRATIONS OPEN



Hands-on Training Program on

GENOME-WIDE ASSOCIATION STUDIES

13th - 17th February, 2023

KAUSHALYA

(Knowledge Advancement Using Skills on High-end Applied LifetechnologY for Aspirants)

Jointly organized by

Gujarat Biotechnology Research Centre (GBRC)

R,

National Dairy Development Board (NDDB), Anand

Venue:

National Dairy Development Board Anand - 388 001, Gujarat, INDIA Phone-+91 2692-260148 / 149 / 159 / 160



Correspondence: Gujarat Biotechnology Research Centre Department of Science and Technology 6th Floor, MS Building, GH Road, Sector-11, Gandhinagar, Gujarat-382011 Phone: 079-23258500 Email: info-gbrc@gujarat.gov.ir

Hands-on training on

PCR and Real-Time PCR

20th - 24th February, 2023

As a Part of

KAUSHALYA

(Knowledge Advancement Using Skills on High-end Applied Lifetechnolog Y for Aspirants)

Jointly organized by

Gujarat Biotechnology Research Centre (GBRC)

Kamdhenu University (KU)



Department of Veterinary Microbiology,

College of Veterinary Science and Animal Husbandry, Kamdhenu University,

Sardarkrushinagar, Banaskantha-385506



Correspondence Gujarat Biotechnology Re Department of Science and Technology MS Building, 6th Floo GH Road, Sector-11 Gandhinagar, Gujarat-382011 Phone: 079-23258500 Email: info-gbrc@gujarat.gov.in

UPCOMING TRAININGS

27th February - 3rd March, 2023 Transgenic Plant Tissue Culture

13th - 17th March, 2023 Advance bioinformatics

20th - 24th March, 2023 Transgenic Plant Tissue Culture

27th - 31st March, 2023 Molecular Docking and Molecular Dynamics







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NEW RESEARCH FACILITIES

MEDIA COVERAGE

THE TIMES OF INDIA

Lumpy skin disease strain in Gujarat, Rajasthan more virulent, fatal: GBRC study



AHMEDABAD: The strain of lumpy skin disease (LSD) virus that affected lakhs of bovines in Gujarat and Rajasthan in the recent outbreak differed from the strain observed in 2019-20, indicated research carried out by Gujarat Biotechnology Research Centre (GBRC) researchers. The teams had collected scores of samples from both living and dead animals after the outbreak in August-September.

"The strain indicated higher infectivity and mortality than its predecessor. The virus' roots can be traced to eastern Africa, from where it travelled to southern Europe, countries like Iran, and then to Pakistan before entering India," said a researcher.

'Study will help improve LSD vaccine'

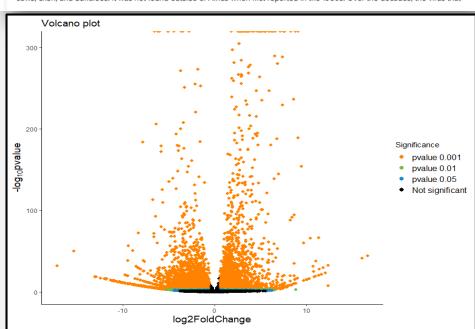
The lumpy skin disease (LSD) that affected close to 1 lakh heads of cattle

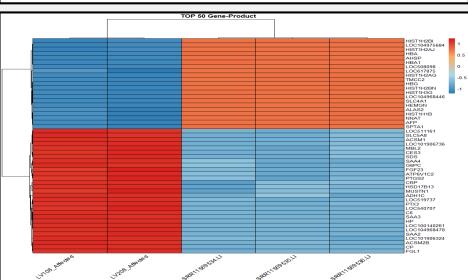
in Guiarat and caused the deaths of 3,800 animals in August-September is a more infectious and virulent strain of its predecessor, indicated a study carried out by researchers from Gujarat Biotechnology Research Centre (GBRC). The study is part of the report submitted to the Gujarat government in the aftermath of the outbreak.

Out of 33 districts, 24 had reported the infection among animals. According to government figures, the widespread drive for vaccination covered over 4 lakh heads of cattle.

Experts said that the findings would help improve the existing vaccine or aid in developing a new one to counter the spread.

"Compared to viruses found in humans, LSD - one of the pox of proxiviridae viruses - is over two times bigger and is found in cows, oxen, and buffaloes. It was not found outside of Africa when first reported in the 1980s. Over the decades, the virus that





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.



