Volume 9 | Issue 103 | February 2022
ISSN: 2454-6968 | RNI No. UPENG/2013/54102

e-copy - Rs. 50 | Print - Rs. 800

BIOTECH EXPRESS

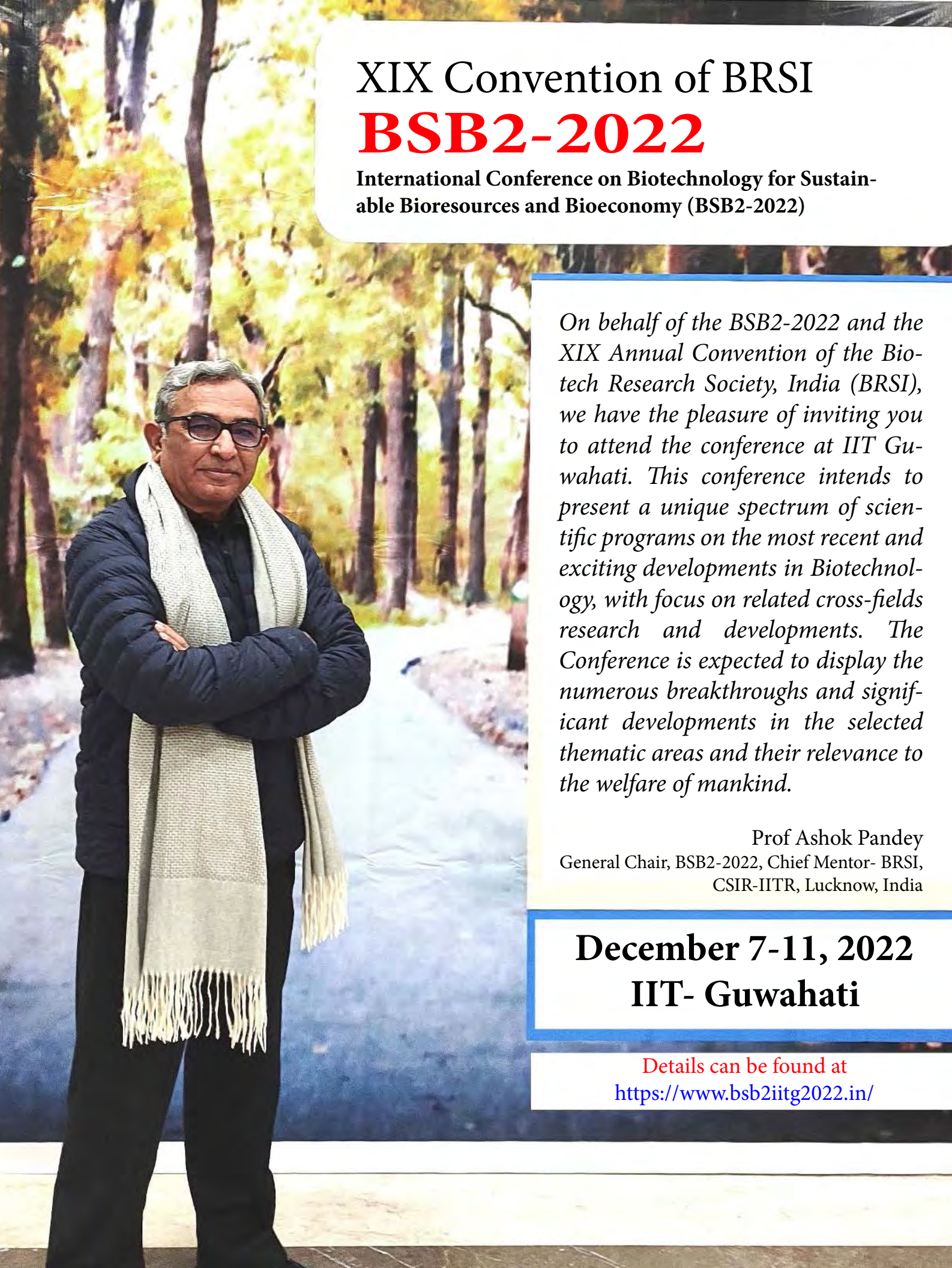
Padma Awardees Biotech Billionaires

Dr Krishna Ella: From farmer to Biotech Tycoon

Mahima Datla and B P Acharya to receive FABA 2022 special awards

Cover Article: Drs Ella deserve Padma Award for their innovations and management in biotechnology: India's pioneer recombinant biologist Prof Ramareddy Guntaka

Cyrus Poonawala, the "Vaccine King" awarded Padma Bhushan 2022 for his achievements in biotechnology



XIX Convention of BRSI

BSB2-2022

International Conference on Biotechnology for Sustainable Bioresources and Bioeconomy (BSB2-2022)

On behalf of the BSB2-2022 and the XIX Annual Convention of the Biotech Research Society, India (BRSI), we have the pleasure of inviting you to attend the conference at IIT Guwahati. This conference intends to present a unique spectrum of scientific programs on the most recent and exciting developments in Biotechnology, with focus on related cross-fields research and developments. The Conference is expected to display the numerous breakthroughs and significant developments in the selected thematic areas and their relevance to the welfare of mankind.

Prof Ashok Pandey
General Chair, BSB2-2022, Chief Mentor- BRSI,
CSIR-IITR, Lucknow, India

December 7-11, 2022
IIT- Guwahati

Details can be found at
https://www.bsb2iitg2022.in/

BIOTECH EXPRESS

Chief Editor
Dr. Seema P. Upadhye

Managing Editor:
Kamal Pratap Singh

VOLUME 9 ISSUE 103
February 2022

Online and Social Media
www.biotechexpressmag.com
www.facebook.com/BiotechExpressmagazine
www.linkedin.com/in/biotechexpressmagazine
https://twitter.com/KBiotechexpress

Subscription: http://www.biotechexpressmag.com/subscription/

Contact: **Biotech Express**, V-31/4, Ext-1, Shalimar Garden, Sahibabad, Ghaziabad, U.P- 201005.
Phone: +91- 9311986177

Article and Ad submission
All queries related to article and ads submission can be sent to biotechexpressindia@gmail.com. For more information kindly visit website: www.biotechexpressmag.com

Publisher : Kamal Pratap Singh

Printed at : Monex offset, B-12 SD complex, near MMG hospital, Ghaziabad- 201005.

Individual rates available to subscribers paying by personal cheque or NEFT. Order for Students, PhDs, postdoc subscription must be accompanied by a copy of student ID.

The Biotech Express magazine publishes between 10th to 15th of every month.

Subscription
Biotech Express

The Monthly magazine of Biotechnology

Subscription packages

RNI No. UPENG/2013/54102 ISSN: 2454-6968

Period	Print				Digital			
	Indian Subcontinent		Other countries		Indian Subcontinent		Other countries	
	Institutional	Individual	Institutional	Individual	Institutional	Individual	Institutional	Individual
Single	₹1000	₹1000	USD 150	USD 50	600	₹ 100	USD 50	USD 15
1 Year	₹10,000	₹ 5,000	USD 1000	USD 500	5000	₹ 600	USD 500	USD 100
2 Year	₹19,000	₹ 9,000	USD 1900	USD 900	9000	₹ 1000	USD 900	USD 180
3 Year	₹28,000	₹ 14,000	USD 2800	USD 1400	13000	₹ 1500	USD 1300	USD 250
5 Year	₹45,000	₹ 14,000	USD 2800	USD 1400	20,000	₹ 2200	USD 2000	USD 400

Note: Print subscription includes digital subscription as gratis (no extra cost) for the subscribed period.

Terms and Conditions:

1. Please fill the form in CAPITAL letters.
2. Print Subscription is valid in India only.
3. Print Subscription cost includes first class courier charges.
4. Print subscription includes digital subscription as gratis (no extra cost) for the subcribed period.
4. The mode of payment should be cheque/DD/NEFT favouring "Biotech Express". Please write your name and contact details on the back side of cheque/DD.
5. Your subscription will commence from the next available Issue OR within four weeks.
6. For Multiple Subscriptions/error use seprate forms (Photocopies allowed).
7. Biotech Express will not entertain cancellation of subscription after commencement of the same. No request for refund will be entertained.
8. In case of changing address, kindly send us in writing one month in advance.
9. Non delivery should be reported within 20 days of publishing of monthly issue to consider repost by us. After which no request will be entertain under any circumstances.
10. Annual Subscription can be avail throughout the year.
11. Previous Volumes are available on request.

Annual Sponsorship

Title	25 Lakh	40,000 US $
Platinum	18 Lakh	27,000 US $
Gold	15 Lakh	23,000 US $
Silver	8 Lakh	12,500 US $

Mode of communication: Cover Article, Other Pages Ads, Back Articles, Email Newsletter, Website Linking, Events etc.

Online/NEFT Payment

Account Name: BIOTECH EXPRESS
Account No: 65183799804
Bank Name: SBI, Dilshad Garden,
Bank Address: 7, Local Shopping Centre, B-block, Dilshad Garden, Delhi, India.
Pin – 110095.
Branch code : 009370
IFSC: SBIN0009370,
MICR code: 110002183

Note: BEM Sponsorship will be valid for a period of one year from booking of the same.

Contact: biotechexpressindia@gmail.com, Phone: +91-9311986177

BIOTECH EXPRESS

News...

Volume 9 | Issue 103 | February 2022

BioNews | p28

Biotech Research & Govt. news | p45

Bad Research | p54

Biotech Industry News | p56

More Inside...

Advisory & Editorial Board

Chief Editor:
Dr Seema Pavgi Upadhye
PhD, Biochemistry

Managing Editor:
Kamal Pratap Singh
M.Sc Genetics

Assistant Editor:
Dr Piyush Kumar, PhD

From the very first issue, Biotech Express team has been delivering what's best for Biosciences community. The audience of this magazine includes students, researchers, faculties and executives of highly prestigious organizations of India. In year 2016, BEM has made new editorial Board combining experience of eminent Advisory Board Members who have been into Award winning Research and head of prestigious Administrative positions.

Advisory Board Members

Prof Sopory Sudhir Kumar, Ph.D., FNA., FNASc., FNAAS., FASc., FTWAS
Padma Shri, Shanti Swarup Bhatnagar Awardee, SERB Distinguished Fellow, DST, ICGEB 2018----, Vice –Chancellor, JNU, Delhi, 2011-16
Director, ICGEB 2014-15

Prof Pandey Ashok, D.Phil., FRSB., FNASc., FBRS., FIOBB., FISEES., FAMI
Distinguished Scientist, CSIR-IITR
Former Dy Director & Chief Scientist, CSIR- National Institute for Interdisciplinary Science and Technology; Founder, Biotech Research Society of India (BRSI)

Prof Mishra Kaushala Prasad, Ph.D., F.M.A.Sc., FNASc.
Former Head, Radiation Biology Dept., BARC, India; Former Vice-Chancellor, Nehru Gram Bharati University; Founder, Radiation Biology Society, Founder President, Society for Radiation Research , India(SRRI), President, Asian Association for Radiation Research (AARR)2017-2021

Prof Ramareddy V Guntaka, Ph.D
Chairman and Chief Scientist, Sudarshan Biotech Pvt Ltd., India &
Emeritus Professor, University of Tennessee Health Science Center, USA

Prof. Pallu Reddanna, Ph.D
BSR Faculty Fellow, School of Life Sciences, University of Hyderabad, Hyderabad, India
Executive President, Federation of Asian Biotech Associations (FABA)

Consulting Editors

Dr. S Venkata Mohan
FNAE, FBRS, FT(AP)AS, FIEI, FABAP, FISEES
Principal Scientist
Bioengineering and Environmental Sciences (BEES), (CSIR-IICT)
Hyderabad, India.

Dr. Dubey K K
Associate Professor
School of Biotechnology
Jawaharlal Nehru University, New Delhi (India)

Dr. Sunita Varjani
Scientific Officer
Gujarat Pollution Control Board
Paryavaran Bhavan, Gandhinagar, Gujarat, India.

Dr. Rachna Agarwal
Associate Professor, Neurochemistry
Institute of Human Behaviour and Allied Sciences (IHBAS), Delhi, India.

Dr. Shailendra K. Saxena
Professor and Head,
Centre for Advance Research, King George's Medical University (KGMU), Lucknow, India

Editorial Board Members

Dr. Barun K Bhattacharya
Scientist in charge, Biotechnology R&D, East India Pharmaceuticals Works Ltd.

Dr. Dinesh K Gautam
Assistant Professor, Department of Zoology, Hansraj College, Delhi University.

Dr. Rajni Gupta
Associate Professor, Botany, Kirori Mal college, Delhi University.

Dr. Darshan Malik
Associate Professor, Biochemstry, Shivaji College, Delhi University.

Dr. Anand Sonkar
Assistant Professor, Department of Botany, Hansraj College, Delhi University

Dr. Sharvan Sehrawat
Asst Professor, IISER Mohali, Punjab, India.

Dr. Tathagata Choudhuri
Professor, Dept of Biotechnology, Visva Bharati University, Santiniketan, West Bengal.

Dr. Shailesh K Tiwari
Scientist at IIVR, Varanasi.

Dr. Sumit Gandhi
Senior Scientist at CSIR-Indian Institute of Integrative Medicine (CSIR-IIIM), Jammu.

Dr. Yogesh Joshi
Assistant Professor at Department of Bioinformatics Solapur, Maharashtra.

Dr. Deepak Kala
Assistant Professor, Chandigarh University

Dr. Kavit Mehta
Assistant Prof. biotech at Ganpat University, Ahmedabad, Gujarat, India.

Dr. Seema Amin
Assistant Professor at Charotar University of Science & Technology (CHARUSAT), Ahmedabad, India.

Dr. Mukund Bodhankar
Teaching and research at Bharati Vidyapeeth University, Pune.

Dr. Selvarajan Ethiraj
Research Assistant Professor at SRM University (Sri Ramaswamy Memorial University), Kanchipuram, Tamil Nadu,

Dr. Burusa Prasad Rao
Senior Scientist at CLRI, Chennai Area, India.

Dr. Paramjit S Panesar
SLIET University, Longowala, Punjab.

Dr. Sukanta Majumdar
Gour Banga University.

Dr. Rupesh Chaturvedi
Professor at Jawaharlal Nehru University New Delhi, Delhi, India.

Dr. Himani jain
Teaching Associate at Deenbandhu Chhotu Ram University of science & technology, Murthal, Haryana.

Dr. Baskar Gurunathan
St.Joseph's College of Engineering, Chennai.

Pratyush Kumar Das
Ph.D Scholar, Centre for Biotechnology, Siksha 'O' AnusandhanOdisha, India.

Editorial

Drs Ella deserve Padma Award for their innovations and management in biotechnology: India's pioneer recombinant biologist Prof Ramareddy Guntaka

by Kamal Pratap Singh

Drs. Krishna Ella and Suchitra Ella traveled through a rough road to bring Bharat Biotech to the forefront in vaccine production. Dr. Poonawala also made Serum Institute the major Vaccine Production unit in the world. I am happy to see that the Government of India honored them with Padma awards.

Ramareddy

As I recall one of his interview, he said the Indian biotech sector is today worth about USD 7 billion and according to the National Biotechnology Development Strategy, the target is to make it into a USD 100 billion industry by 2025, which he surely can support through his various initiatives as his company is doing great, said Prof Guntaka Ramareddy.

This year Dr Krishna Ella, Chairman, Hyderabad based Bharat Biotech along with Suchitra Ella, Director of the company and Dr Cyrus Poonawalla, founder of Pune-based Serum Institute of India (SII) are all set to be bestowed with Padma Awards. Both pharmaceutical firms – SII and Bharat Biotech – have led the country towards becoming self-sufficient in Covid-19 and other vaccines production and making them available at the lowest possible price in the world.

Dr Ella has joined an elite club of Padma awardee scientists like Varaprasad Reddy, Kiran Mazumdar Shaw who were not only the scientists but biopreneurs who started from scratch and touched skyline though their efforts, dedication and scientific temper.

I also remember how quickly he made Hepatitis-B vaccine immediately after us when I developed India's first recombinant product and first Hepatitis b vaccine of India for Varaprasad Reddy (Padma Bhushan- 2005) who also did great work to start Shantha biotech in 1993 and with this product in

hand becomes the first Indian company to develop, manufacture and market recombinant human healthcare products in India. In 1997, Shantha developed and commercialised India's first r-DNA Hepatitis-B vaccine.

Adverse Events which are nearly absent in Covaxin as compared to other vaccines is a great advantage of scientific temper. Since he chose the dosage very low, it has very less chance of any adverse reaction unless a live virus enters the vial. On the other hand, it is proved after many reports that Moderna, Pfizer, Astrazeneca or SII's, etc. vaccine have serious side effects as compared to covaxin. On this note Dr Ella deserves padma awards for his most safe and effective vaccine in times when an innovative and entrepreneurship approaches both were required.

