Volume 9 | Issue 105 | April 2022
ISSN: 2454-6968 | RNI No. UPENG/2013/54102
e-copy - Rs. 50 | Print - Rs. 800

BIOTECH EXPRESS

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Tamil Nadu makes scientifically dubious claim on vaccines in the Supreme Court

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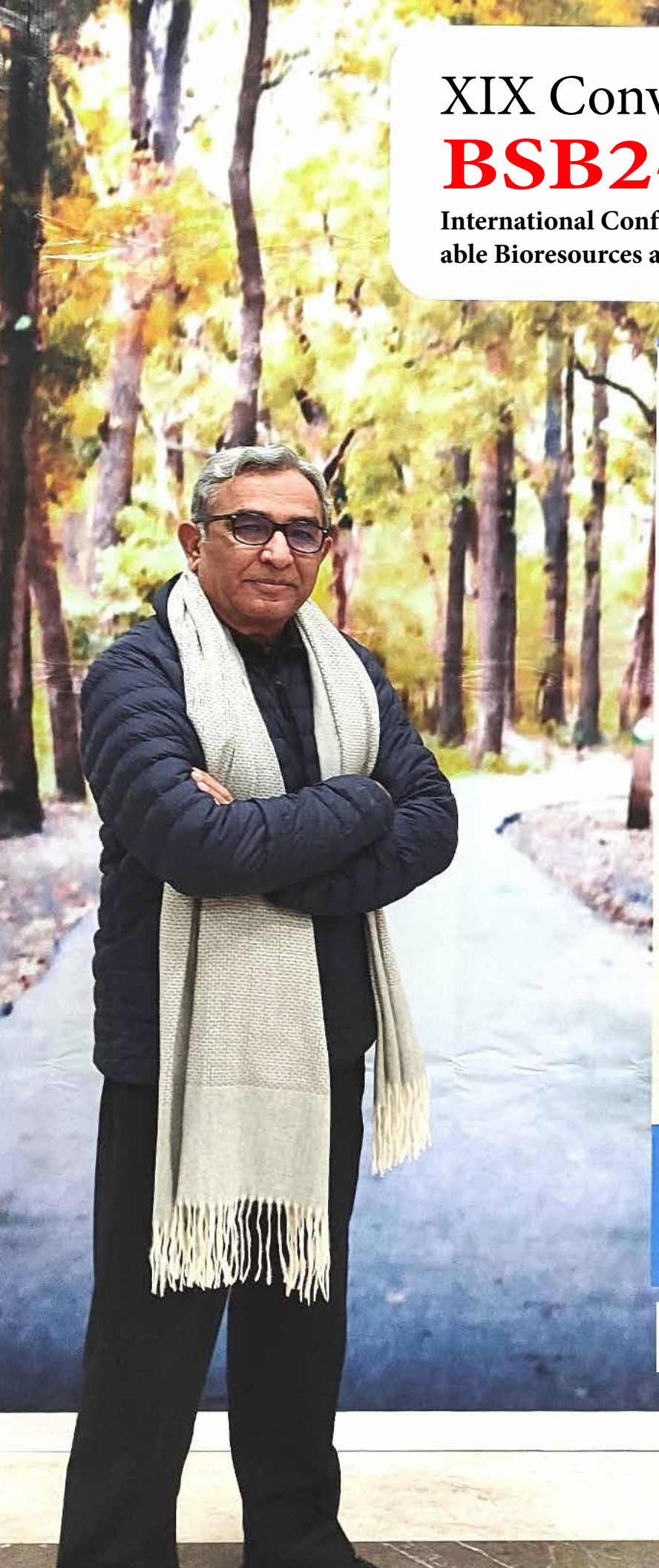

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VOLUME 9 ISSUE 105
April 2022

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

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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

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

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What serious side effects reported after inoculation of Indian COVID-19 vaccines: Survey of AEFI reports

Kamal Pratap Singh

According to the latest news article published on Business Today February 7, 2022, total 70,102 adverse events after vaccination are reported in India in which Covishield comprised 63,315 cases, followed by Covaxin at 6,757 and Sputnik at 30. Out of the total cases a total 1,013 fatalities are reported following the COVID-19 vaccines, 921 were after Covishield, 92 after Covaxin, and Sputnik reported zero such incidents, the Ministry of Health and Family Welfare informed the Parliament.

So we have seen that Covishield has highest rate of adverse event including number of deaths, but it is also important to note that it is also the most inoculated COVID vaccine in India followed by Covaxin and Sputnik. So what is the purpose of this article? This article will discuss about updates on AEFI system in India and what are the side effects people can face while getting injected by vaccines that were granted permission in emergency mode. We will also see how FDA lost the battle in US court in regard to disclosing of vaccine trial data that it used to get approval of the vaccine but later this data revealed hidden secrets.

The COVID vaccine inoculation in India was started on Jan 16, 2021. Covishield was first vaccine to get EUA from Drugs Controller General of India (DCGI), it was version of Oxford Astrazeneca vaccine which was produced in India and thus Covaxin was the only vaccine that was produced indigenously. Since Oxford vaccine was approved worldwide SII got the advantage of early inoculation and thus comprises large number of doses as compared to Covaxin, even today Covaxin is assumed to be given to 10% out of total around 185 million doses.

Serious adverse events have fuelled mistrust among public from the start

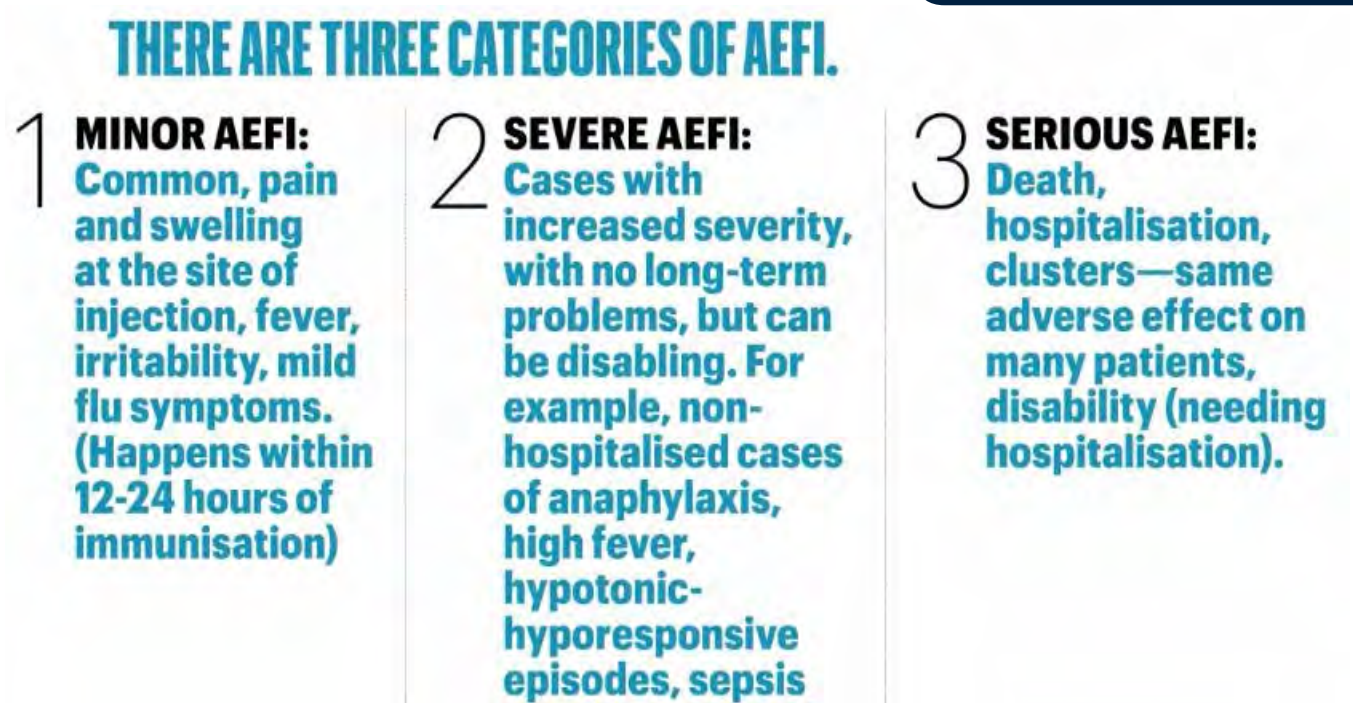


Image source: https://www.fortuneindia.com/

of inoculation not only in India but in US and other countries where many serious adverse events after Pfizer and other vaccines were reported but ignored. Vaccine hesitancy then has become a widespread challenge including in India, particularly in rural areas where 65·5% of the population resides.

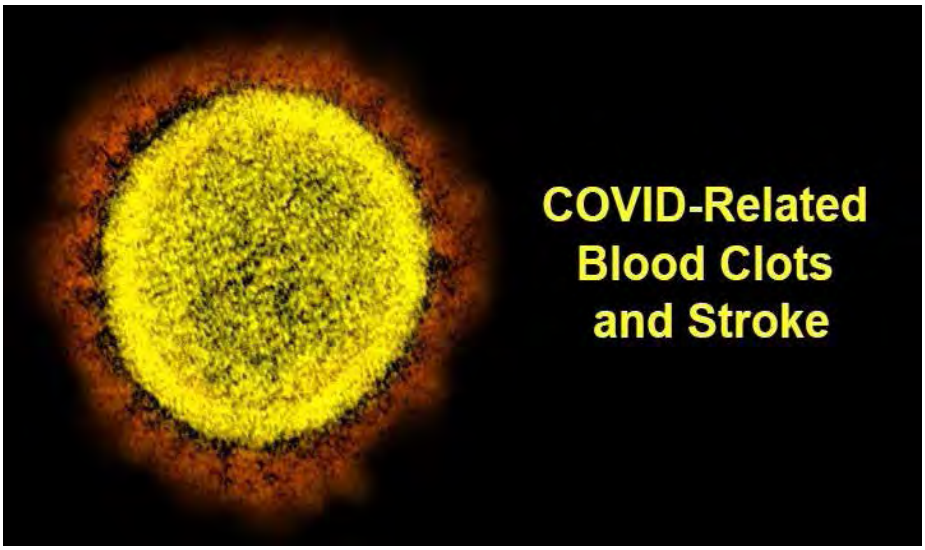
Since the vaccines were given approval without making trial data public, many of the experts have always argued about long term effects of vaccine. They also asked to strengthen Adverse event reporting system like the USA having where anyone can make entries to public databases whereas in India these events are fed by concerned department only. The government of India also in its reply said that AEFI reported in developed countries is well established, it is self-reporting of adverse drug reactions and using the internet for reporting AEFI online.

AEFI reporting not sufficient

In comparison to developed countries the adverse event reporting system is not strong enough in India. As reported by TOI on Jul 22, 2021, head of the AEFI committee, Dr N K Arora, asked vaccinators to report all events of concern occurring within 28 days of Covid-19 vaccination. He added that due to low AEFI reporting, the country may be missing some adverse events, which could be of relevance to Indian and foreign regulators as some vaccines in use in the country have also been deployed globally. This implies that Dr Arora was also convinced by the fact that proper reporting of adverse events was not taking place. The national Adverse Effects Following Immunisation (AEFI) committee at the time urged all states to ensure all side-effects after Covid-19 jabs are reported to the CoWIN portal. The committee said there was drastic drop in reporting levels by states.

The co-convenor of the All India Drug Action Network, Malini Aisola, also said that the current reporting system is extremely weak and unresponsive. She said, "Many people were facing difficulties while reporting AEFI, let alone securing medical support from the vaccination programme, even though there is a provision for medical management in the protocols." She added that the quality of evidence while investigating AEFI at the local level was very poor with many events being brushed aside as unrelated to vaccination, even before the evidence has been collected. "It revealed poor awareness and training among district-level authorities and committees," Aisola said, adding that the slow pace of reporting does not serve the purpose. She said it's also unlikely families of the affected have been informed. "So there is little being done to instil confidence in a system that's meant to protect patient safety".

Since the start of vaccination many



experts are arguing about pitfalls in existing AEFI reporting system but still health ministry has not taken effective steps to overcome the problem and many people are facing difficulties in reporting adverse events. Experts suspect that many of the adverse events are going unnoticed.

Trial Data not provided by Indian manufacturers and Regulators: FDA is doing for Pfizer after US court order

For more expert scrutiny, to gather more adverse event data from Indian Covid vaccine manufacturers, a petition was filed by Dr. Jacob Puliyel, a former member of the National Technical Advisory Group on Immunisation, challenging vaccine mandates, including those that made vaccination a precondition for accessing any benefits or services. He argued that these mandates were violative of the rights of citizens and unconstitutional.

After continuous efforts of Indian Bar Association and Awaken India Movement which challenged covid mandates, in last week of February 2022, Honorable Bombay High court has ended all COVID mandates in state and so did Delhi, U.P and other states (https://timesofindia.indiatimes.com/city/mumbai/train-travel-curbs-removed-hc-now-to-scrutinise-if-covid-fines-were-illegal/articleshow/90672933.cms).

But coming back to adverse event data from vaccine trials, "**Covid-19 vaccine makers refuse to disclose data on adverse events"** as reported by Financial Express, on March 23, 2022 (https://www.financialexpress.com/lifestyle/health/covid-19-vaccine-makers-refuse-to-disclose-data-on-adverse-events/2468515/).

Bharat Biotech and SII told the Supreme Court that such motivated pleas like filed by Dr Puliyal are an attempt to cause vaccine hesitancy and public hysteria in the midst of an unprecedented global pandemic.

Bharat Biotech said that it had extensively published the findings of clinical trials for its Covid-19 vaccine in publicly available reputed peer reviewed journals, including its website and Lancet medical journal.

SII, which manufactures Covishield vaccine, also opposed any plea for disclosure, saying as a matter of principle the petitioner cannot ask for data. "My data is with the regulator. That is where it should be. There is no locus for them (petitioner). Even under the RTI, they have to show there is public interest," it said.

Some experts opposed the statement of Bharat Biotech and SII and said that we have seen how disclosing of Pfizer data is unfolding many secrets, it was done only when US court intervened and ordered probe and FDA is now releasing data of around 4.5 lakh pages. If it can be done in USA then why not in India, if the vaccine data has no problem then why there is a problem for manufacturer to disclose complete data.

In Pfizer case, a federal judge in Texas ordered the FDA to make public the data it relied on to license Pfizer's COVID-19 vaccine. The court "concludes that this FOIA request is of paramount public importance to ensure transparency in the process and dispel doubts about the vaccine's safety.