Komal Sapara, Awarded For **Best Monthly** Presentation For October-2022



Dr. Poonam Patel, Awarded For **Best Monthly** Presentation For November-2022



Mr. Dinesh Kumar. Awarded For Best employee of the Month For October-2022



Dr. Dalip Singh Rathore. Awarded For Best Question in **PRABODH** For September-2022



Dr. Himanshu Joshi, Awarded For Best Ouestion in **PRABODH** For October-2022



Ms. Urvi Budhbhatti. Awarded For Best employee of the Month For November-2022



Plant Tissue Culture Lab. Awarded as the Best cubicle of the Month For September-2022



Animal Tissue Culture Lab. Awarded as the Best cubicle of the Month For October-2022



General Molecular Biology Lab, Awarded as the Best cubicle of the Month For November-2022

INVITED TALKS DELIVERED BY GBRC TEAM

- Prof. Chaitanya G. Joshi (Director, GBRC), Dr. Amrutlal Patel, Dr. Niraj Kumar Singh (Joint Director, GBRC) and Dr. Ramesh Pandit (Scientist B, GBRC) delivered lecture at Half Day Symposium on Metagenomics and NGS Technologies: Exploring the Microbial Dark Matter organized by Shri Alpesh N. Patel PG Institute of Science and Research on 8th October 2022.
- Dr. Madhvi Joshi presented work of GBRC entitled "Role of NGS in management of COVID-19. One health approach to pandemic management" at 1st RAJMICROCON-2022 organized by IAMM Rajasthan Chapter & Department of Microbiology SMS Medical College, Jaipur on 9th October 2022.
- Dr. Madhvi Joshi was one of the panelist for the panel discussion at the Sustainability Fair 2022 organized by the University of Petroleum and Energy Science (UPES) Dehradun on 14th October 2022.
- Dr. Madhvi Joshi delivered virtual talk in GCRF UKRI One Health Poultry Hub Conference held on 25th-27th October 2022.
- Dr. Madhvi Joshi delivered talk at National Institute of Biomedical Genomics (NIBMG) on "Waste Water Based Epidemiology (WBE) For SARC-COV-2 A Powerful Tool for Forecasting, Preparedness and Management of Pandemic" on 23rd November.

ARRIVAL & DEPARTURE

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

- > Dr. Deepak Prasad Dr. Chitra Nehra
- Mr. Tejaskumar Shah Ms. Sneha Agula
- Mr. Krutarth Raval
- - Ms. Nisha Yadav
- Dr. Himanshu Joshi > Ms. Shreya Vachhani > Ms. Devanshi Gajjar Mr. Akhilesh Modi

Ms. Durga Bethala

- ➤ Mr. Tixit Sagpariya
- Mr. Kartik Deopujari Ms. Nikita Dalal

bright minds who had left

Mr. Bhadreshsinh Gohil > Mr. Dipesh Parikh

GBRC wishes best for the future of the

- Mr. Nishantkumar Patel > Ms. Manisha
 - Aniyaliya
- Ms. Priyanka Panwar > Mr. Maheshkumar Barad Ms. Reshma Talkal
 - Mr. Shailesh Jasani

Ms. Jinal Thakor

VISIT BY DIGNITARIES

Visit on 15th October 2022



Dr. Aparna Chaudhari (Principal scientist & head, Fish Genetics and Biotechnology Division,

Visit on 3rd November 2022



Mr. Sangram Chaudhary, Managing Director and Dr. Prahlad Vaghela, Manager, Banas Dairy

Visit on 23rd November 2022



Shri Manoj Aggarwal, IAS, Additional Chief Secretary, Department of Health and Family welfare, GOG

Visit on 24th November 2022



Dr. Sanjeev Khosla, Director, Dr. Srikrishna Subramanian, Chief Scientist and Dr. Srinivasan Krishnamurthi, Principal Scientist from CSIR_IMTECH, Chandigarh

Visit on 23rd December 2022



Dr. Shri Vijay Teng, President - Global Animal Health and Fertility and **Dr. Nitin Bhatia**, Vice President- Technical & Vet Regulatory, Intas Pharmaceuticals, Ahmedabad

VISIT BY COLLEGE/ ACADEMIC INSTITUTES

Visit on 3rd October 2022



Students from faculties from Shankersinh Vaghela Bapu Institute of Pharmacy, Gandhinagar