It is also believed by some that committees does sometime makes mistakes while deciding awards, it is imperative to note that Dr Ella was mistakenly placed in Trade category though he was the chief scientist behind the vaccine development and thus would have come under Science or medicine category. There is a huge difference between the selection criteria of each of PADMA AWARDEE and there could be change in category, I believe the decision has come nice when the Indian govt. has recognized efforts of Dr Krishna Ella toward his scientific contribution in novel vaccine development.

About Suchitra Ella

Mrs. Suchitra Ella is the Joint Managing Director of Bharat Biotech, which she co-founded with his husband Dr. Krishna Ella in 1996. With experience in customer operations, finance, marketing and business development, Mrs. Ella is a strong pillar of support and guidance at Bharat Biotech, overseeing a wide range of operations in the company.

Mrs. Ella holds a BA in Economics and Social Sciences from the University of Madras. She followed this up with diploma in business development from UWCU—Madison, diploma in real estate management from University of South Carolina and post-graduate diploma in patent law from NALSAR—Hyderabad. Several awards have been conferred on her including the South Indian Business Achievers Award 2016, Zee TV Best Women Entrepreneur Award, SAARC Women Entrepreneur Award etc.

Mrs. Suchitra Ella is also the Chairperson of CII Indian Women Network. She serves on the Boards of ISB Well Wisher's Trust and United Way Hyderabad—an International Charity Partner focused on social empowerment in local communities with focus on livelihoods, health and education. She was a former Board member of TTD. Mrs. Suchitra strongly believes in corporate citizenship and social responsibility. She spearheads the CSR initiatives of the company.

About Prof Ramareddy V Guntaka

Professor Guntaka is Emeritus Professor in Department of Microbiology, Immunology & Biochemistry, University of Tennessee, Health Sciences Center, Memphis, TN, USA and Chairman and Chief Scientist at Sudarshan Biotech Pvt Ltd., India.

- Prof Guntaka was one of the four members team that discovered Proto-oncogenes, genes implicated in causing cancer.
- Prof Guntaka was the first one to molecularly clone the entire genome of Rous Sarcoma Virus
- Prof Guntaka was the key scientist behind the successful development of the Recombinant Hepatitis B Vaccine. by Shantha Biotech
- Prof Guntaka was also the key scientist behind the successful development of interferon alpha used to treat hepatitis B infections.
- Prof Guntaka was also the first scientist to clone and study the complete genome of the Indian strains of Hepatitis C virus.

Editorial

Cyrus Poonawala, the "Vaccine King" awarded Padma Bhushan 2022 for his achievements in biotechnology

by Kamal Pratap Singh

This year in 2022, Cyrus Poonawalla again has been conferred Padma Award. He got Padma Shri before in 2005 and thus have joined few elite Indians who consistently are doing for betterment of Indian Biotech and thus getting recognized on national as well as international level.

Cyrus Poonawalla's life is an excellent example of taking challenges and turning it into opportunity. Though he came from a wealthy family background with an established business, yet he took a chance in a completely new domain when the chances of his survival were limited by government policies and he had to struggle for his survival in rapidly changing India after independence. He had no experience in vaccine development but he tried and hired doctors and scientists and within two years of operations produced the first vaccine. Today he is the most successful Biotechnology entrepreneur and Industrialist with net worth of around 18 billion USD, the richest in Indian Biotechnology and in top 10 richest Indian category.

A conversation with a veterinarian at the farm led him into the world of vaccines. He realized that the farm's retired horses were donated to the Haffkine Institute, which was owned by the government, to make vaccines from horse serum. Poonawalla

Image: Dr Cyrus Poonawalla in Serum Institute of India

thought of trying to meet the demand for vaccines in India by extracting the serum from the horses himself, in order to create vaccines at a much cheaper rate. Dr Balakrishnan, who gave him the idea that would transform his fortunes. He suggested that Cyrus put up a processing plant in a corner of the Poonawalla farm and get into the business himself. The family's advantage over the big pharma companies was that they had plenty of land to house the horses. The family doctor, Jal Mehta, who subsequently became vice-chairperson of SII, introduced Cyrus to Dr P.M. Wagle, who had just retired as director of the Haffkine Institute. Cyrus employed two scientists to build a small laboratory in a corner of the farm, which had a lot of barren land for breeding.

During his initial years, Poonawalls faced hardships in arranging finances for his company. He started Serum Institution in 1966 with USD 12,000, which he raised by selling horses. In 1966, on Cyrus's wedding day, the foundation stone for the SI was laid. It was a small-scale industry, with a capital of five lakh rupees to derive therapeutic serum from horse blood.

In 1967 i.e. within three years, Serum launched its first therapeutic tetanus serum and started producing anti-tetanus vaccines of which there was a huge shortage in the country. Cyrus, who has always loved horses, stopped using them to produce the serum, moving on to discarded army mules instead. The company quickly became hugely profitable and branched out into the manufacture of other vaccines.

By 1974, it started making DTP vaccine, which is known to protect children from diphtheria, pertussis, and tetanus. In 1981, it created anti-snake venom serum to treat snakebites. Later, SII specialises in the Tetanus, Measles, Mumps, Rubella, Whooping Cough, Tetanus, Tuberculosis, Influenza, Meningitis, Polio, Rotavirus, Rabies, Pneumonia and several other diseases.

Today in his leadership, Serum Institution turned the world's largest vaccine manufacturers, catering to 150 countries, including America and European countries. It is also a notable name in producing pediatric vaccines. Serum Institution holds a 60 percent market share in the global vaccine manufacturing segment. Dr. Poonawalla is a person who has always had a vision of creating an atmosphere where high quality vaccines do not remain as a mere luxury for children in India or the world and are offered at inexpensive prices.

Since the beginning, Cyrus focused on producing affordable vaccines to improve the lives of the mass. Some of the vaccines produced by Serum Institution are priced at Rs 5, which is even less than the price of a cup of tea in India. He had the vision to provide high-quality vaccine to all and produced a wide range of pediatric vaccines at an affordable cost. Several international agencies have collaborated with Serum Institution in his noble cause.

Editorial

Dr Krishna Ella: From a Farmer to Biotech Tycoon

by Kamal Pratap Singh

Bharat Biotech was the first and only company in India which has made COVAXIN, India's indigenous COVID-19 vaccine developed in collaboration with the Indian Council of Medical Research (ICMR) – National Institute of Virology (NIV). The indigenous, inactivated vaccine is developed and manufactured in Bharat Biotech's BSL-3 (Bio-Safety Level 3) high containment facility. The vaccine received DCGI approval for Phase I & II Human Clinical Trials and the trials commenced across India from July, 2020. After successful completion of the interim analysis from the Phase 1 & 2 clinical trials of COVAXIN, Bharat Biotech received DCGI approval for Phase 3 clinical trials in 26,000 participants in over 25 centers across India.

This is just about COVID 19 pandemic but in this article we will see how Dr Ella, the first generation entrepreneur started this company and fulfilled the dream of India of providing effective and affordable drugs.

A research scientist in Molecular Biology and university gold medalist Dr. Krishna Ella (b.1969) is currently the Chairman & Managing Director of Bharat Biotech International Limited, which he incorporated in 1996 along with his wife Suchitra Ella. He was born into a Telugu-speaking agriculturist family in Tiruttani village in Tiruvallur district of Tamil Nadu.

Dr Krishna Ella started his academic career with his bachelor's degree from the Tamil Nadu Agricultural University and joined for a Master's degree at the University of Agricultural Sciences, Bangalore. Dr Krishna Ella started off his career by joining the pharmaceutical and life sciences company Bayer, as part of its agricultural division but soon left the company and went abroad for higher education. On a Rotary fellowship he completed his master's degree from University of Hawaii in Plant pathology. He finished his Ph.D, in Biochemistry from University of Wisconsin-Madison (1987-1992).

For four years he worked as a research faculty at the Medical University of South Carolina, Charleston. Dr. Krishna Ella returned back to India in 1996 to start Bharat Biotech in Hyderabad which cost him Rs 12.5 crore. Bharat Biotech shot into the limelight when it launched Revac-B, a recombinant Hepatitis-B vaccine, in October 1998. Priced at $1, almost 25 cents less than its closest competitor produced by Shantha Biotechnics.

Today Bharat Biotech International Limited is a reputed Indian biotechnology company headquartered in Hyderabad, India engaged in the drug discovery, drug development, manufacturing of vaccines, bio-therapeutics, pharmaceuticals and health care products.

The company is now worth over thousands of crores of rupees and has delivered over 4 billion vaccine doses to the underprivileged people in more than 150 developing countries through UNICEF, GAVI and other distribution channels. With more than 140 patents, the company has over 16 vaccines for bio-therapeutics, registered in 116 countries and the WHO prequalified vaccines in its portfolio.

Krishna Ella in the recent press conference said that Bharat Biotech has invested about Rs 1,500 crores into research and manufacturing. The company takes loans, grants, and sold shares to fund research.

Bharat Biotech revenues mainly

Image: Dr Krishna Ella with Dr Abdul Kalam

come from the government of India and other emerging countries, multilateral agencies like UNICEF, WHO, and GAVI and other agencies involved in mass immunisation programmes. Along with OPV, Bharat Biotech's Rotavirus and Typhoid vaccines are WHO prequalified. WHO prequalification of vaccines makes them eligible for supplies to UN agencies and participate in public tenders in developing countries.

According to the rating firm ICRA, Bharat Biotech FY 2020 revenues have jumped 35 percent year-on-year to Rs 1,079.7 crore, the net profit rose 200 percent to Rs 298 crore. The operating margins saw significant improvement from 22.1 percent in FY2019 to 42 percent in FY 2020.

The company acquired Chiron Behring Vaccines from GlaxoSmithKline Asia in February 2019. Chiron is a WHO pre-qualified manufacturer of rabies vaccines with a manufacturing plant in Ankleshwar, Gujarat, eligible for supplies to UN agencies and has product registrations in more than 20 countries.

On a philanthropical note, Dr Krishna was seen to compromise with the pricing of vaccine in a timely manner because he did not think about profits but the benefits of his discovery. Similarly, in polio pandemic Jonas Edward Salk denied to patent his vaccine. He said however that we had to bear the production cost and yes we took govt support for that but we also prepared our facilities to become global pharmacy of biotech drugs like vaccines, hormones (insulin) etc.

He is also not untouched by critics but he handled them clamly, on the Adar Poonawalla's statement about BB vaccine as safe as water, he calmly replied that, "Covaxin has shown less than 10% adverse reactions, while others have 60-70% adverse reactions. AstraZeneca was giving 4g paracetamol to volunteers to suppress such reactions. We haven't given paracetamol to any volunteer," as ANI quoted. However all this stunt showed that Adar Poonawalla started controversies by bringing down others instead of highlighting his product which he did not invent but only manufacture for foreign partners.

Dr. Ella also added "I haven't got any (Bill & Melinda) Gates Foundation money, I have not got any money from (the) government of India, I have taken all the risk of creating a BSL-III facility, we have done clinical trials at our own cost, and manufactured 20 million doses at risk, I never said the government

Image: Dr Krishna Ella outside BSL facility

Image: Dr Krishna Ella with Ghulam Nabi Azad

should buy, it's the moral responsibility as a scientist that I should do for the country,"

Bharat Biotech has ties with the Washington University School of Medicine in St Louis, Missouri to manufacture up to a billion doses of a single-dose intranasal Covid-19 vaccine.

For his contributions to science and biotech industry, Dr. Ella has been awarded more than 100 National and International awards including the recent prestigious Padma Bhushan, Asia Pacific Bio-Business Leadership Award 2005 (University of Southern California), Best Entrepreneur Award and Business World, Marico Foundation Innovation Award and many others. Dr. Ella was invited in the Rashtrapati Bhavan to meet President & First Lady George Bush during their visit in India. In 2008, he received Best Technology and INNOVATION award from the Prime Minster of India.

Dr. Ella was also instrumental and advised the Government in setting up Biotech Park in Hyderabad. For more than five years he was the Co-Chairman of Indo-USA High Technology Cooperation Group (HTCG) on behalf of Govt. of India and facilitated Knowledge initiative bill signed by two countries. He gave more than 300 lectures to

Image: Bharat Biotech plant in Genome Valley, Hyderabad

motivate young Indians on topics like Innovation, Bio-entrepreneurship and Regulatory issues.

Dr. Ella is a Member on numerous committees involved in shaping India's science education and policy, including his current role on prominent Government of India bodies as Member -Scientific Advisory Committee to the Union Cabinet (SAC-C), Member- Governing Body, Council of Scientific & Industrial Research (CSIR) and Member- Technology, Information, Forecasting & Assessment Council (TIFAC).

Latest about Bharat Biotech

According to the latest press releases of company, the following information were gathered about BB:

Bharat Biotech had been working on the development of three COVID-19 vaccine candidates, two of which are international collaborations with University of Wisconsin-Madison and Thomas Jefferson University. The third is an indigenous vaccine development project in collaboration with ICMR. Covaxin™ is India's 1st indigenous vaccine developed against COVID-19. The strain of SARS-CoV-2 used in this has been isolated from ICMR-National Institute of Virology (NIV), Pune.

An excellent track record of innovation with more than 145 global patents, a wide product portfolio of more than 16 vaccines, 4 bio-therapeutics, registrations in more than 123 countries and the World Health Organization (WHO) Pre-qualifications.

Bharat Biotech has a world-class vaccine & bio-therapeutics, research & product development, Bio-Safety Level 3 manufacturing, and vaccine supply and distribution and in the process of development of BSL-4 lab in Bangalore after which it will become world only second such kind of facility.

Bharat Biotech was the first company in the developing world to develop Rotavirus vaccine ROTAVAC ® and also the first company in the world to develop Typhoid Conjugate Vaccine TYPEBAR TCV®. BBIL was the first company to file a global patent on Chikungunya and Zika Virus vaccine in the world too.

Bharat Biotech has a track record of working on neglected diseases since many neglected diseases turns out to be pandemic diseases.

Bharat Biotech received more than $300 million as a Grant from Bill & Melinda Gates Foundation,

Welcome Trust and many Governments for the various clinical programmes in the past.

Bharat Biotech has developed vaccines for influenza H1N1, Rotavirus, Japanese Encephalitis, Rabies, Chikungunya, Zika, and the world's first tetanus-toxoid conjugated vaccine for Typhoid.

The acquisition of the rabies vaccine facility, Chiron Behring, from GlaxoSmithKline (GSK) has positioned Bharat Biotech as the world's largest rabies vaccine manufacturer.

Bharat Biotech is the first to manufacture a preservative-free vaccine (Revac-B mcf Hepatitis B Vaccine), and launch India's first cell-cultured Swine Flu vaccine.

Bharat Biotech has successfully developed Rotavac, the most affordable vaccine against rotavirus induced diarrhoeal infections and death in the world.

It is also the first company to have proven the efficacy of a TCV through human challenge studies conducted at Oxford University in 2018.

The biggest of all is the Covid-19 vaccine. Ella moved fast, his early collaboration with ICMR to use its SARS-CoV-2 strain is seen as a masterstroke by rivals. Bharat Biotech has grown the virus and inactivated it through a chemical process. The company started testing the vaccine on animals for safety and efficacy as part of pre-clinical studies. With the support from ICMR and the regulatory body - the company was able to accelerate the whole process of pre-clinical studies and got into human testing by July.

Bharat Biotech which had built India's biggest BSL-3 high-containment facility for manufacturing inactivated polio vaccine, has converted it to manufacture COVID-19 vaccine. This could possibly be the main reason that gave confidence for ICMR to give the SARS-CoV-2 strain it had isolated to Bharat Biotech.

Editorial

India's Notable Padma Awardee Biotech Billionaires

by Seema Pavgi Upadhye

The previous articles in this issue have already mentioned about Dr Krishna Ella and Cyrus Poonawalla. This article discusses about other biotech billionares in the sector, though they are only few as compared to Pharma billionaires.

K I Varaprasad Reddy (2005)

Dr. K I Varaprasad Reddy is the Founder and currently, the Non-Executive Chairman of the Board of Shantha Biotechnics Pvt Ltd. An electronics engineer by profession, Dr. Reddy established Shantha Biotech in 1993 with the sole purpose of developing efficacious and cost effective vaccines, within the reach of common man.

Shantha Biotechnics' successful development of recombinant products heralded the bio-pharma revolution in India which motivated many scientists and entrepreneurs to develop and produce life-saving drugs indigenously. Under his leadership, Shantha Biotechnics won several awards for the company's contribution in the field of bio-technology. For his efforts in developing an affordable vaccine against Hepatitis B, Dr. Reddy was conferred upon the prestigious National Award – Padma Bhushan – by the Hon'ble President of India. Among his numerous achievements, he also received an Honorary Doctorate from Sri Venkateshwara University. Dr. Reddy is fond of music and literature and has been felicitated by many local literary, cultural organizations and non-resident Telugu associations abroad.