The petition against Pfizer and FDA was filed by a group that includes more than 200 doctors, scientists, professors and public health professionals, including some who have publicly questioned the efficacy of lockdown policies, mask mandates and the vaccine itself. (https://www.reuters.com/legal/government/paramount-importance-judge-orders-fda-hasten-release-pfizer-vaccine-docs-2022-01-07/)

Earlier, the FDA said it may take until 2096 to release all 451,000 pages it used to approve Pfizer's vaccine. On this, group members argued that if FDA can review these many pages in two months for approval then why it cannot disclose data within a mat-

ter of days. The documents released by the FDA now have been uploaded to the Public Health and Medical Professionals for Transparency website (https://phmpt.org/pfizers-documents/) (also the pages cleared in March) - in total, there are now 150 documents available to view.

After MARCH 2022 release, documents by the US FDA reveal that drugmaker Pfizer recorded nearly 160,000 adverse reactions to its COVID-19 vaccine in the initial months of its rollout.

The reactions ranged from mild to severe and were 1,223 fatal. More than 25,000 nervous system disturbances have been reported, together with 17,000 musculoskeletal and connective tissue disorders and 14,000 gastrointestinal disorders. A range of Several autoimmune conditions have been reported together with some peculiar diseases, including 270 "Spontaneous abortions", and accidents of herpes, epilepsy, heart failure and blows, among thousands of others. (https://www.tasnimnews.com/en/news/2021/12/13/2625070/variety-of-vaccine-side-effects-revealed-in-pfizer-documents)

In a separate report by a Whistle blower Paul D Thacker, he revealed poor practices at a contract research company helping to carry out Pfizer's pivotal covid-19 vaccine trial. The report published in BMJ "**Researcher blows the whistle on data integrity issues in Pfizer's vaccine trial**" raised serious questions about data integrity and regulatory oversight. (*BMJ* 2021; 375 doi: https://doi.org/10.1136/bmj.n2635, Published 02 November 2021)

Similarly serious adverse events were also reported in Oxford-Astrazeneca vaccine like thrombocytopenia-associated cerebral venous sinus thrombosis, multiple thrombosis, and bleeding within a short timeframe after receipt of the vaccine but the EMA concluded that "benefits still outweigh the risks despite possible link to rare blood clots with low blood platelets and allowed the vaccination to continue (https://www.ema.europa.eu/en/news/covid-19-vaccine-astrazeneca-benefits-still-outweigh-risks-despite-possible-link-rare-blood-clots).

Adverse events after Indian COVID vaccines

In India too, serious adverse events including deaths are also being recorded after covid vaccination. Since the AEFI reporting is not so strong experts suspect the number of adverse event are much higher. These adverse events can be accessed on the Ministry of Health and Family welfare website - https://main.mohfw.gov.in/Organisation/Departments-of-Health-and-Family-Welfare/immunization/aefi-reports. As on April 19, 2022, 13 documents that recorded only 1099 cases can be found on this webpage which again raised one important question that where is the publicly available data of remaining 69003 adverse events (see the business today news in first line of article). This data lis in the form of Press releases dated between March 5, 2021 to March 21, 2022. Since this was the only data present, the following observations were made using this data only. From this data, the observations made are given in the table 1.

As per the ministry classification, the AEFI event recorded in the category are shown in Table 1.

It is imperative from the reports that some cases occur where COVID 19

emerged in individuals after injecting covid vaccines, for example as reported in IND(CO-AEFI)PBSAN21004 (covishield) and IND(CO-AEFI)WBDJL21015 (covaxin).

Corbevax, which is a protein-based vaccine manufactured by Biological E, got emergency use authorisation from India's drug regulator on 21 February 2022 for the age group of 12-18 years.Since past 1 months constant news are coming of side effects and deaths in children after vaccine. It is to note that Dr Jayaprakash Muliyil, member of the National Technical Advisory Group on Immunisation in India (NTAGI) said that there is no need for children to get vaccinated against COVID-19 for now. Given that children and adolescents tend to have milder disease compared to adults, the World Health Organization (WHO) states that unless they are part of a group at "higher risk of severe COVID-19", it is "less urgent" to vaccinate them.

The covid vaccine for children was not recommended at all but corbevax has been approved for them **Without NTAGI Clearance**. It is not available in news that if it has any side effects on children but many news are coming about serious side effects after vaccines in children which include deaths in some instances. Since AEFI is weak, one can hope to see the reports after some time and till then we all can just wait for the casualities to happen if any.

Dr Sanjay K Rai, professor of community medicine at AIIMS Delhi also warn about the vaccination in children, he said The risk of vaccine led deaths in children is higher than severity of Covid19" (https://www.youtube.com/watch?v=UVZqjOUcDWY).

Only two news were identified to be included in the article where vaccine and children deaths were connected. Five petitioners filed a petition before the Supreme Court of India say that they lost their children due to adverse effects after taking COVID vaccination.(**https://www.livelaw.in/top-stories/supreme-court-pil-covid-19-vaccination-children-deaths-caused-post-immunisation-189701**) and Kin of 2 girls in Madhya Pradesh say they died after Covid vaccine, in both cases, deaths occurred more than 24 hours after vaccine (http://timesofindia.indiatimes.com/articleshow/88766680.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)

A recent news from WHO reported that it has suspended the supply of COVAXIN under the Covax facility, citing manufacturing deficiencies. Bharat Biotech has agreed on the same and has not challenged WHO, in such a situation it is has not become clear that what were the deficiencies and was it safe in long term to take covaxin which was produced all around the year with existing deficiencies and are there any long term side effects of these manufacturing deficiencies.

Conclusion

It is discussed here that the AEFI reporting system is not comparable to western systems and the entries are made by healthcare personal or concerned staff only, this left many adverse event unreported. Also the adverse events in trial data should be available in public domain so that people can take informed decision more cautiously as the vaccines have serious side effects including unexplained deaths and sudden cardiac arrests, most of the side effects after covishield have clot related diagnosis. Like Pfizer the data can be made public in India too for more transparency. Covishield vaccine has more and serious side effects as compared to covaxin, but it needs more data to make any conclusion in this regard because the number of covaxin doses administered as compared to covishield are very less. Further, In light of above discussion states should curb vaccine mandates and decision about vaccination of children should be seen more cautiously.

Table 1: Showing overall adverse events after vaccination, it does not include the number of times the event reported but if it has happened it is written here. (diseases are explained in BOX 1)

Events	Covishield	Covaxin
A1 - Vaccine Product Related Reaction	Anaphylaxis, Allergy,Fever And Vomiting, Nausea, Sudden Cardiac Death, Thrombocytopenia, Acute Gastritis With Fever, Acute Febrile Illness, Facial Puffiness, Hypotension, Transverse Sinus Thrombosis with Temporal Haemorrhagic Infarct, Multisystem Inflammatory Syndrome Of Children, Joint Pain, Myalgia, Angioedema	Anaphylaxis, Syncope, Allergic Reaction, Acute Febrile Illness
A2 - Vaccine Quality Defect Related Reaction	Only 1 event reported	None
A3 - Immunization Error Related Reaction		
A4 - Immunization Anxiety Related Reaction	Vasovagal Presyncope, Vertigo, Conversion Reaction	Vasovagal Attack
B1 - Temporal Relationship Is Consistent But There Is Insufficient Definitive Evidence For Vaccine Causing Event	Acute Transverse Myelitis, Guillain Barre Syndrome, Facial or Bell's Palsy, Plasma Cell Myocarditis With CHF, Seizure, Acute Myocardial Infarction, Ischemic Stroke, Retinal Vein Occlusion, Acute Disseminated Encephalomyelitis, Acute Idiopathic Thrombocytopenic Purpura, Focal Seizure, Sensorineural Hearing Loss, Acute Multi Segmental Demyelination of Cord, Sub Arachanoid Haemorrhage, Sudden Cardiac Death, Optic Neuritis, Urticaria, Neuromyelitis Optica, Lower Limb Deep Vein Thrombosis, Unstable Angina	Right Basal Ganglia Haemorhagic Stroke, Arthralgia
B2 - Reviewing Factors Result In Conflicting Trends Of Consistency And Inconsistency With Causal Association To Immunization	Peripheral Facial Nerve or Bell's Palsy, Seizure, Thrombosis With Thrombocytopenia	
C - Coincidental - Underlying Or Emerging Condition(S), Or Conditions Caused By Exposure To Something Other Than Vaccine	Acute Coronary Syndrome, Sudden Cardiac Death, Herpes Zoster Covid 19 Disease, Covid 19 Pneumonia, Urinary Tract Infection With Acute Kidney Injury, Acute Gastroenteritis, Acute Ischaemic Stroke, Eye Keratitis, Cervical Spondylosis, Tubercular Meningo-Encephalomyelitis, Benign Paroxysmal Positional Vertigo, Lower Respiratory Tract Infection, Pontine Infarct, Hypocalcemic Tetany	Acute Exacerbation of Bronchial Asthma, Cereberovascular Accident, Acute Gastritis, Covid-19 Disease
D - Unclassifiable	Unexplained Death	

Note: Some entries may be missing, For complete information please visit MoHFW, India website.

BOX: A short introduction to Diseases that appeared after AEFI

Source – Mayo Clinic online disease data (https://www.mayoclinic.org/)

1. Anaphylaxis - Anaphylaxis is a severe, potentially life-threatening allergic reaction. It can occur within seconds or minutes of exposure to something you're allergic to.
2. Thrombocytopenia – It is a condition in which you have a low blood platelet count.
3. Gastritis - Inflammation of the lining of the stomach.
4. Febrile illness - Fever of unknown origin.
5. Cerebral venous sinus thrombosis - occurs when a blood clot forms in the brain's venous sinuses. This prevents blood from draining out of the brain. Venous sinus, in human anatomy is any of the channels of a branching complex sinus network that lies between layers of the dura mater, the outermost covering of the brain, and functions to collect oxygen-depleted blood.
6. Hemorrhagic infarct (HI) can be defined as an ischemic infarct in which an area of bleeding exists within necrosing cerebral tissue i.e. bleeding in brain and death of brain tissue.
7. Myalgia describes muscle aches and pain, which can involve ligaments, tendons and fascia, the soft tissues that connect muscles, bones and organs.
8. Angioedema is swelling underneath the skin. It's usually a reaction to a trigger, such as a medicine or something you're allergic to. It is not normally serious, but it can be a recurring problem for some people and can very occasionally be life-threatening if it affects breathing.
9. Vasovagal syncope - occurs when you faint because your body overreacts to certain triggers, such as the sight of blood or extreme emotional distress. It may also be called neurocardiogenic syncope. The vasovagal syncope trigger causes your heart rate and blood pressure to drop suddenly.
10. Vertigo is a sensation that the environment around you is spinning in circles. It can make you feel dizzy and off-balance.
11. Acute Transverse Myelitis - Transverse myelitis is an inflammation of both sides of one section of the spinal cord. This neurological disorder often damages the insulating material covering nerve cell fibers (myelin). Transverse myelitis interrupts the messages that the spinal cord nerves send throughout the body. This can cause pain, muscle weakness, paralysis, sensory problems, or bladder and bowel dysfunction.
12. Guillain-Barre syndrome is a rare disorder in which your body's immune system attacks your nerves. Weakness and tingling in your extremities are usually the first symptoms. These sensations can quickly spread, eventually paralyzing your whole body.
13. Facial or Bell's Palsy- The symptoms of Bell's palsy include sudden weakness in your facial muscles. In most cases, the weakness is temporary and significantly improves over weeks. The weakness makes half of your face appear to droop. Your smile is one-sided, and your eye on that side resists closing.
14. Myocarditis is an inflammation of the heart muscle (myocardium). The inflammation can reduce the heart's ability to pump and cause rapid or irregular heart rhythms (arrhythmias). Infection with a virus usually causes myocarditis.
15. Seizure is a sudden, uncontrolled electrical disturbance in the brain. It can cause changes in your behavior, movements or feelings, and in levels of consciousness. Having two or more seizures at least 24 hours apart that aren't brought on by an identifiable cause is generally considered to be epilepsy.
16. Myocardial Infarction - A heart attack (myocardial infarction) happens when one or more areas of the heart muscle don't get enough oxygen. This happens when blood flow to the heart muscle is blocked.
17. Ischemic stroke occurs when a blood clot blocks or narrows an artery leading to the brain. A blood clot often forms in arteries damaged by the buildup of plaques (atherosclerosis). It can occur in the carotid artery of the neck as well as other arteries.
18. Retinal vein occlusion is a blockage of the small veins that carry blood away from the retina.
19. Acute disseminated encephalomyelitis (ADEM) is a neurological, immune-mediated disorder in which widespread inflammation of the brain and spinal cord damages tissue known as white matter.
20. Idiopathic thrombocytopenic purpura is a blood disorder characterized by an abnormal decrease in the number of platelets in the blood.
21. Focal (Partial) Seizures occur when nerve cells in the brain send out sudden, excessive, uncontrolled electrical signals.
22. Sensorineural deafness is a type of hearing loss. It occurs from damage to the inner ear, the nerve that runs from the ear to the brain (auditory nerve), or the brain.
23. Subarachnoid hemorrhage is bleeding in the space between your brain and the surrounding membrane.
24. Optic neuritis occurs when swelling (inflammation) damages the optic nerve — a bundle of nerve fibers that transmits visual information from your eye to your brain causing vision loss.
25. Urticaria - Hives are red, itchy raised red bumps that result from a skin reaction. The welts vary in size and appear and fade repeatedly as the reaction runs its course. The condition is considered chronic hives if the welts appear for more than six weeks and recur frequently over months or years.
26. Neuromyelitis optica (NMO), also known as Devic's disease, is a rare condition where the immune system damages the spinal cord and the nerves of the eyes (optic nerves).
27. Deep vein thrombosis (DVT) occurs when a blood clot (thrombus) forms in one or more of the deep veins in your body, usually in your legs.
28. Unstable angina is a condition in which your heart doesn't get enough blood flow and oxygen. It may lead to a heart attack. Angina is a type of chest discomfort caused by poor blood flow through the blood vessels (coronary vessels) of the heart muscle (myocardium).
29. Pulmonary edema is a condition caused by excess fluid in the lungs. This fluid collects in the numerous air sacs in the lungs, making it difficult to breathe.
30. Arthralgia is a term used to describe aching or pain in one or more of the joints in the body.