VISIT BY COLLEGE/ ACADEMIC INSTITUTES

Visit on 12th October 2022

Visit on 23rd December 2022



Students from faculties from Department of Applied and Interdisciplinary Sciences, SP University, VV Nagar

Students and faculty members from Dept. of Life Sciences, Parul Institute of Applied Sciences, Parul University, Vadodara

Visit on 30th December 2022



Students and faculty members from M. G. Science Institute,
Ahmedabad

Visit on 31st December 2022



Students and faculty members from Shri R. P. Arts Shri K. B. Commerce and Smt. B. C. J. Science College, Khambhat

Visit on 3rd January 2023



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

MEMORANDUM OF UNDERSTANDING (MoUs)

Mou between GBRC and Navrachna University

GBRC signed MoU with Navrachna University, Vadodara to provide the best quality education to students, academicians & other staff

MEMORANDUM OF UNDERSTANDING (MoUs)

MoU BETWEEN GBRC AND NIPER-AHMEDABAD

MoU BETWEEN GBRC AND CHARUSAT, Changa



GBRC signed MoU with NIPER-AHMEDABAD for collaborative biomedical research



The objective of this MoU is to collaborate on research, education, and training in the field of biological sciences

PRABODH

GBRC invites various experts in their field time to time under the in house activity "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 EXPERTS



Expert (15/10/2022)
Dr. Aparna Chaudhari,
Principal Scientist & Head,
Fish Genetics and Biotechnology
Division, ICAR- CIFE, Mumbai

Topic: "Development of White Spot Syndrome Virus (WSSV) Vaccine."



Expert (19/11/2022)
Prof. L.S. Shashidhara
Professor and Eminent
Scientist in Evolutionary
Biology,
IISER, Pune

Topic: "From Flies Genetics To Cancer Genomics".



Expert (18/12/2022)

Dr. Gitanjali Yadav,

Scientist-V, (NIPGR), Delhi

Topic: "Green Carbon for Food Security: Genomes & Networks".

PRESENTATIONS FROM GBRC MEMBERS



Article: The bacterial effector AvrRxo1 inhibits vitamin B6 biosynthesis to promote infection in rice.

Journal: Plant Communications Impact factor: 8.625

Dr. Fenil Patel, Scientist-B, GBRC



Article: Cooperative Action Of Gut-microbiotaaccessible Carbohydrates Improves host metabolic function

Journal: Cell Reports **Impact factor:** 9.995

Dr. Abhi Shah, RA, GBRC

PRABODH

PRESENTATIONS FROM GBRC MEMBERS



Article: The short Chain Fatty Acid Butyrate Imprints an Antimicrobial Program in

Macrophages

Journal: Immunity

Impact factor: 31.74





Article: MBD5 and MBD6 stabilize the BAP1 complex and promote BAP1-dependent cancer **Journal:** Genome

Biology

Impact factor: 9.995

Dr. Harshini Vemula, RA, GBRC



Article: Improved Cultivation and Isolation of Diverse Endophytic Bacteria Inhabiting Dendrobium Roots by using Simply Modified Agar Media.

Journal: Microbiology

Spectrum

Impact factor: 9.043

Dr. Dalip Singh Rathod, TA, GBRC



Article: Integrating taxonomic, functional and strain level profiling of diverse microbial communities with bioBakery 3

Journal: eLife

Impact factor: 8.140

Dr. Krishna Bharwad, RA, GBRC

GUEST LECTURES



Expert (28/11/2022)

Dr. Malini Laloraya

Scientist G, Rajiv Gandhi Centre
for Biotechnology,

Thiruvananthapuram, Kerala



Expert (26/12/2022)

Dr. Sumit Pandey,
Scientific Investigator, GSK
Immunology Network, UK

Topic: "Towards the development of newer strategies for improved Assisted reproduction Outcome.".

Topic : "Molecule to medicine-precision medicine approach".

RECENT PUBLICATIONS

SURVEILLANCE AND MOLECULAR CHARACTERIZATION OF SARS-COV-2 INFECTION IN NON-HUMAN HOSTS IN GUJARAT, INDIA

Authors: Dinesh Kumar, Sejal P. Antiya, Sandip S. Patel, Ramesh Pandit, Madhvi Joshi, Abhinava K. Mishra, Chaitanya G. Ioshi and Arun C. Patel

Journal: International Journal of Environmental Research and Public Health

Impact factor: 4.6

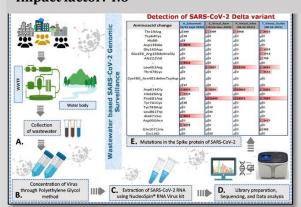


Figure showing graphical abstract.