Awards and Felicitations: Padma Bhushan (2005) from Govt. of India Honorary Doctorate from SV University in 2005 Honorary Doctorate from GITAM University in 2011 Best Entrepreneur Award (1999) from Ernst & Young Entrepreneur of the Year For Healthcare and Life Sciences (2000) Lifetime Achievement Award (2008) from Pune Vidyapeeth-Govt. of Maharashtra State Bank of India-Pragna Bharathi Puraskar (2002).

Kiran Mazumdar-Shaw (2005)

Kiran Mazumdar, (born March 23, 1953, Bangalore, Mysore state (now Bengaluru, Karnataka state), India), Indi-

BOX: About Padma Awards

The Padma Awards are one of the highest civilian honours of India announced annually on the eve of Republic Day. All persons without distinction of race, occupation, position or sex are eligible for these awards. Government servants including those working with PSUs, except doctors and scientists, are not eligible for these Awards.

Padma Award Categories		
Bharat Ratna		
Padma Vibhushan for exceptional and distinguished service	Padma Bhushan for distinguished service of a high order	Padma Shri for distinguished service.

Fields	
Art	Music, Painting, Sculpture, Photography, Cinema, Theatre etc.
Social work	social service, charitable service, contribution in community projects etc.)
Public Affairs	Law, Public Life, Politics
Science & Engineering	Space Engineering, Nuclear Science, Information Technology, Research & Development in Science & its allied subjects
Trade & Industry	Banking, Economic Activities, Management, Promotion of Tourism, Business
Medicine	medical research, distinction/specialization in Ayurveda, Homeopathy, Sidhha, Allopathy, Naturopathy
Literature & Education	Journalism, Teaching, Book composing, Literature, Poetry, Promotion of education, Promotion of literacy, Education Reforms distinction/excellence in administration by Government Servants etc.
Sports	popular Sports, Athletics, Adventure, Mountaineering, promotion of sports, Yoga
Others	propagation of Indian Culture, protection of Human Rights, Wild Life protection/ conservation

an businesswoman who, as chairman and managing director (1978–) of Biocon India Group, led a pioneering enterprise that utilized India's homegrown scientific talent to make breakthroughs in clinical research.

Ranked among the world's most influential people in biopharma, she is the only Indian on the list of the world's self-made women billionaires. A first-generation entrepreneur, Mazumdar-Shaw is the first Indian businesswoman to reach a net worth of USD 1 billion.

She earned an undergraduate degree in zoology from Bangalore University in 1973 and a graduate degree in brewing from the University of Ballarat, Melbourne, in 1975. Upon returning to India, however, she found no companies willing to offer a brewing job to a woman. Instead, she did consulting work for a few years before meeting Leslie Auchincloss, then owner of an Irish firm, Biocon Biochemicals. Impressed by Mazumdar-Shaw's drive and ambition, Auchincloss took her on as a partner in a new venture, Biocon India, which was launched in 1978 and produced enzymes for alcoholic beverages, paper, and other products.

In 2001 Biocon became the first Indian company to gain the approval of the U.S. Food and Drug Administration (FDA) for the manufacture of a cholesterol-lowering molecule. The company subsequently expanded exponentially. The Profits of the company jumped more than 42% in 2003 alone. After a wildly successful initial public stock offering the following year, Biocon's stock-market value

skyrocketed, and Mazumdar-Shaw, with a nearly 40% stake in the company, became the richest woman in India. Over the following years, Biocon continued its trailblazing work, with the testing and development of the world's first orally consumed insulin product among its most notable undertakings.

Mazumdar-Shaw became the recipient of numerous awards. The World Economic Forum (an international conference for the discussion of world economic, political, and social development) recognized her as a "Technology Pioneer" in 2000, and Ernst & Young named her best entrepreneur in the field of health care and life sciences in 2002. She was honoured as the businesswoman of the year by the Economic Times in 2004. In 2005 Mazumdar-Shaw also received the Padma Bhushan award, one of India's highest civilian honours, for her pioneering work in industrial biotechnology.

Current Net Worth – $3.7 Billion (USD – 370 Crores), (Rupees – 27.5 Thousand Crores)

Dilip Shanghvi (2016)

Dilip Shanghvi (born 1 October 1955) is an Indian billionaire businessman and one of the country's richest people. He founded Sun Pharmaceuticals. The Government of India awarded him the civilian honour of the Padma Shri in 2016. India Today magazine ranked him 8th in India's most powerful people of 2017 list.

Sanghavi started by helping his father in his business, which was a wholesale dealership of medicines, mainly generic drugs, in Kolkata. It was during this work that he thought of manufacturing his own drugs instead of selling products made by others.

In 1982, the 27-year-old Sanghavi finally opened his first manufacturing unit with a capital of INR 10,000. He named his venture Sun Pharmaceutical Industries. According to Forbes, as of October 2021, Shanghvi is the 14th richest person in India with a net worth of US$14.3 billion.

Table: Padma Awardees in last 3 years in Science and allied categories (2020-2022)

2022		
1. Shri Krishna Ella and Smt. Suchitra Ella* (Duo)	Trade and Industry	Telangana
2. Shri Cyrus Poonawalla	Trade and Industry	Maharashtra
3. Shri Sanjaya Rajaram (Posthumous)	Science and Engineering	Mexico
4. Shri Subbanna Ayyappan	Science and Engineering	Karnataka
5. Ms. Sanghamitra Bandyopadhyay	Science and Engineering	West Bengal
6. Dr. Himmatrao Bawaskar	Medicine	Maharashtra
7. Dr. Prokar Dasgupta	Medicine	United Kingdom
8. Shri Aditya Prasad Dash	Science and Engineering	Odisha
9. Dr. Lata Desai	Medicine	Gujarat
10. Dr. Vijaykumar Vinayak Dongre	Medicine	Maharashtra
11. Ms. Sosamma Iype	Others - Animal Husbandry	Kerala
12. Shri Moti Lal Madan	Science and Engineering	Haryana
13. Dr. Narendra Prasad Misra (Posthumous)	Medicine	Madhya Pradesh
14. Shri Amai Mahalinga Naik	Others - Agriculture	Karnataka
15. Shri Anil Kumar Rajvanshi	Science and Engineering	Maharashtra

16. Dr. Sunkara Venkata Adinarayana Rao	Medicine	Andhra Pradesh
17. Dr. Veeraswamy Seshiah	Medicine	Tamil Nadu
18. Shri Seth Pal Singh	Others - Agriculture	Uttar Pradesh
19. Dr. Bhimsen Singhal	Medicine	Maharashtra
20. Shri Ajay Kumar Sonkar	Science and Engineering	Uttar Pradesh
21. Dr. Balaji Tambe (Posthumous)	Medicine	Maharashtra
22. Dr. Kamlakar Tripathi	Medicine	Uttar Pradesh
23. Shri Jyantkumar Maganlal Vyas	Science and Engineering	Gujarat
2021		
1. Harish Chandra Verma	Science and Engineering	Uttar Pradesh
2. Dr. Belle Monappa Hegde	Medicine	Karnataka
3. Narinder Singh Kapany (Posthumous)	Science and Engineering	The U.S.A.
4. Rattan Lal	Science and Engineering	The U.S.A.
5. Nanadro B Marak	Others- Agriculture	Meghalaya
6. Rattan Lal Mittal	Medicine	Punjab
7. Dr. Chandrakant Sambhaji	Medicine	Delhi
8. Dr. J. N. Pande (Posthumous)	Medicine	Delhi
9. Pappammal	Others- Agriculture	Tamil Nadu
10. Krishna Mohan Pathi	Medicine	Odisha
11. Dhananjay Diwakar	Medicine	Kerala
12. Ashok Kumar Sahu	Medicine	Uttar Pradesh
13. Dr. Bhupendra Kumar Singh Sanjay	Medicine	Uttarakhand
14. Prem Chandra Sharma	Others- Agriculture	Uttarakhand
15. Dilip Kumar Singh	Medicine	Bihar
16. Chandra Shekhar Singh	Others- Agriculture	Uttar Pradesh
17. Dr. Thiruvengadam Veeraraghavan (Posthumous)	Medicine	Tamil Nadu
18. Dilip Kumar Singh	Medicine	Bihar

2020		
1. Dr. Yogi Aeron	Medicine	Uttarakhand
2. Dr. Padmavathy Bandopadhyay	Medicine	Uttar Pradesh
3. Dr. Sushovan Banerjee	Medicine	West Bengal
4. Dr. Digambar Behera	Medicine	Chandigarh
5. Dr. Bangalore Gangadhar	Medicine	Karnataka
6. Dr. Raman Gangakhedkar	Science and Engineering	Maharashtra
7. Sujoy K. Guha	Science and Engineering	Bihar
8. Sudhir Jain	Science and Engineering	Gujarat
9. Dr. Leela Joshi	Medicine	Madhya Pradesh
10. Dr. Ravi Kannan R.	Medicine	Assam
11. Dr. Narindar Nath Khanna	Medicine	Uttar Pradesh
12. Naveen Khanna	Science and Engineering	Delhi
13. Kattungal Subramaniam Manilal	Science and Engineering	Kerala
14. Dr. Arunoday Mondal	Medicine	West Bengal
15. Dr. Shanti Roy	Medicine	Bihar
16. Radhammohan & Ms. Sabarmatee (Duo)*	Others-Agriculture	Odisha
17. Batakrushna Sahoo	Others-Animal Husbandry	Odisha
18. Trinity Saioo	Others-Agriculture	Meghalaya
19. Dr. Kushal Konwar Sarma	Medicine	Assam
20. Dr. Gurdip Singh	Medicine	Gujarat
21. Vashishtha Narayan Singh (Posthumous)	Science and Engineering	Bihar
22. Dr. Sandra Desa Souza	Medicine	Maharashtra
23. Pradeep Thalappil	Science and Engineering	Tamil Nadu

Guestorial

Mahima Datla and BP Acharya to receive FABA 2022 special awards

The 44-year-old Mahima has a Bachelor's Degree in Business Administration Management from Webster University, London, has been with Biological E since 2001. Founded in 1948 by her grandfathers as Biological Products Pvt Ltd, the company started out by manufacturing Heparin, a drug to prevent blood clots.

Mahima Datla, managing director of Biological E Limited from Hyderabad and B P Acharya, patron of Federation of Asian Biotech Association (FABA) have been conferred with Dr B S Bajaj Memorial FABA Special Award-2022 and FABA Lifetime Achievement Award, respectively for their immense contribution to the biotechnology sector in India.

The FABA special awards will be conferred during the 19th edition of BioAsia, the largest annual global biotechnology and life sciences summit of Asia, organised by the Government of Telangana and FABA.

The 44-year-old Mahima has a Bachelor's Degree in Business Administration Management from Webster University, London, has been with Biological E since 2001. Founded in 1948 by her grandfathers as Biological Products Pvt Ltd, the company started out by manufacturing Heparin, a drug to prevent blood clots.

Mahima Datla is named for the FABA award for introducing Corbevax vaccine, which is regarded as India's indigenously developed Covid-19 vaccine. Corbevax is a protein subunit COVID-19 vaccine developed by Texas Children's Hospital Center for Vaccine Development and Baylor College of Medicine in Houston, Texas and Dynavax technologies based in Emeryville California. It is licensed to Indian biopharmaceutical firm Biological E. Limited (BioE) for development and production.

According to experts, Corbevax is a recombinant vaccine, developed from the receptor binding domain (RBD) of the spike protein on the virus's surface combined with Dynavax's CpG 1018 adjuvant with alum, which helps the body build the immune response against the virus. The protein is produced by the yeast Pichia pastoris; the process is similar to that of existing Hepatitis B vaccines.

Prof. Reddanna, executive president, FABA while speaking at the announcement of the awards, said, "The Dr B S Bajaj Memorial Award is a distinction bestowed on the individual or organization most committed to the advancement of Life Sciences. The contributions made by Biological E under the abled leadership of Mahima Datla are conscientiously recognized and commended by the biotechnology fraternity. Their vaccine, Corbevax being scalable and affordable to the low-middle income countries, makes Biological E the most promising candidate for this award".

B. P. Acharya (born 30 October 1960) is a senior officer of the 1983 batch Indian Administrative Service (IAS). On his retirement in 2020, he was Director General for MCR HRD Institute of Telangana and also Special Chief Secretary in General Administration Department for Telangana State.

The Indian Council of Medical Research (ICMR) in 2021 has appointed retired Telangana bureaucrat BP Acharya, as the advisor of the National Animal Resource Facility for Bio Medical Research (NARFBR) that is coming up over an area of 100 acres at the Genome valley near Shamirpet.

Acharya had served as the Special Chief Secretary in before retirement and also as the DG of MCRHRD Institute of Telangana. The ICMR said that this appointment is in recognition of Acharya's efforts to create the world-class life sciences cluster in the Genome Valley and his contribution to the sector. The NARFBR project is being developed with an investment of Rs 300 crore and will cater to the pharma and biopharma/vaccine industry in the country in their pre-clinical animal trials.

As Secretary, Industries and Commerce, he was involved in creating Genome Valley on the outskirts of Hyderabad and many such industrial clusters.[6] After retirement, he was appointed as advisor to the Indian Council of Medical Research for their National Animal Resource Facility for Biomedical Research in Genome Valley.

Adding further Reddanna also hailed the services rendered by B P Acharya, who has been conferred with FABA Lifetime Achievement Award and said that Acharya has been serving as advisor to ICMR for the National Animal Resource Facility for Biomedical Research (NARFBR) ever since the time of his retirement from MHRD in 2020 and his coordinating efforts and initiatives taken up by him during the regime of government of Andhra Pradesh are commendable as it has helped develop the concrete base for the Genome Valley and Biotech Sector in Hyderabad.

It is also learnt that B P Acharya's efforts have enabled the erstwhile Andhra Pradesh state achieve the 'Bio State of the Year 2003' Award, 19 years ago and from then onwards the Biotechnology sector in Hyderabad has grown to become the global vaccine manufacturing hub in India.

About FABA

Federation of Asian Biotech Associations (FABA), established in 2005, is a non-profit organization created to provide a global platform for the development of biotechnology across the globe, particularly in Asian countries.

The mission of FABA is to promote innovation and entrepreneurship in the biotech industry, academia, and healthcare sector. For more than 15 years, FABA has been fostering collaboration between academia, industry, and government, thus promoting investments in biotechnology and related fields. FABA promotes collaboration between academia and industries engaged in Biotechnology among the member countries in Asia.

Know more: https://biofaba.org.in

Editorial

Rajeev Varshney, India's third highest cited scientist joins Murdoch University Australia

By Kamal Pratap Singh

Prof Rajeev Varshney, an eminent agricultural biotechnologist, with an H index > 100 and ca. 49000 citations has joined Murdoch University on senior leadership positions such as Director, State Agricultural Biotechnology Centre; Director, Centre for Crop & Food Innovation; and International Chair in Agriculture & Food Security. It is a great recognition for India and Indian biotechnology that Australia has picked up an Indian scientist from India to lead their internationally recognised centre for research and development in agriculture and veterinary biotechnology in Western Australia.

Professor Varshney served International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) headquartered in India and led the baton of scientific excellence, translational agriculture, capacity building & impactful partnership for last 16+ years. He joined ICRISAT as Senior Scientist- Applied Genomics in the year 2005 and since then due to his hard work, dedication, perseverance and leadership qualities, he rose to various ranks including Principal Scientist- Applied Genomics (2007-2022), Director, Center of Excellence in Genomics & Systems Biology (2007 onward), and three global Research Programs- Grain Legumes (2013- 2016), Genetic Gains (2016- 2021) and Accelerated Crop Improvement (2021-2022).

Among many of his significant

contributions, he is credited to establish & nurture a globally recognized center for genomics research at ICRISAT. This center together with several other programs that he led during his tenure and in collaboration with national programmes and advanced research institutes from India and many countries from Asia and sub-Saharan Africa, Australia, Europe, North America and South America, he delivered immensely on high quality upstream and translational research.

To highlight some, he led the genome sequencing of 11 tropical crops; advanced genetics and enhanced trait understanding, developed gene expression atlases, mapped more than 50 traits in legume crops and spearheaded the translational research together with partners to deliver more than 10 improved, climate change ready legumes crop varieties developed through molecular breeding approach. His collaborative efforts have delivered huge genomic resources for these crops and have helped them shed the tag of orphan crops, as they were known earlier due to lack of genomic resources.