Table 2: Some Media reports of deaths after vaccination

S. No	News Title	Date of Publication	Source Reference
1.	Bihar: Woman dies after taking second dose of Covid vaccine	November 20, 2021	https://www.indiatvnews.com/news/india/bihar-woman-dies-after-taking-second-dose-of-covid-vaccine-745937
2.	Man dies nine days after receiving Covishield vaccine in Karnataka	February 19, 2021	https://www.deccanherald.com/state/top-karnataka-stories/man-dies-nine-days-after-receiving-covishield-vaccine-in-karnataka-953127.html
3.	49-yr-old man dies within 2 hours after taking first COVID-19 Covishield vaccine dose in Noida,	April 1, 2021	https://www.deccanherald.com/state/top-karnataka-stories/man-dies-nine-days-after-receiving-covishield-vaccine-in-karnataka-953127.html
4.	TN girl loses vision days after Covid vaccine, Another girl diagnosed with Guillain-Barre syndrome	March 09, 2022	https://www.newindianexpress.com/states/tamil-nadu/2022/mar/09/tn-girl-loses-vision-days-after-covid-vaccine-parents-seek-govt-aid-for-treatment-2427949.html
5.	19 Year Old Allegedly Dies Post Covishield Vaccination: Kerala High Court Seeks Centre's Response On Parents' Plea	April 16, 2022	https://www.livelaw.in/news-updates/19-year-old-dies-post-covishield-vaccination-kerala-high-court-seeks-centres-response-on-parents-plea-196742
6.	12 children fainted due to 'fear' after receiving COVID-19 vaccine in MP's Satna, says health official	March 25, 2022	https://www.aninews.in/news/national/general-news/12-children-fainted-due-to-fear-after-receiving-covid-19-vaccine-in-mps-satna-says-health-official20220325230808/
7.	Family claims 16-year-old girl died 24 hours after Covid-19 jab in Ujjain, doctors panel to perform autopsy	January 7, 2022	https://www.freepressjournal.in/indore/madhya-pradesh-family-of-school-girls-claim-duo-dies-after-covid-19-vaccination-admin-orders-probe
8.	Death Due To Alleged Side Effects Of Covishield Vaccine: Doctor's Father Files Plea In Bombay HC, Seeks Rs 1,000 Crore Compensation,	February 1, 2022	https://www.livelaw.in/news-updates/bombay-high-court-covid-19-vaccine-death-due-to-side-effect-1-crore-compensation-190899
9.	6 of 7 kids who died of Covid in Delhi from Jan 9-12 had comorbidities,	January 15, 2022	https://www.hindustantimes.com/cities/delhi-news/6-of-7-kids-who-died-of-covid-in-delhi-from-jan-9-12-had-comorbidities-101642186989888.html

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Guestorial

Demand for Nationalization of Healthcare Services in India

What we need is one robust National Healthcare System where all the resources of our country are channelized for the best care of our people.

Dr Maya Valecha

As is thoroughly exposed during this corona time, not only the fact that private sector healthcare service is of no use when it comes to the health care of vast majority of "poor" people during normal time but during a health crisis it was of no use also to the minority of rich people from whom it earned exorbitantly all along.

It was only our government hospitals which were neglected in the era of privatization, that came to the rescue of We the People of India.

80% of the patients prior to lockdown were going to private healthcare especially because in the era of privatization governments neglected funding government hospitals. There have been instances when prestigious government hospitals with attached medical college, would not have even proper ECG machine. Patients are advised routinely to get medical tests and medicine from outside. From

Photo: Dr Maya Valecha

equipments to staff to drugs government hospitals always faced shortages.

Private doctors in even otherwise normal times charged heavily and large-scale malpractice in terms of unnecessary investigations, drugs and surgeries is an open secret. We keep on getting reports in between and label it as some bad apples in the basket. With five star corporate hospitals on one hand to substandard small private hospitals, patients were suffering financially and in terms of healthcare.

But the corona has exposed the whole system fully. As soon as the lockdown was declared private hospitals shut down their shutters. They stop seeing or admitting even the non-corona patients. And even the ambulance service which is 10 times more in private sector in most cities than government ambulances, stopped functioning. When they were forced to open for covid patients we know how heavily they charged like black marketing of oxygen too. Instances were reported when non covid patients were treated after bargaining for heavy charge to give treatment. So the greed for money was exposed like any other business.

Government hospitals were overburdened because of this sudden closure of private sector and the policy of admitting mild patients of corona and institutional quarantine even of asymptomatic corona positive persons. Obviously some medical and other care was diverted for even asymptomatic persons. And with extra procedures for crematoriums and the patients dying only in government hospitals, who were dying previously all spread over the city, now we saw piling up of deadbodies.

The lesson that We The People of India have learnt from this is that health is such a sensitive and important part of our life that we cannot neglect it with private and public sectors running parallel. We have seen that in such a situation with number of factors playing part the public sector is neglected and private sector becomes more and more commercial. In the end public interest is not served. Some Charity Hospitals giving good services can always be integrated in the public health infrastructure created.

Pharma Industry is an integral part of healthcare system. Not only for availability of medicine at affordable prices but also orientation of researches as per the need of the people. There are examples. Once BCG vaccine has been introduced in Universal Program, further evaluation of its effectiveness, need to develop any other variety is never examined. And we have more than 1400 people dying of Tuberculosis daily. In case of Oral Pulse Polio in spite of knowledge that it was causing harm, it took years to change it. And though injectable polio vaccine is the safest for children, just because it is costlier oral doses are universalized.

LET US ALL ACCEPT IN SPITE OF ALL THIS IT WAS THE GOVERNMENT FACILITIES CREATED MAINLY AFTER INDEPENDENCE TILL 1990s THAT STOOD AS OUR BACKBONE IN THIS CRISIS.

So when we demand Nationalization of Healthcare, Pharma Industry is included to have the optimum, need based production and availability of medicines.

What we need is one robust National Healthcare System where all the resources of our country are channelized for the best care of our people. Of course the government will have to spend more. And for that government will have to tax rich people. For years they are given all tax benefits, subsidies, tax free periods, tax cuts, bailouts and host of other advantages. Superrich tax is one such but even otherwise tax slabs are too low for rich.

Because of the schemes like Ayushman Bharat scheme or the Medical Insurance Schemes the poor people's money is ultimately transferred to the private drug companies and private doctors. My citizenship of this country is my permanent Insurance. No other insurance or premium should be there. It is possible to create a system where quality healthcare can be provided to all without any payment. It has been calculated that just the wealth tax and inheritance tax can cover basic necessities like health, education, old age pension and schemes for differently abled people.

Lives of the people are far more important than the extra luxurious life for few. It is the experience world over that wherever the healthcare is nationalized with good governance, on one hand unnecessary investigations, medicines and surgeries are avoided but when required, it is always available.

For that we demand following:

1. Immediate takeover of all private hospitals with reasonable compensation at depreciated value of assets. Small clinics can be converted to government Mohalla clinics.
2. Strengthen and expand the already existing chain of government health infrastructure from Sub-Centers in villages, Primary Healthcare Centers, Community Healthcare Centers to District Level Hospitals and Multi-specialty Hospitals.
3. Enough Doctors, Nurses and other paramedical staff should

be available at all the levels. A compulsory village level service is a must for all doctors before postgraduation and then in rotation as per the need. Let us remember the resources of the country and poor patients are used for training the doctors.

4. Let us pay a dignified handsome salary to doctors as well as all other medical staff. Class 1 salary and then as the experience and degree goes higher, the way IAS officers are given, they can go higher in the ladder.

5. **The most important part** is the direct democratic control of people to oversee the functioning of healthcare system.

6. A committee of hospital administration, doctors' representative, other paramedical staff's representatives and people's representatives elected directly for this should be formed to solve day to day problems.

7. The hospitals have to hold a public meeting every month to hear the suggestions, complaints of people apart from complaint and suggestion boxes. The boxes should also be opened in these meetings.

8. Every patient should be offered a survey form (digital for those who can), about their experience after each visit the way many banks and other companies are doing it to improve performance.

9. A strong suggestion is made to teach different practices of medicine, that is Allopathy, Homeopathy, Ayurved and others at undergraduate level to all students and only at specialization level they do separate training. That way the best practices of all can be used for patients. Instead of mutually exclusive all these should become complementary. Today, the patient who is the least knowledgeable decides which practice she should choose for a particular sickness.

10. Environment science should become important part of curriculum.

11. After the nationalization of Drug Companies, all decisions will be taken in a transparent manner. Even for the administration of these companies those experts and administrators will be appointed in whom people will show their faith after listening to them in open public discussions.

A wide spread demand from people to force the government to do all this and take the lives of people seriously is the only way to a secure future.

Editorial

Plastic found in human blood – Call an urgency to switch to bioplastic

Dr Seema Pavgi Upadhye, Krish Gupta

We all know that plastics are one of the leading pollutants on the planet, from mountains to oceans large amounts of plastic waste is dumped which enters into food chains.

A recent study on plastics " Micro-plastics Found In Human Blood For First Time" has shattered the world since it is a direct health hazard when we are using plastic for our daily needs. Tiny particles of plastics, called micro plastic have been detected in the human blood for the first time by a group of researchers from the Netherlands. Microplastics are tiny pieces of plastic less than 0.2 of an inch (5mm) in diameter. The researchers analysed blood samples from 22 anonymous donors and found microplastic in 17 of them, according to the research published in the Journal Environment International.

The levels are low - 1.6 micrograms (1.6 millionths of a gram) in every millilitre of blood - but are enough to raise an alarm. Prof Dick Vethaak, ecotoxicologist at Vrije Universiteit Amsterdam in the Netherlands, and lead author of the study, showed lot of concern and got worried.

The discovery shows the particles can travel around the body and may lodge in organs. The impact on health is as yet unknown, but researchers are concerned as microplastics cause damage to human cells in the laboratory and air pollution particles are already known to enter the body and cause millions of early deaths a year.

This study is the first indication that we have polymer particles in our blood – it's a breakthrough finding. But more research is needed with increase in the sample sizes, the number of polymers assessed, etc. Previous work had shown that microplastics were 10 times higher in the faeces of babies compared with adults and that babies fed with plastic bottles are swallowing millions of microplastic particles a day.

Existing techniques can detect and analyse particles as small as 0.0007mm. Some of the blood samples contained two or three types of plastic. The team used steel syringe needles and glass tubes to avoid contamination and tested for background levels of microplastics using blank samples. The amount and type of plastic varied considerably between the blood samples.

A recent study found that microplastics can latch on to the outer membranes of red blood cells and may limit their ability to transport oxygen. The particles have also been found in the placentas of pregnant women, and in pregnant rats, which they pass rapidly through the lungs into the hearts, brains and other organs of the foetuses.

Plastic particles may be transported to organs via the bloodstream. The human placenta has been shown to be permeable to 50, 80 and 240 nm polystyrene beads (Wick et al., 2010) and to microsized polypropylene (Ragusa et al., 2021). In a study of acute lung exposure to nanopolystyrene spheres (20 nm) in rats, plastic particles could move to placental and fetal tissues (Fournier et al., 2020). Bioaccumulation of small polystyrene micro-particles in the liver, kidney and gut was observed after oral administration in mice in vivo (Deng et al., 2017).

Further supporting evidence for the translocation of plastic particles comes from drug delivery sciences, where polymeric carriers of pharmaceuticals have been dosed in mammalian test systems (Yee et al., 2021). The polymeric nano-sized carriers are able to deliver drugs across the blood brain barrier (Han et al., 2018). The typical residence time of plastic particle in the bloodstream is at present unknown, as is the fate of these particles in the human body. From polymeric nano-carrier research, researchers expect the residence time to vary with particle chemistry , surface charges, shapes and sizes (Bertrand and Leroux, 2012, Rabanel et al., 2012, Rabanel et al., 2019). In preclinical experiments in drug delivery it is known that a phenomenon termed accelerated blood clearance (Dams et al., 2000) acts to reduce residence time upon repeated (chronic) exposure to polymeric nanoparticles in the bloodstream.

The uptake routes of plastic particles detected in human bloodstream are likely to be via mucosal contact (either ingestion or inhalation). Dermal uptake of fine particles is unlikely except if the skin is damaged (Schneider et al., 2009). Airborne particles between 1 nm and 20 µm are considered respirable. Ultrafine (<0.1 µm) inhaled particles may become absorbed and accumulate in the lung, while most larger particles are expected to be coughed up and eventually swallowed, and have a second chance of absorption via the gut epithelium (Wright and Kelly, 2017).

The plastic particle concentrations reported inrecent study are the sum of all potential exposure routes: sources in the living environment entering air, water and food, but also personal care products that might be ingested (e.g. PE in toothpaste, PET in lip gloss), dental polymers, fragments of polymeric implants, polymeric drug delivery nanoparticles (e.g. PMMA, PS) and tattoo ink residues (e.g. acrylonitrile butadiene styrene particles).

Human exposure to plastic particles results in absorption of particles into the bloodstream. This indicates that at least some of the plastic particles can be bioavailable and that the rate of elimination via e.g. the biliary tract, kidney or transfer and deposition in organs is slower than the rate of absorption into the blood. It remains to be determined whether plastic particles are present in the plasma or are carried by specific cell types (and to which extent such cells may be involved in translocating plastic particles across mucosa to the bloodstream). If plastic particles present in the bloodstream are indeed being carried by immune cells, what will happen then.? A new review paper published and co-authored by Vethaak, assessed cancer risk and concluded that more detailed research on how micro- and nano-plastics affect the structures and processes of the human body, and whether and

BOX: **What are microplastics?**

Micro-plastics are small plastic pieces less than five millimeters long which can be harmful to all life on earth. Nanoplastic is a term for plastic particles in the submicron range, <1 µm. In the nanotechnology field, 'nanoplastic' may refer to engineered particles <100 nm, i.e. the nanotechnology application size limit.

As an emerging field of study, not a lot is known about microplastics and their impacts yet. The NOAA Marine Debris Program is leading efforts within NOAA to research this topic. Standardized field methods for collecting sediment, sand, and surface-water microplastic samples have been developed and continue to undergo testing. Field and laboratory studies can tell us how much micro plastic is released into the environment and how much have same impact on living beings and turned into debris.

Micro plastics come from a variety of sources, including from larger plastic debris that degrades into smaller and smaller pieces. In addition, microbeads, a type of microplastic, are very tiny pieces of manufactured polyethylene plastic that are added as exfoliants to health and beauty products, such as some cleansers and toothpastes. These tiny particles easily pass through water filtration systems and end up in the ocean and Great Lakes, posing a potential threat to aquatic life.

Micro-beads are not a recent problem. According to the United Nations Environment Programme, plastic microbeads first appeared in personal care products about fifty years ago, with plastics increasingly replacing natural ingredients. As recently as 2012, this issue was still relatively unknown, with an abundance of products containing plastic microbeads on the market and not a lot of awareness on the part of consumers. They pass unchanged through waterways into the ocean where aquatic life and birds can mistake microplastics for food.

Most prominent are polyethylene terephthalate (PET), a common type of plastic used in making drink bottles, food packaging and fabrics, and even lip gloss.

The second most commonly found plastic are polystyrene, which is used to make a wide variety of common household products including disposable bowls, plates and food containers, and what we call styrofoam.