Joshi et al., 2022

SARS-CoV-2 has been spreading world wide, in the human population. As well as reported in domestic and wild animals. A systematic surveillance study was conceptualized to detect SARS-CoV-2 among species of veterinary importance. Animals were found positive in rtPCR tests for the virus. Whole genome sequencing of a dog, 32 mutations, including 29 SNV and 2 deletions, were detected. Among them, nine mutations were located in the receptor binding domain of the spike (S) protein. The lineage assigned to this SARS-CoV-2 sequence is B.1.617.2. Thus, the present study highlights the transmission of SARS-CoV-2 infection from human to animals and suggests being watchful for zoonosis.

RECENT PUBLICATIONS

NASOPHARYNGEAL MICROBIOME OF COVID-19 PATIENTS REVEALED A DISTINCT BACTERIAL PROFILE IN DECEASED AND RECOVERED INDIVIDUALS

Authors: Dinesh Kumar, Ramesh Pandit, Sonal Sharma, Janvi Raval, Zarna Patel, Madhvi Joshi, Chaitanya G. Joshi

Journal: Microbial Pathogenesis

Impact factor: 3.7

In the present paper the bacterial co-infections in SARS-CoV-2 patients has been determined to find the correlation with the disease severity. Among the distinct nasopharyngeal microbiome profiles of deceased, recovered, and control COVID-19 patients, deceased patients showed higher species richness compared to the recovered and control groups. Pathogenic genera, including *Corynebacterium* (LDA score 5.51), *Staphylococcus, Serratia, Klebsiella* and their corresponding species were determined as biomarkers in the deceased COVID-19 patients. *Ochrobactrum*, and *Burkholderia*, were found in the recovered group which harbors ordinal bacteria as biomarkers. Similarly, Pseudomonas, and several healthy nasal cavity commensals including *Veillonella*, and *Porphyromonas*, were biomarkers for the control individuals. The difference in the bacterial community can trigger the defense responses in the healthy ones. This research finding provide vital information and have significant implications for understanding the microbial diversity of COVID-19 patients. This study can be extended further to find the key microbial to be used as the diagnosis purpose.

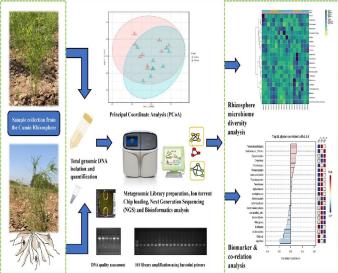
RHIZOSPHERE MICROBIOME ANALYSIS OF HEALTHY AND INFECTED CUMIN (CUMINUM CYMINUM L.) VARIETIES FROM GUJARAT, INDIA

Authors: Dinesh Kumar, Meenu Saraf, Chaitanya G Joshi, Madhvi Jos

Journal: Current Research in Microbial Sciences

Impact factor: 1.106

Cumin is a popular herbal seed spice used in culinary preparation in India. India is the largest supplier and exporter of cumin across the globe. However, production of cumin is suffering from loss of crop production due to the plant pathogen infections, especially from *Fusarium oxysporium* sp. In this study, the microbial diversity from the healthy and fungal infected rhizosphere samples of the three different Gujarat Cumin (GC-2, GC-3, and GC-4) varieties have been analyzed. The major dominant family represented by *Bacillaceae*, *Solibacteraceae*, *Nostocaceae*, *Paenibacillaceae*, *Scytonemataceae*, and *Halothio bacillaceae*, while at genera level of taxonomic abundance were represented by Bacillus, *Candidatus solibacter*, *Synechococcus*, *Nostoc*, *Anabaena*, and *Oscillatoria*.

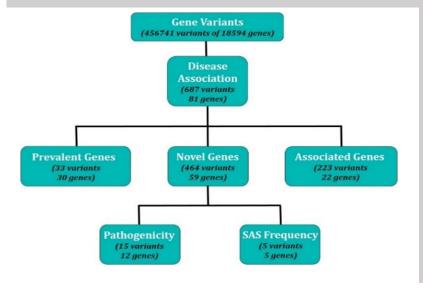


IDENTIFICATION OF NOVEL EXONIC VARIANTS CONTRIBUTING TO HEREDITARY BREAST AND OVARIAN CANCER IN WEST INDIAN POPULATION

Authors: D Bhargav N. Waghela, Ramesh J. Pandit, Apurvasinh Puvar, Franky D. Shah, Prabhudas S. Patel, Hemangini Vora, Harsh Sheth, Bhoomi Tarapara, Shashank Pandya, Chaitanya G. Joshi, Madhvi N. Joshi