In addition, to delivering the results in the hands of smallholder farmers, together with his team, collaborators and partners he has introduced several novel genomic concepts and approaches, like, Genomics- assisted breeding (GAB), GAB 2.0, Super- pan genome, 5Gs for crop improvement, Fast-forward breeding, Rapid delivery systems etc. These approaches are being adopted and implemented across several NARS breeding programs to accelerate the scientific research and development and delivery of climate change ready crop varieties.

Dr Varshney's high quality science and strong network of international partnership has brought great visibility to India at the global forums.

As a prolific author together with his team, he has delivered on all fronts including advancing the cause of scientific research by publishing more than 500 high quality research articles including 20 papers in Nature journals, which is a rare feat for any research center across the globe.

Prof Varshney's contributions can be appreciated with an 8- min video https://youtu.be/Jq3flNFMRqs that his colleagues prepared on the occasion of his farewell.

Prof Varshney has extended his gratitude to all his colleagues, collaborators, friends and well wishers in his recent blog post- https://bit.ly/33Oyy3i

While talking exclusively to Biotech Express, Prof Varshney says, "It has been a memorable, productive and a rewarding stint for me while working at ICRISAT in India. As I embark to my new journey, I carry a sense of pride and satisfaction that I have contributed to make a positive impact in the lives of smallholder farmers through integrating advanced genomics discoveries in crop improvement and nurturing the next generation of scientists." He further said, "Neither science, nor scientists have boundaries for new discoveries and making an impact on society. While I will be leading biotech research and crop & food innovations in Australia, my research is expected to contribute to agriculture in Australia and also India and other parts of world including Africa and Asia". He added, "Thanks to you, KP Singh for your contributions in taking our research and its impacts to general public and policymakers through Biotech Express magazine."

Prof Varshney has been a "people's person" in scientific community at international level. He has an unique skill to interact starting from a research technician to highest level of authorities including Prime Minister, Ministers, CEOs, Directors. This is the reason that more than 170 eminent scientists and researchers and policymakers from the world including including Drs M S Swaminathan, Gurdev Khush, Andrew Bennett, Peter Langridge, Panjab Singh, Kadambot Siddique, Andrew Paterson, Asis Datta, Susanne Brink, SK Pat-

tanayak, Arabinda Padhee, Dyno Keatinge, Henry Nguyen, congratulated Prof Varshney for achievements made during last 16+ years and extended their wishes to him for the start of new journey.

While these messages in details are available at
https://bit.ly/3hbOdwM
a few messages highlighting contributions of Prof Varshney are provided here:

Working with Rajeev for the last two decades has been a distinct privilege. In addition to being a outstanding scientist, he is a great team leader, wonderful colleague, magnificent friend and a delightful person.

Dr OP Yadav
Director, ICAR-CAZRI

Wonderful Scientist, Great human being, lovely brother with smiling face. A star in Indian Science. Wishing you all the best. Lord Jagannath bless you.

Dr Ajit Shasany
Director, ICAR-NIPB

You have come a long way since 2005. So much has been accomplished in legume genomics because of your talent, vision, and leadership. I am proud to be your collaborator and friend. All the best to you and your family for the next journey in Western Australia.

Prof Henry Nguyen
Director, National Centre for Soybean Research, USA

Please accept my heartiest congratulations on accepting your new assignment. You are a great scientist and will continue to contribute to science of biotechnology wherever you are. We shall miss you but in the digital era we shall remain quite connected. Please do remember me if I could be of any use to you in your new assignment. I wish you and your family all the best in Australia.

Prof. Panjab Singh
Chancellor, RLBCAU, Jhansi

Dr Varshney, a close friend, is a Star Scientist not only for ICRISAT, but for the entire Agri Science community. It was a pleasure to know him during our stint at ICRISAT. I wish him all success in future. May his impactful research help in the wellbeing of smallholder farmers across the planet. We are going to miss him greatly.

Dr Arabinda Kumar Padhee, IAS
Director, Business & Country Relations, ICRISAT

You made your mark and brought laurels to ICRISAT with your unwavering commitment. You took unprecedented initiatives, led from the front, pushed boundaries, made seminal contributions, and showed the world what all can be achieved as a team. With an 'h-index' over 100 and citations touching 50,000, you remain on the TOP of the scientific world. Glorious future, Love, Regards-

Prof. KC Bansal
Secretary, National Academy of Agricultural Sciences

As improbable as the prospect of matching, much less surpassing, your prodigious accomplishments at ICRISAT seems, may your future accomplishments be even more astounding! Let us continue with the efforts to make this beautiful planet even better for all its inhabitants.

Prof. Chikelu Mba
Team Leader, Seeds and Plant Genetic Resources, UN FAO, Italy

As you get ready to depart, I would like to convey my warmest best wishes for your continued success in tackling new challenges. You have left excellent footprints of achievements at ICRISAT. I have no doubt you will excel in your new responsibilities at Murdoch University.

Prof Gurdev S. Khush
Fellow of Royal Society,
Member of US National Academy of Sciences
World Food Prize Laureate

On behalf of Indian biotechnology community and our readership, Biotech Express congratulates Professor Varshney for his incredible and impact oriented contributions to agriculture in India and elsewhere and wish him all the best in Australia to continue to raise flag of Indian biotechnology high!

Product Launch

Key PCR: Highly Affordable Thermal Cycler (PCR Machine) for making Genetic Research More Accessible

Hyderabad based start-up, 30M Genomics envisions to improve the molecular biology skills among life science students through development of highly affordable version of thermal cycler.

30M Genomics is incubated at ASPIRE BioNEST, University of Hyderabad and has received financial support from BIRAC, Meity and VFSTR for developing affordable genetic diagnostics. The start-up has developed, "Key PCR" which is a bluetooth operated thermal cycler having equivalent performance of a sophisticated thermal cycler.

The equipment is portable, weighing less than 600 grams and completely 3D printed with biodegradable material.

Thermal cycler or PCR machine, is an indispensable equipment for life sciences research. However, it is inaccessible to majority of students/researchers as most of the educational institutions cannot afford the sophisticated equipment for student purposes. This restricts the student getting skilled in molecular biology experiments.

30M Genomics plans to market launch, "Key PCR" on 26th February, 2022 in an event organized by ASPIRE BioNEST. The cost of Key PCR is expected to be 10 times lesser than market available thermal cyclers.

Featured Biotech News

VACCINE HESITANCY: Men Wrestles Official, Climbs Tree To Dodge Covid Shot

January 28, 2022

A team of health officials in Uttar Pradesh's Ballia, out on a Covid vaccination awareness drive, faced cases of extreme hesitancy in a remote village. The videos shot by health officials shows a man climbing a tree to escape vaccination, another video shows a man wrestling a health official to the ground.

"Please come down," a group of people urge a man on a tree. "I won't come down. I don't want to get jabbed. I am scared," the man replies. Finally, he relents and co-operates with the health officials.

In another video, a man is seen wrestling with health authorities as he tries to escape from getting the Covid vaccine. "I will come for vaccination later, not now," he says as he runs away.

The two videos from Uttar Pradesh's Ballia showcase the challenges health officials face as they try to get more people inoculated against the tightly infectious coronavirus.

Video source: https://www.ndtv.com/india-news/india-coronavirus-news-uttar-pradesh-man-wrestles-official-another-climbs-tree-to-dodge-covid-shot-2718629

Global response to COVID-19 pandemic has been amateurish: Dr. Amitav Banerjee

January 28, 2022

Panic, fear and irrational behaviour allowed greed to exploit the pandemic. We have lessons to learn from the way we dealt with Covid

The global response to the current pandemic has been amateurish from the beginning. Lockdowns, school closures and physical distancing were all panic reactions based on a school computer project of a 14-year-old daughter of a computer scientist in the US. Similarly, study of efficacy of masks was first done on hamsters (rodents) under laboratory conditions and overlooked the fact that humans do not behave like hamsters either inside or outside the lab! Subsequent randomized trials, in Denmark and Bangladesh, on the efficacy of masks, thankfully in humans reported negligent to very modest impact.

Covid-19 is not as simple as it looks, or, counter intuitively, a simple problem has been turned into a complex one.

The gullible public, the majority in most countries too numbed to think clearly, accepted mostly the red hats thrust on them, the red hat of emotions - fear, panic and anxiety. Cowed into submission people happily fell prey to the greed of politicians, market forces and even career scientists.

The latest data available confirm that initial estimates of the lethality of the virus were highly exaggerated. Most people who died in the West were around 80 years old with co-morbidites. Only 6% of the reported Covid-19 deaths were solely due to the virus.

From these figures it is evident that risk of dying from Covid-19 for children and young people is negligible. This is important for framing policy since a recent paper in Toxicology Reports titled, "Why are we vaccinating children against Covid-19," concludes that deaths from Covid-19 in children are negligible, but post-vaccination deaths in children are not.

"Expert" narratives fuelled this faith in vaccines as the saviour of humankind. Waiting for the vaccine justified prolonged lockdowns and associated misery. The inflated estimates of lethality of the virus were not corrected in people's mind, leading to a sort of "medical stampede" during the second wave in India when a majority of people who had Rt-PCR positive results, but who had mild to no symptoms, rushed to hospitals overwhelming the system and depriving more serious patients of beds and oxygen.

Dr. (Prof) Amitav Banerjee is Epidemiologist and Professor and Head, Department of Community Medicine, Dr DY Patil Medical College, Pune, India

Full article is available here: https://www.nationalheraldindia.com/opinion/global-response-to-covid-19-pandemic-has-been-amateurish-complex-issues-need-many-thinking-hats

Russia's Sputnik Light vaccine receives authorisation in India

February 7, 2022

The Russian Direct Investment Fund (RDIF, Russia's sovereign wealth fund) has announced that the Russian one-shot Sputnik Light vaccine against coronavirus has been authorized by the Drug Controller General of India (DCGI).

Sputnik Light has been registered in more than 30 countries with total population of over 2.5 billion people. A number of countries, including Argentina, Bahrain, UAE, San Marino and Philippines, have already authorized Sputnik Light as a universal booster.

A preliminary study of the Gamaleya Center has found that Sputnik Light as a booster significantly increases virus-neutralizing activity against Omicron, which is comparable to titers observed after Sputnik V against wild-type virus, associated with high levels of protection.

Dr. Reddy's Laboratories, a major partner of RDIF in India, has conducted local clinical trials of Sputnik Light in India. Positive data from these trials have been presented to India's regulator and contributed to the positive decision by DCGI. Clinical studies and the real-world data in many countries have demonstrated Sputnik Light is a safe and effective vaccine when used both on a standalone basis and as a booster.

Sputnik Light will add to India's national vaccine portfolio and join Sputnik V, which was approved in the country in April 2021. India is the leading production hub for Sputnik V.

Virus can also brings Protective mutations in COVID-19, shows research

January 4, 2022

Virology researchers at the University's Sahlgrenska Academy have mapped mutation patterns in the SARS-CoV-2 coronavirus. The results, published in the journal PNAS, indicate that the body's natural enzyme ADAR1 (adenosine deaminases acting on RNA) impairs reproduction of SARS-CoV-2.

ADAR1, found inside the cells' protective membrane, can replace the nucleotides, which are the building blocks in the RNA of the virus. Nevertheless, how ADAR1 affects the coronavirus causing COVID-19 it has been unclear to date.

"Our study shows that there is an inverse relationship between the viral load (the measurable amount of virus in the body) and the extent to which ADAR1 has mutated the virus. We also found that ADAR1-induced mutations are the most common type of SARS-CoV-2 mutation," says Johan Ringlander, Ph.D. student in virology at Sahlgrenska Academy and the study's first author.

Analyses of more than 200,000 virus strains from patients who were ill with COVID-19 showed that mutations caused by ADAR1 were mainly circulating in summer 2020, when transmission and mortality rates were low in Europe. When transmission and mortality rates were higher, virus variants with ADAR1-induced mutations were uncommon, probably because they were outcompeted by more infectious virus strains.

Glenmark, India launched nasal spray to treat Covid-19

February 9, 2022

Glenmark Pharmaceuticals and Canada-based SaNOtize Research & Development have introduced the Nitric Oxide Nasal Spray (NONS) to treat Covid-19 in adult patients in India.

To be marketed under the brand name FabiSpray, the treatment is intended for Covid-19 patients at increased disease progression risk.
The latest development comes after Glenmark obtained manufacturing and marketing approval from the Drugs Controller General of India (DCGI) for NONS under the accelerated approval process.

The multicentre, parallel-arm, double-blind trial analysed the safety and efficacy of NONS against saline nasal spray enrolling 306 non-hospitalised patients across 20 clinical sites in the country.

In July last year, Glenmark and SaNOtize signed an exclusive long term strategic collaboration for producing, marketing and supplying NONS to treat Covid-19 in India and various other Asian markets.

AIIMS Delhi discontinues Covid testing before in patient hospitalisation

February 10, 2022

AIIMS, Delhi today announced to discontinue routine COVID-19 testing prior to in-patient hospitalisation and surgeries, news agency ANI reported. AIIMS Medical Superintendent DK Sharma in a letter today said in accordance with current ICMR's national guidelines, it has been decided to discontinue routine Covid-19 testing prior to inpatient hospitalisations (regular as well as daycare) and also prior to any minor or major surgical or interventional or non-interventional procedures and imaging in clinically asymptomatic patients.

His letter states that OPD or emergency patients as well as those patients who were earlier Covid-19 positive and have since recovered & transferred to the parents' department's inpatient ward for continued treatment are also included in these guidelines.

Letter posted on Twitter by ANI

Centre places purchase order for 5 crore doses of COVID-19 vaccine Corbevax

FEBRUARY 05, 2022

The Centre has placed a purchase order with Biological E for five crore doses of COVID vaccine Corbevax each costing ₹145 excluding taxes, official sources said on Saturday.

The government is yet to decide on which segment of beneficiaries this new vaccine would be administered.

However, according to sources, discussions are underway in technical groups and in the Health Ministry's immunisation division about expanding the scope of the precaution doses which are currently being given to healthcare and frontline workers, and comorbid senior citizens.

The HLL Lifecare Limited, a public sector undertaking, has issued the supply order of Corbevax to Biological E in January-end on behalf of the Union Health Ministry. According to the order, the Hyderabad-based company is expected to provide the supplies in February.

"The cost implication of five crore dosed of Corbevax at the rate of ₹145 per dose plus GST as applicable come to ₹725 plus GST as applicable.

"In this regard, it is also stated that ₹1,500 crore has been released as advance vide sanction order dated June 2, 2021, to HLL Lifecare Limited for procurement of Corbevax from Biological E Limited," the order stated.

The government has told Parliament that any decision on expanding the list of eligible beneficiaries for precaution dose of COVID-19 vaccines and vaccination of children below 15 years will be in accordance with the recommendations of the NTAGI based on a review of the available scientific evidence.

India's Drug Regulator approved India's first indigenously developed RBD protein sub-unit vaccine against COVID-19, Corbevax, for restricted use in emergency situation.

Corbevax is administered through an intramuscular route with two doses scheduled 28 days apart and is stored between 2 degrees Celsius to 8 degrees Celsius. It is presented as 0.5 ml (single dose) and 5 ml (10 doses) vial pack.

The company has conducted phase 1/2, 2/3 clinical trials of its COVID-19 vaccine in the country. It has also conducted a phase 3 active comparator clinical trial to evaluate superiority against Covishield vaccine, the health ministry had stated.

The Emergency Use Authorization proposal for Corbevax was reviewed by CDSCO in consultation with SEC on December 10 and 27 last year. After deliberation, it recommended for grant of permission for restricted use in emergency situation to manufacture and market Corbevax in 18 years and above subject to various regulatory conditions.

The recommendations were accepted by the Drugs Controller General of India subsequently.

Pfizer drops India vaccine application after regulator seeks local trial

FEBRUARY 5, 2021

Pfizer Inc said it had withdrawn an application for emergency-use authorisation of its COVID-19 vaccine in India, after failing to meet the drug regulator's demand for a local safety and immunogenicity study.

The decision means the vaccine will not be available for sale in the world's two most populous countries, India and China, in the near future. Both countries are running their immunisation campaigns using other products.

Unlike other companies conducting small studies in India for foreign-developed vaccines, Pfizer had sought an exception citing approvals it had received elsewhere based on trials done in countries such as the United States and Germany.

Indian health officials say they generally ask for so-called bridging trials to determine if a vaccine is safe and generates an immune response in its citizens. There are, however, provisions under India's rules to waive such trials in certain conditions.

The drug regulator said on its website its experts did not recommend the vaccine because of side effects reported abroad were still being investigated. It also said Pfizer had not proposed any plan to generate safety and immunogenicity data in India.

Data On Suicides During 1st Covid Wave Released By Home Ministry, India

FEBRUARY 10, 2022

"As many as 8,761 people committed suicide due to unemployment, bankruptcy or indebtedness in the year 2020," Minister of State of Home Affairs Nityanand Rai informed the Rajya Sabha. The Home Ministry also said that in the three years between 2018 and 2020, as many as 25,251 lost their lives because of financial crises.