The third most likely plastic is polyethylene, a material regularly used in the production of paints, sandwich bags, shopping bags, plastic wrap, detergent bottles and in toothpaste.

Polypropylene is used in making food containers and rugs.

how they can transform cells and induce carcinogenesis, is urgently needed, particularly in light of the exponential increase in plastic production. The problem is becoming more urgent with each day.

Humans have produced 18.2 trillion pounds of plastics – the equivalent of 1 billion elephants – since large-scale plastic production began in the early 1950s. Nearly 80% of that plastic is now in landfills, researchers say. By 2050, another 26.5 trillion pounds will be produced worldwide.

Plastic flowing into the world's oceans, rivers and lakes will increase from 11 million metric tons in 2016 to 29 million metric tons annually in 2040, the equivalent of dumping 70 pounds of plastic waste along every foot of the world's coastline, according to research from The Pew Charitable Trusts.

Lot of studies are needed to be done on occupationally exposed

workers that what is impact of micro plastics on their health. Also studies on environment and ecosystem is needed. Such type of studies done by Dr Mahua Saha at Sal Estuary in Goa, showed impact of microplasticson fish, seafood, plants, water and soil quality .

Conclusion

Lot of research is needed in this field and have to take lot of steps towards reducing plastics. It is utmost requirement to produce bio plastics which is biodegradable. We have also to reduce daily use of plastics in our life especially for children.

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Startup

Fibroheal raises debt funding from BIRAC

March 28, 2022

Fibroheal Woundcare has raised a venture debt funding of about $1 million (about Rs 7 crores) from Biotechnology Industry Research Assistance Council (BIRAC) under their PCP Fund (Product Commercialisation Fund) and the existing promoters and investors.

The company intends to scale up its go-to-market capabilities, recruit more people on board and create an impact through the economic multiplier potential of silk protein and healing different types of acute, chronic, non-healing, slow healing, difficult-to-heal wounds including post-operative wounds.

The company has a range of products catering to different types and stages of wounds which include sheets, mesh, foams, powder, particles and range of adhesive dressings which are already commercialised so far in the market under the umbrella brand of "D FIBROHEAL range."

The company received early support from BIRAC and the Department of Biotechnology (DBT) and was also winner of LEAP programme of BIRAC and got investment through CCAMP (Centre for Cellular and Molecular Platforms).

Earlier, in September 2021, KITVEN – Karnataka IT Venture Fund, the venture capital arm of Karnataka government has also made an investment of undisclosed amount to ramp up its manufacturing capabilities to cater to the increased expected demands from the market. They previously raised money from the existing promoters, Telama Investments, CCAMP and KITVEN.

Featured Biotech News

WHO suspends Covaxin supply to UN agencies

April 5, 2022

The World Health Organization (WHO) has confirmed it has suspended the supply of Covaxin, produced by city-based Bharat Biotech, through UN procurement agencies and recommending to countries that received the covid vaccine to take actions as appropriate.

A statement issued by WHO on Saturday said the suspension is in response to the outcomes of its post EUL (emergency use authorisation) inspection held between March 14-22, 2022 and the need to conduct process and facility upgrade to address recently identified GMP (good manufacturing practice) deficiencies.

There will be interruption of supply of Covaxin due to suspension of production for export, WHO said. The risk assessment to date does not indicate change in the risk-benefit ratio. The data, available to WHO, indicate the vaccine is effective and no safety concern exists, WHO said. Bharat Biotech on April 1 announced the temporary slowing down of production of its covid-19 vaccine Covaxin across its manufacturing facilities, having completed its supply obligations to procurement agencies and foreseeing the decrease in demand.

During the recent WHO inspection, Bharat Biotech agreed with the former's team on the scope of the planned improvement activities and indicated that they will be executed as soon as possible.

The company has committed to comply by addressing the GMP deficiencies and is developing a corrective and preventive action plan, for submission to the Drugs Controller General of India (DCGI) and WHO.

In the interim and as a precautionary measure, the company has indicated its commitment to suspend its production of Covaxin for export, WHO said.

19 Year Old Allegedly Dies Post Covishield Vaccination: Kerala High Court Seeks Centre's Response On Parents' Plea

April 15, 2022

The petitioners' daughter, a postgraduate student, was vaccinated with Covishield on July 28, 2021. Since she started feeling unwell the very next day, on August 5, she was taken to a hospital where an antigen test was taken. But the test result came out to be negative. Therefore, she was given symptomatic treatment for her headache and fever, treated in casualty and was discharged on the same day.

However, her condition worsened soon and was thereafter taken to another hospital with complaints of reduced responsiveness, tiredness, headache and a history of vomiting. While at the hospital, she remained unconscious and later developed generalised convulsion. Thereafter, she was intubated and put on a ventilator.

The petitioners' daughter expired on August 12 morning, and her cause of death mentioned in post mortem report was that she died of intracranial bleeding.

Her grieving parents filed a complaint before the Human Rights Commission claiming compensation for the same and based on this complaint, an enquiry was conducted by the District Medical Officer (Health). It was found that there was no available documentary evidence to suggest that she had any preceding neurological illness and the enquiry confirmed that her symptoms started after she had taken the first dose of the Covishield vaccine.

The Medical Officer also recorded his finding that upon verification of her hospital records, it was evident that she might have suffered from thrombocytopenia and thrombosis syndrome which is a rare immunogenic response to the Covishield vaccine.

Therefore, the plea moved through Advocates C. Unnikrishnan and M.R Sudheendran argued that the death of the petitioners' only daughter is a direct aftereffect of the administration of the Covishield vaccine.

They asserted that vaccination was made compulsory by the Union and State so the deceased had no choice but to book a slot on Cowin.gov.in. It was also argued that the vaccine was administered to the deceased from the hospital without any communication as to the risk factors of the vaccine.

The parents have also pointed out that although their daughter was taken to the respondent Hospital on 6th August, she was given only symptomatic treatment and that there was no proper diagnosis as to the illness and appropriate timely treatment.

Therefore, it has been submitted that the manufacturer of the vaccine, the Union and the State are jointly and severally liable to compensate the petitioners.

Case Title: Jean George & Anr v. Serum Institute Of India & Ors.

New Zealand High Court ENDS Vaccine Mandate: "It's a Gross Violation of Human Rights"

April 1, 2022

New Zealand Prime Minister Jacinda Ardern was left reeling on Friday after a High Court ruled that her vaccine mandate represented a "gross violation of human rights" for New Zealanders.

The landmark case means that the police and NZDF cannot be fired for refusing to take the experimental vaccine. This case will be used to overthrow all of Ardern's illegal mandates in New Zealand.

Justice Francis Cooke ruled that ordering frontline police officers and Defence staff to be vaccinated or face losing their job was not a "reasonably justified" breach of the Bill of Rights.

Nzherald.co.nz reports: The lawyer for the police and Defence staff at the centre of the claim is now calling for the suspended workers to return to their jobs immediately, saying many have given decades of service to their community and are still committed to their jobs.

The challenge, put forward by a group of Defence force and police employees, questioned the legality of making an order under the Covid-19 Public Health Response Act to require vaccination for frontline employees.

The challenge was supported by a group of 37 employees affected by the mandate, who submitted written affidavits to the court.

The judge said that while it's clear the government isn't forcing Police and NZDF employees to get vaccinated against their will and they still have the right to refuse vaccination, the mandate presents an element of pressure.

"The associated pressure to surrender employment involves a limit on the right to retain that employment, which the above principles suggest can be thought of as an important right or interest recognised not only in domestic law, but in the international instruments," Justice Cooke stated.

Substandard, fake medical products increased by almost 47% from 2020 to 2021 during pandemic: report

Criminals saw crisis as an opportunity to sell more such products, taking advantage of vulnerability of people in need, ASPA president Nakul Pasricha says

MARCH 29, 2022

Criminals saw crisis as an opportunity to sell more such products, taking advantage of vulnerability of people in need, ASPA president Nakul Pasricha says

During the COVID-19 pandemic, incidents of substandard and falsified (SF) medical products increased by almost 47% from 2020 to 2021. Trade-in pharmaceutical counterfeits during this period spiked majorly relating to COVID-19 products, including vaccines, medicines, test kits, antibiotics, face masks and sanitizers. This, according to the latest report released by the Authentication Solution Providers' Association (ASPA), an organisation working against fake medical products.

The ASPA has studied the major counterfeit incident noticed during the COVID-19 period and its impact in the country and released a report titled – "Substandard and falsified medical products, learning from COVID-19 Pandemic and Technological tools to ensure medicines and patient safety".

The report highlighted the trends on pharmaceutical crime and incidents of SF medical products and recommendations to combat it. "We welcome the Government of India's decision to make QR Codes mandatory on Active Pharmaceutical Ingredients (APIs); however, we suggest a comprehensive approach towards building an authentication ecosystem in the country," it noted.

National authentication projects have been trending internationally for the last few years, with China, Brazil, Turkey, the U.S., and the EU being the pioneers in this area. It had helped them to reduce the shadow market in various industries, improve tax collection and significantly reduce losses incurred by businesses from counterfeit products and illegal trade.

ASPA secretary Chander S. Jeena said, "India should also implement these measures in other sectors to join the league of advanced digital economies." The report had been made by monitoring and collating news from leading media across the country, the World Health Organisation (WHO) medical alert etc, he added.

Tamil Nadu makes scientifically dubious claim on vaccines in the Supreme Court

An affidavit filed by Tamil Nadu Government in the Supreme Court makes the questionable, and scientifically false, claim that the unvaccinated can spread the virus, but not the vaccinated.

March 27, 2022

Covid-19 vaccines have brought hope to many, especially the elderly and the vulnerable, in reducing their risk of severe Covid. However, several authorities in India have been resorting to coercive techniques, even as the Central Government has clearly said that there is no provision for coercion.

Notwithstanding the benefit of vaccination, coercive techniques are legally as well as ethically questionable. The United States Supreme Court recently struck down President Biden's workplace vaccine mandate. There is an ongoing case in the Indian Supreme Court since several months, to similarly strike down vaccine mandates issued by various authorities.

On 19 Nov 2021, the state government of Tamil Nadu (TN) issued a notification prohibiting unvaccinated people from even stepping onto the street. Is this a reasonable and proportionate measure? To explain this, the state of Tamil Nadu (TN) was impleaded (along with three other states) in the ongoing Supreme Court case on Covid-19 vaccine mandates.

In response, the TN government filed an affidavit in the Supreme Court on 03 Jan 2022, justifying its notification.

The main justification offered by the TN affidavit is that unvaccinated people can be virus carriers, but not the vaccinated. Such a claim is doubly wrong scientifically.

Second, the claim that vaccinated people are safe to be around is contradicted by the government's own protocols. Even a layperson knows by now that Covid-19 vaccination does not prevent infection, or transmission from that person to others after infection.

Fraud Trial of Former Theranos Executive Ramesh' Sunny' Balwani Begins

Balwani is facing multiple counts of wire fraud and conspiracy to commit fraud. He and Holmes were both charged by the government in 2018 but were given separate trials.

MARCH 29, 2022

More than two months after Elizabeth Holmes was found guilty of fraud, the trial of her business associate and one-time romantic partner Ramesh "Sunny" Balwani has finally begun. Like Holmes, Balwani faces multiple counts of fraud related to the business practices of Theranos.

During opening remarks, the prosecution painted Balwani, the company's former president, as working hand-in-hand with Holmes as the duo fed false information to investors about its proprietary blood-testing technology. U.S. Assistant Attorney Robert Leach, who also prosecuted Holmes, told jurors that Holmes and Balwani, who served as chief operating officer, were "partners in everything, including their crimes," Fox Business reported. Leach said the two Theranos executives lied to investors to secure hundreds of millions of dollars to bolster Theranos.

"This is a case about fraud. About lying and cheating to obtain money," Leach said, according to the report. "He did this to get money from investors and he did this to get money and business from paying patients who were counting on Theranos to deliver accurate and reliable blood tests so that they could make important medical decisions."

In contrast, Balwani's attorneys painted him as a savvy businessman who was already highly successful when Holmes dropped out of Stanford at 19 to found Theranos. During his opening remarks, Stephen Cazares told jurors that when Balwani stepped down from his C-suite roles at Theranos in 2016, he left the company in a strong financial position. At the time, Theranos had a valuation of approximately $9 billion. His departure was also right around the time that whistleblowers began leaking information about the failures of the company's blood-testing devices.

The prosecution's arguments will likely mirror that of Holmes, which included copies of text messages shared between her and Balwani during their long romantic and business partnership. The specter of some accusations made by Holmes against Balwani during her own trial will also likely play a role in the case. During her testimony, Holmes described the relationship she entered into with Balwani as "controlling and abusive." She testified that he groomed her in business and also forced her to engage in sexual activities following heated arguments in order to prove his love for her.

Dr. Anthony Fauci, Biden admin operated with missing data as CDC issued pandemic guidance, emails show

The emails also indicate that Dr. Anthony Fauci flagged an article citing scientific studies was "decades-old research."

March 25, 2022

The Biden administration didn't have data on students' learning loss when the Centers for Diseases Control and Prevention (CDC) issued its COVID-19 school reopening guidance, internal emails show.

The emails also indicate that Dr. Anthony Fauci flagged an article citing scientific studies disputing the need for students to stay 6 feet apart, noting that the rule appeared to be based on "decades-old research." Additionally, the CDC denied a Harvard University public health expert's request for state-level vaccine distribution data, which she needed for her research about how policies affected vaccinations, the emails show.

"These emails show the CDC forged ahead and crafted pandemic policy based on poor data – even after they've been warned old and out-of-date research was being used to support their guidelines," Caitlin Sutherland, executive director of Americans for Public Trust, told Fox News. "First, the CDC allowed teachers' unions to write the guidance on school reopenings, and now we just learned the CDC isn't publishing large portions of the COVID data it collects."

CDC officials recently acknowledged in unrelated internal emails that the agency must clean up its data-gathering process, which hindered the pandemic response, Politico reported.