Journal: Gene

Impact factor: 3.688



NGS-based screening has accelerated molecular diagnosis of various disease including cancers. In the performed present study, we whole-exome sequencing (WES) of 30 patients of breast or ovarian cancer (HBOC). The study revealed the novel variants and gene candidates having significant association with HBOC conditions. The genes are associated with various biological processes such as DNA integrity maintenance, transcription regulation, cell cycle regulation, and apoptosis. The findings provide novel and prevalent gene variants associated with the HBOC condition in the West Indian population which could be further studied for early diagnosis and better prognosis of HBOC.

RECENT PUBLICATIONS

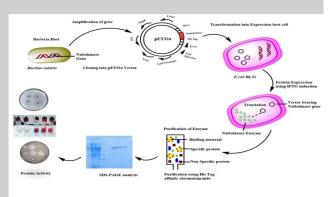
HETEROLOGOUS EXPRESSION OF RECOMBINANT NATTOKINASE IN ESCHERICHIA COLI BL21(DE3) AND MEDIA OPTIMIZATION FOR OVERPRODUCTION OF NATTOKINASE USING RSM

Authors: Akhilesh Modi, Ishan Raval, Pooja Doshi, Madhvi Joshi, Chaitanya Joshi, Amrutlal K. Patel

Journal: Protein Expression and Purification

Impact Factor: 2.025

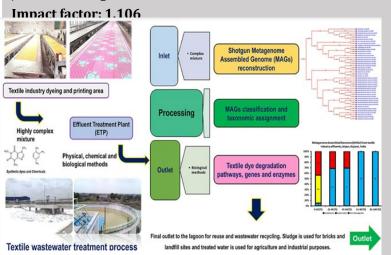
Nattokinase, a protein discovered in *Bacillus subtilis* is essential for the lysis of blood clots and the treatment of cardiac diseases including atherosclerosis, thrombosis, high blood pressure, stroke and particularly effective for the treatment of cardiovascular diseases. In this study, we cloned the nattokinase gene from the *Bacillus subtilis to* produce recombinant nattokinase. The optimized media produced 1805.50 mg/L of expressed nattokinase and 42.80 gm/L of bacterial mass. The fibrinolytic activity obtained from refolded native protein was 58FU/mg, which was five times higher than the available orokinase drug (11FU/mg).



TEXTILE INDUSTRY WASTEWATER MICROBIOME: RECOVERY OF METAGENOME ASSEMBLED GENOMES (MAGS) USING SHOTGUN SEQUENCING APPROACH FROM JETPUR, GUJARAT, INDIA

Authors: Dinesh Kumar, Zarna Patel, Priti Raj Pandit, Ramesh Pandit, Amrut K Patel, Madhvi Joshi, Chaitanya G Joshi

Journal: Ecological Genetics and Genomics



In the present research report the microorganisms in textile industry effluent have been recognized using metagenome-assembled genomes (MAGs).. The research will facilitate the understanding of textile industry wastewater microbiome, ecology and adaption, genomic characteristics and impact of pollution from textile industry. The microorganisms we obtained could be utilized for bioremediation of polluted industrial sites. The genes involved are related to biogeochemical cycling process, methane metabolism, biofilm formation, and textile dye degradation, metabolism of xenobiotics by cytochrome P450 pathway and metabolism of aromatic compounds.

KAUSHALYA TRAINING PROGRAMS SPONSORED BY GSBTM

COMPLETED TRAININGS No **Training** Date 10th - 14th October, 2022 1 Next Generation Sequencing Jointly organized by GBRC and Kamdhenu University Sponsored by GSBTM 2 Molecular Docking and Molecular Dynamics 17th - 21th October, 2022 Wastewater-based Surveillance of SARS-COV-2" at the 3 11th - 14th October, 2022 Sustainability Fair 2022 organized by the University of Petroleum and Energy Science (UPES) Dehradun, from 11th -14th October 2022 7th - 11th November, 2022 4 Metagenomic Data Analysis. Jointly organized by GBRC and Gujarat University 5 Capillary Sequencing & Fragment Analysis. Jointly organized by 14th - 18th November, 2022 **GBRC** and National Forensic Sciences University