The data assumes significance given that in 2020, the government had told parliament that there was no record of deaths of migrant workers so the "question does not arise" of compensation. Back then, the government's written response to a question on whether families of those who had lost their lives while trying to reach home in the coronavirus lockdown had been compensated had triggered anger and criticism from the opposition.

However, the ministry had admitted that more than 1 crore migrants made their way back to their home states from various corners of the country in the weeks following the sudden lockdown announced by Prime Minister Narendra Modi in March without giving them time to prepare. The numbers also come on a day when the Facebook live video of a trader in Uttar Pradesh went viral, a day after he took poison along with his wife, blaming heavy losses and PM Modi's economic policies like the Goods and Services Tax or GST.

Following the disturbing incident just ahead of polls in the state, Rajiv Tomar, a shoe trader in Baghpat – one of the towns voting tomorrow – is critical but his wife died.

Moderna and Excision Launch HIV trials Inspired by COVID-19 Pandemic, involve Gates funds

January 28, 2022

Pharmaceutical giant Moderna announced that it has launched a clinical trial for a human immunodeficiency virus (HIV) vaccine.

The first participants in Phase I of the trial—56 healthy, HIV-negative people—were given their first dose of the vaccine at George Washington University (GWU) School of Medicine and Health Sciences in Washington, D.C. The mRNA vaccine was created using the same technology Moderna used to create its COVID-19 vaccine.

Currently, about 38 million people worldwide are living with HIV—with a few treatment options, but no cure. Clinical trials have been researching possible cures since 1987. A study of a vaccine in the 2000s run in Thailand reportedly decreased infections by about 30%, but the results are controversial.

The immunogens used in this trial were developed by IAVI, a nonprofit scientific research foundation dedicated to learning more about HIV and AIDS, and the Scripps Research Institute, with support from the Bill & Melinda Gates Foundation and the U.S. National Institute of Allergy and Infectious Diseases.

Now that the study has begun, the next step is a booster shot. Forty-eight of the participants will receive one or two doses of the mRNA vaccine, and 8 participants will receive a boost of the immunogen alone. Patients will be monitored for safety for six months after their last vaccination.

Philadelphia-based Excision BioTherapeutics also announced that they have initiated Phase I of a two-phase clinical trial. Their treatment uses CRISPR-based technology called EBT-101 to remove sections of the HIV genome from the human body.

Ivermectin for COVID-19: A study Addressing Potential Bias and Medical Fraud

February 5, 2022

Ivermectin has become a controversial potential medicine for coronavirus disease 2019. Some early studies suggested clinical benefits in treatment of infection. However, the body of evidence includes studies of varying quality. Furthermore, some trials have now been identified as potentially fraudulent. A study present a subgroup meta-analysis to assess the effects of stratifying by trial quality on the overall results. The stratification done is based on the Cochrane Risk of Bias measures and raw data analysis where possible.

The results suggest that the significant effect of ivermectin on survival was dependent on largely poor-quality studies. According to the potentially fraudulent study (risk ratio [RR], 0.08; 95% CI, 0.02–0.35), ivermectin improved survival ~12 times more in comparison with low-risk studies (RR, 0.96; 95% CI, 0.56–1.66). This highlights the need for rigorous quality assessments, for authors to share patient-level data, and for efforts to avoid publication bias for registered studies. These steps are vital to facilitate accurate conclusions on clinical treatments.

The results from this analysis highlight the need for rigorous quality assessments when evaluating clinical trials of drugs for COVID-19. Existing and widely used risk of bias assessment tools are not enough. These tools provide a systematic framework for identifying potential key sources of bias in a trial's internal methodology but work on the fundamental assumption that a published study is reporting accurate and complete findings. They allow reviewers to make judgments on the assumption that basic standard procedure is followed, the data are real, and no information is being intentionally hidden.

With cases of potential medical fraud now identified, it is essential that access to patient-level databases be provided. If authors fail to provide these data, the study should be considered with a higher index of suspicion. Additionally, it should be mandatory that all registered trials report their findings. We understand that these are substantial changes to established procedures. However, the failure to recognize the potentially fraudulent studies, which led to multiple meta-analyses suggesting significant benefits of ivermectin for COVID-19, indicates that the tools currently used to evaluate the quality of clinical trials are insufficient. These events warrant our stringent recommendations.

Now Truckers: what else the scientists need to see to know that their science has failed

FEBRUARY 1, 2022

Nowadays in every part of globe protests against vaccine mandates and lockdowns have become common but political parties everywhere are still not giving up chances to favor pharma profiteers and mainstream news media is not covering such events.

A convoy of truckers and others who oppose vaccine mandates has rolled into Ottawa, Canada for a weekend of rowdy protests, putting Canada's capital city on edge amid warnings from police that they don't know how large the crowds will get. The demonstrators have been hailed as heroes by anti-vaccine groups on mainstream and alternative social media platforms.

Thousands of protesters pile into downtown Ottawa and onto the grounds of Canada's Parliament buildings, while a long line of big rigs, pickup trucks, RVs and other assorted vehicles trickled through the streets blasting on their horns, bringing gridlock to the city core.

The initial motivation for the protest was a new rule requiring truckers to show proof of vaccination when entering Canada, which Prime Minister Justin Trudeau's government implemented on Jan. 15. Until then, truckers had been allowed to cross the U.S.-Canada border with few restrictions. The U.S. imposed a similar mandate on Jan. 22.

After news of his hiding Prime Minister Justin Trudeau on Monday, announced he and two of his three children tested positive for Covid-19. Asked about whether he would negotiate with truckers protesting COVID-19 vaccine and public health mandates in Ottawa, Prime Minister Justin Trudeau said on Monday he has chosen not to "go anywhere near" those expressing hateful rhetoric, violence against fellow citizens or disrespect towards science and health professionals.

Henry Hildebrandt, the firebrand pastor of The Church of God in Aylmer, Ont., preached to hundreds of trucker's convoy protestors attending a sermon on Sunday outside the Prime Minister's office. If the Prime Minister won't "heed to the word of God," then the protestors may "knock on your door," he told the energetic crowd:

A Manitoba politician has been punished for meeting with and supporting truckers protesting COVID-19 vaccine mandates.

Ban on unjabbed citizens from travelling in local: Maharashtra govt asked to prove its decision was in larger public interest

February 8, 2022

A bench of Chief Justice Dipankar Datta and Justice Makarand Karnik has now given time to the state till Thursday to prove that their decision wasn't arbitrary and was in the larger interest of the public and thus it shouldn't be interfered with.

The Bombay High Court on Tuesday slammed the Maharashtra government for not maintaining minutes of the meetings held since last year in which it was decided to prohibit unvaccinated citizens from travelling in local trains. The HC said the state government has contradicted its own rules which mandate maintaining meetings held by the executive during the pandemic.

The bench was seized with a bunch of PILs challenging the SOPs issued by the state government denying entry to non-vaccinated citizens from travelling in suburban local trains.

On Monday, senior counsel Anil Anturkar representing the state told the judges that the government officials haven't maintained any records of the meetings in which the state on recommendations of experts, decided to prohibit non-vaccinated citizens from travelling in the locals.

"So Mr Anturkar, you need to show us judgments passed by the Supreme Court by next hearing, wherein it is held that courts cannot interfere with state decisions if they are for larger public interest despite the fact that their decision-making process was flawed and defective," Chief Justice Datta said while adjourning the matter till Thursday.

Meanwhile, the Union government through additional solicitor general (ASG) Anil Singh submitted that as a matter of social obligation and a responsible citizen, it is the duty of every citizen to get vaccinated to avoid the spread of the infection.

"We have been encouraging vaccination and requesting people to get vaccinated in the larger public interest," ASG Singh said, adding, "But no one can be forced to get a vaccine."

How JAMA manipulating science to decrease vaccine hesitancy and adverse event

January 8, 2022

Those adverse COVID-19 vaccine side effects your friend told you they experienced may have been all in their head, according to a recent study conducted by researchers at Harvard Medical School and Beth Israel Deaconess Medical Center.

In this systematic review (doi:10.1001/jamanetworkopen.2021.43955) and meta-analysis of 12 articles including AE(such as fatigue or headache) reports for 45 380 trial participants, systemic AEs were experienced by 35% of placebo recipients after the first dose and 32% after the second. Significantly more AEs were reported in the vaccine groups, but AEs in placebo arms ("nocebo responses") accounted for 76% of systemic AEs after the first COVID-19 vaccine dose and 52% after the second dose.

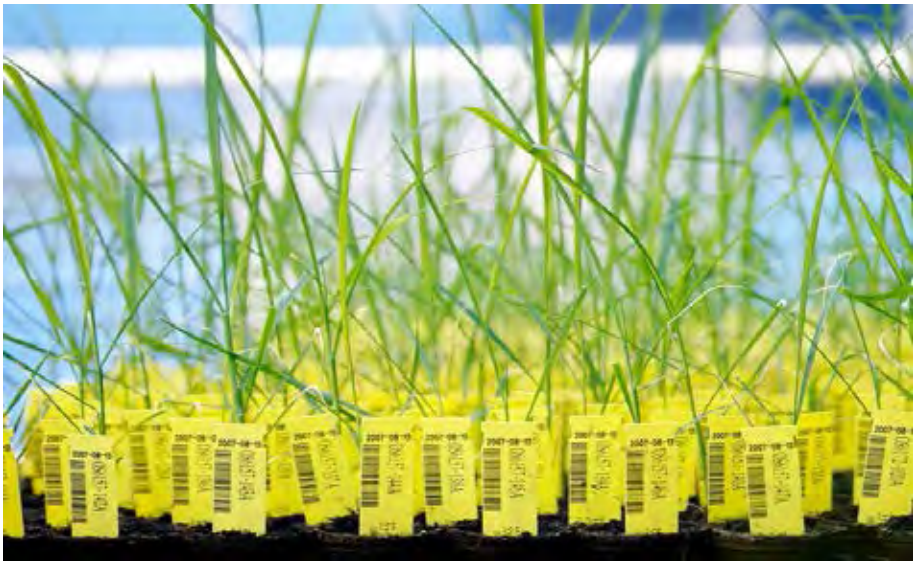
This study found that the rate of nocebo responses in placebo arms of COVID-19 vaccine trials was substantial; this finding should be considered in public vaccination programs.

Although the reasons for vaccination hesitancy are diverse and complex, concerns about potential adverse events (AEs) from the COVID-19 vaccines seem to be a major factor.

The study did not take into accounts the serious adverse event like myocarditis or early signs of transverse myelitis, Guillain-Barre Syndrome, a myopathic disorder, myocarditis or thrombosis, anaphylaxis and blood clots etc.

Adoption of GM Crops Can Help Fight Climate Change -Study

February 9, 2022



A study by the University of Bonn projected that if the European Union (EU) were to allow the adoption of already existing genetically modified (GM) crops, it could result in a reduction equivalent to 7.5% of the total agricultural greenhouse gas emissions of Europe.

The researchers highlighted that yield increases by GM crops that can help in climate change mitigation have not been previously quantified in previous studies. They argue that the yield increase helps prevent additional CO2 emissions by reducing the need to convert new lands to agricultural land. They decided to focus on the EU for this projection study because the region has not widely accepted GM crops and is currently undergoing reassessment of its regulatory policies.

The results of their study predicted that growing GM crops in the EU could reduce greenhouse gas emissions by 33 million tons of CO2 equivalents per year. This is the equivalent of 7.5% of the total agricultural greenhouse gas emissions of the EU in 2017.

Likewise, they found that GM crop adoption would lead to higher EU exports, lower imports, and can help decrease the land-use changes in their import-country partners. The researchers cited corn and soybeans as examples.

Europe currently imports corn and soybeans from Brazil, among other countries. To keep up with the soybean demand, parts of the Brazilian Amazon are converted to agricultural land. The adoption of GM soybeans by the EU can help alleviate the tropical deforestation in that part of the Amazon. Thus, the adoption of GM crops not only reduces greenhouse gas emissions but can help preserve biodiversity as well.

PH Agri Secretary: Biotechnology a Powerful Tool of Science to Feed the Future

February 9, 2022

Philippines Department of Agriculture Secretary William Dar, in a recent interview, said, "The stance of the Department of Agriculture (DA) is clear: biotechnology is a pillar of our 'One-DA approach' to ensuring agricultural productivity, sustainability, economic growth, and nutritional security."

At a Healthier Rice Project Team and Advisory Committee meeting held on February 2, 2022, Secretary Dar highlighted the DA's programs or the massive production of Golden Rice seeds and production of Golden Rice in its pioneer provinces. The DA-Philippine Rice Research Institute (PhilRice) will bring Golden Rice to the vitamin A-deficient provinces in the Philippines.

The secretary was among the first to taste the Golden Rice when it was launched in September 2021. During the meeting, Secretary Dar explained that the Department continues to pursue programs to entice youth into venturing careers in agriculture, specifically in biotechnology.

"The achievements made by the Philippines exemplified by the biosafety approvals for Golden Rice as well as Bt eggplant hopefully will inspire more young Filipinos to pursue this field because we need more biotechnologists, scientists to help us drive the agriculture and fisheries sector towards modernization and industrialization," Secretary Dar said.

How Eisenhower Predicted Fauci

Feb 11, 2022 | First appeared on https://www.msn.com/

If it wasn't obvious before, the COVID-19 pandemic has shown that science has become thoroughly politicized. Though normally focused on observable and verifiable causes and effects in the natural world, many scientists, especially government employed ones, have taken on a political role and have shaped scientific findings in the service of those political ends. The truth eventually came out, but at a massive cost to people's mental health, finances and trust. President Dwight Eisenhower foresaw this abuse by government scientists, and he shows us the way out.

With all of these issues, some of the federal government's top scientists made a concerted effort to stifle debate. Dr. Francis Collins, the former head of the National Institutes of Health, requested a "devastating takedown" of those who disagreed with his insistence on lockdowns, referring to dissenting scholars from Harvard, Oxford and Stanford as "fringe." He and other public health officials selectively ignored real data. Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Disease (NIAID) and chief medical adviser to the president, declared that "attacks on me, quite frankly, are attacks on science."

Collins' approach and Fauci's sentiment are exactly what President Eisenhower warned the American public about in his Farewell Address. He advised vigilance against the "danger that public policy could itself become the captive of a scientific-technological elite." These "task forces of scientists," Eisenhower cautioned, would lead to the "domination of the nation's scholars."

Likewise, the World Health Organization's 2019 program for an influenza pandemic does not recommend facemask use for the non-symptomatic or uninfected, and only recommends business and school closures in the most severe circumstances, even while acknowledging that these measures lack good evidence of effectiveness. This too was missing from COVID policy discussions.

Eisenhower issued two warnings in his Farewell Address: "the acquisition of unwarranted influence...by the military-industrial complex" and "that public policy could itself become the captive of a scientific-technological elite."

While the scientist may be able to predict the consequences of some of our decisions, it is the statesman who must create policy that balances various needs, especially the tradeoff between freedom and safety. What should the quarantine policy be for COVID-exposed children in schools? Should hospital workers be obliged to get vaccinated? This requires a deliberative process, one best suited for legislative bodies.

South African Doctor who discovered Omicron says she was told to make it sound worse

February 9, 2022

The South African doctor who discovered the Omicron strain has revealed she was 'pressured' into describing the variant as more dangerous than it really is.

Dr Angelique Coetzee was one of the first to report the new variant in November last year and said it caused 'mild' symptoms for those in her country.

But she claims she was told by scientists and politicians from around the globe that her description was wrong.

'Because of all of Covid's mutations, all of these scientists and politicians who aren't from South Africa were contacting me telling me I was wrong when I spoke out, that it was a serious disease … they were telling me I had no idea what I was talking about, they kept attacking me,' Dr Coetzee told The Daily Telegraph.

'In South Africa it is a lighter disease, but in Europe it has been a serious, serious illness, which is what the politicians want me to say. There has been a lot of pressure from European scientists and politicians who have said ''Please don't say it is a mild illness''.'

The GP said those who had contracted the variant in South Africa experienced much milder symptoms compared to the Delta strain and often only experienced a sore throat and fatigue.

'They are accusing me of lying, of downplaying Omicron because of how it has been in Europe … in their minds, it is impossible for a disease with more than 38 mutations to be mild,' she said.

She said she couldn't understand why politicians wouldn't listen to her, despite her seeing the effects first hand. NSW Chief Health Officer Kerry Chant had echoed Dr Coetzee's statements when the state saw a surge in Omicron cases.

She said that based on evidence from overseas as well as in Australia, hospitalisations from the variant were a lot less common than they were from the Delta strain.