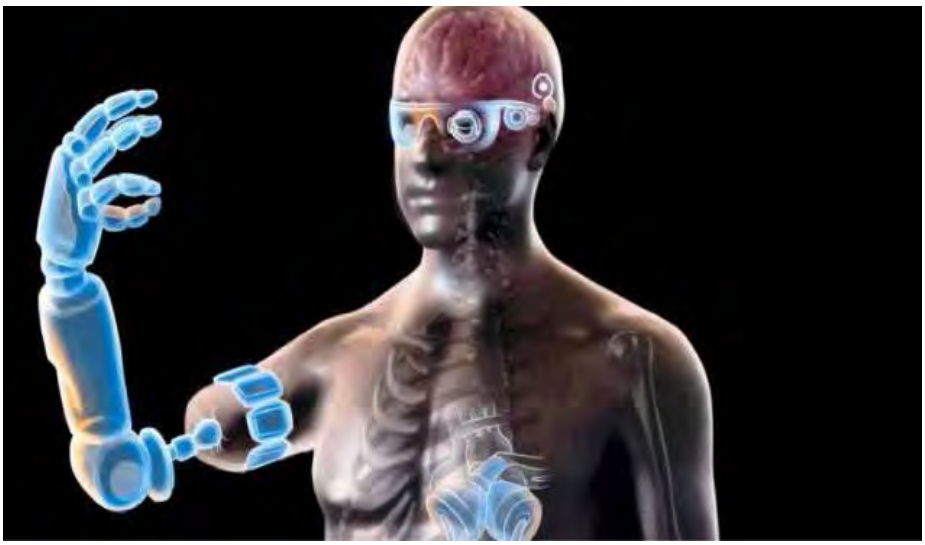
APT provided the emails to Fox News after obtaining them through Freedom of Information Act requests submitted to the CDC.

The government didn't have data concerning learning loss in various communities, emails show just one day before the CDC issued school reopening guidance.

"We don't have federally collected data on what is happening inside schools," Donna Harris-Aikens, deputy chief of staff at the Department of Education, said during a Feb. 11, 2021, briefing between CDC and department officials and Rep. Bobby Scott, a Virginia Democrat.

Fauci, the chief medical adviser to the president, flagged for Walensky an article published in a health- and science-centric publication that was critical of the CDC's guidelines for school reopening.

S&T Ministry to support startup in medical implants



MARCH 31, 2022

The Union Ministry of Science and Technology's Technology Development Board (TDB) has decided to provide financial support to a Visakhapatnam-based startup company for the development and commercialisation of a range of medical implants, robotic surgical instruments, and devices using metal injection molding (MIM) process.

Dr. Srivari Chandrashekhar, Secretary, Department of Science and Technology, and Chairperson, TDB, said, "Currently, surgical instruments are either imported or made with casting or forging technologies and are not suitable for robotic surgical instruments or critical care surgical instruments applications. The global surgical instruments market currently comprises of only 2-3 global players, namely Johnson & Johnsons, Strykar and Smith and Nephew.

Rajesh Kumar Pathak, Secretary, TDB, noted that TDB had been an invisible thread in development of the the Indian health ecosystem, funding most Indian healthcare companies in their startup days. "India's first Liver Transplant Facility by M/s Ravindranath GE Medical Associates Pvt. Ltd. and first CBCT Radiotherapy system for Cancer Treatment by M/s Panacea Medical Technologies was partly funded by TDB".

The recent Covid-19 pandemic has increased the demand for technologically advanced, high-quality, low-cost medical devices, accessible to the Indian population. These factors also attract international companies to set up production facilities in India. The MedTech sector in India, which was worth US$ 10.36 billion in 2020, is expected to be US$ 50 billion during 2020–2025. Around 4,000 Indian health-tech start-ups are undertaking multiple innovations, which are helping boost the MedTech market.

The startup that has been now chosen for financial support aims to manufacture a range of medical surgical instruments and device components like bone cutters, tweezers, metzenbaum wound closure clips, clamps, needles, staplers, and surgical accessory spoons, spatulas, and catheters.

Experts write to PM against WTO proposal on COVID-19 vaccine waivers

APRIL 08, 2022

Six experts from India, South Africa and the United States have written to Prime Minister Narendra Modi to reject the current version of a proposal at the World Trade Organisation on intellectual property waivers for COVID-19 medicines, that includes vaccines, drugs and diagnostics.

In October 2020, at the WTO's Trade Related Aspects of Intellectual Property Rights (TRIPS) Council, India and South Africa proposed that the WTO do away with certain provisions of the TRIPS Agreement for the duration of the pandemic to facilitate access to technologies necessary for the production of vaccines and medicines. Such a waiver would aid scaling up of local production, critical to ensure wider access to affordable and effective vaccines. Most of these patents are held by pharmaceutical companies in the U.S. and the European Union.

The waiver proposal was blocked at the TRIPS Council and the WTO ministerial Council, though there have been several rounds of discussions involving ministers of several WTO member-countries. In the last year, though 100 countries, including the U.S., supported the proposal, the EU remained a stumbling block. Last month, however, a leaked document that suggested a compromise between the EU, U.S., India and South started doing the rounds. This said that all patent rights that protect the manufacturing of COVID-19 vaccines will be waived for three to five years, but did not include such waivers for diagnostics and drugs.

Undisclosed industry payments rampant in drug-trial papers in Australia

March 29, 2022

One in four Australian medical researchers involved in drug trials failed to declare money they had received from pharmaceutical companies when submitting journal manuscripts, a study reports.

The authors cross-checked statements on financial conflicts of interest listed by Australian authors of 120 drug trials published in the first eight months of 2020 against a database of company-made payments reported to Medicines Australia, the country's pharmaceutical-industry association. The research, published in the Journal of General Internal Medicine1 this month, is one of only a few studies outside the United States to examine discrepancies between drug-company payments made to health professionals and author disclosure statements.

The study found that missing or incomplete declarations were common. Half of the trials and a quarter of the 323 Australian authors involved had at least one undeclared financial conflict (see 'Undeclared conflicts'), with undisclosed payments ranging from AU$140 to AU$97,600 (US$100 to US$71,000) for consulting, advisory meetings, speaker fees and education events.

The results are sobering and similar to those from US studies2, which "suggests that the fundamental problem of conflict-of-interest non-disclosure is a persistent one" in clinical research — evident across journals, across countries and over time, says James Baraldi, a neuroscientist at the University of Pittsburgh, Pennsylvania.

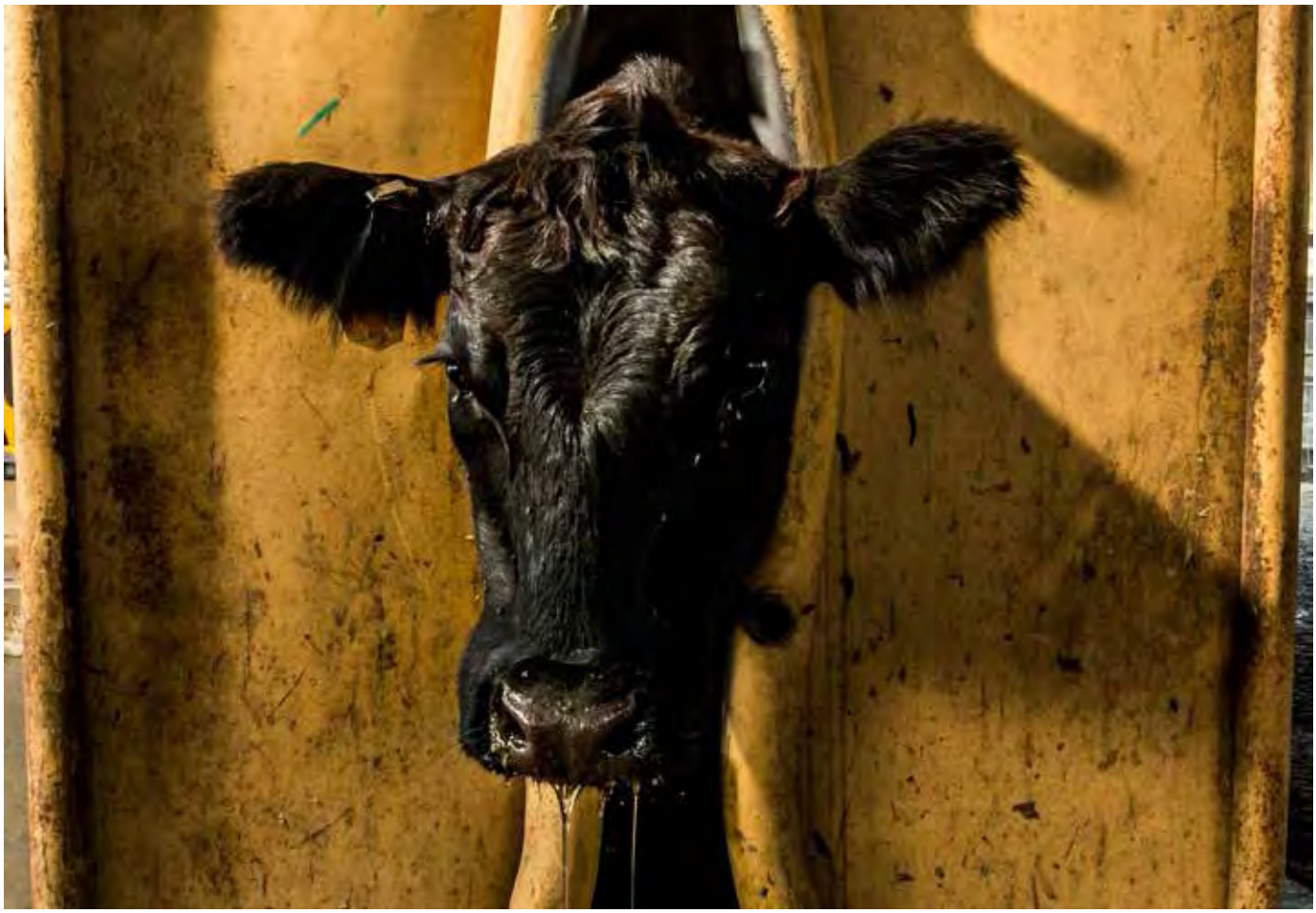
The Australian study found that roughly half of the Australian trial investigators with incomplete disclosures failed to declare any conflicts of interest when company reports showed they had been paid, while 43% of trials had partial declarations

Undeclared financial ties are especially concerning in drug trials, in which transparency is paramount given the deep-rooted influence of pharmaceutical-industry funding that can sway prescribing practices3 and distort research outcomes4, adds Mintzes.

Publicly accessible and government-run databases have helped to expose financial ties between the pharmaceutical industry and medical researchers mainly in the United States, where drug companies and device manufacturers have been legally required to report payments to health-care providers since 2014.

Despite this public scrutiny, evidence suggests that medical researchers are continuing to under-report conflicts of interest, which undermines integrity in science, says Cameron Taheri, a physician-researcher at the University of Calgary in Canada. A 2021 meta-analysis of mostly US studies2, led by Taheri, found that, on average, two-thirds of clinical-trial authors omitted at least one financial conflict in published works.

FDA Clears Marketing of Genome-Edited Beef Cattle



March 30, 2022

The U.S. Food and Drug Administration has announced the low-risk determination for the marketing of products derived from genome-edited beef cattle. The decision is the first low risk determination for marketing of products from an intentional genomic alteration (IGA) in an animal for food use.

IGA refers to changes introduced into the DNA of animals using biotechnological techniques, including genome editing. The IGA in the beef cattle led to a short-hair coat trait present in some conventionally bred cattle, known as a "slick" coat. After the FDA's review of scientific data, the product was determined as low-risk and does not raise any safety concerns. Thus, FDA does not expect the developer to submit an application for approval before marketing the product.

"Today's decision underscores our commitment to using a risk and science-based, data-driven process that focuses on safety to the animals containing intentional genomic alterations and safety to the people who eat the food produced by these animals," said Steven Solomon, Director of the FDA's Center for Veterinary Medicine.

"We expect that our decision will encourage other developers to bring animal biotechnology products forward for the FDA's risk determination in this rapidly developing field, paving the way for animals containing low-risk IGAs to more efficiently reach the marketplace," he added.

IISc, India to set up public health centre with Rs105 cr funding from philanthropist

March 27, 2022

The Indian Institute of Science (IISc) on Thursday entered into a memorandum of understanding with philanthropist and entrepreneur Ajit Isaac and his wife, Sarah Isaac, who have donated Rs 105 crore for establishing a centre for studying public health. It will be named Isaac Centre for Public Health.

The centre will offer dual-degree programmes Master of Public Health-PhD (5-6 years) and Master of Public Health-MTech (3 years) to nurture education and research in the area of public health. It will be operational by 2024 and will encourage students to pursue careers in clinical research to develop new treatments and healthcare solutions driven by a bench-to-bedside philosophy, according to a statement from the institute.

The student intake will be about 10 per year with a steady-state student population of about 40 over time. According to the IISc, the centre will have state-of-the-art biomedical research computing infrastructure to host data as well as develop and test big data analysis methods tailored for public health.

Govindan Rangarajan, director of the IISc, said, "There is an acute need for India to have a world-class centre for clinical and academic research in public health to be able to make quicker and more impactful strides in realising the goal of quality healthcare for all. The proposed centre will interface between all the departments of the IISc Medical School, and also other science and engineering departments of the IISc in the context of public health research. In particular, the centre will create a niche for health data science and analytics through close collaboration with the existing world-class computer science and data science departments at the IISc, putting it on par with international counterparts like the Johns Hopkins Bloomberg School of Public Health. We are grateful for such contributions from philanthropic leaders like Mr and Mrs Isaac who make it possible for us to move from aspirations to actually realising our goals."

The funding also supports international fellowships for students, scholarships, visiting chair professorships and endowed chair professorships. The centre will also provide funding for research projects such as in bio-surveillance, digital health and mobile-based diagnostics.

Government of India
Department of Science & Technology
Ministry of Science & Technology

CEFIPRA

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RAMAN–CHARPAK FELLOWSHIP 2022

Call for Applications
for
Indian & French PhD Students and French Masters' Students

The Raman–Charpak Fellowship program is in honour of two Nobel Laureates in Physics, Prof C.V. Raman, Indian Nobel Laureate (1930) and Prof Georges Charpak, French Nobel Laureate (1992).

The Fellowship was launched during the State visit of the President of France to India during in February, 2013. The aim is to facilitate the exchange of doctoral students between the two countries, in order to broaden the scope and depth of future engagements in Science, Technology and Innovation.

The Raman-Charpak Fellowship is the only Indo-French bilateral Fellowship programme jointly funded by the Department of Science and Technology (DST), Government of India and the French Institute in India (IFI), French Embassy in India, Ministry for Europe and Foreign Affairs, Government of France.

This programme implemented by the Indo French Centre for Promotion of Advanced Research (IFCPAR/ CEFIPRA) aims at improving the doctoral skills of Indian and French students by providing them an opportunity to carry out part of their research work in a University / Research & Development Institute based in France or India respectively.

This programme is now also open to French Master Students, who wish to spend some time in India in accordance to their curriculum. It aims at improving the Masters skills of French students by providing them an opportunity to carry out internship work in a University / Research Institute based in India.

The scheme also provides an exposure and experience about the current research methods and trends in France/India, while discovering each other's cultural context.

Please note: Applicants must have a pre-determined project proposal that has been discussed and agreed upon by the student and the two supervisors (Indian and French) before applying.