KAUSHALYA TRAINING PROGRAMS SPONSORED BY GSBTM

COMPLETED TRAININGS

No	Training	Date
6	Next Generation Sequencing Jointly organized by GBRC and Junagadh Agricultural University	21 th - 25 th November, 2022
7	In Vitro Fertilization Jointly organized by GBRC and Kamdhenu University	28 th November- 2 nd December, 2022
8	Next Generation Sequencing Jointly organized by GBRC and SN GeneLab Pvt. Ltd.	14 th -18 th December, 2022
9	In Vitro Fertilization Jointly organized by GBRC and Gujarat University	12 th - 16 th December, 2022
10	Analytical Techniques Jointly organized by GBRC and NIPER	19 th - 23 rd December, 2022
11	Molecular Docking & Molecular Dynamics Jointly organized by GBRC and Gujarat Biotechnology University	26 th - 30 th December, 2022
12	Good Clinical Practice & Recent updates on Regulatory requirements	29 th December, 2022

UPCOMING TRAININGS

No	Training	Date	
1	In Vitro Fertilization Jointly organized by GBRC and Kamdhenu University, Gandhinagar	2 nd – 6 th January, 2023	
2	Basic bioinformatics training Jointly organized by GBRC and HNGU – Patan	9 th – 13 th January, 2023	
3	Analytical techniques Jointly organized by GBRC and Gujarat Vidyapeeth	16 th – 20 th January, 2023	
4	Metagenomic data analysis organized by GBRC, Gandhinagar	23 rd - 27 th January, 2023	
5	Genome-wide association study Jointly organized by GBRC and National Dairy Development Board, Anand	13 th – 17 th February, 2023	
6	PCR & Real Time PCR Jointly organized by GBRC and Kamdhenu University, Sardarkrushinagar Campus	20 th – 24 th February, 2023	
7	Transgenic Plant Tissue Culture Jointly organized by GBRC and Anand Agriculture University, Anand	27 th February – 3 rd March, 2023	
8	Advance bioinformatics Jointly organized by GBRC and INFLIBNET Centre, Gandhinagar	13 th – 17 th March, 2023	
9	Transgenic Plant Tissue Culture organized by GBRC, Gandhinagar	20 th – 24 th March, 2023	
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WORLD RECORD FOR THE LONGEST SCIENCE & INNOVATION EXPERT TALK SERIES UNDER "SIF 2022"



On the celebration of the 75th Azadi Ka Amrit Mahotsav 2022. Vigyan Gurjari, Karnavati Gandhinagar Unit, Gujarat organized a Longest Expert Talk Series under "SIF 2022" a Student Innovation Fest across the Gujarat State wherein 75 academicians, scientists, and Industry Experts from 75 Universities, Research Institutes, Colleges & Schools participated and delivered sessions on Science, Technology & Innovation subjects for 75 Days (7500 Minutes) program and set a New Record on 30th August 2022 at Gandhinagar, Gujarat, India. Around 10,000+ Students, Faculties, Researchers, and Employees have participated in this innovation fest. GBRC is also the part of the record. Following faculties of GBRC delivered talk in the event.

- Dr. Madhvi Joshi (Joint Director, GBRC)
- Dr. Haidar Abbas (Scientist B, GBRC)
- Dr. Ishan Raval (Scientist B, GBRC)

Dr. Niraj Kumar Singh (Joint Director, GBRC)

Dr. Apurvasinh Puvar (Scientist B, GBRC)

Dr. Krishna Bharwad (Research Associate, GBRC)

NEW RESEARCH FACILITIES



Orbital Shaker Incubator



BioTek Cytation 5 multimode reader



Ice Flaking Machine Vertical Autoclave



GLIMPSE OF GARBA EVENT-2023



"Consciousness is never experienced in the plural, only in the singular. Not only has none of us ever experienced more than one consciousness, but there is also no trace of circumstantial evidence of this ever happening anywhere in the world. If I say that there cannot be more than one consciousness in the same mind, this seems a blunt tautology—we are quite unable to imagine the contrary".— Erwin Schrödinger

Contact Information

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Website: http://gbrc.res.in For Shared Lab Facility: https://gbrc.org.in/











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Dr. Amrutlal Patel Joint-Director - GBRC

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GUJARAT BIOTECHNOLOGY RESEARCH CENTRE

DEPARTMENT OF SCIENCE & TECHNOLOGY GOVERNMENT OF GUJARAT

ANNOUNCES



- ➤ 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