'It indicates that infection with Omicron is likely to be milder than infection with Delta, with the risk of hospitalisation being around 60 per cent to 80 per cent less than for Delta,' Dr Chant said in December.

Research and Govt. News

Depression and anxiety spiked in pregnant women during COVID-19 pandemic, research

January 31, 2022

The COVID-19 pandemic caused a spike in depression and anxiety in expectant mums, a new study has revealed. There was an increase in reported depression rates of 30 per cent from pre-pandemic levels, from 17 per cent to 47 per cent -- with anxiety rates also jumping up 37 per cent in expecting mothers to 60 per cent.

The peer-reviewed study of 150 women took place during the height of the Coronavirus crisis between April 2020 and January 2021 -- before the vaccination programme rolled out -- and was led by Dr Maria Laura Filippetti and Dr Rigato, researchers at the Essex Babylab in the University of Essex.

The paper showed that prenatal trauma, such as the one experienced during the COVID-19 pandemic, can significantly amplify vulnerability to mental health problems. It also emerged from the study that pregnant women with higher depressive symptoms reported feeling less attached to their unborn babies.

Dr Rigato said: "While this result is in line with previous observations that women's mood during pregnancy influences the early relationship with her child, it reinforces the need for authorities to support women throughout their pregnancy and the postnatal period in order to protect their health and their infants' development."

Importantly, the research also revealed the positive effect that social support plays in protecting expecting mothers' mental health. The authors found women who considered the impact of COVID-19 to be more negative showed higher levels of anxiety.

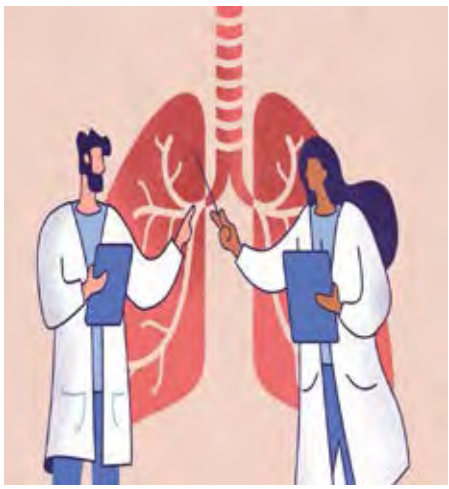
Omicron is less severe because it does not infiltrate the lungs

January 3, 2022

A team of researchers at Hong Kong University's faculty of medicine found Omicron replicates 70 times faster than Delta in human airways.

The study, which is yet to be peer-reviewed, showed that when compared with both Delta and the original coronavirus, the Omicron variant was much quicker at getting into the bronchus or tubes that run through the upper airways and lungs but much slower at infiltrating the lung tissue itself.

According to the researchers, the Omicron variant replicated less efficiently, more than 10 times lower, once inside the human lung tissue than the original SARS-CoV-2 virus, which may suggest lower severity of disease. It is hypothesised that serious illness from COVID-19 occurs once the virus gets into the lungs and spreads to other parts of the body from there, if it can be contained in the upper airways, the mouth, nose, etc, there is much less chance of severe disease.



However, the lead author Dr Michael Chan has urged caution over the findings. "It is important to note that the severity of disease in humans is not determined only by virus replication but also by the host immune response to the infection," said Dr Chan.

A team studying the Omicron variant in Glasgow think they have found the answer as to why this variant is unable to infect the lung cells as much as it does the upper airways. They found an essential protein found on lung cells called TMPRSS2, which usually helped previous SARS-COV-2 variants to gain entry into the lung cells themselves bound less strongly to Omicron, meaning it was more difficult for this variant to get inside and infect lung cells.

Indian scientists introduce DriverFuse: An R package for analysis of NGS datasets to identify cancer

February 3, 2022

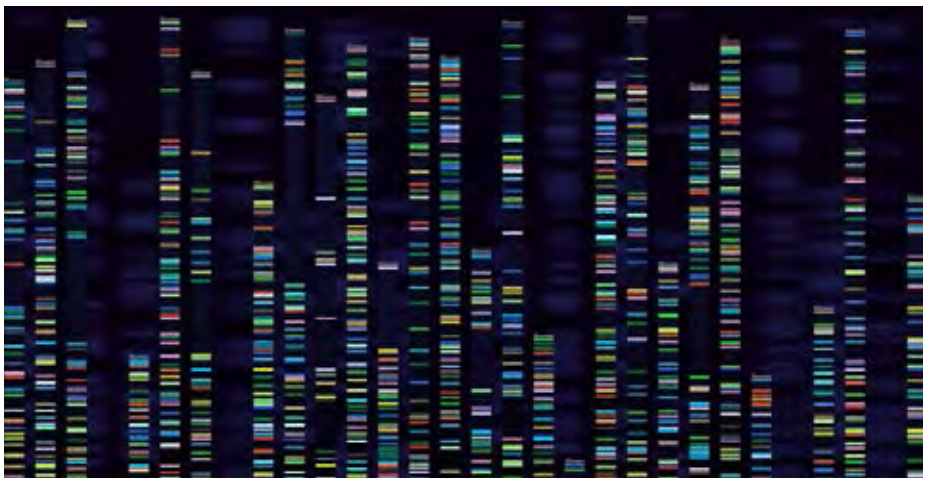
Shikha Roy and Dinesh Gupta developed the DriverFuse package to integrate orthogonal data types such as Structural Variants (SV) and Copy Number Variations (CNV) to characterize fusion genes in cancer datasets. A fusion gene is reported as a driver or passenger fusion gene, based on mapping SV and CNV profiles.

DriverFuse generates a fusion plot of fusion genes with their mapping SV, CNV profile, domain architecture and classification of its role in cancer.

The analysis facilitates discrimination of driver fusions from passenger fusions. To demonstrate the utility of DriverFuse, we analyzed two datasets, one each for CCLE (Cancer Cell Line Encyclopedia) for lung cancer and HCC1395BL for breast cancer. The analysis validates the driver fusion genes that are already reported for the datasets. Thus, DriverFuse is a valuable tool for studying the driver fusion genes in cancers, enabling the identification of recurrent complex rearrangements that provide intuitive insights into disease driver events.

The DriverFuse consists of several functions developed for specific tasks. The DriverFuse function Input_svc creates an input SV file for a user input data to determine if a mapping fusion gene is "Driver" or a "Passenger". Input_cnv function creates an input CNV file for a user input data to determine if a mapping fusion gene is "Driver" or a "Passenger." Driver_result_list classifies list of input fusion genes into "Driver" or "Passenger" fusion genes, based on mapping coordinates of SVs and the CNVs. The Driver_object function creates an object of input fusion gene based on their mapping SV and CNV. The function Driver_plot plots the mapping SV and CNV profile for input fusion transcripts. The Driver_correlation_coefficient function plots the correlation coefficient between mapping SV and CNV profile for a given input fusion gene. The Cancer_gene_classification function provides genomic annotation for the driver fusion gene, categorizing its role in cancer along with other features such as tumor and mutation type. The Driver_domain function provides genomic feature annotation for driver fusion genes. Exploring the domain-level landscape of fusion genes is important to identify the role of the genes in cancer progression.

Unlike previously developed tools, DriverFuse classifies input fusion genes as driver or passenger fusion genes based on mapping SV and CNV profiles. The utility of DriverFuse has been demonstrated by the analysis of two datasets with known driver fusion genes. It predicts the driver fusion genes and provides the information of molecular events responsible for its formation. Additionally, it is a user-friendly R package that provides additional information such as



domain architecture and cancer gene classification, which gives clues for its biological mechanism for promoting or accompanying cancer.

Korea to offer inhaled COVID-19 antibody cocktail therapy

07 February 2022

Celltrion Group, based in South Korea, has submitted an Investigational New Drug (IND) application to conduct a global Phase III clinical trial evaluating the efficacy and safety of an inhaled COVID-19 antibody cocktail therapy for patients with mild-to-moderate symptoms of COVID-19; the trial is expected to enrol 2,200 patients globally.

The inhaled COVID-19 antibody cocktail is a combination of monoclonal antibodies with regdanvimab (CT-P59) and CT-P63 and has been developed to target newly emerging mutations of SARS-CoV-2, including the Omicron variant (B.1.1.529).

The global Phase III clinical trial proposed in the IND is designed to evaluate the safety and efficacy profile of the inhaled COVID-19 antibody cocktail.

The muco-trapping antibody platform used for the inhaled COVID-19 antibody cocktail directly traps the virus in airway mucus, preventing the local spread of the infection, and quickly eliminates the virus from the lungs through the body's natural ability to clear mucus.

Dr. HoUng Kim, Ph.D., Head of Medical and Marketing Division at Celltrion Healthcare said, "Inhaled delivery substantially reduces the dose required to achieve a therapeutic effect compared to intravenous injections, thereby reducing the cost of treatment.

Merck's cancer blockbuster Keytruda "Might" treat HIV too, Not proved

Merck's Keytruda (pembrolizumab) is the company's blockbuster checkpoint inhibitor used to treat numerous cancers. And now, a study published in Science Translational Medicine suggests it might help treat HIV.

This sounds like early COVID announcements when Ivermectin and several other drugs were reported to give cure against COVID-19 but failed miserably after experts opinions.

Keytruda is an anti-PD-1 antibody. PD-1 stands for programmed cell death protein and is a protein found expressed by T cells during activation. It has a role in regulating the immune system's response. Cancer cells often trigger PD-1 in order to hide from the immune system. Drugs like Keytruda block that interaction, allowing the immune system to work better against tumors.

HIV attacks and "lives" in CD4+ T cells, which express PD-1. The research evaluated the effect of Keytruda on the HIV reservoir — HIV levels in the T cells — in 32 people living with HIV who were on suppressive antiretroviral therapy and also diagnosed with cancer. The authors wrote, "They observed evidence of increased unspliced HIV RNA and the unspliced RNA: DNA ratio, consistent with anti-PD-1 treatment having the potential to reverse HIV latency."

In a statement, Adeeba Kamarulzaman, President of the International AIDS Society, said, "This is an exciting advance. Being able to stop HIV from hiding is an important part of finding an HIV cure."

Novo Nordisk India launch world's only peptide in a pill for diabetes

January 20, 2022

Novo Nordisk India has launched the world's first and only "peptide in a pill", oral semaglutide, a gamechanger in diabetes management. Semaglutide, a GLP-1 receptor analogue (GLP-1 RA) – one of the drug classes to treat diabetes, till now was available only in the form of injections. This is the first time a GLP-1 RA has been developed in an oral formulation.

Oral semaglutide is a co-formulation of GLP-1RA semaglutide with an absorption enhancer SNAC which protects semaglutide from undergoing degradation in the stomach like other peptides and enhances its absorption.

Novo Nordisk invested 15 years of continuous research, innovation, and development to make oral formulation of semaglutide into a reality. Due to this scientific breakthrough, it received the Prix Galien Award in 2020, a prestigious award in the industry, for the best biotech innovation.

It has undergone 10 rigorous Phase 3a clinical trials called PIONEER, across several countries including India.

The completed and ongoing global trials with oral semaglutide includes more than 10,000 patients of which more than 1,000 participants are from India. In addition to the unprecedented glycemic control, oral semaglutide demonstrated unsurpassed weight loss and consistent cardiovascular safety in clinical trials. Oral semaglutide has been approved by the Drugs Controller General of India (DCGI) in 2020. Oral semaglutide, which is indicated for glycaemic control in adults with type 2 diabetes, is expected to be a gamechanger and a life changer in diabetes management.

Speaking at the launch, Vikrant Shrotriya, Corporate Vice President and Managing Director, Novo Nordisk India, said "We are extremely proud and elated to launch oral semaglutide in India. With a strong clinical profile, we believe, it has the potential to revolutionise the treatment of type 2 diabetes, given that millions of people do not achieve the targeted blood sugar levels with currently available oral antidiabetic medications. Its launch coincides with our hundred-year centenary of insulin discovery, that changed the life of people with diabetes needing insulin.

He added, we believe, semaglutide in oral form will transform the management of diabetes – demonstrating our dedication to advancing patient care through continued innovation."

167 Deaths Reported As Adverse Events After Second Dose Vaccination: Centre

February 11, 2022

Minister of State for Health Bharati Pravin Pawar on Friday informed the Lok Sabha that 167 deaths have been reported as Adverse Events Following Immunization (AEFI) after the second dose of the COVID-19 vaccine in the country.

The highest number of 43 fatalities has been reported as AEFI from Kerala, followed by 15 from Maharashtra, 14 from West Bengal and 12 each from Madhya Pradesh and Odisha, according to data provided by the minister in response to a written question.

Further, Mr Pawar said 1,53,26,714 precaution doses have been adminis-

tered to eligible beneficiaries, of which 37,00,573 doses went to healthcare workers, 48,84,424 doses to frontline workers and 67,41,717 doses to people aged 60 years and above having co-morbidities.in this case the genetically-modified pig's heart, is the only option available for a patient faced with a serious or life-threatening medical condition. The authorization to proceed was granted in the hope of saving the patient's life.

India develops first universal infectious disease genomic test

February 8, 2022

The test deploys Next-Generation Sequencing (NGS) technology to identify existing and emerging infections, while providing information on drug resistance.

HaystackAnalytics, an Indian healthtech startup, supported by the Department of Science & Technology, Govt of India, Dr Velumani, and private players such as GE Healthcare and Intel, has developed the first of its kind Universal Infectious Diseases (ID) Test in the country, that deploys Next-Generation Sequencing (NGS) technology to identify existing and emerging infections, while providing information on drug resistance to support and identify correct treatment options for patients.

HaystackAnalytics has partnered with various diagnostic centers such as Unipath, Anderson, Sterling Accuris, Apollo Hospitals and over 20+ hospitals including AIIMS, to introduce their Sequencing based clinical products for TB and COVID-19 in the past.

The new Universal Infectious Diseases test developed by HaystackAnalytics will be rolled out with their current partners in a phased manner over the next three months, and will be initially targeted at identifying and treating sepsis in Intensive Care Unit (ICU) patients, but gradually be made available to anyone suffering from a fever of unknown origin, by eradicating the need to conduct multiple tests.

The Universal Infectious Diseases (UID) test developed by HaystackAnalytics, comes at an opportune time, as the learnings from the Covid-19 pandemic highlight the need for better diagnostic technologies, appropriate antibiotic use, and the renewed importance of infection prevention strategies. HaystackAnalytics is building an all encompassing platform for healthcare, and has already introduced a game-changing TB test which is being used for accurate diagnosis of tuberculosis in India, yet another life threatening disease which claimed over 4.5 lakhs deaths in 2019.

Single shot for every variants of SARS-COV-2 designed by scientists At IISER Berhampur

February 15, 2022

Scientists at the Indian Institute of Science Education and Research (IISER), Berhampur and the Kazi Nazrul University, Asansol claim to have developed a vaccine that can be effective against all variants of coronavirus.

The scientists claim that the peptide vaccine could provide protection against any future variants of coronavirus. The research was accepted for publication in the Journal of Molecular Liquids.

Dr Malay Kumar Rana, Assistant Professor, Chemical Science Department,

IISER Berhampur and two PhD students of the institute Parth Sarthi Sen Gupta and Saroj Kumar Panda and Abhigyan Choudhury and Suprabhat Mukherjee from Kazi Nazrul University were part of the research.

"The designed vaccine was found to be highly stable, antigenic and immunogenic," the researchers said.

The team developed the vaccine using computational methods and the next stage would involve the production of the vaccine which would be followed by testing, said Choudhary.

The vaccine is first-of-its-kind. No other vaccine in the world has been designed to fight all the Coronaviridae family viruses at a single time, he said.

Saroj Panda said permission would be sought from the Indian Council of Medical Research (ICMR) for the trial of the vaccine.

China Drafts New Rules for Gene-edited Crops

January 26, 2022

China has published trial rules for the approval of gene-edited plants, paving the way for faster improvements to crops as it seeks to bolster its food security.

Gene editing - or altering the genes of a plant to change or improve its performance - is viewed by some scientists as less risky than genetically-modifying them, which involves transferring a foreign gene.

The new guidelines, published by the Ministry of Agriculture and Rural Affairs late Monday, come amid a raft of measures aimed at overhauling China's seed industry, seen as a weak link in efforts to ensure it can feed the world's biggest population.

"Given the strong investment of the Chinese government in genome editing, we expect the release of a relatively open policy in the coming years," Rabobank wrote in a December report.

China's research institutes have already published more research on market-oriented gene-edited crops than any other country, it added.

Regulation is also less cumbersome in some countries, such as the United States, although the European Union is still reviewing how to regulate the technology.

The draft rules stipulate that once gene-edited plants have completed pilot trials, a production certificate can be applied for, skipping the lengthy field trials required for the approval of a GM plant.