Deadline: May 15th 2022

For any further information please contact:
Mr. Kunal Kasariya, kunal@cefipra.org
Office Tel. No.+91 11 24682251, +91 11 24682252
Indo-French Centre for the Promotion of Advanced Research
(Centre Franco-Indien pour la Promotion de la Recherche Avancée-CEFIPRA)
Core 5B, Ground Floor, India Habitat Centre Lodhi Road, New Delhi 110 003 (India)
Website: http://www.cefipra.org
Office Tel. No.+91 11 24682251, +91 11 24682252

वै.औ.अ.प. - केन्द्रीय औषधीय एवं सगंध पौधा संस्थान

(वैज्ञानिक तथा औद्यागिक अनुसंधान परिषद)
पोस्ट आफिस - सीमैप कैम्पस, लखनऊ-226015 (उ0प्र)

CSIR - Central Institute of Medicinal & Aromatic Plants

(Council of Scientific & Industrial Research)
PO CIMAP Campus, Lucknow-226015 (U.P.)

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1.ऑनलाइन आवेदन आरंभ करने की तिथि	सोमवार, 11 अप्रैल, 2022; 10.00 Hrs. IST
1. Start date for Online Application:	Monday, 11 April, 2022; 10.00 Hrs. IST
2.ऑनलाइन आवेदन की अंतिम तिथि	मंगलवार, 17 मई, 2022; 23:59 Hrs. IST
2. Last date for Online application:	Tuesday, 17 May, 2022; 23:59 Hrs. IST
3.सीमैप में सभी संगत प्रपत्रों के साथ आवेदन पत्र के प्रिंट आउट प्रति की प्राप्ति की अंतिम तिथि	मंगलवार, 31 मई, 2022; 17:30 Hrs. IST
3. Last date for Receipt of printout copy of application alongwith all relevant documents at CIMAP:	Tuesday, 31 May, 2022; 17:30Hrs. IST

सीएसआईआर-केन्द्रीय औषधीय एवं सगंध पौधा संस्थान, लखनऊ, वैज्ञानिक और औद्योगिक अनुसंधान परिषद (सीएसआईआर) की एक इकाई एवं एक प्रमुख वैज्ञानिक संगठन है जो जैविक और रासायनिक विज्ञानों के विभिन्न क्षेत्रों में उच्च गुणवत्ता वाले अनुसंधान और औषधीय एवं सुगंधित पौधों (एमएपी) का उपयोग करने वाले किसानों एवं उद्यमियों को तकनीक और सेवाओं का विस्तार करने में शामिल है। संस्थान द्वारा उत्पाद विकास / प्रौद्योगिकी नवाचार / एप्लाइड टेक्नोलॉजी / ट्रांसलेशन रिसर्च इत्यादि में शामिल उत्साही युवा और गतिशील भारतीय नागरिकों, जिनके पास एक अभिनव तरीके से अनुसंधान और विकास करने की क्षमता के साथ उत्कृष्ट शैक्षणिक रिकॉर्ड / सिद्ध वैज्ञानिक उपलब्धियां / अपेक्षित अनुभव है, से निम्नलिखित वैज्ञानिक पदों के लिये आवेदन आमंत्रित किये जा रहे हैं :-

CSIR-Central Institute of Medicinal and Aromatic Plants, Lucknow, a unit of Council of Scientific and Industrial Research (CSIR), is a premier scientific organization involved in conducting high quality research in different areas of biological and chemical sciences and extending technologies and services to the farmers and entrepreneurs using medicinal and aromatic plants (MAPs). The Institute invites applications from enthusiastic young and dynamic Indian Nationals involved in Product Development/Technology Innovation/Applied Technology/Translation Research etc. having excellent academic record/proven scientific achievements/requisite experience with ability to undertake R&D in an innovative way for the following Scientific Positions:

पदनाम/ Designation	**पदों की संख्या एवं आरक्षण की स्थिति/No. of Posts & Reservation**	**पे मैट्रिक्स लेवल/ Pay Matrix Level**	***कुल परिलब्धियाँ/ Total Emoluments**	****17.05.2022 को अधिकतम आयु/ Upper Age limit not exceeding as on 17.05.2022**
वैज्ञानिक/ Scientist	**06 पद/ Posts** (अनारक्षित-03, अ.पि.व.-01, अ.जा-01, आ.क.व-01) (UR-03,OBC-01, SC-01, EWS-01)	**पे मैट्रिक्स लेवल/ Pay Matrix Level-11** रु0/Rs.67700-208700	रु०/Rs.110305/-	32 वर्ष/years
वरिष्ठ वैज्ञानिक/ Senior Scientist	**04 पद /Posts** Unreserved	**पे मैट्रिक्स लेवल/ Pay Matrix Level-12** रु0/Rs.78800-209200	रु०/Rs.126844/-	37 वर्ष/ years

Biotech Industry News

Bharat Biotech and BIOFABRI partner to develop, manufacture and distribute novel TB vaccine

March 28, 2022

Bharat Biotech, has partnered with BIOFABRI, a Spanish biopharmaceutical company, to develop, manufacture and market a new tuberculosis vaccine MTBVAC in over 70 countries in Southeast Asia and sub-Saharan Africa.

MTBVAC is the only live attenuated vaccine against Mycobacterium tuberculosis in development. It is currently being developed for two purposes: as a more effective and potentially longer-lasting vaccine than BCG for newborns and, on the other hand, for the prevention of TB disease in adults and adolescents, for whom there is currently no effective vaccine. MTBVAC will start phase 3 clinical trials in Senegal, South Africa and Madagascar in the second half of 2022.

The vaccine is being manufactured and developed by BIOFABRI, in close collaboration with the University of Zaragoza, IAVI and the Tuberculosis Vaccine Initiative (TBVI). MTBVAC has been designed and discovered by Carlos Martín team of the University of Zaragoza.

The agreement between Bharat Biotech and Biofabri would guarantee the worldwide production and the supply of the future vaccine in more than 70 countries with a high TB incidence, such as India which has the highest TB burden in the world, with a 25% of all cases.

The only currently available TB vaccine, the Bacillus Calmette-Guérin vaccine (BCG), was developed 100 years ago and has limited efficacy in preventing pulmonary TB in adults, who, along with adolescents, are the biggest spreaders of the disease.

The company has opted for this vaccine candidate owing to its advanced stage of clinical development as well as the extremely promising results from Phase 1 and Phase 2 clinical trials, said Dr. Krishna Ella, Chairman and Managing Director Bharat Biotech.

"For us, this agreement is a milestone in the MTBVAC project. Indonesia, the Philippines, Pakistan and South Africa, among others, where tuberculosis is a public health problem due to its high incidence", said Esteban Rodríguez, CEO, Biofabri.

"Accelerating efficacy studies for TB vaccines that have shown better protection than BCG in different preclinical models and to be immunogenic and safe in humans, as is the case of MTBVAC, is possible as it has been

done for Covid vaccines.

The experience of Bharat Biotech will reinforce the collaboration with TBVI and IAVI. We are ready, as soon that we can demonstrate that MTBVAC protects against pulmonary forms of TB, the sooner we can begin to save live and to have huge impact in TB pandemic, including multidrug resist forms of TB" stated Professor Carlos Martín, principal investigator, TB Vaccine project, University of Zaragoza, Spain.

Drug-resistant/multidrug-resistant TB is becoming a growing problem due treatment of DR/MDR TB is arduous, expensive and not always successful. A vaccine that prevents TB disease would be a big step to tackle the DR/MDR TB problem.

A vaccine against tuberculosis is more necessary than ever and, thanks to the different agreements promoted by Zendal Group through the biopharmaceutical company BIOFABRI, it is possible to speed it up, stated the company.

WHO selects Biological E to transfer mRNA COVID vaccine tech

Apr 01, 2022

Indian biotechnology and biopharmaceutical company Biological E has been selected as a recipient of mRNA technology from the World Health Organization (WHO) technology transfer hub.

Bio E already manufactures a number of critical vaccines, including Corbevax, a second-generation vaccine for COVID-19.

"After reviewing a number of proposals from India, WHO's Product Development for Vaccines Advisory Committee (PDVAC) today selected the company BiologicalE (Bio E) as a recipient of mRNA technology from the WHO technology transfer hub," the WHO said in a statement issued on Friday.

"WHO and partners will work with the Indian government and Bio E to develop a roadmap and put in place the necessary training and support so that the company can start producing mRNA vaccines as soon as possible," the apex public health body said.

Primarily set up to address the COVID-19 emergency, the WHO technology transfer hub has the potential to expand manufacturing capacity for other products as well, including treatments, and target other priorities such as malaria, HIV and cancer, it said.

Announced on 21 June 2021, the objective of the technology transfer hub is to build capacity in low- and middle-income countries to produce mRNA vaccines through a centre of excellence and training (the mRNA vaccine technology hub).

Hyderabad-based Bio E recently received emergency use authorisation

(EUA) from India's drug regulator for its coronavirus vaccine--Corbevax--which is country's first indigenously developed Receptor Binding Domain (RBD) Protein sub-unit vaccine against COVID-19 for the 12 to 18-year age group.

Dr. Reddy's Laboratories and MediCane Health Announce the Launch of Medical Cannabis Products in Germany

April 01, 2022

Dr. Reddy's Laboratories Ltd. (BSE: 500124, NSE: DRREDDY, NYSE: RDY, NSEIFSC: DRREDDY, along with its subsidiaries together referred to as "Dr. Reddy's") and MediCane Health Inc. (along with its subsidiaries together referred to as "MediCane") today announced the launch of its medical cannabis product in Germany.

As part of a collaboration between Dr. Reddy's and MediCane that started in 2021, MediCane will supply the medical cannabis products to Dr. Reddy's from its EU-GMP-certified facilities in Portugal along with providing logistical and regulatory support. As the exclusive distributor of the products in Germany, Dr. Reddy's will provide access to MediCane's medical cannabis products under its own brand supported by a specialized field force that can provide education on the use of the products and guidance on the health insurance reimbursement process to healthcare professionals.

The launch marks MediCane's entry into the pharmaceutical sector of a major European market. For Dr. Reddy's, the launch reinforces its presence in Germany's growing medical cannabis market, building on its recent acquisition of Nimbus Health GmbH that specializes in the distribution, registration, sales and marketing of medical cannabis.

Dr. Reddy's and MediCane have also signed an agreement for the co-funding of a phase II clinical trial for a cannabis product aimed at symptom relief of Behavioral and Psychological Symptoms of Dementia (BPSD). Dr. Reddy's will hold exclusive sales and marketing rights for such product in Europe (except Russia and CIS countries) upon completion of such trial. The parties expect to commence the clinical trial of the product during the second half of 2022. BPSD refers to the spectrum of commonly observed non-cognitive and non-neurological symptoms of dementia, such as agitation, aggression, psychosis, depression, and apathy.

Patrick Aghanian, Head of European Generics, Dr. Reddy's, said: "This collaboration with MediCane Health demonstrates Dr. Reddy's commitment to take a leadership position in Europe's rapidly growing medical cannabis market. With MediCane, we join forces with a unique and differentiated research-based partner in the medical cannabis field. We are very pleased about the strategic, multi-dimensional collaboration with MediCane, which further complements our mission to accelerate access to medical cannabis to meet unmet patient needs and improve the quality of life of patients."

Yossi BenAmram, co-founder and Group CEO, MediCane, said: "This collaboration articulates MediCane's

strategy to develop evidence-based medical products and partnering with leading pharmaceutical companies to maximize the potential of these drugs for patients.

This collaboration is a very important step for MediCane, for the short, medium and long term and we couldn't be more excited to partner with a reputable and resourceful company like Dr. Reddy's. With MediCane's agro-technical and biological cannabis-specific R&D resources and know-how, and Dr. Reddy's proven sales, marketing and distribution capabilities, with wide geographic access in line with our strategy, as well as powerful regulatory and R&D capabilities for generic drug development, I believe this synergistic partnership can be at the forefront of the European medical cannabis market makers in the foreseeable future."

Covishield, Covaxin prices drop to ₹225 per shot day before booster drive begins

A day before the drive to administer precautionary Covid-19 vaccine dose to all adults begins, both Covishield and Covaxin manufacturers have decided to reduce the prices for private hospitals.

The Serum Institute of India has cut the rates of Covishield from ₹600 to ₹225 per dose, while Bharat Biotech has brought down the price of Covaxin from ₹1,200 to ₹225.

SII's Adar Poonawalla and Bharat Biotech cofounder Suchitra Ella took to Twitter to make the announcement. "We are pleased to announce that after discussion with the Central Government, SII has decided to revise the price of COVISHIELD vaccine for private hospitals from Rs.600 to ₹ 225 per dose. We once again commend this decision from the Centre to open precautionary dose to all 18+," Poonawalla tweeted.

A little later, Ella wrote: "Announcing #CovaxinPricing. We welcome the decision to make available precautionary dose for all adults. In consultation with the Central Government, we have decided to revise the price of #COVAXIN from ₹ 1200 to ₹ 225 per dose, for #privatehospitals."

Phablecare Raises ₹187 Cr In Funding

April 11, 2022

Phablecare, a continual illness administration startup, on Monday stated it has raised ₹187 crore in a funding spherical led by Kalaari Capital, which additionally noticed participation of Aflac Ventures, Digital Horizon and Stride Ventures together with present buyers Omron Ventures, SOSV, Social Starts, and Fresco Capital.

hablecare's companies are utilized by over 30 lakh sufferers, 1,000 pharmacists. An official assertion stated the corporate's valuation has grown six occasions in a yr with out delving a lot into the main points.

"Our focus over the next two years would be to take the technology to over 30 million Indian households and over 1 lakh super specialist doctors in India and capture 25 per cent of the market," its co-founder Sumit Sinha stated.

In March 2021, it had raised ₹90 crore in a spherical led by Manipal Hospitals and obtained a further ₹14 crore from Omron Ventures by main capital infusion and a enterprise debt and a enterprise debt facility of ₹45 crore from Stride Ventures.

Research and Govt. News

S&T Ministry, India to help commercialise two new vacci nes

March 29, 2022

Union Minister of State (Independent Charge) Science & Technology; Minister of State (Independent Charge) Earth Sciences; Minister of State PMO, Personnel, Public Grievances, Pensions, Atomic Energy and Space, Dr. Jitendra Singh has called for equal stake participation by the industry to sustain startups.

The Minister was speaking at a ceremony where the Technology Development Board (TDB) of the Ministry of Science & Technology and M/s Sapigen Biologix Private Limited, Hyderabad, helmed by Dr. Krishna Ella of Bharat Biotech Ltd, signed an agreement for the development and commercialization of two novel vaccines – an intranasal vaccine for Covid-19 and a vaccine for malaria named `RTS, S'.

Under the agreement, TDB would provide financial support of Rs. 100 Crores out of the total project cost estimated at ₹311.30 Crores. M/s Sapigen Biologix Private Limited would set up a state-of-the-art cGMP facility in Bhubaneswar for the project.