Flavonoids may reduce mortality risk for people with Parkinson's Disease

January 26, 2022

People with Parkinson's Disease who eat more flavonoids -- compounds found in richly colored foods like berries, cocoa and red wine -- may have a lower mortality risk than those who don't, according to a new study published on Jan. 26 in the journal Neurology.

Specifically, the researchers found that when people who had already been diagnosed with Parkinson's Disease (PD) ate more flavonoids, they had a lower chance of dying during the 34-year study period than those who did not consume as many flavonoids. Additionally, they found that eating more flavonoids before being diagnosed with PD was associated with a lower risk of dying in men, but not in women.

"Adding a few servings of flavonoid-rich foods to their diets a week could potentially be an easy way for people with PD to help improve their life expectancy," said Xinyuan Zhang, Ph.D. candidate in nutritional sciences at Penn State. "Greater consumption of berries and red wine, which are rich in the flavonoid anthocyanins, was particularly associated with lower mortality."

Zhang noted that consumption of wine should not exceed the amount outlined in the Dietary Guidelines for Americans, which is one drink per day for women and two for men.

For this study, the researchers analyzed data on 599 women and 652 men who had recently been diagnosed with PD. Participants were asked how often they ate certain flavonoid-rich foods, such as tea, apples, berries, oranges and orange juice, and red wine. Flavonoid intake was then calculated by multiplying the flavonoid content of those foods by how frequently they were consumed.

After controlling for factors like age and several dietary factors like total calories consumed and overall diet quality, the researchers found that the participants in the group of the highest 25 percent of flavonoid consumers had a 70 percent greater chance of survival than the lowest group.

The researchers also analyzed the effects of individual flavonoids. They found that those in the top 25 percent consumers of anthocyanins -- found in red wine and berries -- had a 66 percent greater survival rate compared to those in the lowest 25 percent. Additionally, the top 25 percent consumers of flavan-3-ols -- found in apples, tea and wine -- had a 69 percent greater survival rate compared to the lowest 25 percent.

Journal Reference: Intake of Flavonoids and Flavonoid-Rich Foods, and Mortality Risk Among Individuals With Parkinson Disease: A Prospective Cohort Study. Neurology, 2022; 10.1212/WNL.0000000000013275 DOI: 10.1212/WNL.0000000000013275

Intranasal flu vaccine with nanoparticles offers robust protection, research

January 31, 2022

An influenza vaccine administered through the nose and constructed with nanoparticles that enhance immune response offers strong protection against different influenza virus strains, according to researchers in the Institute for Biomedical Sciences at Georgia State University. These comprehensive immune responses and cross protection were long lasting, exhibiting defense from influenza virus over six months after immunization. The findings are published in the journal ACS Applied Materials & Interfaces.

"The PEI-HA/CpG nanoparticles show good potential as a cross-protective influenza vaccine candidate," said Dr. Baozhong Wang, corresponding author of the study and a professor in the Institute for Biomedical Sciences at Georgia State. "The combination of PEI and CpG in the PEI-HA/CpG nanoparticle group contributed to the multifaceted immune responses, leading to vigorous cross protection. The incorporation of CpG and antigens into the same nanoparticle enhanced cellular immune responses.

"Our results revealed that the nanoparticles significantly enhanced HA immunogenicity, or the ability to provoke an immune response, providing cross protection against different influenza virus strains. The conserved HA stalk region induced substantial antibodies in the nanoparticle immunization groups."

Journal Reference: Polycationic HA/CpG Nanoparticles Induce Cross-Protective Influenza Immunity in Mice. ACS Applied Materials & Interfaces, 2022; DOI: 10.1021/acsami.1c19192

Largest genetic study of migraine to date reveals new genetic risk factors

February 8, 2022

In the largest genome study of migraine yet, researchers have more than tripled the number of known genetic risk factors for migraine. Among the identified 123 genetic regions are two that contain target genes of recently developed migraine-specific drugs. The study involved leading migraine research groups in Europe, Australia and the United States working together to pool genetic data from more than 873,000 study participants, 102,000 of whom had migraine. The new findings, published on February 3, 2022 in the journal Nature Genetics, also uncovered more of the genetic architecture of migraine subtypes than was previously known.

To gain more insight into the specific risk genes, researchers from the International Headache Genetics Consortium assembled a large genetic dataset to conduct a genome-wide association study (GWAS), looking for genetic variants that were more common in those who had migraine in general, or one of the two main migraine types. The results demonstrated that migraine subtypes have both shared risk factors and risk factors that appear specific to one subtype. The analyses highlighted three risk variants that appear specific to migraine with aura and two that appear specific to migraine without aura.

One of the newly identified regions contains genes (CALCA/CALCB) encoding calcitonin gene-related peptide, a molecule involved in migraine attacks and blocked by the recently introduced CGRP inhibitor migraine medications. Another risk region covers the HTR1F gene encoding serotonin 1F receptor, also a target for new migraine-specific medications.

Journal Reference:Genome-wide analysis of 102,084 migraine cases identifies 123 risk loci and subtype-specific risk alleles. Nature Genetics, 2022; DOI: 10.1038/s41588-021-00990-0

Researchers discover repair properties of a protein critical for wound-healing in gut diseases

February 10, 2022

An international team led by the Case Western Reserve University School of Medicine has discovered novel properties of the protein Gasdermin B that promotes repair of cells lining the gastrointestinal tract in people with chronic inflammatory disorders like Crohn's disease and ulcerative colitis.

gans that have direct contact with the external environment -- will play a key role in research on wound formation and designing novel therapeutics to enhance wound repair, said Theresa Pizarro, lead study author and the Louis Pillemer Professor of Experimental Pathology at the School of Medicine. In addition to medical school colleagues on campus, researchers included scientists from Cleveland Clinic, Texas, England and Greece.

The scientists analyzed samples from Crohn's disease and ulcerative colitis patients using state-of-the-art techniques, such as single-cell RNA sequencing, CRISPR/Cas9 and epithelial organoid cultures. Results confirmed substantial increases of GSDMB in biopsies of those with IBD, particularly ulcerative colitis, when compared to levels of GSDMB found in healthy individuals.

The findings unexpectedly showed

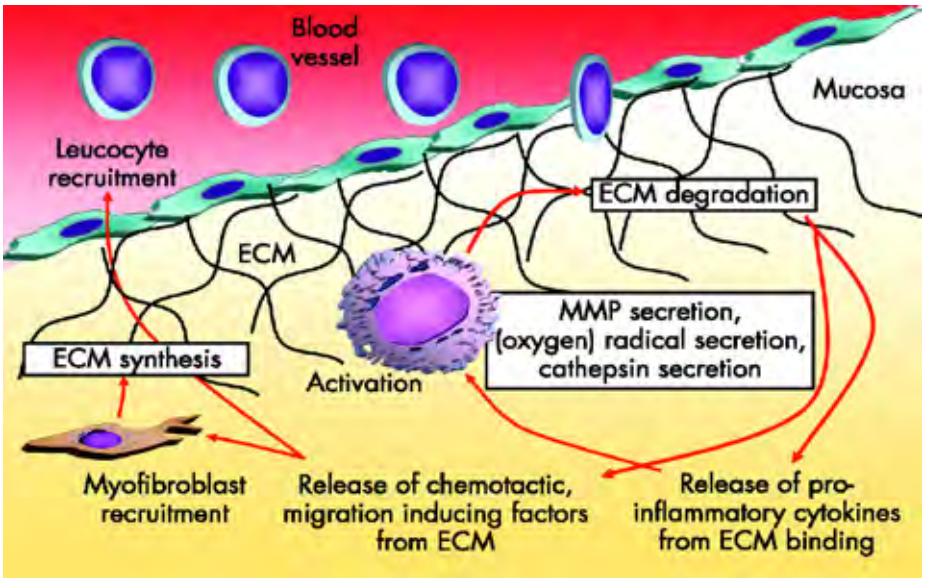


Image: Gut Wound healing and fibrosis in intestinal disease. Source: BMJ

The new findings, recently published in the journal, Cell, are significant because the impact of Gasdermin B (GSDMB) on healing epithelium -- a type of body tissue that lines the organs that have direct contact with the external environment -- will play a key role in research on wound formation and designing novel therapeutics to enhance wound repair, said Theresa Pizarro, lead study author and the Louis Pillemer Professor of Experimental Pathology at the School of Medicine. In addition to medical school colleagues on campus, researchers included scientists from Cleveland Clinic, Texas, England and Greece.

The scientists analyzed samples from Crohn's disease and ulcerative colitis patients using state-of-the-art techniques, such as single-cell RNA sequencing, CRISPR/Cas9 and epithelial organoid cultures. Results confirmed substantial increases of GSDMB in biopsies of those with IBD, particularly ulcerative colitis, when compared to levels of GSDMB found in healthy individuals.

The findings unexpectedly showed the lack of epithelial cell death due to GSDMB; instead, this increased level led to:

Proliferation, or the growth of new cells;

Migration, or the movement of cells;

And decreased adhesion dynamics -- the attractive forces between cells and other surfaces that affect motility.

Together, these processes promote restoration of the epithelial layer and effective wound-healing, Pizarro said.

Journal Reference: GSDMB is increased in IBD and regulates epithelial restitution/repair independent of pyroptosis. Cell, 2022; 185 (2): 283 DOI: 10.1016/j.cell.2021.12.024

Researchers highlight COVID-19 neurological symptoms and need for rigorous studies

January 20, 2022

Neurological symptoms that have been reported with acute COVID-19 include loss of taste and smell, headaches, stroke, delirium, and brain inflammation. There does not seem to be extensive infection of brain cells by the virus, but the neurological effects may be caused by immune activation, neuroinflammation, and damage to brain blood vessels.

Acute COVID-19 infection can sometimes lead to long-lasting effects, that have collectively been termed "Long Covid," and can include a wide variety of symptoms in the brain and nervous system that range from a loss of taste

and smell, impaired concentration, fatigue, pain, sleep disorders, autonomic disorders and/or headache to psychological effects such as depression or psychosis.

Drs. Nath and Spudich outline the current scientific understanding of the potential body responses to acute COVID-19 infection and how those responses could lead to Long Covid symptoms.

They also draw parallels between the symptoms experienced by individuals with Long Covid to those living with myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) or post-Lyme disease, which suggests there could be common risk factors involved.

Finally, owing to the significant variability in symptoms from person to person and the fact that many individuals with Long Covid were healthy prior to a relatively mild COVID-19 infection, the authors highlight the urgent need for significant research efforts into identifying the full extent of Long Covid complications and their causes.

This kind of research, which would include the careful study of individuals with Long Covid categorized by their specific symptoms, is crucial to the development of diagnostic and therapeutic tools to identify and treat what is becoming an ever-increasing public health concern. The NIH RECOVER COVID initiative is an ambitious research program to reach these goals.

Journal Reference: Nervous system consequences of COVID-19. Science, 2022; 375 (6578): 267 DOI: 10.1126/science.abm2052

Scientists profile FDA-approved drugs to potentially treat hundreds of genetic disorders

February 3, 2022

A team of biomedical scientists at the University of California, Riverside, has designed a simple and robust method to determine the effects of drugs on Nonsense-mediated RNA decay, or NMD. The researchers profiled all current Food and Drug Administration-approved drugs to identify NMD modulators, which could potentially help treat hundreds of disorders associated with NMD.

Zheng explained that current FDA-approved drugs are not known to target NMD. They have not been examined closely for their effect on cellular NMD activity. For this study, Zheng and his team first developed a robust sensitive assay or test, termed AS-NMD assay, that quantitatively measures cellular NMD activity. They then obtained a library of 704 FDA-approved drugs. They treated cells with each of these drugs and measured the cellular responses using the AS-NMD assay.

"We wanted to know whether the FDA-approved drugs can be repurposed to modulate NMD," he said. "So we treated cells with each FDA-approved drug and tested whether cellular NMD activity was affected. We found one drug had a strong effect on NMD; four drugs had mild effects. We now have solid information for the effect of 704 FDA-approved drugs on NMD. What made this possible is the method we developed, without which profiling 704 drugs to such a precision level would be unthinkable. Old methods are either too tedious or not precise enough.

Journal Reference: Molecular profiling of individual FDA-approved clinical drugs identifies modulators of nonsense-mediated mRNA decay. Molecular Therapy - Nucleic Acids, 2022; 27: 304 DOI: 10.1016/j.omtn.2021.12.003

Strong and elastic, yet degradable: protein-based bioplastics

February 12, 2022

A team of researchers have now introduced novel bioplastics with properties that can be tailored according to need. To do this they developed two lysine-rich proteins and produced them in bacterial cultures: "ELP" is a polypeptide similar to the connective tissue protein elastin. It does not have defined folding, which leads to tough-

ness and elasticity. "SRT" consists of ELP plus crystalline segments of a squid protein with a β-sheet structure.

ELP (or SRT) is crosslinked with a polyethylene glycol (PEG) derivative by way of its lysine amino side-groups. (PEG is used in pharmaceuticals, among other things.) If the crosslinking occurs in water, the material can then simply be dried in a mold. The result is a tough, transparent, solvent-resistant bioplastic. Its mechanical properties can be varied by changing the proportion of PEG. This allows for the production of bioplastics with high mechanical strength at room temperature in any shape desired, and without toxic chemicals or complex processing steps such as liquefaction, extrusion, or blow molding. Their breaking stress exceeds those of many commercial plastics. One problem left is that they swell in water.

If ELP is crosslinked in a water/glycerol solution, the material gels into soft, elastic bioplastics. The team also used wet spinning to produce biofibers that are as strong as some biotechnological spider silks. The natural enzyme elastase completely degrades all of the new protein-based bioplastics.

Journal Reference: Biosynthetic Structural Proteins with Super Plasticity, Extraordinary Mechanical Performance, Biodegradability, Biocompatibility and Information Storage Ability. Angewandte Chemie International Edition, 2022; DOI: 10.1002/anie.202117538

Study now links non-mutated Apolipoprotein E to dementia in the aging brain

January 31, 2022

Researchers exploring dementia-related proteins in the brain identified Apolipoprotein E (ApoE) as a key misfolded protein. About 25% of individuals, and 50% of individuals with Alzheimer disease, have a genetic mutation, the APOE ε4 allele -- a known risk factor for the disease. The researchers were surprised to find that even in the brains of patients without the disease-driving APOE ε4 allele, ApoE proteins were strongly enriched in dementia. Their findings appear in The American Journal of Pathology, published by Elsevier.

The investigators used mass spectrometry to characterize the complete set of proteins, or proteome, from the amygdalae of 40 participants from the University of Kentucky Alzheimer's Disease Center autopsy cohort. The amygdala is vulnerable to mis-aggregated proteins associated with dementia and is often affected even at the earliest stages of disease. The subjects ranged from cognitively normal to severe amnestic dementia. Although previous studies have examined the human amygdala proteome, none have reported on a sample of this size with dementia subjects and control subjects for comparison.

As anticipated, portions of proteins previously associated with neurodegenerative diseases were found in the brains of patients with dementia, including proteins called Tau (associated with neurofibrillary tangles), Aβ (associated with amyloid plaques), and α-Synuclein (associated with Lewy Body disease). Aβ and α-Synuclein correlated strongly with clinical diagnosis of dementia. Tau and Aβ proteins, but not α-Synuclein, were occasionally detectible in cognitively normal subjects and those with mild cognitive impairment. Overall, Dr. Nelson observes, the findings for these proteins were in line with expectations.

The data also revealed a close correlation between dementia diagnosis and the detection of ApoE peptides in the brain. The correlation with dementia for ApoE was even stronger than that seen for Tau, Aβ, or α-Synuclein. Moreover, the ApoE peptides were significantly enriched even in dementia patients who lack the APOE ε4 allele. The results emphasize the relevance of the ApoE protein as an aberrantly aggregated protein in its own right, rather than just an "upstream" genetic risk factor.

Journal Reference:
Apolipoprotein E Proteinopathy Is a Major Dementia-Associated Pathologic Biomarker in Individuals with or without the APOE Epsilon 4 Allele. The American Journal of Pathology, 2021; DOI: 10.1016/j.ajpath.2021.11.013

Bad Research

Court injunction forces gastro journal to slap expressions of concern on 40 articles about probiotics

February 6, 2022

A gastroenterology journal has issued expressions of concern for forty articles about a probiotic formulation that has been at the center of a long-running legal saga in the United States and Europe.

The articles appeared in the Journal of Crohn's and Colitis, the official journal of the European Crohn's and Colitis Organisation (ECCO) and date back to 2007. All mention a proprietary formulation of probiotics – and therein lies the tale.

The formulation in question was developed decades ago by an Italian researcher named Claudio De Simone. Until 2016, the formulation was sold in United States by Sigma-Tau as VSL#3 – and was referred to as such in scores of journal articles in the gastroenterology literature. In Europe and Canada, Ferring Corp. had the rights to sell VSL#3, although it ceased doing so a few years ago (more on that in a moment).

Sigma-Tau (which had merged with another firm to become Alfasigma) continued to sell a version of the formulation under the name VSL#3. De Simone and ExeGI objected, and sued the company for false advertising. Among the allegations was that Alfasigma was citing clinical studies of VSL#3 without noting that the product used in those trials was not identical to the one it was now selling.

In 2018, a federal court ruling in Maryland agreed, awarding De Simone nearly $20 million in damages and other fees in the case – a judgment that was upheld on appeal. The ruling also barred Alfasigma from citing trials of the De Simone formulation as if it were its own product.

How the FDA could save 2,700 clinical trials from becoming research waste

February 9, 2022

By law, the FDA can and should fine Cutera and the University of Virginia over $10,000 per missing trial result per day.

'Medical aesthetics' company Cutera appears unwilling to disclose efficacy and safety data from clinical trials of the medical devices it sells – unless and until the FDA forces it to put its cards on the table. TranspariMED has over the past two years repeatedly exhorted the company to come clean about its 16 overdue clinical trial results, and upload them onto ClinicalTrials.gov as required by law.

The University of Virginia currently owes its patients and the public the results of 28 clinical trials in violation of the law, making it by far the most profligate law-breaker among American medical research institutions.

Reshma Ramachandran from the student campaign group Universities Allied for Essential Medicines told STAT News that:

If the FDA had enforced the law, it could already have collected over $155 million from Cutera and over $245 million from the university, according to the University of Oxford's FDAAA Tracker. In total, the FDA could have collected nearly $28 billion in fines from law-breaking companies and institutions across the country.

Instead, the FDA is responding to the over 3,000 missing clinical trial results by sending out less than two letters per week, data obtained through a Freedom of Information request and made public by student group Universities Allied for Essential Medicines shows.

"If the FDA is not willing to step in, perhaps the NIH should take a closer look at these and other non-compliant institutions before disbursing further grant funds."

KCL investigation finds misconduct in Lancet Neurology paper

February 8, 2022

A Lancet journal has issued an expression of concern for a 2019 paper by a group in the United Kingdom whose work was found to have included fabricated data and other misconduct.

The article, "Serotonergic pathology and disease burden in the premotor and motor phase of A53T α-synuclein parkinsonism: a cross-sectional study," came from a team at King's College London led by researchers at the school's Neurodegeneration Imaging Group. The senior author on the paper, which appeared in Lancet Neurology, was Marios Politis, who has since left KCL for the University of Exeter.

Here's the expression of concern:

On Dec 15, 2021, we received notification from the Research Integrity Office, Department of Research Governance, Ethics & Integrity, at King's College London (London, UK) that an investigation into research misconduct upheld five allegations concerning an Article in The Lancet Neurology.1 These allegations are falsification, misrepresentation of data, fabrication of results, misrepresentation of involvement, and failure to follow accepted procedures.

On Dec 22, 2021, the authors of the Article notified us of their intention to appeal the decisions and recommendations of the Inquiry Panel that carried out the investigation. We are therefore issuing an expression of concern to alert readers to the fact that serious scientific and ethical concerns have been brought to our attention. We will update this notice as soon as we have information on the outcome of the appeal and the conclusions of the Research Integrity Office on this procedure.

Paper overestimated risk of COVID-19 to endangered apes, retracted

February 9, 2022

A Springer Nature journal has retracted a 2021 article with dire

news for mountain gorillas in Rwanda's Volcanoes National Park about the prospects of extinction on the spikes of SARS-CoV-2 after finding a fatal error in their model of the outbreak.

The article, "Exploring the potential effect of COVID-19 on an endangered great ape," appeared in October in Scientific Reports and was written by a group at the University of Southern Denmark and the the Dian Fossey Gorilla Fund, in Atlanta. The retraction notice explains, the prospect of extinction doesn't appear to be as bad as the authors reported:

It was brought to our attention that we had made an error in our simulation study of the potential effect of SARS-CoV-2 on a subpopulation of the Virunga mountain gorilla population. Specifically, instead of using human infection fatality rates (IFRs) as a reference for our simulations, we used case fatality rates (CFRs) from studies published early during the pandemic in Wuhan, China, and Italy, adjusted to the longevity of the mountain gorillas. Case fatality rates, particularly those early during the pandemic, have since been found to be considerably higher than the actual infection fatality rates. After repeating our analyses with this updated information and using the adjusted CFRs instead of IFRs, we found that our published results significantly overestimated the chances of extinction of the population should a COVID-19 outbreak occur. Although the revised findings are important for mountain gorilla conservation, they substantially change the conclusions of the study. In light of these important discrepancies, we deem it necessary to retract this study.

Paper used to support claims that ivermectin reduces COVID-19 hospitalizations is withdrawn by preprint server

February 11, 2022

The overseers of the preprint server SocArXiv have withdrawn a paper which claims that treating Covid patients with ivermectin dramatically reduces their odds of hospitalization, calling the work "misleading" and "part of an unethical program by the government of Mexico City to dispense hundreds of thousands of doses of an inappropriate medication to people who were sick with COVID-19."

"Ivermectin and the odds of hospitalization due to COVID-19: evidence from a quasi-experimental analysis based on a public intervention in Mexico City," has been a source of controversy for SocArXiv since it was accepted for the site in May 2021.

The paper was written by José Merino, head of the Digital Agency for Public Innovation (DAPI), along with co-authors DAPI, the Mexican Social Security Institute and the Mexico City Ministry of Health. They claimed to find that: We found a significant reduction in hospitalizations among patients who received the ivermectin-based medical kit; the range of the effect is 52%- 76% depending on model specification.

The controversial article, which has been downloaded more than 11,000 times, has been used to justify expenditures on ivermectin by the Mexican government to the tune of "hundreds of thousands of dollars," according to SocArXiv, which cites this article in Animal Politico.

The committee acknowledges that other SocArXiv preprints may "have serious flaws as well" but says that "this particular bad paper appears to be more important, and therefore potentially more harmful, than other flawed work." The withdrawal was, in part, "in response to a community groundswell beseeching us to act," they write.

They continue: Posting a paper on SocArXiv is not in itself an indication of good quality – but it is often a sign that researchers are acting in good faith and practicing open scholarship for the public good. We urge readers to consider this incident in the context of the greater good that open science and preprints in general, and our service in particular, do for researchers and the communities they serve.

Biotech Industry News

Roche Diagnostics India launches COVID-19 At-Home test

Jan 27, 2022

Roche Diagnostics India has announced its latest diagnostic solution– the COVID-19 At-Home Test. The over-the-counter test is intended to be used for detection of SARS CoV-2 infection in individuals with symptoms suggestive of COVID-19 and is approved by the Indian Council of Medical Research (ICMR).

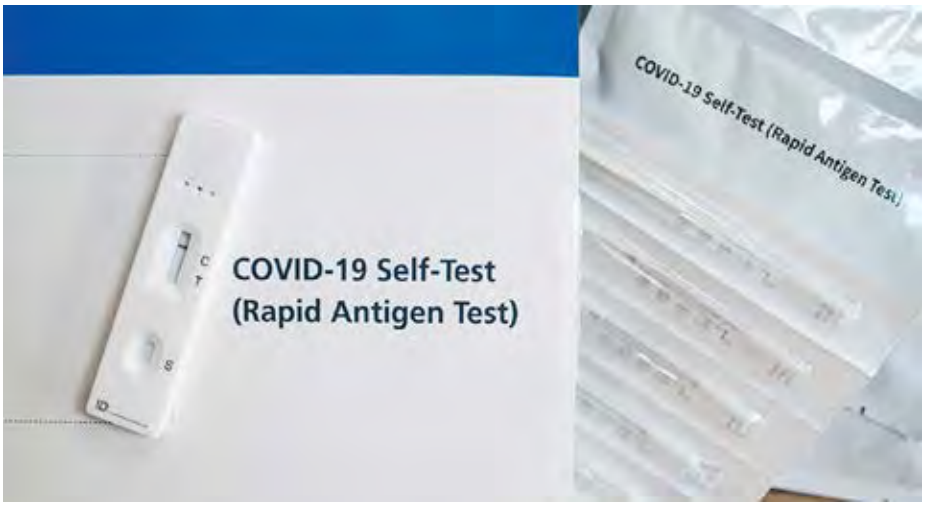
The company has already brought a wide range of COVID-19 testing solutions to the country including the gold standard RT-PCR test, a lab-based antigen test, and Rapid Antigen tests for professional use.

COVID-19 At-Home Test can successfully detect SARS-CoV-2 virus including the Omicron variant.

The Test collects the sample from the front area of the nose instead of the nasopharynx, resulting in a simplified and more comfortable sampling procedure. The test will be available in e-pharmacies and local pharmacies and requires no prescription.

The self-test kit includes a test cassette, a sterile swab, a tube with liquid and nozzle cap, along with a step-by-step self-test guide and QR code to access the instruction video. Users will have to download the 'My Covid-M' app using the QR code which will help them read and interpret the test results and also update the results to the ICMR database (as mandated by ICMR).

The tube with liquid neutralizes the SARS-CoV-2 virus. The test kit will also include a biomedical waste disposal bag for the kit following testing.



Thermo Fisher launches rapid test for detection of airborne SARS-CoV-2 pathogens

08 February 2022

Thermo Fisher Scientific has announced the launch of a new rapid indoor air test to help fight COVID-19. The Thermo Scientific Renvo Rapid PCR Test is the latest solution in the company's product portfolio for monitoring airborne pathogens. The Renvo Rapid PCR Test is applied to air samples collected using the company's Thermo Scientific AerosolSense Sampler.

The Renvo Rapid PCR Test is intended for environmental monitoring only and is not intended for diagnostic use in community settings such as

schools, businesses, healthcare facilities, government agencies and other public areas. This easy-to-use solution provides rapid and extremely accurate detection of SARS-CoV-2 pathogens from indoor air samples and allows users to perform on-site SARS-CoV-2 testing of air samples that are not required for evaluation in a laboratory must be sent.

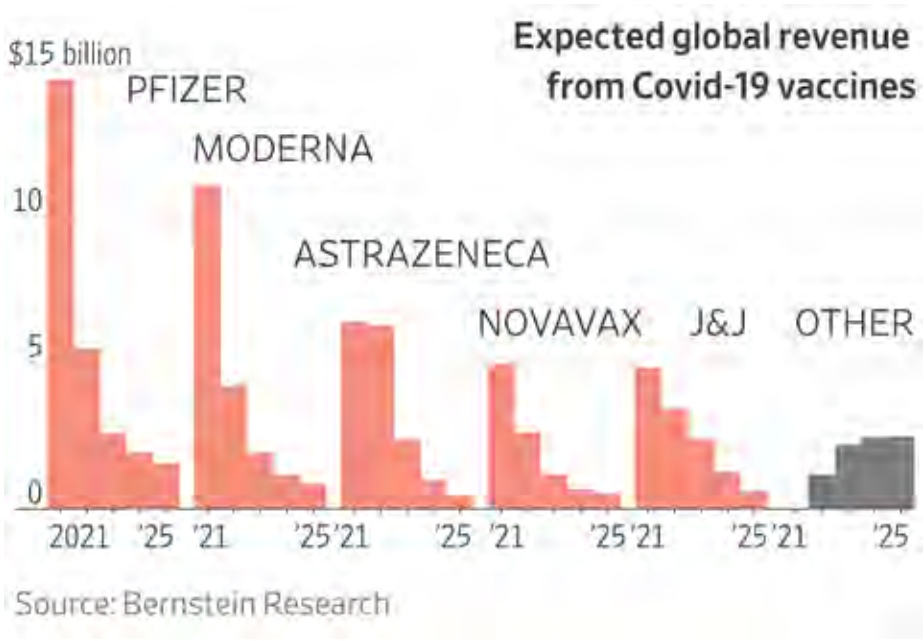
The system uses proprietary Oscar PCR technology to reduce thermocycling times and provide on-site results for SARS-CoV-2 air samples in as little as 30 minutes - a significant improvement over turnaround times of 4 to 24 hours, previously passed at the AerosolSense sampler testing service. This reduced turnaround time supports faster decision making and improves the efficiency of risk mitigation strategies for community sites and facilities.

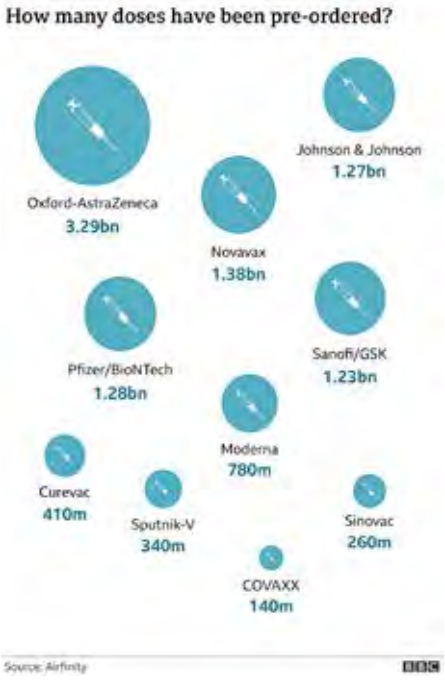
US Companies that are making the Biggest Bucks from COVID-19 Therapeutics Sales

February 6, 2022

Although this news focuses on non-vaccine therapies, it's important to note that the Pfizer-BioNTech vaccine, Comirnaty, brought in $13 billion in third-quarter sales alone, and $12.5 billion in the fourth quarter. SVB Leerink analyst Geoffrey Porges projects the company could rake in $131 billion in total COVID-19-related sales by the end of this year.

1. Gilead Sciences' Veklury. The first new drug to be authorized and approved to treat COVID-19, Gilead's





Veklury (remdesivir) brought in $5.6 billion in sales in 2021. The company's entire revenue for the year was $27.3 billion. Veklury brought in $1.4 billion in the fourth quarter alone, but that dropped about 30% compared to the same quarter in 2020. On the other hand, the $5.6 billion figure was a 98% climb from the total 2020 revenue for the antiviral drug.

2. Eli Lilly's Bamlanivimab/Etesevimab Combo. For the full year, Eli Lilly reported $2.2 billion in sales for its COVID-19 antibody therapies, bamlanivimab/etesevimab. Bamlanivimab is administered alone, but the two drugs are also administered together. It was $1.0631 billion for the fourth quarter, an increase from $872.1 million for the same period in 2020. Total revenue for the year was $28.3 billion, up 15% from 2020's figure of $24.5 billion.

3. Merck and Ridgeback's Molnupiravir. Merck and Ridgeback Therapeutics' molnupiravir is the new kid on the block, an antiviral pill authorized for use in the U.S. in December 2021. In the fourth quarter, the companies sold $952 million worth of the drug and projects $5 to $6 billion for 2022.

4. Regeneron's REGEN-COV. Regeneron's antibody therapy, REGEN-COV, brought in $2.3 billion in the fourth quarter. For the full year, the antibody therapy raised $6.19 billion. Like the Merck antibody therapies, the U.S. government has limited its use against the Omicron variant.

CFX96 TOUCH REAL-TIME PCR SYSTEM

ADVANCING qPCR TOGETHER

Easily start runs using the intuitive touch screen.

The CFX96 Touch Real-Time PCR System is a flexible and precise real-time PCR instrument. Its unsurpassed thermal cycler performance and innovative optical design produce accurate, reliable data. The powerful and intuitive software accelerates every step of your real-time PCR research, shortening the time between getting started and obtaining great results.

Biometra Thermal Cycler Family

Analytik Jena's Biometra thermal cycler family provides outstanding PCR technology.

The Biometra thermal cycler family offers a range of high-quality models to meet individual user needs.

The **Biometra TOne** is a high-performance system with a 96-well block, also available with a gradient function. The combination of excellent technical data and an attractive price makes it the right choice for many research and routine laboratories.

Users looking for a premium system will find their desired device in the **Biometra TAdvanced.** Its features include the combination of ultra-fast heating and cooling rates, the wide range of exchangeable block modules and the professional user management system.

The **Biometra TRIO** thermal cycler includes three independent blocks in one instrument. Both multiuser environments as well as users with lower sample numbers but different samples will enjoy this model. The three-block design and the specific Temperature Optimization Step function support the fast optimization of ideal annealing temperatures.

Biometra TRIO

Biometra TAdvanced Twin

Unique features of the Biometra thermal cycler family:

- **Fast Ramping, Best Accuracy, Block Control (RAC):** What you set is what you get
- **High-performance Smart Lid (HPSL):** Defined pressure control for highly reproducible results
- **Whisper Quiet:** Low noise emission of max. 45 dB
- **Linear Gradient Tool:** For easy gradient programming to identify the ideal annealing temperature