The nasal Coronavirus vaccine is expected to give a new thrust to the fight against the infection as it will generate a mucosal immune response, thereby protecting both the upper and lower respiratory systems. The plant will use a technology platform developed by Washington University School of Medicine in St Louis. It is reported to have several advantages. For instance, it will require a single dose of 0.1 ml instead of 2 doses of 0.5 ml each of I-generation vaccines. Also, it can be administered even by untrained health workers, and self-immunization will be possible.

The RTS, S Malaria Vaccine, in turn, is a vaccine that was recently recommended by the World Health Organization (WHO)'s top advisory bodies for a phased introduction in selected areas of sub-Saharan Africa. The vaccine results from 30 years of research and development by GlaxoSmithKline and through a partnership with PATH and with support from a network of African research centres.

M/s Sapigen Biologix Private Limited aims to produce 100 million doses/ annum of intranasal Covid-19 vaccine by April 2023 and 15 million doses/ annum of the RTS, S Malaria vaccine by the end of April 2025.

Bharat Biotech and TDB have also agreed to support another initiative, where each of them will contribute Rs.200 crores to form an Rs. 400 Crores fund to support startups in different fields across India using the services of professional agencies with

flexible terms and conditions.

Dr. Jitendra Singh noted that the vaccine strategy of India symbolised Prime Minister Narendra Modi's idea of an Atma Nirbhar Bharat as it aims to bring pharma, industry, and academia together in a partnership with an eye on meeting the current as well as possible future challenges.

Hon'ble Supreme Court fixes time-lines for filing of claims for payment of ex-gratia assistance to families of COVID-19 deceased

APRIL 11, 2022

The Hon'ble Supreme Court vide its Order dated 24th March 2022 in the Miscellaneous Application No. 1805 of 2021 in Writ Petition (C) No. 539 of 2021 has fixed the following time-lines for beneficiaries to file claims for payment of ex-gratia assistance to families of COVID-19 deceased as announced by National Disaster Management Authority.

The key directions issued by the Hon'ble Court are:

An outer time limit of sixty days shall be applicable from 24th March 2022 to file the claims for compensation in case the death occurred due to COVID-19 prior to 20th March 2022. For any future deaths, ninety days' time shall be provided from the date of death due to COVID-19 to file the claim for compensation.

The earlier order to process the claims and to make the actual payment of compensation within a period of thirty days from the date of receipt of claim shall continue to be enforced.

The Hon'ble Court however directed that in case of extreme hardship where any claimant could not make an application within the time prescribed, it will be open for the claimant to approach the Grievance Redressal Committee and make the claim through Grievance Redressal Committee which shall be considered by the Grievance Redressal Committee on case to case basis and if it is found by the Grievance Redressal Committee that a particular claimant could not make the claim within the stipulated time which was beyond their control his/her case may be considered on merits.

Moreover, the Hon'ble Court also directed that in a bid to minimize the risk of fake claims, a random scrutiny of the 5% of the claim applications shall be made at the first instance.

If it is found that anybody has made a fake claim, the same shall be considered under Section 52 of the DM Act, 2005 and liable to be punished accordingly.

New materials & processes for carbon capture and utilization could show new light for global warming challenge

APRIL 11, 2022

A group of scientists have computationally designed a hybrid material which can absorb greenhouse gas methane, converting it to clean Hydrogen and also simulated a process of capturing carbon dioxide in-situ and converting it to high purity hydrogen from non-fuel grade bioethanol. They have also designed a facility that can test such materials and help further carbon capture research at the institute.

Given the global warming potential of greenhouse gases, scientists are trying to explore innovative methods of absorbing these gases and converting them to useful substances. New materials that can play dual role of absorption as well as conversion is the new challenge area for scientist in carbon capture innovation.

Responding to the challenge, in a series of researches on carbon capture and utilization scientists from Indian Institute of Chemical Technology (IICT), Hyderabad have not only computationally designed a hybrid material that can capture methane and also act as catalyst to convert it to high purity hydrogen, but also simulated and designed a process for in situ capture of carbon dioxide and its conversion to high purity hydrogen from non-fuel grade bioethanol through a mechanism called the optimized intensified chemical looping reforming. The later research has been published in the Elsevier journal Chemical Engineering and Processing.

They researchers have also fabricated a facility that can further carbon capture and conversion research at the institute. The facility, a dual operational fixed cum fluidized bed reactor system (FBR) can carry out sorption enhanced steam methane reforming (SESMR) for high purity H2 production based on the modelling and preliminary experimental studies.

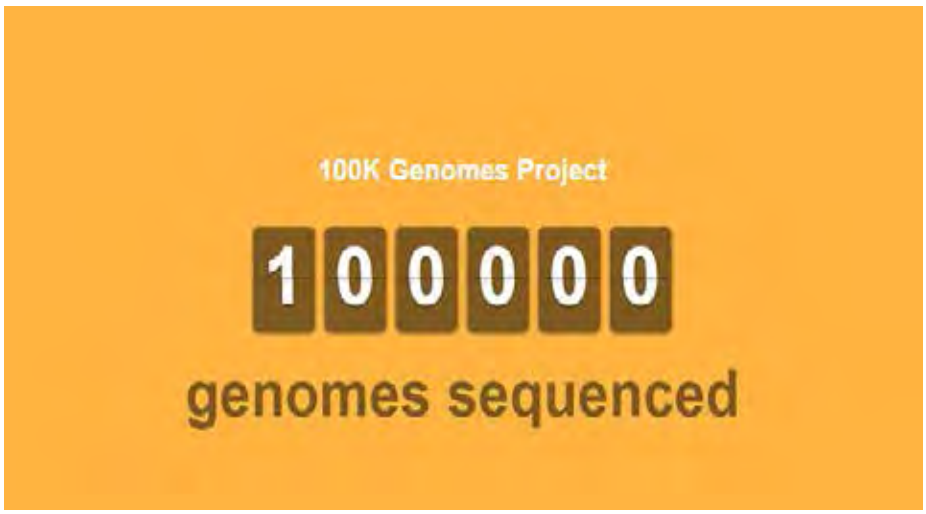
The FBR facility has been successfully commissioned recently in Jan 2022 at CSIR-IICT, Hyderabad, under a Mission Innovation Project supported by Department of Science and Technology to IICT Hyderabad. It is unique and available for the first time in the country to test the performance of dual functional materials for SESMR in fluidized bed reactor system. SESMR offers specific advantages of in-situ CO2 removal through sorbents and thereby overcomes the equilibrium limitations of steam reforming and leads to high purity H2 production. Potential dual functional materials identified from theoretical predictions are now being synthesized and simultaneously FBR operating conditions are being optimized for existing sorbent/catalyst materials for meeting increasing challenges of carbon capture and utilization and associated research.

Publications: 1) Shadab Alam, N. Lingaiah, Y. Soujanya, C. Sumana, Intensified chemical looping reforming processes with in-situ CO2 capture for high purity H2 production from non-fuel grade bioethanol Chem. Eng. Process.: Process Intensif., Vol. 171,2022, 108733, ISSN 0255-2701, https://doi.org/10.1016/j.cep.2021.108733. 2)

First 100,000 genomes released by USA scientists

Mar 25, 2022

All of Us, an ambitious health and genetics study aiming to enroll 1 million volunteers who represent the diversity



of the United States, has reached a major milestone: the first release of nearly 100,000 whole genomes. The DNA sequences are tied to anonymized health records from the participants, allowing the study of how gene variants influence health.

The data made available today will be a bonanza for exploring the interplay among DNA, the environment, and diseases, particularly in people who identify as Black and Hispanic, who are missing from most genomic studies, researchers say.

"This data access provides a huge leap for genetics research," says Cristen Willer of the University of Michigan, Ann Arbor, who studies the genetics of cardiovascular and metabolic diseases. She's disappointed, however, that at least for now, only scientists at U.S. institutions can use the data.

All of Us is modeled after similar studies in other countries, such as the UK Biobank, which holds genome and health data on 500,000 people of mostly European ancestry.

The U.K. project has tied hundreds of DNA markers that vary among people to traits and illnesses, from arthritis to heart disease. Started in 2018, the All of Us program run by the National Institutes of Health (NIH) has enrolled about 330,000 participants so far.

The data released today include whole genome sequencing data for more than 98,600 people, much of them linked to electronic health records, measurements from brief clinical exams, and survey responses.

The All of Us project, which has cost more than $2 billion so far, had to halt enrollment early in the COVID-19 pandemic but is again steadily recruiting. Denny hopes to reach 1 million participants by the end of 2026.

Scientists publish the first complete human genome

APRIL 01, 2022

Scientists published the first complete human genome, filling in gaps remaining after previous efforts while offering new promise in the search for clues regarding disease-causing mutations and genetic variation among the world's 7.9 billion people. Researchers in 2003 unveiled what was then billed as the complete sequence of the human genome. But about 8% of it had not been fully deciphered, mainly because it consisted of highly repetitive chunks of DNA that were difficult to mesh with the rest.

A consortium of scientists resolved that in research published in the journal Science. The work was initially made public last year before its formal peer review process. "Generating a truly complete human genome sequence represents an incredible scientific achievement, providing the first comprehensive view of our DNA blueprint," Eric Green, director of the National Human Genome Research Institute (NHGRI), part of the U.S. National Institutes of Health, said in a statement.

"This foundational information will strengthen the many ongoing efforts to understand all the functional nuances of the human genome, which in turn will empower genetic studies of human disease," Green added.

The consortium's full version is composed of 3.055 billion base pairs, the units from which chromosomes and our genes are built, and 19,969 genes that encode proteins. Of these genes, the researchers identified about 2,000 new ones. Most of those are disabled, but 115 may still be active. The scientists also spotted about 2 million additional genetic variants, 622 of which were present in medically relevant genes.

The consortium was dubbed Telomere-to-Telomere (T2T), named after the structures found at the ends of all chromosomes, the threadlike structure in the nucleus of most living cells that carries genetic information in the form of genes.

"In the future, when someone has their genome sequenced, we will be

able to identify all of the variants in their DNA and use that information to better guide their healthcare," Adam Phillippy, one of the leaders of T2T and a senior investigator at NHGRI, said in a statement. "Truly finishing the human genome sequence was like putting on a new pair of glasses. Now that we can clearly see everything, we are one step closer to understanding what it all means," Phillippy added.

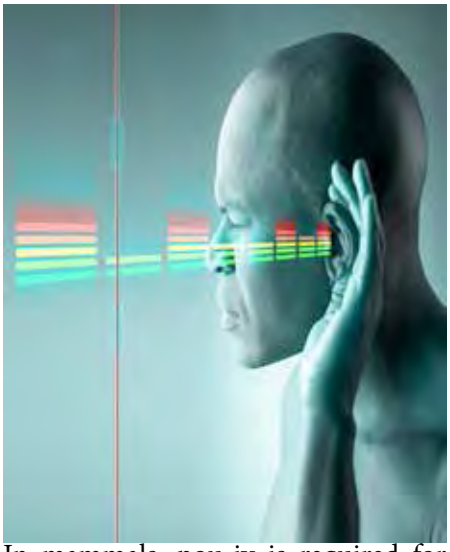
Among other things, the new DNA sequences provided fresh detail about the region around what is called the centromere, where chromosomes are grabbed and pulled apart when cells divide to ensure that each "daughter" cell inherits the proper number of chromosomes.

"Uncovering the complete sequence of these formerly missing regions of the genome told us so much about how they're organized, which was totally unknown for many chromosomes," Nicolas Altemose, a postdoctoral fellow at the University of California, Berkeley, said in a statement.

Gene linked to hearing in humans also linked to touch in sea anemones

April 1, 2022

Auditory cells in the vertebrate inner ear that pick up vibrations to enable hearing are called hair cells. While they aren't known to be able to hear, sea anemones have similar-looking cells on their tentacles -- also called hair cells -- that they use to sense the movements of their prey.



In mammals, pou-iv is required for proper hair cell development, and mice that lack pou-iv are deaf. Sea anemones also have a pou-iv gene, but, prior to the research team's work, no one had ever examined its role in anemone hair cell development.

The researchers knocked out the pou-iv gene in a sea anemone and found that it resulted in abnormal development of tentacular hair cells, removing the animals' response to touch. They also found that pou-iv is needed to turn on the polycystin 1 gene in sea anemones, which is required for normal fluid flow sensing by vertebrate kidney cells. Taken together, this suggests that pou-iv has a very ancient role in the development of touch sensation that goes back at least as far as our last common ancestor with sea anemones.

"This study is exciting because it not only opened a new field of research into how mechanosensation develops and functions in a sea anemone, which has ample potential for novel and important discoveries (to be reported in the future)," Nakanishi said, "but it also informs us that the building blocks of our sense of hearing have ancient evolutionary roots dating back hundreds of millions of years into the Precambrian."

The paper, titled "Cnidarian hair cell development illuminates an ancient role for the class IV POU transcription factor in defining mechanoreceptor identity," was published in eLife. Additional authors included Ethan Ozment, Arianna N. Tamvacakis and Jianhong Zhou from the U of A. Pablo Yamild Rosiles-Loeza, Esteban Elías Escobar-Hernandez and Selene L Fernandez-Valverde from The Center for Research and Advanced Studies of the National Polytechnic Institute in Irapuato, Mexico, served as co-authors.

Cryo-electron microscopy facility opens at CCMB Hyderabad

25 MARCH 22

A cutting edge facility for cryo-electron microscopy was inaugurated by Director-General, Council of Scientific and Industrial Research (CSIR), Dr Shekhar Mande, at Hyderabad-based Centre for Cellular and Molecular Biology (CCMB) on Friday.

The CSIR-funded cryo-electron microscopy will allow scientists to look at matter to its atomic details, CCMB researchers in a release said. A close look at molecules such as proteins has been at the forefront of understanding the structural details of living cells and drive drug discovery. In the last two years, such insights have enabled the scientists and pharmaceutical industries to understand the coronavirus and find out potential cures, CCMB said.

"The facility is expected to help us view the functioning of several molecular machines that operate in the cell that were earlier not amenable to conventional structure determination methods such as X-ray crystallography or Nuclear Magnetic Resonance (NMR)," said Dr Rajan Sankaranarayanan, an eminent structural biologist at CCMB.

Dr Vinay K Nandicoori, Director, CCMB said that the new facility will be accessible to researchers in CCMB, other CSIR labs, research institutes, universities, biotech and pharmaceutical industries. The facility has been largely built in CCMB in the last two years during Covid pandemic". This facility will allow working with samples at cryogenic temperatures, around -173 degree Celsius and photographing individual molecules using the electron microscope.

Methane-eating bacteria convert greenhouse gas to fuel

March 27, 2022

By studying the enzyme the bacteria use to catalyze the reaction, a team at Northwestern University now has discovered key structures that may drive the process.

Their findings, to be published Friday (March 18) in the journal Science, ultimately could lead to the development of human-made biological catalysts that convert methane gas into methanol. "Methane has a very strong bond, so it's pretty remarkable there's an enzyme that can do this," said Northwestern's Amy Rosenzweig, senior author of the paper. "If we don't understand exactly how the enzyme performs this difficult chemistry, we're not going to be able to engineer and optimize it for biotechnological applications."

The enzyme, called particulate methane monooxygenase (pMMO), is a particularly difficult protein to study because it's embedded in the cell membrane of the bacteria. In this study, the team used a new technique entirely. Christopher Koo, the first author and a Ph.D. candidate in Rosenzweig's lab, wondered if by putting the enzyme back into a membrane that resembles its native environment, they could learn something new. Koo used lipids from the bacteria to form a membrane within a protective particle called a nanodisc, and then embedded the enzyme into that membrane.

"By recreating the enzyme's native environment within the nanodisc, we were able to restore activity to the enzyme," Koo said. "Then, we were able to use structural techniques to determine at the atomic level how the lipid bilayer restored activity. In doing so, we discovered the full arrangement of the copper site in the enzyme where methane oxidation likely occurs."

The researchers used cryo-electron microscopy (cryo-EM), a technique well-suited to membrane proteins because the lipid membrane environment is undisturbed throughout the experiment. This allowed them to visualize the atomic structure of the active enzyme at high resolution for the first time.

"As a consequence of the recent 'resolution revolution' in cryo-EM, we were able to see the structure in atomic detail," Rosenzweig said. "What we saw completely changed the way we were thinking about the active site of this enzyme."

Rosenzweig said that the cryo-EM structures provide a new starting point to answer the questions that continue to pile on. How does methane travel to the enzyme active site? Or methanol travel out of the enzyme? How does the copper in the active site do the chemical reaction? Next, the team plans to study the enzyme directly within the bacterial cell using a forefront imaging technique called cryo-electron tomography (cryo-ET).

Bad Science

Bose Institute Scientists earn retraction due to manipulation

Professor Joyoti Basu is in Department of Chemistry, Bose Institute. Her areas of specialization are Molecular and Cellular Biology with special reference to mycobacteria. Dr Basu was awarded the INSA Medal for Young Scientists (1989) and the National Bioscience Award of the Department of Biotechnology (2002). She is a Fellow of Indian Academy of Sciences, Bangalore and National Academy of Sciences (India), Allahabad.

According to the retraction on 24 Feb 2022, Following the publication of this article "Novel Role of Phosphorylation-Dependent Interaction between FtsZ and FipA in Mycobacterial Cell Division", concerns were raised regarding the results presented in several figures.

Specifically,

In Fig. 2A and 9C, the following results appear similar despite being used to represent different experimental conditions:

- The Fig. 2A immunoblotted (IB): FipA panel (lanes 1 and 2) and the Fig. 9C IB: FtsZ panel (bottom right) flipped horizontally.
- The Fig. 2A IB: FtsZ panel and the Fig. 9C IB: anti-S panel.
- The Fig. 9C IB: FipA panel (top right) and the Fig. 9C IB: FtsQ panel (center right).

In Fig. 2A (top panel), lanes 1 and 2 are labelled IB: FipA and lane 3 is labelled IB: PPK1, but no explanation was provided for how the blot was probed with antibodies against two proteins, or how proteins of different expected molecular weights are presented side-by-side.

In Fig. 3A (top left panel), there appears to be repetitive elements in the background pattern of lane 1.

In Fig. 4A, there appears to be vertical discontinuity between lanes 2 and 3 of the Coomassie gel.

In Fig. 6C, when color levels are adjusted, the overall background is lacking detail, and there are regular shapes around the areas of fluorescence.

In Fig. 9A IB: FipA panel, there appears to be vertical discontinuity between lanes 1 and 2.

In Figure S6A, when color levels are adjusted, the background is lacking detail, and areas near the cells are unlike the overall background.

The corresponding author provided raw images for western blots presented in Fig. 2A, 3A and 9C, and the Coomassie gel presented in Fig. 4A. The raw images for western blots do not appear to show the full blot area. The corresponding author stated that raw image data were not available for Fig. 6C, 9A, and Figure S6A. The corresponding author apologized that raw data for all figures could not be retrieved due to the time elapsed since the experiments were performed and due to inadequate archiving.

The corresponding author stated that the duplicate panels in Fig. 2A and 9C were due to errors in the preparation of Fig. 9C, and provided a version of Fig. 9 in which the panels of concern were replaced. For Fig. 4A, the corresponding author noted that lanes from different parts of the Coomassie gel were cropped together for presentation, and this explanation was confirmed by the raw image provided.

The raw image data provided for Fig. 2A (top panel) and Fig. 3A did not satisfactorily resolve the concerns described above. Raw image data was not available for Fig. 9A, and the author provided replicate data. The PLOS ONE Editors remain concerned about these figures.
The corresponding author stated that the issue in Fig. 6C could be due to background noise, and they were unable to identify the issue in Figure S6A. As no raw data were available, the concerns in these figures were not resolved.

The issues impact multiple figure panels, and underlying data were available for only some of the affected figures. The raw data or replacement panels that were available did not satisfactorily address all the above issues. In light of the concerns affecting multiple figure panels that question the integrity of these data, the PLOS ONE Editors retract this article.

Kamakshi Sureka, Tofajjen Hossain, Partha Mukherjee, Paramita Chatterjee, Pratik Datta and Manikuntala Kundu were co-authors of the study.

COVID-19 scientists are facing an avalanche of abuse, Science survey shows

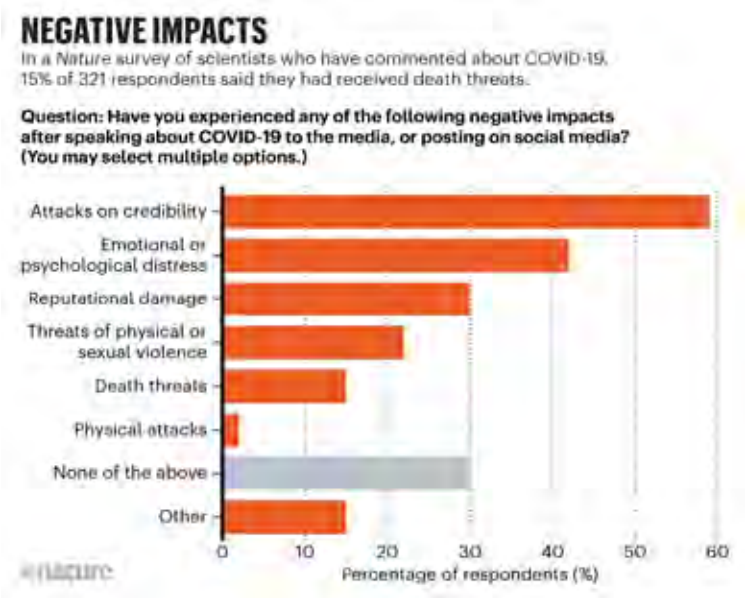
24 Mar 2022

To better understand the level of intimidation, its effects, and the ways scientists cope with it, Science asked 9585 researchers who have published on COVID-19 to fill out an online survey about their experiences. Of 510 who responded, 38% reported at least one type of attack, ranging from insults to death threats, delivered on social media, by email or phone, or sometimes even in person. Those who were harassed described a range of effects on their lives, including workplace problems and mental health issues.

The findings broadly align with other indications that harassment is hitting science and related fields. The Geneva-based nonprofit Insecurity Insight reports 517 instances of physical violence related to COVID-19, including 10 health workers killed, 24 kidnapped, and 89 injured.

A study published in the American Journal of Public Health on April 13, 2022 (https://ajph.aphapublications.org/doi/10.2105/AJPH.2021.306649) found harassment experiences at 57% of 583 U.S. local health departments and 80 departures by officials who reported harassment.

A Nature survey published in October 2021 (https://www.nature.com/articles/d41586-021-02741-x) gave a startling figure: Eighty-one percent of 321 scientists who had frequently discussed COVID-19 in the media reported receiving at least occasional personal at-



tacks, with 25% saying these attacks were common or constant.

The pandemic has nonetheless made things far worse for some researchers. More than half of the COVID-19 researchers who reported harassment said it was a new experience for them, and a further 31% said the pandemic had increased the problem. One reason is greater exposure: These researchers grew their audiences during the pandemic or entered the public sphere for the first time. The pandemic also struck at a time when polarization was already on the rise.

Many other people working in the public interest—from election officials to school board members—are under attack as well, says Sarah Sobieraj, a sociologist at Tufts University who studies digital abuse and harassment. The widespread vitriol, she says, "impacts not just those people who are attacked, but all of us who rely on these kinds of professionals to do the work to keep societies functioning in a healthy way."

Some commentators say increased attention to the new victims and the shocking experiences they describe may be the catalyst for research institutions to finally pay some attention to the issue, rather than treating it as a problem for researchers to solve on their own—or, worse, blaming and even punishing them for the abuse they experience.

US Cancer researcher faked data for 24 images in work funded by nine NIH grants

March 31, 2022

A cancer researcher faked data in a grant application, her PhD thesis, and seven published papers, according to the U.S. Office of Research Integrity.

Toni Brand, who earned her PhD from the University of Wisconsin and served as a postdoc at the University of California, San Francisco (UCSF), "engaged in research misconduct by knowingly or recklessly falsifying or fabricating western blot data, by reusing and relabeling data to represent expression of proteins in control experiments measuring the purity of cytoplasmic and nuclear cell fractionation, measurements of proteins of interest, and measurements of the same protein under different experimental conditions or loading controls," the ORI said in a report published today.

One of Brand's papers, published in Science Signaling, was retracted in November 2021. The notice said that the Wisconsin committee found that 11 images in the paper were "duplicated, mislabeled, or had other anomalies" but "found that these issues were due to carelessness and lack of attention to detail rather than through any intent to deceive, and thus concluded that no research misconduct was committed."

Moderna recalls thousands of COVID vaccine doses in Europe

March 14, 2022

Moderna Inc said on Friday it was recalling 764,900 doses of its COVID-19 vaccine made by its contract manufacturer Rovi (ROVI.MC) after a vial was found contaminated by a foreign body.

No safety issues have been identified, Moderna said about the lots that were distributed in Norway, Poland, Portugal, Spain and Sweden in January.

The drugmaker said the contamination was found in just one vial, and it was recalling the whole lot out of "an abundance of caution". It did not disclose what was found in the vial.

Japanese authorities last year suspended the use of some doses of the vaccine, which Moderna later recalled, after an investigation found stainless steel contaminants in some vials.

Over 900 million doses of the Moderna COVID-19 vaccine have been administered worldwide to date.

Moderna said it did not believe the contamination posed a risk to other vials in the lot.

Lockdowns, Not the Pandemic, Created Havoc

April 1, 2022

It may be years before we fully realize the ramifications of the lockdown policies governments around the world have imposed on their citizens in response to covid-19, but evidence of the costs is starting to trickle in.

A recent study (https://www.cdc.gov/mmwr/volumes/71/su/su7103a5.htm?s_cid=su7103a5_x) conducted by the Centers for Disease Control and Prevention (CDC) surveyed thousands of high school students on the effects of the pandemic. "Since the

beginning of the pandemic," the study reports, "more than half of students found it more difficult to complete their schoolwork (66%) and experienced emotional abuse by a parent or other adult in their home (55%)," which correlated heavily with students who "experienced insecurity via parental job loss (29%), personal job loss (22%), and hunger (24%)."

A related CDC study (https://www.cdc.gov/mmwr/volumes/71/su/su7103a3.htm?s_cid=su7103a3_x), released the same day, examined the effects the pandemic has had on the mental health of high school students. It found that "during the 12 months before the survey, 44.2% experienced persistent feelings of sadness or hopelessness, 19.9% had seriously considered attempting suicide, and 9.0% had attempted suicide."

These findings should be no surprise. Only a few months into the pandemic, the CDC's morbidity and mortality report surveyed people of all ages regarding substance abuse and suicidal thoughts, and young people showed the most dramatic increase compared with precovid surveys. This report was all but ignored, of course, as the demagogues in politics and the media predicted Armageddon if the world didn't embrace their draconian isolation policies.

Now that the Chicken Littles have come home to roost, the real question is whether the findings of these studies are the consequence of the pandemic or the response to it. One CDC representative, speaking of the studies, provided a revealing answer to this question: "This really gives us the evidence to say with certainty that the pandemic was incredibly disruptive for young people and their families" (emphasis added). The "pandemic took a toll," according to every media headline reporting on the studies.

To some, the distinction between the pandemic and the lockdowns may seem like splitting hairs, but the choice of words can have important consequences on present and future policies. The logic behind the social-distancing mandates has been that such policies are necessary to lessen the severity of the pandemic. Even in the face of overwhelming evidence that the lockdowns have proven ineffective, the faithful will always find ways to dismiss the naysayers and urge even more severe mandates (the problem is that we haven't isolated enough!).

It is time for the media to start reporting that it is the lockdowns, the isolationism, and the social-distancing mandates—not the pandemic—that have taken such a toll on teenagers.

Chris Calton is an economic historian and a former Mises Research Fellow. He was the writer and host of the Historical Controversies podcast. This article was originally published on the Mises Institute.

Pfizer Hired 1,800 Additional Employees In 2021 To Process Huge Increase In Vaccine Adverse Events

April 9, 2022

According to recently leaked secret records, Pfizer hired 1,800 additional full-time employees in the first half of 2021 to deal with "the large increase" in adverse reactions to its COVID vaccination.

"Pfizer has also taken a multiple actions [sic] to help alleviate the large increase of adverse event reports. This includes significant technology enhancements, and process and workflow solutions, as well as increasing the number of data entry and case processing colleagues," the confidential report stated. "To date, Pfizer has onboarded approximately 600 additional full-time employees (FTEs). More are joining each month with an expected total of more than 1,800 additional resources by the end of June 2021."

On April 1, the FDA disclosed 10,000 pages of Pfizer-COVID-19 BioNTech's vaccine evaluation materials, in response to a court order issued in January requiring the company to speed up the process of making the information public.

Last month, the FDA revealed a slew of documents revealing that the company was aware that the mRNA injections could cause over 1,000 different types of side effects.

The most recent findings were made in a document titled "Cumulative analysis of post-authorization adverse event reports" for the Pfizer-BioNTech vaccine, which covered adverse events reported from February 28, 2021 to February 28, 2022.

The documents were first made public in November 2021, but much of the information was censored, including the number of personnel Pfizer claimed to have hired and planned to hire.

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